

NATURE IN THE CITY

A guide to ecological gardening
in Stratford, Ontario



Artist Credit: From the triptych entitled, *Summer*
by Gerard Brender à Brandis, Wood Engravings
<https://www.gerardbrenderabrandis.ca/>

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Energy and Environment Advisory Committee,
City of Stratford, Ontario

LAND ACKNOWLEDGEMENT

We acknowledge that Stratford is positioned on the traditional territory of the Haudenosaunee, Anishinaabe and the Neutral (Attawandaron) peoples.

As we gather, we are reminded that the City of Stratford is situated on treaty land that is steeped in rich Indigenous history and home to many First Nations, Métis, and Inuit peoples today.

We acknowledge that Stratford is situated on land that was shared between the Haudenosaunee, Anishinaabe and the Neutral (Attawandaron) peoples. We are grateful to have the opportunity to live, work, and play on this land.

FOREWORD

Our gardens

Every resident has a meaningful role in shaping a healthier, more resilient Stratford. By planting native trees, shrubs, and wildflowers in our yards, gardens, and shared spaces, we help strengthen the city's natural systems.

In nature, everything is connected; native plants support biodiversity, provide habitat for pollinators, conserve water, and increase carbon sequestration. By adopting these nature-based solutions, we create multiple benefits that together enhance our community's capacity to adapt to a changing climate.

Autumn Loosemore
Climate Change Program Manager
City of Stratford

See: City of Stratford Community Climate Action Plan (CCAP)

<https://www.stratford.ca/en/live-here/resources/INFRASTRUCTURE-SERVICES/CLIMATE-ACTION/Community-Climate-Action-Plan-2024.pdf>

Climate Action Page

<https://www.stratford.ca/en/live-here/climate-action.aspx>

Our city parks, and green spaces

Parks play a crucial role in reducing greenhouse gas emissions and mitigating climate change. They serve as natural carbon sinks, absorbing more carbon dioxide than they release, which helps to draw down carbon levels in urban areas. The vegetation, soil, and bodies of water in parks absorb and store carbon dioxide contributing to global carbon sequestration. Urban parks and green spaces are shown to have a similar amount of carbon stored in their soils as in natural areas.

Parks also provide diverse ecosystem services, such as sequestering carbon, supporting biodiversity, managing storm water, and providing benefits for physical and psychological well-being.

The Parks Division have and will continue to plant native trees in both natural areas and street plantings. We work with different organizations such as the Energy & Environment Committee, Garden Stratford, Communities in Bloom, the Civic Beautification and Environmental Awareness Committee, Scouts Canada, Upper Thames River Conservation Authority, Stratford and District Horticulture Society, school groups and various other volunteer groups to do multiple projects and plantings annually.

Quin Malott,
Parks, Forestry and Cemetery Manager
City of Stratford

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INTRODUCTION

Indigenous Knowledges, Interdependence and Reciprocity

“In the Western tradition there is a recognized hierarchy of beings, with, of course, the human being on top – the pinnacle of evolution, the darling of Creation – and plants at the bottom. But in Native ways of knowing human people are often referred to as ‘the younger brothers of Creation.’ We say that humans have the least experience with how to live and thus the most to learn – we must look to our teachers among the other species for guidance. Their wisdom is apparent in the way that they live. They teach us by example. They’ve been on the earth far longer than we have been, and have had time to figure things out...we need to learn to listen.”

Robin Wall Kimmerer¹

The writers of this guide have referred to books and listened to Indigenous leaders and teachers to help them better understand Indigenous world views and differences from those of our settler forebears.

As Robin Wall Kimmerer, tells us, Indigenous world views typically place human beings within the circle of nature that includes all creatures, including humans and plants living in reciprocity and dependent on one another – everything interdependent. All of nature is a continuum; humankind is not apart from it, we are a part of it. With that philosophy as a starting point, we have the beginning of a healthy garden and, as a result, a healthier world.

The ancient Haudenosaunee practice of planting the Three Sisters provides a lesson in interdependence and thriving in the plant world:

“The Haudenosaunee (people of the long-house) have been using the Three Sisters method of planting since the 1300’s and were thought to pass their wisdom on to the European settlers who arrived three centuries later.

The Three Sisters method of sustainable companion planting provided soil fertility and a healthy diet from one single planting.

The corn provides structure for the beans; the beans pull nitrogen from the air and bring it to the soil and as vines wind and twist towards the sunlight, they bind the three together and provide further structure; the large leaves of the sprawling squash provide shade, keeping the soil cool, moist and weed-free. The prickly squash leaves also keep away critters.”²



Photo Credit: Riverwalk Commons and Kaswentha-Two Row Now

Taking Climate Action in Our Community

In 2024, the City of Stratford published the *Community Climate Action Plan* (CCAP), a “road map to achieve the ambitious target of 30% greenhouse gas (GHG) reduction (below 2017 levels) by 2030 and to become a net-zero city by 2050.”

The Plan provides a guide for community-driven action toward sustainability. The section entitled *Natural Assets*, describes city activities on tree cover and biodiversity, and encourages naturalized vegetation in public green areas and private lawns through planting of native trees and shrubs.³

Our “community” encompasses the agricultural lands which surround us. The practices on those lands affect our urban life and vice-a-versa. What we do in our parks, waterways, gardens, and what we do to the air, has an effect on the worlds around us; it is a reciprocal relationship. Indeed, environmental practices are global, what we do here is not isolated to our boundaries, but the effects – positive and negative – can travel around the world.

In 2017, Stratford was officially designated a Bee City by Bee City Canada⁴ which requires the City to focus on protecting pollinators, and in 2025, Nature Canada officially named Stratford a Bird-Friendly City, which requires the City to see that key threats to birds are effectively mitigated.⁵

Nature’s Role in Sequestering Greenhouse Gas Emissions (GHGs)

Greenhouse gas emissions are one of the biggest challenges to a healthier world. Plants of all kinds play essential roles in curbing these emissions. Trees are efficient in their sequestration, acting as “carbon sinks” by providing carbon storage in their trunks, branches, leaves and roots, and plants transfer carbon into the soil through root growth and as leaf litter.

Carbon sequestration is the process by which trees and other plants absorb CO₂ from the atmosphere and store it in their biomass, as well as in the soil. Trees do this through photosynthesis, and the stored carbon remains in the tree until it decomposes or is burned. The amount of carbon a tree can sequester depends on many factors, but, generally over its lifetime, a tree absorbs the equivalent of about 1 tonne of CO₂⁶.

The most common GHGs are carbon dioxide (CO₂) and methane, atmospheric gases which, when emitted, trap heat, thereby raising surface temperatures on earth, resulting in global warming, the increase in the temperature of Earth’s atmosphere. The burning of fossil fuels causes the largest part of the emissions, with agriculture and industry adding to the rest.

Through our choices as gardeners, we can make an important contribution to carbon sequestration.

Background to Nature in the City

In 2008 the City issued a booklet entitled *Stratford, Naturally*, produced by the Pesticide-Free Education Ad-Hoc Committee. It addressed such issues as limits to pesticide use, improving soil, lawn problems, pollinator benefits, alternative ground covers, gardening tips, avoiding West Nile disease, dandelions, keeping leaves on gardens and a glossary. As it has been some 18 years since its issue, and with climate change and the consequent pressures on our lands, waters and biodiversity as well as the goals of the *Community Climate Action Plan*, members of the Energy and Environment (E&E) Advisory Committee decided to issue a new guide.

E&E's main role is to study all matters coming to its attention which might have any effect on the environment, particularly the environment of the City of Stratford and its surroundings. The Committee comprises eleven (11) community members and two (2) members of City Council.⁷

As Stratford gardeners, by taking an "ecological" approach (being mindful of the interactions and interdependencies between organisms and their environment) to what we plant in our gardens and yards, we can play an important part in the protection of the quality of the air we breathe, and in the ability to sustain life on our planet, to the advantage of all.

Water, Soil, Wildlife and Plants - the four elements in gardening - provide the main subject areas in this guide and the approaches we can take to ecological gardening.

This guide would not have been possible without the contributions of the expert consultants who gave so generously of their time and knowledge. Our deepest thanks to:

Water – Joe Salter, Biologist and, for 35 years, the Manager of Water Treatment and Distribution for the City of Stratford and Chair of the Ontario Water Works Association and Vanni Azzano, Supervisor, Community Education, Upper Thames River Conservation Authority.

Soil – Lucas Tingle, Professor of Environmental Stewardship of Soils and Water, Fanshawe College and Farm Manager of The Local's Oak Street Farm, Stratford.

Wildlife and Plants – Don Farwell, an avid gardener and Master Gardener for over 25 years and his presentation of *Kiss a Bumblebee* Climate Momentum Community Climate Conversation, March 27, 2025.

Birds – Antony John, artist and former co-owner of the Soiled Reputation farm in Sebringville for 32 years and a lifelong bird advocate, birdwatcher and caretaker.

Butterflies – Barb Hacking, a retired teacher, is deeply involved in community and environmental initiatives, including work with Communities in Bloom. She coordinates the Ted Blowes Memorial Pollinator Peace Garden and has written four books inspired by her mission to protect Monarchs.

WATER

“Water is the driving force of all nature.”

Leonardo da Vinci

Municipal Water Supply

Within the City of Stratford Drinking Water System there are a total of 11 confined artesian wells that draw groundwater from a deep bedrock aquifer. There are also two water towers off Forman and Dufferin Streets within the distribution system that provide both storage and pressure stability. Municipal well water is tested and is safe to drink.

Over our aquifer is 30 metres of heavy clay “overburden,” the soil dumped by the glaciers when they retreated some 10,000 years ago. The recharge area for the bedrock aquifer which feeds Stratford is very large. When water hits the ground, it seeps through the overburden, filtering it, before flowing into the fractured limestone, a process that may take 100’s of years. It can take water as long as 600 years to reach the wells from the edges of the aquifer. The water in the aquifer flows in the same direction as the Avon River.

Drinking Water Source Protection

Source water is the raw, untreated water that we take from lakes, rivers and underground aquifers to supply drinking water. “Drinking Water Source Protection” or “Source Water Protection” means protecting these sources of drinking water from contamination and overuse.⁸

Our Water

Wastewater from our homes (toilets, drains, etc.) is connected to the City’s sanitary sewer system and treated at the Water Pollution Control Plant located on West Gore Street, on the edge of TJ Dolan Natural Area. The treated water (effluent) is clean enough to be discharged into the Avon River to support aquatic life. The storm sewers collect runoff water on roadways and direct it to natural drainage systems which make their way to the Avon River. The runoff enters the river mostly through storm drains as well as overland flow. Since this stormwater runoff is not treated, it can carry pollutants from the land into the

river, damaging aquatic species.

Great Lakes Connection

The Avon River is a tributary of the North Thames River. Water from the Avon River enters the North Thames just upstream of St. Marys and takes 4 to 10 days to flow through London and Chatham to Lake St. Clair. About two weeks later, it reaches Lake Erie via the Detroit River. The Avon River is in the Thames River Watershed, which is part of the Lake Erie watershed.⁹

Soft and Hard Water

The river water is considered to be “soft” and the water from the wells is considered to be “hard” – full of minerals. Our drinking water is slightly basic (pH above 7) and rainwater is slightly acidic (pH below 7) and each may be used for our gardens. The pH of rainwater has improved from past years due to more recent emissions controls. Because our bedrock in Stratford is limestone, it also contributes to buffering the acid in rainwater.

In order to reduce the build-up of scale on pipes in our homes, most homes have a salt water softening system for both hot and cold water. Water softeners can be plumbed such that only hot water is softened - with a hard water drinking tap, typically in the kitchen, and with a hard water outside tap (ask your plumber.) Softened water can be used for watering gardens, but it does contain a higher sodium content, which can build up around plants. Ideally, gardens are watered mainly by the rains and by using rain barrels where rain water can be stored for use on the garden.

Taking Care of Our Precious Water

The concern for water management in the City and for residents is to take great care to not contaminate the aquifer and to conserve our water:

1. Rather than letting the tap run to get cold water, pour a pitcher of water, let it stand for a few minutes to let the chlorine evaporate and then store it in the fridge;
2. Save water by turning off the tap running when washing the dishes, brushing your teeth or washing your face;
3. If they are carefully timed, showers use less water than baths;



4. Use a dishwasher if you can, as dishwashers use less water than washing by hand;
5. Take care with what is washed down the drain, or into the storm grates, toxins, grease or chemicals may pollute the waters.¹⁰

SOIL

“Soil is a resource, a living, breathing entity that, if treated properly, will maintain itself. It's our lifeline for survival. When it has finally been depleted, the human population will disappear. . .Project your imagination into the soil below you next time you go into the garden. Think with compassion of the life that exists there. Think, the drama, the sexuality, the harvesting, the work that carries on ceaselessly. Think about the meaning of being a steward for the earth.”

Marjorie Harris¹¹

Soil is an active, living, breathing ecosystem, just like us

Soil is the basis for all terrestrial life on our planet. Our microbiome, the microorganisms (e.g., bacteria, fungi, viruses) which live in and on us and play crucial roles in health by aiding digestion, boosting immunity and influencing moods, is a mirror image of healthy soil. “We are what we eat.” When soils are degraded, our food supply is degraded and consequently our health. In fact, it is healthy for us to spend time with the soil. It can provide “eco-therapy” to be in touch with the soil, good for both our physical and mental health.

Healthy food and clean water start with soil biodiversity. Soil is the most biologically diverse material on the planet. In fact, a teaspoon of healthy soil contains more organisms than there are people on earth.

Soil is made up of 4 parts: organic material, things that are living, or used to be living; minerals; water and air. Within these are the elements of sand, silt, and clay. Soil balance is determined by the ratio between all these elements.

Healthy soil depends on a range of life forms which include bacteria and fungi, protozoa, nematodes (microscopic worms), earthworms, ants and other insects, as well as small mammals. Soil provides a food web, the biology, which microbes, voles, mice, earthworms, beetles, and bees rely on.

Biologist, Dr. Toby Kiers of Vrije University in Amsterdam, tells us that fungi work as a decentralized organism and key engineers in our ecosystem and one of their most important roles is to build soil. Mycorrhizal fungi form “beautiful” networks with plants, forming the earth’s underground circulatory system. Plants provide carbon which gets shuttled down to the fungi and the fungi collect nitrogen,

phosphorus and water and move that up to the root systems creating a dynamic flow of nutrients – a trading system evolved over millions of years. These networks move a massive amount of nutrients and carbon, drawing about 13 billion tonnes of CO₂ into soil systems every year, about 1/3 of the emissions from fossil fuels worldwide.¹²

Maintaining Healthy Soil

The soil in Stratford is termed, silty clay loam, having a high clay content, creating “heavy” soil. Organic matter and clay are the elements that hold the nutrient content. The goal is to have a high level of organic matter, at least 6% and above. Organic matter is increased by adding compost and roots to a soil. Keep soil planted and leave the roots of plants in the soil. They also keep the soil intact. Bare soil leaves the door open to erosion by wind and water. Foliage slows the velocity of raindrops hitting the ground and the dislodging of soil particles.

Soil structure helps in regulating water flow and retention, fertility retention, and in creating aerobic (using oxygen) conditions for roots. Every time we disrupt the soil, we kill the beneficial fungus. There is up to 40% more nutrient uptake when fungi is intact.

Topsoil

If your home was built after the 80’s, the topsoil has likely been removed, leaving just enough soil for grass. Topsoil is about 10,000 years old and is not renewable. Over 300 acres of farmland per day is being lost to development in Ontario, a rate that nearly doubled from 1996 to 2016.¹³ This often results in the loss of topsoil. About 5% of Ontario’s land is considered arable (suitable for farming), making topsoil a precious resource for long-term food security and independence.¹⁴ The major threats to topsoil come from increased development and urban sprawl.

Benefits of Soil

1. Soil protects us from heat, especially in cities;
2. Soil prevents and regulates flooding;
3. Soil captures and stores carbon;
4. Soil stores, filters and transforms nutrients, contaminants and water;
5. 59% of the earth’s biodiversity is underground, and soil produces most of our food globally.

Threats to Soil

We often take soil for granted. Soil is a finite resource that can be endangered, and soil degradation puts us all at risk due to such factors as urban sprawl, deforestation (and wildfires), habitat conversion, excessive cultivation, overgrazing and climate change.

When soil decreases in quantity and quality, there are costs in lost benefits, such as:

1. Increased costs for fertility in agricultural production;
2. Decreases in property value;
3. Decreased quality of drinking water and food;
4. Increased water treatment costs;
5. Increased illness and health care costs;
6. Increased costs to manage waterways and estuaries;
7. Losses to fishery resources; and
8. Decreased revenues from tourism activities associated with healthy ecosystems.

“We are as much alive as we keep the Earth alive.”

Chief Dan George¹⁵



Photo Credit: Mike Beitz

Some useful resources:

Ducks Unlimited Canada, <https://www.ducks.ca/soil/>

Soil Conservation Council of Canada, <https://soilcc.ca/>

WILDLIFE

“This planet is an exquisitely arranged and interconnected system. What’s controlled in one place is going to have consequences in another place. Our job as gardeners is to try and figure this out no matter how small our allotted space might be... It means not gardening without thinking of the garden as a habitat: for mice, for squirrels, for bees and wasps. For other living creatures beyond ourselves.”

Marjorie Harris

Pollinators

No pollinators, no food – without pollinators, we have no future on earth; we will become extinct. Yet their numbers are decreasing. This is something we can all work on.

What is pollination?

- It is the mechanism of moving pollen from male flower parts (anthers) to fertilize female flower plants (through the stigma);
- Cross-pollination happens when bees travel from flower to flower gathering pollen which transfers from their body parts to other flowers they visit. This transfer of pollen is cross-pollination;
- Self-pollination refers to when pollen moves within a single flower, or between flowers of the same plant;
- The wind can also transfer pollen, as can water;
- Some bees have pouches on their bodies to transport pollen besides carrying it on their legs;
- 87% of all flowering plants require or benefit from pollinators.

What are some pollinators?

They are many and various. We often think of honeybees when we hear “pollinator,” but that is only one type of bee, and it is farmed, not native. In fact, there are 4,000 species of native bees and 14,000 of moths and butterflies in North America, as well as birds and bats, reptiles and amphibians, all working as pollinators to ensure that flowers are pollinated so that plants can grow, trees

can produce fruit, animals (including humans) will have something to eat, and life can continue.

Apart from bees, other pollinators are:

- Beetles, the oldest pollinators, are attracted to strong scents and open-bowled flowers;
- Butterflies, prefer open areas with full sunshine;
- Moths, of which there are over 3,000 species in Ontario, are very important pollinators. These night-time pollinators are often overlooked, but they are essential;
- Flies are significant pollinators, especially in cooler climates;
- Wasps;
- Hummingbirds, with the Ruby-throated Hummingbird as the only native species;
- Bats, though only one in Ontario is a pollinator.

Bees

How many kinds of native bees are there in southern Ontario?

Stratford Master Gardener, Jennie Girard, says she could spend hours talking about bees. There is a lot to learn about these fascinating creatures, of which there are over 350 native species in Southern Ontario (this excludes honeybees, which are not native.)

How did they evolve? Do all bees like the same things? What happens to bees in the winter?

Bees and plants have evolved together over many millions of years, as each symbiotically grew to rely on the other to help them survive and reproduce. Native bees do best with native plants, which Girard termed "of high-octane value" compared to non-native ones, but their taste in plants varies. Some species are attracted to all plants, others to a select few, and then there are the *monolectics*, which depend on just one pollen source. Squash Bees are a good example of this.

There are bees that tickle, long-haired bees, bees with long tongues and short ones, small bees and big ones, and there are also Bumblebees, "the teddy bears of the bee world," and Carpenter Bees, that look like them "but have shiny butts."

Unlike wasps, from which they evolved, bees are not by nature aggressive and don't often sting. Girard also points out that "bees evolved from carnivorous wasps, but they got wise and became vegetarians!"

There are solitary bees and social bees, but all rely on pollen and nectar when it comes to procreation and life. Only the females collect pollen and only those that are "queens" reproduce. All die in the winter, except the queens, dubbed *gynes*, which have thousands of eggs in the spring to start a new cycle. Males exist to fertilize the queen – and only one in seven is successful!

Girard makes it clear that while plants and bees depend on each other, we depend on them if life is to continue. We owe it to them, and to ourselves, to help them survive. Yet some are currently threatened and numbers generally are decreasing. Their habitats are threatened and changes in the climate create many challenges and negative effects.¹⁶



Photo Credit: Mike Beitz

How to Create Habitat for Stem-Nesting Bees



WINTER

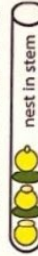
Leave dead flower stalks intact over the winter

SPRING

Cut back dead flower stalks leaving stem stubble of varying height, 8 to 24 inches, to provide nest cavities.



Female bees find cut or naturally occurring open stems, start a nest, then lay an egg on the pollen balls. Larvae eat the pollen.



SUMMER

New growth of the perennial hides the stem stubble.



Bee larvae develop in cut dead stems during the growing season.



FALL



WINTER



Bees hibernate in stems during the winter



SPRING

Cut back dead flower stalks. Old stem stubble will naturally decompose.



Adult bees emerge and start nests in newly cut dead stems or in naturally occurring open stems.



Photo Credit: Xerces Society for Invertebrate Conversation, <https://www.xerces.org/>

Insects

Here we turn for advice to Don Farwell, a Stratford Master Gardener. A start is to change the way we view bugs and caterpillars, which are essential to the cycle of life. Caterpillars are the very basis of the food chain, for they become moths and butterflies and other insects, and these bugs feed birds and bats. Without them an important link is lost.

How many caterpillars do Chickadees need to raise a brood of chicks?

Chickadees feed their babies caterpillars and, according to Entomologist and Ecologist, Doug Tallamy¹⁷, it takes up to 9,000 caterpillars to feed one clutch of Chickadees. Farwell speaks of the view expressed in an old adage “the only good bug is a dead bug.” In fact, he said, “all bugs are good”.

Non-native Insects

Though it may well be true that all native insects are good, there are an increasing number of non-native insects in the area that are invasive and destructive. These include the Japanese Beetle, the Spongy Moth and the Ash Borer, insects that have devastating impacts on our ecosystems because there is nothing to keep them in check. Birds and other creatures do not recognize these insects as food. Gardeners can use non-toxic methods, like dropping hand-picked Japanese Beetles into soapy water, as a method of control.

Birds

What do birds do for our ecology?

Birds are ancient and wondrous creatures. They play an important role in maintaining biodiversity and in helping to keep our ecosystems in balance. They aid in controlling pests such as rodents, invasive insect infestations on plant life and certain tree species and spread plant life through dispersing seeds and cycling nutrients. As examples, one type of hummingbird is a pollinator while others scavenge, aiding in the health of wetlands, and, in the case of woodpeckers, creating cavities that can be used by other species. Birds provide essential ecological services, but we need a variety of species to do that. The richer the environmental tapestry, the better it is at resisting environmental changes and impacts, because it is more difficult for a pest or problem to focus on one element.



Artist Credit: *Bluebird*, Oil on Canvas, Tom Campbell

How diverse is Stratford's population of bird species?

Bird populations are in decline due to climate change, loss of habitat through development and industrial activities, and monoculture practices in farming. Although some species are in decline, other species are moving northward as a result of the warming climate. Stratford offers a diversity of birds; in fact, one bird watcher we consulted has observed, over some 30 years, more than 140 species, out of 500 species in Ontario.

If birds are at risk, what can we do to help?

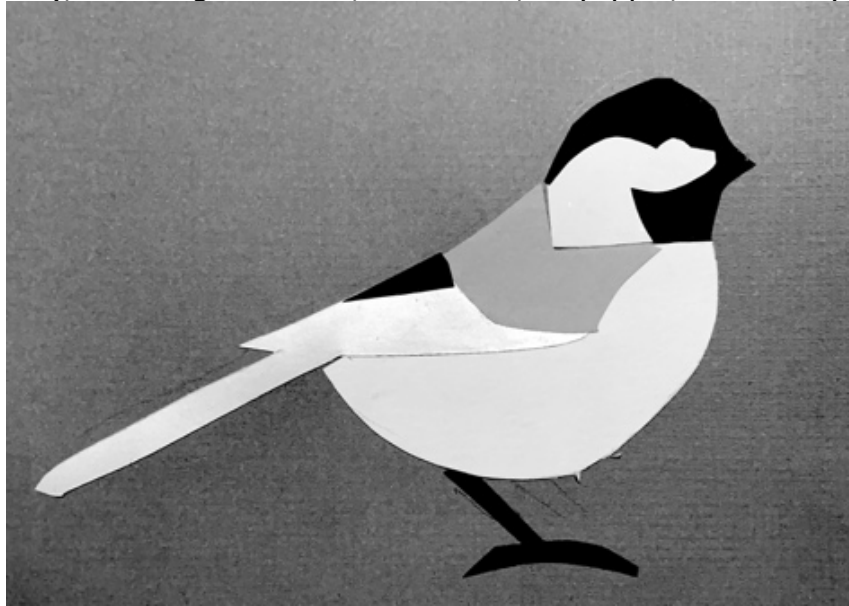
We need to work together to replace their lost habitats. Birds need sufficient area to thrive, e.g. each pair of breeding birds requires an area bigger than one backyard to raise their young and they need contiguous habitat. We can help by planting native flowers, shrubs and trees, and by making our windows safe from accidental bird collisions by covering window surfaces with dots no more than 2 inches apart.¹⁸ The leading cause of mortality of birds in North America is thought to be predation by domestic cats. To create a safe yard for birds, it is advised to keep cats indoors, walk them on leashes and/or provide a secure outdoor cattery.

Some Ontario birds are especially at risk:

- Bluebirds are suffering from the overabundance of Starlings (imported from Europe in the 1800's). We can help by putting up Bluebird houses;
- Barn Swallow populations are decreasing due to the destruction of wooden barns. We can build Barn Swallow shelters for them to nest under;

- Grassland birds such as the Meadowlark and the Bobolink are disappearing due to loss of pasture lands offering alfalfa and clover. We need to build up and set aside grasslands.

The best support is provided by native perennial plants, grasses, trees and shrubs offering a variety of heights, colours, fruits, and seeds (Pigweed, Lambs Quarters, Little Blue Stem grass). Plant Joe Pye Weed, Milkweed (for Monarch Butterflies too), New England Aster, Goldenrod, Mayapple, and Showy Lobelia.



Artist Credit: *Chickadee*, Paper Collage, Tom Campbell

Some native trees are more attractive to birds than others. The Hackberry is a tree whose leaves provide food for moths and butterfly larvae, and whose fine branches are safe for perching. Birds and squirrels eat its fruit. It needs space, as it can grow 30 to 40 feet tall and 20 feet across. Serviceberry trees provide fruit and habitat for many different species. Bee Balm (Monarda) attracts birds, and Red Bee Balm (which requires full sun) attracts the Ruby Throated Hummingbird.

Bird Feeders

A variety of foods will attract a variety of birds, e.g., Finches like small seeds, Cardinals and Jays like larger seeds, Mourning Doves like cracked corn, Woodpeckers and Hatches like suet. Black oil sunflower seed attracts Purple Finches, Cardinals, Goldfinches, Grosbeaks, Juncos, Chickadees, Nuthatches and others. Sunflower, millet, nyger and safflower seeds are also popular.

Food can be provided year-round, but it is best to provide food from the end of September through April. (Some say November through March). Different birds need different types of feeders, e.g. a tubular mesh type with small perching

areas is good for smaller birds, but larger birds need more of a surface for perching. Hummingbird feeders with special syrup can be put out in the spring to the end of September.

Separating food types and feeders gives smaller birds a chance to eat without being scared away by larger birds. Use metal feeders to keep squirrels from chewing them. Squirrel-busting baffles can be installed on pole bird feeders. Birds have excellent spatial memory, so once they have found a food source they will return.

Place feeders at least 4 metres away from windows and predators, but near to protective cover in trees and shrubs. In the summer, provide a birdbath for drinking and bathing, and as a cooling station. Change the water daily to keep it clean.

Birdfeeders typically need cleaning and re-stocking weekly or bi-weekly. Depending on usage, feeders can be cleaned with 1 part chlorine (or hydrogen peroxide) to 10 parts water and rinsed thoroughly and dried before refilling. Salty, moldy or sugary foods can be dangerous for birds.



Artist Credit: *Baltimore Oriole*, Oil on Canvas, Candida Girling

Birdhouses provide nesting boxes in the spring but need to be cleaned of debris before the birds return. Most of the birds in our area are migratory, either “obligatory migrants” who migrate to the same place each year, or “adaptive migrants” who go south only as far as they need to find insects. Migration patterns follow the same compass headings –in the fall, southwest, and in the spring, northeast.

Some useful resources:

Origin Native Plants, 5420 ON-6, Guelph (nursery location), Phone: (519) 760-0055 (plants organically grown) www.originnativeplants.com

Wildlife Gardening: www.wildlifegardening.ca

Birds Canada, <https://www.birdscanada.org>

Canadian Wildlife Federation, <https://cwf-fcf-org>

Pollinator Resources, Tri-County Master Gardeners, Climate Momentum Community Climate Conversations, <https://climatemomentum.ca/wp-content/uploads/2025/04/Stratford-Climate-Conversations-3-2-25.pdf>

Acorn, John. *Bugs of Ontario*. Edmonton, AL: Lone Pine Publishing, 2003. This book makes no pretense to be comprehensive but includes some of the more unusual insects that make Ontario their home.

Free Apps for identifying and tracking birds:

Merlin from Cornell University has a GPS driven database and can identify location and has a record function so that when birdsong is heard it can be recorded and the bird identified with detailed information provided.

eBird has a database tracking the location and lists of birds. It also offers rare bird sighting notification and can generate a computer map of a walk and where birds were sighted.



Artist Credit: *Owl* and *Hummingbird*, Needlepoint, Alice F. Erickson

Butterflies

The overall picture, What do they do for the environment?

Where do butterflies fit into the schemata of all living things? Butterflies and moths form a large percentage, 17.4%, of all insect invertebrates. Below is a chart of vertebrates (animals with backbones) and invertebrates (those without).

Vertebrates (by group, 5% of all living creatures)	Percentage
Mammals	0.4%
Amphibians	0.5%
Reptiles	0.6%
Birds	0.7%
Fish	2.27%

Invertebrates (by group)	Percentage
Insects	71.1%
Mollusks	8.5%
Crustaceans	4.3%
Spiders	3.1%
Others	13.0%



Artist Credit: *Monarch on Swamp Milkweed*, by Gerard Brender à Brandis, Hand-tinted Wood Engraving

The three main types of insect, by their order and percentage, are:

Insects	Percentage
Beetles	40%
Butterflies and Moths	17.4%
Ants, Bees, Wasps	30%

In Ontario, there are hundreds of different kinds of butterflies seen over the year, though not all are native; many butterflies migrate and cross borders in the process. Though they possess commonalities when it comes to form and stages of growth, they exhibit many differences when it comes to habitat, overwintering, and larval and adult food sources.

Most people know about Monarch butterflies' dependence on milkweed, but many other butterflies have similarly exclusive host plants. The Zebra Swallowtail needs the Paw-Paw tree to survive, and another Swallowtail, the Pipevine, feeds on the Dutchman's pipevine. Other butterflies have more eclectic tastes, and this needs to be considered if you are planning a butterfly garden.

Butterfly Gardens

When creating a refuge for butterflies there are four main requirements:

1. Food plants for caterpillars,
2. Food sources, especially flowers rich in nectar, for adult butterflies,
3. Some kind of shelter, and
4. Sunshine.

Shelter

Butterflies require shelter throughout their four stages: eggs, caterpillars (larvae), chrysalis (pupae) and adults. Eggs are often laid under leaves to avoid detection from predators, caterpillars feed out of sight, and chrysalis are attached in areas sheltered from the wind. Shrubs, bushes and trees provide these sheltered areas.

Food

Native plants are always best. The selection of these should be based on the requirements of the kind of butterfly you want to attract. Attention at this stage must also be made to what plants their larvae need, because adult butterflies will not lay eggs unless there is an adequate food supply.

Plan the garden so that there will be blooms throughout the growing season.

Butterflies require water. A small mud puddle or shallow pool of water will provide this to adults.

Sunshine

Sunshine is necessary, and well-located sunny resting places, like flat rocks, can help butterflies get it. If sunshine is lacking in your area, you could consider woodland species, like the Northern Pearly-Eye, that can adapt.

Overwintering

Some species of butterflies, like the Monarch, Painted Lady, and Red Admiral, migrate to a warmer climate in the fall. The rest can be found in Ontario in one life stage or another, sheltering in areas protected from the elements.



Photo Credit: *Ted's Blowes Memorial Pollinator Peace Garden*, Mike Beitz

Native Butterfly & Pollinator Plants

Spring Bloomers (April–June)

These support early emerging bees and butterflies after winter.

Wildflowers

- Golden Alexanders (*Zizia aurea*)
- Wild Columbine (*Aquilegia canadensis*)
- Wild Blue Phlox (*Phlox divaricata*)
- Virginia Bluebells (*Mertensia virginica*)
- Wild Geranium (*Geranium maculatum*)
- Hairy Beardtongue (*Penstemon hirsutus*)
- Foamflower (*Tiarella cordifolia*)
- Wood Anemone (*Anemone quinquefolia*)



Shrubs / Woody Plants

- New Jersey Tea (*Ceanothus americanus*) – also a butterfly host plant
- Willows (*Salix* species) – extremely important early nectar and host plants

Summer Bloomers (June–August)

This is the peak butterfly season. Many of these are excellent nectar plants.



Wildflowers

Tall Nectar Plants

- Joe-Pye Weed (*Eutrochium/Eupatorium maculatum*)
- Ironweed (*Vernonia gigantea*)

Autumn Bloomers (August–October)

These are critical for migrating Monarchs and late pollinators.

- New England Aster (*Symphyotrichum novae-angliae*) a major Monarch nectar plant
- Smooth Blue Aster (*Symphyotrichum laeve*)
- Heath Aster (*Symphyotrichum ericoides*)
- Canada Goldenrod (*Solidago canadensis*)
- Showy Goldenrod (*Solidago speciosa*)
- Sneezeweed (*Helenium autumnale*)
- Dense Blazing Star (*Liatris spicata*)

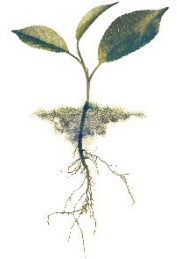


Keystone Host Plants

(Especially valuable, “keystone plants” are native plants critical to the food web and necessary for many wildlife species to complete their life cycle.)

If you want butterflies to breed in your garden, include some host plants:

- Milkweeds (*Asclepias*) – Monarchs
- Violets (*Viola*) – Fritillary butterflies
- Golden Alexanders (*Zizia aurea*) – Black Swallowtails
- New Jersey Tea (*Ceanothus americanus*) – Azure butterflies
- Willows (*Salix*) – dozens of butterfly species



A simple pollinator garden formula for Stratford



- 3–4 Spring plants
- 6–8 Summer plants
- 3–4 Fall plants
- At least one milkweed species

This provides continuous nectar from April to October.

Some useful resources:

Hall, Peter W., Colin D. Jones, Antonia E. Guidotti, et al. *The ROM Field Guide to Butterflies of Ontario*. Toronto: Royal Ontario Museum, 2014.

Murawski, Darlyne and Nancy Honovich, National Geographic Kids: *Ultimate Bug-opedia: the most complete bug reference ever*, National Geographic. 2024.
<https://www.nationalgeographic.com/subscribe/topic/kids>

Cambridge Butterfly Conservatory, <https://www.cambridgebutterfly.com/>,

Native Plant Connection, Native Plant Nurseries,
<https://nativeplantconnection.com/> native-plant-nurseries-ontario

Worms

“It may be doubted whether there are many other animals which have played so important a part in the history of the world as have these lowly organized creatures.”

Charles Darwin

What role do worms play?

Worms are essential to the creation of soil that is healthy. The way they work is analogous to the way we eat fresh, leafy vegetables to help feed our bodies; worms eat vegetable matter for food and then excrete *castings* which put nutrients and organic matter back into nutrient-deprived, dry soil.

How do they do this?

Aristotle called worms the intestines of the earth. They wriggle, writhe, burrow, aerate, chew, digest, process, till, transform, and eventually excrete organic matter across the surface of the planet.

They have had millennia to do their thing all over the world. Though it is often thought a worm is a worm is a worm, there are in fact over four thousand identified species, and probably more that are unidentified.

Recently, earthworms have become a problem in northern Ontario forests. Often left behind when used as bait in fishing, they can devastate tree growth and jeopardize trees' function as carbon capturers.

How can you contain them, and thereby get the most benefit from them?

So that worms can thrive, avoid transporting them to forested areas and putting toxins in gardens. Some people become involved in vermiculture.

What is vermiculture?

Vermiculture is the keeping of worms, especially red wigglers, in an enclosed environment where they are fed food scraps and transform them into the highest grade of compost available.

There are three different kinds of worms:

1. **Endogenic** worms live in the deeper mineral area of the earth. They are not well-suited to vermiculture.
2. **Anecic** worms include the nightcrawler seen at night. They like to range widely in their activities, which makes them unsuitable for life in the enclosed space of a worm bin. They are also the kind of worm favoured for fishing.
3. **Epigenic** worms live on the surface, which is their preferred environment. They feed on dead and decaying matter, transforming it into new soil. They eat "locally" and whatever is available.

Epigenic worms prefer soil with a lot of compostable material and layers of thick mulch where they can feed off rotting substances. This makes them perfectly suited to the confined space of a composter with its menu of food scraps, old leaves, and vegetable matter.

What do you need?

You can start basic and create your own worm bin in a do-it-yourself project. There are also companies that specialize in selling premade bins.



PLANTS

The Relationship Between Plants and Wildlife

It is no coincidence that plants come together here with wildlife/pollinators (or vice versa); plants cannot exist without creatures, and creatures, including humans, cannot exist without plants. So, it has always been.

The first plants evolved millions of years ago. Over time, they began to flourish in every climate around the globe. At the same time, other life forms were also evolving in the same areas, with the creatures dependent on the plant life around them for food and shelter.

As humans came along in their turn and developed, plants and other creatures helped their societies grow. But how do humans and plants live together now? Is our relationship mutually advantageous, or has it changed? And what will our relationship be in the future?

Importance of Native Plants

Native plants thrive when native creatures thrive, as it is a reciprocal relationship. We can also plant native trees and provide all the advantages of doing so - native plants and trees that are best suited to make Stratford gardens, including yours, healthy for everyone.

What are the plants we should look to, and where can we find them?

- Native plants can be locally or regionally native – the Striped Maple, for instance, is native to Eastern Ontario but not Southwestern Ontario.
- Native plants are better adapted to our soil and climate than hybrid or non-native plants, so they grow better, require less water, and fewer, if any, amendments to the soil.

When choosing native plants it is advised to put three (or five or some other uneven number) different kinds together, plant three (or five or seven, etc.) of each, and choose them to have blooms through all three seasons to ensure an esthetically pleasing effect.

What is the recommended ratio of native plants for local gardeners?

When planting, aim for 70 per cent native biomass (having a ratio of 70 per cent native plants to 30 per cent others) to help bring nature to the yard.

Native Plants and Soil

Native plants have evolved relationships with soil and micro-organisms with which they share some of their energy, and which in turn provide plants with nutrients and help the roots access more water. This is a reciprocal relationship which works best for native plant species that have been in the same system for a long time.

The roots of native plants are typically deep as they are perennial and they continue contributing to the soil all year. Native plants tend to be larger and have more diverse fungal and bacterial relationships with the soil than non-native plants. This leads to the improved structure and function of a healthy ecosystem. Native plants promote aeration, water and nutrients while limiting erosion because the deep roots keep the soil intact.

The deep root systems also retain a high carbon content, and in maintaining the soil structure, the capacity for carbon storage is enhanced. Soils are typically carbon-limited, which is why it is important to nourish the soil with leaves.

Plant Photosynthesis and Carbon Sequestration

Living roots continually feed the soil carbon drawn down from the atmosphere into the soil. When photosynthesis occurs, carbon is stored.

Perennial grasslands, with their deep fibric root systems, are some of the most valuable and prolific ecosystems with regard to storing carbon. These root systems have adapted to survive in conditions with limited precipitation.

Grassland ecosystems provide many ecosystem services, but most notable is their prolific ability to store excess carbon that is in the atmosphere.

Photosynthesis begins when plant leaves absorb energy from the sun that helps power metabolism and development. At the other end, plant roots are secreting (exuding) a metabolic byproduct that fuels nutrient cycling in the soil. This metabolic product is commonly referred to as plant "exudates."

Exudates are carbohydrates or sugars released into the soil through plant roots. These carbohydrates/sugars feed microbial life (bacteria) and fungal life, creating a symbiotic relationship between plant roots and the soil ecosystem, with the carbon being drawn down into the soil and sequestered in fungal networks and microorganisms.

Millions of microbial organisms in the soil also feed on and store carbon in the soil, by using plant exudates to fuel nutrient cycling. Most organic fertilizers (i.e. compost or manure) are applied in a form that initially makes nutrients unavailable to plants. Microbes then process materials such as compost and mineralize the nutrients for release into the soil solution for plant uptake.

Bolstering microbial and fungal populations helps to maximize nutrient recycling, and thereby the nutrient available to plants. Keeping living roots in the ground and limiting soil disturbance are the two most significant practices that contribute to increased nutrient cycling and carbon sequestration. Gardening practice should begin with these two fundamentals as the basis for healthy, ecologically sensitive gardening habits.

Living roots continue the photosynthetic process and encourage the symbiotic relationship between plants and the soil fungi and microbes. Keeping soil planted feeds the soil life that is essential for nutrient cycling.

Native Plants for Stratford

Native perennials that grow in the sun:

- Gray-headed Coneflower (*Ratibida Pinnata*)
- Black-eyed Susan (*Rudbeckia Hirta*)
- Canada Goldenrod (*Solidago canadensis*)
- Evening Primrose (*Oenothera biennis*)
- Butterfly Milkweed (*Asclepias tuberosa*)
- New England Aster (*Aster novae-angliae*)
- Ironweed (*Vernonia missurica*)
- Swamp Milkweed (*Asclepias incarnata*)

- Tickseed (*Coreopsis lanceolata*)
- Joe Pye Weed (*Eupatorium maculatum*)
- Bergamot (Beebalm) (*Monarda fistulosa*)
- Dense Blazing Star (*Liatris spicata*)



Artist Credit: *Black-eyed Susans and Wild Bergamot*, Acrylic on Paper, Patsy Berton

Native perennials that grow in the shade

- Foamflower (*Tiarella cordifolia*)
- Canada Anemone (*Anemone Canadensis*)
- Cranesbill (wild geranium) (*Geranium maculatum*)
- Woodland Sunflower (*Helianthus Divaricatus*)
- Wild Ginger (*Asarum canadense*)
- Virginia Bluebells (*Mertensia virginica*)
- Wood Poppy (*Stylophorum diphyllum*, also called Celandine Poppy)
- May Apple (*Podophyllum*)

Native shrubs and trees that provide cover, nest sites and food for birds

- Flowering Crab Apple (*Malus*)
- Red Pine (*Pinus Resinosa*)
- American Beech (*Fagus grandiflora*)
- Serviceberry (*Amelanchier*)

- Staghorn Sumac (*Rhus typhina*)
- Eastern Red Cedar (*Juniperus virginiana*)
- Dogwood (*Cornus florida*)
- Witch Hazel (*Hamamelis virginiana*)



Artist Credit: *Crab Apple Blossoms*, Ink and Watercolour, Rachelle Mingail Shubert

Native Grasses and Sedges

There is more to grass than meets the eye – if, that is, we are referring to the native variety. Ecologist Shaun Booth opened our eyes when he spoke at a Garden Stratford meeting a couple of years ago when he revealed that native grasses are much more than a lawn, and infinitely preferable. They are fundamental to the birds, the bees and the butterflies, and can be as beautiful as flowers.

They are “protein bars for birds” helping to provide some of the 300-500 caterpillars that Chickadees need every day to raise their brood. They are also “natural bird feeders” during the winter months, as long as they aren’t cut down in the fall. They are often overlooked, but provide colour, texture, movement, and importantly, food, as well as holding the soil together.

Booth, co-author of *A Gardener’s Guide to Native Plants of the Southern Great Lakes Region*, continues to fill common information gaps regarding this topic, e.g, there are cool season grasses, that grow in the spring and fall, and also

warm season grasses, that flourish in the summer. There are many types of both that can be chosen, according to what they are needed to do and where they are needed.¹⁹

When it comes to grasses, here are a few he mentioned; there are many more:

- Big Bluestem is adaptable, drought tolerant, and sun-loving, with a height of 4-7 feet. This grass feeds 24 species;
- Sweetgrass, this Indigenous favorite, is slow-growing, has a lovely scent, and beautiful, wispy flower heads;
- Canada Rye will grow to 5 feet in sun or partial shade. It is fast-growing and will cover the ground quickly. It self-seeds and "birds go crazy for them";
- Little Bluestem is a warm season, drought resistant grass which starts out blue then becomes golden in the fall. It has a showy and upright form, requires little maintenance, and feeds songbirds;
- Indian grass is another warm season grass. It is tall, elegant and upright and produces red seedheads in the fall; its foliage persists through the winter months.

What is the difference between grasses and sedges?

Are sedges grasses with edges? In fact, sedges are not grasses, but grass-like plants. As with grasses, there are many different varieties.

Here are a few:

- Ebony sedge is a cool season sedge. It grows a foot high in sun or partial shade, and adds brightness to shady spots;
- Mace sedge is another cool season sedge. It has a clumping habit with spiky seedheads that feed birds and skipper butterflies;
- Palm sedge has a refined look, grows up to 3 feet high, and "plays well with other plants";
- Oak sedge likes shade, dry to average soil, and can handle moderate foot traffic;
- Sideoats grama (or sedge) needs full sun and well-draining soil. It is a hardy, drought tolerant plant that is excellent for erosion control and meadow landscapes. It provides food for birds and is a host for Skipper Butterflies.

Booth reminds us that grasses and sedges are “far more than just green background,” and are invaluable to the environment. His website: <https://inournature.ca/>, features over a hundred varieties – at least one for every location and need.

Where can we get native plants?

- Obtain them from a nursery that specializes in native species rather than digging them up in the wild.
- Avoid mixed seed packages that call themselves “a meadow in a can” or something similar since these often are imported and contain non-native seeds.
- Choose authentic native plants (which can be identified by their Latin name) and avoid cultivars and hybrids.

Some useful sources:

- The North American Native Plant Society, <https://nanps.org>
- Tall Grass Ontario, <https://tallgrassontario.org/wp-site/>
- The Upper Thames River Conservation Authority, <https://thamesriver.on.ca/>
- CFUW Stratford, lists of native plants and where to purchase them, <https://cfuwstratford.ca/advocacy-climate-action/>
- Tri-County Master Gardeners, Oxford-Perth-Huron, tricitymastergardeners.ca

Invasive Plants

Invasive plants are a significant cause of native species extinction. They can grow in a variety of climate conditions, in sun or shade, and different soil conditions, and displace native plants through their rapid spread.

- Native pollinating insects, birds and other wildlife cannot use invasive species as a food source, causing great harm to the cycle of nature.
- Invasive plants also threaten agricultural land through their rapid growth, competition with crops and degradation of the soil.
- Invasive plants threaten forests, prairies, meadows, pastures, roadsides, ditches, streams, rivers and lakes.

In Stratford, the members of the Ecological Working Group of the Energy and Environment Advisory Committee organize regular campaigns to control and eradicate invasive species in the area. A majority of these plants have originated from our gardens and horticultural practices and have infiltrated our forests and wild areas, and should be removed from our gardens to prevent future spread. Periwinkle and goutweed are examples of two highly invasive plants that are much in evidence in Stratford.

What are some alternatives to invasive plants for ground cover?

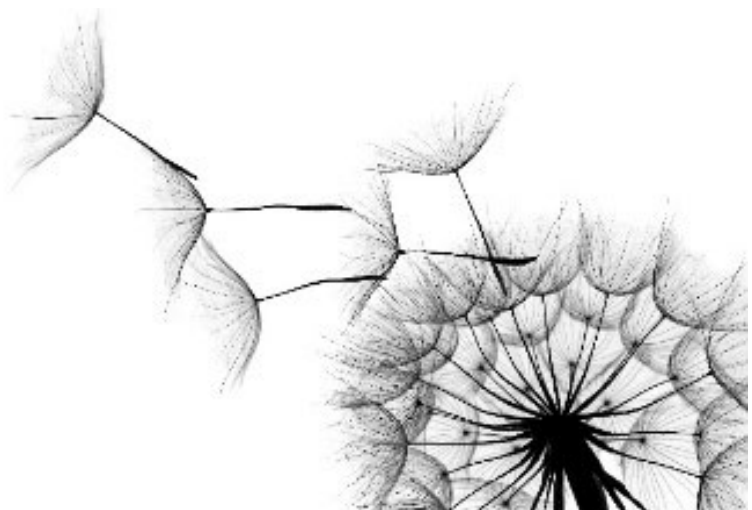
- Junipers (*Juniperus horizontalis* and *J. communis*), both are native;
- Wild Ginger (*Asarum canadense*) is a native species with large heart-shaped leaves. It spreads slowly and is good for shady slopes;
- Canada Violet (*Viola Canadensis*) sports white flowers in early spring, grows to one foot (30 cm) and looks lovely in mass plantings;
- Canadian Anemone (*Anemone canadensis*);
- Wild or Woodland Strawberry;
- Sedges (Pennsylvania, Bristle-leaf Appalachian, Ivory).

What about Dandelions – the good and the bad?

Dandelions are not native to North America; they are transplants from Europe.

They have good points:

- They are edible and rich in vitamins C, D, and B-complex and minerals such as magnesium, iron, copper, phosphorous, zinc, potassium and manganese;
- They have the highest Vitamin A levels of all the leafy greens;
- They are used in natural remedies throughout the world; Their roots are so long that they bring nutrients up into soil and aerate it.



They also have bad points:

- They have been overrated as pollinators by some in the past; in fact, they do little for native bees;
- They can take over a lawn.

A summary of what we can do

1. Plant keystone plants (plants that support the most different forms of life). Prominent among them are Goldenrod (which does not cause hay fever - the culprit is Ragweed), Aster, Black-eyed Susans, and Sunflowers;
2. Some pollinators, like Monarch butterflies, depend on just one plant; Milkweed, for Black Swallowtail butterflies, the carrot and parsnip plant family, and, for the Miner Bee, Dogwoods;
3. Choose plants that will flower at different times in the season so as to ensure an ongoing and ready source of nutrition for pollinators;
4. Plant keystone trees (native trees that support native insects). A good example is Oak, which supports 500 species. There are many others, including Birch, Maple, Cherry, Willow and Cottonwood.
5. Some beautiful trees, like the Ginkgo, are non-native, so will not support ecological life other than through their carbon effect;
6. Pull out invasive plants, which take over and choke out native species;
7. Cut grass less often or replace it with a native garden and native grasses;
8. Cut a pathway to walk through your garden;
9. Leaves and rotting branches left on the ground in the fall can host insects including queen bees (gynes) that will emerge in the spring;
10. Pesticides can be harmful, take care;
11. Have conversations with your neighbours and local garden centres.



Artist Credit: *Chrysalis*, Digital Illustration, Graeme Gerussi

Some useful resources:

Invasive Species Centre Canada

<https://www.invasivespeciescentre.ca/invasive-species/>

The Ontario Invasive Plant Council and updated technical Bulletins

<https://www.ontarioinvasiveplants.ca/>

Gardeners Toolkit with resources to help grown native plants, spot invasive threats and make eco-friendly decisions at the garden centre:

<https://www.invasivespeciescentre.ca/gardening-resources/>

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Pendreigh, Kirsten and Elke Boschinger (illus). *When a Tree Falls: Nurse Logs and Their Incredible Forest Power*. San Francisco: Chronicle Books, 2025.

Tallamy, Douglas website: <https://homegrownnationalpark.org/>

Wohlleben, Peter. *The Power of Trees: How ancient forests can save us if we let them.* (Translated by Jane Billingham) Vancouver: Greystone Books, 2023.

Free plant identifier app: iNaturalist, <https://www.naturalist.org>, a not-for-profit initiative to identify species and record nature observations



Photo Credit: Mike Beitz

A SEASONAL CHECKLIST

Spring - March, April, May

1. Check for water leaks, test toilets by putting food colouring in the tank to see if colour shows up in the toilet bowl; if it does, there is a leak in your tank, which is often the source of leaking water and a rise in water usage;
2. Sweep the driveway rather than using a hose to remove winter debris. When using a leaf blower, be mindful of the noise pollution and your neighbours;
3. Use rain barrels to collect rain water to put on your garden, being sure to have a screen on top. Keep rain barrels clean and free of mosquitoes and mosquitoes depositing their eggs. It is not recommended to use rain barrel water from the roof to water vegetables and edible plants;
4. Native plants (once established) use less water;
5. Consider replacing turf grass with native grasses and a ground cover such as clover, which is low profile and which provides nutrients to the soil and aids in retaining moisture. It is also beneficial to insects. Non-native grasses can be replaced with trees, shrubs, and "forage" crops, like native grasses, legumes, and grains which support soil health;
6. Fertilizing rebalances nutrients. Add compost, which is primarily nitrogen, and use aerobic compost. If you have enough sunlight and a place in your garden, get a composter and make your own compost. A generous 2 to 3 inches of compost will feed the average garden for 1 to 2 years;
7. When using commercial fertilizer be careful to apply only the specified amounts – it is easy to over fertilize;
8. Turning the garden over in the spring upsets the seeds deep in the soil and disrupts the structure of the soil. Instead, try using a broad fork or a pitch fork to create air pockets in the soil, every 6 to 8 inches prior to planting. This helps break up the compactness of the clay, loosens compacted soil without inverting and disturbing the soil layers; and aids water and fertility retention;
9. After aerating, apply compost – rake it on to the surface level of the soil;
10. When direct seeding, disturb soil only where the seeds are being planted. This way you'll be plugging your plant roots into an intact fungal system and thriving microbial ecosystem that will help support your plants throughout the season;

11. Plant perennial native plant gardens, remember the root systems spread as plants develop;
12. Most bugs have benefits. Pollinators (like larvae and caterpillars) are beginning to come out from winter refuges under the leaves, in wood piles and other shelters;
13. Help birds with nesting materials, e.g., take sisal twine, cut in foot long lengths, unwound and splayed and hung off a limb, it will be picked up for nest-building by Baltimore Orioles;
14. Plant the boulevard with salt-resistant native plants. These can be mini-gardens, meadows, or pollinator pathways. Remember, city by-laws limit height to .6m (24 inches). Check out <http://bloomingboulevards.org/>; and for their list of salt tolerant plants, <https://bloomingboulevards.org/salt-tolerant-native-plants>.



Photo Credit: Mike Beitz

When to plant vegetables for outdoor sowing (and indoor seed starting)

Stratford is in Climate Zone D, characterized by cold winters, warm summers, and significant seasonal temperature variations with four distinct seasons and moderate precipitation throughout the year. The average date for the last frost is typically May 21 and the first frost date, October 1.

Seeds/plants fall into 4 categories. Below are the average first dates for each category, the range of dates for the planting season and some related plants:

1. Frost Hardy, April 20 (mid to late April) Asparagus, broccoli, Brussels sprouts, cabbages, lettuce, onions (set, seed, Spanish), radishes, rhubarb, peas, spinach, parsnips, early potatoes - plants are not usually damaged until the temperature drops to -2C at 1.5m above the ground.
2. Semi-frost Hardy, April 30 (late April to early May) Beets, carrots, cauliflower, celery, late potatoes, early sweet corn.
3. Semi-frost Tender, May 20 (late May to June) Snap beans, sweet corn, tomatoes and some flowers, trees and shrubs.
4. Tender, May 20 (late May to June) Beans, cucumbers, eggplant, melons, peppers, pumpkins, squash and flowers, trees and shrubs.

Reference: <https://www.torontomastergardeners.ca/askagardener/when-to-start-spring-planting/>

See also: Climate zones and planting dates for vegetables in Ontario:
<https://www.ontario.ca/page/climate-zones-and-planting-dates-vegetables-ontario>

Native seeds benefit from being winterized, "cold-stratified," to mimic living through winter in the soil. Wet a paper towel (or better a piece of cloth), get it damp but not soaking, sprinkle seeds over it, fold over and put it in a zip lock bag (or glass storage container). Don't seal out all the oxygen (the seeds need some oxygen). Put in fridge for a minimum of 4 weeks (8 weeks ideally). Plant when it is warm, the rush of heat begins the germination process.

Most seed packets come with good information on how to start, both indoors and outside.

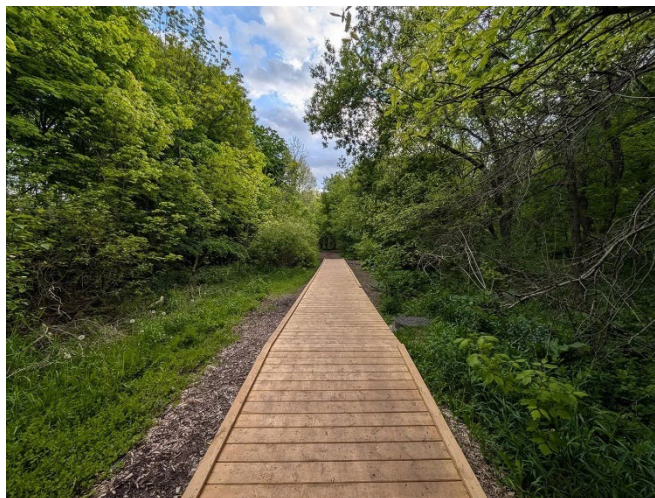


Photo Credit: Mike Beitz

Summer - June, July, August

1. Try using a bucket for washing your car and hose to rinse rather than letting the hose run. Also, washing your car on your lawn will minimize runoff entering the storm drains;
2. Watering in the evenings or early in the morning before the sun heats up reduces the evaporation of the water from the sun's heat and provides maximum opportunity for your plants to absorb the water, instead of during the day when they are photosynthesizing.
3. Drip water into the root structure. Use a trickle (perforated) hose, if you can, to soak the ground and also to get the water close to the plant roots to maximize benefit;
4. Cover pools and hot tubs when not in use to minimize water evaporation;
5. Remember that water in birdbaths should be changed regularly and standing water should be drained;
6. If you can, plant trees and shrubs to provide more organisms for insects and other pollinators to feed on and live in;
7. If you can, plant fruits and vegetables and aid in maintaining our food sovereignty.

Vegetables like lettuce, kale, tomatoes, carrots, zucchini, butternut squash are good for people and also good for providing nutrients to the soil;

8. Floodlights can confuse moths, which are major pollinators. Try directing lights downwards, using a yellow hue and timers or motion sensors.
9. Leaving sections of garden mulch-free, allows many native bee species to ground nest and burrow into patches of bare soil. Butterflies benefit from mudding sites to get minerals and warming sites to gather energy in the morning to be able to fly;
10. Pesticides can be harmful, take care.

Fall – September, October, November

1. When turning off the water to the outside taps, turn off inside and leave tap open outside so that water doesn't get trapped in the line to the outside;
2. Divert the downpipes from the rain barrels, remove the rain barrels and store for the winter, if you can;
3. When draining the water from pools and hot tubs, don't drain into storm sewers. The chlorine or salt can be harmful to nature and wildlife. If possible, allow pool, spa or hot tub sit uncovered and untreated at least two weeks to allow the chlorine to dissipate naturally. The water may also be neutralized by using dichlorination tablets.

If possible, drain into a sink or other drain connected to the City's sanitary sewer system. If there isn't a sink or drain to be used, use the lawn or garden. The ground acts as a natural filter to help remove chlorine before it travels into the rivers and waterways. Drain the water slowly so the ground can absorb it and be careful not to let water flow onto any other property.

Saltwater pools must be drained into a drain connected to City's sanitary sewer system. A licensed water hauler can also drain the pool or hot tub. For more information: <https://www.stratford.ca/en/live-here/draining-your-pool-or-hot-tub.aspx>

4. Protect the soil. Mulch your garden to preserve moisture for your plants, but be careful to chop up leaves so that air gets through, or use straw mulch. By utilizing straw with the leaves as mulch, oxygen is let into the soil. Chopped paper and cardboard can also be used and will disintegrate by spring. You can also put chicken wire over the plant beds to create breathing space between ground and the mulch. There is a caveat though - too many leaves can disturb the pH factor (potential of hydrogen) in the soil, that is, the ratio between carbon and nitrogen.

A bale of straw can be purchased at a farm store and broken up to put on the garden in the fall. The small pieces make it easier to digest and be absorbed by the soil. Insects of all kinds will use the mulch shelter to overwinter. Bees die, leaving the queen to re-populate the hive in the spring, so don't disturb her habitat. Mulch around trees and shrubs, but not around plants. Don't leave leaves on lawns over the winter; rather, rake into gardens. Create "soft-landings" for leaves under trees by planting some low shrubs or sedge species;

5. Hold off on fertilizing – wait till the spring;
6. Leave deadheads on flowers and plants; birds eat the seeds of dried plants in the winter for essential food;
7. Keep cover crops. Get “winterkill” cover crops which you plant in the fall, such as carrots and lettuce. They die over the winter, keeping the soil rich in nutrients. Also, you can plant oats and peas in August and September to provide live coverage of soil over the winter. They die in January and are broken down by springtime. These add more structure and photosynthetic energy.
8. Woody plants are best planted in spring and fall.

Winter – December, January, February

1. Use a minimum amount of salt (a tablespoon of salt is enough for a square metre of ice, do not use salt on snow) and gravel on driveways and sidewalks. Use sand and, if you can, use a salt melting product that is pet and plant friendly. Non-clumping kitty litter can also be used. Shovel or plow the snow as soon as you can before it packs down and turns to ice. Remember, salt is not effective at -10 C or lower.
2. Remember pollinators are not active in the winter; they are getting ready for spring.



Artist Credit: *Tree of Life*, Needle Point, Alice F. Erickson

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“The lands that provide our nations with hunting grounds and provisions of all sorts are regarded as One Dish, which Mother Earth has filled with everything that we need to live. It is seen as a gift, and therefore shared in common. There are multiple nations in this accord, but only One Spoon, not a big one for some and a little one for others. It is an agreement for sharing with a joint responsibility for care.”

Robin Wall Kimmerer, *The Serviceberry, Abundance and Reciprocity in the Natural World*. Scribner (Simon & Shuster). 2024.

The Dish with One Spoon Treaty is a 1701 peace agreement and wampum covenant between the Anishinaabe and Haudenosaunee nations. The Dish represented what is now referred to as southern Ontario, from the Great Lakes to Quebec and from Lake Simcoe to the United States.



Artist Credit: *First Light*, Oil on Panel, Lucas Tingle

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- ¹ Wall Kimmerer, Robin. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Milkweed Editions, 2013. ISBN 978-1-57131-355-5
- ² Kaswentha-Two Row Now: <https://tworownow.ca> and Riverwalk Commons: <https://rwcommons.com/>
- ³ City of Stratford Community Climate Action Plan: <https://www.stratford.ca/en/live-here/resources/INFRASTRUCTURE-SERVICES/CLIMATE-ACTION/Community-Climate-Action-Plan-2024.pdf>
- ⁴ Bee City: <https://beecitycanada.org/wp-content/uploads/2026/01/Stratford-Renewal2026.pdf>
- ⁵ Bird Friendly City: <https://visitstratford.ca/bird-friendly-stratford/>
- ⁶ United Nations: <https://www.un.org/en/climatechange/science/climate-issues/degrees-matter>
- ⁷ Energy and Environment Committee: <https://www.stratford.ca/en/inside-city-hall/energyandenvironmentcommittee.aspx>
- ⁸ Drinking Water Source Protection: <https://www.stratford.ca/en/live-here/drinking-water-source-protection.aspx>
- ⁹ Thames River Watershed: https://thamesriver.on.ca/wp-content/uploads/RC_Avon.pdf
- ¹⁰ Take care with the drains: <https://www.stratford.ca/en/live-here/fats-oils-and-grease.aspx#What-can-you-do-to-help>
- ¹¹ Marjorie Harris (<https://marjorieharris.com>), *The 7 Essential Steps for the Canadian Gardener* (2007. Random House Canada ISBN-13 978-0679314486)
- ¹² Dr. Toby Kiers: <https://www.cbc.ca/listen/live-radio/1-63-the-current/clip/16195770-how-fungi-save-planet>
- ¹³ Ontario Federation of Agriculture: <https://ofa.on.ca/>
- ¹⁴ Ontario Farmland Trust: <https://ontariofarmlandtrust.ca/> and National Farmers Union-Ontario: <https://nfuontario.ca/>
- ¹⁵ *Chief Dan George: The Golden Rule in Native North American Spirituality, Reverence for Mother Earth*, Frances Sanderson and Mark Hathaway, <https://frasercentre.ca/sm-archive>
- ¹⁶ Girard, Jennie. *Bees and Native Bees*. Garden Stratford Meeting, September 9, 2024, <https://gardenontario.org/event/garden-stratford-meeting-bees-and-native-bees/>
- ¹⁷ Tallamy, Douglas W. *Nature's Best Hope: A New Approach to Conservation That Starts in Your Yard*. Portland OR: Timber Press, 2020.
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- ¹⁹ Gray, Rick and Booth, Shaun. *The Gardener's Guide to Native Plants of the Southern Great Lakes Region*. Richmond Hill: Firefly Books, 2024.