



The Butterfly Effect

Winter 2017
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Harnessing the spirit of residents, schools, organizations, places of worship,
and businesses to create a greener community.

An Introduction to This Journal

In mathematical chaos theory, the butterfly effect is the concept that a *very small difference in the initial state of a physical system can make a significant difference to that state at some later time*. What can this theory offer to the communities in which we live? We think it offers a lot. The cumulative effort of individual actions can positively impact the local ecosystems that comprise our lakes, streams, wetlands, yards, gardens, recreational areas, open spaces, roadsides, schools, and places of worship. Margaret Mead’s powerful idea, “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it’s the only thing that ever has,” informs the articles you will read in this journal.

Neighborhood Greening, a non-profit organization dedicated to environmental education and stewardship, publishes *The Butterfly Effect* four times each year. In the journal, we celebrate community successes, examine small but impactful changes we can make to become better stewards of our local ecosystems, and tell the stories of those who are striving to green their neighborhoods. By harnessing the spirit of community, we believe focused efforts will make our neighborhoods better places to live for both humans and wildlife. There is much we can do to positively impact our shared environment—together. House by house. Block by block. Neighborhood by neighborhood.

We hope you enjoy *The Butterfly Effect* and that you look forward to receiving this free publication in your inbox four times per year. You can sign up by visiting www.neighborhoodgreening.org.

Cover photo: Looking like a butterfly disguised as a bat for Halloween, this American snout butterfly was photographed by Vicki Bonk in October on a farm in Sogn Valley, Minnesota. In the U.S., this butterfly inhabits the southern part of the country and migrates to central California, southern Nevada, Colorado, and a large swath of the eastern U.S. It is not, however, expected in Minnesota—especially in October. When photographer Bonk spotted the resting butterfly, she knew she was photographing something unusual. As seen in this image, the American snout’s coloring mimics a dried leaf. Check the back cover to see the surprising coloring of the top side of this butterfly’s wings. **Right:** Rose milkweed seeds getting ready to find a new home. **Photo credits:** Vicki Bonk.



Confluence: Meeting of the Waters

“Talking Trash” with MRCs



Get a group of people together who have gone through the [Master Recycler/Composter \(MRC\) program](#) and the conversation flows easily. That’s because they share a common concern: there’s too much waste in this world. While communities across the country sponsor MRC programs, three counties in the Twin Cities metro area—[Dakota](#), [Hennepin](#), and [Carver-Scott](#)—offer the innovative MRC program for their residents. The cost to participate in the six-week MRC program is about \$30, which includes talks by industry experts, field trips, and dynamic coverage of a wide range of topics.

While the thought of attending a class to learn about “garbage” taught by a government agency may seem a bit dry, a group of MRCs who gathered this past spring to talk about the eye-opening learning that takes place in the program enthusiastically agreed it was a fantastic experience. Many sought out the program for a specific reason. Lannette Peterson, who has signed up for [Dakota County’s drop-off organics program](#), took the class

Left: Saved from a landfill, this waste is destined for an organics recycling drop-off facility.

to learn about composting. “I got a lot more out of this class than I ever expected,” says the early-childhood educator who now [composts at home](#) to decompose food scraps.

Peterson is also a big fan of Dakota County’s popular [Fix-It Clinic](#), where people can bring in household items to be repaired or sewn. The talented volunteers at the clinic offer guided assistance in sewing or repairing small electronics, coffee pots, fans, jewelry, clothing, and more. “It’s a fun experience at the clinic,” explains Peterson. “People are curious about it and get excited when they realize they can get things fixed for free.”

Cassandra Schueller, a Dakota County employee who works as the recycling coordinator for the cities of South St. Paul, West St. Paul, and Mendota Heights took the class as a gift to herself. “I was interested in waste issues before taking the class.” But since participating in the program, she has a heightened sense of consumption. “Everything I buy I ask myself, ‘Is this necessary? Do I really need this?’” says Schueller, who loves to shop at thrift stores.

Taking the MRC class also inspired attorney Betsy Moran to lead the Blue2green initiative at Blue Cross where she works. The program focuses on how employees can reduce waste while reducing corporate expenses. “We’re trying to build a business case around recycling and energy efficiency. One of our major efforts was to eliminate styrofoam coffee cups. And we no longer single-page print.” Her green team at work is now exploring bathroom paper towel composting. Brian Johnson, Betsy’s husband and also an attorney, says he is now very much aware of everything that goes into the trash at his workplace. His office has gone paperless, and at home, Brian and Betsy have virtually eliminated landfill trash by recycling or composting everything they possibly can.

“The world’s first recycler” is how Kay Craighead, who’s been recycling for decades, describes herself. As a child, her family fixed, saved, or re-used things before ever buying anything new. That ethic has stuck with her all her life. Inspired by the MRC

Right: Around the world, a million plastic bottles are bought every minute. That translates to 20,000 per second. Out on a walk? Bring a bag with you and pick up trash as you go. And skip the bottled water on your next visit to the grocery store.





class, Kay spearheaded a neighborhood group that negotiated pricing with one local trash hauler in exchange for exclusive business. So far, 60 percent of the families in her neighborhood have signed up. “We had six trash haulers to choose from. That meant 18 trucks—one for trash, one for recycling, and one for yard waste—coming through our neighborhood. We got bids from haulers and chose one. Now we have better pricing and still have excellent service,” she explains.

Nancy Schmitt, a microbiologist, saw a description of the MRC program and just knew she had to take it. The class tour of a landfill shocked her. “You can’t get a good grasp of the sea of waste that is in our landfills unless you witness it for yourself,” she explains. The experience reinforced her desire to use and fix things rather than impulsively buy something new. She uses a [USAgain](#) collection bin located at a local middle school to recycle clothing, shoes, and other textiles. The avid gardener also composts at home.

District 197 sustainability manager, Lisa Johnson, has seen recycling evolve over the years. The district originally partnered with Dakota County to increase recycling in the schools. Then lunchroom composting was added. Then bins were added to the bathrooms to compost paper towels. “Things are always changing as the industry evolves. Milk cartons used to be composted. Now they’re recycled. And what is recyclable or compostable is always changing for the better,” says Johnson, who took the MRC class to confirm that she wasn’t missing any opportunities for the school district to reduce waste, compost, or recycle.

Leslie Pilgrim admits she was one of those who was skeptical about the program when she signed up to take it. “I wanted to learn more about the topic but couldn’t imagine how I would stay interested for six weeks. I was really wrong. The MRC Program is one of most interesting learning experiences I have had.”

Left: Among the 175 residents who have gone through Dakota County’s MRC program are, from left to right, Lisa Johnson, Lannette Peterson, Nancy Schmitt, Kay Craighead, Cassandra Schueller, Leslie Pilgrim, Betsy Moran, and Brian Johnson. Cassandra Schueller is the recycling coordinator for the cities of South St. Paul, West St. Paul, and Mendota Heights.

More than one-third of what is thrown in the trash could be composted. That’s nearly nine pounds per household every week. To counter this needless waste many counties and cities in the metro area offer organics recycling programs. (Some communities also offer curbside pick-up.) Residents can bring a long list of compostable items to county/ city drop-off sites. Organic waste collected at these sites is turned into nutrient-rich garden compost.

Common items accepted at drop-off sites:

- All food scraps (table scraps, uneaten leftovers, fruit and vegetable peels, pits, etc.)
- Eggs and eggshells
- Bread products
- Dairy products
- Meat
- Bones
- Soiled paper towels, napkins, tissues
- Paper egg cartons
- Food-stained pizza boxes
- Toilet paper rolls/paper towel rolls
- Coffee grounds/coffee filters/tea bags
- Popsicle sticks
- Cut flowers
- Dryer lint

Note: Yard waste is not accepted at organics recycling facilities.

A Partial List of Organics Recycling Programs in the Twin Cities

- [Anoka County](#)
- [Carver County](#)
- [Dakota County](#)
- [Hennepin County](#)
- [Minneapolis](#)
- [Ramsey County](#)
- [St. Paul](#)

“He who buys what he does not need steals from himself.”

–Swedish proverb

Not All Paper Should be Recycled

Talking Trash

Thermal Receipts

That smooth, shiny receipt you just stuffed into your pocket shouldn't be recycled. Thermal receipts may contain the chemical Bisphenol-A (BPA) which can contaminate paper production from recycled materials. BPA is suspected to cause [human health issues](#). According to the non-profit [Toxic Free Future](#), "Often times, these recycled paper products are used for primary (directly in contact with food) or secondary (packaging around a separate internal package) food packaging. As a result, there is at least some possibility that contaminants could migrate to food." Or to grocery shopping bags, or to toilet and tissue paper manufactured from recycled paper products.

Next time, have your receipt texted or emailed to you if you can. If you do get a receipt, dispose of it only in landfill trash. Wash your hands after handling thermal receipts, [especially if you work in an environment](#) in which you are frequently exposed to thermal paper infused with BPA. Avoid the use of hand sanitizer when handling thermal receipts. Research indicates that hand sanitizer [speeds the absorption of BPA into the bloodstream](#) by a factor of 100 or more.

Egg Cartons

Most paper egg cartons are not recyclable as they are made from previously recycled paper that has reached the end of its "recyclable life." Placing paper egg cartons in your recycling bin may merely be an exercise in "wish cycling." However, cardboard egg cartons break down quickly in the backyard compost pile or can be brought to a local compost drop-off location. And, paper cartons also make great seedling starters. Once seedlings are ready to place in the garden, there is no need to remove them from their biodegradable egg carton planter.





This Pooch is Precious But Her Poo Isn't

Talking Trash

You love your pooch but its poo is an environmental pollutant—so much so that the EPA has put it in the same category as herbicides and insecticides; oil, grease and toxic chemicals. Always bag it up and throw it in the trash (or [flush it down the toilet](#) if you have petit pooch poo and aren't on a septic system). Pet waste is full of [microorganisms that are both pathogenic to humans and resistant to several classes of antibiotics](#). It is also a serious water pollutant. A [recent study by the University of Minnesota](#) indicates that, "...households are the main sources of nutrient pollutants in the Twin Cities urban watershed. Pet waste is the leading source of phosphorus to these watersheds." Simply said, doggie doo is polluting our water and it's seriously unsafe to leave it laying around.

Unfortunately, many of us are lazy when it comes to picking up poo. According to [LiveScience](#), "Only about 60 percent of dog owners pick up after their pets, according to surveys. Among the excuses offered by the 40 percent who don't pick up: 'Because eventually it goes away;' 'too much work;' 'small dog, small waste;' 'it's in the woods;' or, in a reverse NIMBY: 'It's in my yard.'" [Dog feces can include giardia, salmonella, Leptospira, E. coli, parvovirus, and roundworms \(the CDC shows 14% of Americans are infected with roundworms\)](#). So, [Dog Doogity](#) doo your duty!



What We Plant Matters

The Winter Garden

The Winter Garden

Your Garden “Still Works” in the Winter

It’s hard for many gardeners to resist “cleaning up” their gardens in the fall or spring. But many moths and butterflies overwinter as caterpillars, pupae, and even adults in the soil surface, leaf litter, dead plants, twigs, and other hiding places in the garden. Other insects such as native bees, beetles, and more, need “messy” habitat to survive—year-round.

Removing a garden’s protective layers means you may be unknowingly removing the very butterflies you are trying to attract (some pupae look exactly like leaf litter so you won’t even know you are removing them).

Even log piles provide the perfect spot for some moths and butterflies, as well as other insects, to lay eggs and hibernate.



Above: Stem stubble in the garden should be cut to about 15” tall in late spring. Keep these stems intact 24/7. They will eventually break down and add nutrients to your garden soil. **Left:** Every yard should have a rotting log (or two!). Dead trees and rotting logs (also known as “snags”) are crucial habitat for a wide range of insects, the lifeblood of our ecosystem.

Hiding Places and Nesting Spaces

Many species of native bees lay their eggs in the cavities of stems or rotting wood. Some excavate pith-filled stems while others make their home in pre-existing cavities in rotting wood. According to Heather Holm, in her excellent book [*Bees, An Identification and Native Plant Forage Guide*](#), it is important to leave the garden alone in the fall and throughout winter. And because some native bees reuse these cavities in the spring, they should remain intact year-round. Holm explains, “Then in the spring, cut off the top of the old stems about 15 inches above the ground, leaving flower stalk stubble. No further maintenance is required. Within a few weeks new growth from the perennials hides the dry stems and within a year or two, the stems naturally breakdown.”

The carpenter bee’s life cycle illustrates the need to keep natural nesting cavities standing year-round. According to Heather Holm, “Small carpenter bees overwinter as adults and the following spring, they may reuse the same stem that they hatched from for a new nest” (from *Bees, An Identification and Native Plant Forage Guide*).

Lastly, as the life cycles of many insects take place underground at least part of the year, gardens and landscapes that use landscaping fabric (plastic or breathable) will eliminate a surprising amount of wildlife from the yard.

Keep your garden’s fallen leaves, plant stems, natural debris, and hiding places intact, not just in the fall, but throughout the year. Some insects require garden debris for more than just overwintering habitat. Your garden is one place where it’s OK to be messy! You will provide important habitat for bees and butterflies, and other beneficial insects as well. A winter garden left intact will also provide winter seeds for birds, attract wildlife, and provide visual interest for you.



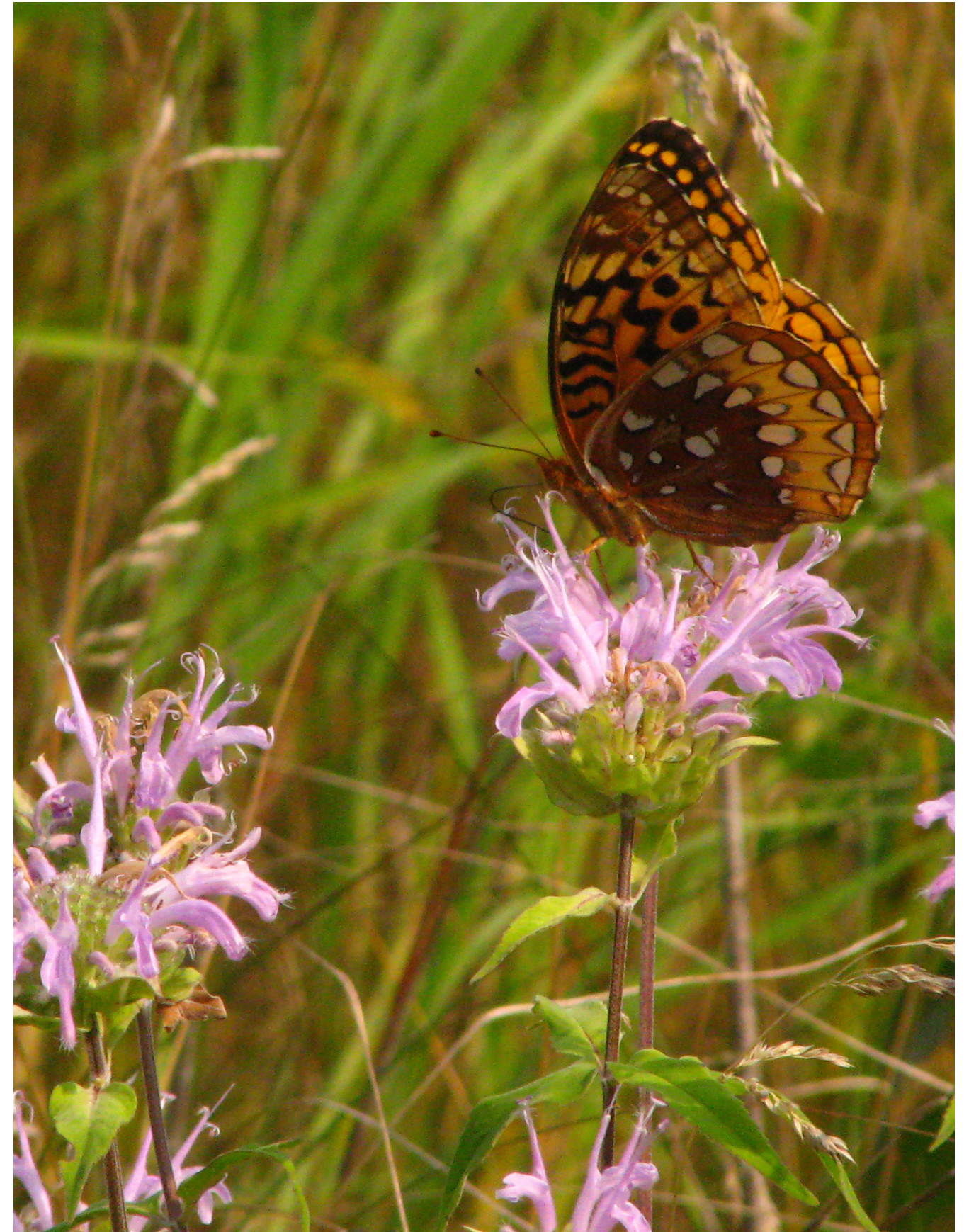
Right: A pure green metallic sweat bee (*Augochlora pura*) nesting in a cavity in a decaying log. **Photo credit:** Heather Holm.



Above: A small carpenter bee (*Ceratina* sp.) on *Rosa blanda*. **Right:** And excavating her nest in the end of a flowerstalk stem.
Photo credits: Heather Holm.



Above: The delicate form of the golden Alexander reflects peachy sun and decorates the winter garden. **Photo credit:** Vicki Bonk.
Right: The great spangled fritillary is just one example of a species of butterfly that depends on winter habitat. Its tiny caterpillars (larvae) hatch in early fall and nestle into plant litter to enter winter dormancy. In the spring, the caterpillars emerge, begin to eat, and quickly grow. **Photo credit:** Dave Crawford.



Offering a wide range of native plant foods from the natural habitat in your yard is the best option for bird nutrition, but bird feeders are nonetheless helpful in the winter. In an article by Karen Bussolini ([For the Birds](#)), she quotes entomologist Doug Tallamy: “We have modified habitats so much in suburbs and urban environments that there’s not enough food. The sterile manicured suburban setting—with 46.5 million acres of lawn—is not conducive to bird survival unless we put out feeders. We need more plants in whole neighborhoods.”

Bird feeders located by windows for the pleasure of humans can be deadly for birds. Be sure to think of birds when placing feeders in your yard. Are you providing cover from predators (e.g., prowling cats) for ground feeding birds? Is there risk of collision from the deception and confusion of windows? [Special decals](#) can help birds see windows. The [Audubon Society offers some good tips and a short list of the best feeders](#) for winter birds.

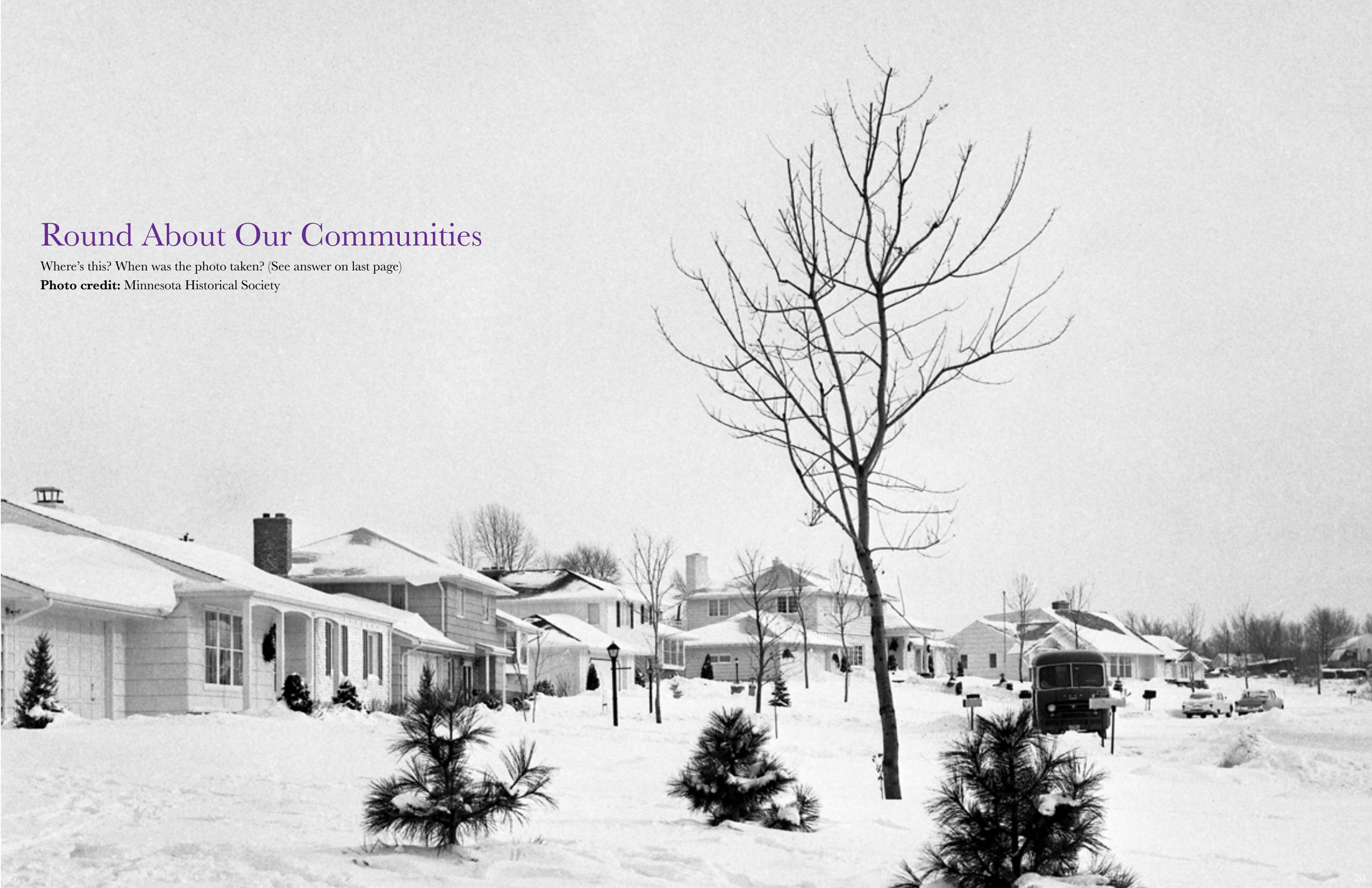
Right: Content to forage on grain, fruit, sap, nuts, seeds, and insects, the non-migrating northern cardinal is a joyful presence in the winter garden. **Photo credit:** Travis Bono.



Round About Our Communities

Where's this? When was the photo taken? (See answer on last page)

Photo credit: Minnesota Historical Society





Dreaming of Monarchs in Our Yards Next Season

Each September, Eastern monarch butterflies begin to leave the Twin Cities for the Oyamel fir forests of Mexico. The seemingly fragile monarch, which weighs less than $\frac{1}{4}$ of a dime, travels about 25 miles per day. Amazingly, monarchs that migrate from our Minnesota gardens travel more than 2,000 miles to reach their winter roosts in Mexico.

While monarch butterflies sip nectar from a wide variety of flowers, they lay their eggs only on milkweed plants. Decreased monarch habitat, and increased use of insecticides and herbicides, have caused the Eastern migrating monarch population to plummet 80 percent in the past 20 years.

Only two percent of monarch eggs make it to adulthood; that's just two adult monarchs for every 100 eggs. And, according to the Monarch Larva Monitoring Program at the University of Minnesota, it takes about 30 milkweed stems to produce one monarch butterfly. By planting milkweed as well as nectar flowers, you can help fortify the monarch population.

You can also help by becoming a valuable citizen scientist with the [Monarch Larva Monitoring Project](#) through the Monarch Lab. And the non-profit, Journey North, has an [online map](#) that lets you post your sightings and follow the spring and fall migrations as they progress.

This spring, as your milkweed grows taller, the astonishing monarch will be making its journey north. They will depend on the habitat in all of our yards.

Clockwise from top left, Photo credit: Vladimir Rukavina. **Top right:** A monarch suns its wings on the orange butterfly milkweed. [Fourteen species of milkweed](#) are native to Minnesota. **Photo credit:** Vicki Bonk. **Bottom right:** From miniscule egg, to five stages of caterpillar, to chrysalis, to butterfly, the monarch performs one of nature's most amazing magic acts. **Photo credit:** Vicki Bonk. **Bottom left:** It's simple: no milkweed, no monarchs. Monarch caterpillars eat only milkweed, nothing else. You can buy native milkweed, [here](#), [here](#), [here](#), [here](#), and [more](#).

Winter Project

Build an Aldo Leopold Bench

While [Aldo Leopold](#) is best known for his [writing](#), teaching, and work regarding his forward-thinking “[land ethic](#),” back in the early part of the last century, he also designed a nifty little bench. His design is a reflection of simplicity, functionality, oneness with nature, and surprising timelessness.

The design for the Leopold bench is so straight-forward that it has been a favorite workshop project for decades. Rumor has it that even those of us who lack “real” carpentry skills can make this bench in three hours or less. Make one this winter—better yet, make two! They can easily be moved around your yard as needed and blend in remarkably well in all kinds of naturescapes. Plans abound on the Internet. [Here is one suggestion.](#)



“We abuse the land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”

—Aldo Leopold, known as the father of wildlife ecology

Right: The Aldo Leopold Bench

Stormwater: Oh, The Places You'll Go!

Salt in Our Stormwater

Water that goes down the stormwater drain on the street outside your home is funneled to the nearest waterbody. That could be the pond in your backyard, the lake down the road, or even the Mississippi River.

An ever-increasing environmental stressor to our local waters is salt (de-icer). Melting ice and snow runs off our roofs, sidewalks, and driveways and flows to and down our stormdrains. Any salt picked up on this journey makes its way into to our local waterbodies. While salt dissolves in water, it does not break down. It remains a permanent pollutant that accumulates over time. The only known method of removing salt from water is through costly reverse osmosis, which isn't an option for cleaning up our waterbodies.

The best solution is prevention—and individuals' actions make a big impact. All salt de-icing products pollute, no matter what the packaging may claim. One teaspoon of salt permanently pollutes five gallons of water. **Used over the course of a winter, the contents of a 50-pound bag of salt will permanently pollute 10,000 gallons of water.**

Right: A stormwater drain. **Photo credit:** Mississippi Watershed Management Organization.





Salt 101

Here are some important tips to help reduce salt in our storm water and drinking water:

- **Only use salt when you think it is necessary for your safety.** Always remove as much snow as possible before applying it.
- **In extreme cold, use sand or a de-icer that is labeled for use in those temperatures.** Most salts stop working when the temperature is colder than 15°F, so check the label before applying. While sand doesn't melt snow, and it too poses environmental problems in our waterbodies through sediment buildup, it can offer surface traction.
- **More salt doesn't mean ice will melt faster.** If you spread salt, do not use more than four pounds of salt per 1,000 square feet. More salt isn't more effective. One pound of salt is the equivalent of a heaping 12-ounce coffee mug. When applied, salt granules should be spaced no closer than an average of three inches apart.
- **Once salt or sand has done its job, sweep it up and put in the trash.** Old sand and salt won't serve as a preventive measure for the next snowfall. If the salt or sand has dried, store it in a tightly covered container to use again. Help even more by sweeping up salt and sand that has accumulated around the curbside stormwater drain on the street where you live.
- **If you use a snow removal service, hire one that's certified by the Minnesota Pollution Control Agency in [Smart Salting Snow and Ice Level 1 Best Practices](#).** Or, ask your service how it applies salt and observe their practices.

- [Reconsider home water softeners.](#) According to the Minnesota Pollution Control Agency, our wastewater treatment facilities are not designed to remove chloride (salt). Salt from our home water softener system eventually also finds its way to our public waters.

An excellent video titled [Improved Winter Maintenance: Good Choices for Clean Water](#) is available online through the Mississippi Watershed Management Organization.

Above, left: Just one teaspoon of salt permanently pollutes five gallons of water. Eyeball the image above and it's easy to conclude what a season's worth of cumulative municipal road salting does to add to the contamination of our waterways. Residential salting adds up, too. Used over the course of a winter, the contents of a 50-pound bag of salt will permanently pollute 10,000 gallons of water. You can help keep salt out of our waters. Sweeping up both residential and municipal salt from curbsides and stormdrains helps keep this pollutant out of our groundwater, lakes, wetlands, and streams. **Below, left:** Salt patches like this are a common sight on our roads. While salt dissolves in water, it does not break down. It remains a permanent pollutant that accumulates over time. Sweeping up excess salt and throwing it away (or saving for future use on sidewalks and driveways) helps keep destructive salt out of our waterways.

Notice Nature Everywhere

The Night Sky



Above: The Milky Way as observed from Theodore Roosevelt National Park, North Dakota. **Photo credit:** Max Saucedo.

As daylight transitions to nighttime “electric daylight,” the cosmos above never fully reveal themselves to most of us. According to an article, [The End of Night](#), in the digital journal, *aeon*, “More than 60 per cent of the world, and fully 99 per cent of the U.S. and Europe, lives under a yellowy sky polluted with light.” [Satellite imagery](#) reinforces this statistic.

Our collective loss of darkness is taking its toll on a wide range of wildlife as well as [human health](#). Animals, such as [birds](#), that rely on the night sky for navigation are especially vulnerable to the perils of light pollution. A multi-year study of the annual 9/11 “[Tribute in Light Memorial](#)”—88 powerful searchlights that point straight up into the night sky each September, 11—has strangely offered an opportunity to measure [the stunning quantity of disoriented birds](#) that are drawn to the artificial light produced by this event. Navigational orientation is quickly restored once the spotlights are turned off for a period of time.

[Lights Out](#) programs across the country work to increase awareness of the millions of birds that die each year from building collisions due to navigational confusion caused by nighttime illumination. These programs benefit more than just birds. [All kinds of creatures from sea turtles](#), to puffins, zooplankton, insects, coral reefs, and more, are adversely affected by light pollution. Night-foraging animals such as bats and mice that rely on the cover of darkness are more vulnerable due to the glow of lights that make them easier prey. [Even fireflies are thought to be suffering from the effects of light pollution](#).

[The International Dark-Sky Association](#) educates about the many benefits of natural darkness, muted lighting, ecolighting, and more. A collective turning off of nighttime lights in office buildings, the use of residential outdoor floodlights only when necessary, the closing of drapes at home (to keep the effects of light inside), and the turning off of unneeded home lights, all help to mitigate light pollution. Installing shielded, downward facing exterior lighting is another of the Association’s many suggestions. As is becoming a “dark sky” activist such as helping to pass ordinances that require billboard lighting be pointed downward rather than upward, whereby the collective glare and glow add to that yellowy polluted sky.

Click [here](#) for a discussion on lighting and crime and safety.

“Do all you can, with what you have, in the time
you have, in the place that you are.”
—Nkosi Johnson

Did You Enjoy This Edition of *The Butterfly Effect*?

Don't miss the next journal! Sign up to receive your free e-version of *The Butterfly Effect* at www.neighborhoodgreening.org/the-butterfly-effect. Be sure to “[friend](#)” Neighborhood Greening on Facebook to keep learning how to help green your neighborhood throughout the year.

Do you have a story or idea to share about how you or someone you know is making your neighborhood greener, more environmentally sustainable, or wildlife friendly? Please send your ideas to Green@neighborhoodgreening.org.

The Butterfly Effect is published four times per year by Neighborhood Greening, a 501(c)(3) non-profit organization dedicated to community environmental education and stewardship. Block by block. Neighborhood by neighborhood.

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Events, Classes & Volunteer Opportunities

Be sure to visit Neighborhood Greening's Resources page at <http://neighborhoodgreening.org/resources/#calendar>.





Answer to Round About Our Communities

“Cherry Hills Development, Mendota Heights, 1961.”

While suburban development began well over 150 years ago around the Twin Cities, the post-WWII period saw an unprecedented flurry of tract home building. New neighborhoods on the periphery, like Cherry Hills, offered residents the chance to live in greener, more expansive settings. Suburbanites are now, however, re-evaluating the construction processes, aesthetic choices and environmental consequences of this postwar growth, shaping new ways forward in the evolution of this landscape.

– [Holley Wlodarczyk, Ph.D.](#), author, *Somewhere That’s Green? Visions of Sustainable Suburbia*

Back Cover The top side of the American snout’s wings. The top and bottom sides of butterfly wings are sometimes wildly different in appearance depending on environmental adaption for survival. Wing coloring or markings are used to attract a mate, camouflage, create deception, send a warning to potential predators, blend in with flowers or leaves, absorb or repel heat (thermoregulation), and more. **Photo credit:** Vicki Bonk

