

## Why We Love (and Need) Native Plants

### The Co-Evolution of Plants and Insects, Why it Matters to All of Us, and How to Get Started with Natives

You wouldn't go into the woods and start eating random leaves or berries – you know that many plants contain chemicals that are poisonous to us. It turns out, insects have the same problem. In fact, 90% of plant-eating insects are “specialists” that can eat only one – or a couple – plant species. For example, Monarch butterfly caterpillars can *only* eat plants in the milkweed family – and nothing else.

Yet milkweed leaves are toxic to most other insects. These relationships between host plants and insects have evolved over the last ten thousand or so years, at least since the last ice age. The plants evolved various chemical means to avoid being eaten. The insects that overcame the defenses of specific plants gravitated to those plants, and never evolved the ability to eat other types. Since different insects specialized in eating different plants, they didn't compete with each other for food.

This works fine as long as each of those plants remain plentiful. But if an insect's host plants decline in numbers – and humans are mostly to blame here – so will the insects. They cannot simply switch to eating something else. Native insects need the native plants with which they co-evolved. Another example: the endangered Karner Blue butterfly larvae can *only* eat wild lupine, which is in sharp decline. Other plants are simply not an alternative – the larvae cannot get past their unique chemical defenses.



Non-native plants are not an option. Douglas Tallamy, in his engaging book *Bringing Nature Home, How You Can Sustain Wildlife with Native Plants* writes this about non-native plants: “In an ecological and evolutionary sense, the alien plant's new neighbors won't know what to make of it and, in most case will exclude it from their biological interactions. The plant will occupy space and use resources (light, water and soil nutrients) that would otherwise have been available for a native plant, but it will not pass the energy it harnesses from the sun up the food chain.”

Tallamy offers several examples of how a plant, introduced into a new area, does not sustain insects the same way it does in its original location. One example is *Phragmites australis*, which was introduced to the U.S. over 400 years ago. It is a host to just five insect species in the U.S., but 176 species in its European homeland. With few biological controls (insects and diseases) here to keep it in check, this alien plant continues to take over shorelines, ditches and other low-lying areas, while providing virtually no benefit.

Another example is “butterfly bush.” If you want to plant for butterflies, you need plants that provide nectar for the adults, and host plants for the larvae (caterpillars) to eat. The landscape industry made a savvy marketing move when they named this plant. While it does provide some nectar – although studies have shown it is not the preferred source if enough natives are nearby – this non-native does not support any butterfly larvae in the U.S. No butterfly will deposit its eggs on the butterfly bush. None! It makes no sense to feed the adults, if you're starving the babies.

Many of Michigan's 450+ native bee species are specialists that also require specific native plants from which they can get pollen or nectar, and these are the most threatened if their host plants are in decline. Most species, however, will use whatever flowers are available, though native plants are still preferred.

The native plants listed in the “Plant This, Not That” table at the end are useful to many of our pollinators.

## Why Worry About *Bugs*?

Have you eaten – anything – lately? The pollinators – the adult butterflies, moths, bees (mostly native ones, not just the European honeybee) and many other insects such as beetles and ants – made most of those foods possible. Some of our crop plants (such as tomatoes, potatoes, peppers and blueberries) require “buzz pollination,” which is done by some native bees (primarily bumblebees), but not by honeybees.

The insects themselves are also a crucial part of the diet of the birds we enjoy watching. While most adult birds will eat seeds, berries and fruits, their nestlings need fat and protein to quickly grow, and that comes from the insects – primarily caterpillars – that the parents bring back to the nest. For example, one bluebird pair brings up to 300 caterpillars back to their nest every day. And a single pair of chickadees require 6000 caterpillars to raise one clutch of their young. In fact, 96% of non-water dwelling bird species (many of which are in serious decline) feed their babies insects. Native plants make that possible.



We have been brainwashed into thinking that pest-free plants, like the butterfly bush, are perfect for our yards. But a diversity of insects will attract natural enemies, like birds, that keep them in check. In fact, homeowners who have planted natives exclusively found that only three percent – a miniscule amount – of the leaves on their properties were damaged by insects. (If even that would bother you, apply the ten-foot rule: if you see leaf damage, just back up ten feet.)

## Plants and Thurston Nature Center

The Thurston Nature Center Committee adopted a policy in 2014 to introduce only plant species that are native to our region. The goal is to provide the greatest benefit to the local ecosystem, with a diverse selection of native trees, shrubs, wildflowers and grasses – each of which supports a subset of the insect population. At the same time, we are trying to rid the Center of alien plant species: the phragmites mentioned above, non-native honeysuckles, buckthorns, garlic mustard, purple loosestrife, various invasive groundcovers, and over three dozen others. Unchecked, these species – most of which escaped from yards into the area – often take over an area to the complete exclusion of native plants.

See <https://thurstonnaturecenter.info/invasives/> for more info.

## How You Can Help

First of all, do not introduce any plant into Thurston Nature Center without approval from one of our Stewards. That person will ensure that the plant is native, not overly aggressive, and is being placed in an appropriate location. There have been times in the past when alien plants were purposely introduced by well-meaning people – unfortunately, we are still battling some of those. Many accidental introductions also occur, with seeds and berries of non-native plants spread by birds, the wind, shoes, and other means.

Secondly, add natives to your own yard. The Nature Center is surrounded by paved surfaces, homes, and non-native turf grass and yard plantings. The landscape industry has supplied us with mostly non-native plants, or cultivars of natives that have all the biodiversity of the original plants bred out of them (they propagate their trademarked stock from cuttings, not seed, to ensure uniformity). In many cases, these cultivars are unusable by the insects that can feed on the original native plant. For example, the bloom time

may be different, so nectar and pollen are not available when needed. Or in versions with double petals instead of single, the nectar becomes inaccessible. And color changes both modify its appearance (so it does not attract the insects from afar), and may alter the chemical make-up of the plant (which is sensed up close), either of which can make it unrecognizable as a food source.

As nearby homeowners and businesses add more native plants to their landscapes, it reduces habitat fragmentation, bringing beneficial insects – “bird food” to quote Tallamy – to your yard and the entire neighborhood. Greater use of natives around the Nature Center has another benefit – it reduces the chance of accidental introduction of still more non-natives. See the “Plant This, Not That” ideas below for plants that make excellent substitutions for some all-too-common invasive non-native plants.

There are hundreds of wonderful native trees, shrubs, flowers and grasses available from reputable local sources (see Resources below). Consider this: just as we import other country’s plants for their perceived beauty, uniqueness and “pest” resistance, they import ours for the exact same reasons! Of course, our native plants become aliens *there*, taking up resources and not giving back to those local ecosystems.

Because they’ve grown here without our help for so many thousands of years, natives need no watering, no fertilizer, and no winter protection once they’ve become established in an appropriate setting. Their deep roots sequester carbon and break up hard-packed soil, helping to reduce runoff and replenish the water table. They also come in almost any size, color and bloom time you would like, so you can have beautiful flowers from early spring through late fall, with interesting stems, berries, and seed heads that add winter interest (and attract overwintering birds desperate for food).

The easiest way to introduce native plants is to substitute one whenever you remove a dead or otherwise undesirable plant. You can also make new landscaped areas, such as a rain garden, to reduce the size of your lawn – and reduce lawn maintenance chores.

## Resources

<http://plants.usda.gov/home> USDA’s Plant Database. A good source for verifying the native status of plants. Note, you need to zoom in on the maps to see where within a state the plant is native, as the entire state is marked native even if the plant is native in just one county.

<https://www.washtenawcd.org> The Washtenaw County Conservation District conducts native plant and tree & shrub sales twice yearly.

<https://newleafnatives.com> A Manchester native plant grower and the new owner of native landscaping business Creating Sustainable Landscapes <http://www.creatingustainablelandscapes.com>

<https://www.feral-flora.com> A native plant grower located at Green Things Farm in NE Ann Arbor.

<https://www.ypsilantinativeplantnursery.com> A Native plant grower located in Ypsi's Depot Town.

<http://www.wildtypeplants.com> Wildtype is a native plant grower in Mason, MI. Their website has some excellent lists and articles on using native plants. Plants also available at Downtown Home & Garden, A2.

<http://www.michiganwildflowerfarm.com> Michigan Wildflower Farm, located in Portland, MI. They sell seeds only.

<http://nativeconnections.net> Native Connections, another seed producer, in Three Rivers, MI.

<http://www.prairiemoon.com> Prairie Moon Nursery, located in Minnesota. They sell mostly seeds, but also bare-root and potted plants. Their website has a searchable plant finder, photos and characteristics of the plants and seeds they sell, along with range maps. If you order from them, please use their maps to verify that the plant is a Michigan native.

<https://www.prairienursery.com> Prairie Nursery, in southern Wisconsin. They primarily sell plants, but also some seeds. Like Prairie Moon, this is an excellent source of information on many locally native plants, and both sites also have numerous guides to sowing, planting and working with native plants.

<https://www.wildflowersmich.org> The Wildflower Association of Michigan encourages preservation and restoration of Michigan's native plant communities. Grass and flower seeds for our Oak Savanna were purchased using WAM grants.

<https://www.facebook.com/ThurstonNatureCenter> Our Facebook page.

<https://thurstonnaturecenter.info> Our website.

<https://annarbor.wildones.org> The Ann Arbor chapter of Wild Ones. Wild Ones (<https://wildones.org>) is a national organization that promotes native landscapes through education, advocacy, and collaborative action. Meetings are at Matthaei Botanical Gardens, and at members' yards for garden tours.

There are two local groups that offer free (donation-supported) help to beginners. Seeds to Community (<https://www.facebook.com/groups/seedstocommunitywashtenaw>) through Ann Arbor Wild Ones helps you grow native plants into plugs, using locally harvested seeds. Adapt: Community Supported Ecology (<https://adaptecology.org/>) will provide plants and help you build a small starter garden of 30-40 plants.

Various other plant finders at:

<https://www.audubon.org/native-plants/search?zipcode=48105&tab=full-results> and  
<https://www.nwf.org/NativePlantFinder> and  
<https://www.xerces.org/pollinator-resource-center/great-lakes>

Favorite books:

- Doug Tallamy: Bringing Nature Home; The Living Landscape (with Rick Darke). Also, articles and videos at <https://homegrownnationalpark.org/tallamys-hub>
- Weaner & Christopher: Garden Revolution
- Diboll & Cox: The Gardener's Guide to Prairie Plants
- Lynn Steiner: Landscaping with Native Plants of Michigan; Grow Native: Bringing Natural Beauty to Your Garden

### **Plant This, Not That**

The non-native plants in the following list are some of the commonly used landscape plants that have escaped cultivation and are threatening many natural ecosystems. Several of these have shown up in Thurston Nature Center.

The suggested native flowers, grasses, shrubs, trees and vines are great sources of nectar and many are butterfly larva hosts. Some are also the sole source of nectar and pollen required by certain specialist bees. There are many, many other native plants that you could choose that are equally good choices.

Instead of This ...	Plant These Natives Instead ...	
Butterfly Bush	New Jersey Tea ( <i>Ceanothus Americanus</i> )	Pussy Willow ( <i>Salix discolor</i> )
	Buttonbush ( <i>Cephalanthus occidentalis</i> )	White Meadowsweet ( <i>Spiraea alba</i> )
	Dogwood (various) ( <i>Cornus Spp.</i> )	Steeplebush ( <i>Spiraea tomentosa</i> )
	Spicebush ( <i>Lindera benzoin</i> )	American Cranberrybush ( <i>Viburnum trilobum</i> )
Burning Bush	Highbush Blueberry ( <i>Vaccinium corymbosum</i> )	Arrowwood Viburnum ( <i>Viburnum dentatum</i> )
	Eastern Wahoo ( <i>Euonymus atropurpureus</i> )	American Cranberrybush ( <i>Viburnum trilobum</i> )
	Purple Chokeberry ( <i>Photinia floribunda</i> )	Winged or Fragrant Sumac ( <i>Rhus copallinum, R. aromatica</i> )
	Black Chokeberry ( <i>Photinia melanocarpa</i> )	Blackhaw Viburnum ( <i>Viburnum prunifolium</i> )
Privet, Boxwood, others used as screens	Winterberry (Michigan Holly) ( <i>Ilex verticillata</i> )	American Hazelnut ( <i>Corylus Americana</i> )
	Common Ninebark ( <i>Physocarpus opulifolius</i> )	Arrowwood Viburnum ( <i>Viburnum dentatum</i> )
	Purple Chokeberry ( <i>Photinia floribunda</i> )	American Cranberrybush ( <i>Viburnum trilobum</i> )
	Black Chokeberry ( <i>Photinia melanocarpa</i> )	Blackhaw Viburnum ( <i>Viburnum prunifolium</i> )
Japanese Barberry	Common Ninebark ( <i>Physocarpus opulifolius</i> )	American Cranberrybush ( <i>Viburnum trilobum</i> )
	Steeplebush ( <i>Spiraea tomentosa</i> )	White Meadowsweet ( <i>Spiraea alba</i> )
	New Jersey Tea ( <i>Ceanothus Americanus</i> )	Shrubby St. Johns Wort ( <i>Hypericum prolificum</i> )
	Winterberry (Michigan Holly) ( <i>Ilex verticillata</i> )	Highbush Blueberry ( <i>Vaccinium corymbosum</i> )
Forsythia	Spicebush ( <i>Lindera benzoin</i> )	Pussy Willow ( <i>Salix discolor</i> )
Non-Native Honeysuckles (Vines & Shrubs)	Vines:	Shrubs:
	Red Honeysuckle ( <i>Lonicera dioica</i> )	Red Elderberry ( <i>Sambucus pubens</i> )
	Trumpet Honeysuckle ( <i>Lonicera sempervirens</i> )	Common Elderberry ( <i>Sambucus Canadensis</i> )
	Virginia Creeper ( <i>Parthenocissus quinquefolia</i> )	Winterberry (Michigan Holly) ( <i>Ilex verticillata</i> )
Hosta	Purple Clematis ( <i>Clematis occidentalis</i> )	Spicebush ( <i>Lindera benzoin</i> )
	Solomon's Plume ( <i>Smilacina racemosa</i> )	Wild Geranium ( <i>Geranium maculatum</i> )
Maiden Grass, Fountain Grass (Miscanthus species)	Wild Ginger ( <i>Asarum Canadense</i> )	Twinleaf ( <i>Jeffersonia diphylla</i> )
	Taller Species:	Shorter Species:
	Indian Grass ( <i>Sorghastrum nutans</i> )	Prairie Dropseed ( <i>Sporobolus heterolepis</i> )
	Switch Grass ( <i>Panicum virgatum</i> )	Little Bluestem ( <i>Schizachyrium scoparium</i> )
	Big Bluestem ( <i>Andropogon gerardii</i> )	Side-Oats Grama ( <i>Bouteloua curtipendula</i> )
Bottlebrush Grass and Wild Ryes ( <i>Elymus spp.</i> )	Purple Lovegrass ( <i>Eragrostis spectabilis</i> )	
Tufted Hairgrass ( <i>Deschampsia cespitosa</i> )	Sedges (various) ( <i>Carex spp.</i> )	
Periwinkle (Vinca), English Ivy, Other Ground Covers	Wild Geranium ( <i>Geranium maculatum</i> )	Wild Blue Phlox ( <i>Phlox divaricata</i> )
	Wild Strawberry ( <i>Fragaria Virginiana</i> )	Moss Phlox ( <i>Phlox subulata</i> )
	Foamflower ( <i>Tiarella cordifolia</i> )	Violets (various) ( <i>Viola Spp.</i> )
	Big-leaved Aster ( <i>Eurybia macrophylla</i> )	Barren Strawberry ( <i>Geum fragarioides</i> )
	Creeping Strawberry-bush ( <i>Euonymus obovata</i> )	Common Cinquefoil ( <i>Potentilla simplex</i> )
	Sedges ( <i>Carex spp.</i> )	Bearberry ( <i>Arctostaphylos uva-ursi</i> )
Norway Maple	Red Maple ( <i>Acer rubrum</i> )	Sugar Maple ( <i>Acer saccharum</i> )
	Amer. Basswood/Linden ( <i>Tilia americana</i> )	White or Red Oak ( <i>Quercus alba, Q. rubra</i> ), other oaks
	Sassafras ( <i>Sassafras albidum</i> )	Common Hackberry ( <i>Celtis occidentalis</i> )
	Kentucky Coffeetree ( <i>Gymnocladus dioicus</i> )	Ohio Buckeye ( <i>Aesculus glabra</i> )
	Hophornbeam ( <i>Ostrya virginiana</i> )	Blackgum ( <i>Nyssa sylvatica</i> )
	Tuliptree ( <i>Liriodendron tulipifera</i> )	Hickories: Shagbark, Pignut, Bitternut, Shellbark ( <i>Carya spp.</i> )
Bradford and Callery Pears	Black Cherry ( <i>Prunus serotina</i> )	Serviceberry (various) ( <i>Amelanchier Spp.</i> )
	American Plum ( <i>Prunus Americana</i> )	Hawthorn (various) ( <i>Crataegus Spp.</i> )
	Chokecherry ( <i>Prunus Virginiana</i> )	Eastern Redbud ( <i>Cercis Canadensis</i> )
	Flowering Dogwood ( <i>Cornus Florida</i> )	American Witch Hazel ( <i>Hamamelis Virginiana</i> )

Spp = Species, indicating several options are available

This list was compiled from numerous sources. All of these substitutions are native to SE Michigan. However, they each have preferred growing conditions. Use the above resources to view details (size, bloom color and timing, best growing conditions, etc.) of these native substitutions.

## Suggestions for Choosing and Buying Plants

First of all, don't buy a "meadow in a can" from a traditional nursery or big-box store. They are full of invasive non-native plants. If you want to install a high diversity native planting, use a reputable native plant supplier. They have plenty of seed mixes and/or multi-species plug trays that are all native, and are matched to specific growing conditions or uses (such as short- vs. tall-grass prairies).

The Prairie Moon and Prairie Nursery websites have some great guides for using native plants. Below are just a few of the key points.

Even though native plants evolved here, they still have preferred growing conditions. So it's important to identify your conditions, and choose plants that will work there. Sun exposure and soil wetness are the main considerations. Soil composition, from clay to sand, and soil pH may also be important to some plants.

Many plant species have more than one common name, and some common names refer to multiple species. This makes it hard to tell what you are actually buying. It is always best to use the Latin (scientific) name when buying. However, on occasion, even the scientific name may change, due to DNA analyses that cause species to be moved to another family. For example, Big-leaved Aster may be called *Eurybia macrophylla* or *Aster macrophyllus*, depending on how up-to-date the listing is.

Many native plants have been modified by the horticulture industry in ways that may make them more appealing to us, but can render them less useful (or completely unusable) by pollinators. Changes may include leaf or flower color, bloom time, flower shape, etc. Such plants are often sold by big box stores and conventional nurseries. It is very common for cultivars of native plants to be misleadingly labeled as native. These "nativars" can be identified by their name – there will be a trademarked name in single quotes following the scientific name. For example, Aster macrophyllus 'Twilight'. You might also find a label saying "pest free" (indicating its relative uselessness to the food chain) or one saying that it is illegal to further propagate the plant. (Note: it is believed that a cultivar that has been modified only to grow shorter or more compactly, with no changes to the flowers or leaves, may still retain most of its usefulness to wildlife. Shrubs modified this way may fit into your area better than the straight native it was developed from.)

The nurseries listed above in the Resource section sell true natives, grown from locally harvested seed. These locally sourced plants are best adapted to local conditions.

## Suggestions for Sowing/Planting

Seeds take longer, usually by a couple of years, to fill in compared with potted or bare-root plants. But they are much less expensive. They are therefore typically used for large areas. Most seeds will not survive to maturity, so must be sowed heavily (typically 50-200 seeds per sq. ft.). If planting flowers or grasses, one plant per sq. ft. is common. You can also do a combination of planting and sowing, depending on size of area, number of desired plants of each species, availability of seeds vs. plants, etc. Most woodland plants do not grow well from seed, but prairie plants generally do.

If you are starting from seed, be aware that most natives have a mechanism to prevent germination when conditions are not ideal. This keeps them from germinating just as winter is arriving. Typically, these seeds need to either overwinter outside, or (if sowing in spring or starting plugs indoors) have their dormancy broken artificially by following the germination codes found on websites such as Prairie Moon Nursery's.

Group plants of a given species together. This looks more natural, and makes it easier for pollinators to find and use the plants without expending a lot of energy. Using more plants from fewer species generally looks best, especially in a small garden. The smaller the plant, the more should be grouped together.

On the other hand, in a really small area, it may look better to not group the plants, so there will always be something blooming throughout the entire space.

Use vertical layers – trees, shrubs, grasses, flowers, groundcovers combined. This provides more ecological services (food, hiding and nesting sites) to birds and insects, for a given area. It also looks more natural.

Put plants in spots that match their preferred conditions, so you don't need to amend the soil. Unlike when growing turf grass, adding fertilizer is not needed (the plants evolved to live here without our help!). Weeds love added nutrients, but it is not needed for the native plants. Adding nutrients also tends to cause natives to grow abnormally tall, leading to them flopping over.

It greatly helps to kill any existing grass and weeds prior to planting. See the guides at Prairie Moon or Prairie Nursery for methods. If you choose to use chemicals, glyphosate (without any other active ingredients) is recommended. It does not stay active in the soil, so it does not travel underground where it can kill nearby plants, and you can sow or plant in the area as soon as the sprayed plants have died.

Mulching when you first plant helps retain moisture and reduces weeds, but is only recommended the first year (it should last at least a second year). By planting very close together, and including ground covers (living mulch) among your other plants, the plants themselves will fill in enough to minimize weed growth.

Include “cues to care” in your design to make your garden more neighbor-friendly. Keep tall plants away from sidewalks. Statues, signs, a mowed grass border, a bird bath, all make a garden look more intentional.

### **Suggestions for Maintenance**

Weeding will be necessary at least the first year, likely more. If growing from seed, it helps to be able to distinguish between your emerging natives and weeds. (The Diboll/Cox book has pictures of seedlings.)

Watering may be necessary the first year also. Most natives put their energy into establishing their roots the first couple of years, before there is a lot of above-ground growth. So watering is generally unnecessary once the plants have reached mature size.

Plan on your garden looking different every year. Some plants grow fast, others take a couple years to fill in. All will eventually spread to new locations, whether by seeds or spores, stolons or rhizomes. Most gardeners “edit” their gardens, especially in more formal gardens. You may want to fill in sparser areas with additional species, or with more of the ones already there. Or move plants elsewhere, to re-establish your plant groupings or to move taller-than-expected plants behind shorter ones.

In a garden, plants often get taller than they would in their natural habitat. This is because our gardens may be located where we have used fertilizer or soil amendments in the past, and because they typically have less competition from surrounding plants than they do in a natural setting. Avoiding fertilizer, planting densely, and including ground cover among the other plants help prevent that. But if plants still get too tall and flop over, that can be prevented in subsequent years by chopping off a foot or so of the stem as soon as you can in late spring or early summer. It will come back, but shorter and usually a bit bushier. Flowering may be delayed slightly, but not by much.

Many insects overwinter in hollow stems or under foliage. Protect them by leaving your plants up until the temperature reaches 50 degrees regularly the following spring. This also provides lots of seeds for birds to feed on over the winter – you are literally growing your own birdfeeders.