City of Ramsey
Agenda
City Council Work Session
Tuesday, February 28, 2017
5:30 pm
Lake Itasca Room, 7550 Sunwood Drive NW

1. Call to Order

2. Topics for Discussion

1. EPB Work Plan
2. Website RFP Update

3. Topics for Future Discussion

1. Review Future Topics/Calendar

4. Mayor/Council/Staff Input

5. Adjournment

CC Work Session **2. 1.**

Meeting Date: 02/28/2017

Information

Title:

EPB Work Plan

Purpose/Background:

Per City Code, the Environmental Policy Board (EBP) is required to develop a Work Plan subject to the approval of the City Council. The purpose of this case is to consider and discuss potential topics for a 2017-2018 Work Plan. At the EPB' February meeting, the Board discussed various topics that it believed were relevant and warranted their attention. There was general consensus amongst the Board that the following topics, in no particular order, be included in their Work Plan:

1. Development of a Pollinator Initiative Program.
    - The Board found that this effort would address multiple initiatives of the City. Not only would it create more pollinator habitat and attract more wildlife, but it would simultaneously result in a lower demand on water supply as these sustainable landscapes do not require as many inputs as traditional turf grasses.
        - Education and Awareness
        - Review of existing city practices for possible improvements
        - Incorporate pollinator friendly practices and concepts into the Natural Resources Chapter of the Comprehensive Plan (a concept identified from the initial round of the Strategic Plan update)
        - Work collaboratively with the Parks and Recreation Commission to identify areas within existing parks suitable for converting to pollinator friendly landscapes
2. Water Resources
    - Water supply continues to be an important issue for the City. Maintaining a focus on water resources will help keep the community informed on the importance of potable water (both quality and quantity).
        - Develop incentives and/or rebates for water conservation initiatives (e.g. retrofitting existing irrigation systems with water efficient technologies)
3. Utilize the Mississippi River Shoreline Inventory to connect with potential candidates for riverbank stabilization projects.
    - The inventory that was completed in 2016 indicated that over 5,000 tons of sediment is being lost to the river annually. This has a serious impact on water quality. This information was obtained with the intention of potentially accessing grant funds to assist willing and suitable candidates with stabilization projects (this seems to fit in with the concept identified in the initial round of the Strategic Plan update process of building off the strength of the two rivers).
4. Organics Recycling.
    - Organics, which consists primarily of food waste and non-recyclable paper products, is the largest component of trash and can be recovered and converted into compost. Not only would an organics program help the City meet its annual recycling goal, but the finished product is a great soil amendment that acts as a slow release fertilizer and has great water holding capacity as well.
        - Develop a pilot program to offer residents a more convenient option that the County's compost sites (nearest one is off Hanson Blvd in Coon Rapids).

There is a wealth of information available on both pollinators and water conservation that can be used in the newsletter and linked to from the City's website. Examples of some of those resources are attached (note that some articles may need to be edited to be more specific to Ramsey).

The intention of this joint meeting was to present these topics for City Council consideration and feedback. Additionally, the joint meeting provides an opportunity for open dialogue between the EPB and City Council on any other topics of relevance.

Finally, there are a number of opportunities to tie together the City Council's recent Strategic Plan Session SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats).

- Strengths - build of the strengths of our two rivers.
- Weaknesses - address a perceived weakness to better integrate our natural resources and open spaces in new developments.
- Opportunities - use the balance between our built environment and natural environment to our benefit. Our two rivers are also an opportunity. Identify opportunities to integrate our natural resources as a recreational opportunity.
- Threats - be proactive in policy and practice in threats to our natural environment such as natural disasters, Asian Carp, and challenging geography.

Timeframe:

Up to 60 minutes

Funding Source:

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

Responsible Party(ies):

City Planner

Outcome:

Provide input on the proposed Work Plan topics. Staff will ultimately draft a formal Work Plan for consideration at a future City Council meeting.

Attachments

Pollinator Resources Examples

Pollinator Framework Document

Water Conservation Resources Examples

Mississippi River Shoreline Inventory Executive Summary

DRAFT EPB Meeting Minutes Dated 2.22.17

Form Review

Inbox	Reviewed By	Date
Tim Gladhill	Tim Gladhill	02/23/2017 02:13 PM
Kurt Ulrich	Kurt Ulrich	02/23/2017 03:08 PM
Form Started By: Chris Anderson		Started On: 02/22/2017 01:44 PM
Final Approval Date: 02/23/2017		

A QUICK REFERENCE GUIDE TO

Earth-Friendly Home Landscaping

Look for **TO DO** *Actions throughout this Guide. They indicate things you can do now to make your landscape more earth-friendly.*

Hennepin

This resource was produced by Hennepin County Environmental Services in partnership with the University of Minnesota Extension Service of Hennepin County. Portions were reproduced with permission from Dakota County Environmental Management and the Dakota County Soil and Water Conservation District.

Acknowledgements

Julie Weisenhorn
University of Minnesota

Diane Riggs
Vermillion River Watershed Handbook

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University of Minnesota Extension Service of Hennepin County

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University of Minnesota

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Professor and Extension Specialist
University of Minnesota

Anoka Soil and Water Conservation District

Dakota County Soil & Water Conservation District

Minnesota Department of Natural Resources/Metro Watershed Initiative

Hennepin County
Environmental Services
612-348-3777

www.hennepin.us/sustainablelandscaping

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Visit an Eco-Yard

SEE A DEMONSTRATION OF EARTH-FRIENDLY HOME LANDSCAPING

The Eco-Yards demonstrate an approach to home landscaping in which plants thrive with minimal inputs of pesticides, fertilizer, water and time.

PLANTINGS HIGHLIGHTED AT THE ECO-YARDS

- Prairie and wildflowers
- Rainwater garden
- Fescue lawn
- Backyard composting
- Small and tall shrub massings
- Tree groves with plantings beneath
- Swale planting with sweet grass (Midtown)
- Permeable paver plaza (Midtown)

ECO-YARD TOURS

The Eco-Yards are open throughout the growing season for self-guided tours. Guided tours with a landscaping professional can be arranged. Call 612-348-3777 to schedule a tour.

Check out our website at *www.hennepin.us/ecoyardtours* for more information on eco-yard tours.

Eco-Yard in Brooklyn Park
8100 Jefferson Highway, Brooklyn Park
Adjacent to the Recycling Center

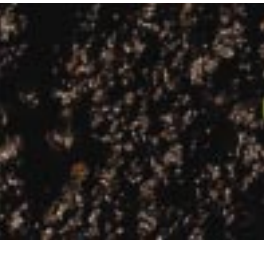
Hours: Tu, Th, Fri . . . .10 am - 6 pm
Wed . . . . . .10 am - 8 pm
Sat . . . . . .8 am - 5 pm

Eco-Yard Midtown
2801 21st Ave S, Minneapolis
Adjacent to the Green Institute

Hours: Open every day until sunset

Landscape Design

ON THE PATH TO AN ENVIRONMENTALLY-FRIENDLY LANDSCAPE



In Minnesota, we only have a short time to enjoy our yards. As a result, we take advantage of them as play areas, gardens and as places to gather with friends and family. We also spend a great deal of time and money making sure our shrubs, trees, flowers and lawns look great. Traditionally, this high-maintenance type of yard care may have included large quantities of inputs – water, fertilizers, pesticides, weed control and money; not to mention our own sweat and time.

Enter environmentally-friendly landscaping, otherwise known as sustainable landscaping. This type of landscaping employs some basic principles that can reduce the impact we have on the environment and the amount of time and labor while still creating a functional, aesthetically pleasing landscape that can be easily maintained in the years to come. These principles include such practices as improving your soil, choosing the right plant according to conditions, replacing lawn areas that are difficult to maintain with better adapted shrubs and trees and reducing inputs into the environment.

A sustainable landscape is not a "no-maintenance" landscape and some of these changes will take time to get established. Your landscape will still require some level of care, but not as much because ***you are working with the environment instead of against it.***

Look at your yard. Wouldn't it be great to spend more time enjoying it rather than working on it? You'd no doubt have a lower water bill, while minimizing the use of pesticides and fertilizers. To learn how you can do all this and more, take a look at the following tactics for turning your yard into an environmentally-friendly and sustainable landscape. *It's your chance to make a positive impact on the environment.*

GETTING STARTED: CREATE A BASE MAP

The first step to creating a new landscape design is to assess what you have and consider how you would like to use your yard.

TO DO/What are your current conditions?

- How much sun does the area receive each day? Keep track of how many hours of sun different parts of your yard receive during spring and summer days. Is it morning sun or afternoon sun?
- What is the soil like? Heavier, sticky clay? Lighter, more porous sand? Or is your soil rich, black loam? (see Improving Soil, pg 4)
- What is the moisture level of the area? Does it remain damp after a rainstorm or watering, or does it dry quickly? Are there low areas that may make for great rain garden locations? (see Rain Gardens, pg 19)
- Are there plants or other features that you would like to keep?
- Where are your utility lines (above and below ground)? What planting restrictions apply to these areas? (see TO DO/Call before you dig, pg 4)
- Do you have an underground irrigation system? If so, where are the lines/sprinkler heads?

TO DO/How would you like to use your space? (What are your needs?)

- Where are your high traffic areas?
- How much open space do you need for yard activities? (play areas)
- Which views would you like to enhance?
- Would you like to create areas for wildlife? A butterfly garden, a bird feeding station?
- Would you like more privacy?
- Would you like to add features to improve water quality? (see Practices to Improve Water Quality, pg 15)

TO DO/Drawing the Base Map:

Now that you have answered the basic questions, create a map to build from. First measure the dimensions of any permanent structures (home, shed, fence, etc.) and your lot. Include locations for major doors and windows. This will help as you develop views from inside your home, and determine available plant space. Then measure from a fixed location, the corner of the house, to the street, to the property line, to the driveway etc. Plot these measurements on a large sheet of graph paper. Next draw in the features

that you would like to remain or that cannot be moved (utility fixtures, large trees, sandbox). Use a piece of tracing paper to overlay the base map. Draw your new designs and ideas on the tracing paper. Using multiple sheets of tracing paper will allow you to create different landscape options without damaging or redrawing your base map.

WORK FROM THE GROUND UP: IMPROVING SOIL

The soil is the basis of your entire yard and garden. Consider it the foundation of your landscape similar to the foundation of your house. If you have a weak foundation, your house will have maintenance problems in the future. If you have a strong foundation, your house will endure.

Poor soil may be compacted, lacking in nutrients and organic matter and may have poor water-holding capacity. Healthy soil is loose, contains organic matter and holds water easily, yet allows it to easily drain excess water. We tend to pay more attention to our plants and lawns, forgetting that plant care begins with the soil. Here are some basic steps you can take to start improving your soil:

TO DO/Call before you dig:

Before you dig, call Gopher State One at 800-252-1166 statewide or 651-454-0002. Gopher State One will notify your local utilities and they will mark their electric, gas lines, and cable lines that are buried in your yard. Always be careful of lines installed by previous homeowners (e.g., from the house to an external garage), Gopher State One does not mark these lines.

TO DO/Do a soil test:

Find out the condition of your soil before you do anything. Your local county extension service can provide you with the proper instructions and bags used to collect soil samples. Be sure to collect samples from various parts of your lawn. The University of Minnesota Soil Laboratory (soiltest.cfans.umn.edu, 612-625-3101) will be able to give you valuable information on the current condition of your soil – nutrient levels, soil structure, and pH – and make recommendations for improvement.

TO DO/Aerify your soil:

Maintaining a healthy soil will improve short and long term lawn health. Where soils are hard and compacted, core aerifying can be used to improve plant health, increase rooting volume and improve infiltration. Aerification is done using a machine that can usually be rented from dealers in your area. The machine pulls 2-3" cores of soil from your yard, enabling air to be incorporated into the soil. Aerification will also allow greater access to soil water and nutrients, as well as improving plant stress tolerance.

TO DO/Add organic matter:

Organic matter is an important component of soil health. It increases the soil's capacity to absorb and release nutrients. It improves moisture-holding capacity of sandy soils and the drainage capability of heavy clay soils. It also improves the structure of soil by providing a good environment for root growth and by encouraging earthworms and microorganisms that are beneficial to plant health. You can easily add organic matter by using compost as a mulch on your garden soil and around shrubs and trees. To do this, mix 1-2 inches of well-decomposed compost into the top 6-8 inches of soil around your plants. You can also improve the health of your lawn by top-dressing. This means lightly spreading compost (about 1/4" maximum) over your lawn and gently raking it into the lawn.

TO DO/Amend soils:

Many lawns, especially those where the soil has been compacted by heavy machinery during housing construction are impervious and provide little infiltration of water. Tilling the soil to at least 4 to 6 inches with a garden tiller and incorporating 1 to 2 inches of well-decomposed compost will increase infiltration. Remember to lightly compact the soils before planting or seeding. A good rule of thumb is to measure how deep an impression your foot makes when stepping on the soil. Your foot impression should not be more than 1/4 inch deep. Choosing plants that develop a deep root structure (>4-6") will further increase the potential for water to infiltrate. (see Plant Selection, pg 7)

PLANT THE RIGHT PLANT

Choosing the right plant material for your yard is an important step in creating a landscape that is sustainable. It's easy to get caught up in the beauty of a plant you discover at the garden center, only to find it requires conditions that don't match your yard.

By selecting plants that are suited to the conditions of your location, you will reduce the work required to establish and maintain the plants and they will survive longer and look better in your landscape. Be sure to consider the location's soil, moisture, available light, and mature size when selecting plants.

The same goes for your lawn. The fine-leaved fescues as well as the older, common types of Kentucky Bluegrasses are better suited to lower inputs than turf-type perennial ryegrasses and many of the newer, improved types of Kentucky Bluegrasses.

LESS IS MORE: ALTERNATIVES TO GRASS

Let's make it clear up front: there is nothing wrong with having a lawn. Grass is one of the toughest, most successful ground covers available. It is easy to grow, reduces dust, cools the surrounding air, and it prevents wind and soil erosion.

However, sometimes we establish grass in areas that we don't actively use or in areas that grass doesn't grow well, or are difficult to mow and maintain. These are the areas where less is more. It is often better to utilize other plant materials for these areas: flower beds, shrubs, no-mow ground covers, or mulch, such as wood chips. This makes the area functional, maintainable, and environmentally-friendly. *Part of a sustainable landscape is analyzing how you use your lawn and the areas in which a different type of ground cover would be better.*

REDUCE INPUTS, REDUCE IMPACT

Inputs are anything you put into a landscape. This would include: pesticides, fertilizers, water, money and labor. At times, we will need to rely on these inputs to help our plants through weather, disease, insect infestation, or we may have to replace a plant altogether. The goal of sustainable landscaping is to reduce the need for these inputs as much as possible, by working with basics – soil, plant selection, lawn use – and by thinking ahead.

FOR MORE INFORMATION:

– Visit the University of Minnesota Extension Service's Sustainable Urban Landscape Information Series at *www.sustland.umn.edu*

– Visit the University of Metro Watershed Partner's "Tips for Keeping Minnesota Water Clean" at *www.cleanwatermn.org*

Plant Selection

A CRITICAL STEP IN CREATING A SUCCESSFUL LANDSCAPE

Selecting plants that fit the moisture and light conditions of a location is a critical part to a successful landscape. (see Landscape Design, pg 2) The following lists offer some suggestions for plants that fit various conditions. These lists are by no means all-inclusive. Homeowners should consult books, magazine articles, and web sites. County extension services and master gardeners are also good resources.

The plant materials below are listed by their italicized botanical names (genus, species and cultivar, if applicable) followed by the common name. Whenever possible, use the botanical name when purchasing a plant, as it is the most accurate and will ensure you are buying the right species.

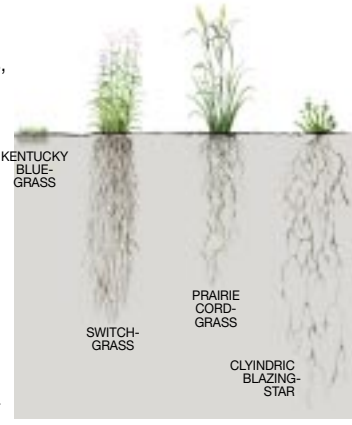
NATIVE vs. NON-NATIVE SPECIES:

Native plants are defined as plants originating in a particular location, such as Minnesota or the North Central United States. Non-native species have been brought into an area and naturalized. The Norway maple is a good example of a tree that has been naturalized in Minnesota, yet originated in Europe. Native species may be hardier, less invasive and less prone to disease and insect problems. However, there are many non-native species that have become adapted to climate as well as resistant to pests and diseases, which make good choices.

Native vs non-native species, con't next page

Some native plants develop deeper root structures, allowing for better water infiltration. A deeper root structure also provides stabilization along lake or stream banks which help us to improve the quality of our lakes, streams and wetlands. Native prairie plants often times develop roots that penetrate to a depth 2-3 times that of the plant's height.

A NATIVE PLANT THAT IS 2 FT TALL, LIKELY HAS A ROOT STRUCTURE AT LEAST 6 FT DEEP. TYPICAL LAWN GRASS HAS A ROOT STRUCTURE THAT REACHES ONLY 4-6 INCHES.



TREES & SHRUBS

Choosing a shrub that physically fits into a location is important. Pay attention to its mature size as noted on the plant information tag. You may also want to double check with the nursery staff as sometimes cultural influences such as light, moisture, soil condition and pruning will have an effect on the mature size a shrub can reach.

Deciduous Trees & Shrubs under 25 feet tall

Acer spicatum . . . . . .Mountain Maple
Amelanchier laevis . . . . . .Allegheny Serviceberry
Amelanchier canadensis . . . . . .Serviceberry (clump form)
Amelanchier x grandiflora 'Autumn Brilliance' . . .Autumn Brilliance Serviceberry
Carpinus caroliniana . . . . . .Blue Beech
Chionanthus virginicus . . . . . .White Fringe Tree
Crataegus crus-galli inermis . . . . . .Thornless Cockspur Hawthorn
Cornus sericea . . . . . .Pagoda Dogwood
Cornus alternifolia . . . . . .Redosier Dogwood
Hydrangea paniculata 'Grandiflora' . . . . . .Pee Gee Hydrangea Tree
Prunus americana . . . . . .Wild Plum
Syringa reticulata amurensis japonica . . . . . .Japanese Tree Lilac
Viburnum lentago . . . . . .Nannyberry
Viburnum dentatum . . . . . .Arrowwood Viburnum
Viburnum trilobum . . . . . .American High Bush Cranberry

Evergreen Trees & Shrubs under 25 feet tall

Juniperus scopularum . . . . . .Rocky Mountain Juniper
Juniperus virginiana . . . . . .Eastern Red Cedar
(height can be taller than 25 ft)
Thuja occidentalis 'Techny' . . . . . .Techny Arborvitae

SHRUBS THREE TO FOUR FEET TALL

Deciduous shrubs for **SUNNY & DRY** Areas

Amorpha canescens . . . . . .Lead Plant

Ceanothus americanus . . . . . .New Jersey Tea

Diervilla lonicera . . . . . .Dwarf Bush Honeysuckle

Physocarpus opulifolius 'Dart's Gold' . . . . . .Dart's Gold
(height can be > 3-4 ft)

Prunus pumila . . . . . .Dwarf Sandcherry

Rosa arkansana . . . . . .Prairie Rose

Symphoricarpos orbiculatus . . . . . .Coralberry

Vaccinium angustifolium . . . . . .Lowbush Blueberry
Note: Requires acidic soil for best results.

Evergreen shrubs for **SUNNY & DRY** Areas

Juniperus communis depressa . . . . . .Oldfield Common Juniper

Juniperus horizontalis . . . . . .Creeping Juniper

Deciduous shrubs for **SUNNY & MOIST** Areas

Aronia melanocarpa . . . . . .Black Chokeberry
(height can be > 3-4 ft)

Ilex verticillata cultivars . . . . . .Winterberry
(height can be > 3-4 ft)
Note: Requires male and female plants for berries

Salix purpurea 'Nana' . . . . . .Purpleosier Willow

Symphoricarpos albus . . . . . .Snowberry

Deciduous shrubs for **SHADY & DRY** Areas

Amelanchier stolonifera . . . . . .Running Serviceberry

Hydrangea arborescens 'Annabelle' . . . . . .Annabelle Hydrangea

Symphoricarpos orbiculatus . . . . . .Coralberry

Ribes alpinum . . . . . .Alpine Currant

Deciduous shrubs for **SHADY & MOIST** Areas

Clethra alnifolia cultivars . . . . . .Summersweet

Dirca palustris . . . . . .Leatherwood

Ledum groenlandicum . . . . . .Labrador Tea

Symphoricarpos albus . . . . . .Snowberry

Evergreen shrubs for **SHADY & MOIST** Areas

Thuja occidentalis 'Hertz Midget' . . . . . .Hertz Midget

Tsuga canadensis 'Gracilis' . . . . . .Gracilis Hemlock

Tsuga canadensis 'Coles Prostrate' . . . . . .Coles Prostrate Hemlock

GROUND COVERS

Ground covers are plants that spread rapidly and grow close to the soil level. They are good choices for areas that need erosion control and/or are difficult sites for other types of plants. Ground covers can also replace turf grass in areas that are difficult to maintain, eliminating the need to mow. It is important to note that some can be very invasive – a characteristic that may or may not be desirable in a ground cover.

Ground Covers for **SHADY** Areas

Asarum canadensis . . . . . .Wild Ginger

Aster macrophyllus . . . . . .Big Leaf Aster

Cornus canadensis . . . . . .Bunch Berry
Note: Needs acid soil

Galium odoratum . . . . . .Sweet Woodruff

Hosta species and cultivars . . . . . .Hosta or Plantain Lily

Lamiastrum galeobdolon . . . . . .Lamiastrum

Mitchella repens . . . . . .Partridgeberry
Note: Needs acid soil

Ground Covers for **SUNNY** Areas

Arctostaphylos uva-ursi . . . . . .Bearberry
Note: A broadleaf evergreen; prefers acid soil

Gaultheria procumbens . . . . . .Wintergreen
Note: A broadleaf evergreen; prefers acid soil, grows in partial shade

Sedum . . . . . .Sedum

Waldsteinia fragarioides . . . . . .Barren Strawberry
Note: A broadleaf evergreen

ORNAMENTAL & NATIVE GRASSES

There has been a surge of interest in the use of ornamental and native prairie grasses in home landscapes and it's easy to see why. They are easy to care for, have almost no disease or pest problems, have low nutrient requirements and grow quickly. Grasses can also add winter interest to landscapes with their persistent seed heads, varied colors, and textured leaves and stems.

Grasses for **SHADY** & DRY Areas

Bromus ciliatus . . . . . .Fringed Brome
Bromus kalmii . . . . . .Kalm's Brome
Carex pennsylvanica . . . . . .Pennsylvania Sedge
Carex sprengellii . . . . . .Long Beaked Sedge
Deschampsia caespitosa . . . . . .Tufted Hairgrass
Elymus hystrix . . . . . .Bottlebrush Grass
Hakonechloa macra . . . . . .Hakonechloagrass
Luzula multiflora . . . . . .Woodrush
Luzula parviflora . . . . . .Greater Woodrush

Grasses for **WATER GARDENS & MOIST** Areas

Acorus calamus . . . . . .Sweet Flag
Calamagrostis acutiflora . . . . . .Feather Reed Grass
Carex crinita . . . . . .Fringed Sedge
Carex comosa . . . . . .Bottlebrush Sedge
Carex vulpinoidea . . . . . .Fox Sedge
Hierochloe odorata . . . . . .Sweet Grass
Juncus effusus . . . . . .Soft Rush
Molinea caerulea . . . . . .Moorgrass
Panicum virgatum . . . . . .Switchgrass
Note: Aggressive
Scirpus cyperinus . . . . . .Woolgrass
Scirpus atrovirens . . . . . .Dark Green Bulrush
Spartina pectinata . . . . . .Cordgrass

Grasses, continued next page

GRASSES for **EROSION CONTROL** *(may be invasive)*

Calamagrostis canadensis . . . . . .Canada Bluejoint Grass

Hierochloe odorata . . . . . .Sweet Grass

Panicum virgatum . . . . . .Switchgrass
Note: Aggressive

Spartina pectinata . . . . . .Cordgrass
Note: Performs best in moist soils in full sun; invasive especially in sandy soils.

Grasses for **SUNNY & DRY** Areas

(Also excellent choices for erosion control)

Andropogon gerardii . . . . . .Big Blue Stem

Bouteloua curtipendula . . . . . .Sideoats Grama

Bouteloua gracilis . . . . . .Blue Grama

Koeleria brevis . . . . . .Blue Hairgrass

Koeleria macrantha . . . . . .Junegrass

Schizachyrium scoparium . . . . . .Little Blue Stem Grass

Sorghastrum nutans . . . . . .Indiangrass

Sporobolus heterolepis . . . . . .Prairie Dropseed Grass

Grasses for **SHADY & MOIST** Areas

(Also excellent choices for erosion control)

Bromus ciliatus . . . . . .Fringed Brome

Carex stipata . . . . . .Awl Fruited Sedge

Carex comosa . . . . . .Bottlebrush Sedge

Elymus hystrix . . . . . .Bottlebrush Grass

Glyceria striata . . . . . .Fowl Manna Grass

Juncus effusus . . . . . .Soft Rush

Deschampsia caespitosa . . . . . .Tufted Hairgrass

Luzula parviflora . . . . . .Greater Woodrush

Schizachyrium scoparium
Little Blue Stem Grass

NATIVE WILDFLOWERS

Planting tough, vigorous perennial wildflowers can make for an attractive, fairly low-maintenance garden. They add color and attract birds and butterflies.

Wildflowers for **SHADY & DRY** Areas

Anemone cylindrica . . . . . .Thimbleweed
Aster macrophyllum . . . . . .Big Leaf Aster
Astragalus canadense . . . . . .Canada Milk Vetch
Campanula rotundifolia . . . . . .Harebells
Galium boreale . . . . . .Northern Bedstraw
Geranium maculatum . . . . . .Wild Geranium
Helianthus strumosus . . . . . .Woodland Sunflower
Heuchera richardsonii . . . . . .Alum Root
Polemonium reptans . . . . . .Jacob's Ladder
Thalictrum dioicum . . . . . .Early Meadow Rue

Wildflowers for **WATER GARDENS & MOIST** Areas

Anemone canadensis . . . . . .Canada Anemone
Asclepias incarnata . . . . . .Swamp Milkweed
Aster umbellatus . . . . . .Flat-Topped Aster
Caltha palustris . . . . . .Marsh Marigold
Chelone glabra . . . . . .Turtlehead
Eupatorium maculatum . . . . . .Joe Pye
Helenium autumnale . . . . . .Sneezeweed
Liatris pycnostachya . . . . . .Prairie Blazingstar
Mimulus ringens . . . . . .Monkeyflower
Pycnanthemum virginianum . . . . . .Virginia Mountain Mint

Wildflowers, continued next page

Wildflowers for **SUNNY & DRY** Areas

Agastache foeniculum . . . . . .Anise Hyssop
Asclepias tuberosa . . . . . .Butterflyweed
Dalea purpurea . . . . . .Purple Prairie Clover
Echinacea angustifolia . . . . . .Narrow-Leaf Coneflower
Lupinus perennis . . . . . .Wild Lupine
Penstemon grandiflorus . . . . . .Large Flowered Beardtongue
Ratibida pinnata . . . . . .Yellow Coneflower
Rudbeckia hirta . . . . . .Black Eyed Susan
Solidago rigida . . . . . .Stiff Goldenrod
Tradescantia bracteata . . . . . .Spiderwort

Wildflowers for **SHADY & MOIST** Areas

Adiantum pedatum . . . . . .Maidenhair Fern
Aquilegia canadensis . . . . . .Wild Columbine
Arisaema triphyllum . . . . . .Jack-in-the-Pulpit
Aster umbellatus . . . . . .Flat-Topped Aster
Caltha palustris . . . . . .Marsh Marigold
Lobelia cardinalis . . . . . .Cardinal Flower
Lobelia silphilitica . . . . . .Great Blue Lobelia
Matteuccia struthiopteris . . . . . .Ostrich Fern
Osmunda spp . . . . . .Ferns
Solidago flexicaulis . . . . . .Zig Zag Goldenrod

Rudbeckia hirta
Black Eyed Susan

FOR MORE INFORMATION AND TO VIEW PLANT PHOTOS:

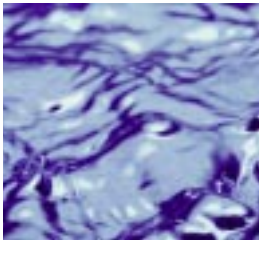
– Visit the University of Minnesota Extension Service's Sustainable Urban Landscape Information Series at *www.sustland.umn.edu*

Practices to improve water quality

REDUCE RUNOFF AND PREVENT POLLUTION TO IMPROVE OUR WATER

STORMWATER RUNOFF MANAGEMENT

Much of the rainwater that falls in urban areas, runs off rooftops and driveways to streets; through the storm sewers; and finally, to lakes, streams, or rivers without filtration or treatment. As it travels, water picks up a variety of pollutants, including sediment. The goal of runoff management is to keep excess water and pollutants from reaching the storm drains in your neighborhood streets.



KEEP WATER IN YOUR YARD

Increase the opportunity for water to soak in or infiltrate into your soil. Many of our flooding and erosion problems exist because we move water too quickly off of our landscape. Water that once took days to filter through to the nearest lake, wetland or stream, has been channeled and moved off the landscape quickly through a series of impervious surfaces and pipes.

TO DO/Divert roof top water runoff by:

- Moving or extending the downspouts to flow onto a vegetated area.
- Creating a rainwater garden. (see Rain Gardens, pg 19)
- Creating a water retention area with a shallow, grass-covered turf depression in the lawn.
- Stationing a rain barrel at the end of one or more shortened down-spouts. (see Rain Barrels, pg 36)

TO DO/Reduce runoff from your driveway, patio or sidewalk:

If you need to replace an existing hard surfaced area or would like to add an extra parking spot, patio, etc. install a porous surface that will allow water to seep through.

- Use cement or gravel tracks with a strip of vegetation in the middle for your driveway.
- Use reinforced soil products so that you can create a grass or gravel driveway.
- Place a drywell filter box of sand and crushed rock at the end of the driveway's down slope.
- Create a channel or gentle berm that diverts water running down the driveway into a rainwater garden or turf depression.
- Reduce unneeded impervious areas and replace it with vegetation.
- Slope one side of the patio toward a vegetated area.

TO DO/Reduce runoff from your lawn:

Many lawns allow for little infiltration because the soil has become compacted during house construction. The following practices can increase infiltration.

- Amend and aerate your soils. (see Improving Soil, pg 4)
- Replace shallow rooted turf grass with deep rooted alternatives. (see Plant Selection, pg 7)
- Create a rainwater garden (see Rain Gardens, pg 19)

POLLUTION PREVENTION

TO DO/Reduce pollution from impervious surfaces:

- Clean up oil, gas, radiator fluid, and other leaks and spills on your driveway with absorbent cat litter, and then place in the garbage. Fix persistent leaks.
- Sweep any fertilizer from the driveway into the grass.
- Sweep up any grass clippings, leaves, and dirt (including those on the street).
- Avoid using salt and chemical products for ice control.
- Take your car to a commercial car wash facility, where wastewater is treated.

TO DO/Reduce use of pesticides and fertilizers:

The U.S. Environmental Protection Agency estimates that homeowners and lawn care services apply nearly 70 million pounds of active pesticide ingredients (herbicides and insecticides) to urban lawns every year. Fertilizers are even more popular.

- Test your soil to determine how much fertilizer, if any, your lawn and garden needs (see Improving Soils, pg 4).
- Topdress with compost as an organic matter amendment to soil and/or lawn surface.
- Use fertilizers containing zero phosphorus if you must fertilize your lawn. Minnesota State Law prohibits the use of phosphorus containing fertilizers on existing lawns unless a soil test indicates a phosphorus deficiency. It's best to fertilize only in the fall.
- Instead of applying herbicides over the entire yard, spot treat weeds.
- Never use pesticides more than 10 years old. Bring them to a Hennepin County Drop-Off Facility (see Resources, pg 43).
- Never apply pesticides or fertilizer if rain is forecasted within the next day or two.
- Use low maintenance plants and grass varieties to reduce the need for pesticides and fertilizers.

TO DO/Properly dispose of pet waste throughout the year:

During spring snowmelt and during summer storms, pet waste that is left on the ground travels with runoff directly to water resources and contributes to elevated bacteria and nutrient levels. Keep pet waste from polluting:

- Flush pet waste down the toilet, so your septic system or the sewage treatment plant can treat it.
- Seal the waste in a plastic bag and throw it into your garbage.

TO DO/Compost yard waste:

It is a Minnesota state law that property owners cannot throw yard and tree waste (grass clippings, leaves, trees, stumps wood chips, garden debris, weeds) in with their household garbage. It is against some cities' ordinances to rake or blow leaves and grass clippings into the street, because they clog storm sewers and overload streams, lakes and rivers with nutrients and sediment. Here is what you can do:

- Leave grass clippings on your lawn when you mow. Decomposing grass clippings offer the same benefits as one application of fertilizer each year.
- Compost excess grass clippings and other yard waste. Yard debris will decompose into a soil amendment for your yard and garden (see Home Composting, pg 23).
- Use curbside collection or drop-off facilities for yard waste. Contact your waste hauler or city recycling coordinator.

CONSERVE WATER

TO DO/Water efficiently to conserve water:

- Be sure to water properly:
    - Choose the right size and type of sprinkler.
      Those that mist lose a lot to evaporation.
    - Water from 4-8 am
      (Cooler, less windy, reduced sunlight-all reduce evaporation loss.)
    - Do not water when it is windy or extremely hot.
      Water evaporates before it reaches the roots.
    - Sprinkle only plants – not pavement – to prevent unnecessary runoff.
    - Water thoroughly to a depth of 5-6 inches.
      (see Watering, pg 33)
- Rake in some compost to improve moisture retention and reduce the need for fertilizer.
- Let your grass grow longer to create a healthier root system.
  (see LiLaC: Low Input Lawn Care, pg 37)
- Spread mulch around the base of flowers, shrubs, vegetables, and trees.
  It keeps plants from losing water to evaporation and promotes plant growth.
  (see Mulching, pg 30)
- Replace some of your thirsty lawn with other attractive landscape plants that require less water. (see Landscape Design, pg 2)

FOR MORE INFORMATION:

– Visit the Metro WaterShed Partner's tips for keeping Minnesota Water Clean at *www.cleanwatermn.org*

Rain Gardens

DESIGNED TO COLLECT AND FILTER RAINWATER

Traditionally, rainwater has been directed from our rooftops and sidewalks into storm sewers. On it's way to the road, this water picks up pollutants such as oil from our cars and lawnmowers, fertilizer, and grass clippings. Storm sewers are often allowed to empty directly into our lakes and rivers, where the extra nutrients can cause algae blooms and other pollutants can harm wildlife. These are the very same lakes and streams we use for drinking water and recreation.

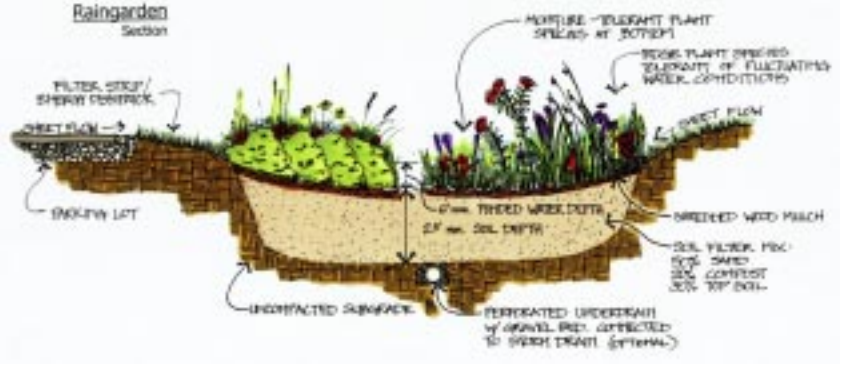
Rain gardens are depressional areas planted with a diverse mix of native wildflowers and grasses. rainwater, from your roof, driveway, or other impervious surfaces, collects in a shallow pool and slowly filters into the ground instead of into storm sewers. There are many benefits to rain gardens including:

- Stormwater retention reduces runoff of pollutants and nutrients into our lakes and streams. Reduced run-off into sewers can help with flooding problems as well.
- Deep-rooted native plants stabilize soil to prevent erosion during large storm events.
- Diverse plantings with many species are more resistant to drought, flood, insects and disease than a single type or low diversity planting.
- Once established, on-going maintenance is usually very minimal.

- The deep-rooting nature of many native species encourages infiltration of stormwater runoff.
- Native plantings are adapted to local conditions and, in some cases, are more tolerant of flooding, drought and disease than non-native plantings.
- A diverse native mix with wildflowers attracts a variety of wildlife including butterflies and birds.
- In the winter, vegetation collects snow and provides interesting texture as well as habitat.

GETTING STARTED

Site Design: Map your property, including property lines, buildings, utility lines and existing vegetation. Determine areas which will catch water from downspouts, driveways, or other impervious surfaces. The rain garden should be about 7-10% of the size it receives run-off from and at least 10 feet from your home. Choose local, native species based on your site conditions and personal preference.



YOUR RAIN GARDEN IS SIMILAR TO A LAKESHORE, ABLE TO TOLERATE BOTH FLOODING AND DROUGHT CONDITIONS, AND WILL CONTAIN SIMILAR PLANT SPECIES.

Site Preparation: If a depressional area is not already present, dig a shallow bowl to a depth of 3-4" with sides gently sloping up towards the lawn. If soil is heavy and does not drain well it may be necessary to dig down further and back-fill with a lighter soil. Remove unwanted vegetation through smothering, through the use of herbicides, or a combination of these. Line the site with 2-3" of shredded mulch, which is useful in retaining moisture for the young seedlings and discouraging weed seeds from germinating.

Planting: Seedlings can be planted from late May to mid September, however, summer planting may need frequent watering. Seedlings should be planted 12-18" apart with flood tolerant species towards the bottom and drought tolerant species towards the edge.

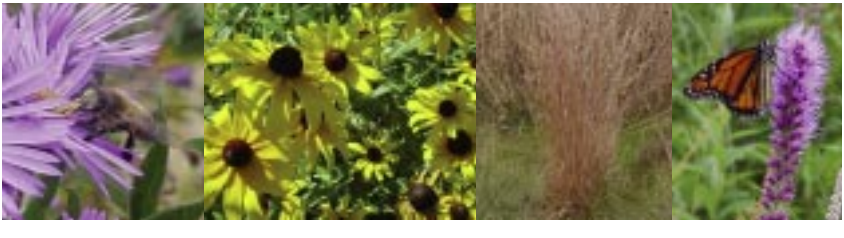
Maintenance: Make sure your plantings receive at least one inch of water a week for the first two months. Your garden will also require light weeding the first few years.

SUITABLE PLANT LIST

UPLAND – MESIC ZONE (SOIL IS MOIST, BUT NOT WET)

Achillea millefolium . . . . . .Yarrow
Agastache foeniculum . . . . . .Anise Hyssop
Allium stellatum . . . . . .Prairie Onion
Andropogon gerardii . . . . . .Big Bluestem
Anemone cylindrica . . . . . .Thimbleweed
Aquilegia canadensis . . . . . .Columbine
Amorpha canescens . . . . . .Lead Plant
Asclepias tuberosa . . . . . .Butterfly Milkweed
Aster species . . . . . .Aster
Dalea candida . . . . . .White Prairie Clover
Dalea purpurea . . . . . .Purple Prairie Clover
Echinacea purpurea . . . . . .Purple Coneflower
Geum triflorum . . . . . .Prairie Smoke
Heliopsis helianthoides . . . . . .Common Ox-eye
Heuchera richardsonii . . . . . .Alum Root
Liatris species . . . . . .Blazing Star
Lupinus perennis . . . . . .Wild Lupine
Monarda fistulosa . . . . . .Bergamot
Rudbeckia hirta . . . . . .Black-eye Susan
Schizachyrium scopariurm . . . . . .Little Bluestem
Solidago species . . . . . .Goldenrod
Sorgastrum nutans . . . . . .Indian Grass
Sporobolus heterolepis . . . . . .Prairie Dropseed
Verbena stricta . . . . . .Hoary Vervain
Veronicastrum virg. . . . . . .Culver's Root
Zizia aptera . . . . . .Heartleaf Alexanders

Wet Meadow Zone, continued next page



RAIN GARDENS ARE AN ATTRACTIVE, HEALTHY ALTERNATIVE TO TRADITIONAL GARDENS. THEY HELP REDUCE NUTRIENT AND SEDIMENT RUN-OFF INTO OUR LAKES AND STREAMS WHILE PROVIDING WILDLIFE HABITAT AND A BEAUTIFUL, LOW MAINTENANCE LANDSCAPE. PICTURED ABOVE, LEFT TO RIGHT: NEW ENGLAND ASTER, BLACK-EYE SUSAN, LITTLE BLUESTEM, BLAZING STAR.

WET MEADOW ZONE (SOIL IS WET, RARELY STANDING WATER)

Acorus calamus . . . . . .Sweetflag
Asclepias incarnata . . . . . .Swamp Milkweed
Aster novae-angliae . . . . . .New England Aster
Carex bebbii . . . . . .Bebb's Sedge
Carex comosa . . . . . .Bottlebrush Sedge
Carex stricta . . . . . .Tussock Sedge
Chelone glabra . . . . . .Turtlehead
Eleocharis species . . . . . .Spike Rush
Eupatorium maculatum . . . . . .Joe-pye Weed
Eupatorium perfoliatum . . . . . .Boneset
Gentiana andrewsii . . . . . .Bottle Gentian
Helenium autumnale . . . . . .Sneezeweed
Iris versicolor . . . . . .Blue Flag Iris
Liatris species . . . . . .Blazing Star
Lilium michiganense . . . . . .Turk's Cap Lily
Lobelia cardinalis . . . . . .Cardinal Flower
Lobelia siphilitica . . . . . .Great Blue Lobelia
Pycnanthemum virginianum . . . . . .Virginia Mountain Mint
Scirpus atrovirents . . . . . .Green Bulrush
Scirpus cyperinus . . . . . .Wool Grass
Spartina pectinata . . . . . .Prairie Cord Grass
Verbena hastata . . . . . .Blue Vervain
Vernonia fasciculate . . . . . .Ironweed

FOR MORE INFORMATION:

'*Lakescaping for Wildlife and Water Quality*'-DNR Publication

'*Restore Your Shore*' Interactive CD-ROM MN-DNR Publication

University of Wisconsin Extension Service – Rain Garden Publication
http://clean-water.uwex.edu/pubs/home.htm#rain

Wisconsin Department of Natural Resources – Resources on Rain Gardens
www.dnr.wi.gov/runoff/rg/links.htm

ACKNOWLEDGEMENT:

Information, graphics and photographs displayed in this section were generously provided by the Anoka Soil and Water Conservation District.

Home Composting

TURN WASTE INTO A MATERIAL TO IMPROVE YOUR SOIL.

Composting is a microbial process that converts waste from your kitchen and yard, such as fruit and vegetable peelings, grass clippings and leaves, into a more usable organic soil amendment or mulch. Gardeners have used compost for centuries to increase soil organic matter, to improve soil's physical properties, and to supply some of essential nutrients for plant growth.

THE BENEFITS OF USING COMPOST

As a soil amendment: Compost loosens and aerates soil, and improves water and nutrient retention. By adding 1-2" of compost to the top 6-8" of garden, you can improve structure over time, making it easier to work while creating a better environment for plant growth. Compost also improves drainage and aeration in heavy clay soils. Sandy soils benefit from compost as well, it improves moisture-holding capacity.

Adding compost to your soil will attract beneficial organisms such as earthworms and microorganisms, that break down organic matter naturally. Compost can also improve seedling emergence and water infiltration by reducing the potential for soil crusting.

As a mulch: Adding 6-8" of compost to garden beds can suppress weeds by blocking light to the soil surface. The mulch will decompose, adding organic matter to the soil. Compost also reduces the potential for erosion by protecting the soil surface from wind and the impact of hard rain.

Using compost as mulch can reduce moisture loss. Top dressing your lawn with compost to conserve moisture and add organic matter. Use compost in window boxes and container gardens where rapid moisture loss is a factor. Compost may also keep soils cooler in the summer and warmer in the winter.

MATERIALS TO COMPOST

Many of us understand what we should compost, but we sometimes get confusing information about what we should NOT compost. Composting is a microbial process and microbes – also called microorganisms – will not decompose synthetic products such as plastics or glass. Meat, dairy, grease and oil can attract critters to your compost bin and, in an urban setting where homes are close together, can cause foul odors (and possibly complaints from your neighbors). Feces from pets may carry pathogens that could cause health problems and therefore should not be included in your compost. Weeds with seeds should be composted separately to reduce the potential for the weed seeds in your compost. Large pieces of wood do not compost quickly and require a lot of energy to decompose, so wood should be chipped or shredded and used minimally. Other organic materials that can be added to enhance the nutritive value of compost are blood and bone meal, cotton seed meal, livestock manure, and aquatic plants.

What to Compost

- **Yard waste:** grass clippings, plant trimmings, leaves, weeds without seeds, pine needles;
- **Kitchen waste:** fruit and vegetable scraps, coffee grounds, tea bags, egg shells, potato peelings;
- Small amounts of sawdust, wood chips, and small sticks;
- **Wood ashes:** use no more than 1 cup per bushel of compost. Ashes act as a lime source and affect the pH of your compost.

What NOT to Compost

- **Meat and dairy:** meat pieces, dairy products, bones, fish scraps, raw eggs;
- **Fats:** cooking oil, drippings and grease;
- **Synthetics:** motor oil, glass, plastic, Styrofoam, polyester;
- Feces from dogs, cats and humans;
- Weeds with seeds;
- Large pieces of wood.

What about cuttings treated with herbicides?

Studies have shown that low levels of herbicides are detectable even in well-decomposed yard trimmings, but these levels are less than 1% of the level found in trimmings prior to composting and is not considered a risk for using in the garden. Ideally, grass clippings from lawns treated with herbicides should be left on the lawn to decompose, also allowing the herbicides to degrade.

BUILDING YOUR OWN COMPOST PILE

TO DO/Choose a compost bin design:

You can find dozens of different styles of compost bins on the Internet and in garden supply catalogs, as well as many plans for building your own bin. Your bin can be as simple as a few stakes and chicken wire or as advanced as a tumbler-style bin. Choosing a bin can be a bit overwhelming, so here are some points to remember:

- The bin should be sturdy and have slits or spaces on the sides for air circulation. It should be made of a rot-resistant material such as cedar, plastic, concrete block or wire. The bin can be square or round.
- The lid or cover should fit or lock firmly to keep out critters and not be blown off by strong wind.
- The opening from which you retrieve the finished compost should be large and easily accessible with a spade or garden fork.
- Your bin should be no smaller than 3' x 3' x 3' and no larger than 5' x 5' x 5'. Smaller bins do not allow for enough material and larger bins are too big to manage successfully.

TO DO/Find a place for your compost bin:

Location, location, location! Choose a place in your yard where your bin is easily accessible, but not an eyesore for your neighbors. Some people incorporate a bin into the design of their landscape, sometimes planting their garden right around the bin! Select a spot where your bin gets some sun and heats up your pile. Locating your bin in full sun will heat up the compost pile faster, but it will dry out more often, requiring periodic watering. Some shade will prevent this.

Good drainage is important for your compost bin as is accessibility. You should have enough room around the bin to allow you to turn the compost, and a water source nearby in case you need to add moisture.

Each city has its own ordinances about composting. Check with your city recycling coordinator for details concerning your local laws.

THE RECIPE FOR A SUCCESSFUL COMPOST PILE:

There are four basic ingredients for good compost: carbon, nitrogen, oxygen and moisture.

In the composting process, microorganisms use carbon for energy and nitrogen to make proteins. For home composting, this translates to a proportion of three parts carbon (brown materials) and to one part nitrogen (green materials). Given this “diet,” microorganisms can make short work of your compost.

Successful Compost Pile, continued next page

Oxygen and moisture are important for the health and activity of the microorganisms. An active compost pile – one in which microorganisms are actively converting organic materials to compost – has good air circulation and moisture consistency of a wrung-out sponge. If a pile is compacted, or too wet or too dry, the microorganisms will cease their work, making the pile passive.

Air circulation can be accomplished through turning your pile with a garden fork or – in the case of the tumbler bin models – turning the whole bin! Do not allow the pile to become soggy. This causes anaerobic conditions (meaning no air) and usually will produce a foul smell. A pile that is too wet can be due to excess water from rain or from too much green material. This condition can be corrected by adding carbon material and turning the pile to increase the oxygen level.

TO DO/Layer your materials:

Start your pile with a six-inch layer of brown materials, such as twigs and/or cornstalks. This will help elevate your pile and allow air to circulate at the base of the pile. Then alternate layers of brown materials with green materials, adding layers of garden soil or finished compost. This layer will provide the microorganisms required to speed up the decomposition. Add a little water to dampen the pile and you are on your way!

TO DO/Maintain your compost pile:

As your compost pile begins the decomposition process, the temperature of the pile will begin to rise, especially in the center of the pile. A well-built pile may reach temperatures from 130˚–160˚ F in just a few days. The pile will begin to cool in four to five days and a depression may appear in the middle of the pile. At this point, it is time to turn the pile. Use a garden fork and turn the outside of the pile inward. Steam may rise form the pile–this is a sign that the decomposition process is working. If the pile is dry, add a small amount of water. If is too wet, add some dry material such as dry leaves or cornstalks. Cover the pile and it will start to re-heat.

Turn your pile on a regular basis – about once a week. Doing so will speed up the decomposition process and you will have compost sooner.

Browns (*carbon*)	**3 TO 1**	Greens (*nitrogen*)
straw, sawdust, twigs, dried grasses, leaves		grass clippings, green leaves, plant trimmings, fruit and vegetable peelings, coffee grounds

TO DO/Identify when your compost is finished:

Under warm conditions, a well-tended compost pile will be finished and ready for use in about 2-4 months. Left untended, a bin may take a year to decompose. A finished compost pile is about half its original size, is loose, dark and crumbly, and it smells good – like fresh soil. None of the materials should be identifiable. You can also tell your pile is composted when it is no longer heating up. This is a good indication the composting process is complete and the finished product is ready for use.

TIPS FOR HOME COMPOSTING

Keep your compost pile at the right moisture level.
If your compost pile has a bad odor, it lacks air circulation or it may be too wet.
Try turning the pile and/or adding dry material to the pile.

●

If your compost pile is not heating up, it may need more nitrogen or
"green" material. Add grass clippings or a nitrogen fertilizer to the pile.

●

Bury kitchen scraps at least 8" deep in the compost pile to discourage critters.

●

You can keep adding to your compost pile as it is composting.
However, you may want to start a second pile if you have enough materials.

●

Add a layer of straw or hay to the top of your compost pile
in the winter to keep it warm and keep on composting!

●

The best pile is made up of a variety of materials.

●

The smaller the pieces of compost material,
the faster the pile will decompose.

FOR MORE INFORMATION:

–The University of Minnesota Extension Service offers extensive composting resources, available in print or online at *www.extension.umn.edu*

–"Composting and Mulching: A Guide to Managing Organic Yard Wastes" (Extension Publication BU-03296) available online at *www.extension.umn.edu/distribution/horticulture/DG3296.html*

Managing Yardwaste

IDEAS FOR THE REUSE OF YARD WASTE

Leave grass clippings on the lawn. A growing season's worth of clippings is equal to one fertilizer application.

Compost in your backyard. Home composting is an easy way to turn much of the waste from your yard and kitchen into a rich material that you can use to improve your soil. To learn how to get started, visit *www.hennepin.us*, search: backyard composting.

Use curbside collection or municipal drop-off facilities. Contact your waste hauler or city recycling coordinator for options in your community.

Hennepin County maintains a list of yard waste drop-off locations. Call 612-348-3777, or visit *www.hennepin.us*, search: yardwaste.

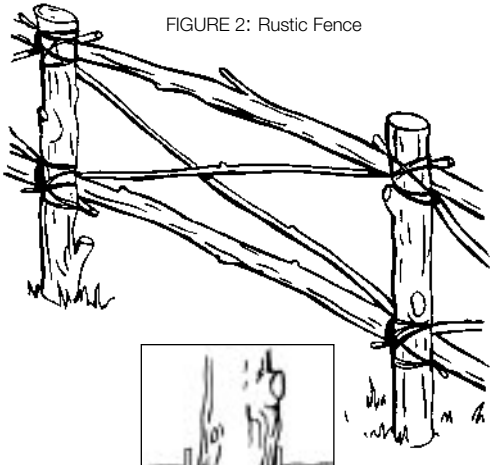
CREATIVE USES

Fences and trellises made from branches leftover from pruning can enhance your landscape by adding structure and vertical focal points, as well as provide great support for you plants. These kinds of supports are very popular and you can purchase them through gardening and landscape catalogs. However, they are expensive, and here you have all the materials to make your own while “reducing, reusing and recycling” your yard waste!

TO DO/Create fences and trellises:

To make them, lay out the pieces of wood on your driveway or sidewalk, arranging them in a pattern you like (SEE FIGURES 1 AND 2). Sometimes the wood is hard to work with and difficult to nail into easily. An alternative is to tie the branches together using wire from a floral or craft store (#16 or #18 gauge). To make them look more finished, tie raffia or twine over the wire. This will hide the wire (in case it rusts!) and still keep that rustic look. These creations will last several years. The wooden footings will begin to decompose from being in direct contact with the soil, so it's a good idea to lengthen the life of the fence or trellis by protecting them with a plastic pipe, such as PVC. Drill 3 or 4 small drain holes in an endcap and glue it to a piece of pipe. Sink it into the ground so the top of the pipe is just above the soil line. Then just insert the wooden footing of the fence or trellis into the pipe. The plastic pipe will protect the wooden footing and make it last much longer (SEE FIGURE 3).

FIGURE 2: Rustic Fence



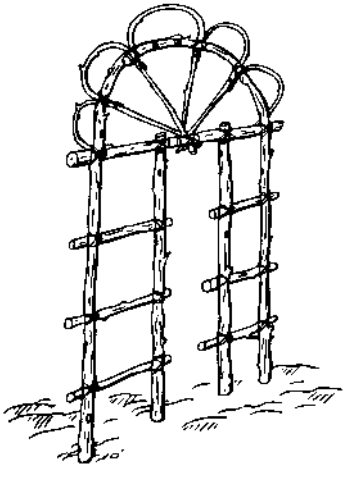


FIGURE 1: An attractive trellis can be made from woody yard waste.

FIGURE 3: Wooden footings can be protected from rotting in the soil by using capped PVC pipe.

TO DO/Use small branches for plant support:

Small to medium branches (about 1/2"–1 1/2" in diameter) can be used as plant supports. This works well for holding up taller perennials. Take four similar sized branches and secure them into the ground in the shape of a square around a plant (SEE FIGURE 3). Fasten smaller branches in a criss-cross pattern across the four supports. These should be 6-8 inches above the soil line. As the plant grows, continue adding small, criss-cross branches at 6-10 inch intervals until the plant reaches mature height. At maturity, the plant should hide the supports.

Mulching

HOLDS MOISTURE, DETERS WEEDS, PROTECTS THE ENVIRONMENT.

By definition, mulch is an insulating substance or material spread over the ground and around plant material. Usually it is organic material, and its primary purpose is to prevent loss of soil moisture by evaporation. It also will deter weeds and maintain an even soil temperature. *Mulch materials include: wood chips, shredded bark and wood, leaves, pine needles, straw, grass clippings, compost, and a variety of other organic materials.*

BENEFITS OF MULCHING

Mulch can serve several functions in your garden and landscape. For example, mulches can accent plants and give your landscape a finished look. Also, they have beneficial effects on plant growth and help reduce the time and effort you will have to spend on routine garden maintenance. Mulches also:

- *Provide a more uniform soil temperature* throughout the growing season.
- *Reduce soil erosion, compaction, and moisture loss.* For example, mulches improve soil water properties by reducing the impact of rain drops on the soil surface and permitting water to soak into the soil; helps prevent run-off into our storm sewers and gutters and, ultimately, our lakes, streams and rivers.

- *Improve soil structure* by adding organic matter to the soil as the mulch decomposes; increase earthworm activity which is valuable for soil aeration and decomposition of future organic matter.
- *Reduce or eliminate weeds*, making hand-removal more efficient, thus reducing the need for chemical control.
- *Reduce soil-borne disease* caused by water splashing onto lower plant foliage.
- *Reduce chance of injury to trees* by keeping weed whips, lawn mowers and other garden tools away from tree trunks and roots.
- Provide a way for you to *recycle* your woody yard wastes as a garden resource.
- *Reduce mud and weeds* in areas of heavy foot traffic and utility. Some examples include the area around firewood piles, paths, children's play areas, pet areas, trash can storage and tool sheds. Wood chips can easily be turned into the soil or a lawn area if the use of that area changes.
- *Create an environmentally-friendly and attractive finish* to your landscape.
- *Cover unsightly areas where grass and groundcovers will not grow* such as under fences.
- *Eliminate need for tilling*, lessens root injury, and reduce bruising of fruits and vegetables.

TYPES OF MULCHES

There is a large selection of mulches available commercially and locally to homeowners, which range from expensive to free of charge. Commercially, exotic mulches such as cypress, coco beans, cedar, and redwood chips can be purchased at garden centers and home improvement stores, and will certainly give you benefits listed above. *However, in sustainable landscapes, we are striving to reuse local and nearby materials.* Therefore, it is recommended that one take advantage of the municipal wood chip piles located in our area. These mulches are made of ground or chipped trees that have fallen in storms, been removed by the city or homeowners, or are the result of pruning by utility companies. They are easily accessible and usually free of charge to citizens.

Wood Chips: Wood chips are made by propelling pieces of logs and larger branches through a chipper, reducing them to chips of varying sizes. For mulch, chips 1 to 4 inches in diameter will give you the best results. They are less likely to be washed or blown away, and the large pieces will slow the decomposition rate, making replacement of mulch less frequent. Commercially, some chips are screened to give buyers a consistent size which creates a more finished and formal look to your landscape.

You can produce your own wood chips if you own a wood chipper. Be sure to follow all safety precautions and wear safety goggles when using a chipper. Sometimes you may have green leaves and smaller branches in your finished product if you have been chipping branches that were actively growing. While this may affect the appearance of your mulch, it will ultimately add more organic matter into your soil.

Shredded wood: Shredded wood mulch is made by running branches and wood pieces through a machine called a tub grinder. The finished product is irregular and usually elongated. It is also usually uneven and rough, causing the wood pieces to bind together well. This helps keep them in place on the soil surface, making shredded wood mulch an excellent choice for slopes and hillsides where wind and water erosion is a factor. Even though the pieces differ in size, the finished look of shredded mulch is more uniform and natural looking than wood chips, making it a popular choice for landscapes.

TO DO/Apply fresh wood chips:

Application of fresh wood chips can cause a temporary reduction of nitrogen in your soil. This is due to the large amount of nitrogen needed by the soil bacteria responsible for decomposition of organic matter to do their jobs. Because they are more efficient users of nitrogen than plants, these microorganisms may cause plants to suffer from a temporary nitrogen deficiency. *To counteract this, supply additional nitrogen* to your plants at the time you apply the mulch. This will help meet the demands of both the plants and the microorganisms. Ammonium Sulfate and Ammonium Nitrate are examples of nitrogen fertilizers you could use. Work into the soil one or two cups per bushel of chips prior to applying your mulch.

Concerns about wood chips and disease

Wood infected by Dutch Elm Disease and Oak Wilt is chipped by some municipalities and may be in the wood chips or shredded wood mulch you get from these sites. However, according to forestry personnel, you do not need to be concerned about the potential of these diseases being transmitted to your plant materials. The heat from the chipping process, subsequent drying out, and the small particle size of the finished product does not allow for the transmission of these diseases through wood chips or shredded bark. Do not use shredded or chipped wood from Buckthorn.

Watering & Rain Barrels

EFFICIENT WATERING CONSERVES WATER, REDUCING MAINTENANCE COSTS

Watering practices affect all areas of yard care: lawns, gardens, trees, shrubs and soil conditions. Efficient watering practices are important to all homeowners who want to conserve water, maintain a sustainable, healthy landscape as well as reduce maintenance costs.

PLANT WATER USE

Understanding how plants use water and their ability to tolerate dry conditions is the first step to placing the right plant in the right place to perform the right function. Water is an essential ingredient of all living cells. Plants absorb and take up water primarily through their roots. Nutrients from the soil are dissolved in the water and this solution is transported throughout the plant, nourishing all areas and supporting plant development. When the plant experiences water stress (usually meaning a lack of water) the first sign is wilting caused by reduced water pressure in its cells. Plants also use water to maintain their own temperature and the temperature of their immediate surroundings. Water vapor eventually diffuses out of the plant leaf through small pores called stomata. These small pores are spaced close together on upper and lower leaf surfaces. This evaporation process helps cool the plant and its surrounding microenvironment.

HOW TO WATER

It is best to keep watering to a minimum without stressing your plants. *Thorough, infrequent watering will force your plants to develop deep, strong root systems that will be able to absorb water from soil better* than shallow roots that develop from light watering. With the exception of the warm summer months of June, July and August our climate and weather in Minnesota usually supply enough moisture to support our plant life without supplemental watering. Water in the landscape is lost back into the atmosphere through evaporation and is used by the plant for cooling purposes (a process known as transpiration). Together these two phenomena are known as "evapotranspiration."

Watering time and frequency is affected by plant type, soil type, the weather, and the amount of sun and wind your plant or lawn is receiving. During hot, dry weather, the time between watering should be shorter. Cooler, dryer conditions enable you to water less often. Our cool-season turf grasses do a majority of their growing during cool spring and fall months. During the hottest parts of the summer months some of our older lawn grasses will actually go into a dormant state or slow their growth considerably in order to survive these periods. While they may not look their best at this time, it is actually a natural part of their lifecycle. Other plants, such as prairie grasses and flowers will actually suffer if watered as frequently as other plants, such as many garden perennials. Some plants will require more watering than others due to their size, placement, amount of sun and general physiology. Hand watering these plants and areas may be a more efficient use of your water than just turning on the sprinkler and watering areas that don't need watering. So understanding the needs and climate of your particular plants, shrubs, turfgrass, etc. is important to knowing how often you need to water.

A very light application of water is called syringing. Essentially, you are wetting the leaves of grasses and plants to reduce heat stress and cool plant and soil surfaces along with the surrounding air. Syringing is useful after seeding a lawn or lawns recovering from certain root diseases.

The amount of water you apply will depend on your type of soil and its moisture level. *The best method is to thoroughly dampen the soil to a depth of five or six inches.* Applying too much water will saturate the soil. Any additional water applied may be lost via run-off or it may move too deeply into the soil where plant roots cannot utilize it. Also, water needs will vary considerably from one type of plant to the next. For example, tree roots are much wider spreading and grow deeper in the soil than a shrub. Thus, adequately watering a mature tree will require watering a much larger area than a mature shrub.

TO DO/Measure when you water:

Determine the amount of water you are applying by putting several containers (coffee cans work!) under your sprinkler or drip irrigation hose. After an hour measure the amount of water collected in the container. This will tell you how much water has been applied in an hour. Note: When determining when and how much to water, be sure to consider any rainfall that has fallen recently.

WHEN TO WATER

You never want to tell it's time to water by seeing your plants wilting. This means they are under severe water stress.

TO DO/Check before you water:

Check your garden by feeling the soil a few inches below the surface. Squeeze a handful into a ball and poke it with your finger. If the soil ball holds its shape but breaks apart easily when poked, the moisture level is just right. If the soil ball holds its shape and doesn't break apart easily the soil is too damp. If the soil doesn't even form a ball, it's definitely time to water. Lastly, if you cannot easily dig down a few inches because the soil is too hard, you have bigger problems than watering! Generally, this condition is the result of severe soil compaction and will need to be modified to improve soil conditions.

The best time of day to water is early in the morning, from about 4 to 8 a.m. when cooler temperatures, lower wind velocity, and reduced sunlight will lower water losses due to evaporation. In addition, water demand on municipal systems is usually less at that time. While it will cool plants and reduce heat stress, watering in the middle of the day is not as efficient because some of the water will evaporate before it can be absorbed by the soil or used by the plant. Watering at night may result in plants and grass staying too wet most of the night thereby increasing the chances of disease development.

Watering too much is as detrimental as watering too little. Knowing your plants' requirements is important to good plant health. Plant roots that are growing in soil that is constantly wet become susceptible to many soil-borne pathogens such as fungi and bacteria. Root rots caused by fungi and bacteria will turn plant roots to mush and can weaken or even cause the death of those plants.

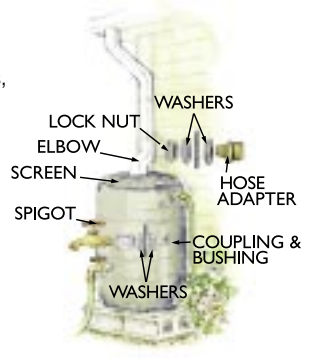
You can reduce the amount of watering required by using mulches (see Mulching, pg 30). Mulch will hold a significant amount of moisture in the soil, reducing evaporation and the need for water.

FOR MORE INFORMATION:

– More information and details about watering can be found on the Sustainable Urban Landscape Information Series website: *www.sustland.umn.edu*

RAIN BARRELS

Rain is naturally soft water and is devoid of minerals, chlorine, fluoride and other chemicals found in the water that comes from your home's faucet.



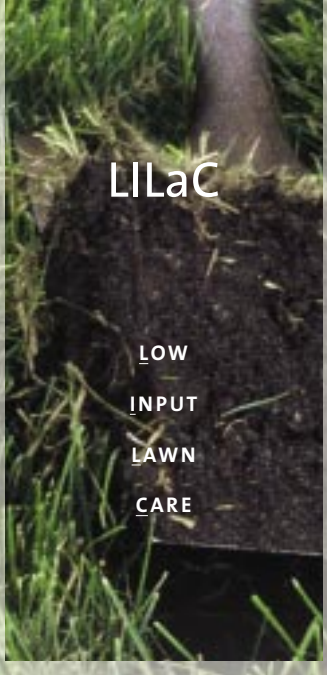
TO DO/ Install a rain barrel:

A rain barrel system placed under a shortened downspout collects the rooftop rainwater runoff and stores it for watering your lawn and gardens. A rain barrel system varies from the simple use of a 55-gallon drum, to a high tech system with flow controls.

BENEFITS OF RAIN BARRELS

- Help lower water costs (a rain barrel can save approximately 1,300 gallons of water during peak summer months.)
- Store rainwater for garden and lawn use- conserving municipal water.
- Reduce roof top water runoff to storm sewers.
- Soft water is good for plants.
- Easy to build and install and can be inexpensive.

Visit *www.cwp.org/Community_Watersheds/brochure.pdf* for instruction on how to build a rain barrel. To purchase- search the web for retail "Rain Barrels."



LILaC is a strategy of lawn care that focuses on low maintenance grass varieties and reduced use of pesticides and fertilizers as well as water, time and labor traditionally thought to be necessary for maintaining a healthy lawn.

WHY CHOOSE LILAC?

Because it focuses on less inputs, LILaC helps homeowners to conserve water by watering less frequently. LILaC also reduces the application of fertilizers and weed control products by improving soil and selecting the right plant material for the site conditions. All this helps to contribute positively to water quality and the health of our environment.

If you are considering converting your high maintenance lawn to a LILaC lawn, *you should first think about how much use your lawn gets*. LILaC lawns are best suited for low to medium use areas. Also, converting a high maintenance lawn to a LILaC lawn will take time, so you'll need to be patient – it will pay off in the long run.

Practicing LILaC strategies means thinking differently about how a healthy lawn looks. In the world of LILaC lawn care, it's OK to have a weed here and there – your lawn is still healthy. Controlling weeds and pests means assessing the severity of the problem and then targeting just the areas that need pesticide use or weed control, rather than applying to the entire lawn. *LILaC is a more focused effort.*

FEATURES OF LILAC	BENEFITS OF LILAC
• Utilizes low-maintenance grasses like fine leaved fescue and common types of Kentucky Bluegrass including varieties such as 'Park' and 'Kenblue'	• Low maintenance grasses thrive with less care
• Improve the condition of your soil	• Provides nutrients and a good root growing environment
• Mow your grass higher and less often	• Produces less noise, fewer emissions, and reduces time and labor
• Leave grass clippings on your lawn	• Recycles nutrients to your lawn
• Minimize use of fertilizers and pesticides	• Less potential for pollution

FREQUENTLY ASKED QUESTIONS

Can I use some of the LILaC techniques without totally converting my existing lawn to a LILaC lawn?

Yes. Improving your soil is a good place to start. You can also gradually reduce your use of nitrogen fertilizers and water. Start mowing your grass higher, maintaining it at approximately 2-3 inches high, and leaving the grass clippings on the lawn. Remember not to mow more than 1/3 of your grass height at one time. If you have very long grass, set your mower as high as possible or weed whip it first. Then wait about a week and cut it again, gradually bringing it back to the desired height.

How long will it take to convert my lawn to a LILaC lawn?

Successfully converting a lawn takes time – about 2-3 growing seasons. Be patient! It is worth it in the end.

What can I do now to start improving my soil for the future?

Have a soil test done first to determine the overall condition of your soil and any specific needs. You can obtain a soil test kit from your county extension service or the University of Minnesota Soil Laboratory. You should also aerate your soil to reduce compaction. This should be done about every two years. Top-dress your soil with compost by lightly spreading a high-quality compost over your lawn about 1/4" thick. Lastly, leave those grass clippings on your lawn. They won't contribute to thatch build-up. If clumps of clippings are left behind, just rake and compost them.

How should I treat for weeds in a low input lawn?

First, determine the severity of the problem and why an area is weedy. Are the weeds in one area? What kind of weeds are growing there? Many of our annoying weeds in our home landscapes are warm weather plants, meaning that they grow most in the warmer months of mid-summer. Sometimes altering the growing environment helps by encouraging grass to grow. For example, pruning evergreen branches to increase sunlight in shady areas.

Spot treat for weeds vs. broadcasting or spraying weed control over the entire landscape. This will save money in herbicides, will keep any negative impact on the environment to a minimum, and will still manage your weed population.

FOR MORE INFO:

The University of Minnesota Extension Service offers extensive lawn care resources, available in print or online at *www.extension.umn.edu*

"Low Input Lawn Care" (Extension Publication FO-07552-GO) available online at *www.extension.umn.edu/distribution/horticulture/DG7552.html*

Common Mistakes to Avoid

BASIC PRINCIPLES OF SUSTAINABLE LANDSCAPING

We often make mistakes when planting and caring for landscapes. The good news is most of these errors can be easily avoided by practicing some basic principles of sustainable landscaping and doing your homework before problems arise.

TO DO/ Avoid cutting lawns too short:

Lawns should be mowed at a minimum height of 2.5 – 3" with a sharp blade, and you should never remove more than 1/3 of the blade at a time. Cutting your lawn too short will make the grass more vulnerable to weeds. Higher blade height will encourage deeper root systems, better absorption of moisture and nutrients, and better stress tolerance during heat and dry conditions.

For more information on lawn care, see "LILaC."

TO DO/ Water less frequently:

Most landscape plants and turf require just one inch of water per week. By watering landscape plants and lawns too often, you are encouraging the grass roots to remain near the surface. By watering less, you are actually forcing the grass roots to search more deeply into the soil for moisture, resulting in deep, healthy root systems that can tolerate the hot summer months.

For more information, see "Watering & Rain Barrels."

TO DO/ Minimize fertilizing:

Lawns in Minnesota are made up of cool season grasses, meaning their heaviest growth period is during the cool months – spring and fall. Such grasses need only be fertilized each fall for a healthy lawn, and possibly in the spring for a lawn that needs a boost.

For more information, see "LILaC."

TO DO/ Plant trees, shrubs and perennials at the proper depths:

When planting most containerized plants, the soil level of the new planting location should match the soil level of the container. When planting most bare root plants, the soil level should meet the point where the roots meet the stem.

For more information, see "Plant Selection."

TO DO/ Match plant species with their preferred growing environment:

Sometimes people choose plants based on appearances, only to get them home and find they have chosen a shade-loving plant for a sunny area. Take note of the environmental conditions prior to going to the nursery – how much sun/shade a location gets, soil type (Sandy? Clay? Dry? Wet?) and then choose plants accordingly.

For more information, see "Plant Selection."

TO DO/ Take note of the recommended spacing and height requirements for trees and shrubs:

You should always note the grower's information about plants – the width requirement, the mature height, sun or shade, etc. Woody plants should be planted with mature height and width in mind. Planting too close together will result in lack of air circulation, poor form and potential health problems for the plants. Planting too far apart will result in poor design and dissatisfaction with the final result.

For more information, see "Plant Selection."

TO DO/ Avoid using too much wood mulch:

For a typical planting, 2-3" of mulch is plenty. Woody plants contains lignin, a chemical which gives the plant the strength and physical properties we call "wood." A great deal of energy is required to decompose wood. By using too much mulch, you are allowing the wood to take nitrogen and other nutrients away from the plants. Too much mulch also attracts detrimental insects and animals such as slugs and moles that like to burrow or like to stay protected in the cool mulch.

For more information, see "Mulching."

TO DO/ **Plant species that are hardy for your temperate zone:**

In Minnesota, we are in planting zones 3 & 4. Planting zones are based on the average high and low temperatures for our area. Plants that are not hardy for these temperatures and other climactic conditions (e.g. snow, drought) most likely require special protection from weather. By planting species that are proven to flourish in our area, you will have less maintenance and better results.
For more information, see "Plant Selection."

TO DO/ **Brush up on pruning techniques before you make the first cut:**

Pruning is an important part of plant care. Pruning our dead or diseased wood or branches that are too close together will improve air circulation and the overall health of the plant. When to prune is as important as what to prune. Pruning certain plants at the wrong time of the year can open them up to a host of disease and insect problems. Always find out about the best time and method of pruning for your particular plant before you make a single cut.
For more information, visit the University of Minnesota Extension Service website: www.extension.umn.edu

TO DO/ **Make sure you can accommodate an overly aggressive species BEFORE you plant it:**

Sometimes we introduce a new plant to our landscape only to find out it is invasive and choking out the other plants. Be sure to read about or discuss a new plant selection with a professional. Find out how it spreads – by seed, by rhizome, by root – and make sure you are ready to accommodate it. Don't select it thinking you can contain it completely.
For more information, see "Plant Selection."

Resources

GREAT PLACES TO START FOR MORE INFORMATION

Hennepin County Environmental Services

612-348-3777

www.hennepin.us

Hennepin County provides a variety of information on managing your yard in an earth-friendly way. Information is available on topics ranging from composting to the proper disposal of fertilizers and weed killers.

- Eco-Yard Demonstration Site (see Visit the Eco-Yard, pg 1) and educational programs
- Drop-off Sites for household hazardous waste and recycling, www.hennepin.us, search: A to Z or Drop Off Facilities

U of M – Extension Service of Hennepin County

612-596-2110

www.extension.umn.edu

The Extension Service provides education outreach for the University of Minnesota, delivering education programs on a variety of topics, including yard and garden information.

- Hennepin County Master Gardener Hotline, 612-596-2118 *www.hcmg.umn.edu*
- Yard and Garden Line, 612-624-4771
- INFO-U Hotline, 612-624-2200
- Sustainable Urban Landscape Information Services *www.sustland.umn.edu* SULIS provides sustainable landscape information to the public and to the horticulture/landscape industry, from planning to maintenance.

Minnesota Department of Natural Resources
651-296-6157
www.dnr.state.mn.us, search: buckthorn

Metro Watershed Partners
Tips for Keeping Minnesota's Water Clean
www. cleanwatermn.org

Wisconsin Department of Natural Resources
1-888-936-7463
www.dnr.wi.gov, search: garlic mustard

BOOKS & PUBLICATIONS

Ornamental Grasses for Cold Climates.
Meyer, Mary Hockenberry; White, D.B.; and Pellett, Harold. North Central Regional Extension Publication 573. Department of Horticultural Science, University of Minnesota. St. Paul, Minnesota. 1996.

Landscaping for Wildlife and Water Quality
Henderson, Carol; Dindorf, Carolyn; and Rozumalski, Fred. Minnesota Department of Natural Resources, St. Paul, Minnesota.

Manual of Herbaceous Ornamental Plants.
Still, Steven. Stipes Publishing L.L.C., Champaign, Illinois. 1994.

Native Plants for Northern Gardens
Snyder, Leon C. Andersen Horticultural Library, University of Minnesota, St. Paul, Minnesota. 1991.

Think Clean Air Landscaping

EARTH-FRIENDLY HOME LANDSCAPING ALSO CONTRIBUTES TO CLEANER AIR

An innovative approach to landscape design and maintenance that minimizes air pollution is called clean air landscaping. Reducing ground-level ozone (smog) is important for maintaining good air quality in the Twin Cities metropolitan area. Lawn mowing, trimming, and leaf blowing are big contributors to ground-level ozone pollution. These common landscape maintenance practices typically result in high emissions of volatile organic compounds (VOCs), which combine with nitrogen oxides, sunlight and heat to cause smog. Emissions are especially high from older, gas-powered yard care equipment – particularly from two-cycle (gas/oil mix) mowers. Old gas cans lacking spill-proof spouts are also a problem. You can help reduce smog and make a difference by implementing the clean air landscaping practices highlighted on this page.

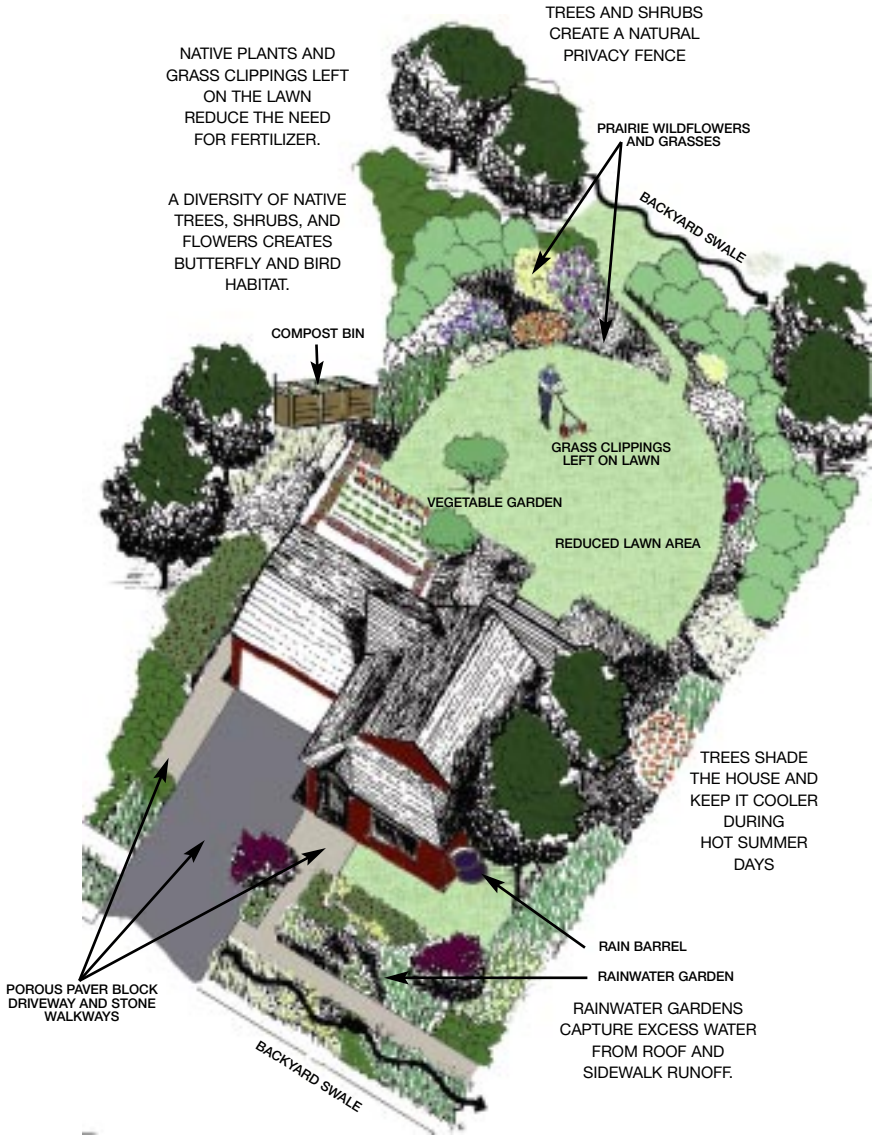
For more information on improving our air quality through modified landscaping practices, visit ***www.hennepin.us/cleanairlandscaping***

The Minnesota Pollution Control Agency notifies people when air quality in the area is compromised. You can sign up for Air Pollution Alerts at ***www.pca.state.mn.us/air/aqi-subscribe.html****.*

- Do not use a gas mower, trimmer, or leaf blower on very hot days or on Air Pollution Alert days
- Mow or trim less frequently, in general, and keep equipment well-maintained
- Convert some turf to 'no-mow' vegetation, such as native grasses and wildflowers
- Replace your old gas can with a new, no-spill model
- Replace your 2-cycle mower with a 4-cycle gas mower, OR
- Replace your gas mower with an electric or reel-to-reel (push) mower
- Never burn yard waste; compost it in your backyard, use your yard waste pick-up service or drop it off at a compost site
- Talk to neighbors and friends about changing their landscaping and yard care practices

HENNEPIN COUNTY IS A FOUNDING PARTNER IN CLEAN AIR MINNESOTA.

EARTH FRIENDLY HOME LANDSCAPING



Hennepin County
Environmental Services
612-348-3777

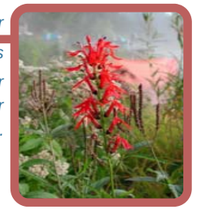
www.hennepin.us/sustainablelandscaping

Native Plants for Wildlife

Wild Columbine
Aquilegia canadensis
Ht: 6"-30" Flower: Red or yellow Bloom: May-August
Wildlife value: An excellent food source for hummingbirds and insects.

Little Bluestem
Schizachyrium scoparium
Ht: 12"-30" Flower: White Bloom: August-September
Wildlife Value: Attracts butterflies and a source of ground cover for birds and small mammals.

Butterfly Milkweed
Asclepias tuberosa
Ht: 24"-36" Flower: Orange Bloom: June-September
Wildlife Value: A great food source for butterflies as well as caterpillars.



Cardinal Flower
Lobelia cardinalis
Ht: 36" Flower: Red Bloom: July-October
Wildlife Value: Excellent source of food for hummingbirds and insects.

Rough Blazingstar
Liatris aspera
Ht: 24"-36" Flower: Pink or purple Bloom: July-September
Wildlife Value: Blazingstars are a favorite food source for many butterflies species and other insects.

Indiangrass
Sorghastrum nutans
Ht: 60" Flower: Amber Bloom: July-September
Wildlife Value: Provides year-round cover for birds and small mammals.

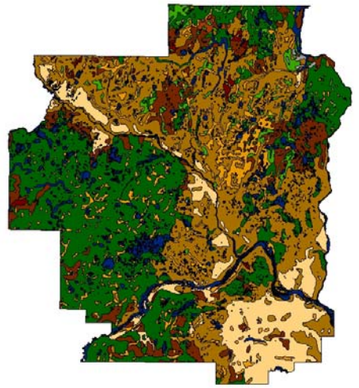
Highbush Cranberry
Viburnum trilobum
Ht: 8-12 ft. Flower: White Bloom: Spring
Wildlife Value: Provides a great source of cover as well as food through late-winter.

American Elderberry
Sambucus canadensis
Ht: 6-12 ft. Flower: White Bloom: Summer
Wildlife Value: An excellent source of food and cover for many species of birds.

White Pine
Pinus strobus
Ht: 75-100 ft. Flower: Purple Bloom: Summer
Wildlife Value: Provides year-round cover that is especially important in winter.

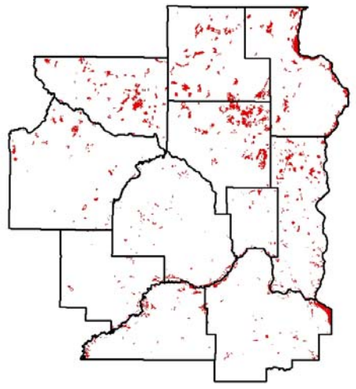
Bur Oak
Quercus macrocarpa
Ht: 60-100 ft. Flower: Yellow Bloom: Spring
Wildlife Value: Provides excellent cover as well as a great source of food (acorns).

Native Plant Communities



Native plant communities (Early 1800's, pre-settlement)

The landscape around us once hosted a mosaic of plant communities: oak savanna, tallgrass prairie, wetlands, maple-basswood forests, etc. The occurrence of a particular plant community depends on topography, geology and disturbances, such as fire. Extensive land development and introduced invasive species have led to the destruction of a majority of these native plant communities and a fragmentation of the few plant communities that remain.



Native plant communities (present)

Of the 3,221,041 acres that comprise the eleven county metro area, native plant communities occupy approximately 3.8% (123,183 acres) of the total land area. Efforts should focus on restoring areas that re-connect and protect the remaining native plant communities.

Metro Conservation Districts

Anoka Conservation District
763-434-2030

Carver Soil & Water Conservation District
952-466-5230

Chisago Soil & Water Conservation District
651-674-2333

Dakota County Soil & Water Conservation District
651-480-7777

Hennepin Conservation District
612-348-9938

Isanti Conservation District
763-689-3224

Ramsey Conservation District
651-266-7270

Scott Soil and Water Conservation District
952-492-5425

Sherburne Soil & Water Conservation District
763-241-1170 Ext. 3

Washington Conservation District
651-275-1136

Wright Soil and Water Conservation District
763-682-1970

LANDSCAPING
For Wildlife

Metro Conservation Districts

A partnership between the eleven soil and water conservation districts of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington and Wright Counties.

Prepared by the
ANOKA CONSERVATION DISTRICT

Landscaping for Wildlife

Urbanization has dramatically impacted wildlife by fragmenting and reducing the abundance of natural habitat. Adding native habitat to your yard relieves some of the pressure put on wildlife. Including multiple habitat components in your landscaping will help to attract a variety of animals such as butterflies, deer, birds, and frogs. Creating and improving habitat increases connectivity among other existing habitats and improves the ecological value of your yard.

Fragmented habitats are too small and have little value to wildlife.

Connecting groups of habitat creates an area much more beneficial to wildlife.

Components of Habitat

There are four basic needs of wildlife that can be considered the key components of landscaping for wildlife. They are:

1) Food

Every species has different food requirements. Animal food preferences often change with age and with the seasons. Including flowers, grasses and trees that provide fruits, seeds, nectar, nuts, and fiber will help to provide a year-round food source for a variety of wildlife.

2) Water

All animals depend on water for survival. That's why lakes, ponds, streams and wetlands are so important to our environment. Water can be the most difficult habitat component to include in your landscape. It can be anything from a simple bird bath, to creating a large pond. Even a small aquatic garden can have an immense value to the frogs and insects that depend heavily on available water sources. The sound of flowing water is particularly effective at attracting wildlife.

3) Shelter

Harsh weather and predators are a constant danger to animals. Shelter is especially important when animals are raising their young and when they sleep. Bird houses are an obvious source of shelter, but there are other ways to include shelter in your landscape. Trees, shrubs, tall grasses, and logs all provide cover during a storm or a place to hide. Structures like rock piles, standing dead trees and hollow logs also provide excellent cover and add another landscaping element to your yard.

4) Space

All animals have different space requirements and territorial needs. Some animals defend a large area when nesting while others don't. Learn about the territorial requirements of the wildlife in your area to determine how much wildlife you can expect in your yard.

Planning

Planning is an important step in any landscaping project. Landscaping for wildlife takes some additional consideration if you want your yard to have beneficial habitat for wildlife. Below are some good steps to take when planning your project.

- *Create a list of project objectives. If there are certain animals you would like to attract, plan your project to incorporate habitat components they need. For example, use water features if you want to attract frogs or dragonflies. Or, include different types of flowers to attract butterflies and hummingbirds. Many small mammals require rock or wood piles for making dens. Learn about the native plant communities in your area and how you can use them in your landscape.*

- *Map out your property. Note topography, buildings, existing vegetation, sunny and shady areas, soil types and other important features. Decide which elements you want to keep and what areas you could enhance. Make sure you consider family use in the yard so you still have room for a vegetable garden or for the kids to play. Look at your neighbors yard as well and consider adding to any natural features that border your yard. You can also use landscaping as a natural fence or to screen views.*

- *Group similar plants together. It is more appealing to the eye and provides larger areas of similar habitat.*

- *Plant deciduous trees on the south side of the house. Along with providing habitat, they will create shade for your house in the summer and allow sun to reach the house in the winter, reducing energy expenses. Evergreens are great year-round windbreaks and should be positioned near the north-west corner of the house.*

- *If you are using a water feature, consider installing a water pump that will move the water. You could create a small waterfall or just have it trickle over some rocks. This keeps the water clean longer, prevents mosquitoes from breeding and is much more attractive to wildlife. "Disappearing" streams are a great way to avoid standing water.*

Landscape Features

Butterfly Garden

Butterfly Gardens are made up of flowers that are especially attractive to butterflies and caterpillars. There are over 200 species of butterflies in the Midwest, and a huge selection of beautiful plants they enjoy.

Frog Pond

A great way to add a water source to your landscape is with a frog pond. Small and easy to maintain, frog ponds will attract more than just frogs! Introduce some aquatic plants and a small waterfall or rock fountain and you will have a feature that's appealing to the eye, and to wildlife.

Native Prairie Garden

These gardens are designed to replicate the natural prairies in our area. They are adapted to our climate and require minimal maintenance once they are established. They provide ground nesting cover for birds and small mammals. Strong prairie grass holds up even under heavy snow providing valuable shelter in the winter.

Rock or Brush Piles

These landscape features are a great element to incorporate into your gardens or in a corner of your property. While adding another interesting landscape component into your yard, they also provide great escape cover and den sites for rabbits, chipmunks, toads and many other animals.

Birdbaths

Another way to introduce water to your landscape is with a simple bird bath. The key to making them attractive to birds is making sure they stay full and clean. A reliable water source will have birds coming back again and again.

Feeders

Providing food in addition to what is produced by your trees, shrubs, and flowers ensures you will have a variety of wildlife visiting your yard. Seed and suet feeders are great for songbirds and can provide an important food source in the winter. Nectar feeders will attract hummingbirds and orioles. You can also spread seeds or corn on the ground for squirrels. If you choose to use feeders, be consistent and keep them full.

Hummingbird Garden

Ruby-throated hummingbirds are a garden favorite. Hummingbirds prefer red-tubular flowers, and it's a good idea to choose some flowers that bloom in spring and others in the fall. This way you will have hummingbirds visiting your garden all summer.

Native Plants — Dry Soils - Shade

Wild Columbine
Aquilegia canadensis
Ht: 6"-30" Flower: Red or yellow Bloom: May-August
Habitat: Full sun to shade. Dry to moist soils.
Forest, savanna, forest edge or grassland.

Large White Trillium
Trillium grandiflorum

Ht: 6"-18" Flower: White Bloom: April-June
Habitat: Full sun to shade. Moist to dry soils.
Forest or forest edge.

Pennsylvania Sedge
Carex pennsylvanica
Ht: 4"-12" Flower: — Bloom: April-May
Habitat: Full sun to full shade. Moist to dry soils.
Forest, forest edge or grassland.

Wild Geranium
Geranium maculatum

Ht: 10"-24" Flower: Purple, white, pink Bloom: April-June
Habitat: Full sun to shade. Moist to dry soils.
Forest, forest edge or savanna.

False Solomon's Seal
Smilacina racemosa
Ht: 24"-36" Flower: White Bloom: May-July
Habitat: Part sun to full shade. Moist to dry soils.
Forest or forest edge.

White Snakeroot
Ageratina altissima

Ht: 12"-48" Flower: White Bloom: August-October
Habitat: Full sun to full shade. Wet to dry soils.
Woodland and Lake Edge.

American Black Currant
Ribes americanum
Ht: 1-3 ft. Flower: Yellow Bloom: Spring
Habitat: Part sun to full shade. Moist to dry soils.
Woodland and Forest.

American Hazelnut
Corylus americana

Ht: 6-12 ft. Flower: Brown Bloom: Spring
Habitat: Part sun to full shade. Moist to dry soils.
Forest or forest edge.

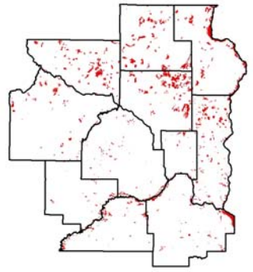
Red Oak
Quercus rubra
Ht: 60-80 ft. Flower: Brown Bloom: Spring
Habitat: Full sun to part shade. Moist to dry soils.
Forest.

Common Chokecherry
Prunus virginiana

Ht: 10-20 ft. Flower: White Bloom: Spring
Habitat: Part sun to full shade. Moist to dry soils.
Forest, forest edge or savanna.

Native Plant Communities

Native plant communities (Early 1800's, pre-settlement)



Native plant communities (present)

The landscape around us once hosted a mosaic of plant communities: oak savanna, tall-grass prairie, wetlands, maple-basswood forests, etc. Extensive land development and introduced invasive species have led to the destruction of a majority of these native plant communities and a fragmentation of the few plant communities that remain. Of the 3,221,041 acres that comprise the eleven county metro area, native plant communities currently occupy approximately 3.8% (123,183 acres) of the total land area. Efforts should focus on restoring areas that re-connect and protect the remaining native plant communities.

Native Plant Selection

Plants differ in their requirements for sunlight, moisture, and nutrients. Therefore, consider the factors below to select species that are well adapted to your site.

Plant Requirements Influenced

Site Properties	*Sunlight*	*Moisture*	*Nutrients*	*Explanation*
North/South Orientation	*X*	*X*		*North facing slopes receive a lower amount and intensity of sunlight than south facing slopes.*
Canopy Cover	*X*	*X*		*Dense canopy cover creates shaded conditions, also influencing evaporation rates.*
Slope		*X*		*Steep slopes result in lower water retention.*
Soil Type		*X*	*X*	*Soil properties are important, influencing moisture retention and nutrient availability. Textures range from dry sands to rich loams to heavy clays, and even wet organics.*
Water Availability		*X*		*Increased soil moisture is common close to lakes, rivers, and wetlands, in depressions, and in areas with high water tables.*

Consider the characteristics of plant species during your selection.

- *Plant height*
- *Growth form (e.g. tree, shrub, grass, forb, vine, etc.)*
- *Bloom time and color*
- *Foliage color and texture*
- *Drought tolerance*
- *Flood tolerance*
- *Root depth and structure*
- *Wildlife value*
- *Growth rate*
- *Native/ invasiveness*

The Minnesota Department of Transportation provides an informational plant selection tool that allows you to query based on site conditions or desired plant characteristics (http://dotapp7.dot.state.mn.us/plant/).

Metro Conservation Districts

Anoka Conservation District
763-434-2030

Carver Soil & Water Conservation District
952-466-5230

Chisago Soil & Water Conservation District
651-674-2333

Dakota County Soil & Water Conservation District
651-480-7777

Hennepin Conservation District
612-348-9938

Isanti Conservation District
763-689-3224

Ramsey Conservation District
651-266-7270

Scott Soil and Water Conservation District
952-492-5425

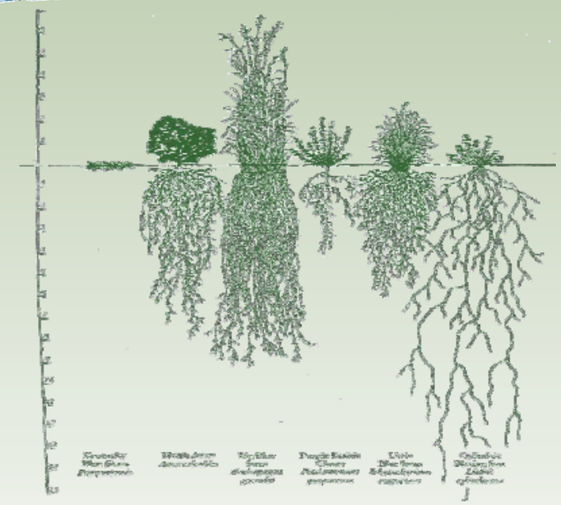
Sherburne Soil & Water Conservation District
763-241-1170 Ext. 3

Washington Conservation District
651-275-1136

Wright Soil and Water Conservation District
763-682-1970

NATIVE PLANTS

Restoring Habitat in the Metro Area



Metro Conservation Districts

A partnership between the eleven soil and water conservation districts of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington and Wright Counties.

Prepared by the

ANOKA CONSERVATION DISTRICT

Native Plants — Dry Soils - Sun

Pale Purple Coneflower
Echinacea angustifolia
Ht: 12”-48” Flower: Purple Bloom: July-August
Habitat: Full sun. Dry soils.
Grassland.

Little Bluestem
Schizachyrium scoparium
Ht: 12”-30” Flower: White Bloom: August-September
Habitat: Full sun to part shade. Moist to dry soils.
Savanna, forest edge, and grassland.

Butterfly Milkweed
Asclepias tuberosa
Ht: 24”-36” Flower: Orange Bloom: June-September
Habitat: Full to part sun. Dry to moist soils.
Savanna, forest edge or grassland.

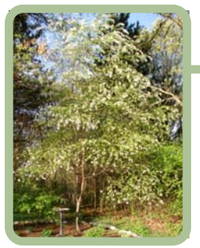
Prairie Dropseed
Sporobolus heterolepis
Ht: 18”-48” Flower: Brown, pink, green
Bloom: August-September
Habitat: Full sun, dry to wet soils. Savanna or grassland.

Rough Blazingstar
Liatris aspera
Ht: 24”-36” Flower: Pink or purple Bloom: July-September
Habitat: Full sun. Dry or moist soils.
Grassland or savanna.

Black Eyed Susan
Rudbeckia hirta
Ht: 12”-36” Flower: Yellow Bloom: July-October
Habitat: Full to part sun. Dry soils.
Savanna, forest edge, meadow, or grassland.

Red Raspberry
Rubus spp.
Ht: 6 ft. Flower: White Bloom: Spring-Summer
Habitat: Full sun. Dry to wet soils.
Forest, forest edge or Savanna.

Juneberry
Amelanchier spp.
Ht: 10-20 ft. Flower: White Bloom: Spring
Habitat: Full to part sun. Dry to wet soils.
Forest, forest edge or Savanna.



Black Cherry
Prunus serotina
Ht: 70-100 ft. Flower: White Bloom: Spring
Habitat: Full to part sun. Moist to wet soils.
Forest, forest edge or Savanna.

Bur Oak
Quercus macrocarpa
Ht: 60-100 ft. Flower: Yellow Bloom: Spring
Habitat: Full sun, dry to wet soils.
Forest or Savanna.

Native Plants — Moist to Wet Soils - Sun

Marsh Milkweed
Asclepias incarnata
Ht: 21”-48” Flower: Purple Bloom: June-August
Habitat: Full sun to part shade. Moist to wet soils.
Wet Meadow, marsh, wooded swamp or lake edge.

Prairie Cordgrass
Spartina pectinata
Ht: 48”-120” Flower: Yellow Bloom: August-October
Habitat: Full sun. Moist to wet soils.
Wet Meadow, marsh, or grassland.

Boneset
Eupatorium perfoliatum
Ht: 36”-60” Flower: White Bloom: August-September
Habitat: Full sun to part shade. Wet to moist soils.
Wet Meadow, marsh, forest edge, savanna or Prairie.

Indian Grass
Sorghastrum nutans
Ht: 36”-96” Flower: Yellow Bloom: August-September
Habitat: Full sun. Moist to wet soils (some dry).
Savanna or grassland.

Blue Flag Iris
Iris virginica
Ht: 18”-36” Flower: Blue Bloom: June-July
Habitat: Full sun. Wet to moist soils.
Wet Meadow or marsh.

Big Bluestem
Andropogon gerardii
Ht: 36”-96” Flower: Purple Bloom: August-September
Habitat: Full sun to part shade. Moist to wet soils.
Savanna, forest edge or prairie.

Red Osier Dogwood
Cornus sericea
Ht: 6-12 ft. Flower: White Bloom: Spring
Habitat: Full sun. Moist to wet soils.
Wet meadow, wooded swamp, forest edge or grassland.

Nannyberry
Viburnum lentago
Ht: 15-18 ft. Flower: White Bloom: Spring
Habitat: Full sun to shade. Moist to wet.
Forest or savanna.

Paper Birch
Betula papyrifera
Ht: 50-70 ft. Flower: Yellow Bloom: Spring
Habitat: Full sun to part shade. Moist to wet soils.
Forest.

Red Maple
Acer rubrum
Ht: 50-70 ft. Flower: Red Bloom: Spring
Habitat: Full sun to part shade. Moist to wet soils.
Forest.

Native Plants — Moist to Wet Soils - Shade

Marsh Marigold
Caltha palustris
Ht: 8”-16” Flower: Yellow Bloom: April-June
Habitat: Part sun to shade. Wet soils.
Wet Meadow, wooded swamp or marsh.

Wild Ginger
Asarum canadense
Ht: 36” Flower: Green Bloom: May-June
Habitat: Part sun to shade. Moist to wet soils.
Wet Meadow and Lake Edge.

Jacobs Ladder
Polemonium caeruleum
Ht: 18”-24” Flower: Blue, white or orange Bloom: May-July
Habitat: Part sun to full shade. Moist to wet soils.
Forest or forest edge.

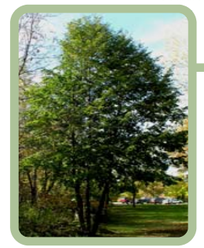
Cinnamon Fern
Osmunda cinnamomea
Ht: 24”-63” Flower: Red/brown spores Bloom: July-October
Habitat: Full sun to part shade. Moist to wet soils.
Forest, wooded swamp, wet meadow.

Bloodroot
Sanguinaria canadensis
Ht: 8”-10” Flower: White Bloom: April-June
Habitat: Full sun to shade. Moist to wet soils.
Forest, forest edge or savanna.

Jack-In-The-Pulpit
Arisaema triphyllum
Ht: 12”-24” Flower: Purple or green Bloom: April-July
Habitat: Part sun to shade. Moist to wet soils.
Forest, forest edge or bog.

Highbush Cranberry
Viburnum trilobum
Ht: 8-12 ft. Flower: White Bloom: Spring
Habitat: Full sun to shade. Moist to wet.
Forest, marsh, wooded swamp.

American Elderberry
Sambucus canadensis
Ht: 6-12 ft. Flower: White Bloom: Summer
Habitat: Part sun to shade. Moist to wet soils.
Forest, savanna, bog or grassland.



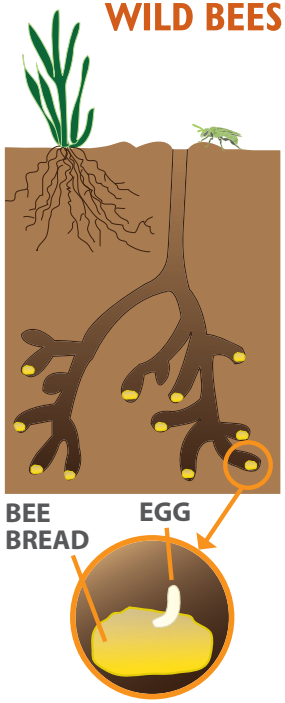
Basswood
Tilia americana
Ht: 60-130 ft. Flower: Yellow Bloom: Spring
Habitat: Part sun to shade. Moist to wet soils.
Forest.

White Pine
Pinus strobus
Ht: 75-100 ft. Flower: Purple Bloom: Summer
Habitat: Full sun to part shade. Dry to wet soils.
Forest.

NATIVE PERENNIALS FOR POLLINATORS

	BOTANICAL NAME	COMMON NAME	COLOR	SOIL	MOISTURE	HT	BLOOM							POLLINATORS					
							APR	MAY	JUN	JUL	AUG	SEP	OCT	BEES	BUTT/MOTH	WASPS	FLIES	BEETLES	OTHER/NOTES
SUN / UPLAND	Agastache foeniculum	Anise Hyssop	purple	sand to clay-loam	med to dry	1-2 ft								X	both	X	X	X	hummingbirds
	Allium cernuum	Nodding Onion	pink	sand to clay	med	1-2 ft								X		X	X	X	
	Asclepias tuberosa	Butterfly Milkweed	orange	sand to loam	med to dry	1-3 ft								X	butterflies	X		X	ants, hummingbirds
	Baptisia lactea	Wild White Indigo	white	sand to clay-loam	wet-med to dry	3-6 ft								X					important spring bumble bee plant
	Campanula rotundifolia	Harebell	violet	sand to loam	med to dry	0.5-1.5 ft								X	moths				grows well in containers
	Coreopsis palmata	Prairie Coreopsis	yellow	sand to loamy clay	med to dry	2-3 ft								X	butterflies				
	Dalea purpurea	Purple Prairie Clover	pink	sand to clay	med to dry	1-2.5 ft								X			X	X	browsed by rabbits
	Echinacea pallida	Pale Purple Coneflower	pink	sand to clay-loam	med to dry	3-5 ft								X	both	X	X	X	
	Eryngium yuccifolium	Rattlesnake Master	white	sand to clay-loam	wet-med to dry	3-5 ft								X	both	X	X	X	
	Helianthus maximilianii	Maximilian Sunflower	yellow	sandy-loam to clay	med to dry	3-8 ft								X	both	X	X	X	
	Heliopsis helianthoides	False Sunflower	yellow	sandy-loam to clay	med to dry	2-5 ft								X	both	X	X	X	
	Heuchera richardsonii	Prairie Alumroot	yell/lime	loam	wet-med to dry	1-3 ft								X					grows well in containers
	Liatris ligulistylis	Meadow Blazingstar	purple	loam to clay-loam	wet to med	3-5 ft								X	both	X	X		hummingbirds, monarch nectar plant
	Lupinus perennis	Wild Lupine	blue-violet	sand to loam-sand	med-dry to dry	1-2 ft								X			X		larval host plant for karner blue butterfly
	Monarda fistulosa	Wild Bergamot	pink	sand to clay-loam	wet-med to med	2-5 ft								X	both	X	X	X	hummingbirds, important bumble bee plant
	Monarda punctata	Spotted Bee Balm	white/pink	sand to sand-loam	med-dry to dry	1-3 ft								X		X		X	short-lived perennial, reseeds
	Penstemon digitalis	Smooth Beardtongue	white	sand to clay-loam	wet-med to med	2-3 ft								X		X	X		hummingbirds
	Phlox pilosa	Prairie Phlox	pink	sand to clay-loam	wet-med to dry	0.5-2 ft									both				hummingbirds
	Ratibida pinnata	Gray-Headed Coneflower	yellow	sand to clay-loam	wet-med to dry	3-6 ft								X	both		X	X	
	Rudbeckia hirta	Black-Eyed Susan	yellow	sand to clay-loam	wet-med to dry	1-3 ft								X		X	X	X	short-lived perennial, reseeds
	Solidago rigida	Stiff Goldenrod	yellow	sand to clay-loam	med to dry	3-5 ft								X	both	X	X	X	clump-forming, fibrous-rooted
	Tradescantia occidentalis	Western Spiderwort	blue-violet	loam to clay-loam	med-dry to dry	1-2 ft								X			X		nectarless flowers
	Verbena stricta	Hoary Vervain	purple	sand to loam	med to dry	2-4 ft								X	both		X	X	hummingbirds
	Zizia aurea	Golden Alexanders	yellow	sand to clay-loam	wet-med to dry	2-5 ft								X	butterflies	X	X	X	important spring forage plant
WETLAND EDGE	Asclepias incarnata	Swamp Milkweed	pink	sand to clay-loam	wet to med	3-5 ft								X	both	X	X	X	hummingbirds, pollinators visit for nectar
	Chelone glabra	White Turtlehead	white	sandy-loam to clay	wet to wet-med	2-4 ft								X					larval host plant for Baltimore checkerspot
	Eupatorium perfoliatum	Common Boneset	white	sand to clay-loam	wet to med	2-5 ft								X	both	X	X	X	attracts beneficial predatory wasps
	Eutrochium maculatum	Spotted Joe Pye Weed	pink	sand to clay-loam	wet to med	4-10 ft								X	both				
	Helenium autumnale	Sneezeweed	yellow	sand to clay-loam	wet to wet-med	3-5 ft								X	both	X	X	X	
	Liatris pycnostachya	Prairie Blazingstar	pink	sandy-loam to clay	wet to med	2-4 ft								X	both		X		hummingbirds
	Lobelia siphilitica	Blue Lobelia	blue-violet	sandy-loam to clay	wet to med	1-4 ft								X					hummingbirds
	Pycnanthemum virginianum	Virginia Mountain Mint	white	sandy-loam to clay	wet to med-dry	1-3 ft								X	butterflies	X	X	X	mint-scented foliage
	Symphyotrichum novae-angliae	New England Aster	purple	sandy-loam to clay	wet-med to med	2-6 ft								X	both		X	X	
	Verbena hastata	Blue Vervain	blue-violet	sand to clay-loam	wet to med	3-5 ft								X	butterflies		X		
	Vernonia fasciculata	Common Ironweed	purple	sand to clay-loam	wet to med	3-6 ft								X	butterflies		X	X	
	Veronicastrum virginicum	Culver's Root	white	sand to clay-loam	wet to med-dry	3-6 ft								X	both	X	X	X	
WOODLAND / SHADE	Dicentra cucullaria	Dutchman's Breeches	white	loam to clay-loam	wet-med to med	0.5-1 ft								X					important spring bumble bee plant
	Eurybia macrophylla	Large-Leaved Aster	white-pink	sandy-loam to clay	wet-med to med	1-4 ft								X			X		
	Geranium maculatum	Wild Geranium	pink	sand to clay-loam	med to dry	1-3 ft								X			X	X	
	Hydrophyllum virginianum	Virginia Waterleaf	pink-violet	sand to clay-loam	wet-med to dry	0.5-2 ft								X			X		reseeds
	Osmorhiza longistylis	Long-Styled Sweet Cicely	white	sand to loamy-clay	med	1-3 ft								X			X		
	Polemonium reptans	Jacob's Ladder	blue-violet	sandy-loam to clay	wet-med to med	1-2 ft								X			X		
	Solidago flexicaulis	Zigzag Goldenrod	yellow	sandy-loam to loam	med to dry	1-4 ft								X		X	X	X	

GROUND-NESTING WILD BEES



CAVITY-NESTING WILD BEES

Cavities in plant stems

Cavities in rocks

Holes in standing dead trees

Bee Squad

Bee Lab

PLANTS FOR MINNESOTA BEES

Bees rely on flowers to supply them with the food they need to survive. Some flowers (e.g. tomatoes) provide only pollen, the main source of protein for bees. Other flowers (e.g. clovers) provide both nectar and pollen, thus providing both protein and carbohydrates.

There are hundreds of different bee species in Minnesota. Different types of bees prefer different flowers. Some of these preferences are due to the physical size or shape of the bees and the flowers. Some flowers have long tubes with nectar at the bottom. Long-tongued bees are the only bees able to reach the nectar. Other preferences are based on nutritional needs. Some bees are only able to raise their young with pollen from particular plants. These bees are called "specialists". Other bees are "generalists" and will collect pollen from a wide range of plants.

There are also seasonal differences in the activity of different bee species. Many bee species forage as adults for only a few weeks out of the year, with different species emerging throughout the spring and summer, into early fall. The rest of the year, the young are developing in nests that are underground or in cavities. Each bee was provided with a pollen ball, a mixture of pollen and nectar, left there by their mother. They will emerge the following season. Many other bee species, including honey bees and bumble bees, are present through the entire spring, summer and early fall.

Providing a diverse array of plants will help ensure that you support a diverse array of bee species. Do your best to provide blooming flowers from April to September.

www.beelab.umn.edu

Agapostemon metallica on *Symphyotrichum* sp.
Photo by Karl Foord

Apis mellifera on *Dalea purpurea*
Photo by Heather Holm

Bombus auricomus on *Monarda fistulosa*
Photo by Karl Foord

This list is not inclusive of all plants that bees will visit in Minnesota. These are flowers that are particularly attractive to bees and can be easily integrated into most landscapes.

= Tree = Herbaceous plant = Shrub ○ = Full sun ◑ = Part-shade ● = Shade

Early=March to May Mid=June to July Late=August to September

Scientific name	Common name	Habit	Sun	Native	Bloom time	Honey bees	Other bees
Crataegus crus-galli	Hawthorn		○	X	Early	X	X
Geranium maculatum	Wild geranium		◑ ●	X	Early		X
Penstemon grandiflorus	Large beardtounge		○	X	Early		X
Salix discolor	Pussy willow		○	X	Early	X	X
Coreopsis lanceolata	Lanceleaf coreopsis		○ ◑ ●	X	Early to Mid	X	X
Hydrophyllum virginianum	Virginia waterleaf		○ ◑ ●	X	Early to Mid	X	X
Lupinus perennis	Wild lupine		○ ◑	X	Early to Mid		X
Aruncus dioecus	Goatsbeard		○ ◑ ●	X	Mid	X	X
Echinacea angustifolia	Purple coneflower		○	X	Mid	X	X
Lobelia siphilitica	Blue lobelia		○ ◑	X	Mid		X
Pycnanthemum tenuifolium	Slender mountain mint		○	X	Mid	X	X
Agastache foeniculum	Anise hyssop		○ ◑	X	Mid to Late	X	X
Asclepias incarnata	Swamp milkweed		○ ◑	X	Mid to Late	X	X
Borago officinalis	Borage		○ ◑		Mid to Late	X	X
Chamaecrista fasciculata	Partridge pea		○	X	Mid to Late	X	X
Cirsium discolor	Bicolor thistle		○	X	Mid to Late	X	X
Dalea purpurea	Purple prairie clover		○	X	Mid to Late	X	X
Eupatorium maculatum	Joe-pye weed		○ ◑	X	Mid to Late	X	X
Eupatorium perfoliatum	Common boneset		○ ◑	X	Mid to Late	X	X
Helianthus spp.	Sunflowers		○ ◑ ●	X	Mid to Late	X	X
Hylotelephium telephium	Autumn joy sedum		◑ ●		Mid to Late	X	X
Impatiens capensis	Jewelweed		○	X	Mid to Late	X	X
Liatris aspera	Rough blazingstar		○ ◑	X	Mid to Late	X	X
Monarda fistulosa	Beebalm		○	X	Mid to Late	X	X
Nepeta x faassenii	Catmint		○ ◑		Mid to Late	X	X
Origanum vulgare	Oregano		○ ◑		Mid to Late	X	X
Ratibida pinnata	Yellow coneflower		○	X	Mid to Late		X
Silphium perfoliatum	Cup plant		○	X	Mid to Late	X	X
Trifolium hybridum	Alsike clover		○ ◑		Mid to Late	X	X
Vernonia fasiculata	Ironweed		○	X	Mid to Late	X	X
Veronicastrum virginicum	Culver's root		○ ◑	X	Mid to Late		X
Solidago rigida	Stiff goldenrod		○ ◑	X	Late	X	X
Symphyotrichum lateriflorum	Calico aster		○	X	Late	X	X

Content and design by Elaine Evans

Pollinator species in decline

Pollinator species contribute significantly to seed and food production in flowering plants. Bees are among the most recognizable pollinator species, but other insects like monarch butterflies, moths, and animal species such as bats and birds contribute to flowering plant pollination as well. Three-quarters of the world's flowering plants rely on pollinator species for reproduction[1]. The health and economic value of pollinator species cannot be understated: almost one-third of the human diet depends upon animal-pollinated plants, and the economic value of the honeybee to the U.S. agricultural industry has been measured at $18.9 billion annually[2].

Pollinator populations across the nation and around the world are now in a measureable decline. There are a number of causes that have been identified as contributing factors in the decline of pollinator populations, including parasites and infections, extreme weather patterns, harmful pesticides and insecticides, and loss of native habitat for pollinators either due to land conversion or changing climate. Pesticides containing neonicotinoid compounds in particular are shown to induce disorientation or death in certain insect species. In August 2016, Governor Mark Dayton issued an executive order[3] outlining significant restrictions on the use of neonicotinoid pesticides in Minnesota and underscoring the importance of pollinator species to the environmental and economic health of the state.

Pollinator programs for cities

Local governments can play a role in reducing pollinator decline by actively protecting or promoting pollinator habitat and reducing the use of toxic compounds that are shown to harm pollinator species. There are a number of existing pollinator initiatives and local advocacy groups that have been formed to encourage city government action. A summary of some of these key initiatives is included here. The City of Ramsey is not currently involved in any existing pollinator protection programs or initiatives, but may consider aligning with one or more of these programs as part of any action to support pollinator protection.

Mayors' Monarch Pledge

This National Wildlife Federation initiative specifically targets protections for monarch butterflies, a pollinator species whose population has declined ninety percent (90%) over the past two decades. The Pledge involves (1) a mayoral pledge commitment to protect monarch habitat and encourage citizen action, (2) a follow up from the City outlining at least three (3) specific actions that will be taken to protect monarchs, (3) taking action and (4) reporting on progress on a quarterly basis.

Humming for Bees

This Minnesota non-profit, volunteer-led effort that describes themselves as "dedicated to contributing to a sustainable future for bees and other pollinators" has partnered with local City Councils to pass "Bee Safe" resolutions. They assisted the City of Shorewood in developing the first bee-friendly city policy in the state, comprising a commitment to refrain from neonicotinoid use as well as planting clover on city

[1] http://www.mda.state.mn.us/protecting/bmps/pollinators/morepollinators.aspx
[2] http://www.pollinator.org/Resources/NAS%20NRC%20selected%20quotes.pdf
[3] https://mn.gov/governor/assets/2016_08_25_EO_16-07_tcm1055-253931.pdf

property. The non-profit provides resources on their website for both cities and private citizens interested in taking action on pollinator protection.

Pollinate Minnesota

Started in 2015, Pollinate MN is a self-described advocacy group that offers a comprehensive toolkit for cities that are considering passing a pollinator-friendly resolution. The toolkit offers suggestions on what local government actions are the most effective and how to construct and augment policies that will work to enhance pollinator health and success.

Pollinator Friendly Alliance

Although this Stillwater-based organization largely targets citizen advocacy for pollinators, they have been involved in a number of pollinator demonstration projects or gardens in the metro area and support cities in their efforts to become pollinator friendly.

Existing pollinator efforts in Ramsey

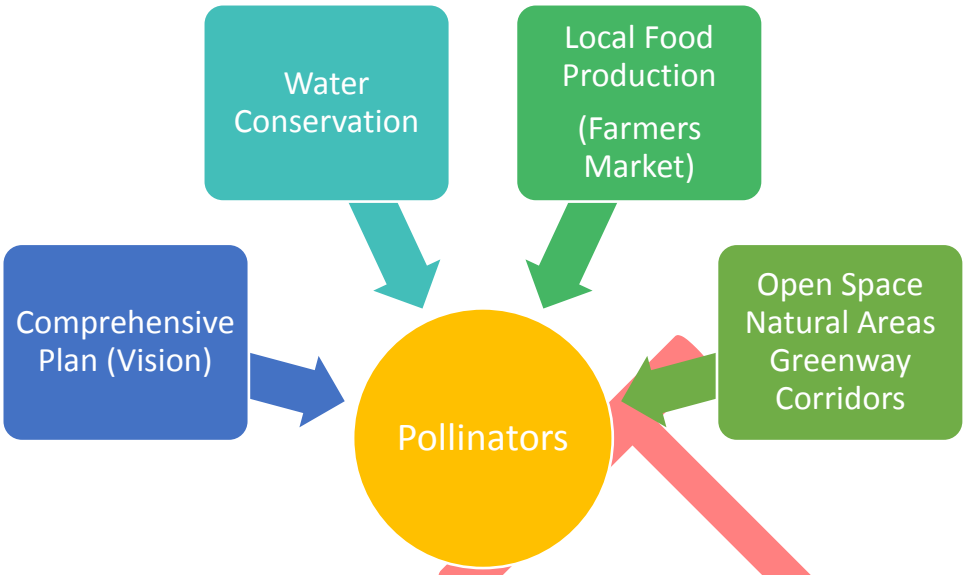
While the City of Ramsey has not made a formal commitment to protect pollinator species, it has certainly engaged in actions intended to directly support pollinators and their habitat. The City completed a Natural Resources Inventory in 2007 that incorporates both extent and quality of natural landscapes in the community, providing a baseline awareness of environmentally important areas and locations that may be ideal candidates for protection efforts to retain natural habitats critical for pollinators. Importantly, city staff has confirmed that that the City does not actively use neonicotinoid pesticides to manage insects in its parks or public facilities.

In 2016, the City approved a collaborative project to create a native prairie landscape along the Trott Brook Trail Connector. The project is primarily focused on bringing milkweed and liatris plantings, both food sources for monarch butterflies, to the area. The City has also supported efforts to bring native plantings to Ramsey Elementary School for their 4th grade classes to plant and maintain to expand a monarch friendly landscape.

Ramsey's City Code does include pollinator-friendly provisions. Native plantings are specifically differentiated from noxious weeds or nuisance vegetation definitions. Prairie vegetation is excluded from the plant height restrictions under the public nuisance section of code, and yards are permitted to include native plantings and/or establishment of native prairie. Ramsey provides information on the benefits from establishing prairie cover on its website. The City has also evolved its policy toward beekeeping from outright restriction, to conditional use, which carried a significant fee, to a beekeeping license with a reduced fee amount, reducing the barriers to beekeeping in the city.

Co-benefits of pollinator protection

Should the City of Ramsey elect to support pollinator protection, it will also promote a number of co-benefits ranging from environmental protection to support of the comprehensive plan. There are several ways in which pollinator protections align with existing City goals and initiatives.



Comprehensive Plan

The City's 2030 Comprehensive Plan acknowledges the importance of Ramsey's natural resources and environments, invoking the need to "respect the balance and connectivity between its unique urban, rural and natural environments" directly in the Plan's vision statement. The Plan also outlines a number of strategies to maintain native vegetation in the community, which provides vital pollinator habitat.

Water protection

Many practices that promote native landscapes also require less water for vegetative maintenance. Certain native plantings also provide greater storm water filtration and ecosystem services than typical turf grasses.

Local food production

A healthy pollinator population is required for flowering plant and food production, from small private gardens to large agricultural-scale crops. The City of Ramsey has a successful and growing farmers market and local foods movement. Supporting pollinator protections will also support farmers and gardeners who are providing locally-produced foods and goods to the community.

Open spaces and natural areas

Based on citizen surveys over the years, the natural environment and open space has been consistently identified as important to the community. Seeking opportunities to preserve natural areas seems to not only be consistent with the survey results, but would also provide protection for critical pollinator habitat. These open spaces and natural areas not only benefit wildlife, but also contribute to water quality, by slowing runoff and filtering sediment and pollutants before discharging into a water body and groundwater recharge, as the slower runoff results in greater infiltration.

Future pollinator action: What can Ramsey do?

Actions at the city level can have a significant impact, given that local governments are given wide latitude to regulate land use through zoning and other ordinances. As public landowners, cities can also

impact environmental outcomes considerably by implementing policies and practices that promote pollinators on their own properties. Local governments can also promote public education and awareness of the importance of protecting pollinators and their habitats by providing access to resources and examples of pollinator-positive actions to members of the community. The level of action a city could take can range from providing public resources (more passive) to conversion of park land into native habitat (more active).

There are a number of actions the City of Ramsey could take to formalize a commitment to protecting pollinator species. The following summarizes possible directions the City of Ramsey could take to actively promote pollinator protection. Most proposed actions could occur at little to no additional cost to the City.

Pass a Pollinator-Friendly Resolution

Ramsey could elect to join the fifteen (15) Minnesota cities that have passed pollinator resolutions intended to express support for pollinator protection and commit to pollinator-friendly practices. Example resolution items include elimination of neonicotinoid pesticides on publicly managed lands, piloting innovative pest management programs, incorporating native plantings in public spaces, and encouraging citizen stewardship and education.

Participate in Mayors' Monarch pledge

Taking the pledge requires following through on at least three (3) actions designed to protect monarch butterflies over the course of one year, and documenting progress toward those efforts.

Partner with a local advocacy group

Humming for Bees, Pollinate Minnesota, and Pollinator Friendly Alliance all provide resources for cities interested in supporting pollinator species including assistance in developing effective city resolution language.

Actively support public awareness & education

The City can support pollinator protection efforts by providing resources and links to community members who are interested in incorporating pollinator-friendly practices on their properties. With the permission of the landowners, the City could showcase exemplary properties that exhibit pollinator-friendly landscapes and practices as a demonstration opportunity to educate the community. There is a wealth of existing information regarding pollinators and native landscapes to support pollinators. Rather than 'recreating the wheel', the City could develop a webpage that serves as a repository of this information that is readily accessible by residents and businesses.

Promote Citizen Science efforts

Across the country, interested individuals and groups are engaging in observational studies and documentation of pollinator locations, behaviors, and habitats and are contributing to a large citizen-driven dataset tracking pollinator activity. The City should encourage and support citizen science efforts as they relate to pollinators and work to connect interested residents to the appropriate resources This could be incorporated into the public awareness and education element as part of a webpage and can link to an another entity such as Journey North that tracks citizen sightings of monarchs and milkweed.

Continue progressive reduction in beekeeping barriers

As restrictive hurdles at the city level towards beekeeping continue to be minimized, more residents may elect to promote pollinators by maintaining bee colonies on their own properties.

Make certain that City's vegetative stock does not derive from harmful pesticide use

Although the City does not use neonicotinoids directly in its parks or public facilities, it can take an extra step by researching whether its plantings come from a stock that is treated with the pesticides that have been proven harmful to pollinator species. If so, the City could look for alternative plant materials that have not been 'pretreated' with neonicotinoid and other systemic insecticides.

Continue to partner with local entities to support native plantings

The City can commit to aid in supporting, funding or facilitating projects that incorporate prairie or native plantings.

Consider conversion of underutilized park land to native plantings

The City can consider doing an inventory of existing, underutilized park and recreation land to discover where conversion to native or low-impact plantings may be appropriate.

Conserving Water Indoors

WaterSense Products

If you are considering a new product that utilizes water, look for those with the WaterSense label. They have undergone independent testing and certification to meet EPA WaterSense criteria for efficiency and performance. The average household could save approximately $170 per year by making simple changes to use water more efficiently. Installation of water-efficient products throughout the U.S. would save more than 3 trillion gallons of water per year, an equivalent of $18 billion dollars.

Low-Volume Showerheads

Installing a low-volume showerhead is an easy and inexpensive way to reduce the amount of water you use every day. Normal showerheads can dispense 5 to 10 gallons of water per minute! Low-volume showerheads can reduce water use in the shower by %50. Reducing your time in the shower, or turning off the water while you soap up will also dramatically reduce water use.

Front-Loading Washers

These washers use half as much water as a standard top-loading washer. Because they use less water, they also use 60% less energy to heat the water. They can also hold more and are easier on your clothes. Savings while using a front-loading washing machine can top $100 per year. To increase savings, only wash clothes when you have enough for a full load.

Low-Volume Dual Flush Toilets

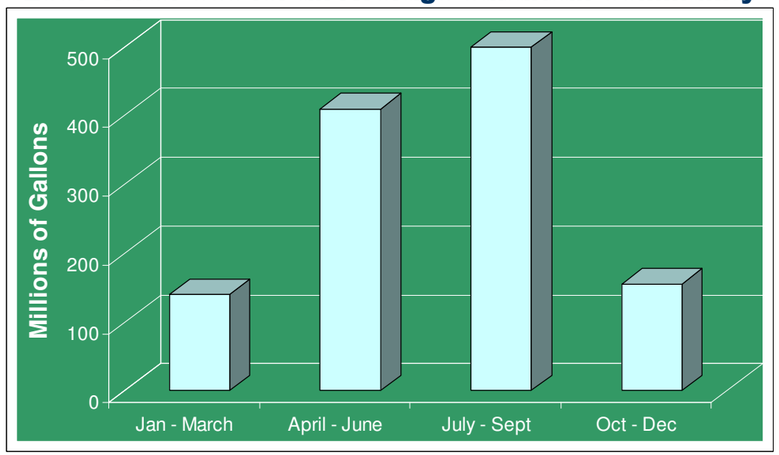
Standard toilets use between 3 and 5 gallons of water per flush. Low-volume toilets only use 1 to 2 gallons. This will cut indoor water use by about 30%. A dual flush toilet allows you to choose between a high and low volume flush. You can reduce they amount of water used by a standard toilet if you sink a couple plastic bottles full of sand and water in the tank.

Faucet Aerators

Aerators are the easiest, and least expensive way to reduce home water use. They come in a variety of styles to fit the needs of your kitchen and bathrooms. They are easy to install and most cost less than $6.

Water Use

2007 Water Use for an Average Suburban Community



The graph above depicts water use for an average suburban community throughout the year. During the non-growing season (October—March), an average of 40 million gallons is used per month. During the growing season (April—September), that amount nearly quadruples to 150 million gallons per month. The majority of the difference between these two numbers is outdoor water use for lawn and garden irrigation, as well as washing cars and maintaining swimming pools. This large increase in water use puts tremendous pressure on groundwater reserves.

When watering your lawn or washing your car, it is important to remember that you are using the same pure drinkable water that comes out of your sink. Finding ways to reduce water use is an easy step we all should take to help conserve this important resource.

Metro Conservation Districts

Anoka Conservation District
1318 McKay Dr. NE, Suite 300
Ham Lake, MN 55304
763-434-2030
www.anokaswcd.org

Carver Soil & Water Conservation District
11360 Highway 212 Suite 6
Cologne, MN 55322
952-466-5230
www.co.carver.mn.us/departments/LWS/swcd.asp

Chisago Soil & Water Conservation District
38814 Third Ave.
North Branch, MN 55056
651-674-2333
www.chisagoswcd.org

Dakota County Soil & Water Conservation District
4100 220th St. West, Suite 102
Farmington, MN 55024
651-480-7777
www.dakotaswcd.org

Hennepin Conservation District
417 North 5th St., Suite 200
Minneapolis, MN 55401
612-348-9938
www.hcd.hennepin.mn.us

Isanti Conservation District
380 South Garfield St.
Cambridge, MN 55008
763-689-3224
www.isantiswcd.org

Ramsey Conservation District
1425 Paul Kirkwold Dr.
Arden Hills, MN 55112
651-266-7270
www.co.ramsey.mn.us/cd/index.htm

Scott Soil and Water Conservation District
7151 West 190th St., Suite 125
Jordan, MN 55352
952-492-5425
www.scottswcd.org

Sherburne Soil & Water Conservation District
14855 Highway 10
Elk River, MN 55330
763-241-1170 Ext. 3
www.sherburneswcd.org/index.html

Washington Conservation District
1380 West Frontage Road, Hwy. 36
Stillwater, MN 55082
651-275-1136
www.mnwcd.org

Wright Soil and Water Conservation District
311 Brighton Ave. South, Suite C
Buffalo, MN 55313
763-682-1970
www.wrightswcd.org

WATER-SMART

Conserving Water at Home

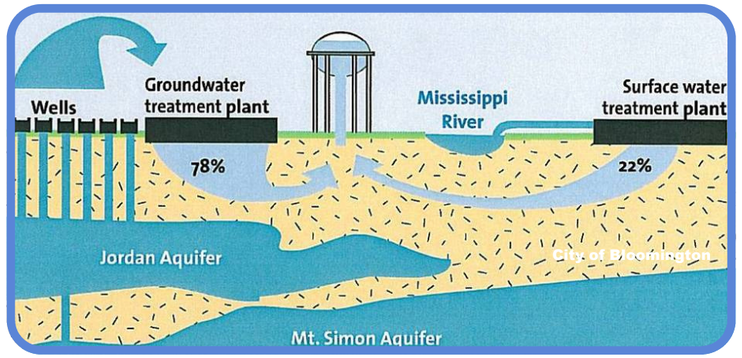
Metro Conservation Districts

A partnership between the eleven soil and water conservation districts of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington and Wright Counties.

Prepared by the
ANOKA CONSERVATION DISTRICT

Where Our Water Comes From

Household water can come from a variety of places including private wells, municipal wells, and treatment plants that take water from local rivers. The majority of our water is taken from aquifers located deep beneath the ground. Aquifers near the surface have their water supply "recharged" relatively quickly through infiltration, while deeper aquifers take much longer. Some of the water pumped by city wells was from glacial melt 10,000 years ago and once it is used up, it won't be recharged in our lifetimes. Water from these reserves is very clean and requires very little treatment to make it safe to drink.



The average suburban home will use over 40,000 gallons of water each year for lawn irrigation. That's about one third of the total annual household water use! Saving this water for drinking instead of growing grass will help maintain our drinking water supplies.

Runoff

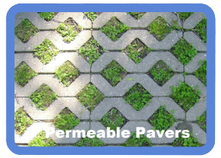
We all value clean lakes and rivers for recreation and clean abundant water for drinking and other household uses. What we do at home can greatly influence the quality and quantity of these resources.

In a one-inch rainfall, a 1/4 acre lot can produce over 5,000 gallons of water from roofs, sidewalks, driveways and even the lawn itself. Grass clippings, leaf litter, soil, fertilizer and other pollutants are all washed off the lot and eventually flow into a storm drain. Water that enters storm drains goes untreated into lakes, streams or ponds. This can severely affect natural systems and water quality by introducing pollutants and excess nutrients.

Runoff can cause a variety of problems for local waterbodies. It transports sediment that reduces the quality of habitat and smothers aquatic life. It carries heavy metals and chemicals that make the water unsafe for human use. Excess phosphorus from grass clippings, leaf litter and some fertilizes are washed into lakes causing algae blooms. Excess algae competes with native aquatic vegetation. Eventually, decomposition of algae will decrease the amount of dissolved oxygen in the water which can result in a fish kill. To prevent these problems, water quality improvement and volume reduction efforts need to be made by everyone, not just the people. living near a water source.

Water-Smart Surfaces


Permeable Pavement Driveway


Permeable Pavers


Permeable Asphalt

Driveways, sidewalks, patios and roofs all produce runoff during a rain storm. However, there are ways of maintaining a hard surface area while also allowing water to soak in. Permeable pavers lock together to create a solid surface but have gaps between the pavers that allow water to soak through. The gaps can be filled with gravel or even seeded to allow small plants to grow! They are great for driveways, sidewalks or patios.

Permeable asphalt is another hard surface that will allow water to soak into the ground instead of flowing into a storm drain. It is extremely durable, can be plowed in the winter and will reduce ice buildup because water will not sit at the surface.

Yard Maintenance Tips

With proper maintenance, you can keep your lawn healthy through the hottest part of the summer while also reducing your water use.

- Water thoroughly, but infrequently to encourage deeper root growth.
- Install a rain shut-off device to prevent watering during rain events.
- Repair leaking sprinklers, and adjust sprinklers to prevent spraying water on driveways or the street.
- Water in the morning to reduce water lost to evaporation.
- Mow your grass no shorter than 3" for deeper roots and fewer weeds.
- Use low-maintenance grasses like fine-leaved fescues and drought-resistant types of Kentucky bluegrass in newly seeded areas
- Let your lawn go dormant during the hottest months. Water 1/4" inch every two weeks (minus rainfall) to keep the crowns healthy.
- Mulch around trees, shrubs and in your garden. It will keep moisture in the soil and reduce weed growth.
- Use a plug aerator to improve water infiltration, making a healthier lawn and reducing runoff.
- Utilize drip-irrigation in gardens to apply water directly where it is needed and minimize losses to evaporation.

Water-Smart Landscaping

There are many ways to landscape your yard that will reduce runoff and water use. Many of them relate to the fact that traditional turf grass is not adapted to live in our climate and requires a lot of water to keep it alive. By limiting turf grass on your property to the areas of active use you can dramatically reduce your watering needs.

- Convert an area of lawn or existing garden to "xeriscaping", a form of landscaping that uses drought tolerant plants.
- Replace high-maintenance grass with low-maintenance trees and shrubs. They provide shade that will reduce the amount of water needed to keep your lawn healthy and have deep roots that promote infiltration.
- Install a water-free landscape feature like a rock garden.

Consider natural landscaping for the rest of your yard. Natural Landscaping is the use of native vegetation that is well adapted to the soil, moisture and sunlight conditions of the property, greatly reducing long term maintenance. Natural landscapes have many other benefits as well.

- Provide a variety of habitats for insects, birds, reptiles and mammals.
- Once established they require very little maintenance, resist disease, and easily survive drought due to deep root structures; saving on water, fertilizers and pesticides.
- They can be designed to look natural or formal depending on your preference.
- You can use natural landscaping to create a rain garden that will capture runoff and allow it to soak into the ground instead of flowing into a nearby water body.

To further reduce water use and runoff from your property ;

- Recycle rainwater with a rain barrel. Rain barrels capture rainwater from your gutters and store it so you can use it later to water your plants.
- Direct downspouts into your yard instead of onto your sidewalk or driveway.


Native Planting


Rock Garden


Rain Garden


Rain barrel

Auditing irrigation systems

By Sam Bauer, Extension Turfgrass Educator sjbauer@umn.edu

Auditing your irrigation system is an important practice for maximizing water use efficiency in the home landscape. Audits entail checking for irrigation uniformity and converting minutes of irrigation to inches of water applied. A basic irrigation audit should be performed every spring as systems are charged up for the growing season. Below is a step-by-guide to auditing home lawn irrigation systems.

REPLACE BROKEN AND LEAKY SPRINKLERS

Step 1: System inspection

Run each irrigation zone. Look for broken sprinklers, low water pressure and arcs or angles of water spray that are distributing water where it is not needed (i.e. on streets). Replace sprinklers, correct water pressure accordingly, and make adjustments to the water distribution so your system is supplying water only where it is needed.

Step 2: Performance testing

Performance testing involves placing catch cans on the lawn in an evenly spaced grid pattern throughout an individual irrigation zone. Can should be placed 5 to 8 feet apart for small area spray-sprinklers and 10 to 20 feet apart for large area rotor-type sprinklers. A minimum of 20 cans should be used for each irrigation zone- more cans allow for greater accuracy. Tuna or coffee cans work well for this, or you can purchase specialized cans for conducting audits.

PLACE CATCH CANS ON A GRID PATTERN

After the catch cans are placed throughout an irrigation zone, run the zone for a set amount of time (30-60 minutes). A longer run-time provides more accurate results. Next, measure and record the depth in inches of water in each can. Repeat this procedure for each individual zone of your irrigation system.

Step 3: Uniformity calculations and scheduling zones

MEASURE THE DEPTH OF WATER IN EACH CAN

To calculate the precipitation rate of each irrigation zone, calculate the average depth of water in the catch cans for one hour of run time. For example, if the average depth of our 20 cans was 0.75 inches and we ran the zone for 30 minutes, our precipitation rate would be 1.5 inches per hour. For uniformity calculations, take the average depth of the lowest 25% of cans (in this case the five lowest cans) and divide by the overall average of all cans. For example, if the average of our five lowest measuring cans is 0.5 inches, divide 0.5 by 0.75 = 0.67 or 67%. Irrigation systems with lower than 60% uniformity should be adjusted for more uniform coverage.

Once you have calculated the precipitation rate for each zone, you can set the run times. If your goal is to apply 0.5 inches in one irrigation cycle and the precipitation rate is 1.5 inches per hour, set the zone for 20 minutes.

For more information:

U of M Extension Lawn Care: www.extension.umn.edu/turfgrass

U of M Turfgrass Science Blog: www.turf.umn.edu

Conducting an Irrigation Audit: www.irrigation.org/Resources/Audit_Guidelines.aspx

Water-Saving Strategies for Your Lawn

By Sam Bauer, University of MN Extension Turfgrass Educator sjbauer@umn.edu

Are you ready for a beautiful lawn this year? In the Twin Cities, on average three times more water is used during the summer than in the winter because of outdoor irrigation. Save money, keep your grass happy and help the city conserve water by following these water-saving tips:

1) **Watch the weather:** During a Minnesota summer, we may see heavy rains followed by extended drought. Save on your water bill by no longer relying on the "set it and forget it" irrigation schedule that is often programmed into automatic systems. Operate irrigation controllers in manual mode and turn the controller on only when your lawn shows signs of drought.

2) **Drought-friendly fescue to the rescue!** Whether you are establishing a new lawn or renovating an existing lawn, choosing the right grass species can make a difference! Fine fescue, and tall fescue offer the best drought tolerance. Fine fescues simply use less water, and tall fescue has a deep root system able to access more moisture.

3) **Adjust irrigation programs to conserve water:** To encourage rooting and drought tolerance, water your lawn infrequently (one time or less per week) wetting the soil six inches deep, assuming no rainfall has occurred. Depending on your soil type, your lawn may only need as little as a half-inch of water. Don't water in the heat of the day--set irrigation programs to water during the morning hours to retain moisture.

4) **"Water-wise" technologies:** Rain sensors connected to irrigation controllers are good water-saving devices along with "smart" irrigation controllers, soil moisture sensors and more efficient sprinklers. Smart irrigation controllers save water by automatically adjusting irrigation programs based on water use estimates or stored historical data. Inexpensive ($150 or less) soil moisture sensors can placed throughout the lawn and they won't allow an irrigation system to run if soil moisture levels are good.

5) **"Water-wise" lawn maintenance:** High mowing heights (3 inches or greater) and proper fertilizer use will not only improve your lawn, but reduce the amount of water it needs. Lawn aeration followed by top-dressing with quality compost can lessen compaction and add organic matter to soil. This improves water infiltration in heavy soils as well as increase moisture-holding capacity of sandy soils that drain rapidly.

6) **Change your expectations:** When it's dry, your grass may not be as green—it may even go dormant. That's okay—it's very rare to have extended droughts that completely compromise the integrity of a lawn.

7) **"Water-wise" landscapes:** Right plant, right place—choose plants that are well-suited to your site including drought-tolerant plants for dry areas. Mulch garden beds to retain soil moisture and reduce weeds. Retain water on-site using rain barrels, raingardens, and planted slopes.

Finally, consider conducting your own irrigation audit—done properly, homeowners can save up to 50% on their water bills!
http://blog-yard-garden-news.extension.umn.edu/2016/09/water-wisely-auditing-home-lawn.html

For more information, go to U of M Extension Lawn Care:
www.extension.umn.edu/turfgrass

Water-Saving Strategies for Home Lawns

By Sam Bauer, University of MN Extension Turfgrass Educator sjbauer@umn.edu

Water use in the home landscape is a hot topic- even in Minnesota. In the Twin Cities, on average three times more water is used during the summer than in the winter and much of this water is used outdoors. As urbanization increases and we continue to experience more extreme heat and drought, greater pressure is placed on our water resources. If you own an irrigation system or water your lawn with portable sprinklers, reduce your overall water use by implementing the following water-saving tips.

WATER-SAVING TIPS

1. **Pay attention to the weather:** During a Minnesota summer, we may see heavy periods of rainfall followed by extended drought. Homeowners with lawns should adjust irrigation practices accordingly. This means no longer relying on the "set it and forget it" irrigation schedule that is often programmed into automatic systems. Operating irrigation controllers in manual mode is one way to solve this issue: turn the controller on only when your lawn shows signs of drought.

RESEARCH AT THE U OF M HAS IDENTIFIED FESCUES AS THE MOST DROUGHT TOLERANT FOR LAWNS

2. **Select lawn grasses that use less water and can tolerate drought:** Whether you are establishing a new lawn or renovating an existing lawn, choice of grass species will impact irrigation requirements. Traditional grass species for Minnesota include Kentucky bluegrass, perennial ryegrass, fine fescue, and tall fescue. Fescue species offer the best drought tolerance. Fine fescues simply use less water, and tall fescue has a deep root system able to access more moisture.
3. **Adjust irrigation programs to conserve water:** To encourage rooting and drought tolerance, lawns should be irrigated infrequently (one time or less per week) with a sufficient volume of water to wet soils to a depth of six inches, assuming no rainfall has occurred. Depending on your soil type, your lawn may only need as little as a half-inch of water. Set irrigation programs to water during the morning hours. Watering during the heat of the day reduces the amount of water absorbed by the soil and made available to plants.
4. **Audit your irrigation system:** Auditing your irrigation system is a good step toward water conservation. Irrigation contractors will perform this service for you if you contract with them. There are three basic steps: 1) check system components including sprinklers, valves and controllers; 2) conduct a performance test, and 3)

program the controller. For more information on conducting an irrigation audit, see "Conducting and Irrigation Audit" noted at the end of this article.

5. **Implement water saving technologies:** Rain sensors connected to irrigation controllers are good water-saving devices. Over the past decade, we have also witnessed "smart" irrigation controllers, soil moisture sensors and more efficient sprinklers. Smart irrigation controllers save water by automatically adjusting irrigation programs based on water use estimates or stored historical data. Additionally, inexpensive ($150 or less) soil moisture sensors can be purchased and placed throughout the lawn. These sensors will not allow an irrigation system to run if soil moisture levels are adequate. Many municipalities offer rebates (as much as $250) for installing these smart irrigation devices on your home irrigation system.

6. **Improve soils and lawn quality through good maintenance:** Lawn care practices have a direct impact on irrigation requirements. High mowing heights (3 inches or greater) and proper fertilizer use will improve lawn quality and reduce irrigation requirements. Aeration of a lawn followed by top-dressing with quality compost can lessen compaction and add organic matter to soil. This will improve water infiltration in heavy soils as well as increase moisture-holding capacity of sandy soils that drain rapidly.

PROPER INSTALLATION OF A RAIN SENSOR

7. **Recycle water when possible:** Recycling water for irrigation requires proper design of water storage containment and separate pumps to supply the water to irrigation sprinklers. Professional contractors who have expertise in this area have designed these systems for large commercial buildings and sports turf complexes. For homeowners, rain barrels can be purchased from local municipalities and companies for the purpose of reusing rain water to irrigate landscape plants.

8. **Change expectation:** Consider changing your lawn expectations to allow for temporary discoloration during drought periods. It is very rare to have extended droughts that completely compromise the integrity of a lawn.

9. **Design landscapes for water conservation:** Choose plants that are well-suited to your site including drought-tolerant plants for dry areas. Mulch garden beds to retain soil moisture and reduce weeds. Retain water on-site using rain barrels, raingardens, and planted slopes.

For more information:

U of M Extension Lawn Care: www.extension.umn.edu/turfgrass

U of M Turfgrass Science Blog: www.turf.umn.edu

Conducting an Irrigation Audit: www.irrigation.org/Resources/Audit_Guidelines.aspx

Watering Newly Planted Trees and Shrubs

University of MN Extension

Newly planted trees and shrubs need regular and consistent watering until root systems establish. Root systems of bare root, containerized, and balled and burlapped trees and shrubs have been severely reduced or restricted by nursery management practices. After planting, root systems will grow and establish until they are much wider than the above ground portion of the plant. During this establishment time, newly planted trees and shrubs need consistent watering to prevent water stress.

When to water

Newly planted trees or shrubs require more frequent watering than established trees and shrubs. They should be watered at planting time followed by watering at the following intervals:

Table 1. Watering schedule for newly planted trees and shrubs

Weeks after planting:	Watering frequency:
1-2	Daily
3-12	Every 2-3 days
Until established*	Weekly

* See Table 2 for tree establishment time. Shrubs establish in 1-2 years.

How long does it take for tree and shrub roots to establish?

Newly planted shrubs are considered established when their root spread equals the spread of the above-ground canopy. In Minnesota, this will take 1-2 years.

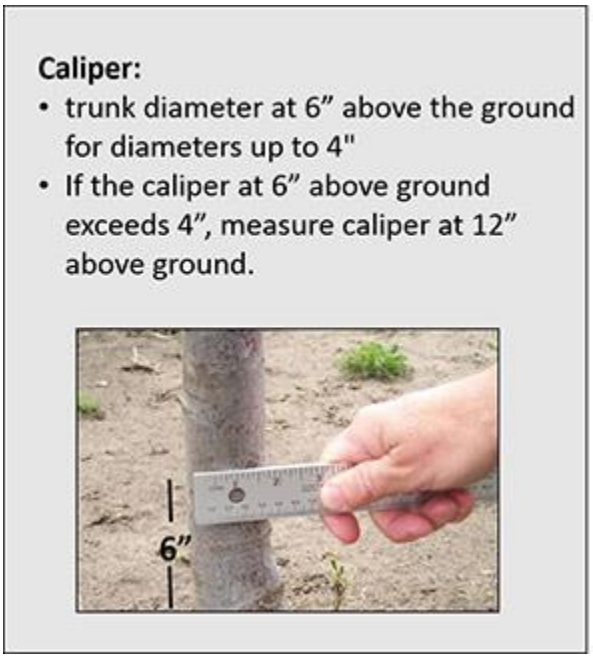
Establishment times for trees increases with tree size. Trunk caliper at planting time can be used to determine the time it takes for roots to establish (Table 2).

Table 2. Establishment time and watering volume for newly planted trees.

Caliper (inches)	Root establishment time for trees (years)	Water applied during each irrigation (gallons)
1	1.5	1-1.5

Table 2. Establishment time and watering volume for newly planted trees.

Caliper (inches)	Root establishment time for trees (years)	Water applied during each irrigation (gallons)
2	3	2-3
3	4.5	3-4.5
4	6	4-6
5	7.5	5-7.5
6	9	6-9



How to measure tree caliper.

Where to water

Apply water directly over the root ball. Also be sure to keep the backfill soil in the planting hole moist. This encourages the roots to expand beyond the root ball into the backfill soil. Tree roots grow approximately 18 inches per year in Minnesota so remember to expand the area being watered over time.

Initial watering of a newly planted tree or shrub is easily accomplished by creating a circular mound of earth 3 to 4 inches high around the plant at the edge of the root ball to create a reservoir for irrigation water. A slow trickle of water can be used to fill this reservoir, which

allows water to slowly infiltrate into and around the root ball. Treegator® bags can also be used to provide a slow delivery of water over the root balls of establishing trees and shrubs.

Mulching trees and shrubs maximizes water uptake

When trees and shrubs are planted into turf, competition for nutrients, water, and space occurs below ground between turf roots and woody plant roots. Turf wins because its dense fibrous root system prevents woody plants from producing water- and nutrient-absorbing roots in the top few inches of soil. As a result, woody plant establishment and growth is slower in turf areas than in mulched or bare soil areas.

To optimize root production, water uptake, and establishment of newly planted trees and shrubs:

1. Eliminate turf and weeds from the base of the plant out to several feet beyond the plant canopy.
2. Leave the top of the root ball bare and start the mulch application at the outer edge of the root ball.
3. Apply a three inch layer of organic mulch around newly planted trees and shrubs in a circle that extends several feet beyond the tree or shrub canopy.

Mulching around newly planted trees and shrubs with organic materials (wood chips, pine needles, etc.) has several advantages over bare soil cultivation. Mulch:

- decreases water evaporation from soil.
- serves as a sponge that prevents runoff around plants growing in heavy clay soils or on sloped sites.
- helps to control seed germination and growth of weeds.
- insulates soil and buffers extreme summer and winter soil temperatures.
- reduces soil compaction from mowing equipment.
- prevents damage to stems and trunks by lawn mowers and weed cutters.
- improves soil health (increases microbial activity, nutrient- and water-holding capacity, soil pore spaces, and air penetration) as it decomposes.

Deep mulch applications can be problematic because they may:

- prevent movement of rain or irrigation water into the root ball of newly planted trees and shrubs. This can result in root desiccation and plant stress.
- lead to root production and growth in the mulch. This often results in circling and stem-girdling roots.
- reduce oxygen levels around roots and cause root suffocation.
- keep poorly drained soils too wet, which favors root rot development.
- keep bark excessively wet when piled around trunks and stems. This may lead to bark decay.
- create habitat for rodents that chew bark and girdle trunks and stems.

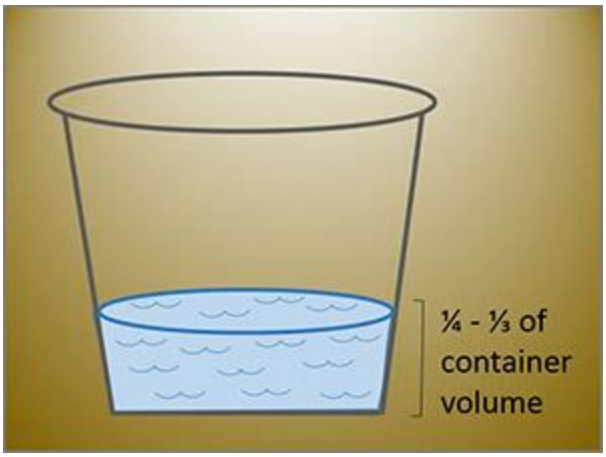
  Other images:

Kathy Zuzek, UMN Extension

Create a reservoir over the root ball for watering

Kathy Zuzek, UMN Extension

Treegator® bags hold 14-15 gallons of water and release a slow trickle of water over 5-9 hours



Kathy Zuzek, UMN Extension

Water newly planted shrubs with a volume of water that is 1/4-1/3 of the volume of the shrub container

Kathy Zuzek, UMN Extension

Apply a 3" layer of mulch from the outer edge of the root ball to several feet beyond the plant canopy

Kathy Zuzek, UMN Extension

This tree's root system was 12-13' wide before it was balled and burlapped

Executive Summary

The City of Ramsey contracted the Anoka Conservation District to complete an inventory of riverbank condition along the entire 5.8 miles of City that border the Mississippi River. The inventory provides the City with a comprehensive record of bank condition. Ten stretches of riverbank with severe or very severe erosion were identified, which if stabilized, would reduce sediment loading to the river by 5,148 tons per year.

The inventory is structured as this report as well as an atlas. The report provides details on the methodology used to estimate bank erosion severity and potential benefits provided by stabilizing the most severely eroding sections of riverbank. The 10 most severely eroding sections of riverbank are also detailed in the report with individual site profiles to highlight additional information and potential solutions. The atlas is presented in Appendix A and provides a complete record of aerial photographs with the corresponding erosion severity categorizations and key pictures collected during the field work portion of this effort. As not all pictures are presented in the atlas, the final deliverables also include the complete picture inventory collected in early December 2015.

Methods

Field Work

The project scope was determined to be the entire 5.8 miles of City that border the Mississippi River. An atlas of the target area was printed prior to conducting the field work to serve as a navigation tool on the river and ensure complete coverage of the riverbank.

The inventory was conducted on December 10th and 11th, 2015. The timing was optimal because the river level was relatively low, bank vegetation was dormant, and snow had not yet fallen to obscure the bank. Other times of the year were considered for the inventory, but frequent high water levels in the spring, dense bank vegetation in the summer, and river ice and snow on the bank in the winter all prevented the collection of a useful picture inventory.

The inventory crew consisted of two Anoka Conservation District (ACD) staff members. A small boat was used to navigate the river and take geotagged pictures using a handheld GPS. These pictures can be viewed similar to pictures taken on a standard camera, but they also contain spatial information (i.e. X and Y coordinates). This feature allows them to be accurately mapped in GIS software. In order to take high quality photos, the boat navigated at idle speed typically between 50 and 100 feet from shore depending on water depth.

Wisconsin NRCS Direct Volume Method – Bank Recession Rate Categorizations

The picture inventory was used to digitize a polyline in GIS along the entire riverbank. Using the Wisconsin NRCS Direct Volume Method, the polyline was classified as slight, moderate, severe, or very severe with respect to erosion severity (Table 1). These erosion categorizations were then converted to lateral recession rates using the table below for use in soil loss calculations.

Table 1: Erosion severity categories.

Symbol	Category	Lateral Recession Rate (ft/yr)	Description
	Slight	0.01—0.05	Some bare bank but active erosion not readily apparent. Some rills but no vegetative overhang. No exposed tree roots.
	Moderate	0.06—0.2	Bank is predominantly bare with some rills and vegetative overhang. Some exposed tree roots but no slumps or slips.
	Severe	0.3—0.5	Bank is bare with rills and severe vegetative overhang. Many exposed tree roots and some fallen trees and slumps or slips. Some changes in cultural features such as fence corners missing and realignment of roads or trails. Channel cross section becomes U-shaped as opposed to V-shaped.
	Very Severe	>0.5	Bank is bare with gullies and severe vegetative overhang. Many fallen trees, drains, and culverts eroding out and changes in cultural features as above. Massive slips and washouts common. Channel cross section is U-shaped and stream course may be meandering.

Soil Loss Estimation

Any section of riverbank identified as either severe or very severe was included in a site profile for more detailed analysis. The analysis consisted of calculating the following variables for every section of severe or very severe erosion (Appendix B).

- ***Depth (D)***: horizontal distance from the toe to the top of the bank; calculated using GIS
- ***Height (H)***: vertical height; measured with November 2011 LiDAR elevation data using GIS
- ***Slope Length (SL)***: length of diagonal slope; calculated using depth and height measurements
- ***Recession Rate (RR)***: annual lateral recession of bank (0.4 ft/yr for severe erosion and 0.75 ft/yr for very severe erosion)
- ***Length (L)***: length of the erosion along the river; calculated using GIS

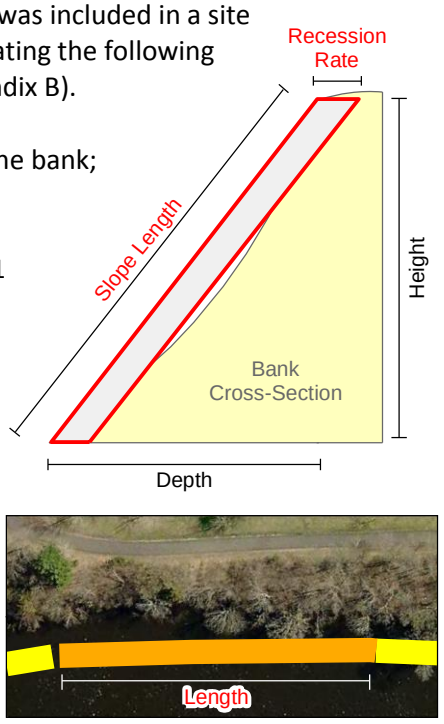


Figure 1: Diagrams of variables used for soil loss estimation.

These variables (Figure 1) were used in the equation below to estimate the annual soil loss. Sandy soil weighs approximately 100 pounds per cubic foot.

$$\frac{SL(ft) * RR(ft/yr) * L(ft) * 100(lb/ft^3)}{2000(lb/ton)} = \textbf{Estimated Soil Loss (tons/year)} \qquad \text{Equation 1}$$

Atlas Generation

All of this information was used to create an inventory atlas of the pool which can be found in Appendix A. The atlas contains erosion severity and photos of the shoreline.

Results

Erosion Severity

Most of the riverbank inventoried had limited erosion (Table 2). Approximately 78% of the riverbank was categorized as either slight (40%) or moderate (38%) erosion severity. This corresponds to a lateral recession rate of 0.0 – 0.2 ft/yr.

Table 2: Summary of erosion severity.

Erosion Severity	Length (miles)	%
Slight	2.32	40%
Moderate	2.21	38%
Severe	0.64	11%
Very Severe	0.60	10%
Total	5.78	100%

In contrast, 11% of the shoreline was categorized as severe and 10% as very severe (Table 2). These categories have lateral recession rates of 0.3 – >0.5 ft/yr.

Table 3: Severe and very severe erosion on public and private lands.

	Severe		Very Severe	
Ownership	Length (miles)	%	Length (miles)	%
Public	0.27	42%	0.37	61%
Private	0.37	58%	0.24	39%
Total	0.64	100%	0.60	100%

Overall, shoreline categorized as either severe or very severe is distributed relatively evenly between public and private ownership (51% and 49%, respectively). However, when looking at the severe and very severe categories individually, the breakdown is not as evenly balanced (Table 3). Public land has a lower percentage of the total severe sections (42%) and a higher percentage of the total very severe sections (61%).

Estimated Soil Loss

The total length of riverbank categorized with severe or very severe erosion is relatively equal between the two categories (Table 4). However, because of the higher lateral recession rate in the very severe sections (i.e. 0.75 ft/yr), those sections represent the majority (77%) of the estimated soil loss.

Table 4: Estimated soil loss by erosion severity.

Erosion Severity	Length (miles)	Estimated Soil Loss (tons/yr)	%
Severe	0.64	1174	23%
Very Severe	0.60	3974	77%
Total	1.24	5148	100%

Stabilization Considerations

The goal of most riverbank projects is to correct or prevent excessive erosion or undercutting through bank stabilization. Stabilization of eroding riverbanks is highly site-specific; there is not a simple solution that can be applied across all sites. For example, factors such as position along the river (e.g. outside bend), river dynamics (e.g. flow and flood elevations), and site accessibility must be considered individually for each project. That being said, stabilization approaches generally fall into two categories: hard armoring and bioengineering.

Hard armoring uses physical structures to protect the riverbank; riprap is used commonly for hard armoring. Riprap does not necessarily need to extend to the top of the slope to be effective and can be inter-planted with native species to soften its appearance. Often times, hard armoring the toe of the slope (i.e. the very bottom) up to a moderate height (e.g. the 2-year flood elevation) is sufficient for stabilizing the rest of the bank.

Bioengineering approaches combine engineering techniques with ecological principles to stabilize the bank. They rely heavily on deep-rooted native plants along with a variety of other natural materials to reinforce and stabilize eroding riverbanks. Bioengineering also incorporates the goals of fish and wildlife habitat restoration, maintenance of water quality, and aesthetic considerations. In addition to bank stabilization, many benefits are achieved through bioengineering:

- Improved aquatic and terrestrial habitat,
- Increased connectivity among habitats along the riverbank,
- Decreased water temperatures through shading, and
- Improved soil and water quality.

The stabilization solution for an eroding riverbank could certainly use a combination of hard armoring and bioengineering. In fact, ACD often recommends this combination on large river systems such as the Mississippi River because of the benefits provided by both approaches.

Possible Stabilization Approaches

Stabilization of riverbanks can be achieved through many different approaches. Below is a list of some common stabilization approaches (both bioengineering and hard armoring) to correct erosion issues. Again, a combination of approaches is often specified as the most effective solution.

- Restoration of Native Vegetation – Deep-rooted, native vegetation creates a buffer along the riverbank that can provide stabilization and minimize erosion. Furthermore, if the bank is damaged, the vegetation has the ability to self-heal with additional growth.
- Cedar Tree Revetment – Anchoring Eastern Red Cedar trees to the toe of the slope reduces water velocities near the bank to protect against erosion. Furthermore, the reduced water velocities promote sedimentation and can actually help rebuild the bank. This provides a cost-effective bioengineering option for moderate to severely eroding riverbanks.
- Live Staking – Dormant, live stakes of native species (e.g. Sandbar Willow) can be installed to establish a dense plant community with high stem density that will stabilize the riverbank.
- Hard Armoring – Hard armoring of the bank may be necessary along riverbanks on large systems that experience the greatest erosive forces (e.g. outside bends). However, it is often not necessary to hard armor the entire bank from the toe of the slope to the top of the bank. Rather, the hard armoring can extend to a predetermined elevation (e.g. 2-year or 5-year flood elevation), above which could be stabilized using the establishment of native vegetation. Furthermore, the sections that are hard armored can often be live staked to provide additional stabilization value, wildlife habitat, and improved shoreline aesthetics.

- Bank Reshaping – Reshaping a severely eroding riverbank may be necessary in order to stabilize vertical, bare banks. This approach must be coupled with other stabilization techniques because in and of itself it does not provide any stabilization benefits. It only creates a bank with suitable slopes for other stabilization approaches.

Favorable Practices for Riverbank Property Owners

Managing a riverbank can present a difficult challenge for property owners. Often times, a misunderstanding of factors that contribute to erosion can actually exacerbate the issue. Below is a list of practices that should be followed by property owners adjacent to rivers in order to minimize erosion and protect their property.

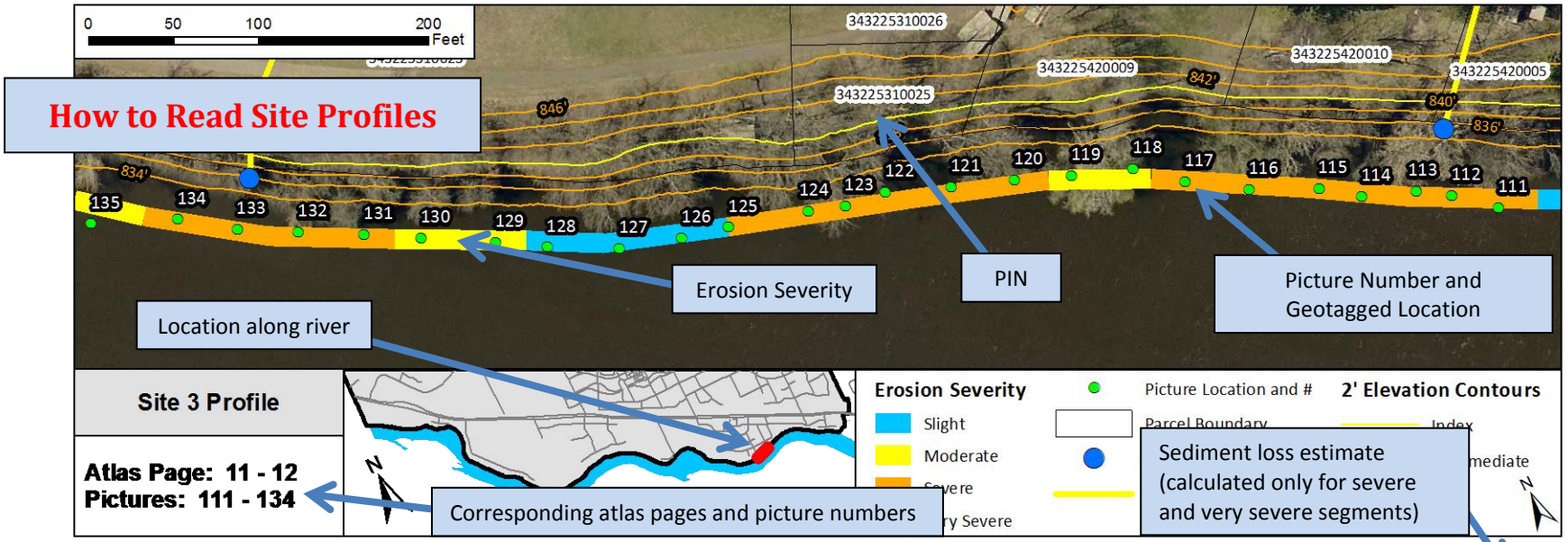
- Avoid mowing near the edge of the bluff or riverbank. Turf grasses have very shallow root systems, providing little soil stability. Deeper rooted species are also better at filtering out excess nutrients and sediments in runoff.
- Control runoff from downspouts and other hard surfaces at the top of the slope to prevent it from flowing over the riverbank. Promote infiltration of rain water into the soil but away from the riverbank where possible, or provide a pipe conduit down to the water's edge to transport water if necessary.
- Dispose of yard waste properly to avoid smothering riverbank vegetation and contributing nutrients to the river, which commonly occurs when leaves and grass clippings are thrown over the riverbank.
- Plant desirable species with preference for multi-stemmed plants with deep, dense, fibrous root systems. However, ensure the species are well suited to the soil type, moisture level, and available sunlight or they will not thrive.
- Prune lower branches on trees to increase the amount of light that penetrates to the ground. This will increase plant growth at ground level where the stems, roots, and foliage will help keep soil in place.
- Remove buckthorn, which is an invasive plant that is believed to release a natural herbicide that suppresses nearby plant growth.
- Remove fallen trees because they can redirect water toward the bank and exacerbate erosive river forces.
- Remove grapevines, which smother trees, shade out understory species, and provide little soil stabilization benefits.

Site Profiles

Detailed site profiles were created for stretches of riverbank throughout which severe or very severe erosion was documented. Table 5 below summarizes key information for each of the 10 site profiles. Following the table are the detailed site profiles that include a map of the site, a general description of the problem, and potential practices to address the erosion. Please note that potential solutions are speculative, and formal designs would need to be prepared prior to completing any stabilization work.

Table 5: Summary of site profiles.

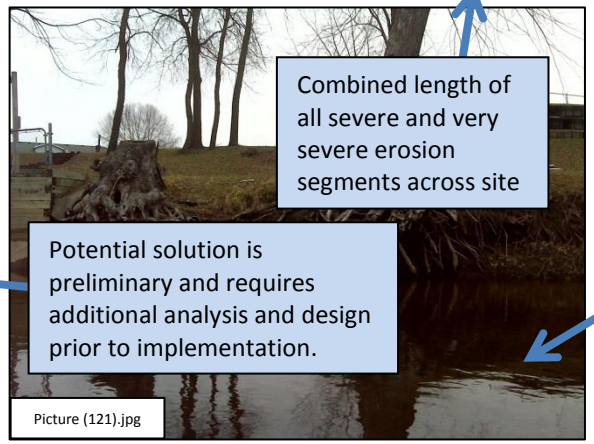
PROPERTY INFORMATION			ERODING FACE INFORMATION					
Site Profile #	**Ownership**	**PIN**	**Length (ft)**	**Height (ft)**	**Depth (ft)**	**Slope (H:V)**	**Recession Rate (ft/yr)**	**Soil Loss (tons/yr)**
1	Private	353225320005	111	12	25	2.1:1	0.4	61.6
2	Private	343225410004	116	22	36	1.6:1	0.4 - 0.75	123.0
3	Private/Anoka County (5 properties)	343225420005 343225420010 343225420009 343225310025 343225310023	566	6 - 10	22 - 40	3.7 - 4.2:1	0.4	323.7
4	Anoka County (3 properties)	343225320001 343225230003 333225110003	1227	4 - 16	7 - 30	1.8 - 2.5:1	0.4 - 0.75	821.0
5	Anoka County (4 properties)	333225110003 333225110002 333225120001 333225120005	1920	4 - 20	8 - 33	1.5 - 2.0:1	0.4 - 0.75	1869.6
6	Private (4 properties)	283225330011 283225330010 283225330009 293225440001	412	6	15 - 24	2.5 - 4.0:1	0.4	152.0
7	Private (2 properties)	293225340001 293225330005	653	4 - 12	7 - 24	1.7 - 2.5:1	0.4 - 0.75	280.4
8	Private (8 properties)	293225330003 293225330002 293225330001 293225320007 293225320006 293225320005 293225320003 303225410012	589	8 - 22	12 - 33	1.5 - 1.9:1	0.4 - 0.75	653.5
9	Private (7 properties)	303225110030 303225110010 303225110013 303225110011 303225110012 193225430014 193225430015	639	6 - 24	11 - 35	1.5 - 2.1:1	0.4 - 0.75	770.9
10	Private (4 properties)	193225430017 193225430018 193225430021 193225430003	325	6 - 8	11 - 14	1.8:1	0.4	92.4

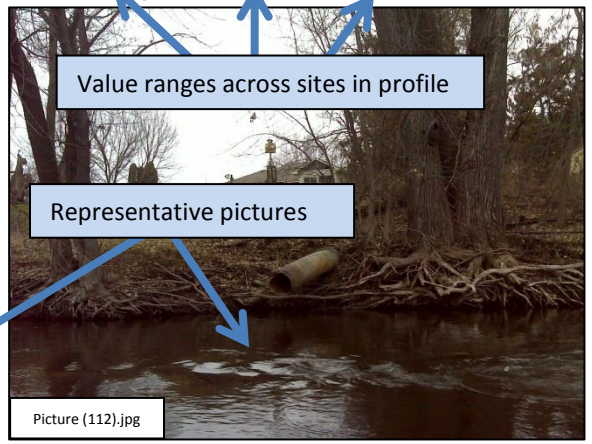


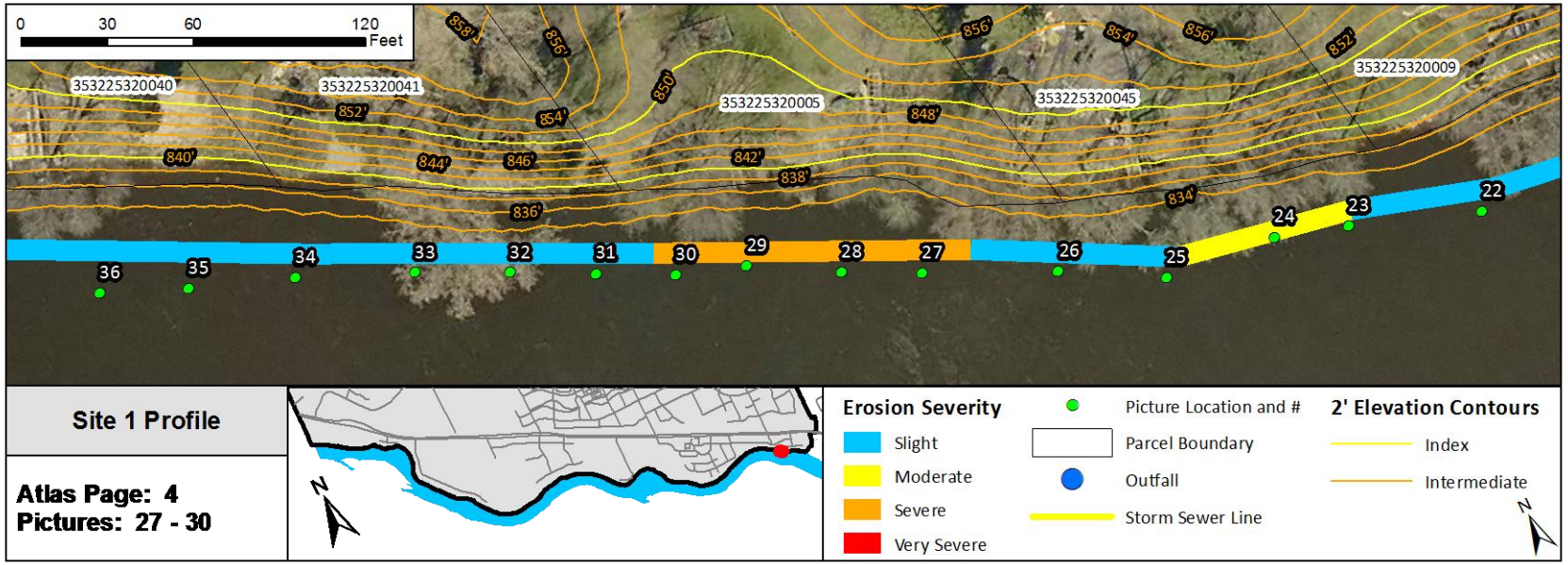
Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private/Anoka County	566	6 - 10	22 - 40	3.7 - 4.2	323.7

Additional Information: This site consists of five properties, four of which are private and one public (Anoka County). Erosion severity was categorized as severe because of the many exposed tree roots and undercut banks.

Potential Solution: Preservation of some of the severely undercut trees could be difficult, and regrading of the bank may be necessary. Stabilization could be accomplished using a combination of hard armoring at the toe of the slope and bioengineering on the upper portions of the bank.







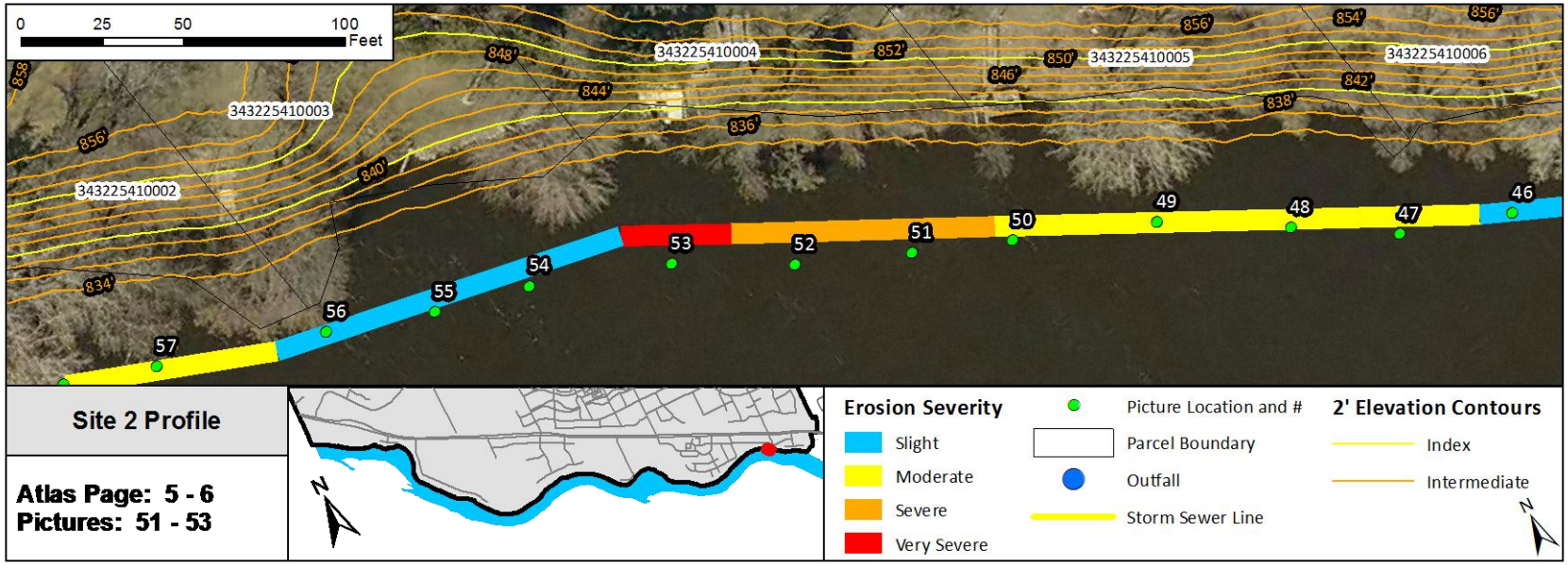
Additional Information: This site consists of one private residential property. Erosion severity was categorized as severe because of the many exposed tree roots and several areas with bank slumps.

Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	111	12	25	2.1:1	61.6

Potential Solution: Stabilization of the riverbank could be accomplished using a combination of hard armoring at the toe of the slope and bioengineering on the upper portions of the bank. A cedar tree revetment could also be a possibility. Thinning of the canopy may be necessary to promote growth of native vegetation on the upper portions of the bank.


Picture (30).jpg


Picture (28).jpg



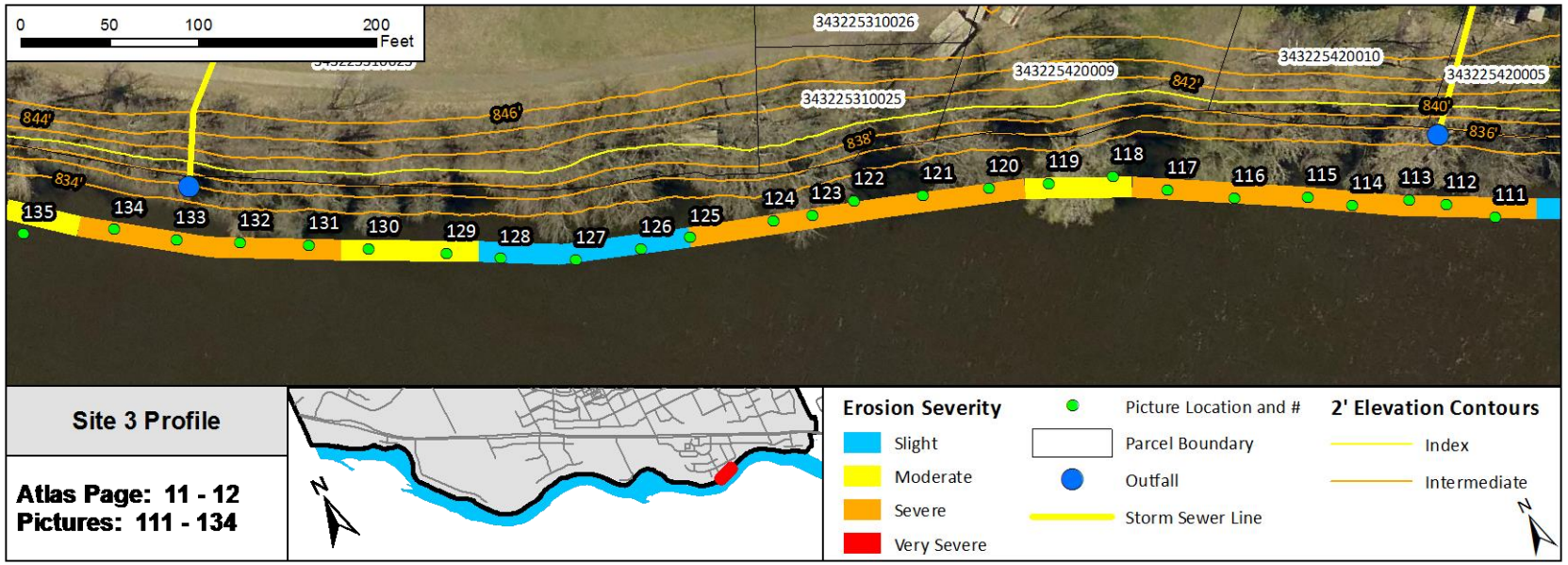
Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	116	22	36	1.6	123.0

Additional Information: This site consists of one private residential property. Erosion severity was categorized as severe and very severe. The many fallen trees on the upstream stretch of the property resulted in the very severe categorization.

Potential Solution: Stabilization of the riverbank could be accomplished using a combination of hard armoring at the toe of the slope and bioengineering on the upper portions of the bank. Because of the large bank slumps, regrading of the bank will likely be required.


Picture (53).jpg


Picture (51).jpg



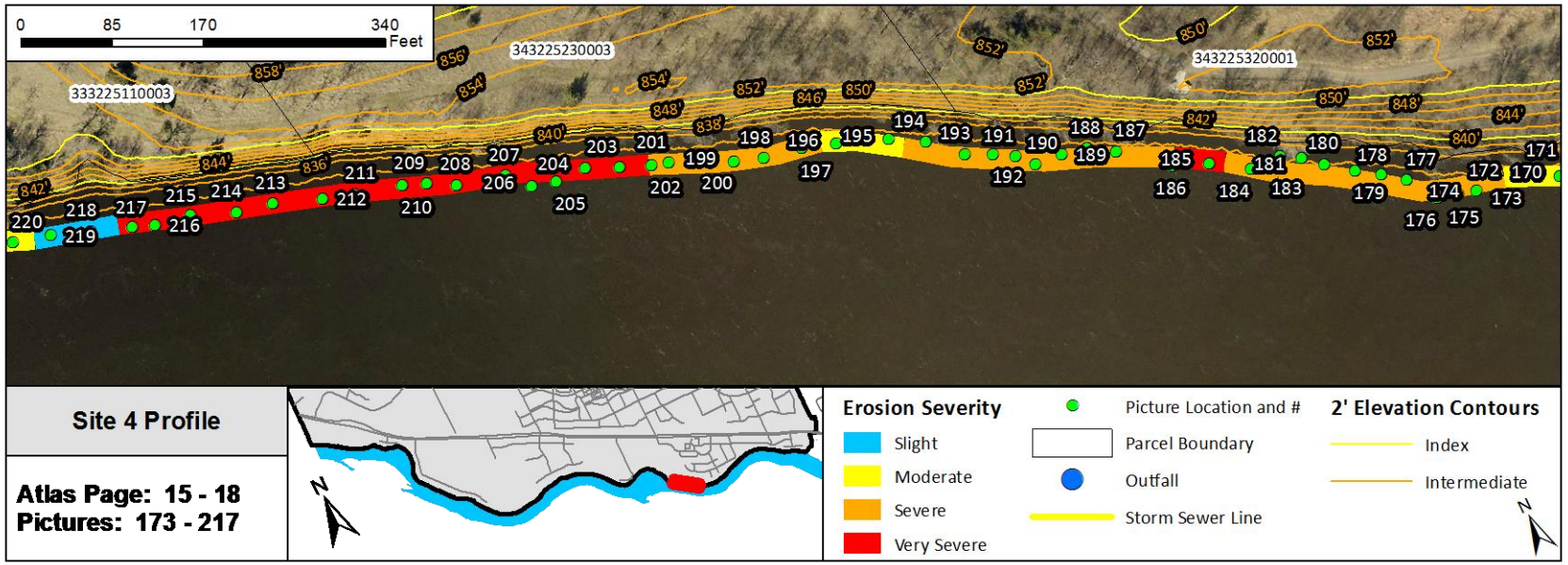
Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private/Anoka County	566	6 - 10	22 - 40	3.7 - 4.2	323.7

Additional Information: This site consists of five properties, four of which are private and one public (Anoka County). Erosion severity was categorized as severe because of the many exposed tree roots and undercut banks.

Potential Solution: Preservation of some of the severely undercut trees could be difficult, and reshaping the bank may be necessary. Stabilization could be accomplished using hard armoring at the toe of the slope and bioengineering on the upper portions of the bank. Cedar tree revetments may also be an option.


Picture (121).jpg


Picture (112).jpg



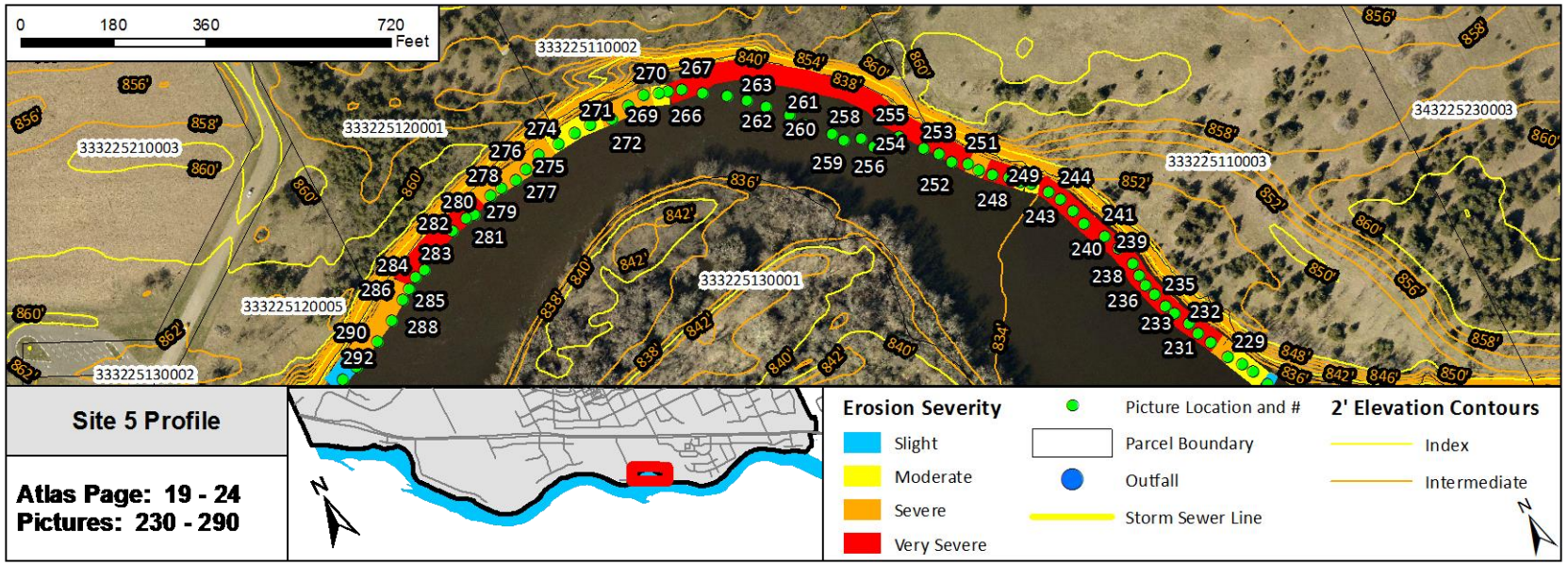
Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Anoka County	1227	4 - 16	7 - 30	1.8 - 2.5	821.0

Additional Information: This site consists of three parcels, all of which are owned by Anoka County. Erosion ranged from severe to very severe along this section with one small area categorized as moderate. The large sections of bare bank were categorized as very severe.

Potential Solution: Stabilization of some areas categorized as severe could be stabilized using cedar tree revetments and native vegetation. The sections of steep, bare bank could be stabilized using a combination of regrading, hard armoring at the toe of the slope, and bioengineering.


Picture (208).jpg


Picture (187).jpg



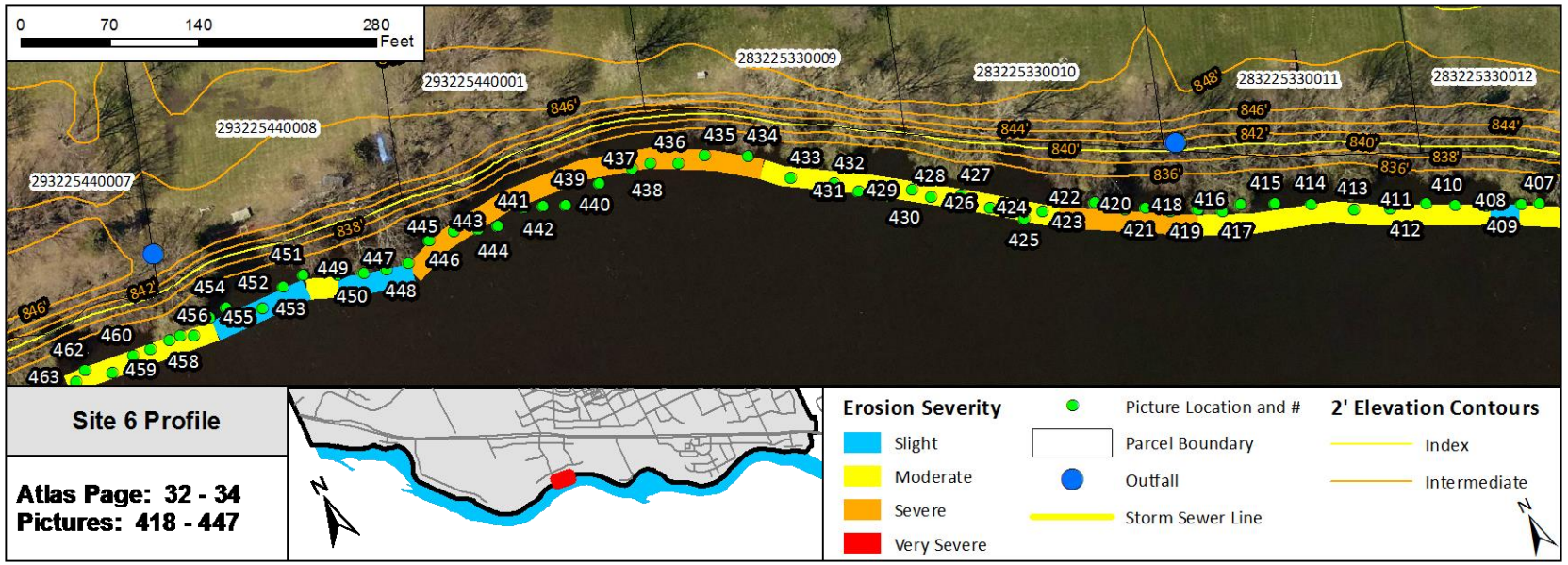
Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Anoka County	1920	4 - 20	8 - 33	1.5 - 2.0	1869.6

Additional Information: This site consists of four parcels, all of which are owned by Anoka County. Erosion ranged from severe to very severe along this section with short sections categorized as moderate. The large sections of bare bank were categorized as very severe.

Potential Solution: Stabilization of some areas categorized as severe could be stabilized using cedar tree revetments and native vegetation. The sections of steep, bare bank could be stabilized using a combination of regrading, hard armoring at the toe of the slope, and bioengineering.


Picture (259).jpg


Picture (235).jpg



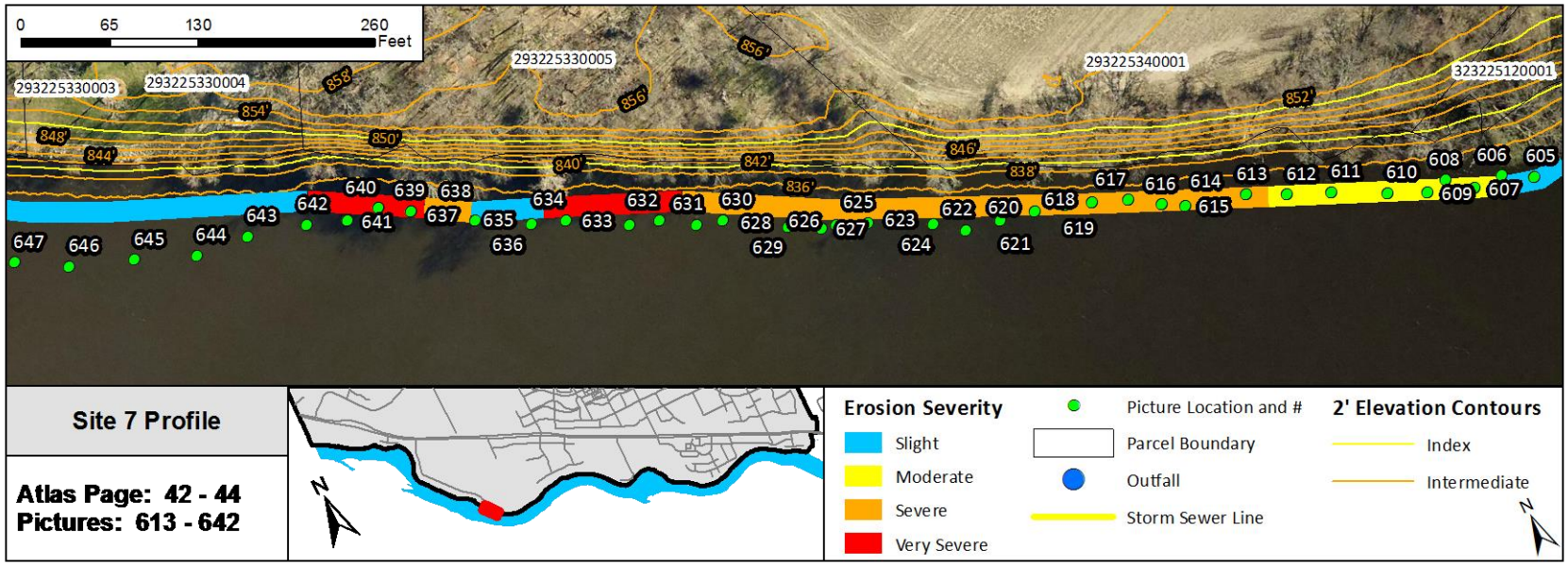
Additional Information: Two sections of severe erosion span a total of four privately owned properties in this site profile. The many exposed tree roots and bank undercutting resulted in the severe categorization.

Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	412	6	15 - 24	2.5 - 4.0	152.0

Potential Solution: Much of the erosion could possibly be addressed using cedar tree revetments inter-planted with native vegetation (e.g. Sandbar Willow or Buttonbush). Areas with more severe undercutting may need to be regraded and may warrant hard armoring at the toe with native vegetation higher on the bank.


Picture (443).jpg


Picture (420).jpg



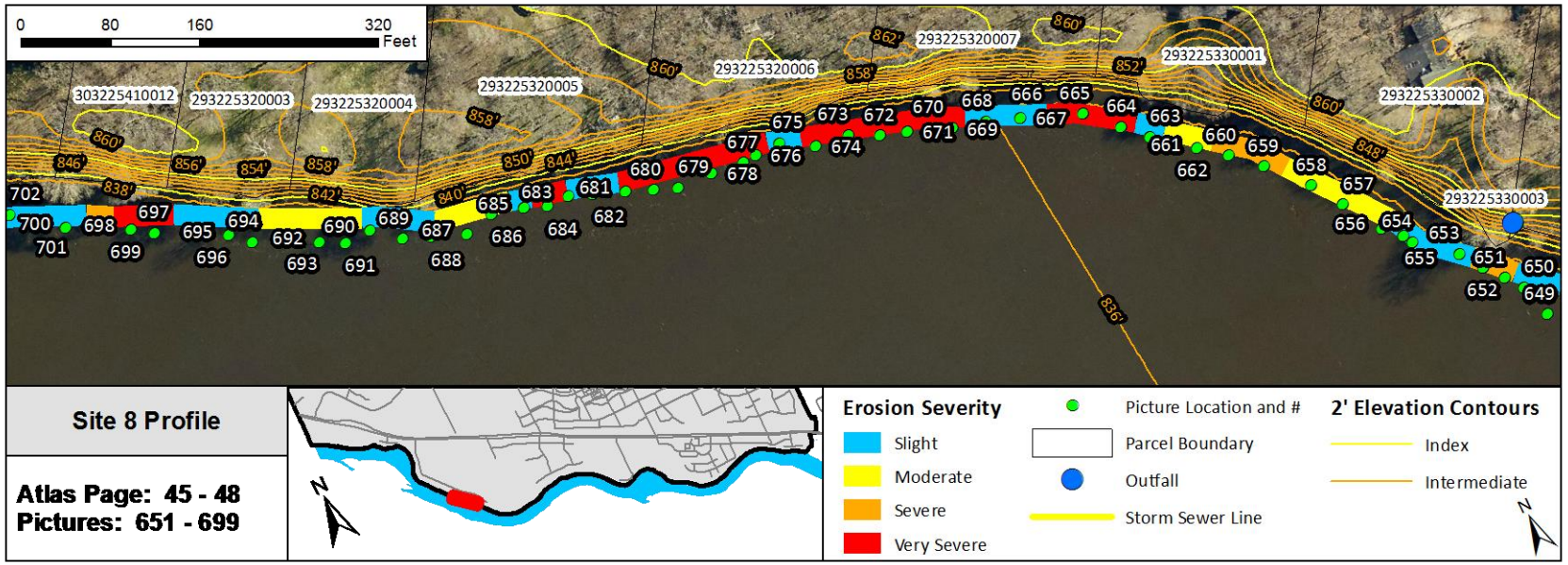
Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	653	4 - 12	7 - 24	1.7 - 2.5	280.4

Additional Information:
Erosion at this site spans two private properties and ranges from severe to very severe. Much of the severe erosion consists of exposed tree roots and some bank undercutting. The very severe sections have fallen trees and bare bank.

Potential Solution: The severe sections may be effectively stabilized with cedar tree revetments and native vegetation (e.g. Sandbar Willow or Buttonbush). Areas with fallen trees and bare bank may need to be regraded and hard armored at the toe with native vegetation farther up the bank.


Picture (639).jpg


Picture (623).jpg



Additional Information:
Erosion at this site spans eight private properties and ranges from severe to very severe. The very severe sections have fallen trees and bare bank.

Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	589	8 - 22	12 - 33	1.5 - 1.9	653.5

Potential Solution: Most of the erosion sections are very severe and will likely require regrading of the bank. Hard armoring of the slope toe up to a modest elevation (e.g. 2-year or 5-year flood elevation) with native vegetation establishment on the remaining areas higher up the bank may be an effective stabilization option.


Picture (698).jpg


Picture (670).jpg

Additional Information:
Erosion at this site spans seven private properties and ranges from severe to very severe, with most areas categorized as very severe. The very severe sections have fallen trees and bare bank.

Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	639	6 - 24	11 - 35	1.5 - 2.1	770.9

Potential Solution: Most of the erosion sections are very severe and will likely require regrading of the bank. Hard armoring of the slope toe up to a modest elevation (e.g. 2-year or 5-year flood elevation) with native vegetation establishment on the higher bank areas may be an effective stabilization option.


Picture (844).jpg


Picture (813).jpg

Site Information	Ownership	Erosion Length (ft) Severe/Very Severe	Height (ft)	Depth (ft)	Slope (H:V)	Soil Loss (tons/yr)
	Private	325	6 - 8	11 - 14	1.8	92.4

Additional Information: Two sections of severe erosion span four private properties in this site profile. The erosion is characterized by exposed tree roots and some undercutting of the bank.

Potential Solution: Much of the erosion could possibly be addressed using cedar tree revetments inter-planted with native vegetation (e.g. Sandbar Willow or Buttonbush). Areas with more severe undercutting may need to be regraded and may warrant hard armoring at the toe with native vegetation higher on the bank.

5.03: Consider Potential Topics for a 2017 Work Plan

City Planner Anderson presented the staff report. He stated that in 2016 the Board focused on developing a Statement of Purpose to better define the role of the EPB. He stated that this was done in lieu of a Work Plan for the year. He stated that with that process now complete, and implemented, the Board can once again focus on developing a Work Plan to outline what their efforts will focus on in 2017, and possibly beyond. He asked the Board to suggest some topics that they would like to focus on in addition to the reason the Board should focus on the topic. He provided an update on recent Council action noting the Council approved Mayor Strommen to take the Mayors for Monarchs Pledge. He stated that he would suggest pollinator initiatives as one of the Work Plan items. He also suggested including the development of the incentive/rebate program as discussed by the Board. He also suggested including prioritization of the shoreline inventory along the Mississippi.

Board Member Valentine asked for more details on how the Board would be involved on the pollinator item.

City Planner Anderson stated that at one point in time the Board was proactively working on articles for a standing column on the City newsletter. He stated that there are some underutilized areas in the parks that the Board could work cooperatively with the Parks and Recreation Commission to determine where native planting could occur to support pollinators. He noted that the Parks and Recreation Commission is on board for the idea as well. He noted that education would also be a possibility for the Board, explaining that the Board Members would not themselves in the field doing the work.

Board Member Valentine stated that he was also confused on how the Board would fit into the prioritization of the shoreline inventory.

City Planner Anderson stated that after potential properties are identified and there are willing property owners identified, the Board could work on letters of support for grant applications and other items of that level. He stated that if there are a lot of interested property owners the Board could also help to select the candidates. He explained that the Work Plan is a tool that staff uses mainly with input and assistance from the Board.

Board Member Covart stated that perhaps the potential landscaping credits mentioned at the end of the last case would also be a good fit.

City Planner Anderson noted that item could fit in well under the pollinator item and would not need to be a standalone item.

Chairperson Stodola stated that perhaps the second item could be broader to state explore rebates and incentive for water conservation initiatives which could include retrofitting and native plantings, among other things.

City Planner Anderson stated that the intention tonight is not to draft the Work Plan to present to the Council next week, but simply be able to discuss some potential ideas that can be mentioned with the Council.

Board Member Anderson stated that perhaps some alternative grasses could be planted in the parks with educational signage. She explained that would lower the maintenance responsibilities and educate visitors as a demonstration.

It was the consensus of the Board that the pollinator initiative could include a bullet that states to work with the Parks and Recreation Commission to identify areas within existing parks to convert to sustainable pollinator friendly landscaping.

City Planner Anderson stated that he wanted to encourage any ideas that come forward as the Work Plan could span more than the course of one year but cautioned that the plan should not span more than three years.

Board Member Valentine stated that it is hard to predict the plans the Board will need to review and consider and therefore he would not want to see the plan contain too many items.

City Planner Anderson stated that he would still welcome any ideas and staff could then vet out the type of resources that would be necessary to accomplish the items. He recognized that some items on the plan will be delayed depending on the amount of regular work that comes in for the Board to consider.

It was the consensus of the Board for the Work Plan to include the following objectives: explore pollinator initiatives, develop rebates and incentives for water conservation initiatives, and prioritization of the shoreline inventory along the Mississippi.

City Planner Anderson noted that water resources could cover the water conservation initiatives and other items such as discovering the relationship between ground water, surface water, and aquifers. He stated that water supply continues to be a high priority for the City and confirmed the consensus of the Board to include that item on the plan.

Board Member Anderson stated that she recently received a flyer from Anoka County regarding organics recycling and asked for more information on that topic.

City Planner Anderson stated that is a great question, noting that he met with Ace Solid Waste today to discuss a pilot program that could provide organics recycling within Ramsey. He noted that topic could be added to the Work Plan as well.

Board Member Anderson noted that education would be a vital component as some people want to do the right thing but are unsure of the category items would fall into.

It was the consensus of the Board to add organics recycling to the Work Plan.

City Planner Anderson confirmed the consensus of the Board to have the main topic be water resources with the water conservation initiatives as a bullet under that item. He also confirmed the Board Members that would be available to attend the joint meeting with the City Council the following week.

CC Work Session **2. 2.**

Meeting Date: 02/28/2017

Information

Title:

Website RFP Update

Purpose/Background:

PURPOSE

(A) Receive update on initiative for a new City website (staff will provide a brief presentation).
(B) Provide staff direction to move forward with the process outlined in this case.

BACKGROUND

The City Council budgeted dollars in the 2017 budget for a new City website. Additionally, the Council recently provided staff information direction to include a tactic in the 2017-2019 Strategic Plan for a new City website (NOTE: this has not been formally adopted).

Primary reasons for new City website:

(1) Mobile Friendly: the City's current website is not mobile friendly.
(2) Up-to-date Technology: the City's website is currently running off of software that is outdated and becoming functionally obsolete (the website is old).
(3) Format/ Communication Style: the format and layout of the existing website could be improved, to be more intuitive and functional for the City's different customer groups (businesses, developers, residents, visitors, etc.). Also, the Ramsey brand could be better portrayed.
(4) Online Payments: the current website had limited capacity/ ability to process online payments.
(5) Online Registration: facility rental/ room rental/ events registration currently cannot take place online. The City currently operates on a manual system.
(6) Flexibility/ Scalability: the current website host does not offer convenient add-on modules/ features. This is important to staff--as the city grows/ evolves, and as demands for the website change, staff recommends a website product that can shift, expand, and contract as-needed.
(7) ADA Compliance: current website doesn't meet recently updated ADA standards.

Process to update the City's website:

(1) Direct staff to release RFP to vendors [February 2017]
(2) Proposals due, staff review [May 2017]
(3) Staff Interviews, Council interview(s) [June 2017]
(4) Negotiation/ Award Contract [July 2017]
(5) Implement/ Complete Website [6-12 months, depending on various factors]

Please note, the proposed website RFP is attached to this case. If the Council would like to discuss the RFP, staff would be happy to review in detail. If the Council has any suggested changes for the RFP, staff would be happy to take that direction as well.

Timeframe:

15-30 minutes

Funding Source:

General Fund, adopted line item for 2017.

Responsible Party(ies):

Brama/ Fredrickson/ Wenberg

Outcome:

(A) Receive update on initiative for a new City website (staff will provide a brief presentation).
(B) Provide staff direction to move forward with the process outlined in this case.

NOTE: if the Council provided direction to move forward, staff would send out the attached RFP. We would then rank candidates proposals, and bring back 1-3 proposals for Council review (at a Council Worksession). At that time, a much more detailed and robust discussion will occur regarding the new proposed website. Upon selection of a firm/ vendor, the City would then negotiate a contract, finalize expectations for the contractor (i.e. detailed scope of services) and begin implementation.

Attachments

Proposed RFP

Form Review

Inbox	Reviewed By	Date
Patrick Brama	Patrick Brama	02/23/2017 05:07 PM
Kurt Ulrich	Kurt Ulrich	02/23/2017 05:16 PM
Form Started By: Kathy Schmitz		Started On: 02/17/2017 10:50 AM
Final Approval Date: 02/23/2017		

REQUEST FOR PROPOSAL (RFP) FOR WEBSITE REDESIGN, DEVELOPMENT, IMPLEMENTATION OF THE CITY OF RAMSEY WEBSITE

RFP Circulation Date: March 1st, 2017
Proposal Submission Deadline: April 10th, 2017

I. Purpose:

The City of Ramsey is issuing this Request for Proposals (*RFP*) to firms or individuals, whom are interested in providing website design services to create a new City website (collectively, *the Respondents*). The City seeks to create a dynamic website, which is designed and organized in a manner that allows all visitors to easily find and access information. The site should act as a marketing tool for the City to highlight the community, its assets, and attractions to potential residents and businesses. The site should be is easy to update and modify by staff and be able to add additional modules and/or incorporate third party components such as mapping sites, online form creation, and online payments.

II. Key Dates

March 1, 2017 RFP Release Date
March 15, 2017 Indication of Interest in Participating in RFP Process
April 3, 2017 Final Date for Clarifying Questions *(7 days prior to due date)*
April 10, 2017 Proposal Due Date by mail or hand delivery 4:30 p.m. CDT
April 13-17, 2017 Tentative Interview Dates
April 25, 2017 Staff Recommendations / Council Update

May 9th, 2017 Council Decision to Negotiate Contract

III. Preliminary Scope of Work

A final scope of work will be developed with the City and the respondent submitting the selected proposal (*The Contractor*) at the time of selection. The following acts only as a preliminary scope to communicate the City's expectations. The City wants to redesign its website focusing primarily on improving ease of use, adding new functionality including, but not limited to: online payment options, facility/amenity online rental, form creation and submission, and mass communication via email, text, and social media.

Proposals for redesign of the website should include or account for, but not be limited to, the following steps:

1. Design a unique, attractive website to fulfill all City requirements, in this RFP and in discussions with the City, following selection of a Contractor.
2. Design a consistent, user-friendly navigation framework for the City website that is understandable to users on all levels.
3. Design a fitting home page for the City website, which allows users quick access to high-traffic pages and information.
4. Design a template for all pages within the site. All pages should be consistent, look professional, and enhance the image of the City.
5. Maintain timely and regular communication with the City during the development process.
6. Assist with the transfer of current information and development of new content, so information is organized, easy to access, and the entire site has a uniform format.

7. Aid the City in transitioning to the new website including staff training and the production of a guidebook or instructions on changing/updating the website. The City intends to utilize staff across several departments to update the website.
8. Contain an option for companion, password-protected intranet website.
9. Suggest any additional features the respondent feels would improve the City website or the transition process. It is expected that the Contractor work with the City to develop a site that will best meet the needs of the City.
10. Suggest any third-party partners that the City should consider working with to provide additional services. This could include services, such as: web hosting, SMS services, other mass notifications, human resources software, and other services.

The primary purpose of the website is as a communication tool between the City and outside citizens. In order to meet the needs of both, it is expected that the completed website would include each of the following components:

- Allow residents to apply to rent meeting room space or park amenities online. Residents should be able to apply for a timeslot, and, once approved, pay for the space online. The City currently uses Exchange calendars to track parks and meeting rooms – the site should utilize these calendars [sync] to stay up-to-date.
- Allow for a password-protected Intranet for City staff only.
- The website should integrate with the City's Active Directory [LDAP] to allow approved users to perform edits and other administrative duties. This would also allow approved users to view the integrated Intranet page.
- Ability to add and change items on the homepage, such as static images, themes, calendars, news items, and rotating banner images.
- Integration with social networking websites, allowing City staff to update social media sites with the content management system.
- Website reactive design for improved usability on mobile devices, including tablets & smart phones.
- The ability to schedule content to unpublish after a given date, time, or time period.
- A search function that allows the user to search the entire site or individual pages within the site from any page.
- Live calendars with a listing of important dates and community events, which can be divided according to department or category. Integration with Exchange calendars desired to eliminate double entry in some scenarios.
- Ability to create multiple separate news pages based on category and/or department.
- Ability to post emergency notices on the website homepage, as well as send out email, text and social media notifications.
- Ability to download applications necessary to view information (ex: Adobe Acrobat Reader.)
- Ability to conduct online polls and surveys with responses in multiple formats using text boxes, radial buttons, and checkboxes.
- A way for residents to subscribe to a mass email distribution list. *The City currently uses third-party software and this relationship can be maintained.*

- Ability for staff to create online forms, post them, and have users to complete them online.
- Ability to preview any changes made to content before publishing to the website. This should apply to all types of content, including but not limited to: pages, calendar events, news, and FAQs.
- Ability to create additional page templates as needed, and assign to departments or content groups to use.
- Ability to unpublish pages and content. These pages would not be accessible by site searches.
- Contain the option for a collective of images and/or videos in an online gallery to be displayed on various pages.
- The ability to ensure compliance with current Americans with Disabilities Act [ADA] recommendations. The more automated this process is, the better.
- [OPTIONAL] Ability to define a review schedule for all content, prompting the site editors to review published, non-date sensitive content periodically to ensure all items remain accurate.
- [OPTIONAL] The option to create multi-step workflow for all content types. This should include the ability to define a review/approval process for each type of content.
- [OPTIONAL] Contain integrated Human Resources software for processing/organizing online job applications. *The City currently uses third-party software and this relationship can be maintained.*
- [OPTIONAL] Contain an online Agenda creator, used to create agendas for work sessions and City council meetings. *The City currently uses third-party software and this relationship can be maintained.*

The City expects that the Contractor and City will work together to plan and organize information on the site, which most likely will include planning sessions, regular meetings, and continued communication throughout the duration of the website design project.

The following represents a preliminary site organizational structure. Actual site organizational structure will be set following selection of contractor. Planning the organizational structure is a part of the scope of work included in the RFP. The Contractor is expected to work closely with the City to develop a site organizational structure based on current website information and trending website design.

Home Page: The index page will contain a navigation bar directing users to a limited number of broad categories such as:

- About City
- Our Government
- Our Community
- City Services
- How do I…

About the City: This section will include pages about the City and include information on City history, facts, maps, links, FAQs, local business links, current events, and the newsletter.

Our Government: This section will include pages on the City's elected officials, meeting dates, minutes, meeting agendas, boards and commissions, department information and services, city code, and links to state and federal officials.

Our Community: This section includes links regarding community events, economic development, local business information, calendars, resident information, and various facts about the City, including: maps, FAQs, history, various links, and the City newsletter.

City Services: This will contain a listing of City-offered services, including: city maps, link to city code, staff directory information, snowplowing information, Utilities and Utility Billing, employment opportunities, recycling information, and park information.

How do I: This section will be a directory, routing citizens to helpful information, such as: how to access and pay utility bills; access city code, minutes, and other documents; locate certain City forms; how to rent meeting spaces or park amenities; access new resident information; or apply for various types of licenses or permits.

Other features to be on the home page could include but not be limited to:

- A secondary list of commonly used services, such as:
    - Agendas & Minutes
    - Online Payments
    - Employment Opportunities
    - Epermits
    - Facility Rental
- City News button or section
- City Master Calendar

A similar but unique structure and organizational design to the following websites would be preferred for use in the City website:

www.plymouthmn.gov
http://www.elkrivermn.gov/
http://ci.andover.mn.us
www.mnstate.edu
www.ca.gov
www.stpaul.gov

IV. Requirements

Website Requirements

All proposals must include the following in order to be considered in the selection process:

1) Contain or be able to implement online payments through a PCI-compliant payment processor.
2) Contain or be able to implement a facility rental software that syncs with the City's on premise Exchange environment. Software must be able to accept payments, and incorporate a workflow approval process of renting spaces/amenities.
3) The site must look professional and uniformly represent the City in online interactions with residents, businesses, and visitors both current and potential.
4) Contain a consistent design for each page throughout the site.
5) The entry point for the site must represent the quality and character of the City.
6) Each page must be sized as to allow printing or contain a printer friendly version.
7) The site should be designed to be accessible by viewers with limited computer knowledge and should avoid using technology that may not be compliant with some browsers. In the event such technology is used, the site should provide alternate means for accessing the information.
8) The City would like the site design to be compliant with Section 508 and Americans with Disabilities Act guidelines. Respondents should make an effort to comply with guidelines, while keeping in mind, staff usability and ease of providing quick updates.
9) The site must be easy to update by City staff using software licensed to or owned by the City.
10) Website content management system should allow for unlimited amount of system users at no extra cost to City.
11) The CMS is required to have the ability for backend users to create their own page template on the fly without any extra cost to the City, and allow restriction of certain templates to only certain users.
12) The website must be able to contain an Intranet site visible to City staff only via a login.
13) The website must utilize responsive design to display on varying monitor sizes, tablets, and all mobile devices (Windows, Android, iOS, etc).

Technical Requirements

Any website design must be Windows based and comply with all technical requirements including specifications regarding hardware, software, and the protocol for transferring and updating information as defined by the City during negotiations on the final scope of work. The City could, if necessary and within reason, update some requirements to accommodate website designs.

Ramsey's website is currently housed on a virtualized server. The City is open to discussing a hosted solution.

Qualifications

Selection of a proposal for contract will be at the sole judgment of the City. Only those respondents meeting the following conditions, however, will be considered:

- Respondent must demonstrate past success with website development.
- Respondent must have specifically designed websites for government agencies, preferably municipalities, in the past.
- Respondent must provide references for at least five (5) organizations, preferably municipalities. References must be organizations for which the respondent has developed a website that is currently in use.

Fee and Award of Contract

Proposal should include a total not-to-exceed contract proposal amount. Please be very explicit in listing and describing any services or items not covered in the proposal fee amount. Proposal fee should be broken down to include major fee categories, including reimbursable items.

Upon selection, final contract amount will be subject to negotiation to determine exact scope of services to be provided. The final contract fee amount and a contract outlining all relevant terms shall be executed by both parties. Selection does not guarantee award of the contract. In the event the Contractor and the City fail to agree to a contract, the City will choose from remaining respondents or put out another Request for Proposals.

The City reserves the right, at its sole discretion, to cancel or modify the RFP in part or in its entirety, or not to accept any or all proposals.

The City will not reimburse respondents for any costs incurred in preparation or submission of the proposal. All proposals are made at the sole cost of the Respondent. Proposed fee should not include or consider the costs incurred in preparation of the proposal.

Submission of proposal

Proposals should be received at the address below before April 10, 2017. Late proposals will not be accepted. Proposals should be hand delivered or mailed. Emailed or faxed proposals will not be accepted. Respondents are to submit all materials together in a sealed packet and clearly mark on the outside of the package “Website Proposal.”

Mailing Address

Ramsey City Hall
7550 Sunwood Drive NW
Ramsey, MN 55303

Proposals are to be sent in duplicate (2 copies) and are to include the following:

- Response to Scope of Work and Requirements outlined in this document.
- A timeline indicating expected completion time of key steps and of the entire project from execution of contract agreement. Key steps should be briefly described.
- Response to respondent questions.

- Reference sheet.
- Bid sheet with detailed fee breakdown.

Proposals containing additional information or missing any contents listed in the RFP will not be accepted. If applicable, please provide explanation as to why submitted proposal deviates from that described in the RFP.

The City reserves the right to request additional information from any respondent after submission of proposal including, but not limited to: additional design templates, clarification of submitted materials, interview requests, or to allow for corrections of misinformation or omitted information.

The City reserves the right to change proposal submission requirements and to change the due date at any point during the RFP process, upon notification of all firms and individuals who have expressed to the City the intent to submit a proposal (collectively the "Expected Respondents").

It is the goal of the City to design a website which best meets the needs of residents, businesses, visitors, staff, and other stakeholders. Improvements or suggestions to any condition in the RFP are welcome and should be explained in the response. Requirements are somewhat flexible and could be altered given a better idea or method.

By submitting the proposal the Respondent relinquishes all rights to submitted proposals or the ideas contained therein. The City reserves the right to retain all submitted proposals and to use any ideas in any proposal submitted, regardless of whether or not the proposal is selected. All material submitted in response to the RFP shall become property of the City and will not be returned.

Prior to the execution of the agreement between the City and the Contractor, the contents of each proposal will remain confidential, to the extent permitted by law, and not made available to anyone except those involved in the selection process.

V. Clarifications

Any questions about requirements or any other instruction contained within or relating to the RFP should be directed to Jason Fredrickson, Information Technology Manager. Questions can be made through phone at 763.433.9827 or email at JFredrickson@ci.ramsey.mn.us. All requests for clarification about any item contained or relating to the RFP should be made in writing or email.

Any clarifications made in response to questions received will be faxed or sent via email to all expected respondents providing contact information and requesting the City do so, as appropriate and as judged necessary at the discretion of the City. Anyone planning to submit a proposal should contact the City contact listed above to convey such intent by March 15, 2017. The deadline for requesting clarification is seven (7) days prior to the due date for proposals.

VI. Selection Process

Selection of proposals will be at the sole judgment of the City. The City will consider all parts of the proposal collectively, but place an emphasis on facility reservation, form creation, online payments, prior experience, and cost in the selection process.

The selection process may include an interview session tentatively scheduled for April 13-17, 2017. The City will select the respondent that, in the sole judgment of the City, best satisfies the requirements in the RFP, the expectations of the City, and can do so at the best value to the City. Selection may not be the proposal with the lowest cost. Respondents may not contest for any reason the selection of the City.

Selection does not guarantee a contract. After selection, the Contractor and City will discuss and agree on final scope of work, the final contract amount, and terms of the Contract. If the Contractor and City fail to reach an agreement, the City is free to select from remaining available respondents, cancel the RFP, or issue additional Request for Proposals.

VII. Contract and Completed Website

The Contract between the Contractor and the City will include provisions indicating compensation schedule, as well as a timeline for completion of and transition to the new website. The City will retain the right of approval for all work done in designing the website. It is the expectation and desire of the City to transition to the new website within the year 2017. The contract will be for the design and implementation of the City website and will include no guarantee or intent to contract for future services.

Upon completion of the contract all content, site design, site templates, and any other item or idea used in the completed website or contained therein will become property of the City. Contractor will relinquish all rights to the website and the City will have sole control over website design, content, and appearance.

VIII. Insurance Requirements

The City requires respondents to hold the following insurance coverage:

- $1.5 million General Liability Coverage
- $1.5 million Professional Liability Coverage, also called Errors and Omissions (This is not to be confused with General Liability Coverage)
- Workers Compensation $1.5 million Employers Liability (for any work to be performed at City Hall offices)

Appendix A

Respondent Questions:

1) Describe your organization’s experience in developing websites. Note any experience with design and development for municipal corporations. Also, comment on the overall history of the organization.
2) Describe different services offered by your organization and the approximate share of business devoted to web design.

3) Provide a brief bio listing qualifications of each employee that would contribute to developing the website for the City, if selected. Please note experience with similar projects.
4) List types of software or practices used for website development and design.
5) Cleary define responsibilities of the City during the web site design process.
6) Describe the expected interaction between your organization and the City throughout the development and transition process.
7) Describe the support your organization will provide during design and transition to the new website. Please be specific with respect to type (training, help only, etc.), contact method (phone, email), and available hours for support. Also, touch on support post-implementation if applicable (hosted solutions).
8) Provide all necessary contact information for your organization.
9) Provide any additional information about your organization that you feel is relevant to the decision process.

Appendix B

Attach References

Our Mission: To work together to resposibly grow our community, and to provide quality, cost-effective, and efficient government services.

CC Work Session **3. 1.**

Meeting Date: 02/28/2017

Submitted For: Kurt Ulrich, Administrative Services

By: Jo Thieling, Administrative Services

Information

Title:

Review Future Topics/Calendar

Purpose/Background:

Attached is the current list of future topics for work session discussion. Items are drawn from Council requests at meetings, or are related to topics that have been identified in the City's strategic plan. Dates will be assigned in the future.

Recommendation:

N/A

Action:

For Council review - no formal action necessary.

Attachments

Future Topics

Form Review

Inbox	Reviewed By	Date
Kurt Ulrich	Kurt Ulrich	02/23/2017 03:08 PM
Form Started By: Jo Thieling		Started On: 02/23/2017 01:16 PM
Final Approval Date: 02/23/2017		

City Council Future Topics – Work Session
(Draft)

Date	**Topics for Discussion – Council Action**
Future	Review Bidding Process for Towing Contract *(Katers)*
Future	Discuss Ordinance Governing Unmanned Aerial Vehicle Use *(Katers)*
Future	Review and Potentially Adopt Ramsey's Portion of Previous Highway 47 Study *(Westby)*
Future	Cost Share a Corridor Study for Nowthen *(Westby)*
Future	ICE Reports for Spot Improvements on Armstrong *(Westby)*
Future	Website Design and Website Services Update *(Fredrickson)*
March 14	McDonald's Discussion *(Brama)*
February	Discussion re the 2016 All-Staff Survey and Work Plan *(Lasher)*
Date	**Topics for Discussion – Regulatory**
Future	Commercial Signage Standards and Community Sign Plan*(Gladhill)*
Future	Property Maintenance Code (Maintenance of Buildings and Structures) *(Gladhill)*
Date	**Topics for Discussion – Policy**
Future	Future Business Park Policy *(Brama)*
Future	Public Facilities Naming Policy *(Riverblood)*
Future	Trail Maintenance Policy *(Westby)*
Future	Stormwater Pond Maintenance Policy *(Westby)*
Future	Citizen Volunteer and Recognition Program *(Ulrich)*
Future	Newsletter Policy *(Brama)*
February	Discussion re Updating the City's Personnel Policy *(Lasher)*
Date	**Topics for Discussion – Planning and Budget**
Future	Summary of Compensation/Development Plan for Employees *(Lasher)*
Future	Review Comprehensive Plan for Long-Term Water Supply *(Westby)*
Future	Review Corridor Improvement Initiatives *(Ulrich)*
Date	**Topics for Discussion – Information**
Future	Follow Up Discussions with ARAA *(Riverblood)* • Special Use Permits • What improvements can we make • Communication – in General
Future	Review Area Recreation Opportunity Assessment *(Riverblood)*