ON THE COVER:
Blue mistflower (*Conoclinium coelestinum*) and black-eyed Susan (*Rudbeckia hirta*) can be seen in bloom nestled among purple lovegrass (*Eragrostis spectabilis*). Photo by Andrea England.

Landscapes designer Andrea England created and photographed the meadow pictured on the cover. In designing the meadow, she used a matrix of grasses and perennials, and tucked small repeated groupings of wildflowers into the mix.

When creating a meadow, Andrea suggests using 50% ground cover plants (grasses and perennials with some mostly evergreen basal foliage), 25% plants for seasonal color, 5-15% structural (taller) plants and 10% filler plants which come and go quickly. Make sure to choose plants so something is blooming all year long. For more photos of Andrea’s meadows and information on how to create a meadow in your home landscape, see Craig Huegel’s article *Planting a Wildflower Meadow* on page 4.

Florida Wildflower Foundation and Florida Native Plant Society Forge a Formal Partnership

Two of Florida’s leading native habitat conservation organizations have strengthened their partnership in order to collaborate on future projects.

The Florida Wildflower Foundation (FWF) and Florida Native Plant Society (FNPS) formalized their longtime partnership by signing an agreement on June 6 to work in tandem for the good of native, natural Florida. The organizations will continue to pursue their own goals while collaborating on projects compatible with their missions.

“Putting this agreement in place is an exciting step,” said FWF Executive Director Lisa Roberts. “Our organization has worked with individual FNPS chapters for years to provide educational opportunities, demonstration gardens and more. Now we will join with FNPS’ state leadership to pursue projects that are within both of our missions. It’s a win-win for native, natural Florida.”

“This Memorandum of Understanding acknowledges the long-standing partnership of the Florida Native Plant Society and the Florida Wildflower Foundation. FNPS and FWF have worked to save Florida native plants from the bulldozers as roads and other development are bearing down on native plant habitat; we’ve worked to help local governments write and approve resolutions aimed at protecting Florida native plants found on roadides from over-mowing. FNPS is pleased to expand this relationship even further to enable us to preserve, conserve and restore Florida native plants and plant communities,” said Juliet Rynear, FNPS Executive Director.

FWF protects, connects and expands native habitat corridors across Florida through education, planting, conservation and research projects. FNPS, which has 33 chapters throughout the state, preserves, conserves and restores native plants and native plant communities. The organizations will assess opportunities to work together on such initiatives as native plant surveys, monitoring and seeding, as well as the promotion of native plant conservation and restoration along roadisdes and within utility corridors.

The FNPS Legacy Society was established to thank and recognize friends and members who wish to offer their support through deferred gifts to special programs, the endowment or the permanent assets of FNPS. The following individuals have remembered FNPS in their will or estate plan and established a legacy of support for FNPS.

Janet Bowers ● Shirley Denton
Laraine Deutsch
Devon Higginbotham
Marlene Rodak ● Cornelia McNamara
Anonymous ● Anonymous
Anonymous

Three popular bequest options are to leave a percentage of your estate after making provisions for family and friends; leave a specified sum of money; or leave a particular piece of property. Many other options, which provide you with numerous tax benefits, exist for legacy giving. It is important to explore options with your financial planner so that both you and FNPS receive the full benefit of a legacy gift.

If you would like to become a member of the FNPS LEGACY SOCIETY, please contact Juliet Rynear, FNPS Executive Director, at 228-238-4657 or executivedirector@fnps.org
MEMBERSHIP
Make a difference with FNPS
Your membership supports the preservation and restoration of wildlife habitats and biological diversity through the conservation of native plants. It also funds awards for leaders in native plant education, preservation and research.

Memberships are available in these categories: Individual; Multi-person household; Sustaining; Lifetime; Full-time student; Library (Palmetto subscription only); Business or Non-profit recognition.

To provide funds that will enable us to protect Florida’s native plant heritage, please join or renew at the highest level you can afford.

To become a member:
Contact your local chapter, call, write, or e-mail FNPS, or join online at www.fnps.org/join

The purpose of the Florida Native Plant Society is to preserve, conserve and restore the native plants and native plant communities of Florida.

Official definition of native plant:
For most purposes, the phrase Florida native plant refers to those species occurring within the state boundaries prior to European contact, according to the best available scientific and historical documentation. More specifically, it includes those species understood as indigenous, occurring in natural associations in habitats that existed prior to significant human impacts and alterations of the landscape.

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Features

4 Planting a Wildflower Meadow
In the previous issue of Palmetto, Craig Huegel wrote about native grasses and his thoughts on wildflower meadows in general. Here, he shares his experiences in designing, installing, and managing a meadow of native plants.
Article by Craig Huegel.

8 Paper Wasps as Pollinators
Paper wasps are intelligent, complex, good-looking, and docile if you don’t provoke them. They are also pollinators, visiting the flowers of corkwood goldenrods, milkweeds and more.
Article by George Rogers.

9 Soil: The Ecosystem Beneath Our Feet
Soil is a complex ecosystem of bacteria, fungi, nematodes, earthworms, ants, salamanders, toads, insect larvae, moles, and more, all living in a substrate of minerals and humus. Learn how soil works, why conventional lawn care can damage it, and how it can be restored.
Article by Ginny Stibolt.

12 Book Review
In his new book, Nature’s Best Hope, Dr. Doug Tallamy has delivered a deep and powerful wellspring of inspiration for the many people craving an opportunity to be part of transformative change for our challenged world.
Review by Sue Dingwell.
Planting a Wildflower Meadow

In the previous issue of Palmetto, I wrote about native grasses and my thoughts on wildflower meadows in general. Here, I share my experiences in designing, installing, and managing a meadow of native plants.

Designing a Meadow

Although natural meadows (i.e. prairies) look random, they are not a random assortment of plants. The grasses and wildflowers present at any one time are the result of environmental conditions such as hydrology, rainfall and fire frequency – what ecologists call abiotic factors. Such factors are rarely constant in nature and subtle changes in any or all of them play an important role in determining what plants are present or absent. What you see as you look at a patch of natural meadow is a snapshot of the area’s abiotic factors at work. With a trained eye, you can make pretty good predictions about each patch’s site conditions by what is growing there – and you will notice these assemblages repeated over and over whenever specific conditions occur.

Above, left to right: This meadow was planted in July 2019 with butterflyweed (Asclepias tuberosa), Florida greeneyes (Berlandiera subacaulis), Maryland goldenaster (Chrysopsis mariana), lanceleaf tickseed (Coreopsis lanceolata), purple lovegrass (Eragrostis spectabilis), stiff sunflower (Helianthus radula), shortleaf gayfeather (Liatris tenuifolia), black-eyed Susan (Rudbeckia hirta), azure blue sage (Salvia azurea), lyreleaf sage (Salvia lyrata), and helmet skullcap (Scutellaria integrifolia). One year later, Maryland goldenaster and Florida greeneyes have reseeded and the grasses and wildflowers have begun to fill in. Photos by Andrea England.

Spring and fall views of a meadow show how blooming changes with the seasons. In the spring, black-eyed Susan (Rudbeckia hirta), softhair coneflower, (Rudbeckia mollis) and helmet skullcap (Scutellaria integrifolia) are in bloom. During the fall, purple lovegrass (Fragrois spectabilis), Chapman’s gayfeather (Liatris chapmanii), spotted bee balm (Monarda punctata), stiff sunflower (Helianthus radula), and split leaf bluestem (Andropogon ternarius) stand out. Photos by Andrea England.
All of this is important as you design your own meadow. It is paramount that you understand your site conditions. You need to choose plants that will work together as a community. This does not mean all the plants you select must grow together naturally in the wild – just that they are adapted to similar conditions. Few of us get the chance to landscape areas where we need to consider the fire ecology of our plantings and for the vast majority of us it is virtually impossible to significantly modify the hydrology. What all of us can evaluate up front are sunlight and soil conditions.

Sunlight and Soil

Meadows – everything from open marshes to dry prairies, almost universally occur in full sunlight. Plants feed on sunlight and meadow plants are generally voracious feeders. You can sometimes force a plant to survive in suboptimal light conditions, but it will rarely flower and grow the way it’s supposed to. Plants that don’t get enough light eventually weaken and perish before their time. If your goal is to make a diverse collection of native grasses and wildflowers, choose an area that gets ample sunlight – a half day or more.

You’ll also want to understand your soil conditions and realize these might change in different parts of your property. As a transplanted Midwesterner, I came to Florida believing that all my landscaping projects were occurring in sandy soil. Over the years, I’ve come to understand there are a lot of important nuances in the definition of sand. The sands of Florida scrub and sandhill are generally “pure” sand. Pour a cup of water on them and the water disappears faster than my bank balance during a good plant sale. None of my former landscapes had sands that acted that way. When they were dry on the surface, they were often dry many inches below that too. When I watered these soils, water would stand on the surface for minutes without soaking in, or it would flow off the surface to a different spot at a slightly lower elevation. This is because areas once covered by turf grasses or ruderal plants build up organic particles and dry organics repel water until they are fully saturated. They also hang on to the water once they are wet and impede the natural exchange of oxygen necessary in the root zone for plants to breathe. It is difficult to adequately change the percolation rate of soils so it is important to work with what you have. Do not use plants (like many of our scrub species) in areas that stay too wet during the rainy summer months or choose plants that can’t possibly get the moisture they need in the drier months of April and May. Select a palette that has similar sun and moisture needs and your chance of long-term success will be greatly enhanced. There are other abiotic factors like soil pH that can play a role, but I’ve never found them to be even marginally as important in a meadow planting as soil moisture and sunlight.

Selecting Plants

Once you’ve chosen your site and understand the abiotic factors, choose the right plants for these conditions. This is a deeply personal endeavor. Plants should function together as a community in your specific site conditions, but they also need to satisfy your goals and personal aesthetics.

As I discussed in the previous issue of Palmetto, different pollinators have different habitat needs and host plants. All meadows should rely heavily on native grasses to provide the structure and habitat natural meadows are known for. What grasses you select will depend on soil moisture, the size of your planting area and the habitat requirements of the wildlife you wish to provide for.

Most natural grass-dominated meadows have a mixture of native grasses and each has a role to play. Short grasses, like the lovegrasses (Eragrostis spp.), wiregrasses (Aristida spp.) and dropseeds (Sporobolus spp.) provide important structure to wildflowers and stay low enough to not compete with them for space and sunlight. Few, however, serve as hosts for grass-dependent butterflies. That role is taken up mostly by taller bunch grasses such as bluestems (Andropogon spp.) and Indiangrasses (Sorghastrum spp.). These grasses are some of our showiest species, but they will take up space and should be used judiciously. I like to plant these in small clumps of not more than 5 per clump, and in clumps no closer than 3 feet apart. In smaller landscapes I don’t plant more than 3 per clump. In large acreages it would be sensible to plant clumps of grasses in larger aggregations. Small grasses can be planted denser and closer together.

In a way, the wildflowers you select are less important than grasses are. Very few native wildflowers are wind pollinated. Instead, they attract the attention of native bees, butterflies, and other pollinators. Some, like milkweeds (Apocynaceae) and members of the carrot family (Apiaceae) serve as host plants, so it is important to match these types of wildflowers with your personal goals of helping specific butterfly or moth species.

Blooming Season, Flower Color and Shape

When selecting wildflowers, an important consideration is blooming season. A fully functioning wildflower meadow, like in nature, will have flowers to pollinate for the greatest number of months possible. As your landscape progresses through the seasons, different wildflower species will come and go, but something should always be blooming to provide nectar and pollen. A few, like Spanish needles (Bidens alba), seem to be in bloom forever, but most have distinct flowering seasons. Information on blooming season is widely available and is best augmented by field trips to natural areas in your vicinity to see what is blooming as the seasons change.

Wildflowers in natural areas have a wide diversity of different colors and shapes. The truth is, there is no universal wildflower designed for pollinators and there shouldn’t be. If you watch an area of wildflowers long enough, you are likely to see that different pollinator species tend to segregate themselves from others by the flowers they spend the most time on. Bees tend to prefer yellow flowers while butterflies like purple and blue. Hummingbirds prefer red flowers, but there are a great many exceptions. What is almost universal, however, is that most pollinators prefer to get more bang for their buck by using flowers that are closely clustered together and simple in flower structure, seeking out lots of floral tubes in a short
flight distance. This is one reason why nearly everything in the Asteraceae is a wonderful choice for wildflower gardens.

Installing a Meadow

Once you’ve selected your location and decided on which plants to use, it is time to consider the installation itself. For most people, the selection process is what holds all of the interest. Very few of us get to create our landscape on a blank palette of native soil – most have to first remove a covering of turf grass and/or ruderal weeds. Removing the covering of any nonnative area exposes both native and nonnative weed seeds. Weeds are simply plants biologically designed to grow rapidly in recently disturbed soils and they persist by dispersing large numbers of seeds. As superb competitors, they will overwhelm everything else, and left alone, you will always have them in large numbers. Weeds must be dealt with harshly if you want diversity and a balanced community of native wildflowers and grasses. This includes weedy species such as horseweed (Conyza canadensis), dogfennel (Eupatorium capillifolium) and yes, even Spanish needles. It matters little if these are native or not, or whether they have some pollinator value. I’ve tried leaving Spanish needles alone in a mixed planting, but over time, it always crowds out everything else. I’m glad it grows across the street on the roadside, but I don’t need it in my planting areas.

You cannot rush a planting if you want it to succeed. You need to remove the existing turf and then weed the bare soil assiduously for whatever time it takes. There are many ways to reduce turf and weeds. What you choose to do depends largely on your personal philosophy and your time and physical limitations. In my new landscape of 18 x 36 feet, I removed the surface vegetation by using a spade. This required a lot of exertion, but I chose not to use herbicides. In large areas like the wildflower meadow I’m installing at Rosebud Continuum, they are often necessary to some extent. Some people choose to solarize their area by covering it with black plastic and burying that with a deep layer of mulch. Regardless, once the soil is exposed, weed seedlings will grow in the bare soil. These need to be pulled as quickly as they appear or they will rapidly mature, produce more seed, and you will soon be left with what you started with. Creating a meadow requires a great deal of commitment.

Even in my relatively small meadow at home, I chose to do the installation in steps. Over the years, I have found it to be most effective to tackle parts of the meadow planting, get it under control and then move on to the next section. Once each section was relatively weed-free and devoid of most of the weed-seed bank, the plants I added were able to prosper and their growth helped to keep future weeds from entering.

A natural meadow setting soon finds its own equilibrium regardless of how you plant it, but you need to put the original pieces in place first for this to happen. Most, if not all, of your new plants are best incorporated in groupings. Create the basic framework with grasses. They should be planted first to provide the structure that will persist over time, then plant wildflowers into the spaces between them. If you plant wildflowers in clusters to start with, they will be pollinated more effectively. Some reseed easily and these will move around quickly. Species such as common tickseed (Coreopsis leavenworthii) and black-eyed Susan (Rudbeckia hirta) are always staples in my wildflower plantings, but they find their own spots once they mature and set seed. Some, like Stoke’s aster (Stokesia laevis), will grow outward from their basal leaves and fill the areas around them. Others, like butterfly milkweed (Asclepias tuberosa) rarely reseed in my garden, so I plant them in the locations where I want them to grow. Take some time to learn the habits of your plants before you plant them.

Planting is best done in the cooler winter months or after the summer rains become regular to keep the soil moist. It is very difficult to plant during the typically hot and dry months of April and May. I prefer to plant established plants. Many of the best can be found at native plant nurseries and these folks are the people that share our commitment. I support them whenever I can. Planting seeds directly into bare ground seems to be an inexpensive approach, but most seeds in nature do not develop into mature plants. Some do better than others, but even then I suspect that fewer than 10% will mature. Planting plants requires some investment up front, but it is not necessary to plant the entire area that way. For example, I added savanna blazing star (Liatris savannensis) to a wildflower area in my former landscape. I started with six plants I had grown from seed. Within three years, I had at

Continued on page 15
Paper wasps (Polistes spp.) are beautiful pieces of creation: intelligent, complex, good-looking, and docile if you don’t ask for it. I’ve spent hours around them in two contexts, botanizing and engaged in home maintenance. About once a decade I’ve been stung from the same cause – grabbing a branch to show flowers to students on a field trip, only to find the branch preoccupied. With a whole class watching, there’s no profanity. If somebody grabbed me I’d sting too, and the wasp’s sting isn’t ferocious, unless the recipient has an allergy.

Some folks may dislike paper wasps as predators. As the sweating co-digger in a home butterfly garden, I do wish they did not consume nice caterpillars, but then again, wolves consume nice deer, and we consume nice cows. By the way, the green lynx spider turns the tables, lurking on flowers and catching pollinators, having a special fondness for a tasty Polistes treat.

You’d be surprised how poorly studied paper wasps are, due largely no doubt to the inconvenience of their lifestyles – nesting naturally in hard-to-visit habitats, roaming long distances, and not universally regarded as charismatic. Most research is centered on their nesting on residential structures – they need wood to chew and form into their papery umbrella-shaped nest.

The nutritional habits of paper wasps are complex and odd. They haul caterpillars and other victims back to the nest to feed larvae. The foraging wasp to some extent consumes, softens, and partially predigests the prey, regurgitating the glop as baby formula.

Continued on page 14
Soil is so much more than just dirt

Soil found in native habitats is a complex ecosystem of bacteria, fungi, nematodes, earthworms, salamanders, ants, toads, insect larvae, moles, and more, all living in a substrate of minerals and humus. The minerals are a mixture of rocks, sand, silt, and/or clay. The humus or organic matter consists of fully or partially digested plant and animal parts. As humus is broken down into simple compounds, it provides a living for decomposers, and eventually yields nutrients for plants.

One gram of healthy, non-poisoned soil (about 1/5 teaspoon) could contain one hundred million bacteria, one million actinomycetes (a special type of bacteria that provide the signature “good-soil” smell), and one hundred thousand fungi – if strung together, their filaments or hyphae would measure about 16 feet in length. This same gram of soil could also contain hundreds of nematodes living on the damp surfaces of soil particles, maybe a few insect eggs or larvae, and some earthworm cocoons. The exact proportions of each of these organisms will depend on soil conditions such as acidity, moisture, aeration, amount of humus, and what’s growing above the soil.

Soil acidity is measured on the pH (potential of Hydrogen) scale, with a pH of 1 being most acidic and a pH of 14 being most alkaline. Most plants grow well in a slightly acidic soil with a pH between 6 and 7, but some plants are adapted to highly acidic soils and other plants thrive in alkaline soils. Chemical conditions including acidity will change the balance of organism populations. Fungi are more plentiful in acidic soils, while actinomycetes and other bacteria prefer more alkaline conditions.

You cannot readily change the nature of your soil for the long run. So it’s best to live with the soil chemistry you have and to find native plants that occur naturally in such soils. Test the soil so you know which plants will work best in your yard. Soil test kits are available online, at the local extension office, or in local garden shops. For general landscape uses, test the soil for acidity and macro- and micro-nutrients; in urban areas, you should also test for heavy metals or other toxins. Sample the soil in several places to obtain a good average of the soil for testing.

Soil texture is determined by its relative portions of sand, silt, and clay particles. These proportions are also not easy to change. Although it seems logical, you should not add sand to a clay soil because you are likely to end up with a cement-like material. You can improve soil structure whether it is sandy or clayey by adding compost, but in a native or mostly native
landscapes, use compost made from local materials with no added manure.

Don’t use peat moss to amend your soil. There is no sustainable way to harvest peat. It takes hundreds of years to form under special anaerobic conditions, and efforts to restore mined peat fields results in more CO2 being released than sequestered. While peat moss adds humus and absorbs moisture, it is extremely acidic and provides virtually no nutrients. A viable substitute might be coconut coir, a by-product of the coconut industry. Absorbent and neutral in its acidity, coir also provides nutrients. The one big drawback of coir is its transportation footprint, because most of it is produced in Indonesia.

You can get some idea of what your native soil might have been before development by consulting the detailed soil maps available online and at your local extension office. The FNPS website has a detailed resource on the various native plant communities which could give you a good idea of what type of plant community might have been in your location (http://fnps.org/natives/native-plant-communities). This could provide a guideline for what to plant. In many Florida neighborhoods, non-native soil was imported for fill as part of the development process, especially in low-lying areas. So there may not be any truly native soil present in your landscape.

You may try to plant native varieties from your area, but your landscape, use compost made from local materials with no added manure. However, no matter what the soil is, you can still host a great native plant community in your yard.

The workings of a soil ecosystem

Whenever a seed germinates in healthy soil, the microbial community is activated because the seed secretes its chemical signals into the soil. Genetic information is exchanged; the various microbial players assume their positions on the tissues of the plant. Sometimes the microbes are nitrogen-fixing bacteria such as rhizobia that form root nodules on legumes, which help them to grow well in poor soil. But more often it is a mycorrhizal fungus that forms a symbiotic relationship with the roots. These collective relationships are called mycorrhizae.

Mycorrhizae work because the fungi colonize the root system of a host plant, providing increased water and nutrient absorption capabilities while the plant provides the fungus with carbohydrates formed from photosynthesis. Mycorrhizae sometimes offer the host plant increased protection against certain pathogens.

Approximately 90% of all vascular land plants live in some association with mycorrhizal fungi. Mycorrhizal fungi are often divided into two groups: the ectotrophic, which do not penetrate the roots cells, and endotrophic fungi that actually penetrate and enter the root cells.

Soil and climate change

Most of us know very little about the soil beneath our feet, and we humans have treated soil carelessly for millennia. More recently, we have finally come to appreciate the complex and valuable role that soils play, both in the way plants grow in it and in soil’s capacity to absorb excess carbon dioxide (CO2) from the atmosphere. Soil sequesters about four times more carbon than forests and all other vegetation making soil the second largest CO2-absorbing medium, after oceans. CO2 is a greenhouse gas and more of it in the atmosphere increases overall temperature averages. Unfortunately, as temperatures rise globally, soils emit more CO2, which in turn increases temperatures.

While some soils in tropical rainforests are deep peat-like materials, most rainforest soils are only a few inches deep and have low nutrients due to weathering and high microbial activity. Despite the dense vegetation of the rainforest, warm temperatures mean the collective metabolism of the soil ecosystem is high and soil humus breaks down very quickly, releasing CO2 into the atmosphere. The huge volume of rain in these ecosystems also rinses nutrients from the soil. This is why slash and burn treatment of tropical rainforests is short-sighted, because land uses such as cattle pastures use up the soil quickly when no rainforest is left to rebuild it.

Soil scientists have extrapolated the findings from tropical rainforests to other areas. They’ve observed that more CO2 is emitted from soils as temperatures rise and have explained this finding by the increased activity and respiration rates of microbes and other soil organisms. However a recent study shows that when drier soil is heated the microbes’ activity rates slow down. Nico Eisenhauer, the senior author of the study states, “It is most likely that instead of soil animals and microorganisms, the plants are responsible for the feedback effect because they also breathe with their roots. In order to improve the validity of climate models, we now urgently need to understand the biological processes in the soil better.” To read more about the study, see “Climate change: Soil animals cannot explain self-reinforcing effect” online at www.sciencedaily.com/releases/2017/12/171221101332.htm

This is how science works. Scientists explain a phenomenon with what is known at the time and then others perform experiments and do studies to confirm the explanation or not. If further studies do not confirm the explanation, then others will perform more studies, and eventually a new explanation will be formed. Science is fluid and adjusts to new findings.
Fungi must absorb their food externally, and thus, they can easily absorb elements from the soil. Plants often have difficulty obtaining and absorbing major nutrients such as nitrogen and phosphorus, so fungi greatly increase the surface area that is open to nutrient and water absorption. The mycorrhizal relationship provides access to these essential compounds and elements for the plants. In return, the plant supplies the fungus with carbohydrates for use as energy.

In addition, mycorrhizae allow trees to communicate with each other and even trade nutrients, so the whole community of trees and other plants works cooperatively. With each other and even trade nutrients, so the whole community of trees and other plants works cooperatively. The mycorrhizal relationship provides access to these essential compounds and elements for the plants. In return, the plant supplies the fungus with carbohydrates for use as energy.

How “conventional” lawn care affects the soil
Given all the complexity of a healthy soil ecosystem, just think what happens when a lawn service applies a general fungicide to your landscape. This intricate dance of fungi and plant roots, which is so important to the health of plants, is halted. The health of the plants will be negatively impacted: they may not die right away, but their growth and vigor will certainly decline.

A typical lawn service includes routine applications of herbicide, such as 2,4-D, to keep out broad-leaved weeds; insecticides to kill mole crickets, ants and webworms; and fungicides to ward off wilt disease. Lawn services also amend the soil with synthetic fertilizers and various conditioners, such as lime, to help turf grass grow. These amendments alter soil chemistry only temporarily, so the applications are repeated. After this toxic mixture is applied, a sign is placed on the lawn warning you and your neighbors to keep off.

What you can’t see is what happens to the soil. The insecticides kill not only mole crickets, webworms and ants, but also centipedes, worms, nematodes (most are beneficial), insect larvae, ground-dwelling bees, and other soil organisms. Fungicides kill off all the fungi, which work to decompose organic matter, so turf may end up with an accumulation of thatch since the dead matter just sits there. Without decomposition, the soil becomes lower in natural nutrients, which is why lawn services then apply synthetic fertilizers so the grass will grow.

With continued chemical applications, the soil becomes more inert and eventually it serves only as an anchor for the turfgrass instead of a supportive growing medium. Repeated treatments for the lawn will continue to weaken its web of support for sustaining life. When the turf finally dies, homeowners are often required to replace the whole lawn with new sod to start the process all over again. Isn’t this the definition of insanity – doing the same thing over and over and each time expecting that the results will be different?

Restoring soil
Even after years of poison applications, a soil ecosystem will begin to recover by itself as soon as the poisons are stopped. For areas in your landscape where you still want to have lawn, stop all chemical treatments and begin the transformation to a “Freedom Lawn,” which is free of pesticides, free from synthetic fertilizers, free from over-irrigation, and free from over-seeding so it’s allowed to go dormant. There will be an adjustment period where there will be some bare spots, but soon other plants that tolerate mowing will take over these areas. This new paradigm will save you money, be good for the environment, and be safe for kids and pets 100% of the time.

You can encourage soil recovery by adding compost. Keep in mind that compost is not used in the same manner as an artificial fertilizer. Instead, it is applied more generously, as a way to improve soil texture and structure along with some nutrients and most importantly providing new populations of soil microbes. Apply compost as a top-dressing to the landscape – to keep soil disturbance to a minimum, do not dig it in. The compost will be absorbed into the soil itself as its soil organisms work. The organic materials in the compost provide the food for the soil’s ecosystem.

For native landscapes or freedom lawns, do not use manure in your compost, because its high nutrient levels may push the plants into unnatural growth spurts. Your goal is to encourage a more resilient landscape with a natural growth cycle.

References and Further Reading
National Pesticide Information Center. Oregon State University online resource. www.npic.orst.edu

About the Author
In his new book, *Nature’s Best Hope*, Dr. Doug Tallamy has delivered a deep and powerful wellspring of inspiration for the many people craving an opportunity to be part of transformative change for our challenged world. Even more compelling than his first book, *Bringing Nature Home*, a seminal work in itself, *Nature’s Best Hope* is a clarion call for the informed appreciation of native plants and the immediate course correction of using them in our own planting spaces to form the connected corridors that will help forestall the loss of species and the loss of ecosystem services that are we currently experiencing.
Nature’s Best Hope: A New Approach to Conservation That Starts in Your Yard, is a richly layered work, providing a contextual look at the evolution of our thinking about conservation, as well as detailed guidelines for getting started with native plants in your own nearby spaces, and, perhaps most importantly, the reasoning that will convince you, your neighbors, and your neighborhoods that now is the time to do so. Far from a dry treatise or an impassioned rant, the writing here reflects Tallamy’s character: cautiously optimistic, and gently but perceptively humorous. This book is an enjoyable read both for his fans, and for those who are new to his ideas about the roles native plants play in our landscapes. One of his stated goals was to write a book that would meet the needs of three groups of people: those who like plants, those who like animals, and those who like neither. He has done so.

Of course, at the heart of this book is the depth of Tallamy’s knowledge and experience. A professor in the Department of Entomology and Wildlife Ecology at the University of Delaware for over 40 years, author of more than 95 research papers, and — read the book cover for a list of awards, and bona fides — a person ultimately qualified to make the arguments he does.

Tallamy’s explanations of the specialized relationships between plants, insects, and animals are fascinating stories, but also foundational building blocks for understanding the natural world we live in, whether we live in the city, the country, or anywhere in between.

So many significant changes have come about in our world since the publication of Bringing Nature Home; the words ‘monarch decline,’ ‘climate change,’ and ‘the sixth extinction’ are no longer strangers to our conversations but have become part of the common parlance. In the new book Tallamy has taken the opportunity to address some of the common questions that have surfaced during this intervening time. Debates about the value of introduced plants and novel ecosystems; the feasibility of restoration projects, or the advisability of letting nature ‘take its course.’ These issues and more receive detailed and clarifying explanations.

A core concept of the new book is an idea Tallamy calls the Homegrown National Park, one that is created by us, as individuals, with no need for new laws to be passed. Tallamy in no way minimizes the extent of the challenges we face, he carefully quantifies all that we have lost in acres, in habitat, and in species, but his mastery of details is what makes his idea of the Homegrown National Park so compelling. He notes that we have witnessed time and again how quickly nature can restore itself, and asks us to imagine how much more quickly she would do so if only we helped her. We have the power as individuals to do so. The connected corridors of our Homegrown National Parks have the potential “to restore some semblance of ecosystem function to more than twenty million acres of what is now ecological waste land.” That is significant.

Tangible evidence of results, even in the most unlikely of places, provide welcome success stories: monarchs and native bees on the High Line in New York City, 103 species of birds in...
a tiny yard half a block from Chicago’s Kennedy Expressway, a grandfather and a toddler who are now loving and deriving the benefits of nature from time spent in their new, native plant, richly diverse backyards. When looking for specific advice within the book, highly visible chapter subdivisions make it easy to find exactly what you are looking for; there is a whole section on suburban yards.

Another valuable feature is the FAQ section at the end. Just one example: in reply to the question, “Doesn’t this (planting natives) take more knowledge than the average homeowner has?” Tallamy replies in part, “In the 1980s we learned how to program our VCRs!” His full answer is more amusing and more edifying than time allows for here, but you can see how this section will be a handy reference for helping you answer the questions you will be getting, too. Toxic plants? Ticks? Yard’s too small? It’s too late to fix? Tallamy has you covered. Extensive illustrations, a comprehensive index, and a bibliography each add to the value of Nature’s Best Hope.

In Nature’s Best Hope you will find the inspiration, the motivation, and the tools you need to help create our next National Park. It’s a positively electrifying read. Buy a book today. Or go to the publisher, Timber Press, and buy a box of them to share with key players in your life. I did.

About the Author

Sue Dingwell is a Master Naturalist in Florida and Virginia, as well as a Master Gardener. She is also a former board member of both the Florida Native Plant Society and the Virginia Native Plant Society. Sue serves on the Conservation and Media Committees for the Colorado Native Plant Society, and she blogs about native plants at http://beautifulnativeplants.blogspot.com/

Note: This review was previously published online February 4, 2020, at http://beautiful-nativeplants.blogspot.com/2020/02/natures-best-hope-by-doug-tallamy-book.html

Paper Wasps as Pollinators

Continued from page 8

Roaming wasps additionally visit flowers to collect nectar for their personal energy needs, and sometimes to contribute honey to the nest.

The birds, bees, and butterflies think they own pollination, but paper wasps are also due some respect. They too pollinate. Some orchids and all figs have wasps as pollinators, but those are different sorts of wasps. Paper wasps visit a lot of flowers, having an exclusive relationship with few. Sometimes wasps may perform double duty, pollinating, and as an added benefit, providing ant-pest defense.

The only totally waspy case I can bring to mind locally is the shrub corkwood, Stillingia aquatica, where pollination in the wet season is fully by wasps, or essentially so. Bees and wasps visit in the dry season, but when the marsh is under two feet of summer rain, the bees bug out and the wasps have a monopoly. Big marshy habitats can be miles across, requiring athletic pollinators.

Stillingsia inflorescences and the surrounding leaves are yellowish. Wasps love yellowish colors, although they visit flowers of other hues too. Some Polistes favorites are goldenrods, additional members of the aster family (Asteraceae) having yellow centers, members of the carrot family (Apiaceae), milkweeds, and sweetscants (Pluchea spp).

Polistes wasps are super-powered. One big brazen Brazilian species, Polistes lanio, has been documented returning to its nest like a homing pigeon after release 2 km away, flying at 8.7 meters/second, potentially covering those two km in under four minutes, almost 20 miles per hour. How does it find its way? Quite a feat for a microscopic brain, and I can’t even find my glasses.

Wasps out foraging and pollinating are mostly females, as the males – which grow from unfertilized eggs – usually live comparatively briefly. There is variation, and in some species males participate in feeding larvae.

What we need around here is a study on the relationships between paper wasps and plants in Florida: where they nest, their daily habits and home ranges, flower preferences, interactions with other flower-visiting insects and spiders, and contributions to pollination. Wow, that would be great if you think about it. So easy to say, but if you think about it more, you’d have to have the power of god! His full answer is more...
least 50 and I was forced to weed some of them out. I like the compromise approach that involves purchasing plants or seed, growing them in controlled conditions in a flat or pot filled with potting soil, and adding the seedlings to the garden only after they are established in the pots.

Managing a Meadow

A planting of anything, native or not, requires management. There will always be some weeds that blow in from the outside world and there will be species that you want, like my blazing star, that need to be thinned out to ensure space for less aggressive species. In nature, meadows of all kinds burn with some regularity. Fire ensures balance, fertilizes everything in the area and dethatches grasses. However, few of us have the luxury of burning our suburban meadows each year to accomplish this. I find that many grasses need to be dethatched manually to maintain their health. I do this each spring before the new blades start putting on their major growth spurt. Do not do it in fall or winter as many creatures use dead grass for cover. If you have a larger area, you can use a dethatching rake.

I do not have an irrigation system and my plantings are designed to thrive without one, but I keep a hose nearby for extended droughts, especially during the first year when plants are establishing themselves. All plants need water to establish themselves and dethatches grasses. However, few of us have the luxury of burning our suburban meadows each year to accomplish this. I find that many grasses need to be dethatched manually to maintain their health. I do this each spring before the new blades start putting on their major growth spurt. Do not do it in fall or winter as many creatures use dead grass for cover. If you have a larger area, you can use a dethatching rake.

I do not mulch my wildflower meadows. Normal leaf fall enhances the natural fertility of the existing soil, but adding additional mulch severely impedes the ability of native wildflowers and grasses to reseed. Of course, this means that I spend some time each week looking for the bad actors and pulling them by hand while they are still small. Nature takes its own course over time. My current wildflower area barely resembles what it looked like last year before my plants reseeded themselves, but all of the parts are still there. I find that spending time in my plantings is therapeutic and I look forward to those times I can set aside to peruse its status and make a few adjustments. Now in its second year, the area produces few weeds to pull, since the time I spent upfront and my regular attention to it have paid off. The developing grasses help reduce bare areas where weeds would more easily find a foothold and leaving the dead stems of the wildflowers that die back to the ground each winter helps with that too.

I wish all of you luck as you move forward to create living landscapes. Wildflower meadows are not for the lazy gardener or the person who simply wants to stop taking care of their yard. Keep your eyes open to the very real issues you will be taking on. Don’t jump into this blindly or with a zeal unmatched by the energy it will take. Value plant diversity; it always promotes wildlife diversity.

Take the time upfront to set objectives for everything, strive to meet those objectives and be willing to make adjustments along the way if something that made sense once turns out to not be working as well as you planned. I have made a great many mistakes in the more-than three decades since I began working with native plants and I am sure to make more, but I have learned more from my mistakes than my successes. If I can save you from making some of the same mistakes before you get started, I will have succeeded with something by writing this article. Enjoy your adventure.

References


Further Reading


About the Author

Craig N. Huegel is owner and operator of Hawthorn Hill Native Wildflowers. He teaches biology at St. Petersburg College, and is the author of Native Florida Plants for Shady Landscapes, Native Wildflowers and Other Ground Covers for Florida Landscapes, and Native Plant Landscaping for Florida Wildlife. His most recent book is The Nature of Plants: An Introduction to How Plants Work, published by the University Press of Florida.

Andrea England combines her background in landscape design with a love of native plants and three decades of experience gardening in Florida. Her company, My Florida Meadow Co., is a boutique meadowscaping company based in Ocoee, Florida that specializes in design, installation and management for biodiverse meadow gardens. https://www.myfloridameadow.com

NOTE: Meadow is used in this article to define a mix of native grasses and herbaceous flowering plants, not to indicate a type of ecosystem. To learn more about Florida’s natural communities, see: www.fnai.org/PDF/AA_Short_Descriptions_Final_2010.pdf and Ecosystems of Florida, edited by R. L. Myers and J.J. Ewel, University Press of Florida.
### FNPS Chapters and Representatives

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