

Washington County Water Consortium

March 5, 2025

2 to 3:30 pm

Remote meeting - Zoom

(If you are not on the Consortium listserv, please email Adriana.Atcheson@co.washington.mn.us for the Zoom link and access code)

Agenda

2:00 – 2:05

Welcome

Introductions, Announcements

2:05 – 2:20

East Metro Water Resources Education Program (EMWREP) Priorities for 2025

Topic: Over the winter, EMWREP staff met with partners to discuss education needs and wants for the coming year. Hear about identified priorities for 2025 and what education and outreach is planned to come your way!

Presenter: Angie Hong, Water Education Senior Specialist, EMWREP

2:20 – 2:40

From Plan to Action: Woodbury's Environmental Vision

Topic: The City of Woodbury recently adopted its first Environmental Stewardship Plan. The plan aims to promote citywide conservation, social responsibility, and best management practices through strategic investments in preservation, adaptation, mitigation, and maintenance. Hear about the process of plan development, components of the plan, and implementation.

Presenter: Jen McLoughlin, Environmental Resources Manager, City of Woodbury

2:40 – 3:15

Ice Damage to Shoreline Properties

Topic: This winter has generated a some very large ice ridges, which are caused by pushing action of a lake's ice sheet against the shore; scraping, gouging, pushing soil and rock into mounds.

Staff from Carnelian-Marine-St. Croix Watershed District and MN Department of Natural Resources will share what they are seeing on shorelines, how they plan to address an increase in landowner inquiries this spring, and what can/cannot be done to ice ridges after they form.

Consortium attendees are welcome/encouraged to share observations – what you are seeing in your area, if your organization has a plan to address ice ridges, etc.

3:15 – 3:30

Questions/Adjourn

From Plan to Action: Woodbury's Environmental Stewardship Vision

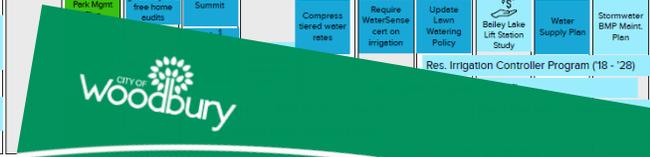
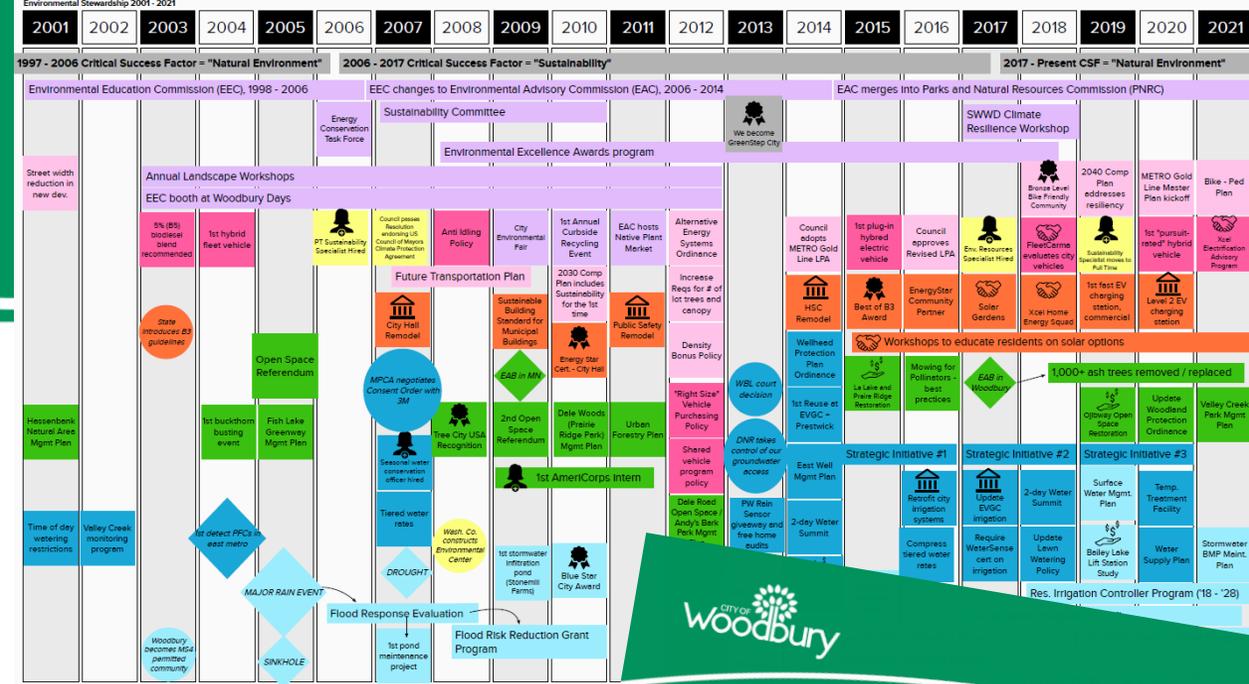
**Jennifer McLoughlin
Environmental Resources Manager**

Agenda

- **Background**
- **Community Engagement**
- **Plan Development**
- **Implementation**
- **Next Steps**



Background



2021

Grassroots effort
Evaluate past initiatives

April 2022

PNRC recommendation to Council

October 2022

Environmental Stewardship Strategic Initiative

- Part I: Environmental Stewardship Plan (ESP)
- Part II: Education and Engagement

2022 - 2024 Strategic Initiative 22-03
Environmental Stewardship
Improving Environmental Outcomes

Critical Success Factor: ENVIRONMENTAL STEWARDSHIP
Understanding that environmental health, economics, and human well-being are interconnected and interdependent, Woodbury is committed to the responsible use and protection of all resources. To preserve our environment for future generations, the City will foster environmental stewardship through focused conservation, social responsibility and best management practices.

The 2040 Comprehensive Plan includes the following guiding principle in support of Environmental Stewardship:
Woodbury is firmly committed to the preservation, responsible use and enhancement of its environment, and recognizes that environmental health, economics and human well-being are interconnected and interdependent. To preserve our environment for future generations, the City will foster environmental stewardship through focused conservation, social responsibility and best management practices. As our local environment faces new challenges, the City will make appropriate investments in preservation, adaptation, mitigation, and maintenance.

Furthermore, one of the implementation items in the 2040 Comprehensive Plan is to develop a plan that identifies actionable items and strategies to help guide preservation, resilience, and adaptation within the community.

In 2021, Council directed staff to work with the Parks and Natural Resources Commission (PNRC) to evaluate the past twenty years of environmental stewardship. Staff created an inventory of key accomplishments, events, projects, activities, programs, and policies and applied it to a timeline, representing the City's leadership in addressing sustainability and environmental issues (see attached infographic). Once complete, the Environmental Stewardship Report and Timeline were presented to City Council and the PNRC. The report showed that the City has made remarkable progress in preservation.

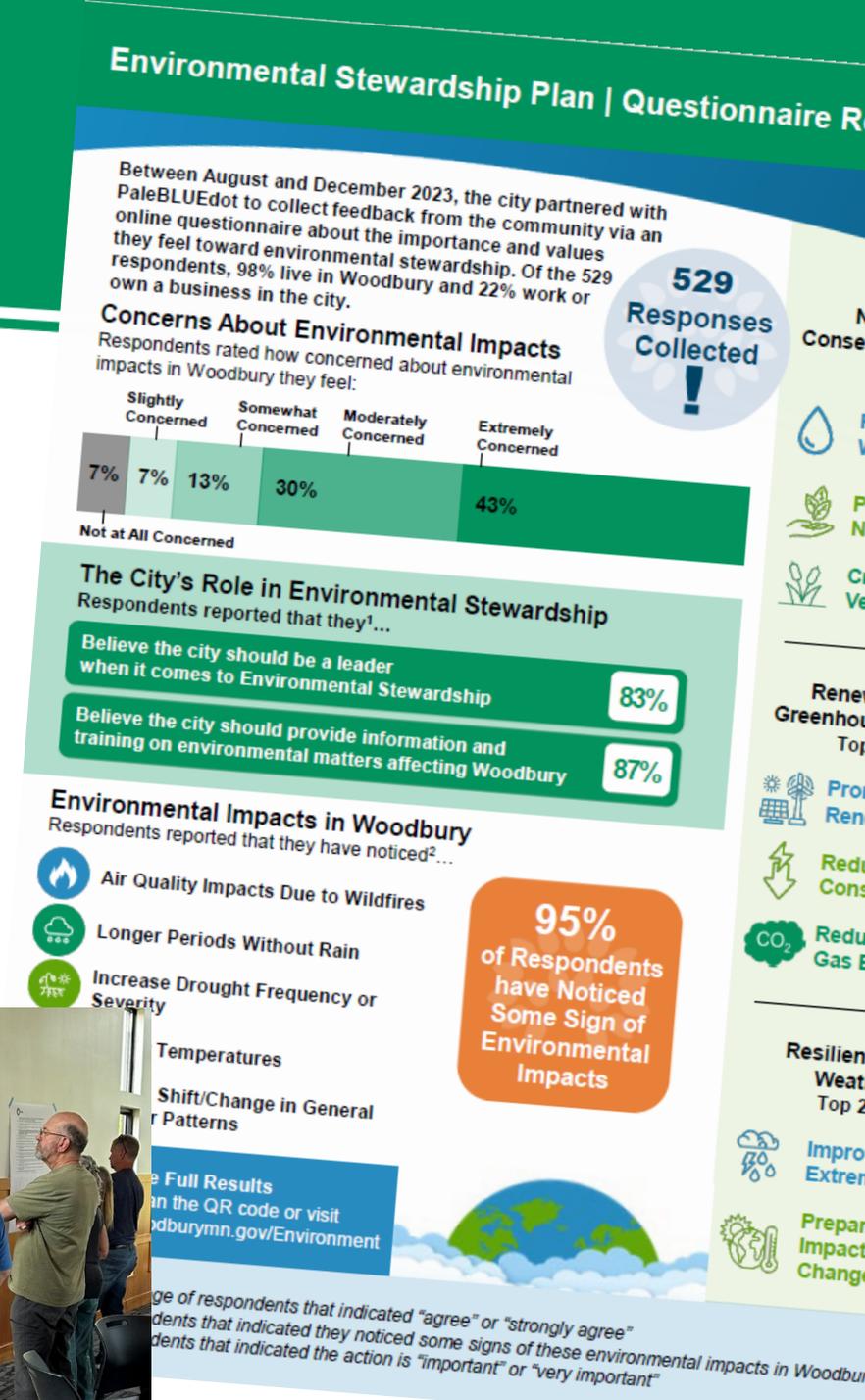
Community Engagement

Phase I – Community priorities

- Online questionnaire (509 responses)
- Communitywide survey (905 responses)
- Four in-person sessions

Phase II – Action prioritization

- Online feedback tool
- Four in-person sessions



Community Engagement

Planning Team

Developed strategic goals and actions for consideration by the Parks and Natural Resources Commission and City Council

- 42 members (residents, PNRC, staff, stakeholders)
- 7 meetings – February-August 2024
- Identified and prioritized plan goals and actions



Plan Format

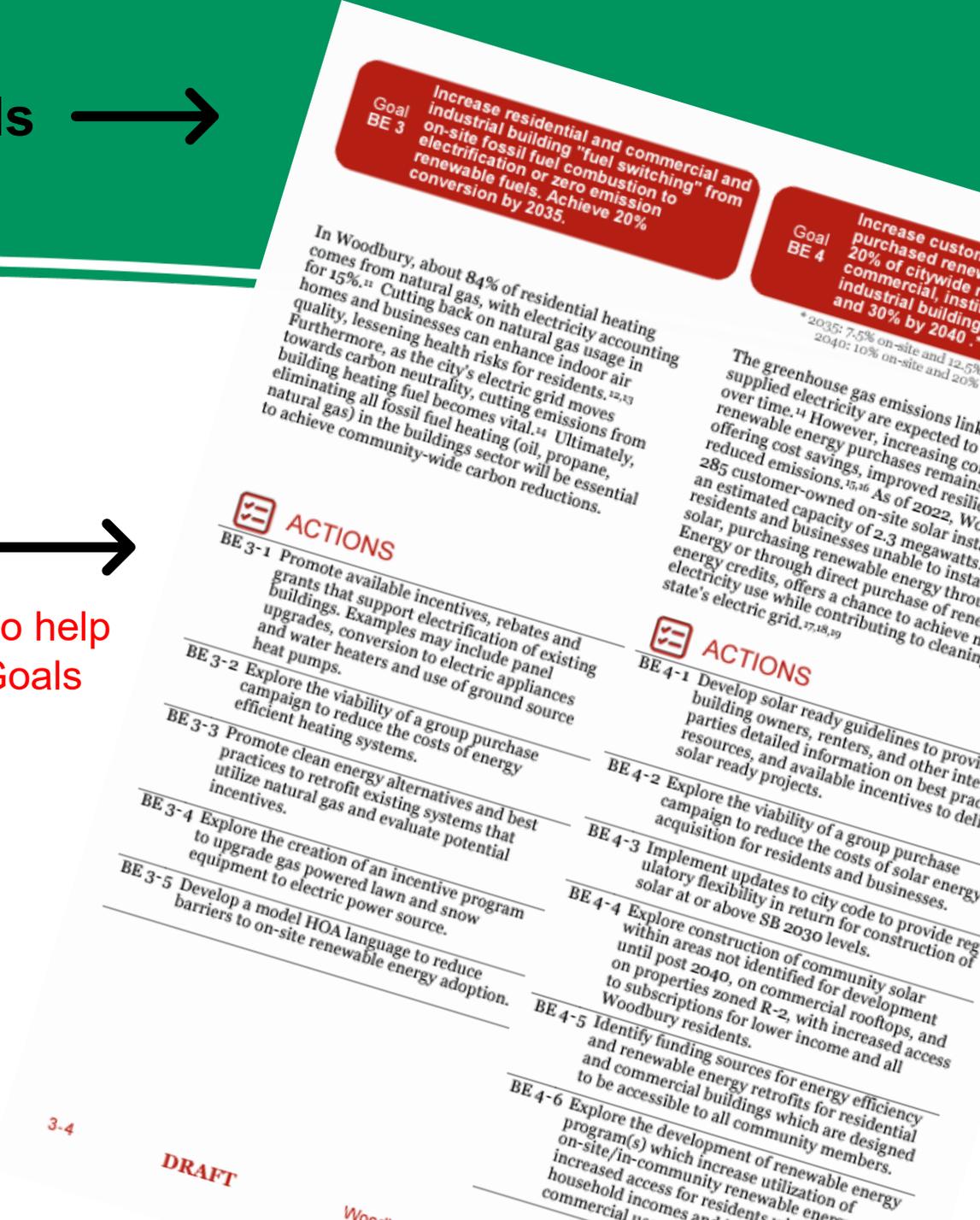
Goals →

8 Plan Sectors
36 Plan Goals



Actions →

Actions are “Tools” to help achieve the plan Goals



Buildings & Energy

Increasing resilience of buildings while reducing environmental impacts through increased energy efficiency, use of renewable energy, and reduction of on-site combustion



Sector Goals

by 2035:



39%

lower greenhouse gas emissions



20%

renewable electricity



5%

less electricity use



30%

less on-site fuel combustion

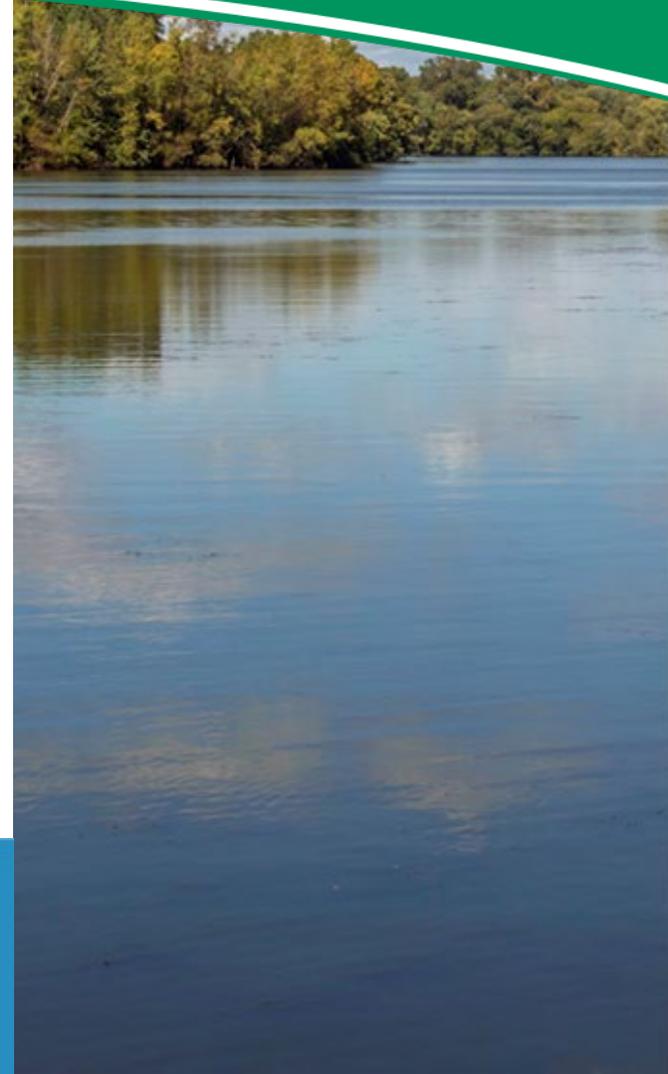


20%

fuel switching from on-site combustion

Water

Reducing impacts associated with water use while increasing Woodbury's resilience to flooding and stormwater management



Sector Goals

by 2035:



10%

reduction in residential water use



10%

reduction in wastewater

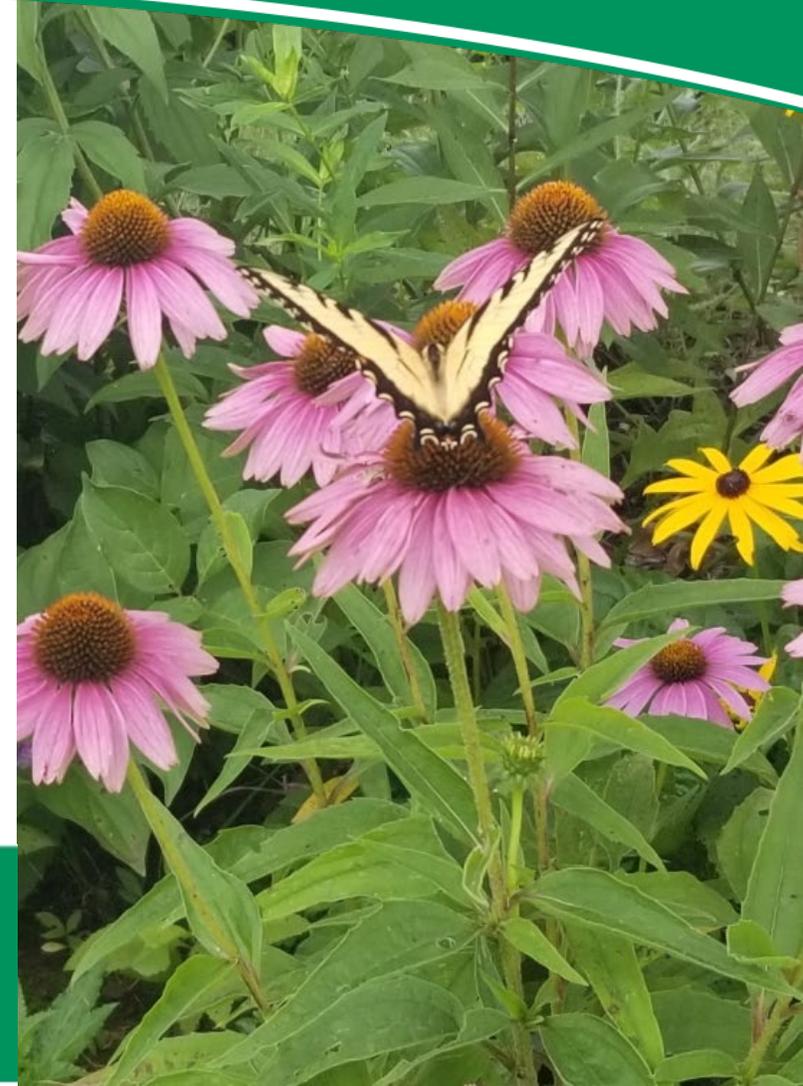


Increased

Water quality and restoration

Greenspace & Ecosystems

Expanding green infrastructure and natural spaces to enhance ecosystem resilience



Sector Goals

by 2035:



2.5%

more tree canopy cover



5 acres

of turf-to-native grass annually



10 acres

reduction in dark impervious cover



100 acres

native landscape restored annually



Increase

ecosystem resilience and biodiversity

Plan Actions

Develop and Finalize Actions

- Planning Team identification
- Thorough staff review
- 160 actions
- Planning Team – final review
- Community prioritization
- Staff buy-in from responsible departments

Sector		Description
Water	Current	W 1-2: Implement the Woodbury Water Wise Implementation Plan
	New	W 2-3: Evaluate requirements for allowable impervious surface
	New	W 2-4: Implement water quality standards for tree preservation
	Expand/Improve	W 3-2: Expand partnerships to improve water resources
Greenspace and Ecosystems	New	W 3-3: Develop a Salt Reduction Plan
	New	GE 1-2: Evaluate locations for solar, trees, and turf conversion
	New	GE 1-3: Develop a tree rebate program
	New	GE 2-2: Implement the city's System-wide Natural Resources Management Plan
	Current	GE 3-1: Promote invasive species control programs
Waste Management	Current	GE 5-1: Expand pollinator habitat
	New	WM 2-1: Partner with Washington County on School Advisory Committee
	Expand/Improve	WM 2-2: Explore compost opportunities with Washington County
	New	WM 2-4: Implement compost collection at city facilities
Buildings and Energy	Expand/Improve	WM 5-1: Expand the city's Purchasing Policy
	New	BE 1-5: Promote alternative roofing materials
	Expand/Improve	BE 2-1: Promote incentives for energy efficiency and renewable energy
	New	BE 3-5: Develop model HOA language regarding on-site renewable energy
	New	BE 5-1: Ensure energy efficient products are evaluated with city facilities
	New	BE 5-2: Conduct a city facility energy audit
Transportation and Land Use	New	BE 5-4: Develop a 5-year plan for city facility energy improvement
	New	BE 8-1: Evaluate city policies to incentivize sustainable building
	Current	TL 2-6: Facilitate public transportation and other transit services
	New	TL 3-4: Evaluate parking standards to reduce underutilized space
Health and Safety	New	TL 5-3: Develop a Fleet Action Plan for city-owned vehicles and maintenance
	Current	TL 6-1: Evaluate the feasibility for city fleet electric vehicles
	New	HS 1-2: Evaluate an anti-idling specification for city contractors
	Expand/Improve	HS 1-3: Promote resilient homes resources
	New	HS 1-5: Develop an emergency response toolkit
Economy	Expand/Improve	HS 3-2: Expand emergency management capacity related to extreme weather
	New	HS 3-3: Promote the city's communication channels and emergency preparedness
Cross-Pollinating Actions	New	E 2-2: Develop outreach campaign and checklist for residents to support the plan
	Expand/Improve	CP 1-1: Identify a sustainable budget to support this plan
	New	CP 1-3: Identify grants and programs for energy efficiency
	Expand/Improve	CP 1-5: Evaluate city code for barriers to implementing this plan
	New	CP 1-6: Evaluate city policies related to waste reduction & recycling
	Expand/Improve	CP 1-8: Develop a Community Engagement and Communication Plan

Two-Year Roadmap (2025-2026)

- **Reflects community priorities**
 - New
 - Current
 - Expand/Improve
- **Staff commitment to initiate**
- **Evaluation every two years**
- **Annual measurement**
- **Online dashboard for tracking**

Environmental Stewardship Plan 2-Year Roadmap 2025-2026

The 2-Year Roadmap incorporates the community's feedback and priorities for the 2024 Environmental Stewardship Plan. The actions outlined in the plan support mitigation, adaptation, and community equity and were prioritized based on specific criteria developed by a resident planning team. Ongoing evaluation, measurement and refinement of these actions are essential to achieving the plan's goals. Every two years, staff will work with the Parks and Natural Resources Commission to update the roadmap.



Water

New	W 2-3: Evaluate requirements for allowable impervious surface.
	W 2-4: Implement water quality standards for tree preservation and green infrastructure.
	W 3-3: Develop a Salt Reduction Plan.
Current	W 1-2: Implement the Woodbury Water Wise Implementation Plan.
Expand/Improve	W 3-2: Expand partnerships to improve water resources.

Greenspace and Ecosystems



New	GE 1-2: Evaluate locations for solar, trees, and turf conversion.
	GE 1-3: Develop a tree rebate program.
	GE 2-2: Implement the city's System-wide Natural Resources Management Plan.
Current	GE 3-1: Promote invasive species control programs.
	GE 5-1: Expand pollinator habitat.



Local Food and Agriculture

New	FA 1-1: Identify potential sites for additional community gardens.
	FA 1-5: Identify potential locations and partnerships for farmers markets.

Transportation and Land Use



New	TL 3-4: Evaluate parking standards to reduce underutilized space.
	TL 5-3: Develop a fleet action plan for city-owned vehicles and mobile equipment.
Current	TL 2-6: Facilitate public transportation and other transit services opportunities.
	TL 6-1: Evaluate the feasibility for city fleet electric vehicles.

Plan at a Glance



Adopted by City Council December 2024

- Two-year planning process
- Extensive community engagement
- 50+ feedback opportunities
- Two-year roadmap
- Ten-year implementation
- Performance metrics
- Woodbury specific

www.woodburymn.gov/environment



Environmental Stewardship
The Plan at a Glance

The Process
The work that went into the Woodbury Environmental Stewardship Plan:

- 2 year planning timeframe
- 5 foundational research study documents
- 42 planning team members
- 11 opportunities for community feedback (8 in-person sessions, 2 online questionnaires, and 1 citywide survey)
- 1,000+ community members providing input

“ Sustainability is important to Woodbury, and residents want the city to focus on protecting water resources and wildlife habitats, creating more native vegetation and tree cover, and promoting renewable energy.”
- City of Woodbury Biennial Community Survey results (2024)

What We Heard Key themes from community input include:

- Leadership**: Woodbury Residents support municipal action and leadership
- Renewable Energy**: Residents want more renewable energy and greenhouse gas reductions
- Climate**: Community members are concerned about climate change
- Conservation**: Natural resource and habitat conservation are widely supported
- Waste**: Waste reduction is important to residents
- Water**: Woodbury should protect and improve water resources

The Plan
Grounded in community input, the Woodbury Environmental Stewardship Plan:

- Addresses 8 Sectors of environmental stewardship
- Through 36 Goals
- Supported by 160 Actions outlining steps that can be taken
- Over a 10 Year implementation timeframe

Environmental Stewardship Sectors
The plan includes eight sectors focused on enhancing environmental stewardship.

- Transportation and Land Use
- Buildings and Energy
- Waste Management
- Water
- Local Food and Agriculture
- Greenspace and Ecosystems
- Health and Safety
- Economy

Plan Outcomes
Successfully implementing the plan will advance 36 environmental stewardship goals and a cumulative reduction of 1,580,000 metric tons of greenhouse gas emissions by 2035. Equal to eliminating 31 Billion Cubic Feet of human-made greenhouse gas emissions into the atmosphere.

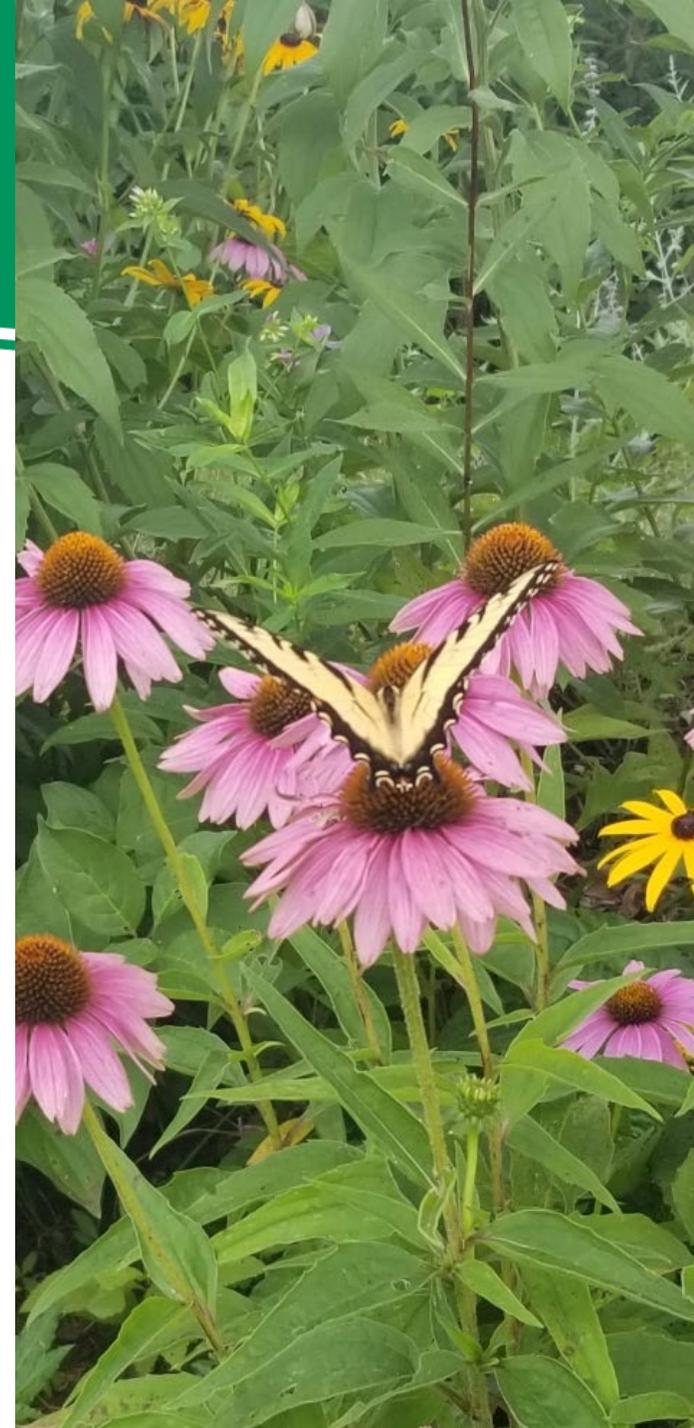
Scan the code or visit woodburymn.gov/Environment to view the full plan.

Next Steps

“Bringing the Environmental Stewardship Vision to Life”

(2024-2028 Strategic Initiative)

- Staff Project Management Team
- Timelines & milestones for two-year actions
- Identify a tracking program (public & internal)
- Community Engagement Plan
- Regular accountability meetings
- Future budgeting



A photograph of a wooden boardwalk winding through a forest with autumn foliage. The boardwalk is made of light-colored wooden planks and runs along a narrow stream or path. The trees and bushes are filled with yellow and orange leaves, suggesting a fall setting. The scene is captured from a low angle, looking down the length of the boardwalk.

Questions?



Carnelian-Marine-St. Croix Watershed District

2025 Extreme Ice Heaving

Agency, County, and LGU Coordination

January 8, 2025 Email

Good afternoon,

The Big Marine Lake westside shoreline is being destroyed by huge ice heaves! Without any snow on the lake it keeps expanding into the shoreline. It's the worst in many years!

Here are some picturesPlease share these with WD board members and invite them to visit.

Mike and Tom, if you're interested in visiting, let me know and I'll do my best to be available. We can discuss future shoreline restorations.



Spring 2024

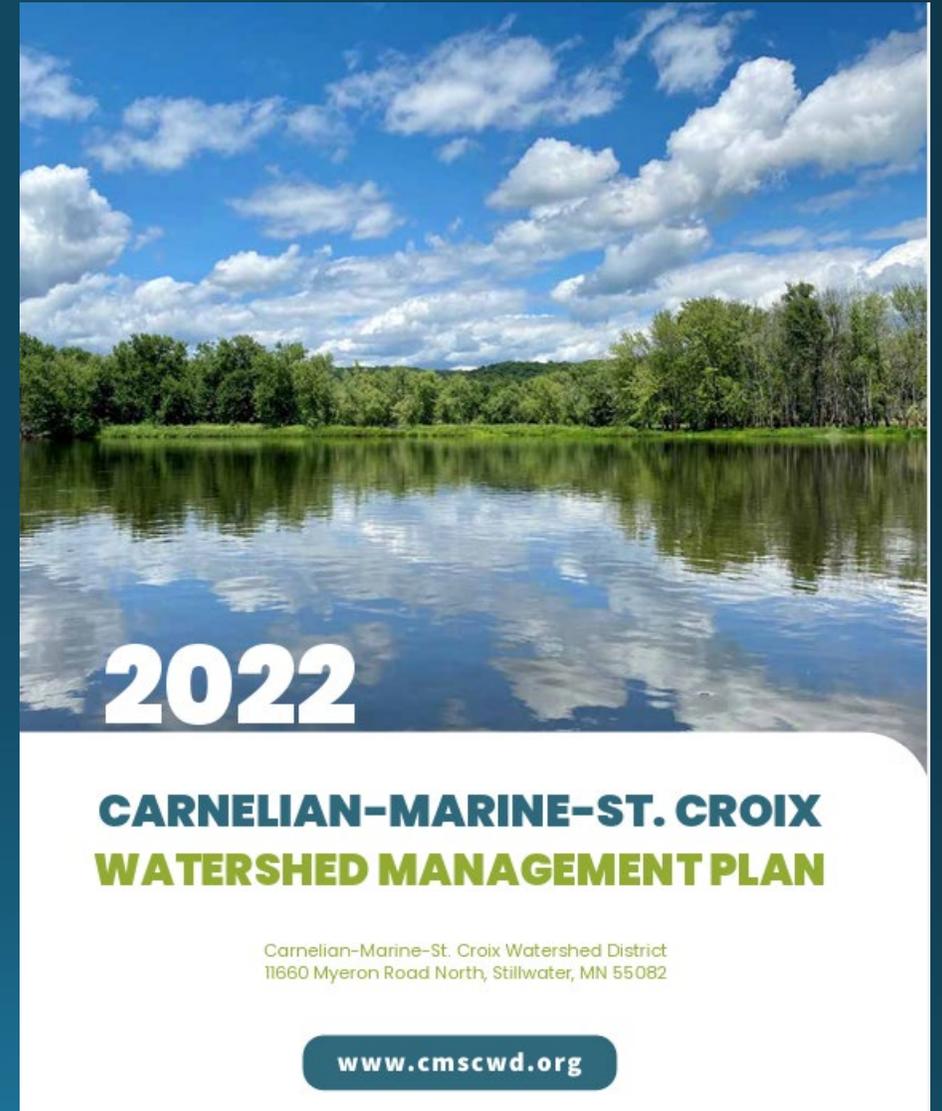


January 8, 2025

CMSCWD Regulatory Program

Guiding principles and policies of the regulatory program include:

- Rules are streamlined and permitting and enforcement is coordinated with local, county, state, and federal permitting



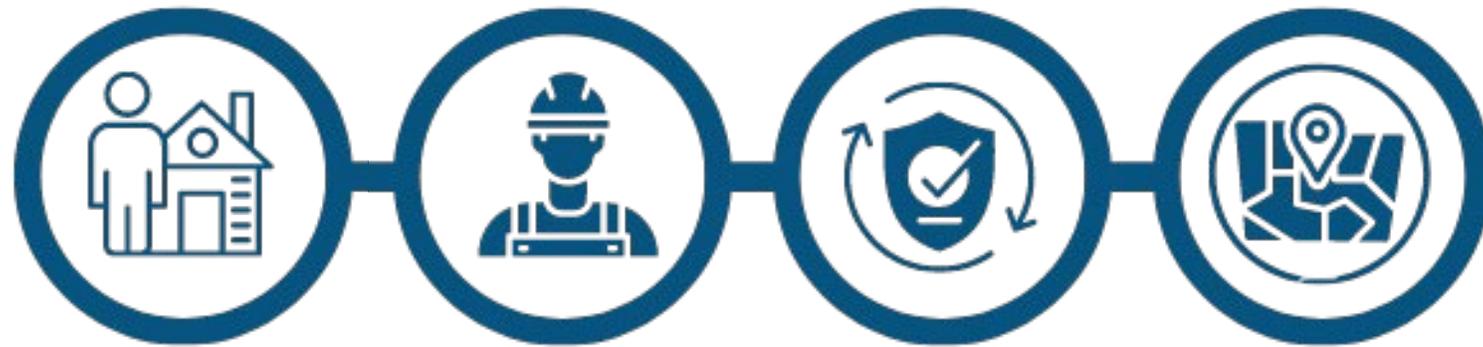
Big Marine



Big Carnelian



Ice Heave Repair Coordination



Landowners

Contractors

State
Regulations

Local zoning/
ordinances



DNR Shoreline/Shoreland

Minnesota Department of Natural Resources

Local zoning officials, the watershed district and the soil and water conservation district are given at least 7 days' notice before beginning the project.



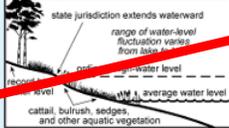
Shoreline Alterations: Ice Ridges



Is an individual permit required?

For most projects constructed *below* the ordinary high-water level* (OHWL) of public waters, an individual Public Waters Work Permit is required from the Minnesota Department of Natural Resources (DNR).

Ice ridges exception: An individual permit from the DNR is not required for the grading or removal of an ice ridge if the conditions outlined on this information sheet are followed.



state jurisdiction extends waterward
range of water-level fluctuations varies from lake to lake
OHWL
average water level
cattail, bulrush, sedges, and other aquatic vegetation

Shoreline cross section

If you have questions concerning the contents of this information sheet, contact your local DNR Area Hydrologist. See contact information on reverse side.

Please note that local units of government and other agencies may require a permit for this project.

*For lakes and wetlands, the OHWL is the highest elevation that has been maintained as to leave evidence on the landscape. It is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the top of the bank of the channel. For reservoirs and storages, the OHWL is the operating elevation of the normal summer pool.

Shoreline Alterations: Ice Ridges/ revised March 2012 Page 1 of 2

What causes ice ridges and what can I do about them?

Property owners occasionally return to their cabins in the spring only to discover they are dealing with property damage caused by a phenomenon called "ice heaving" or "ice jacking". This powerful natural force forms a feature along the shoreline known as an "ice ridge". The result may include significant damage to retaining walls, docks and boat lifts, and sometimes even to the cabin itself.



Ice ridge formed along the shore of Shamneau Lake in Morrison County.

How do ice ridges form? Ice ridges are caused by the pushing action of a lake's ice sheet against the shore. Cracks form in the ice because of different contraction rates at the top and bottom of the ice sheet. This is especially true in years that the ice sheet lacks an insulating snow cover. Ice cracks also develop because the edges of the ice sheet are sometimes firmly attached to the shore. When water rises in the cracks and freezes, the ice sheet expands slightly. Rising air temperatures warm the ice, leading to additional expansion, which exerts a tremendous thrust against the shore. Alternate warming and cooling of the ice sheet leads to additional pushing action, causing the ice to creep shoreward and scrape, gouge, and push soil and rock into mounds (called "ice ridges", "ice pushes", or "ramparts").

What can be done about ice ridges after they form? Because ice ridges do provide ecological benefits (described below), the ideal reaction to the formation of an ice ridge would be to do nothing other than remove personal property from its zone of influence. However, this is often impractical. Ice ridges can impede use of the lake by a property owner or the users of public lakeshore facilities. Therefore, action may be taken to remedy the results of ice activity.

Shoreline Alterations: Ice Ridges

Lake access can be obtained by ramping over or cutting through the ice ridge. However, when it may be necessary to remove or grade an ice ridge, an individual Public Waters Work Permit is *not* required from the DNR to remove or grade an ice ridge if the work meets the following conditions:

- The ice ridge resulted from ice action within the last year.
- The project is either exempt from local permits or is authorized by issuance of a local government permit.
- Not more than 200 feet of shoreline is affected.
- All ice ridge material that is composed of muck, clay, or organic sediment is deposited and stabilized at an upland site above the ordinary high-water level (OHWL; see sidebar on page 1).
- All ice ridge material that is composed of sand or gravel is removed as provided above or graded to conform to the original cross section and alignment of the lakebed, with a finished surface of no more than 18" above the OHWL.
- No additional excavation or replacement fill material occurs on the site.
- All exposed areas are immediately stabilized as needed to prevent erosion and sedimentation (see Lakescaping information sheet).
- Local zoning officials, the watershed district (if applicable) and the soil and water conservation district are given at least 7 days' notice before beginning the project.

Removal or grading of an ice ridge must not disturb emergent aquatic vegetation, unless authorized by an aquatic plant management permit from the DNR's Division of Fisheries.

What can be done about ice ridges before they form? The simplest means of avoiding ice-related damage to shoreline property is to ensure that personal property is out of wrath's path. State and local shoreland regulations requiring setback limits not only lead to improved aesthetics but also help to minimize personal property damage from ice action and wave-induced erosion. Engineering solutions are sometimes pursued to remedy ice ridge problems, but they can be expensive and ineffective. If an engineering solution is pursued, property owners should seek the advice of a professional.

What are the benefits of ice ridges? Ice ridges are natural berms that have formed around Minnesota's lakes over thousands of years. These mounds of material provide the lake with ecological benefits by creating a barrier to nutrient loading. Nutrients collect on the landward side of the mound, producing fertile soil where plants and trees thrive. The root systems of this near-shore plant community help to protect the shore from erosion and soak up additional nutrients. Shade and habitat offered by near-shore plants benefit organisms along the shore and in the lake, thus supporting nesting and spawning fish.

Ice ridges also work to protect the shore from the lake itself. For example, a small ice ridge formed one year is followed by additional pushes in ensuing years. The ridge is fortified by jamming rocks into it. The roots of the near-shore plant community bind together the soil and rock to form natural shoreline protection.

©2003 State of Minnesota, Department of Natural Resources. Prepared by DNR Ecological and Water Resources. Based on Minnesota Statutes 103G, Public Waters Work Permit Program Rules Chapter 6115.

DNR Contact Information	DNR Information Center
 <p>DNR Ecological and Water Resources website and a listing of Area Hydrologists: http://mn.dnr.gov/waters</p> <p>DNR Ecological and Water Resources 500 Lafayette Road, Box 32 St. Paul, MN 55155 (651) 259-5100</p> <p><i>This information is available in an alternative format on request.</i></p>	<p>Twain Cities: (651) 296-4157 Minnesota toll free: 1-888-646-6367 Telecommunication device for the deaf (TDD): (651) 296-5484 TDD toll free: 1-800-657-3929</p> <p>Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available regardless of race, color, national origin, sex, sexual orientation, marital status, status with regard to public assistance, age, or disability. Discrimination inquiries should be sent to Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155-6049, or the Equal Opportunity Office, Department of the Interior, Washington, DC 20240.</p>

Shoreline Alterations: Ice Ridges/ revised March 2012 Page 2 of 2

DNR Also Requires....



- The ice ridge resulted from ice action within the last year.
- The project is either exempt from local permits or is authorized by issuance of a local government permit.
- Not more than 200 feet of shoreline is affected.
- All ice ridge material that is composed of muck, clay, or organic sediment is deposited and stabilized at an upland site above the ordinary high-water level (OHWL; see sidebar on page 1).
- All ice ridge material that is composed of sand or gravel is removed as provided above or graded to conform to the original cross section and alignment of the lakebed, with a finished surface at or below the OHWL.
- No additional excavation or replacement fill material occurs on the site.
- All exposed areas are immediately stabilized as needed to prevent erosion and sedimentation.

Landowners

- Expedited notification process (Watershed, County or City)
- Simple explanation of what qualifies for the exemption
- Guidance on what actions will require local permit (DNR, Watershed, County or City)
- Local contractors who have attended a shoreline stabilization workshop
- Information for design and cost share for restoration of native shoreline



Landowners

Letter and Factsheet



“To simplify notification requirements, we are encouraging everyone to enter basic information about the property and ownership that has ice heave damage via this easy online form: tinyurl.com/2025IceHeave”

DEALING WITH ICE RIDGES AND HEAVES

Many large lakes experience "ice heaving" or "ice jacking" during the winter, especially in years when there is minimal snow cover. As cracks form in the ice, water from above and below fills in and causes the ice sheet to expand. Warming air temps cause the ice to expand even further until eventually, it pushes up onto the shoreline.

Ice heaves are a natural phenomenon that will, over time, create a ridge or berm around your lake.

Hire the right contractor for the job. Be cautious of contractors that promise a quick fix with piles of riprap and hard armoring. This type of hard-scaping destroys sensitive shoreline habitat needed by fish, turtles, loons, and other wildlife.

Contractors should follow state and watershed district rules, but as a landowner, you are ultimately responsible for making sure the job gets done right.

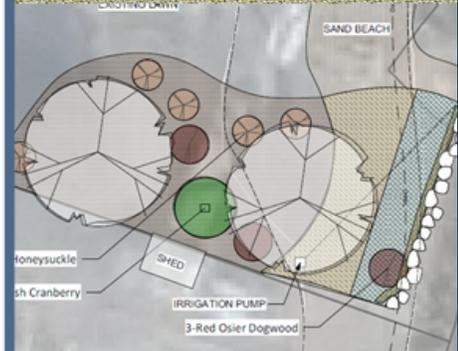
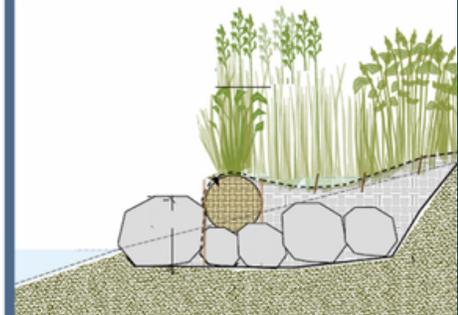
Shoreline Contractor Workshop: Wed., March 19, 9am-noon at Scandia Community Center. Learn more and register at tinyurl.com/2025lakeshore.

*Encourage your contractor to sign-up or ask us for a list of contractors who attend!

An ecological approach: Instead of using sea walls or riprap to stabilize your shoreline, a better long-term approach is to use native plants or bio-engineering. The combined root structures of trees, shrubs, native upland plants, and wetland aquatic plants can resist ice action and minimize the formation of ice ridges.

Grants and technical assistance are available to help with natural shoreline restoration projects!

FIND SHORELINE LANDOWNER RESOURCES:
WWW.LSC1W1P.ORG/SHORELINES



Notification Form



I am providing notice that: *

- This property has ice heave damage. I will be restoring the previous site condition following DNR permit exempt criteria.
- This property has ice heave damage. I want to restore a new shoreline condition and need more assistance.
- I don't have ice heave damage. I need assistance to understand how to make a change to my shoreline.
- Other: _____

I am interested in additional assistances:

- Interested in alternative shoreline designs to protect my property and lake.
- Interested in enhancements that may be grant eligible (i.e. bioengineered shoreline, native plantings).
- Meet with DNR, Watershed, or WCD staff on-site to discuss my shoreline restoration.
- Other: _____

LGU Requirements

CMSCWD Requires 7-day notification and the same requirements for exemption as MnDNR.

Washington County (Township Residents)-
Requires a grading permit.

City of Scandia- Requires a grading and land alteration permit if work within the Shoreland Impact Zone moves more than 10 cubic yards of material and/or disturbs an area of more than 600 square feet.



Local zoning/
ordinances



Local zoning/
ordinances

Contractors



Contractors

Free!

PROFESSIONAL TRAINING for SHORELINE CONTRACTORS

WEDNESDAY, MARCH 19, 9AM-NOON

WORKSHOP TOPICS

Dealing with ice heaves and ridges

- Learn how to manage ice ridges in the spring, without impacting the stability of shorelines or damaging sensitive habitat
- Learn which rules apply and who to contact for proper approvals before beginning restoration work

Staying out of trouble

- Understand local and state rules for shorelines and wetlands and how to avoid violations, common pitfalls, "stop work" orders, and costly repairs

Finding creative ways to meet your clients requests while protecting the health of our lakes

Scandia Community Center
14727 209th St N
Scandia, MN

REGISTER NOW
tinyurl.com/2025lakeshore

East-Metro
Water Resource Education Program

LOWER ST. CROIX WATERSHED PARTNERSHIP

Calling all shoreline contractors!

Join us for a free, informational workshop, sponsored by local government partners in Chisago, Isanti and Washington Counties.

During this workshop, you'll learn about state and local rules that apply to shoreline and wetland projects, as well as cost-share grants and technical assistance available to help landowners complete native planting and bioengineering projects.

This year's workshop will have a special focus on ways to repair ice heaves in the spring.

Coffee & Breakfast Included

Networking Opportunities

Expert Speakers with Q & A

Register online at tinyurl.com/2025lakeshore
Questions? Contact Angie Hong: 651-796-2210 or ahong@mnwcd.org

DNR and MPCA

Big Carnelian and Big Marine Lakes are at high risk of becoming impaired for biological life

Shoreline and shoreland alteration is the primary stressor

Restoration of shoreline and shoreland areas are **needed on developed parcels.**

Lower St. Croix River Watershed Stressor Identification Report—Lakes

A study of local stressors limiting the biotic communities in lakes within the Lower St. Croix River Watershed.



Report prepared for the Minnesota Pollution Control Agency

m DEPARTMENT OF
NATURAL RESOURCES



Cost Share

Two Grant Options

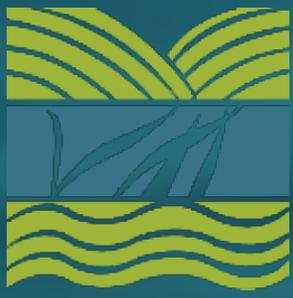
Natural Shoreline Restoration Grant

- 50% Grant for natural shoreline restoration

Shoreline Native Plant Grant

- 75% Grant for \$1,000 in native shoreline plant purchases.





Carnelian-Marine-St. Croix Watershed District

2025 Extreme Ice Heaving

Agency, County, and LGU Coordination

