



City of Sheboygan



Sustainability Guidebook



2019

This guidebook was created by:

City of Sheboygan
Planning & Development Department
828 Center Avenue, Suite 208
Sheboygan, WI 53081

Phone: 920-459-3377

Email: development@sheboyganwi.gov

Website: www.sheboyganwi.gov



CONTENTS

PAGE

Introduction

02

Community Gardens

03

Energy Saving Projects

07

Local Food/Growing Food

13

Waste Stream Management

17

Water Protection and Conservation

23

Native Landscaping/Stormwater Plantings

30

Rain Gardens

34

Introduction



INTRODUCTION

This guidebook is a practical guide to sustainable strategies and projects that can be used by community groups, neighborhood association, non-profits, or even individuals looking for inspiration and information. This guide will lead users through each project from explanation to completion and ongoing maintenance.

At its core, sustainability is a simple concept: we depend on our natural environment to meet all the needs of our daily lives. The sustainable strategies found in this guidebook will allow you to put the concept of sustainability into action.

Sustainable Strategies

The following guidebook is divided into eight sections:

- Community gardens
- Rain barrels and rainwater catchment
- Energy saving projects
- Local food and growing food
- Waste stream management
- Water protection and conservation
- Native landscaping and stormwater plantings (including a native planting guide)
- Rain gardens

Each of these sections includes sustainable strategies that you, your household, and your organization can implement to live more sustainable lives. Implementing these strategies will also reduce costs in the long run. These strategies and projects cover a wide gamut, from quick and easy projects you can do in a few hours to larger, more complex ones. Every strategy can be scaled up or down to meet the needs of an individual, a large organization, or any size in between. Organizations of all sizes and people of all ages, abilities, and means can make sustainability a reality.



COMMUNITY GARDENS

What is a community garden?

A community garden is a parcel of land in an urban or suburban setting where members of the community can rent individual plots of land to grow their own food. Community gardens have many benefits. First, local food is much more sustainable than food which has to undergo processing and travel a long distance to distribution centers. (For more, see the “Local Food” section of this guidebook.) Second, growing your own food is much less expensive than purchasing it. Third, food from community gardens can be much healthier since you can control what you plant and what goes into the soil. In fact, some community gardens ban pesticides, while others may only allow organic pesticides. Fourth, community gardens help to combat food insecurity. Fresh foods are often more expensive than processed foods, making fresh options less affordable for some members of the community. Some people in urban areas do not face food insecurity but do live in homes where gardening is not practical, such as in an apartment or condo. By starting a community garden, you and your organization can help combat all of these effects and make your community and city more sustainable.

Any local nonprofit, neighborhood association, or community group can start a community garden. If interest and demand are high enough, several groups can come together and jointly start one. Generally, the organization will acquire or be leased the land through a donation, lease agreement, or outright purchase. Community members are then allowed to use these plots of land for gardening, including the use of raised beds. Each organization will decide on the rules for their own community garden. Some common rules include the cost to rent and operate a plot, gardening hours allowed, and which pesticides (if any) are permitted. Many community gardens also provide basic equipment such as shovels, hoes, and gloves.



Starting and operating a community garden

A community garden can be successful on almost any size parcel. Often times, the largest obstacle to creating a community garden is acquiring the land. Grants are available for nonprofits, community groups, and neighborhood associations. Some grants are at the federal level, often through the US Department of Agriculture. Wisconsin has grants through the Department of Public Instruction and through the UW Extension. Each grant will have a different application process, eligibility criteria, and timeline, but all are designed to assist with establishing community gardens.

Before the land is purchased or leased, the organization should get a history of the site and have the soil tested. This will ensure that the soil is free of pollutants and any contamination. If the site was previously industrial, the site can be remediated to allow safe gardening. Some community gardens will choose to allow only gardening in raised beds, but one would still want to provide a safe and healthy site for growing food by making sure the soil in the area is safe.



Explore Raised Beds!

Beyond acquiring the land and the rules for operating the community garden, another consideration is site design. Many community gardens, especially on smaller urban lots, will choose to allow only raised beds. A small group of people can construct and fill several raised beds in an afternoon or a weekend for relatively low cost. Raised beds help maximize the potential of the land by allowing successful gardening on every area that is not a pathway or tool storage area, so no corner goes unused. Installing regularly sized raised beds will also make the administrative side easier, since you can track exactly how many square feet of gardening space you rent to each community member.

Raised beds can improve the gardening experience and the productivity of the land. They allow you to add gardening soil and compost above ground level, which makes for easier garden maintenance, more control over the soil conditions, and better drainage. (See the “Composting” section in the “Waste Stream Management” section of this guidebook. Some community gardens have on-site composting, which is both sustainable and will improve the quality of the food.) This may allow you to reduce or eliminate use of pesticides. Raised beds also make gardening more accessible to people of all ages and abilities. A rule of thumb is that three feet between beds will accommodate a wheelchair, five feet will allow a wheelchair to turn around, and seven feet will allow two wheelchairs to pass.

Checklist for starting a community garden

FORM A PLANNING COMMITTEE

- Determine if there really is a need and desire for a garden
- What kind of garden--vegetable, flower, trees, a combination?
- Who will the garden serve--kids, seniors, special populations, people who just want an alternative to trash?
- Organize a meeting of interested people
- Choose a well-organized garden coordinator
- Form committees to accomplish tasks: Funding & Resource Development; Youth Activities; Construction; Communication.
- Make a list of what needs to be done
- Find a garden site
- Obtain lease or agreement from owner
- Decide on a mailing address and central telephone number(s). Try to have at least 3 people who are very familiar with all pertinent information. Form a telephone tree
- If your community garden has a budget, keep administration in the hands of several people.

CHOOSE A SITE

- Identify the owner of the land
- Make sure the site gets at least 6 full hours of sunlight daily (for vegetables)
- Do a soil test in the fall for nutrients & heavy metals
- Consider availability of water
- Try and get a lease or agreement which allows the space to be used at least for 3 years
- Consider past uses of the land. Is there any contamination?
- Is insurance something you need to consider?

PREPARE AND DEVELOP THE SITE

- Clean the site
- Develop your design
- Gather your resources--try to gather free materials
- Organize volunteer work crews
- Decide on plot sizes, mark plots clearly with gardeners names
- Include plans for a storage area for tools and other equipment, as well as a compost area
- Have a rainproof bulletin board for announcing garden events and messages
- Arrange for land preparation--plowing, etc--or let gardeners do their own prep
- Lay out garden to place flower or shrub beds around the visible perimeter. This helps to promote good will with non-gardening neighbors, passersby, and municipal authorities.



Starting a new community garden organization

Many garden groups are organized very informally and operate successfully. Leaders "rise to the occasion" to propose ideas and carry out tasks. However, as the work load expands, many groups choose a more formal structure for their organization.

A structured program is a means to an end. It is a conscious, planned effort to create a system so that each person can participate fully and the group can perform effectively. It's vital that the leadership be responsive to the members. Structure will help an organization to last; it will promote trust; it will help your group grow and create new opportunities for leaders to develop.

If your group is new, have several planning meetings to discuss your program and organization. Try out suggestions raised at these meetings and after a few months of operation, you'll be in a better position to develop bylaws or organizational guidelines. A community garden project should be kept simple as possible, whether large or small.

Things to consider when starting a community garden:

- Are there conditions for membership (residence, dues, agreement with rules)?
- How will plots be assigned (by family size, by residency, by need, by group- i.e., youth, elderly, etc.)?
- If the group charges dues, how will the money be used? What services, if any, will be provided to gardeners in return?
- Will the group do certain things cooperatively (such as turning in soil in the spring, planting cover crops, or composting)?
- When someone leaves a plot, how will the next tenant be chosen?
- How will the group deal with possible vandalism?
- Will there be a children's plot?
- Will the gardeners meet regularly? If so, how often and for what purposes?
- Will gardeners share tools, hoses, and other such items?
- How will minimum maintenance (especially weeding) be handled both inside plots and in common areas (such as along fences, in flower beds, and in sitting areas)?
- Will there be a set of written rules which gardeners are expected to uphold? If so, how will they be enforced?
- Should your group incorporate and consider eventually owning your garden site?



Access to water

Water delivery is a tangible aspect of garden management that links internal and external contexts. Water must first reach the garden site, and once there, it must reliably reach all parts of the garden. Urban gardens built on vacant lots or within public rights-of-way may not have water meters. In these cases, non-profit organizations and local governments may be able to subsidize the extension of water mains from nearby structures to service the garden; fire departments also use hydrants to fill rain barrels. Suburban or rural gardens may require digging or drilling wells. In cases where the garden is between two residential buildings, neighbors might allow gardeners to attach rainwater catchment systems to a house's downspout. Local regulations, though, may call for variances or other permits. As such, consistency in watering can be difficult to attain.



Mead's Seed Library

Use FREE, locally donated seeds from the library to grow your own vegetables and flowers. Then, let some go to seed and return some of the next generation seeds for others to borrow. Everyone will be able to borrow seeds whenever the library is open, year-round, whether or not they have library cards. The Seed Library is located just outside the Imaginarium on the library's second floor.

What is the Mead Seed Library?

Mead Seed Library is a collection of open-pollinated and heirloom seeds that you can borrow to plant and grow at home. Our seed collection depends on donations. You'll see different seeds available at different times, so check in frequently to see what's available.

How many seeds are in each packet?

There are roughly enough seeds for 3-5 plants in each packet. Because not all seeds germinate, this equals about 10-15 seeds. If the seeds are small, there may be even more in the packet. All seeds are donated, and are "buyer beware." We accept all kinds of seeds.



Sources and Additional Resources

https://www.epa.gov/sites/production/files/2014-03/documents/urban_gardening_fina_fact_sheet.pdf

<https://www.epa.gov/brownfields/steps-creating-community-garden-or-expand-urban-agriculture-brown-fields-site>

<https://www.fns.usda.gov/cfs/other-usda-grant-opportunities>

<https://dpi.wi.gov/school-nutrition/grant-opportunities>

<https://blogs.extension.wisc.edu/gardenwise/home/mini-grants/>

ENERGY SAVING PROJECTS

What are energy saving projects?

Energy savings projects reduce your household energy use while maintaining or increasing the performance of your home's systems. Performance will remain the same—or even increase—and power bills will go down, so the only differences you will notice are positive ones.

Energy efficiency projects include:

- Energy efficient lighting
- Programmable or smart thermostat
- Insulating your water heater and hot water pipes
- Sealing air leaks

There are almost endless types of energy saving projects, but we will focus on four projects. These projects were chosen because they have a relatively large impact relative to their upfront cost and are relatively easy first-time projects to do yourself or with a family member or friend.



Energy Saving Projects

What is energy efficient lighting?

Today, there are light bulbs on the market that are much more energy efficient than traditional incandescent light bulbs. There are two predominate types: compact fluorescent (CFL) and light emitting diode (LED) light bulbs.

Incandescent light bulbs get very hot after they've been turned on for a while. This is because incandescent bulbs produce light by passing electricity through a wire called a filament. With enough electricity, this filament glows brightly enough to produce light, but most of the electricity is actually wasted as heat. After a year or two, the filament wears out and breaks—that's when the light goes out. Many incandescent bulbs are rated for about 750 to 1,500 hours of light. That's only about a year or two with typical use.

CFL bulbs work differently. They pass electricity through a tube of inert gas, which glows when it hits the coating on the bulb. Some of the electricity is wasted as heat, but not enough as with incandescent bulbs. CFLs last much longer than incandescent bulbs. Many are rated for 10,000 hours or more, which is over nine years of life with average use.

LEDs produce light by passing electricity through something called a diode. This process is much more efficient than incandescent or even CFL bulbs, and very little electricity is wasted as heat. LEDs can also last many years—sometimes up to 15 years or more.

Energy efficient lighting installation and maintenance

Installation is the same as for incandescent bulbs. CFLs and LEDs screw into light sockets in exactly the same way. Energy efficient light bulbs last much longer, so maintenance is less frequent and basically involves replacement of the bulb, like incandescent bulbs. Please note that CFL bulbs often have mercury, which is safely contained within the bulb, but requires them to be recycled. Your recycling service can tell you how to do this.

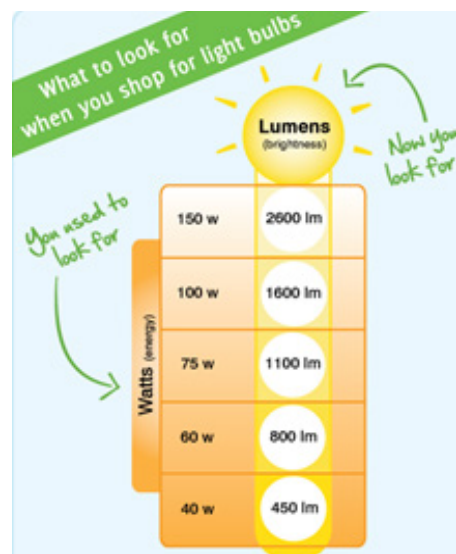
These energy efficient light bulbs sometimes have a slightly higher upfront cost, but prices have dropped rapidly since they became commercially available, especially for LEDs. In addition, you will end up saving money in two ways: CFL and LED lights last longer and use less electricity to produce the same amount of light compared to an incandescent bulb. You don't have to change every light in your house to a CFL or LED at the same time. You could do one or two a month, starting with the lights you use the most. This will help you save the most money. You could also buy a pack of new energy efficient bulbs and replace them as your existing lights go out. Many utility companies will offer special promotions for helping their customers save money including giving out free LED bulbs and reduced prices on other in-home items like thermostats and small light fixtures.

To help you decide which bulb to buy, the Federal Trade Commission has mandated the use of a Lighting Facts label on each package. This looks very similar to the nutrition information labels you check at the grocery store.

This label has all the information you'll need. It will be handy to think of light bulbs in terms of lumens (which describes brightness) instead of watts (which is energy used).

Lighting Facts Per Bulb	
Brightness	800 lumens
Estimated Yearly Energy Cost	\$1.02
Based on 3 hrs/day, 11¢/kWh Cost depends on rates and use	
Life	22.8 years
Based on 3 hrs/day	
Light Appearance	
Warm ————— Cool	
2700 K	
Energy Used	8.5 watts

Figure 1 Lighting Facts <https://www.consumer.ftc.gov/articles/0164-shopping-light-bulbs>



This handy chart will help you do just that. This will be helpful because your new energy efficient bulbs, whether CFL or LED, will use less energy to produce the same amount of brightness.

Figure 2 Lumens and watts <https://www.consumer.ftc.gov/articles/0164-shopping-light-bulbs>

Energy star certified light bulbs

ENERGY STAR Certified Light Bulbs:

- Use about 70-90% less energy than traditional incandescent bulbs
- Last at least 15 times longer and saves about \$55 in electricity costs over its lifetime
- Meet strict quality and efficiency standards that are tested by accredited labs and certified by a third party
- Produce about 70-90% less heat, so it's safer to operate and can cut energy costs associated with home cooling

By replacing just three 60 watt incandescent light bulbs with three 9 watt LED light bulbs there is the potential to save hundreds of dollars over the life of the bulbs.

Annual Total					Life Cycle Total				% Electricity Savings with ENERGY STAR	Total additional purchase price	Simple payback period for additional initial cost (years)	Assumed equipment lifetime (years)
Electricity cost savings	Electricity savings (kWh)	Electricity cost	Electricity consumption (kWh)	Emissions reduction (pounds of CO2)	Electricity cost savings	Electricity savings (kWh)	Avoided cost for replacement bulbs & labor	Net cost savings				
\$24	168	\$4	30	258	\$251	2,295	\$13	\$247	85%	\$17.55	0.7	13.7

The ENERGY STAR models of the selected light bulbs will save approximately 85%. Each year you will save approximately 168 kWh of electricity and \$24. Over the life of the light bulbs you will save approximately \$251 in electricity costs and \$13 in equipment replacement costs. By choosing ENERGY STAR you will reduce emissions by approximately 258 pounds of carbon dioxide annually, which is equivalent to the emissions reduction of not driving your car for 9 days.



What are programmable thermostats?

Setting your thermostat back only 7° to 10° F can lower your heating and cooling energy usage by as much as 10%. You can do this on a manual thermostat, but a programmable or smart thermostat can do this for you—and more. Once you program your thermostat, your system will automatically reduce the temperature for you while you sleep and/or when you are regularly away from the house.

A programmable thermostat lets you program in all of this information. For most models, you can set temperature for time of day and day of the week. You

can program the thermostat to work with your schedule: when you leave for work, when you go bed, and different times on the weekend. Programmable thermostats are typically more expensive than manual thermostats, but if you program it to your schedule, you won't have to worry about setting the temperature manually. Your bills will likely go down, since the system will automatically set the correct temperature for when you are typically at or away from home. This can be a large time-saver and make your life a little bit easier.

Smart thermostats are newer programmable thermostats with added features to help you save even more energy. Many can even program themselves by learning your schedule, and then setting the temperature back when you're not home. Smart thermostats are Wi-Fi connected, so you can program your schedule from your smartphone or computer. With most models, you can also track how much energy your heating and cooling system is using and adjust as necessary. You can even control the temperature remotely. Some smart thermostats have even more convenient options, such as adjusting the temperature just before you get home so you never have to walk into a chilly home in the winter.

All programmable and smart thermostats have buttons to manually change the temperature, so you still have full control over the programmed schedule.

Energy Saving Projects

Programmable or smart thermostat installation and maintenance

Installation and maintenance of a programmable or smart thermostat will vary depending on what model you choose. You will likely want to go to a home center or call a professional to your home to help you decide what is best for you. Installation depends on the model, but is usually best left for a professional. Some models are battery powered; however, these models don't use much power, and most will let you know when the battery needs to be changed.

Every programmable or smart thermostat will come with directions for you to program your heating/cooling schedule. If you have a professional install your new thermostat, most will show you how to program it.

Why should you insulate your water heater and hot water pipes?

All water heaters have some built-in insulation. If you want to know how well your water heater insulation is performing, touch the outside of it. If your water heater is warm, then it would benefit from added insulation. If your water heater is warm to the touch, it is losing too much heat to the room. Tank-type water heaters are always keeping the tank of water hot, so if it's losing heat, it's losing heat even when you're not running hot water. Similarly, hot water pipes should be insulated. Insulating both will have multiple benefits: your energy will go down, and you will get hotter water quicker, which adds convenience and lowers your overall water consumption and water bill. Added insulation can reduce this standby heat loss by 25-45% and lower your water heating costs by as much as 7-16%. For most people, adding insulation will pay for itself in about a year.



Insulating your water heater and hot water pipes

Almost all water heater tanks come in standard sizes. A home center will sell insulation jackets or blankets that are pre-cut to fit many standard size water heater tanks. These are easy to wrap around your water heater.

Always start by turning off the water heater. Leave the top of the water heater tank completely uncovered—this is especially important for gas-fired units. You can cut away any excess material with scissors. Many water heaters, especially electric water heaters, will have an access panel on the side. If there is one, mark a spot on the insulation blanket and cut it out to maintain access to the access panel. A section for controls should be marked on the insulation blanket and cut out in the same way. If your water

heater is gas-fired, cut away excess insulation so the insulation blanket will not cover the burner unit on the bottom of the tank. (Most water heater insulation kits will help you determine if your unit is electric or gas-fired. Only gas-fired hot water heaters have a vent on top of the tank. When the insulation jacket is properly cut so that it fits and does not cover the top of the tank or block any access panels or controls, wrap the insulation around it. Most insulation kits will come with electrical tape, foil tape, or some other kind of fastener. Wrap and fasten the insulation according to the directions and then turn the water heater back on. If your water heater is electric, make sure to set the water heater temperature to a maximum of 130°. This will keep the wiring safe from overheating.

You can also find pre-cut insulation sleeves to fit around standard size hot water pipes. You can easily wrap and fasten these around the hot water pipes that you can easily access, such as those found in the basement or a boiler room. Most will come in long lengths that can be cut to fit sections of pipe. Just like your water heater insulation, wrap and fasten the pipe insulation sleeves according to the directions. Most kits will come with tape, zip ties, or another fastener.

Maintenance on both water heater insulation and water pipe insulation sleeves should be minimal. If the insulation jacket on the water heater is cut well, it should not have to be removed when a professional services the water heater.

What are air leaks?

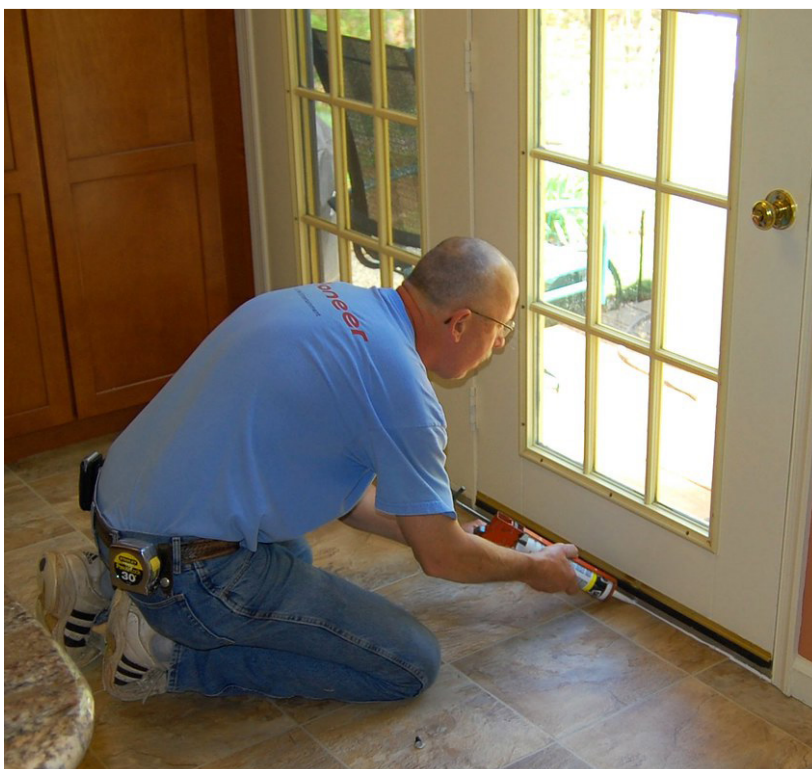
Many homes are under-insulated and have air leaking from the attic, basement or crawlspace, doors, and windows. For a typical home, adding up all the air leaks are the equivalent of one open window. Sealing air leaks will allow your heating system to use less energy in the winter and your air conditioner to use less energy in the summer. This will reduce your energy bills, as all the air you pay to heat or cool will stay inside. Sealing air leaks will also increase comfort, as humidity is better controlled and drafts are reduced or eliminated.

All insulation is rated by its R-value, which describes the insulation's resistance to heat flow. The higher the R-value, the more powerful the insulation.

Besides the previously mentioned energy savings, there are other benefits to adding insulation and buttoning up your home including reduced exposure to noise pollution, reducing pollen and allergens entering the home from outside, and reducing the chances for damaging ice dams developing where the roof meets the gutter system in the winter.



Sealing air leaks



The largest culprits for producing air leaks are located above and below your living space, in the attic and basement or crawlspace. In some cases, large holes where air can leak can be identified visually. You might even know of problem areas, such as a particularly chilly corner of your basement. Other culprits can be much smaller—check for gaps in the ceiling or floor where pipes enter the home from the basement, crawlspace, or attic.

Cracks or gaps can be sealed shut in a variety of ways. Your nearest home center will have many solutions. Spray foam in a can and tubes of caulking are the most common. Spray foam is best for filling cavities and holes where insulation should be, and outdoor-grade caulk is best for sealing cracks or linear gaps. Spray foam will come with an applicator tip, but you will need a caulking gun to apply caulk. An employee at the home store can help you find exactly the right material for your application—for example, spray foam that expands might not be best for all situations.

If your attic is lacking insulation, the easiest option is to buy and install insulation sold in large rolls. An employee at the home center can help you find the best insulation for your attic. These are unrolled into strips (called batts) on the attic floor. Multiple layers of insulation might be required to achieve the recommended total R-value. In Wisconsin's climate, insulation on the floor of an unfinished attic should have a minimum R-value of 38. If you do lay down multiple layers, lay the second row perpendicular to the first layer to seal gaps between the insulation batts. Make sure not to step on or compress the insulation once you've laid it down. This will decrease its R-value, much of which comes from the air pockets in the insulation.

Energy Saving Projects

If you have a vent around the perimeter of your attic (called a soffit vent) do not cover this with any insulation. Leaving the soffit vent uncovered allows cool winter air to flow into the attic, which helps to prevent ice dams. (This is why insulation only goes on the attic floor—the goal is to insulate the living space from the attic, not to insulate the attic from outdoor air.)

Do not cover the attic hatch with insulation. For this, you can buy a special insulated cover for the attic hatch that will allow you attic access without disturbing the insulation. These insulated hatch covers come in standard sized designed to meet standard size attic hatches.



Gaps around pipes can be easily sealed with spray foam. If the gap is very small, caulk can be also be used.

Doors and windows in the living space can be another source of air leaks. One of the easiest and quickest ways to reduce this type of air leakage is to apply weather stripping. Weather stripping is a rubber or plastic system that compresses when the door or window is shut, which creates an air seal and prevents air leaks. The key here is to get the right thickness weather stripping for your application. If the weather stripping is too thick, then the door or window won't close and latch properly. If it's too thin, then the weather stripping won't create a tight seal.



Weather stripping for both doors and windows can be purchased at a home center and be easily installed according to the directions. If your weather stripping is old and worn out (or was never installed) simply close the door or window and use a tape measure to measure the gap. If the gap is small and measuring it proves tricky, an estimate of the gap size will still help an employee at the home center assist you.

Weather stripping can be bought in lengths that you cut to fit the length of the door or window, and have adhesive on one side. Simply peel off the adhesive backing and apply it to the bottom of the door or window according to the directions.

Sources and Additional Resources

Thermostats -

<https://www.energy.gov/energysaver/thermostats>

Water heater and pipes -

<https://www.energy.gov/energysaver/services/do-it-yourself-energy-savings-projects/savings-project-insulate-your-water>

<https://www.energy.gov/articles/new-infographic-and-projects-keep-your-energy-bills-out-hot-water>

Air leaks -

https://www.energystar.gov/campaign/seal_insulate/do_it_yourself_guide

https://www.energystar.gov/ia/partners/publications/pubdocs/ES_Seal_&_Insulate_flyer.pdf

https://www.energystar.gov/campaign/seal_insulate/why_seal_and_insulate

https://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_insulation_table

LOCAL FOOD/GROWING FOOD

What is local food?

Much of the food we eat comes from distant locations. By some estimates, all the food in a typical American meal could have traveled about 1,500 miles from destinations across the country and world to reach your plate. Eating foods grown from far away is somewhat unsustainable due to its transportation requiring massive quantities of fuel. Choosing to eat local food is a sustainable choice because it drastically reduces the energy needed for transportation. Buying local food also supports your local economy. Finally, eating locally can be healthier. Many foods, especially fruits and vegetables, are picked before they are ripe. They then ripen during transit—sometimes with additional processing before shipping—and can arrive in suboptimal condition. Eating local foods reduces all of these unsustainable and unhealthy practices.

Food can be considered local at different scales. It is not always possible to get all or most of your food from within 10 miles of your homes, but a boundary of 100-300 miles is relatively practical for many foods. Because of climate, some foods, like citrus fruits, cannot be grown locally without a greenhouse. But a surprising array of foods can either be bought from local sources or grown yourself.

There is no food more local than the food you grow yourself. A small garden in your yard can provide many of your regular fruits and vegetables. Herbs can easily be grown inside. Scaling up to a community garden is also increasingly popular, as well as very sustainable.



How to eat more local food

Shopping for local food is easy and often fun. If you're at your local grocery store, check the packaging to see where the food was grown. Not everything has to be grown locally. Food from another state involves fewer energy costs than the same food from another country. Food from Wisconsin is clearly more local than cheese from another state, but you can go further and choose to buy food that comes from a nearby farm rather than one across the state.

One of the best places to find local food is at a farmers market. Farmers markets always sell local food, and sometimes local crafts and other goods. These markets can be looked at as social events, as well. The food available at your local farmers market will be seasonal, as well as local. With advances in food preservation, we have accustomed to eating foods out of season, but this preservation and storage requires a lot of energy (and some added preservatives). By eating more local foods when they become available, our diets can become more sustainable and healthier.



How to grow food

Growing your own food can be a rewarding and fun experience—and much less expensive than the alternative. Anyone can grow something in their home or in their yard. Herbs can be grown indoors in pots. Seeds or young plants can be bought at a local garden store and then grown in your kitchen or in a window year-round. Larger plants, such as tomatoes, can also be bought locally and planted in a small garden plot. For a larger home garden, you might want to consider buying or building a raised bed. This allows you to add gardening soil (and some of your compost) above ground level, making garden maintenance easier and having more control over the soil conditions. This could reduce or eliminate use of pesticides. Raised beds can also make gardening more accessible to people of all ages and abilities.

For a great way to scale up locally grown food, consult the “Community Garden” section of this guidebook.

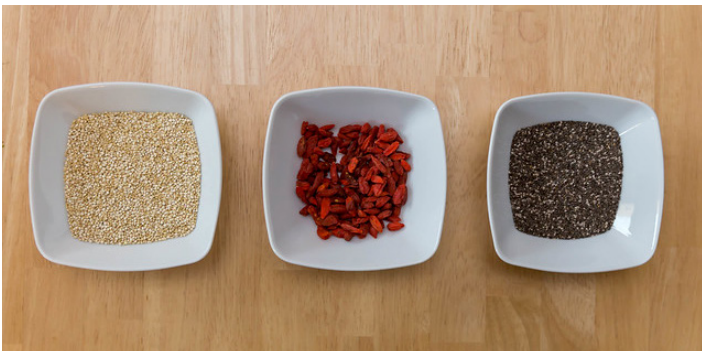


Superfoods!

Superfoods are foods — mostly plant-based but also some fish and dairy — that are thought to be nutritionally dense and thus good for one's health. Superfoods contain a variety of nutrients, such as antioxidants, which are thought to ward off cancer. They also have healthy fats, thought to prevent heart disease; fiber, thought to prevent diabetes and digestive problems; and phytochemicals — the chemicals in plants responsible for deep colors and smells, which can have numerous health benefits.

Superfoods that can be locally grown

- Blueberries
- Quinoa
- Kale
- Chia Seeds
- Sweet Potato
- Goji Berries
- Beets
- Pumpkins
- Sprouts
- Oregano
- Sunflower Seeds



Container Gardening

Container gardening is an easy way to grow vegetables, especially when you lack yard space. All you need is a small garden or simply a patio, balcony, or rooftop to start a container garden. Container gardening gives more control over growing conditions and provides a higher yield with less work.

Here are recommendations on which vegetable varieties are container-friendly

- | | |
|---------------|------------|
| - Beans, snap | - Lettuce |
| - Broccoli | - Onions |
| - Carrots | - Peppers |
| - Cucumbers | - Radishes |
| - Eggplant | - Tomatoes |



SCIO Farmer's Market

The Sheboygan & Plymouth Farmers Markets erupt with fun and natural beauty in the summer. From fresh grown produce and flowers to local cheese artisans and bread makers, the SCIO Farmers Markets offer the best that Wisconsin agriculturalists have to offer. All vendors live within 100 miles of the market, so you are truly supporting your neighbor.

SCIO coordinates three Farmers Markets: The Summer market in Sheboygan at Fountain Park on Wednesday's and Saturday's from 8am-2pm, & Plymouth located at Old Plank Rd Trail 57 & C (East of Fleet Farm) Trailhead, Plymouth from 9am-1pm and the Winter Market in Sheboygan at First Congregational Church the 1st & 3rd Saturday of the month from November-April.



Community Supported Agriculture

Community Supported Agriculture consists of a community of individuals who pledge support to a farm operation so that the farmland becomes, either legally or spiritually, the community's farm, with the growers and consumers providing mutual support and sharing the risks and benefits of food production.

In a traditional CSA model...

- Members share the risks and benefits of food production with the farmer.
- Members buy a share of the farm's production before each growing season.
- In return, they receive regular distributions of the farm's bounty throughout the season.
- The farmer receives advance working capital, gains financial security, earns better crop prices, and benefits from the direct marketing plan.

Benefits of CSAs

- 01** Ultra-Fresh, Locally Grown Produce - Farms give their members the very best of their produce, and many even offer flowers, honey, eggs, and more. Unique varieties are often given to CSA members before others, as well as test types of produce that the farmers are thinking of growing for a larger market.
- 02** Learn About New Vegetables and Fruits - You never know what might show up in your box.
- 03** Serious Understanding of the Seasons and What Grows in Your Area - Many CSA boxes come with newsletters, which often explain field conditions, why the farm is harvesting something early or late (or, sadly, not at all).
- 04** Relationship With the Farmers - CSA membership involves some relationship to a farmer or farmers that one often didn't have before.
- 05** Access to Special Buys - Farms often offer seasonal deals to their CSA members. Boxes of tomatoes to can, a neighbor farmer's grass-fed beef, a chance to get flats of strawberries at the end of the season so they can clear the field.
- 06** Invitations to Members-Only U-Picks at the Farm Many farms hold members-only pick-your-own events for high-demand produce in peak season. Sometimes CSA members are even invited to end-of-the-season post-harvest "gleaning" events where you can pick over a harvested field for any produce left behind.
- 07** Special Events at the Farm - U-pick events, barbecues, pot lucks, farm tours, and more. Different farms handle public events differently, from full-on harvest festivals with bands and dancing to more modest farm tours.
- 08** Saves Money - Assuming you use the produce that comes in the box, most CSA members will save money over a similar amount of quality produce bought at the store or from a farmers market.
- 09** Saves Time - What you give up in choice, you definitely gain in convenience. Picking up a box simply takes less time than going to the farmers market or choosing, bagging, and paying for produce at the store.



Sources and Additional Resources

What is local food -

<https://www.epa.gov/smartgrowth/local-foods-local-places-summary-reports>

<https://cuesa.org/learn/how-far-does-your-food-travel-get-your-plate#targetText=It%20is%20estimated%20that%20the,get%20from%20farm%20to%20plate.>

How to eat more local food -

https://www.epa.gov/sites/production/files/2014-06/documents/lesson8_complete_plan.pdf

<https://blog.epa.gov/2015/08/06/farmers-markets-shrinking-foods-footprint/>

How to grow food -

https://www.epa.gov/sites/production/files/2014-03/documents/urban_gardening_fina_fact_sheet.pdf

<https://www.epa.gov/brownfields/steps-creating-community-garden-or-expand-urban-agriculture-brown-fields-site>

Superfoods -

<https://www.livescience.com/34693-superfoods.html>

Container Gardening -

<https://www.almanac.com/content/container-gardening-vegetables#>

SCIO Farmer's Market -

<http://www.sheboygancountyinterfaith.org/farmersmarket.html>

Community Supported Agriculture -

<https://www.thespruceeats.com/benefits-of-community-supported-agriculture-2216143>

WASTE STREAM MANAGEMENT

What is waste stream management?

No matter who you are—a community group, neighborhood association, non-profit, or even a household or individual—your daily consumption and activities produce waste. The sum of this waste is called a waste stream. Every scale of human life, from an individual to a country, has a waste stream. Proper waste stream management includes everything that happens to that waste: collection, transport, processing, and eventual recycling or disposal.

Just like a stream of water that branches off, different types of waste go to different places. Waste stream management begins with monitoring where different types of waste currently go and how they might be diverted to somewhere less harmful and more useful—for example, from a landfill to a recycling plant. Monitoring also includes monitoring how much waste is produced and determining how waste can be reduced.

For a typical individual or household, most waste in the waste stream goes to one of three places: a landfill, a sorting center/recycling plant, or compost. With proper waste stream management, waste can be diverted from the landfill to either a recycling or compost center. Also, some goods can be resold—clothes and furniture are not typically considered waste, but they can often be donated or resold. When clothing, furniture, or other goods are going to be replaced, they can be diverted from the landfill if they are in decent condition.

Roughly a quarter of all household waste is food waste. Food waste (along with garden or yard waste) can be diverted from landfills and instead be used in composting. Composting can be done at any scale. This includes small scales, such as a small plastic tub under the kitchen sink in an apartment or a barrel in a backyard. This also includes larger scales, such as a neighborhood common area with multiple composting piles, all the way to commercial-scale composting sites. No matter the size of your household or organization, composting can divert a large amount of food and yard waste away from a landfill.



Instituting and maintaining waste stream management

The first and last step in waste stream management is monitoring. First, monitor how much waste you are producing. Then, after solutions have been put into action, continue to monitor your waste stream for areas to improve.

When you first monitor your waste stream, note how much waste goes to which location. For a household or small organization, this can be as simple as noting how many bags or bundles go into the trash and recycling each week. Make note of what types of waste is going into the garbage. You might find that many items being thrown away are recyclable or can be used for another purpose.

Reducing waste

The first step in keeping waste from going to a landfill is to reduce the amount of waste created. In almost all circumstances, waste cannot be eliminated completely—but it can almost always be reduced.

Make sure to pay attention to packaging. Nationwide, packaging is responsible for almost 30% of all municipal solid waste. If this waste is cardboard or certain types of plastic, it can be recycled, but it is more sustainable to simply avoid creating that waste in the first place. Whenever possible, purchase something with minimal packaging.

Also make note of disposable items that could be replaced with reusable ones. Even the most seemingly mundane items are good candidates. Plastic straws can be replaced with reusable plastic or stainless steel straws. Styrofoam cups in an office kitchen can be replaced with glasses and mugs. Paper coffee filters can be replaced with reusable mesh filters. The list is potentially endless.

Recycling

For Sheboygan city residents, curbside recycling is easy and can have a large impact on your waste stream. The following recyclables must be rinsed clean and placed inside the city-provided recycling receptacle to be placed at the curb on the designated day.

- Glass: recyclable bottles and jars only
 - No ceramics, ashtrays, drinking glasses, light bulbs, window or mirror glass, chemical bottles, medical containers or laboratory glasses
- Aluminum: rinsed food trays, foil, and beverage cans only
- Bi-metal: steel and tin food cans only
 - No aerosol or paint cans
- Plastic containers: recycles codes #1, #2, #3, #4, #5
 - No Styrofoam, plastic grocery bags, or hazardous chemical containers
- Newspaper and magazines
- Corrugated cardboard (large boxes must be flattened)
 - No wax coated corrugated cardboard
- Miscellaneous paper products: clean paper products such as cereal and soda boxes, office paper, envelopes, gift boxes, and junk mail should be placed in recycling container. Shredded paper needs to be first placed in a paper bag and then can be recycled
 - Paper products that have been contaminated with food such as paper coffee cups, used paper towels and pizza boxes are not recyclable and should be placed in the garbage

For commercial properties in Sheboygan, recycling can be contracted through a private contractor.

For the most up-to-date garbage and recycling information please visit SheboyganDPW.com/garbage-and-recycling



Composting

Composting can be done at any scale. For a typical household or small organization, there are three typical approaches for three different scales: small scale composting inside, moderate scale composting outside in a barrel or pile, or community scale composting facility with outdoor compost piles.

The process is fundamentally the same regardless of scale. Organic material high in nitrogen should be mixed with organic material high in carbon. Food and garden waste is nitrogen-rich and is commonly called “greens,” and yard waste is carbon-rich and commonly called “browns.” The ratio of greens to browns is important when using compost as fertilizer and should be about 1:2. This means you should mix twice as many “browns” as “greens” by weight. If you’re not sure, always add more browns.

Some types of food waste should never be added, as these will smell unpleasant as they compost. Never add fish or meat scraps, bone, dairy, fat, or oil. Also avoid glossy or waxy paper, labels on fruit or vegetable peels, and scraps from wood that has been stained or treated, as these will not decompose properly.



Brown carbon-rich

- dry leaves
- straw and hay
- shrub prunings
- pine needles/cones
- chopped twigs/branches
- wood ash
- newspaper
- shredded paper (avoid glossy paper)
- cardboard (shredded)
- corn cobs, stalks
- dryer lint (from natural fibers)
- sawdust (from untreated wood)
- eggshells
- brown paper bags (shredded)

Green nitrogen-rich

- table scraps
- fruit scraps
- vegetable scraps
- fresh grass clippings
- lawn and garden weeds (if they have not gone to seed)
- flowers
- seaweed and kelp
- chicken manure
- coffee grounds/filters
- tea leaves (loose or in bags)
- corn cobs, stalks
- hedge clippings
- garden waste
- fresh leaves

The mixture should be slightly damp, but not wet. You can always add water. If the material is too wet, you can add dry browns. Small pieces of cardboard, paper, straw, or sawdust work well. A key to maintaining the right levels of water and oxygen is to occasionally mix the compost. This should be done about once a week. As the greens and browns decompose into compost, the mixture should become warm. This might take a week or longer, depending on local conditions. If your compost pile doesn't smell, you're doing it right. The compost will be done in a month or two. There might still be some small pieces of organic matter, and that's okay. When it's done, it will look and feel like dark, loose, crumbly soil.

How to harvest and use compost

One way to harvest compost is to dig it out of the pile and spread it on a tarp outside to dry. Compost is easier to spread evenly when it's dry. Some gardeners screen their compost, tossing clumps into a new pile for more composting.

Once your compost is ready, you can use it in any number of ways.

Add compost to the soil

Compost improves soil aeration, enhances the soil's ability to hold water, and slowly makes nutrients available to plants. Add up to six inches of compost to the soil each year, or add a little bit to a seed furrow or planting hole. The poorer the soil the more compost it needs. You can never add too much compost!

Make potting mix with compost

Screen the compost through a ½-inch mesh and mix it with equal parts sand (or perlite) and soil. You'll have a well-drained potting soil that is high in organic matter. Use it to repot houseplants, in container gardeners, and as a thin layer on top of the soil of houseplants.

Mulch with compost

Two to six inches of compost spread around trees, shrubs, and other plants will keep weeds down, conserve water, help prevent erosion, and attract earthworms. Unlike some mulches, which can remove nitrogen from the soil when as they decompose, compost is already decomposed. In fact, compost actually adds nutrients to the soil. As with all mulching materials keep the compost away from plants stems and tree trunks.

Make compost tea

Compost tea is basically liquid organic fertilizer, providing plants with nutrients and beneficial microorganisms. To make your own compost tea, put some compost in a cloth sack and tie the sack shut. Place the sack in a bucket of water and let it seep until the water is the color of light tea. You can water houseplants, flowers, and vegetables with this healthful brew by pouring tea in the soil or spraying it on the leaves as a foliar feed. Compost tea doesn't last long, so just make what you can use in a couple of days.

Spread compost on the lawn

Four to six inches of compost tilled to five to eight inches deep is excellent preparation for a new lawn. Apply a thin layer (less than an inch) on established lawns once a year. Compost reduces a lawn's need for food and water and adds organic matter to the soil.



Waste Not Want Not

Waste Not, LLC is a service to divert household kitchen waste from going to landfills. It is composted at local participating farms. As a client you can receive a bucket of compost monthly to use in your lawn or gardens.

Waste Not, LLC specializes in residential service. Our goal is to educate that every little bit adds up! Together we can make a huge impact and create some awesome compost to share!

We turn your scraps and spoiled food into a soil amendment that farmers and gardeners use to grow healthy vegetables. It is just as good for flowers, shrubs and grass.

Sign up for service at <https://www.wastenotcompost.org/sign-up-for-service.html>

Composting outside can be done in piles or in a barrel. A barrel is a good choice for a backyard since it is more controlled than a pile. You can buy barrels made for composting, which come in a variety of shapes, sizes, and designed. Some of these have a locking lid and act as a tumbler, so you can simply close it and slowly spin it to mix the compost. You can also make your own composting barrel. One good solution is to get a plastic trash barrel with a lid. Cut the bottom off and drill a few holes around the bottom section. These holes will let the compost mixture drain properly and let in oxygen. Place the barrel where you will be composting, preferably on bare soil. Add your greens and browns and put the lid on. This way the mixture gets the necessary microorganisms it needs from the soil. You can take off the lid to stir the mixture. The handle of a shovel or rake works well.

Compost piles can be much larger and are a great choice for a neighborhood or community scale compost site. Compost piles get the microorganisms necessary for composting directly from the soil they're on, so you only have to add greens and browns. Composting in piles is only limited by the space available. At this scale, you can have many different piles at different stages of composting. This way, there is always a new pile to add fresh greens and browns to, as well as a finished pile where community members can get compost to add to their gardens, plantings, or even a community garden.

Composting at different scales

Methods for starting, storing, and mixing compost differ depending on scale and location.

If you are composting inside, such as in an apartment, you can buy a small amount of composting earthworms. These worms will provide the chemical processes to decompose the greens and browns into compost. You can buy containers designed for composting inside, or you can make your own. All you'll need is two nesting plastic tubs and a lid. Drill some small holes in the bottom of one container and a few holes in the lower portion of the sides. These holes are to let air into the compost mixture for the compost and for the worms. Finished compost, which is loose and somewhat crumbly, will fall through these holes and collect in the bottom tub. Nest this tub inside the other tub with no holes. Add your greens, browns, and the recommended amount of worms, and put the lid on. Worms prefer a dark place. A good place for your indoor composting tub is under the kitchen sink where it's dark and out of sight.





Donating and reusing

If something is in good condition and can be reused but you don't have space for it or don't need it anymore, consider donating or selling it. Certain items are prime candidates for donating, especially clothes and home/office furniture. Also, consider the other side of the equation: what are some things you could purchase in gently used condition? While it is always great to donate or sell unwanted items, consider shopping at places like Goodwill, resale shops, and yard/garage sales to purchase items and keep them out of the waste stream.

Local resale shops

Goodwill
3657 Greenwing Dr,
Sheboygan, WI 53081
(920) 459-8600

Nikki's Nex 2 New
1019 N 8th St.
Sheboygan, WI 53081
(920) 395-2442

Repeat After Me
931 North 8th Street
Sheboygan, WI 53081
(920) 395-2800

Fringe Benefits
725 South Taylor Drive
Sheboygan, WI 53081
920-783-0027

St. Vincent De Paul
4215 Highway 42 North
Sheboygan, WI 53083
(920) 457-4844

Bethesda
2827 South Business Drive,
Sheboygan, WI 53081
(920) 452-5212

TJ's Closet
520 N 8th St
Sheboygan, WI 53081
(920) 457-5131

Habitat for Humanity
Sheboygan ReStore
1911 N 8th St
Sheboygan, WI 53081
(920) 452-4175

Sources and Additional Resources

Waste Stream Management -

<https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific-data>

<https://www.epa.gov/transforming-waste-tool/managing-and-transforming-waste-streams-tool>

https://community.ifma.org/cfs-file/__key/telligent-evolution-components-attachments/13-465-00-00-01-05-74-11/2016_5F00_Waste-Stream-Management_5F00_How-To-Guides.pdf

Composting -

<https://www.epa.gov/recycle/composting-home>

<http://compost.css.cornell.edu/outdoorbest.html>

<http://compost.css.cornell.edu/chemistry.html>

<https://www.wastenotcompost.org/>

<https://gardeningwormcomposting.com/greens-and-browns-in-composting/>

<https://www.gardeningchannel.com/use-your-compost-now/>

WATER PROTECTION AND CONSERVATION

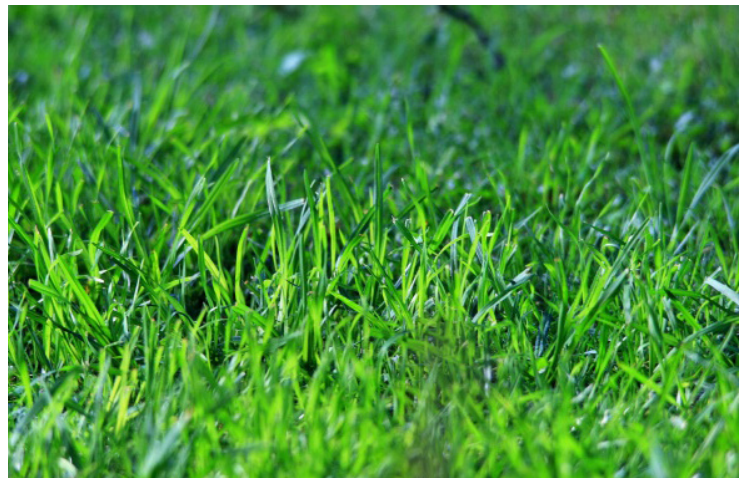
What is water protection and conservation?

Water protection and conservation projects include projects that typically use less water and that do not harm the water system. These types of projects can be done both inside and outside your home. For both types, goals include reduction of your household's or organization's water use while maintaining or increasing the performance of your water systems. Performance will remain the same—or even increase—and water bills will go down, so the only differences you will notice are positive ones.

According to the EPA, the typical American will use an average of 88 gallons of water per day—and that's just at home. That figure can be reduced by up to 20% by replacing existing water-intensive fixtures and appliances with more water-efficient ones.

Water use has hidden costs. In most settings, you will pay for the same water three times: once to buy the water, once to heat the water, and once to dispose of the wastewater. By using less water, you will also save money at each of the three phases. If the water is heated, then by using less water, you will also reduce your utility bill by using less natural gas or electricity to heat it.

Another goal is protecting water quality. This has benefits for people as well as for the environment. An example of water protection would include not disposing of any waste oil or other contaminants in the municipal storm sewer system along the curb in front of your home. In most cases, items falling into the city's municipal storm sewers will end up directly in Lake Michigan or the Sheboygan River.



Indoor water protection and conservation: Faucet aerators

A faucet aerator is a simple and inexpensive way to reduce your water usage in any setting, from a home kitchen or home bathroom to a sink in the office kitchen. An aerator is a small device which easily attaches to the end of a faucet—most new faucets come with built-in aerators, but you can also buy an aerator which will fit your existing faucet. An aerator introduces air into the stream of water as it exits the faucet. This reduces the flow of water but it does not sacrifice performance, since you won't notice that you're using less water.

A faucet aerator is not always a good fit for every application, so it is important to consider the use of the faucet before adding an aerator.

If your faucet is relatively new, it might already have an aerator or it might be a low-flow model—in either case, you are

already reducing your water use. To tell if you should reduce your water use, you can easily check how much water your faucet puts out. Water is measured in gallons per minute (gpm), and most faucets will have this number etched into the ring at the very end of the faucet. If your faucet ring says 1.5 gpm or more, you should consider installing an aerator.

The typical use of each particular faucet will determine which aerator will be optimal. If the faucet is mostly used for volume-based tasks like filling containers, then an aerator might not be needed. This is typically only for faucets dedicated to a specific task, such as a separate pot-filling faucet next to a stovetop.

Some household or office faucets are used mostly for flow-based tasks. This is most typical in a bathroom where hand-washing is the most common task. In this case, a 0.5 gpm aerator will save you a lot of water.

Many sinks are used for both kinds of tasks. Kitchen sinks, for example, are used for washing dishes (which is volume-based), as well as for washing hands (which is flow-based). In this case, a 1.0 gpm aerator would be best.

Installation will vary depending on the specific aerator you purchase. The process for attaching the aerator to the faucet is generally quick and easy. According to the manufacturer's directions, periodic maintenance is recommended and should typically be done every few months or possibly even less frequently. This will generally involve removing the aerator, cleaning out any silt or mineral buildup, and reattaching it.



Indoor water protection and conservation: Low-flow showerheads

Installing a low-flow showerhead is another homeowner-friendly project that can save a lot of water and reduce water and utility bills. Just as with faucets, water flow from a showerhead is measured in gallons per minute (gpm). In the US, the average shower lasts eight minutes. If your showerhead is relatively old and has a flow rate of 4 gpm, then each shower will use 32 gallons of water. Since you would typically use water that is hot, you're not only paying for the water, but you are also paying to heat it and then dispose of the wastewater.

The EPA advises that a low-flow showerhead with 2.5 gpm or less. Many low-flow showerheads offer 2.0 gpm rates that save even more water than a 2.5 gpm showerhead without sacrificing performance. For comparison, many showerheads manufactured before 1992 had flow rates as high as 5.5 gpm. By replacing a showerhead from this era, you can reduce your shower's water use by more than half. Low-flow showerheads can be found in two types: aerating or laminar-flow. An aerating showerhead works just like a faucet aerator to reduce the flow of water and thus, the amount of water used. Laminar-flow showerheads form the water into individual streams, which also reduces overall water flow without reducing performance. A laminar-flow showerhead will create slightly less steam than an aerating one, so a laminar-flow showerhead might be best if you find that your bathroom mirror fogs up easily. Both types will save just as much water—just refer to the gpm number on the packaging.

Installation will vary depending on the specific low-flow showerhead you purchase. The process involves replacing your existing showerhead with the new one, and is therefore no different than replacing a showerhead in any other situation. Periodic maintenance is recommended, again according to the manufacturer's directions. This will typically only involve cleaning any mineral buildup on the showerhead, just as you would with any other showerhead.

Outdoor water protection and conservation

Almost a third of a household's water use is devoted to outdoor uses. Moreover, up to half of that water used outside is wasted. This is generally because of inefficient systems which produce too much runoff or lose too much water to evaporation or wind. Often, irrigation and water systems are seen as necessary because non-native species are planted, requiring additional watering. Another common problem requiring additional watering is planting plants in beds that are not designed to maximize water capture and infiltration.

The single most effective way to reduce outdoor water usage is to use native plants wherever possible. Once native species are planted and established in the soil, they require little or no water beyond normal local rainfall. Refer to the "Native Landscaping" section of this guidebook for more details.

One major way to reduce your outdoor water usage is to consider replanting the area covered by grass with trees, flower beds, and groundcover. Grass is the single most water-intensive plant found on a typical lot, and it typically requires frequent maintenance in the form of mowing and edging. For a typical resident or household, overhauling an entire yard will be a large and sometimes expensive project, but smaller steps will provide benefits. Native trees can be added, and non-native plants in beds can be replaced with native species. If you are creating a new landscape design, moving into a new home, or if your business is relocating, you have the perfect opportunity to plant a less water-intensive landscape. By devoting the area to groundcover, shrubs, and trees that are less water-intensive, you will reduce the amount of water needed to maintain the area. This will drastically reduce outdoor water use while providing aesthetic benefits. Shrubs and groundcover provide more greenery later in the year, while evergreen trees are green year-round and deciduous trees provide beautiful color and visual interest in the fall.



Outdoor water protection and conservation: Rain barrel/Rainwater catchment

The roof of your home or your organization's building produces a lot of stormwater runoff. During a one inch rainstorm, the typical American home will shed 1,870 gallons of stormwater. For comparison, that's enough water to fill over 45 average-sized bathtubs. Sheboygan averages over 35 inches of rainfall annually. Most homes and other buildings have a system of gutters and downspouts, but they don't actually capture this water. Instead, they divert it into the soil or onto hard surfaces such as driveways or parking lots. If the water doesn't infiltrate into the soil, it inevitably ends up in your local stormwater sewer system.



What if instead of treating this rainfall as waste, we could capture it and use it? Rain barrels in particular, and the broader field of rainwater catchment in general, are designed to do just this. Catching and using this rainwater has many sustainability benefits. It's less expensive for you in the long run; rather than paying for water from a utility, you can harvest much of it for free. It's also better for you and your community, who are now more protected from localized flooding and the effects of stormwater runoff. Rain barrels and catchments are also more sustainable; it takes a lot of energy to treat wastewater, while rain barrels or a rainwater catchment system can reduce the amount of energy and cost that goes into wastewater treatment.

Rain barrels are just what they sound like; barrels (or tanks or cisterns) used to capture rainfall. They are connected at the end of your building's gutter system to capture rainfall and hopefully, keep leaves and insects out. You can then use this harvested rainwater for any number of outdoor chores including watering your lawn and garden, washing your car, or even adding a splash of water to a dry compost bin.

Rainwater catchment systems are much larger than rain barrels, but they function in much the same way. These systems involve one or more tanks or cisterns, often installed underground or partially underground. While rainwater catchment systems can, and do, capture rainwater from roofs, they can also capture rainwater from the surrounding soil. These systems are often designed to capture rainwater and to slowly release excess stormwater at a rate slow enough for the surrounding soil and subsoil to absorb. This promotes better drainage and helps to stabilize your soil.

Outdoor water protection and conservation: Rain barrel/Rainwater catchment installation and maintenance

You can buy a rain barrel and install it yourself. Rain barrel kits can be bought at most home centers or from a landscaping retailer. For a fun weekend project, you can even make your own. Whether you're buying a rain barrel or making one, you'll want to estimate about how much rainfall it should handle. If you buy yours at a home center or from a specialty retailer, an employee can help you size the system. Depending on the size of your roof, you might want to install several rain barrels—perhaps one at each existing downspout. In addition to a barrel, all kits will have a system for getting water from your gutters and downspout into the rain barrel. One common type is a closed lid with a port that connects to flexible tubing attached to the downspout. Another type uses flexible tubing connected to the downspout, but has an open lid with a mesh screen which keeps out leaves and other debris. Some kits require you to cut off a small section of the downspout; if so, the kit will have directions for doing so. Your kit should also have directions on how to place your rain barrel. The barrel should be elevated slightly above the ground, typically on some bricks or pavers.

Get Your Neighborhood Involved!

There are several ways you can get your neighborhood involved in rain barrel water conservation

- Host a rain barrel assembly party
- Hold a rain barrel decorating contest/event
- Conduct a rain barrel workshop on how to install and care for a rain barrel and the benefits of using rain barrels



Larger rainwater catchment systems, or cisterns, can improve drainage on any site, from a home lawn to a large yard or even a community greenspace. Installation of these large systems is best left to a professional. That is because their installation involves measurements about rainfall, slope, and soil conditions. All of these measurements will determine the size of the cistern(s) and how and where they will be installed. Many companies specialize in these systems, including some landscaping contractors.

Outdoor water protection and conservation: Lawn maintenance

The one place where native species cannot always be used is for grass in the lawn. However, there are ways to minimize water usage on grass. Many people mow their lawn too short. The recommended height to reduce the need for water and grow a healthier lawn is 2-3". This height will allow the grass to shade the soil, which improves water retention. It also results in a deeper root system which will take up more water. These roots will also anchor the grass down, making the lawn more resistant to foot traffic. Finally, deeper roots allow the grass to better tolerate drought, disease, and pests.

Water Protection and Conservation

Adjusting the height of your mower is quick and easy. Always adjust the height of your lawnmower on a flat, level, and hard surface, such as a driveway. Most mowers will have adjustable levers or knobs on each of the four wheels. In some cases, the levers on the four wheels will tell you the actual cutting height, then you're all set. If your mower does not, you can take a quick measurement with a tape measure. Measure from the ground to the bottom of the casing which houses the blade. Your lawnmower manual (which can often be found online) will provide more specific information. Make sure all four wheels are adjusted to the same height, presumably about 2-3 inches.

Watering and irrigation should be seen, not as routine lawn maintenance, but as a minor use of water used only as a supplement when rainfall is not enough. Many people water their lawns with either a hose or sprinkler or with a programmable in-ground irrigation system. Avoid watering your lawn more than one inch per week. If you use a hose or sprinkler system, mark some empty cans with one inch marks and time how long it takes to reach one inch. You'll only have to do this once. If you have a programmable in-ground system, make sure it is programmed correctly. Consult the manual to program the system to deliver only one inch per week and not to water during or after rainfall. Timing your watering is also important to conserving water. When you do water, maximize water retention by watering in the morning or late evening and avoiding hot or windy days. Your lawn can often go longer than a week without watering, especially in periods with normal to heavy rainfall. (If you're not sure, step on your lawn. If the grass feels soft, it doesn't need to be watered yet.)

Outdoor water protection and conservation: Planting bed maintenance

Planting beds using native species of flowers, shrubs, and trees will minimize water usage and overall maintenance. However, for non-native species (as well as for most fruits and vegetables in your garden) some amount of watering might be necessary. There are still steps you can use to reduce how much water you need. One sustainable project is to consider replacing annuals that die off each year and must be replanted, with perennials that require less planting and maintenance because they typically grow back each spring. A general rule is that if any species will need special care or drip irrigation, plant them in clusters. This will reduce maintenance time and reduce the length of drip hose irrigation which might be required.

For any planting bed, mulching is a quick and easy way to reduce watering and maintenance. Mulch can be bought locally at any home center or a dedicated landscaping store and can be placed in the bed yourself. Mulching will reduce water usage and weeds, thus reducing maintenance time. This is because mulch lowers the rate at which water evaporates from the soil, allowing the plants more time to absorb as much water as they need.

If the bed's existing mulch is over three years old, remove the old mulch and add additional new mulch. Old mulch can be added to a compost barrel as browns. Once the bed is clean, add a one-inch layer of mulch. Keep the mulch several inches away from the base of each plant since mulch absorbs water and too much water at the base of a plant can be a breeding ground for fungi. (This gap around each plant is also the perfect spot for drip hose irrigation.) A good rule of thumb is to remove all the old mulch every three years, and add a new one-inch layer of mulch every year. This will prevent the mulch layer from exceeding three inches. Too much mulch can smother the soil, preventing water from infiltrating and stifling healthy root growth.



For any species that will require regular watering, installing drip irrigation hoses will reduce your overall water usage and provide water at the rates that plants can absorb. Drip hoses slowly release water directly around the plants that require irrigation. The water can immediately infiltrate the soil where the roots can absorb it. This reduces water waste from evaporation and prevents over- or under-watering. They can be installed by anyone. Depending on the size of the beds you will be installing them into, installation time can range from an hour to an afternoon. Drip hoses can be purchased at any home center or specialty gardening/landscaping store.

Each kit will have slightly different directions and should always be consulted before installation; however, the basic steps are generally the same. First, lay the drip hose where it will go, which involves looping it around plants or laying it between plants if they are clustered together. Most kits require you to install emitter heads into the tube of the hose. These emitter heads are where water is released. Installation is quite quick. Finally, connect the hose to your outdoor spigot. To enable use of the spigot with a drip hose installed, you can buy a splitter (enable two hoses to be screwed into one spigot) and screw it into the spigot just like you would screw in a hose.

For a great way to improve the overall health of your plants while reducing waste, consult the “Composting” section of this guidebook.

For a great way to provide water for your planting beds (when necessary), consult the “Rain Barrel” section of this guidebook.

Sources and Additional Resources

Water Protection and Conservation -

<https://www.cleanenergyresourceteams.org/faucet-aerators-are-great-water-and-energy-savings-when-should-you-use-them>

https://www3.epa.gov/region1/eco/drinkwater/water_conservation_residents.html

<https://www.epa.gov/sites/production/files/2017-03/documents/ws-simple-steps-to-save-water.pdf>

Indoor Water Protection and Conservation -

<https://www.cleanenergyresourceteams.org/faucet-aerators-are-great-water-and-energy-savings-when-should-you-use-them>

https://www.epa.gov/sites/production/files/2017-02/documents/ws-ourwater-shower-better-learning-resource_0.pdf#targetText=The%20average%20shower%20lasts%20eight,uses%2018%20gallons%20of%20water!&targetText=Across%20the%20United%20States%2C%20we,Never%20fear!

<https://www.energy.gov/energysaver/water-heating/reduce-hot-water-use-energy-savings>

Outdoor Water Protection and Conservation -

<https://19january2017snapshot.epa.gov/www3/watersense/information.html>

https://www3.epa.gov/region1/eco/drinkwater/water_conservation_residents.html

<https://19january2017snapshot.epa.gov/www3/watersense/pubs/outdoor.html#targetText=The%20average%20American%20family%20uses,for%20watering%20lawns%20and%20gardens.>

https://www3.epa.gov/region1/eco/drinkwater/water_conservation_residents.html

<https://19january2017snapshot.epa.gov/www3/watersense/pubs/outdoor.html#targetText=The%20average%20American%20family%20uses,for%20watering%20lawns%20and%20gardens.>

<https://www.epa.gov/soakuptherain/soak-rain-rain-barrels>

<https://water.usgs.gov/edu/activity-howmuchrain.php>

<https://w2.weather.gov/climate/xmacis.php?wfo=mkx>

<https://blog.epa.gov/2010/06/24/control-your-stormwater-and-save-money-use-a-rain-barrel/>

<https://www.epa.gov/npdes/rainwater-harvesting-conservation-credit-codes-and-cost-literature-review-and-case-studies>

<https://www.epa.gov/soakuptherain/soak-rain-disconnect-redirect-downspouts>

[https://www.lid-stormwater.net/raincist_sizing.htm#targetText=A%20general%20rule%20of%20thumb,will%20yield%20approximately%20600%20gallons.&targetText=Example%3A%20one%2060%2Dgallon%20barrel,0-.042%20ft.\)%20of%20rainfall.](https://www.lid-stormwater.net/raincist_sizing.htm#targetText=A%20general%20rule%20of%20thumb,will%20yield%20approximately%20600%20gallons.&targetText=Example%3A%20one%2060%2Dgallon%20barrel,0-.042%20ft.)%20of%20rainfall.)

NATIVE LANDSCAPING/ STORMWATER PLANTINGS

What is native landscaping?

Native landscaping is the practice of planting native species of trees, shrubs, grasses, and other plants. Every species of plant evolved to thrive in a specific habitat, which means that each species is adapted to certain soils and levels of temperature and precipitation.

Native species need less maintenance than species from a very different climate and will be well-adapted to endure local weather conditions. One large benefit of planting native species is the reduced maintenance cost and time. Native plants require much less fertilizer, which has less negative downstream effects on water quality.

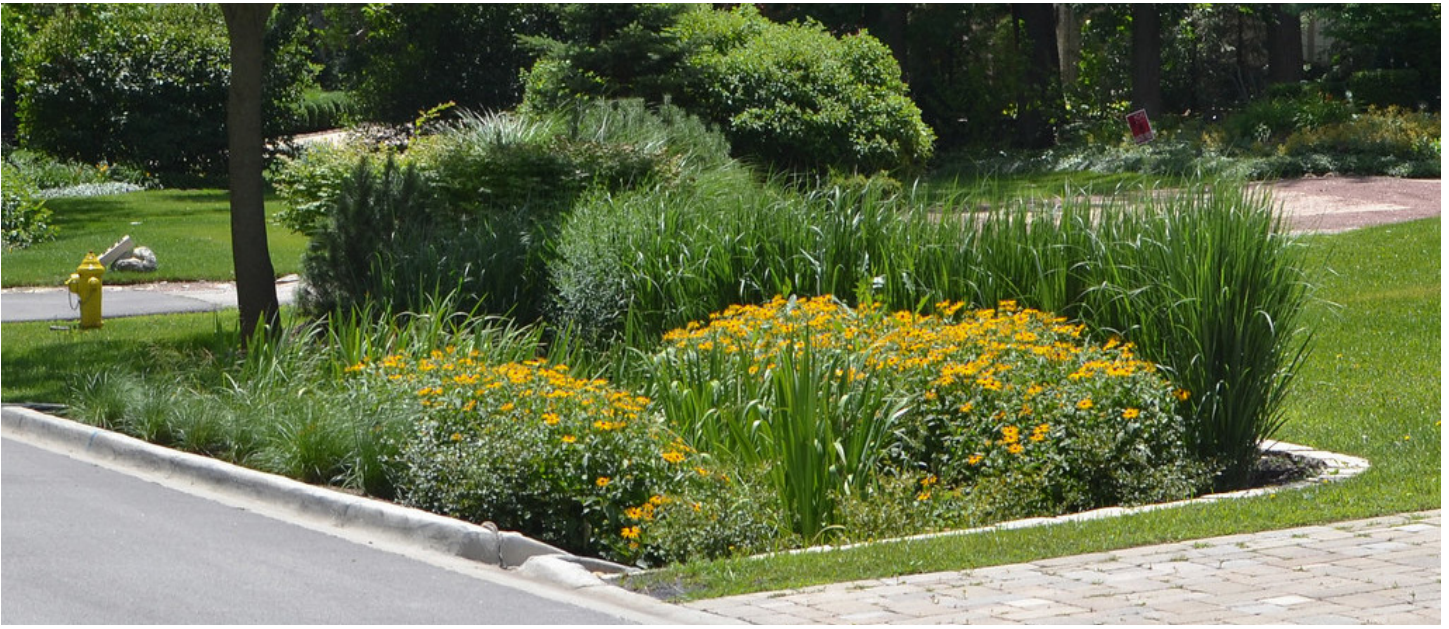
Another clear benefit of using native landscaping is better stormwater management. Because native species are well-adapted to expected local amounts of precipitation and the timing of that precipitation throughout the year, they will be able to retain and absorb stormwater. In fact, local amounts of stormwater will benefit native species and by retaining and absorbing stormwater, native species will benefit the landscapes in which they are planted.

Native landscaping

The USDA maintains maps of “plant hardiness zones” which define where each species can thrive. These zones are defined by average annual extreme low temperature. All of Wisconsin’s lakeshore, including Sheboygan, is in plant hardiness Zone 5b, with average annual extreme low temperatures of -15° to -10° F. The WDNR maintains a separate but similar map that places Sheboygan in Zone 5. When shopping for trees or plants, the first step is to make sure to stick to species adapted to these zones. Not all plants which will thrive in this climate are actually native species, and the goal is a sustainable and native landscape. If you only purchase and plant native species, they will already be adapted to Sheboygan’s climate.

Soil content also determines how plants grow. The three basic building blocks for soil are sand, silt, and clay. Soils in the City of Sheboygan are generally loamy sand or silty loam, depending on the specific location. These types of soil are generally fertile and have good drainage, both of which benefit plants much more than denser clay soils. Keep this in mind when purchasing native species. If you do business with a local vendor, they will often be familiar with the local soil.





Stormwater plantings

The first step in planting and maintaining a native landscape is determining which types of plants (trees, shrubs, etc.) you want to plant. Trees offer maximum stormwater management benefits. This is because trees have deeper root systems than other plants, which allows them to absorb stormwater from a very large area. This deep root network also helps to anchor the soil, which provides benefits for plants nearby. Trees also absorb a lot of stormwater because of their canopies. In fact, trees absorb a lot of their water through their leaves, intercepting some rainfall before it can saturate the soil and cause potential flooding.

Sheboygan maintains a list of tree species approved for planting in the parkway by the city. This list is a good starting point when deciding on tree types for your property since these trees will do well in Sheboygan's climate.

When planting and maintaining trees or making other changes to your landscape, make sure to consult Sheboygan's municipal code. This code lays out requirements for where trees can't be planted and how trees must be maintained. These regulations prevent tree branches and canopies from protruding into streets and alleys and ensures a clean line of sight for drivers, cyclists, and pedestrians.

Trees offer many benefits for stormwater management, but so do many other types of plants. Shrubs and groundcover plants have benefits, as well. They are often better suited for planting closer to an exterior wall, while some are excellent understory plants that will thrive when planted in and around a group of trees.



Native planting guide

The following list is from the DNR's list of trees and plants that will thrive in Zone 5 of Wisconsin, which includes Sheboygan. Most of these species are native, and all include their scientific names so be sure you know what species you're purchasing. The following list is not exhaustive, but it will serve as a solid footing for developing an extensive list of native species:

Evergreen trees

- Jack Pine (*Pinus banksiana*)
- White Pine (*Pinus strobus*)
- Red Pine (*Pinus resinosa*)
- Tamarack (American larch) (*Larix laricina*)

Nut-bearing trees

- Butternut (*Juglans cinerea*)
- Black Walnut (*Juglans nigra*)
- Shagbark Hickory (*Carya ovata*)
- Bitternut Hickory (*Carya cordiformis*)
- White Oak (*Quercus alba*)
- Bur Oak (*Quercus macrocarpa*)
- Swamp White Oak (*Quercus bicolor*)
- Red Oak (*Quercus rubra*)
- Black Oak (*Quercus velutina*)
- Northern Pin Oak (*Quercus ellipsoidalis*)

Other deciduous trees

- Basswood (*Tilia Americana*)
- Hackberry (*Celtis occidentalis*)
- Boxelder (*Acer negundo*)
- Willow (*Salix* species)

Fruit-bearing trees

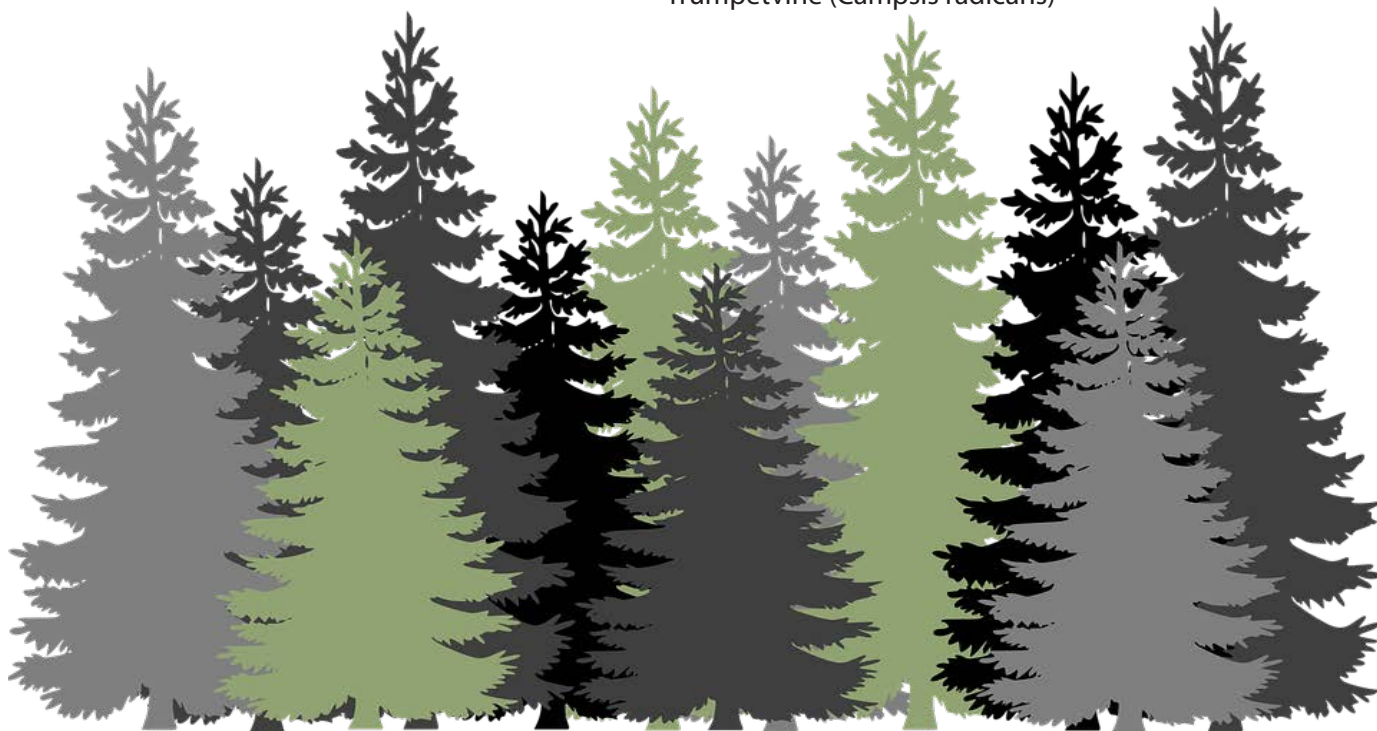
- Prairie Crabapple (*Pyrus ioensis*)
- Sweet Crabapple (*Pyrus coronaria*)
- Hawthorn (*Crataegus* species)
- Wild Plum (*Prunus Americana*)
- Eastern Serviceberry or Shadbush (*Amelanchier Canadensis*)
- Downy Serviceberry (*Amelanchier arborea*)
- Smooth Serviceberry (*Amelanchier laevis*)
- Red Mulberry (*Morus rubra*)

Shrubs

- Green Alder (*Alnus viridis*)
- Speckled Alder (*Alnus incana*)
- Smooth Alder (*Alnus serrulata*)
- Red-osier Dogwood (*Cornus sericea*)
- Silky Dogwood (*Cornus amomum*)
- Common Elderberry (*Sambucus Canadensis*)
- Ninebark (*Physocarpus opulifolius*)
- American Highbush Cranberry (*Viburnum trilobum*)
- Wild Rose (*Rosa* species)

Vines

- Wild Grape (*Vitis* species)
- Bristly Greenbrier (*Smilax hispida*)
- Trumpetvine (*Campsis radicans*)



The following list is from the DNR's list of trees and plants that should be avoided. These species, as well as cultivars derived from them, are non-native. They have the potential to outcompete native species and invade more wild areas. If they do so, they will become very difficult to remove, making a truly native landscape harder to accomplish.

Trees

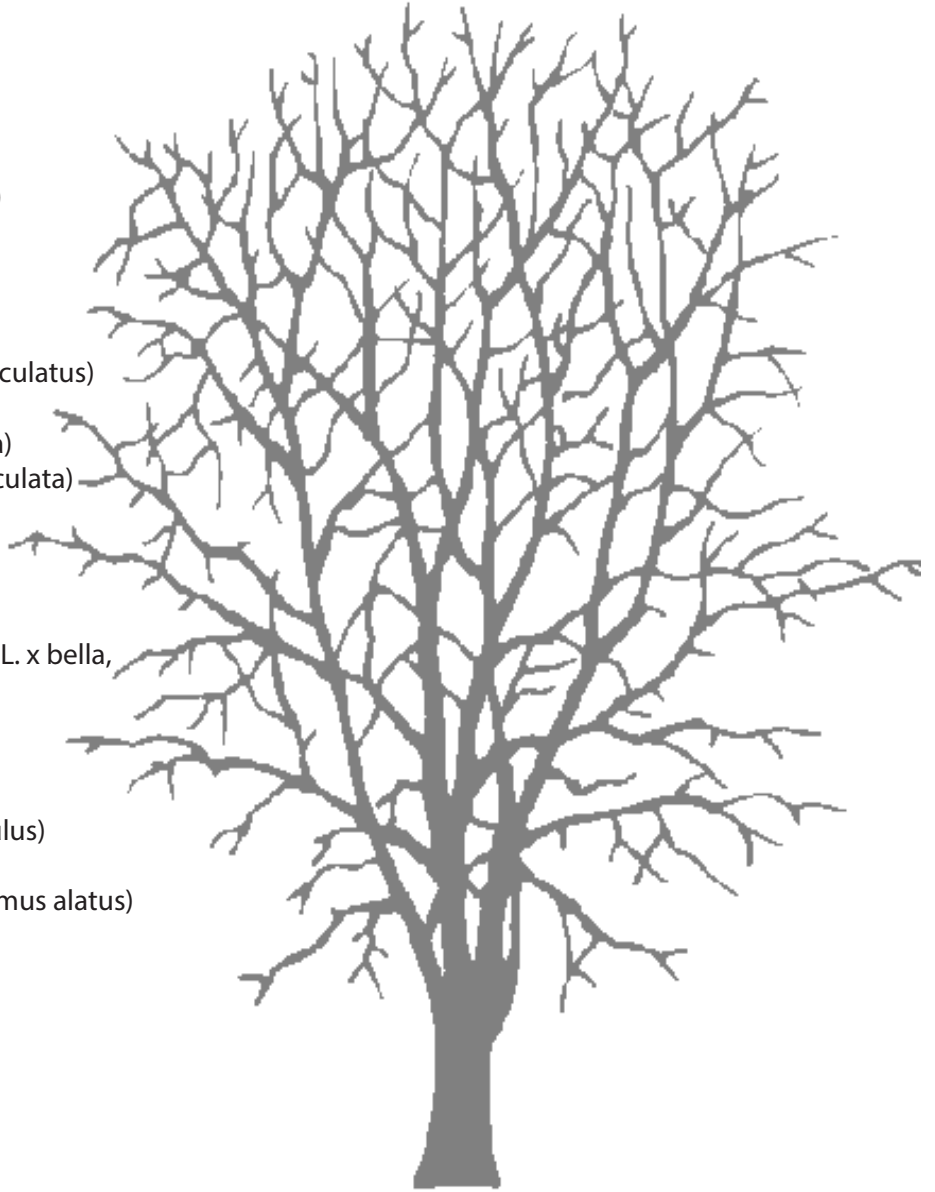
- Common buckthorn (*Rhamnus cathartica*)
- Glossy/columnar buckthorn (*Rhamnus frangula*)
- European Mountain Ash (*Sorbus aucuparia*)
- Amur maple (*Acer ginnala*)
- Norway maple (*Acer platanoides*)
- Black locust (*Robinia pseudoacacia*)
- Chinese elm (*Ulmus parviflora*)
- Siberian elm (*Ulmus pumila*)
- European or black alder (*Alnus glutinosa*)
- White poplar (*Populus alba*)
- Lombardy poplar (*Populus nigra italica*)

Vines

- Round-leaved bittersweet (*Celastrus orbiculatus*)
- Wintercreeper (*Euonymus fortunei*)
- Japanese honeysuckle (*Lonicera japonica*)
- Porcelain berry (*Ampelopsis brevipedunculata*)
- Periwinkle (*Vinca minor*)
- English ivy (*Hedera helix*)

Shrubs

- All bush honeysuckles (*Lonicera tatarica*, *L. x bella*, *L. morrowii*, *L. aackii*)
- Japanese barberry (*Berberis thunbergii*)
- European barberry (*Berberis vulgaris*)
- Multiflora rose (*Rosa multiflora*)
- European cranberry bush (*Viburnum opulus*)
- Common privet (*Ligustrum vulgare*)
- Burning bush/winged euonymus (*Euonymus alatus*)
- Autumn olive (*Elaeagnus umbellata*)
- Russian olive (*Elaeagnus angustifolia*)
- Smooth sumac (*Rhus glabra*)



Sources and Additional Resources

Native Landscaping -

<https://dnr.wi.gov/news/weekly/article/?id=4249>

<https://dnr.wi.gov/files/pdf/pubs/nh/nh0936.pdf>

<https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Native Planting Guide -

https://dnr.wi.gov/files/PDF/pubs/wm/WM0223_a.pdf

RAIN GARDENS

What is a rain garden?

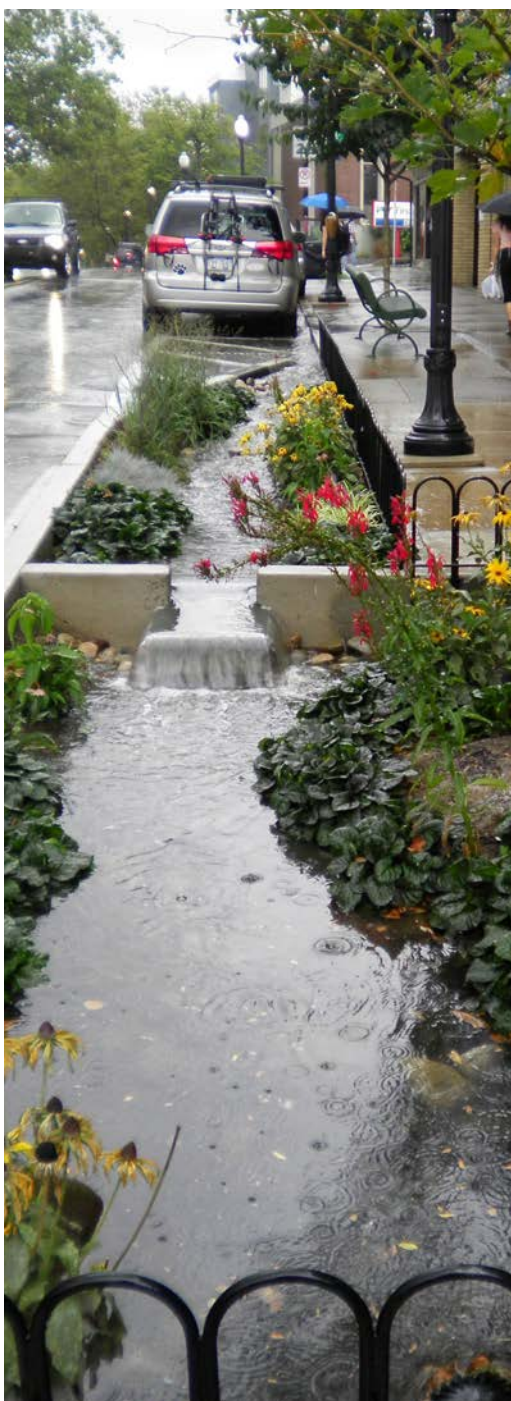
A rain garden is a sunken area in a landscape which is planted with stormwater tolerant plants and acts like an intermittent pond. Rain gardens are planted with specific plants (preferably native species) which are well-adapted to partial submersion. These plants thrive with periodic stormwater—rain gardens actually turn into small intermittent ponds during periods of heavy rainfall and stormwater runoff. The plants themselves absorb much of the stormwater runoff, while the physical sunken of the rain garden design (often including river rocks or gravel as a base) provides a retention space for stormwater as it naturally infiltrates into the soil. Rain gardens often hold water for up to 48 hours (or more after an intense rainfall event) allowing the stormwater to slowly and naturally permeate the soil below.

As stormwater runoff travels across the ground, especially across impermeable surfaces, it can pick up pollutants such as motor oil and other chemicals. The plants installed in rain gardens filter these pollutants from runoff and prevent them from entering the groundwater. By intercepting stormwater runoff, rain gardens reduce peak stormwater flow. This lowers the risk for localized flooding.

Rain gardens can be beautiful and effective stormwater management facilities on any landscape. They work equally well in residential and commercial applications. They can be scaled up for larger areas, either by increasing the size or by installing several rain gardens. They are also not maintenance-intensive, especially when compared to lawns or even planting beds.

By installing a rain garden, you will reduce stormwater runoff on your property and improve stormwater management. The rain garden will also prevent pollutants from runoff from entering the soil and groundwater. The sum of these benefits is a better-managed landscape that requires less maintenance and is less susceptible to localized flooding. It almost goes without saying, but you won't have to water your rain garden. These benefits mean that in the long run, a rain garden will pay for itself and improve water quality.





Rain garden installation and maintenance

Rain garden design and installation is often done by a landscape contractor. During the design and consultation phase, request native plants, if possible. (For more on the benefits of native species, see the “Native Landscaping” section of this guidebook.) However, you can create one by yourself or with some friends in just a weekend. All the supplies and plants you’ll need should be available at a local home center or landscape retailer.

To begin installation, you or the landscape contractor will dig out a space that is fairly broad and deep or expand a natural depression, if one exists. The bottom portion of the hole will be filled with gravel or another material which will let water infiltrate into the soil below. Typically, landscape fabric (which again allows water but not sediments to pass through) will be placed on top of this. Soil will then be added and the correct plants will be installed. To make your rain garden more sustainable and less maintenance-intensive, avoid planting annuals. A good design guideline is to arrange the plants before you plant them, while you can still fine-tune the layout. For a more natural look, avoid arranging plants in straight lines. If you’re planting young plants (which will be less expensive than full-grown ones) leave some space for them to fill in without crowding one another. Typically, the species will vary depending on how much water they might be submerged in, with more water-tolerant plants being installed lower in the basin. Higher up along the slope, plant species that are tolerant of both water and drought will be planted. Remember, you won’t water your rain garden, and it should be self-sustaining even during dry periods. The species will be those you would encounter alongside a river bank or lakeshore, because that is exactly what a rain garden is designed to mimic. Finally, add a layer of mulch a few inches thick, keeping the mulch a few inches away from the base of each plant.

Rain gardens require much less maintenance than the lawns into which they are often installed. Because they are installed at a low point in the landscape, some trash or debris can wash into them. You can easily remove this debris and recycle it if possible. If any weeds or invasive species appear, you can remove them just as you would in a planting bed. Some very heavy rainfall events can erode some of the soil. This soil can be replaced. Mulch on top of the soil will reduce any possible erosion. Most species will not need to be pruned. Reeds, for example, only grow to a certain height even when fully grown.

Sources and Additional Resources

https://stormwater.pca.state.mn.us/images/f/f8/Rain_Garden_Maintenance_Guide_public_use.pdf#target-Text=The%20rain%20garden%20on%20your,heavy%20metals%20from%20the%20water.

<https://cfpub.epa.gov/npstbx/files/MassAudubonRGBrochure.pdf>

<https://www.epa.gov/soakuptherain/soak-rain-rain-gardens>

https://cfpub.epa.gov/npstbx/files/KSMO_buildRainGarden.pdf

https://cfpub.epa.gov/npstbx/files/cwc_raingardenbrochure.pdf