CFAES
CHADWICK ARBORETUM & LEARNING GARDENS
at The Ohio State University

Backyard Wildlife Certification Manual

"In the past, we have asked one thing of our gardens: that they be pretty. Now they have to support life, sequester carbon, feed pollinators and manage water."

— DOUG TALLAMY

Written by Chadwick Arboretum Staff and Volunteers
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Site Analysis for Wildlife

By Kathy Burkholder, Retired Chadwick Arboretum Horticulturist

Site Analysis—What it Is

A site analysis is a traditional tool used in landscape design to help select appropriate plants. It evaluates existing site elements such as the amount of sun the site receives, what kinds of soils it has, where buildings are located, etc. Many resources can be found on the Internet about how to do a site analysis, which is always a good idea before purchasing and installing plants.

Site Analysis for Wildlife

A site analysis for wildlife is a way to evaluate your existing landscape for its wildlife value. This information can then help you make informed decisions about what wildlife benefits your landscape might be lacking and how you can improve them. Look around your neighborhood too. You might find plentiful resources of one type but few of another.

Conducting a Wildlife Site Analysis

Following are some wildlife considerations as you evaluate your property and neighborhood.

Plants

- What species are present?
- Which are native, exotic, or invasive?
- Is there plant diversity (a variety of species and genera)?
- Is there "layering" of plants?
  - Ground layer, small shrubs, large shrubs, small trees, canopy trees.

Food

- Are there plants that produce insects, fruit, nuts, seeds, pollen and nectar, and/or host plants for caterpillars?
- What time of the year are food sources available?

Cover and Nesting

- Are there dense trees and shrubs, brush or rock piles, evergreens, and/or thorny plants?
- Is bare soil available for ground-nesting bees, and stems for cavity nesting bees?

Water

- Is water currently present?
- Where could a water source be sited to provide protection from predators?
- Where is the location of electrical outlets for heaters and pumps? Where are water outlets for cleaning and filling?

Example

Below is a wildlife site analysis from my small, suburban property and how the findings have influenced my decisions.

- The neighborhood has many maples. To increase plant diversity, I'll plant different species than maples.
- The neighborhood has plenty of spring flowering trees and shrubs to benefit pollinators, but few summer and fall flowering plants. I could add species that provide pollen and nectar later in the season.
- Currently I have none of Dr. Tallamy's top caterpillar-producing plants. Find places to plant oaks, cherries, and willows. I discovered three large oaks in neighboring yards!
- I have two hunting-breed dogs. The possibility of ground and shrub nesting birds using the back yard is minimal. But the side and front yards could be developed.
- Two electrical outlets are located against the house. The bird bath and fountain need to be placed nearby to avoid running electrical cords across the yard. I could trip over them, the dogs could chew them, or the lawnmower could hit them.

Resources:

- The work of Dr. Doug Tallamy, entomologist, and author
- National Wildlife Federation: https://www.nwf.org/Garden-for-Wildlife/Certify
- Habitat Assessment Guide for Pollinators in Yards, Gardens, and Parks: xerces.org/sites/default/files/publications/19-038_01_HAG_Yard-Park-Garden_web.pdf

Project Ideas:

- Compile a chart of all of the plants currently on your property. List each plant individually, with columns for the type of food resources it offers, the time of year it produces food, and whether the plant is native, exotic, or invasive. You can also note any plants that are keystone plants, good for specialist bees, or provide exceptional cover or nesting habitat.

- Assess the results and make plans for future plantings. Look for areas that could be improved. For example, can you add more keystone plants or provide food at missing times of the year?

- Are there particular types of wildlife you are trying to support, such as Monarch butterflies, songbirds, or specialist bees? What plants and other resources can you add to help these creatures?

- Depending on space, time, and funds, developing the landscape may be a multi-year process. What are your priorities for each year?

- Compile a bloom chart for pollinators. Throughout the growing season, record when plants flower on your property from spring through fall. Early, peak, and late bloom can be challenging to gauge, so using a time span (such as early to mid-June) can make this easier. You can also use growing degree days from the Ohio State Phenology Calendar: https://weather.cfaes.osu.edu/gdd/ Which plants are most heavily visited by pollinators? Where are there gaps in your bloom sequence? What plants can you add to fill those gaps?

- Research plant options. Some good resources include:
  - The Seek photo app from iNaturalist helps identify plants. It works best when plants are in leaf.
  - The Native Plant Database from Lady Bird Johnson Wildflower Center gives cultural information and wildlife use of native plants, including value to native bees. https://www.wildflower.org/plants/search.php?search_field=&newsearch=true
  - Native Plants by Zip Code lists species native to your zip code and their ability to support caterpillars. www.nwf.org/nativeplantfinder/plants
  - The Plant Finder from the Missouri Botanical Garden provides horticultural information for over 7,500 ornamental and native plants. www.missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx

Shrink The Lawn

By Megan Lovejoy, Chadwick Volunteer

Shrinking the lawn is one way to create a wildlife friendly habitat on your own front step. By decreasing the size of the typical turf lawn you create more space to plant things such as fruit trees, native flowering shrubs, perennials and groundcovers. This allows more habitat for songbirds, pollinators and other wildlife to thrive.

A smaller amount of turf also means less maintenance from mowing, decreased use of pesticides for weed treatments, and decreased water usage during summer months. When you use native plants that are more suitable to the environment, they require less maintenance overall once established.

Some ways to shrink your lawn:

- Create a flower border by removing sod and spreading wildflowers
- Build a raised bed
- Stone pathways with ground covers
- Install a dry riverbed
- Install a pond or bird bath

Resources:

- *Planting in a Post-Wild World: Designing Plant Communities for Resilient Landscapes*, Thomas Rainer
- *The Complete Gardener: A Practical, Imaginative Guide to Every Aspect of Gardening*, Monty Don
- *Planting: A New Perspective,* Piet Oudolf and Noel Kingsbury
- *Redefining Curb Appeal,* Tom Oder : www.nwf.org/Magazines/National-Wildlife/2015/AprilMay/Gardening/Redefining-Curb-Appeal
- *The Incredible Shrinking Lawn: How to Create a Nature Friendly Yard* , Theresa Sullivan Barger: www.connecticutmag.com/home-garden/the-incredible-shrinking-lawn-how-to-create-a-nature-friendly-yard/article_3c721bb2-77b5-11eb-9127-7771235ded49.html

Remove Invasive Species

By Petra Schmalbrock, Ohio Certified Volunteer Naturalist

Invasive plants are non-native plants that displace our native plant communities.

- Native plants feed native populations of herbivorous insects. In turn, other insects, birds and mammals feed on them.
- Invasive plants have a competitive advantage. They have no local predators and often grow quickly on disturbed areas - leafing out before native plants.
- Invasive plants decrease biodiversity.
- In a landscape, invasive plants disrupt ecological succession, arresting the natural progression from field to mature forest.
- Some native plants are considered “aggressive” growers but are not actually invasive. They are early-succession pioneer plants that have evolved to grow aggressively initially to repopulate disturbed area but will be outcompeted by later plant communities. Examples are mare’s tail, goldenrod, blackberries, and black locust.
- There are non-native plants that are not invasive, e.g. dandelion, hybrid flowers. They don’t need to all be attacked and removed; but bear in mind, they don’t provide as much food for critters.

Resources

38 species of invasive plants that cannot be sold in Ohio, ***Ohio Department of Agriculture (ODA)***: agri.ohio.gov/divisions/plant-health/invasive-pests/invasive-plants

Invasive Plants of Ohio, ***Ohio Invasive Plant Council (OIPC)***
https://www.oipc.info/invasive-plants-of-ohio.html
https://www.oipc.info/uploads/5/8/6/5/58652481/oipcassessedplantlist-handout2019.pdf
The first link lists many invasives that you may find on your property and has pictures and factsheets of these plants. The second link scores the invasiveness of 70 species. The OIPC websites has information on their invasiveness scoring.

Booklet, “Plant Invaders of Mid-Atlantic Natural Areas,” descriptions and removal suggestions for invasive plants: www.invasive.org/alien/pubs/midatlantic/midatlantic.pdf

iNaturalist, a smartphone app can help identify plants. The more detailed website https://www.inaturalist.org/ has lots of information on where and how the plants grow and what plants look similar.

How to go about removing invasive plants on your property and how to prioritize the work:

Approach 1: Identify invasive plants by the referenced lists and remove them.
Pulling, digging and cutting are best because that is least disruptive for native plants nearby. Cutting plants before they go to seed reduces spreading. For plants with deep roots, and plants that can sprout from stems or remaining roots in the soil, cutting and daubing the cut stem with herbicide is needed, and avoids excessive herbicide use.

What about invasive plants you planted not knowing? For example, we have a 35-year-old Norway Maple that shades the south side of our house reducing AC usage, surrounded by vinca. We are keeping the Norway Maple lowering our carbon footprint, but are working on replacing the vinca with native ground covers. If you decide to keep invasive plants in your yard, at least stop them from spreading.

Pulling, cutting and digging works for a small urban lot - even though it may be a lot of work over a few years. What if you have some acreage that is infested with invasives?

Approach 2: Prioritize your work by thinking about how the plant community functions

- Try to prevent take-over such that the only management is by bulldozer and chemical warfare. It's always easier to at least cut invasive flowers before they go to seed. It's easier to remove invasive shrubs when they are small, rather than waiting until they require chainsaw cutting.
- Don't demonize some invasive species, study your plant community and try to find what invasive plants are most impeding your whole plant community, thus limiting diversity. This may help to find a location where to start removal.
- How can you improve your native plant community to give it better chance to out-compete invasive plants? What needs to be done to restore the ecological function of your plant community and to improve the food web? Find out the growth patterns of the invasive plants, how/when can you hit them when they are most vulnerable.
- What is your ultimate goal of restoring your landscape? Are you aiming to install pollinator habitat? Are you planning to let the land succeed to diverse mature forest? Deciding your goal may help prioritize where and how to start with removal of massive infestation of invasive plants.

And if there was not enough trouble with *invasive plants*, there is also a host of *invasive insects and diseases*. Here is one example: A conversation about Emerald Ash Borer - fun to read! mcewanlab.org/2016/04/30/an-invasion-biology-skeptic-meets-an-invasion-biologist-a-hopeful-dialogue/

Plant Keystone Genera

By Mary McMunn, Master Gardener Volunteer

key·stone spe·cies

noun
A species on which other species in an ecosystem largely depend, such that if it were removed the ecosystem would change drastically.

What do we mean when we say to plant keystone genera? It's really very simple. Plant natives!

Why? There are so many reasons! Just a few:

- They're a source of food (think nectar, pollen, and seed),
- They don't require fertilizer and pesticides.
- They help prevent erosion.
- They have a deep root system which means they require less water.
- They provide a source of shelter for the wildlife in your area.
- They are not considered to be invasive, which means they won't overtake other desirable plants in your garden.

Imagine your neighborhood in the summer, without lawn mowers and weedwhackers! Native plants don't require those nuisances because they require less maintenance. Less noise and air pollution and less carbon caused by the burning of fossil fuels is a huge benefit.

If you're ready to get started, here are a few tips to ensure success:

1. Take a look at where you want to put your natives. Is your yard full sun, all day? Do you have lots of shade? If you want your plants to thrive, make sure you know if they can tolerate the site where you intend to plant. How's the soil? Is it clay? Does it drain well? You may need to modify the soil in order for the plant to get established.
2. Plan for the weather. Plants don't like hot, dry July days when they're first getting established. Early spring or fall is the best time, on cooler days.
3. Soil tests are great way to determine if you need to add organic compost. Save yourself the time and expense of having to dig up dead or diseased plants by making certain your garden beds are in good shape, prior to planting.
4. There are lots of garden design ideas on the web. Find one that appeals to you. Consider adding a birdbath or tuck a small log for bees in your bed.
5. TLC will be rewarded with a beautiful garden, lots of birds and insects and a sense of accomplishment for you! Weed, weed, weed!
6. Plant variety if you can. Flowers like bee balm provide nectar for hummingbirds, asters provide seeds for songbirds, and some bushes produce berries. These are all great ways to keep food in your backyard year-round.

By researching and planning in advance, you're sure to have a beautiful and healthy garden that provides so much for all living species! Here are a few good resources to guide you:

- *Native Plants,*OSU Department of Plant Pathology: plantpath.osu.edu/nativeplants
- *Landscaping for Wildlife*, US Forest Service: www.fs.fed.us/wildflowers/Native_Plant_Materials/Native_Gardening/landscapingforwildlife.shtml
- *Lists of Native Plants*, Ohio Department of Natural Resources: ohiodnr.gov/wps/portal/gov/odnr/discover-and-learn/safety-conservation/about-ODNR/nature-preserves/Documents/native-plants-lists
- *Plants for Birds,* The Audubon Society: www.audubon.org/plantsforbirds

Interested in learning more about native plants in Ohio? There are many groups who offer terrific education opportunities (membership may be required):

- Midwest Native Plant Society: www.midwestnativeplants.org/
- Native Plant Society of Northeast Ohio: www.nativeplantsocietyneo.org/
- Ohio Native Plant Month: www.ohionativeplantmonth.org/

Asimina triloba, Pawpaw

Be Generous with Your Plantings: Increase Diversity, Abundance, and Natives

By Joe Carter, Naturalist and Volunteer Pollinator Specialist

In identifying what abundance and diversity mean, I thought of E. O. E. Wilson's, "the little things that run the world". What are the little things that Wilson is referring too? Insects.

Insects convert plant energy from the sun into protein and sugars that are then available to move through the energy food web. Insects are a keystone of our biosphere. Again quoting Wilson, "the biosphere does not belong to us. We belong to it." In thinking about our yards and wildlife, abundance is important to think about, including those "little things that run the world."

Insects are the most diverse group organisms ever to evolve with over four million species in the world. Insects can live without us - but we can't live without them. We need healthy insect populations to survive. Only native plants planted in abundance can provide us with the diversity that we need to convert the suns energy.

The best way to increase insect diversity in your yard is with native plants. You can start small but by keeping at it you can convert you garden into a food web powerhouse, never complete, always evolving.

Consider planting in layers to increase abundance. Also consider your soil health. Limit cultivation, the use of herbicides, pesticides, fertilizer, and leave the leaves. Many important functions of the energy food web take place in the soil.

If cost is an issue, consider growing you own native plants by starting a small nursery in your yard. Buy, collect or trade seeds with friends. Below, you will find a method that I use for germinating seeds that need stratification or you can find other methods that work for you. If you start some plants share them with your friends, family and community. Share what you have learned and know!

References:

Soil Science for Gardeners: Working with Nature to Build Soil Health, Robert Pavlis

Half Earth: Our Planets Fight for Life, Edward O. Wilson

Attracting Native Pollinators: Protecting North America's Bees and Butterflies, The Xerces Society

Germinating Native Seeds in Pots and Potting Soil

Use potting soil so you know what is germinating. Sow a few seeds in medium size pots in late fall November/December (soil temperature below 50 degrees). label pots well. Determine a sunny nursery area before potting.

Set pots in nursery area and cover with hardware cloth to keep squirrels from digging in them. Cover with leaves, burlap or landscape fabric for the winter.

No need to water as winter rain, snow, and cold temperatures will do the job stratifying the seeds. In early to mid-spring (mid to late March) remove the covers from the top of the hardware cloth as soon as you observe seed germination but keep covers handy and re-cover to protect from freezes.

Wait to transplant to a prepared garden bed when plants are established - usually June/mid - July or when you see roots coming out of the bottom of pots. Do not mulch! Watering will be needed for the first season.

Once a native plant is established it should not need watered as native plants often have very deep root systems. The plant usually will not grow to full size in its first season and may not flower in its first season. A few plants may even take two seasons before flowering. Native plants take very little maintenance once established, a weeding or thinning of more aggressive plants might be needed, but no mulching, watering or fertilizing.

By Joe Carter

Create or Enhance Natural Layers

By Lori Kingston, Master Gardener Volunteer

Overview:

Private landowners play an essential role in providing wildlife habitat. Providing a diverse selection of native plants in the landscape provides the essential elements of space, food, water, and shelter for many varieties of birds, insects, and mammals. When planning a garden or landscape that provides these elements, considering structure through the layering of plants is an important practice. Layering is the choosing and placing of diverse, native varieties of trees, shrubs, and smaller plants according to their *size* to produce conditions closest to that of nature.

Layers:

- Canopy layer: the tallest and most mature trees, usually 30 – 100 feet
- The understory: saplings, smaller flowering trees, vines and woody shrubs of between 12 and 30 feet
- Shrub layer: smaller, woody vegetation of up to 12 feet
- Ground layer: ephemerals, flowers, grasses sedges

For example, Canopy trees, both deciduous and evergreen, provide shade and wind protection, serve as host plants, food sources, and habitats for birds, insects, and wildlife. Low growing flowering shrubs produce nectar, berries, and seeds thereby providing food resources throughout the seasons. Creating soft edges where plants are arranged from tallest to lowest provides habitat for birds. Ground level plantings are often intended to attract pollinators. A thicket of native woody shrubs will draw birds to gather for food and protection.

Enhance what you already have by infilling between layers that already exist. Create dense patches of ground level plants instead of using mulch between plants. Plant low ground layers under canopy trees. The more an individual property incorporates these layers with a diversity of plants, the more wildlife it will attract.

Resources:

- Buckeye Yard and Garden Line, Ohio State University: bygl.osu.edu
- Landscape for Life™: a collaboration between the Lady Bird Johnson Wildflower Center and the United States Botanic Garden: landscapeforlife.org/plants/gardening-for-wildlife
- *The Living Landscape*, Rick Darke and Doug Tallamy

Plant for Birds and Pollinators

By Anna Williamson, Chadwick Arboretum Horticulturist

Overview:

Incorporating native plants in the garden is essential for supporting bird and pollinator populations. Native plants provide food and shelter for many native species, who in turn support the plants. Pollinators rely on plants to lay eggs, feed, and hide themselves from predators. Birds rely on the plants as a food source for both insects and seed. Certain plants support specific functions for specific pollinator species, such as monarchs laying their eggs only on milkweed, while others are more generalists.

When selecting plants to incorporate into the garden, consider not just the look of the plant, but also the functions it can provide to wildlife, such as birds and pollinators.

Plant for Specialist Bees

By Kathy Burkholder

What Are Specialist Bees?

All bees require pollen to feed their young. Specialist bees collect pollen from a limited number of plant species, usually plants that are closely related. Some specialists will only use one plant species. In contrast, generalist bees visit a wide variety of plants. The OSU Bee Survey estimates that about 25% of bee species in Ohio are specialists.

Why Should I Plant for Specialist Bees?

Specialist bees have evolved to use local, native plants. They are especially vulnerable to population declines when habitat loss depletes their food sources. Generalist bees will use the same plants that are favored by specialist bees, so you can help both types of bees by planting for specialists.

What Do I Plant for Specialist Bees?

For lists of plants used by specialist bees, see the following resources:

- *The Guide to Specialist Bees of Ohio*, The Ohio Native Bee Collaborative: cpb-us-w2.wpmucdn.com/u.osu.edu/dist/2/86606/files/2021/04/GuidetoSpecialistBeesofOhio_2021.pdf
- Host Plants for Pollen Specialist Bees of the Eastern United States, Jared Fowler: jarrodfowler.com/host_plants.html

Project:

Conduct a site analysis of your property's pollinator value using the "Xerces Society Habitat Assessment Guide for Pollinators in Yards, Gardens and Parks." What can you do to improve your property for pollinators?

xerces.org/sites/default/files/publications/19-038_01_HAG_Yard-Park-Garden_web.pdf

Resources:

- *Specialist Bees Need Special Plants,* Virginia Native Plant Society: vnps.org/specialist-bees-need-special-plants/
- *Creating a Pollinator Garden for Native Specialist Bees of New York and the Northeast*, Cornell Botanic Garden: pollinator.cals.cornell.edu/sites/pollinator.cals.cornell.edu/files/shared/documents/Creating%20a%20Pollinator%20Garden%20for%20Specialist%20Bees_FINAL_071620_.pdf
- *Pollen Specialist Bees of the Eastern United States,* Jarrod Fowler: jarrodfowler.com/specialist_bees.html

Build a Conservation Hardscape

By: Lori Kingston, Master Gardener Volunteer

Hardscape is defined as the man-made features within a landscape. Not exclusive to concrete patios, sidewalks, or paved paths, hardscape also includes fences, fountains, gazebos, water features, decks, outdoors lights, and any other introduced feature that is not vegetation.

Using conservation hardscape practices can support and protect many species of wildlife.

Some types of conservation hardscape include:

Rocks, boulders, logs

Piles of small rocks or logs of 3 – 6 inches in diameter can provide shelter to bees, toads, insects, and beneficial predators. They also can create a microclimate in your garden by maintaining cool, wet soils, and provide ground level shade. Decaying wood returns organic material to the ground and provides a food source for some insects.

Water features

One of the necessary elements of a wildlife sanctuary is a water source. Water features range from ponds, to manmade "creeks," to a small rock lined pool with a bubbler, or a birdbath with a solar powered pump that creates the gurgling sound so attractive to birds.

When choosing a water feature, be sure to provide one with a surface where birds can comfortably perch and isn't too deep for them to drink from (.5 to 1 inch depth is best) . Bees and butterflies also need a water source and benefit from a very shallow container filled with saturated sand, gravel, or dirt and a few small stones to create small puddles. The stones provide a perch to sit while drinking. It is important to practice consistent maintenance of water features to mitigate disease and to prevent mosquito infestation.

Homes.

Install nest boxes specific to the kind of bird you observe in your landscape or want to attract. Adding a bat house to your landscape requires the proper size and placement but could serve to house these important mosquito eaters, and in some locations, pollinators. A bee hotel is another shelter that can be provided.

Permeable paving materials

Bricks and permeable pavers or stone with space between each or stepping stones surrounded by ground cover all allow water to be absorbed into the surrounding soil thereby reducing runoff. Additionally, the amount of heat that radiates from broad areas of hardscape can also be reduced by using these materials. Mulch or gravel paths provide the same benefit as other permeable surfaces, with mulch returning organic material to the soil. Consider all options when planning paving or paths in your landscape.

Lighting.

Outdoor lighting, particularly spot and security lighting that is left on for hours after dark draws and kills beneficial insects, particularly moths. Install outdoor lighting with motion sensors to maintain security without harming night-flying insects.

Resources:

The Cornell Lab of Ornithology, Allaboutbirds.org

Welcome all life stages: Eggs, Larvae, Pupae and Adults

By Zoe Eads-Scofield, Chadwick Arboretum Horticulturist

Why care about insects?

Insects are the most abundant animals on earth and are overall enormously beneficial. Insects pollinate plants and provide food for birds, fish, and mammals. Many beneficial insects prey on other insects that are pests. By studying insects, we gain a better understanding of their role in the web of life, as indicators of environmental quality, as predators of harmful species, and as potential threats to crops, homes, and health. Through the study of insects, we help to preserve beneficial species by understanding their behavior patterns and modifying their habitat.

Despite this, by in large people know next to nothing about the most diverse group of organisms ever to evolve and what they do know comes from negative encounters with a few species. Crop-devouring caterpillars may transform into a beautiful luna moth or a monarch butterfly, which is why it is so important to know how to create and sustain environments in which all life stages of insects can develop and grow.

How to care for insects of all life stages:
To memorize the specific metamorphic needs of each potentially beneficial insect in your yard would be unrealistic for the average homeowner, so a good rule of thumb is this: Be a lazy gardener.

This might be a hard rule to follow for some, but it is one of the best things you can do for the butterfly and moth species overwintering in your yard. Caterpillars can improve their chances of reaching their butterfly stage when we refrain from mowing, raking, digging, and removing leaf litter in the vicinity of their host plants. Many moths are earth pupators, meaning they are in the leaf litter or just below ground with no cocoon to protect them, which is why it is important to leave leaf litter and brush piles in place.

Another important practice is to check before you prune or to avoid pruning until the spring. Certain species of caterpillars overwinter in leaf shelters attached to the stems of plants or inside the stems themselves. Other species of butterflies spend their winter in a chrysalis that looks like a stick and is secured to sturdy stems, pots, decks, lawn furniture, and more. Overall, one of the most beneficial practices for beneficial insects is to adopt low maintenance landscaping.

Resources:

- *Insects:* University of Missouri Extension: extension.missouri.edu/publications/mg12

Integrated Pest Management

By Kathy Burkholder

What is Integrated Pest Management (IPM)?

"Integrated pest management (IPM) is an approach to managing pests that seeks to limit or suppress pest populations by using a variety of compatible tactics that minimize potential harmful effects on human health and the environment. Chemical controls (e.g., insecticides) are used only as a last resort.

The concept of IPM was first developed in the late 1950s to address environmental issues caused by the overuse of chemical controls. Indiscriminate insecticide use for insect pests had led to widespread non-target effects and the development of insecticide resistance, resulting in crop failures. While IPM was originally developed to address insect problems in agricultural systems, the basic approach can be applied equally to pests in the broader sense, such as weeds, nematodes, and plant pathogens (i.e., disease-causing organisms) in smaller-scale home gardens."

From: Integrated Pest Management (IPM) for Home Gardeners, New Mexico State University: https://aces.nmsu.edu/pubs/_circulars/CR655.pdf

IPM treatment methods generally fall into the following categories:

- Cultural
- Mechanical and Physical
- Biological
- Chemical

Resources:

- *Protecting Pollinators While Using Pesticides,* OSU OhioLine FactSheet: ohioline.osu.edu/factsheet/anr-68
- National Pesticide Information Center: npic.orst.edu/pest/gardenipm.html
- *The Risks of Pesticides to Pollinators*, Xerces Society: www.xerces.org/pesticides/risks-pesticides-pollinators
- *Protecting and Enhancing Pollinators in Urban Landscapes*, Michigan State U. Extension Bulletin: www.canr.msu.edu/uploads/236/78920/ProtectPollinatorsInLandscape_FINAL-HigherRes.pdf
- *Managing Invasive Plants: Methods of Control*, The New England Wild Flower Society extension.unh.edu/sites/default/files/migrated_unmanaged_files/Resource000988_Rep1135.pdf
- Invasive Plant Fact Sheets, Ohio Invasive Plants Council (for removing specific plant species) www.oipc.info/invasive-plants-of-ohio.html
- *Natural Organic Lawn Care*, OSU Extension: ohioline.osu.edu/factsheet/hyg-4031

Educate your Neighborhood and Network with Neighbors

By Anna Williamson and Zoe Eads Scofield

Supporting wildlife doesn't work if only one backyard in a neighborhood participates. The effort must be collective to improve conditions for our native species and ensure their survival. To do this, networking with and educating neighbors is vital. Explain the benefits of gardening for wildlife and show that native plants can be beautiful in a landscape. Place a sign in your yard for your neighbors to see. Encourage your neighbors to plant diverse species that flower at different times. Creating a neighborhood of diverse native plants, trees, and shrubs will do more to promote biodiversity than a singular backyard.

A strong community benefits individuals, the community itself, and the greater society. People of all ages who feel a sense of belonging tend to lead happier and healthier lives, and strong communities create a more stable and supportive society.

Some ways in which we can help to build relationships within our communities while simultaneously educating our neighborhood include gardening and horticultural outreach. Gardening is an easy activity that helps to bring people together while instilling valuable hands-on knowledge. Some potential ways to implement a gardening program in your neighborhood would be to volunteer, meet your neighbors, visit local farmers markets, organize or attend a neighborhood or community party, and make an effort to meet newcomers to your community. Once you have a strong rapport within your community you can then begin to establish horticultural lessons and activities that will help to bring people together while educating your neighborhood on the importance of various ecological practices.

Resources:

- *Embracing Your Community:* Penn State Extension, extension.psu.edu/programs/betterkidcare/early-care/tip-pages/all/embracing-your-community
- *Where Can I Buy Ohio Native Plants and Support Ohio Growers?* www.ohionativeplantmonth.org/native-plant-sources
- *The Smithsonian: Meet the Ecologist Who Wants You to Unleash the Wild on Your Backyard*, www.smithsonianmag.com/science-nature/meet-ecologist-who-wants-unleash-wild-backyard-180974372/

Add Your Square Footage to the Map

Homegrown National Park™ is a term coined by Doug Tallamy and is the key to his call-to-action:

"Our National Parks, no matter how grand in scale are too small and separated from one another to preserve species to the levels needed. Thus, the concept for Homegrown National Park, a bottom-up call-to-action to restore habitat where we live and work, and to a lesser extent where we farm and graze, extending national parks to our yards and communities."

THE MAP is an interactive community-based visual that will show each person's contribution to planting native by State, County and Zip Code.

There will be a gauge showing progress towards the goal of 20 million acres of native planting in the U.S.

Importantly, the map is a way for individuals to see their part in the greater whole – creating new ecological networks and restoring biodiversity.

Find the link to add your square footage to the map here: homegrownnationalpark.org/

Submit your Project for a Chadwick Arboretum Backyard Wildlife Certificate

Write up your plan of action to add the elements above to your landscape. Include a timeframe and be as specific as possible. When you have finished, use this form to send in your plan to Chadwick Arboretum's Review Team: **go.osu.edu/wildlifecertificate**

Please allow three weeks for our reviewers to look over your project once the Tending Nature Course has completed. For completing this project, participants will receive a PDF certificate that they can print and frame if they would like and a 1-year membership to Chadwick Arboretum & Learning Gardens.

To learn more about the benefits of membership, please visit: chadwickarboretum.osu.edu/become-member/benefits-membership