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LAWN GONE NATIVE: GROWING THE SUBURBAN WILD, ONE YARD AT A TIME

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ABSTRACT

Across the United States, lawns are wreaking havoc on our ecosystems. They replace native habitats with mono-culture carpets, and the extensive maintenance regimen consumes water, fertilizer, and energy, polluting our air and water. Society relies on the health of the interconnected environmental systems to clean our air and water and provide food. As these systems fracture and shrink, so too does our ability to thrive. Large ecological restoration projects do a great service to wildlife, but their value doesn't always reach society. For society to care what happens to the insects, birds, and mammals, the connection between people and nature must be restored. The suburban lawn presents an opportunity to bring people back to these ecologies and to grow native habitats lost to the acres of turf. A wealth of information on native yard planting is spread across the internet and books, but for a busy homeowner, it can be difficult to figure out a first step. The Lawn Gone Native thesis project aims at creating a guide for homeowners that make it easier to convert a backyard of turf into a thriving ecosystem that supports birds, pollinators, and humanity.

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Chapter 1

Lawns of the Present, Habitat of the Future

The American lawn is an ecological desert. Its ubiquity and rapid spread causes increased stormwater runoff, pollution, fertilizer usage, noise pollution, and a host of other problems. Once vibrant forests and meadows have been reupholstered with a turf carpet, severely-pruned shrubbery, and not much else. The diversity of native plants which provide food and shelter for local wildlife fractures and fades with rapidly spreading suburban areas connected by extensive road networks.

Of course, the lawn did not set out to be such a destructive force. Its existence was limited before the Civil War, when houses were built closer to the road. Small yards displayed fenced gardens, rather than patches of turf. Maintenance was a great deterrent in this time period, as the introduced grasses from England struggled to survive in the variable climates of North America. Diligent homeowners had to shear their lawns with scythes (Jenkins, 1994). Still, it persisted. New inventions in mowing from the push mower in 1870 to the gas-powered mower in the 1960s, as well as innovations in turf growing aided in lawn's appeal (American Lawns, 2019). With the end of World War II, the proliferation of automobiles and the flight of the middle-class from the cities spurred the growth of suburban America. Each cookie-cutter home was surrounded by a sprawling lawn (Jenkins, 1994). In suburban communities, a well-manicured lawn became a status symbol, a display of control and order. The culture surrounding lawns may be why we are still drawn to them. They provide places of play and gathering. Visions of family reunions, day camp, picnics, and backyard projects materialize on a grass stage

of possibilities. Nowhere else but on an open lawn can so much spontaneous experimentation take place.

But do we really need so much? As of 2005 lawn cover accounts for 128,000 square kilometers of the United States, larger than the area of irrigated corn (Milesi et. al., 2005). All this lawn must be watered, mowed, and fertilized – maintenance practices that produce pollutants in addition to consuming energy and water. On average, seventy hours a year are spent mowing and maintaining each suburban lawn (American Time Use Survey, 2017). Lakis Polycarpou, writing for Columbia University’s Earth Institute, found that in the United States, lawn mowers account for five percent of air pollution and that watering lawns may use 40-60 percent of the urban water supply (Polycarpou, 2010). Homeowners are also likely to over-apply fertilizers and pesticides on their turf. These toxic chemicals seep into groundwater or enter streams through surface runoff, disrupting aquatic ecosystems and harming birds, fish, and insects (Robbins et al., 2003).

In addition to the environmental damage of lawns, the few shrubs, trees, and flowers that many homeowners plant in their yards are often non-native. Because they have only been part of the local ecosystem for a short period of time, the many native insects, pollinators, birds, and mammals are not well adapted to use these plants for sustenance. In Doug Tallamy’s book, *Bringing Nature Home*, he explains how the role of a species changes from its native range to a non-native range. *Phragmites australis*, a European grass, only supports five species in North America but supports over 170 species in its native European homeland (Tallamy, 2007). Sterile lawn landscaping provides very little for the native wildlife. What it means for a plant to be “native” is still contested by different professionals; however, the most beneficial definition for the purpose of creating habitat is decided by Darke and Tallamy in *The Living Landscape*. They

assert that “native” constitutes, “a plant or animal that has evolved in a given place over a period of time sufficient to develop complex and essential relationships with the physical environment and other organisms in a give ecological community” (Darke et al., 2014, 91). The European grass, while able to support five insect species in North American, has not developed the crucial interconnected relationships of a native grass like little bluestem (*Schizachyrium scoparium*), which hosts several caterpillars, provides pollen for pollinators, and seed for birds throughout the late fall and winter (New Moon Nursery, 2019).

Lawns are a monoculture, made up of only one or two species of non-native grasses that can't sustain the diversity of life required for a dynamic, interconnected ecosystem. Competition for resources forces plants to adapt to many different niches. Leaf textures, root depths, light and soil preferences, and height are used by plants to take advantage of an environment's resources where another plant cannot (Rainer et al., 2015). Diverse ecological communities of plants and animals grow and compete in a dynamic dance for survival. This complex web of interactions supports the soil, cleans the air, and filters the water. But lawns have no competition, because there is only one species, no diversity, and a significantly simplified web of interactions. Lawns may be able to support an insect or two, but that is not enough (Milesi et al., 2007). Ecology is confined to nature preserves and national parks while allowing those areas deemed unimportant to be broken, fragmented, and converted to suburbia. To bring back diversity, the idea of habitat must leave the confines of parks and preserves and seep into our back yards.

Reimagining the yard as a native landscape is not a new concept. Planting with natives is becoming increasingly popular among homeowners who are already knowledgeable, ecologically minded gardeners. However, the average homeowner may find it difficult to sift through vast stores of knowledge. My desire to reconnect people with more robust natural

processes and to increase wildlife habitat is best captured in the idea of *lawn gone native*. That is, a friendly guide that introduces homeowners to the realm of native planting and encourages them to transform their own lawns into vibrant gardens.

Establishing Purpose

To justify a project goal that relies on public participation for success, it is important to prove that people are interested in implementing tactics in the Lawn Gone Native guide on their own yards. I created an online survey that was responded to by 308 people. This successful response supported the rationale for creating a native planting yard design typology that could encourage residents to replace much of their turf with gardens. The first section of the survey aimed to prove that yard owners would respond positively and may be more likely to take action if they had some guidance on plant acquisition, planting, and ongoing maintenance ([Figure 1](#)).

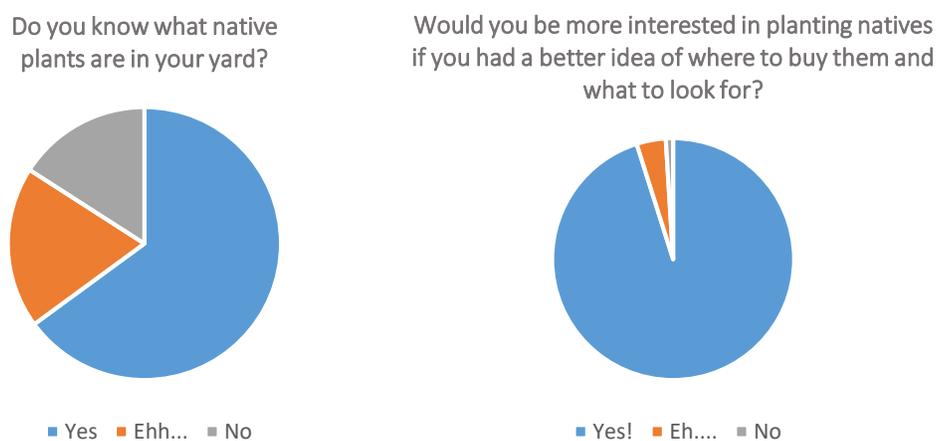


Figure 1. Charts showing native planting knowledge and interest

Results of the survey may be slightly skewed since it was shared on the “Pollinator Friendly Yards” Facebook group and by a group of master gardeners in Missouri, both

communities of people proponents of using native plants and replacing lawns with gardens. However, the results of the survey still strongly suggest that even with prior familiarity with native plants, these groups of people are interested in information focused on planting design.

For the second section of the survey, the goal was to determine what environments and qualities the planting designs should focus on. Different yard design themes were ranked from “Very helpful!” to “Not interested” by survey participants. **Figure 2** below shows the results from the survey. Most people thought templates focusing on sun and shade, wet and dry, pollinator friendly, and native plant communities would be most helpful.

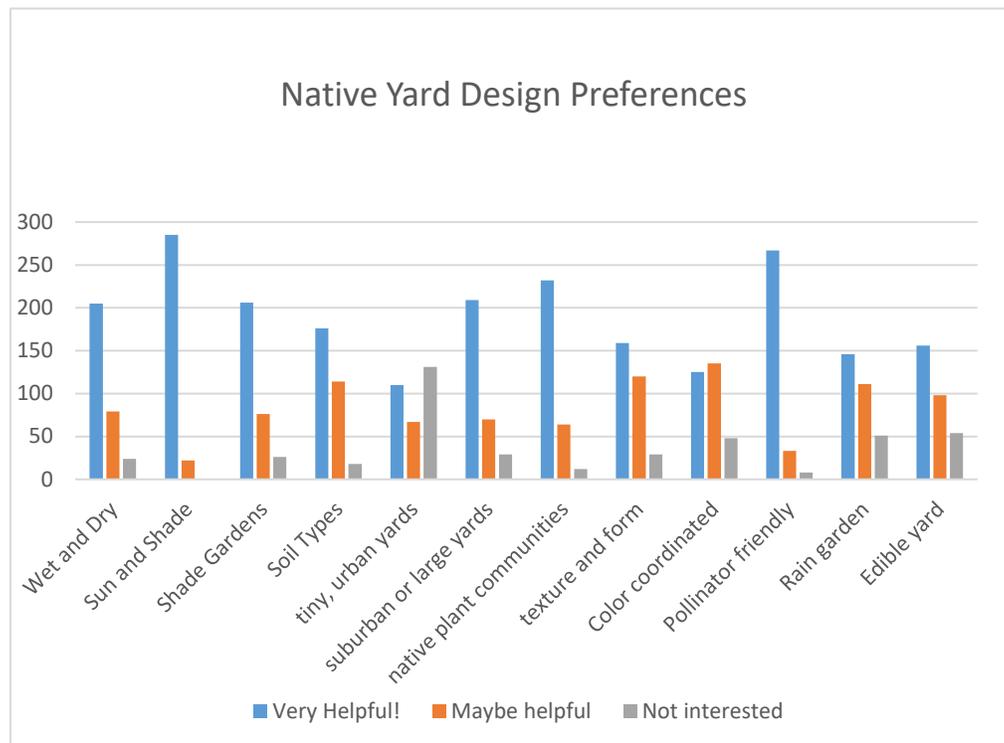


Figure 2. Native yard design template preferences

Conclusions from the survey grounded this project, revealing that motivated homeowners are interested in and would take advantage of resources aimed at native planting design.

Project Statement

The ecological issues surrounding lawns, while acknowledged by professionals and some homeowners, are not at the forefront of the environmental movement. Habitat restoration and nature preserves can fend off the effects of biodiversity loss at a large scale, but lawns offer a unique opportunity that large projects do not. They are small, manageable, and privately owned. There is no red tape and no hierarchy of approval. Planting designs can be tailored to the homeowner's needs, budget, and to the surrounding environment. And, crucial to re-engaging people with their local ecosystems, yard owners can build a more empathetic relationship to their plants. Taking care of plants, watching them grow, and encountering butterflies on your flowers adds intangible value to a homeowner's yard that is not accessible when visiting a nature preserve. Still, changing a sea of monocultured turf into a thriving place for wildlife is a slow process. Eliminating the lawn requires residents who understand, care, and have an idea of how to begin.

There is a gap between the knowledge base of researchers and professionals and the ability to synthesize this information into a format that resonates with a typical suburban homeowner. "Lawn Gone Native" (See [Appendix C](#)) is a project aiming to close this gap, by creating distributable material in an easily-digestible format that exposes the ecological dangers of the spreading lawn, shows how native planting can improve both the surrounding ecology and value for the homeowner, and offers a design typology of suggested native planting arrangements for different yard conditions and various desired functions, specifically for Pennsylvania.

Chapter 2

Lawn Gone Native

The resulting products from the project statement are a website and printable planting design templates. The website works in conjunction with the templates to create a simply-worded, comprehensive guide to understanding native plants. Together, they teach readers that replacing their lawns with native gardens is not an arduous, difficult process but a feasible, worthwhile endeavor. Suggested plant palettes are directed at residents of Pennsylvania and the mid-Atlantic region. A URL for the website can be found in [Appendix C](#).

The website was created to reach a large audience and maximize the accessibility of the project's information for homeowners. The home page briefly introduces the project and provides links to additional resources. Scrolling further down, site visitors find illustrated explanations for why homeowners should be concerned about lawns and how planting native species can start to remedy these issues ([Figure 3](#)).

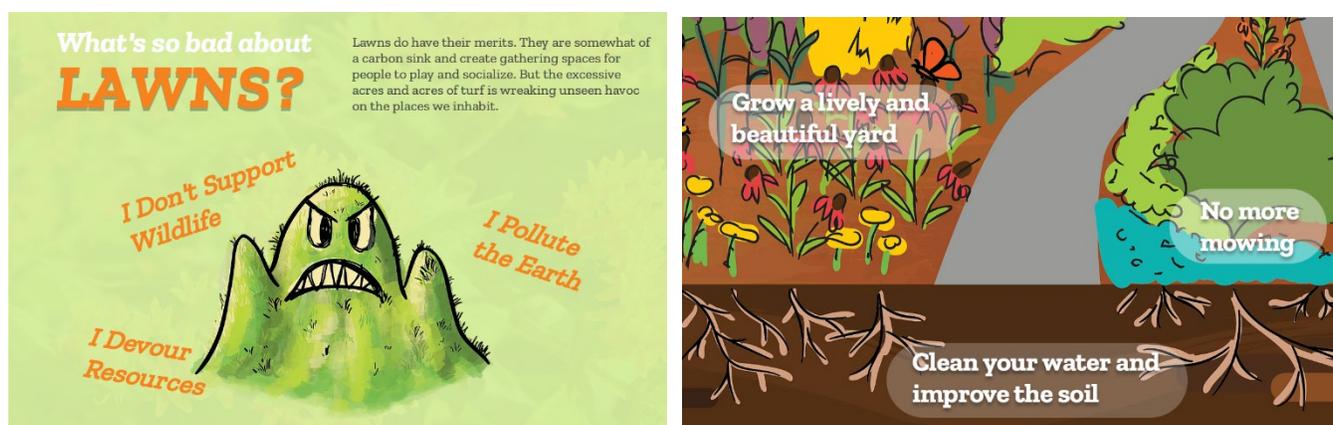


Figure 3. Homepage screenshots

At the bottom of the homepage is a link to open the Lawn Gone Native Planting Guide. This is the main focus of the project. The guide itself is broken into five sections. “A Bit About Plants” introduces plant habits, environmental requirements, and qualities. “Basic Planting Design” covers a few planting design concepts and introduces various aesthetic considerations. “Plan & Prepare” provides an implementation timeline to spread out time-sensitive tasks. “Design Templates” introduces four downloadable planting designs that can be used as a starting point to lay out garden beds and choose plant species. Finally, “Maintenance Tips” briefly describes suggested maintenance for the garden post-installation.

The Lawn Gone Native Planting Guide

First, “A Bit About Plants” provides a brief introduction to plant ecology and why plant species adapt to certain environments, as well as an overview of different features that plants may have. Local plant species evolved in cohabitation with other species and have adapted to certain environments and participate in crucial interactions within the energy web (Darke et. al., 2014). A call-to-action for homeowners allows readers to take the information discussed on the webpage and take steps toward the end goal of replacing lawn with native species ([Figure 4](#)). Before a homeowner considers plant species or design ideas, they must first define their goals and do a basic site analysis. Encouraging them to go out into their yard, gather some basic data, and think critically about the light, soil, and moisture conditions of their property, as well as how those qualities affect a plant’s ability to grow, increases the chances that a homeowner will choose species that will thrive. Considering local ecology and connecting their future garden to

the needs of surrounding wildlife also reveals how their choices influence and even improve the ecosystem.

SOMETHING YOU CAN DO!

A deep knowledge of local flora and fauna is certainly helpful in planning your native yard, but it's certainly not necessary. A basic understanding of your yard's conditions can be enough to put you on the right track.

Get Sketchy!

Step one on the road to planting a brighter yard is to observe its existing conditions. This simple activity will help get you acquainted with your yard which will, in turn, make it easier to choose the right plants and create a long-lasting garden.

STEP 1: Map Existing Conditions

Make a very rough sketch of the shape of your yard



Figure 4. Call-To-Action on "A Bit about Plants"

The next section mentions features of plants that are typically considered in a planting design (Figure 5). These include appearance characteristics like height and spread, bloom color, and growth habit, as well as services provided by the plant like erosion control, improving water infiltration, and providing wildlife value.

Height and Spread

Plants grow. And designing a garden without knowing how plants grow can lead to over-grown and under-grown areas.

Bloom Time

For a garden that blooms from spring to fall, it's important to look at bloom time.

Seasonal Interest

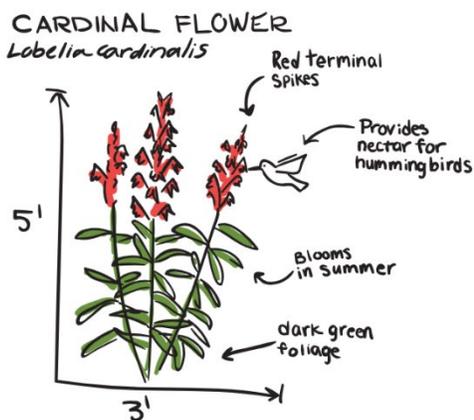
There are lots of other interesting plant features besides the blooms. Many stems and leaves turn interesting colors.

Bloom Appearance

Flower heads have different shapes and textures.

Growth Habit

The growth habit of a plant refers to its shape and how it spreads and propagates.



You can see some of the characteristics of the cardinal flower identified in the above drawing

Figure 5. Website screenshot showing plant qualities to consider

After creating a better understanding of plant habits and characteristics, the “Basic Planting Design” page focuses on simple strategies for successful planting design. And it explains how using the plant features discussed in the previous section creates a garden catering to the homeowner and the environment. Visual design concepts for arranging planting and the aesthetic qualities of plants encourage readers to consider how these strategies take shape in their own yards. Among these strategies is that of the layered garden (**Figure 6**). Much of the residential landscaping seen today has a few plants spaced far apart, in an otherwise empty bed of mulch. Layering of plant species of varying heights creates a visually full garden and provides a highly-textured habitat that creates a diversity of niches for local wildlife to fill (Darke et.al., 2014). Another “call to action” at the end of this section suggests that readers begin researching plants for their gardens, now that criteria for aesthetics, service, and environmental constraints can narrow down a search.

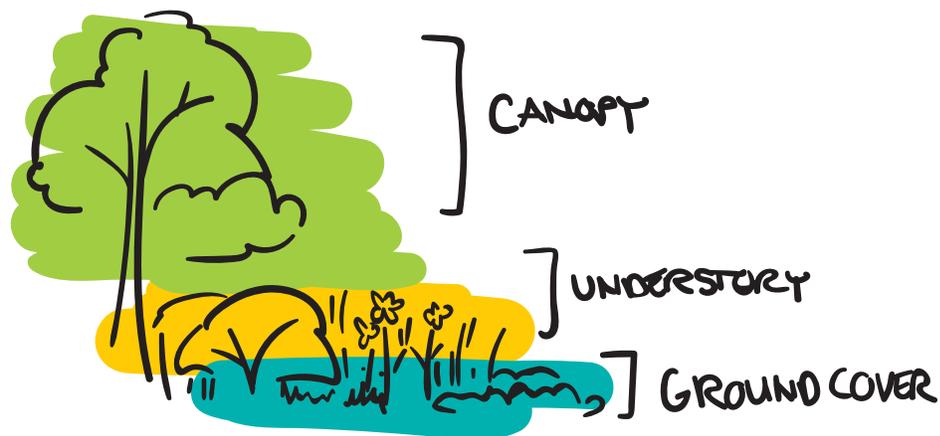


Figure 6. Gardens have Layers planting design strategy

“Plan & Plant” provides a realistic timeline that readers can follow to plan for and plant their gardens. A four-season calendar lists different tasks to be done and decisions to be made in

each season, dispersing tasks and suggesting that time sensitive tasks such as amending soil, ordering stock, and garden installation happen at optimal times of the year. Post-installation maintenance is mentioned as well but is explained further on a later page.

Once the reader gains a basic understanding of planting and design and a realistic implementation timeline is established, the “Design Templates” page introduces the ultimate focus of the Lawn Gone Native project – the design templates. Four templates, Sunny & Dry, Sunny & Wet, Shady & Dry, and Shady & Wet, are listed with short descriptions about the designs ([Figure 7](#)). Generally, each template responds to the light and moisture conditions of the yard as described by the template’s title. A booklet for each design provides additional information about existing conditions and plant species, among other things. These templates are



Sunny & Dry

This design focuses on planting in a rectangular lot that is predominantly sunny and dry with some surrounding trees. It aims to create privacy from adjacent neighbors and to attract butterflies. A central lawn space is kept in the back and smaller lawn is kept in the front.

Click to download

[SUNNY & DRY BOOKLET](#)

[SUNNY & DRY FULL-SIZED 8.5 x 11 TEMPLATE](#)

[SUNNY & DRY FULL-SIZED 11 x 17 TEMPLATE](#)

Figure 7. Planting templates on the website

suggestions for species and basic layout of garden beds which can be modified by the homeowner based on personal preference and individual site conditions.

Following the design templates, a final “Maintenance Tips” page describes a few important maintenance practices. Once established, a garden would ideally have very little maintenance as it fills in and builds up robust root systems. However, there is still some routine maintenance that keeps plants healthy and can enhance the aesthetics of the garden. Adding a thin, yearly layer of mulch until canopy closure, staking plants that start to droop, and deadheading spent flowers are a few suggestions.

In addition to the Lawn Gone Native Planting Guide is a section with of “Helpful Resources” that with personally-compiled and external sources for plant selection, design, and information about plant ecology. I created a database of plant characteristics for Pennsylvania native herbaceous perennials that visitors can search to find alternative or additional species to add to their yard (Figure 8). As native plants are not always readily available in all home and garden stores, I also compiled a map of plant nurseries that carry native plants helps homeowners locate growers and distributors. Lastly, a list of suggested readings and external websites for plant species provides readers with a plethora of information about native planting.

	Common name	Scientific Name	Plant Type	Life Cycle	Growth Habit	HEIGHT	SPREAD	Leaf Color	Flower color	BLOOM
11	Blue Star	Amsonia tabernaemontana 'Montana'	Forb	Perennial	Upright	1-1.5	0.75-1		Light blue	Apr-Ma
12	Blue wood aster	Symphyotrichum cordifolium	Forb	Perennial	Clumping	2-5	1.5-2		Blue	Aug-Sep
13	Blue-eyed grass	Sisyrinchium angustifolium	Forb	Perennial	Clumping	1.5-2	0.5-1		Violet	May-Jul
14	Brown eyed susan	Rudbeckia triloba	Forb	Perennial	Clumping	3-5	1-2		Yellow	Jul-Aug
15	Butterfly weed	Asclepias tuberosa	Forb	Perennial	Upright	1-2.5	1-1.5		Orange	Jun-Aug
16	Canada anemone	Anemone canadensis	Forb	Perennial	Spreading	1-2	2-2.5	Dark green	White	May-Jul
17	Cardinal flower	Lobelia cardinalis	Forb	Perennial	Upright	2-4	1-2		Red	Jul-Sep
18	Common milkweed	Asclepias syriaca	Forb	Perennial	Upright, Clumping	2-3	0.75-1	Dark green	Pink, White	Jul-Aug
19	Common sneezeweed	Helenium autumnale	Forb	Perennial	Upright, Clumping	3-5	2-3		Yellow	Aug-Oct
20	Dwarf Crested iris	Iris cristata	Forb	Perennial	Spreading, Colonies	0.5-0.75	0.5-1	Medium green	Light purple	Apr-Apr
21	False aster	Boltonia asteroides	Forb	Perennial	Clumping	5-6	2-4	Darker green	White, light pink, light purple	Aug-Sep
22	Foam flower	Tiarella cordifolia	Forb	Perennial	Groundcover, runners	0.75-1	1-2		White	May-Ma
23	Golden ragwort	Packera aurea	Forb	Perennial	Clumping	0.5-2.5	0.5-1.5		Yellow	Apr-Apr
24	Great blue lobelia	Lobelia siphilitica	Forb	Perennial	Upright, Clumping	2-3	1-1.5		Blue/Purple	Jul-Sep
25	Joe pye weed	Eutrochium purpureum	Forb	Perennial	Upright	5-7	2-4		Pink	Jul-Sep
26	Large Flower tickseed	Coreopsis grandiflora	Forb	Perennial	Upright	1.5-2.5	1-1.5		Yellow	Jun-Aug

Figure 8. Screenshot of compiled PA native plants database

Planting Templates

Responses from the online survey informed the four resulting planting templates. Each template deals with a different yard environment, planning for a sunny and dry, sunny and wet, shady and dry, and shady and wet site (see [Appendix A](#)). Of course, every yard has much more specific characteristics like soil type and pH, surrounding land uses, and homeowner preferences, but a broad approach allows for more flexibility with plant selection. Additionally, each template has certain design goals that relate to those expressed by the needs of homeowners through the survey. The sunny and wet site is a pollinator and hummingbird garden with winter interest. The sunny and dry site becomes a pollinator garden, as well as a privacy screen. The shady and dry site plantings provide erosion control and a calming shade garden with blooming groundcovers. Finally, the shady and wet site focuses on sequential blooms and winter interest.

A multi-page booklet for each template provides additional information that the homeowner can use to implement the design in their yard. In addition to the final design template, the booklet contains a graphic plan showing the yard's existing conditions, a suggested phasing diagram, a table of the plant species used in the design and their basic characteristics, additional tips, and a project implementation timeline. The existing conditions graphic shows the reader what site conditions the planting design is responding to so homeowners can see the logic behind the species choices and layout. A phasing diagram suggests the implementation order for each planting bed, to spread cost and labor out over time. Species lists give the reader an idea of the characteristics of plants growing in each hypothetical yard, including growth size, light and soil preferences, and suggested uses. These relate to ecological or personal goals of the design like winter interest or creating a privacy screen. A page of additional tips and suggestions as well as the implementation calendar aim to make the process of planning for and planting a garden

easier. On the website, each of these templates is available to view and download as a PDF.

Additionally, there is an option to download a full-sized version of each design template that fits on two sheets of standard-sized printer paper and a version that fits on an 11”x17” sheet. See [Appendix B](#) for a sample of the booklet. With a greater understanding of a homeowner’s yard conditions, along with knowledge gained through the Lawn Gone Native guide about native plants and planting design, they can choose the template that best matches their yard’s conditions and personal goals as a starting point for plant selection and bed layout. And, hopefully, they will be confident enough to plant their native garden.

Chapter 3

Anticipated Outcomes

The goal of Lawn Gone Native is to reach out to homeowners with lawns and show them an alternative that creates habitat and provides heightened aesthetics and environmental services and convinces them to take it upon themselves to plant a native garden. Outreach is critical to the project's spread and success, as the very idea of encouraging homeowners to take action requires participation. It would be ideal to identify a few homeowners interested in using this project to replace their lawns with gardens, asking them to give feedback about the usability of the website and templates. The website will continue to be updated post launch in response to feedback and new information or strategies that may be gathered. A page dedicated to public feedback allows instant responses from site visitors so that improvements may be made after the initial launch.

Lawn Gone Native is not an infallible process but an experimental project for a grass-roots movement to grow a better suburb – not just ecologically, but humanistic-ally. It aims to show that being ecologically conscious can benefit more than just the environment and to reveal the underlying web of energy that connects us all.

Appendix A

Yard Design Templates



Figure 9. Appendix A: Sunny & Dry Template

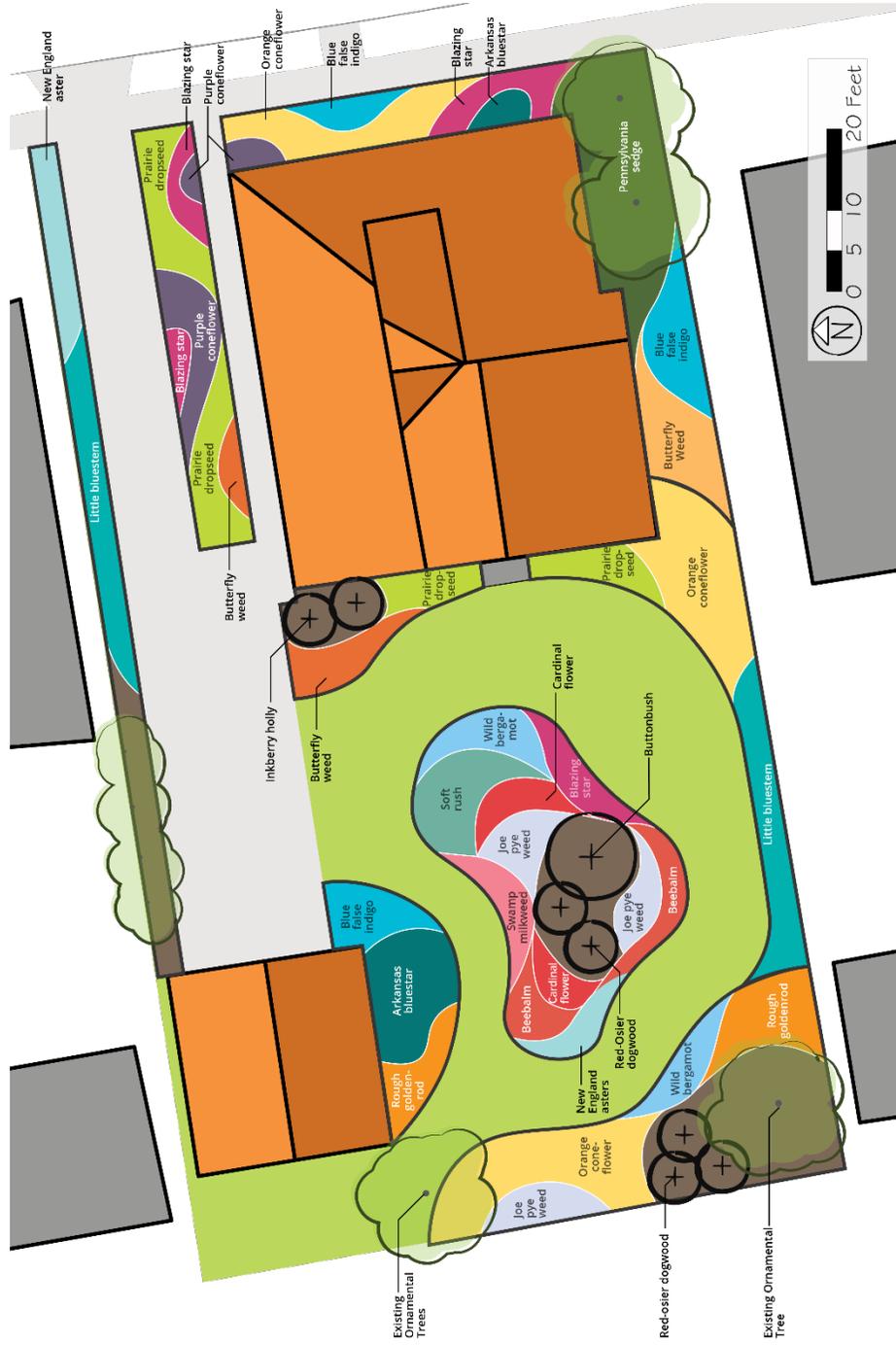


Figure 10. Appendix A: Sunny & Wet Template



Figure 11. Appendix A: Shady & Dry Template



Figure 12. Appendix A: Shady & Wet Template

Appendix B

Sample Booklet

This example is the Sunny & Dry planting template.

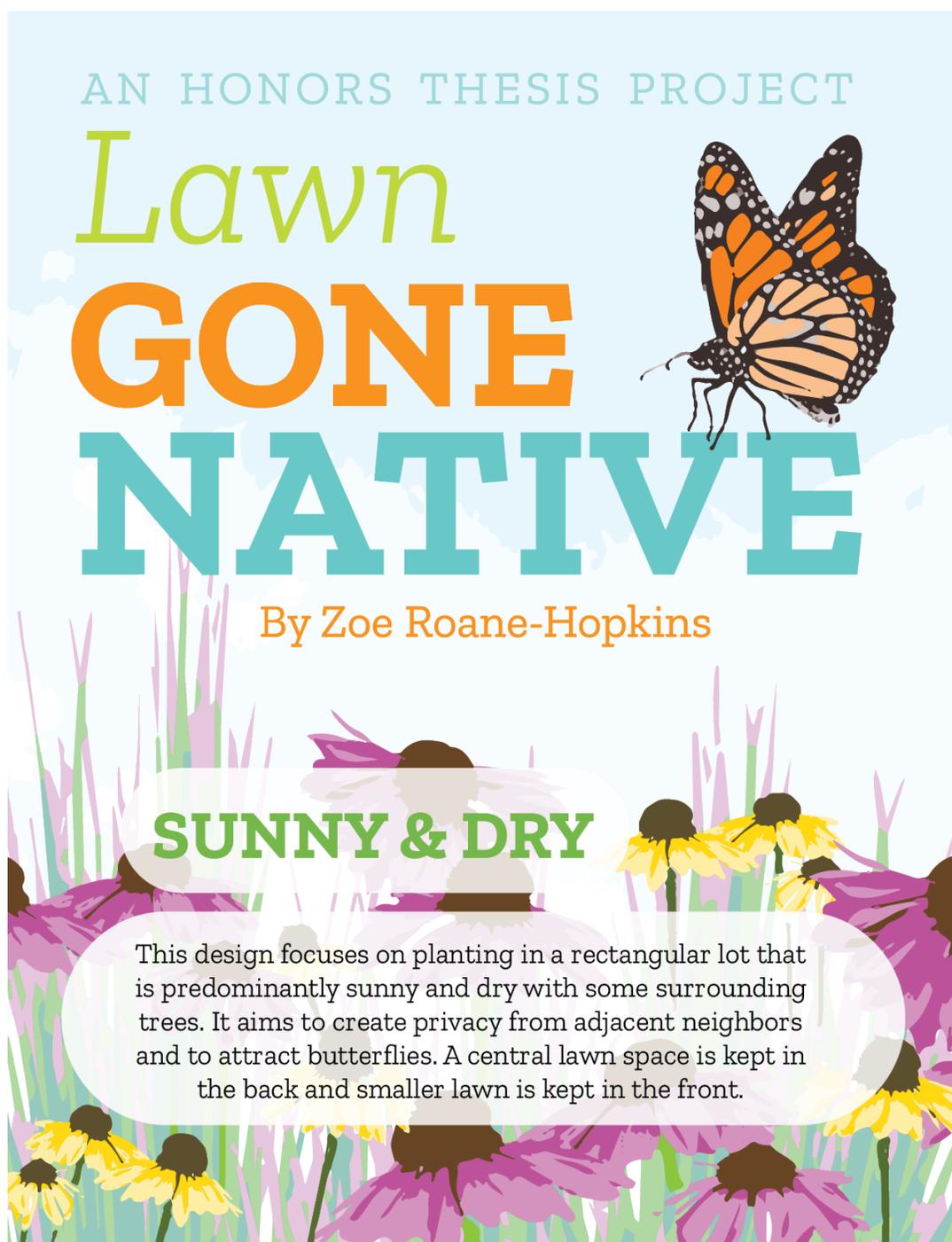


Figure 13. Appendix B: Front cover

WHAT'S IN THIS GUIDE, ANYWAY?

1 Existing Conditions

Before looking at the planting design, we need to see what that design may be responding to. The existing conditions of the yard show problems and desires that may be remedied in the design.

2 Planting Template & Phasing

A suggested planting layout that can (and should be) modified for your own yard and a phasing diagram that breaks down the design into manageable phases that you can implement over time.

3 Species Suggestions

A list of all plants in the design and some of their characteristics are organized into a handy chart for you to reference. You can use these characteristics to search for similar plants if you want to change things up.

4 Planting & Maintenance

Additional tips for planting design and a four-season timeline for implementing and maintaining your new garden.

How to Read the Plant List

Common Name
This is the name most often used. Some species have multiple common names. Use the scientific name to see if two common names refer to the same plant.

Bloom & Color
Range of months when the flower is in bloom and color of the blooms.

Wildlife Value
Environmental benefits of the plant these include:

- Butterflies
- Pollinators
- Songbirds
- Hummingbirds

Use For
Best use for the species, including:

- Pollinator garden
- Shade garden
- Wet area
- Erosion control
- Ground cover
- Fall interest
- Winter interest
- Privacy screen

Scientific Name
Use the scientific name to look up information on a specific species to make sure the facts you find match the plant you are actually looking up.

Seasonal Interest
Mentions if there is visual appeal during fall and/or winter and what part of the plant supplies the interest.

Species Type

- Flower
- Fern
- Grass/Grass-like
- Shrub
- Tree

Hardiness Zones
The temperature zone(s) that plant is most well-adapted to. PA's HZ range is 5-6.

Height & Spread
A range for how high the plant gets and how wide the plant spreads over the ground.

Light
Shows the light preferences of a plant.

- Full sun
- Partial sun/shade
- Full shade

Water
Shows the wetness of the soil that the species prefers.

- Less water
- Average water
- Lots of water

Soil
Describes the general texture of soil the plant likes.

- C CLAY Fine
- L LOAM Average
- S SAND Gritty

FLOWERS

	APPEARANCE	ENVIRONMENT	USES	NOTES
<p>Threadleaved coreopsis <i>Coreopsis verticillata</i></p> <p>Height: 2-3' Spread: 2-3' HZ: 5-9</p>	<p>Bloom: May-Jun</p> <p>Color: Light Orange</p> <p>Seasonal Interest: Fall texture</p>	<p>Light: </p> <p>Water: </p> <p>Soil: C L S</p>	<p>Wildlife Value: </p> <p>Use For: Pollinator garden, erosion control, accent</p>	<p>Tolerates dry soil and drought. Low maintenance. Will flop over in soil that is too rich.</p>

Figure 14. Appendix B: Booklet contents overview

EXISTING CONDITIONS



SUNNY & DRY TEMPLATE 3

Figure 15. Appendix B: Yard existing conditions

PLANTING TEMPLATE

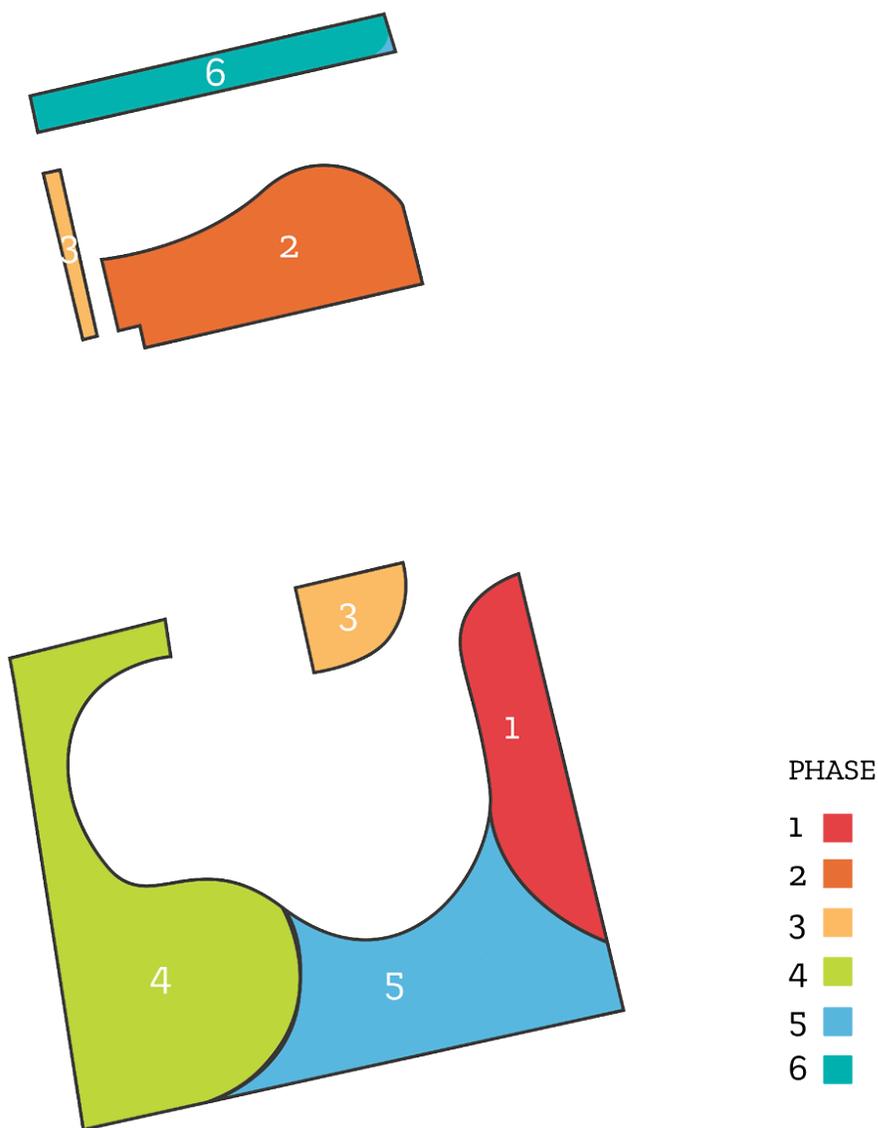


4 SUNNY & DRY TEMPLATE

Figure 16. Appendix B: Planting template

DESIGN PHASING

Breaking down the whole design into smaller, manageable planting beds allows costs and labor to be spread out over time. This diagram shows a suggested order of planting, starting with Phase 1. The idea of the order is to continue filling in your yard without leaving awkward spaces during installation of different phases. Of course, you can really do these in any order you choose. Or, if you're feeling ambitious and want to do it all at once, go right ahead! Just make sure you're planting in late spring (after the mud) or early fall (before the freeze).



SUNNY & DRY TEMPLATE 5

Figure 17. Appendix B: Phasing diagram

SPECIES LIST

Browse this list at your leisure but keep in mind that these are just suggestions! There are so many wonderful plants out there, and it's up to you to understand your yard's conditions and to pick the plants that work best with the soil and surrounding environment. Just remember to keep it native!

FLOWERS, FERNS, AND GRASSES/SEDGES

		APPEARANCE	ENVIRONMENT	USES	NOTES
	Anise hyssop <i>Agastache foeniculum</i>  Height 2-4' Spread 2-3' HZ 4-8	Bloom Jul-Sep Color Purple Seasonal Interest	Light  Water  Soil C L S	Wildlife Value  Use For Pollinator garden	Drought tolerant, requires good drainage, has aromatic foliage
	Arkansas blue star <i>Amsonia hubrichtii</i>  Height 2-3' Spread 2-3' HZ 3-8	Bloom Apr-May Color Powdery blue Seasonal Interest Golden leaf in fall	Light  Water  Soil L	Wildlife Value  Use For Pollinators, fall interest	Deer resistant
	Blue false indigo <i>Baptisia australis</i>  Height 3-4' Spread 3-4' HZ 3-9	Bloom May-Jun Color Blue/purple Seasonal Interest	Light  Water  Soil C L	Wildlife Value  Use For Pollinator garden, erosion control	Deep root system. Do not disturb once planted.
	Butterfly weed <i>Asclepias tuberosa</i>  Height 1-3' Spread 1-2' HZ 3-9	Bloom Jun-Aug Color Orange Seasonal Interest	Light  Water  Soil	Wildlife Value  Use For Pollinator garden, erosion control	Tolerates clay soil and drought
	Common milkweed <i>Asclepias syriaca</i>  Height 2-3' Spread 1-2' HZ 3-9	Bloom Jul-Aug Color Pink Seasonal Interest Seed pod	Light  Water  Soil C L	Wildlife Value  Use For Pollinator garden	Tolerates dry soil, host for monarch caterpillars and butterflies
	Oxeye sunflower <i>Heliopsis helianthoides</i>  Height 3-6' Spread 2-4' HZ 3-9	Bloom Jun-Aug Color Yellow Seasonal Interest	Light  Water  Soil C L S	Wildlife Value  Use For Shade garden, erosion control, accent	Prefers moist soil but tolerates dry, clay. Unpalatable to deer. Supports variety of pollinators and birds.
	Threadleaved coreopsis <i>Coreopsis verticillata</i>  Height 2-3' Spread 2-3' HZ 3-9	Bloom May-Jun Color Yellow Seasonal Interest Fall texture	Light  Water  Soil C L	Wildlife Value  Use For Pollinator garden, erosion control, accent	Tolerates dry soil and drought. Low maintenance. Will flop over in soil that is too rich.
	Wild blue phlox <i>Phlox divaricata</i>  Height 1' Spread 1' HZ 3-8	Bloom Apr-May Color Light blue Seasonal Interest	Light  Water  Soil L	Wildlife Value  Use For Shade garden, ground cover	Needs good air circulation. Nectar supports swallowtail butterflies, sphinx moths and hummingbirds.
	Wild columbine <i>Aquilegia canadensis</i>  Height 1-3' Spread 1-2' HZ 3-9	Bloom Apr-May Color Red/orange Seasonal Interest	Light  Water  Soil C L S	Wildlife Value  Use For Shade garden, accent	Tolerant of drought and basic soil. Caterpillar host. Does best in partial sun.

6 SUNNY & DRY TEMPLATE

Figure 18. Appendix B: Species list, page 1

HZ Hardiness Zone Butterflies Pollinators Songbirds Hummingbirds Flower Fern Grass/Grass-like Shrub Tree

		APPEARANCE	ENVIRONMENT	USES	NOTES
	Wild lupine <i>Lupinus perennis</i> Height 1-2' Spread 1-2' HZ 4-8	Bloom Jun-Jul Color Blue Seasonal Interest	Light Water Soil L S	Wildlife Value Use For Pollinator garden, accent	Fragrant bloom
	Pennsylvania sedge <i>Carex pensylvanica</i> Height 2-4' Spread 1' HZ 3-8	Bloom May Color Green Seasonal Interest Semi-evergreen	Light Water Soil C L S	Wildlife Value Use For Shade garden, erosion control, winter interest	Black walnut tolerance, lawn alternative, prefers acidic soil.
	Prairie dropseed <i>Sporobolus heterolepis</i> Height 2-3' Spread 2-3' HZ 3-8	Bloom Aug-Oct Color Pink/brown Seasonal Interest Fall texture	Light Water Soil C L S	Wildlife Value Use For Erosion control, accent, fall & winter interest	Tolerates drought and pollution. Seed eaten by songbirds.
	Sideoats grama <i>Bouteloua curtipendula</i> Height 1-3' Spread 1-2' HZ 4-9	Bloom Jul-Aug Color Orange Seasonal Interest Fall texture	Light Water Soil C L S	Wildlife Value Use For Ground cover, accent, erosion control	Tolerates black walnut and air pollution

SHRUBS AND TREES

		APPEARANCE	ENVIRONMENT	USES	NOTES
	Fragrant sumac <i>Rhus aromatica</i> Height 2-6' Spread 6-10' HZ 3-9	Bloom Apr Color Yellow Seasonal Interest Fall color	Light Water Soil C L S	Wildlife Value Use For Erosion control, Ground cover, fall interest	Tolerates wide range of soils and black walnut. Fragrant leaf.
	Eastern red cedar <i>Juniperus virginiana</i> Height 30-65' Spread 8-25' HZ 2-9	Bloom Color Seasonal Interest Evergreen	Light Water Soil L S	Wildlife Value Use For Winter interest, privacy screen	Tolerates Black walnut
	Serviceberry <i>Amelanchier arborea</i> Height 15-25' Spread 15-25' HZ 4-9	Bloom Mar-Apr Color White Seasonal Interest	Light Water Soil C L S	Wildlife Value Use For Accent, fall interest	Tolerates air pollution and clay soil. Fruit attracts many birds and is edible by humans.

Figure 19. Appendix B: Species list, page 2

ADDITIONAL TIPS

BEFORE YOU PLANT

Do a Percolation Test

Soil drainage is a pretty good indicator of what can live in your yard. To test how your yard drains, dig a hole one foot deep and one foot wide. Place a measuring stick in the hole to make sure it's a foot deep. Fill up the hole once or twice to saturate the soil. Then fill it up again and watch how fast the water level drops. If it disappears quickly, within 5 or 10 minutes, you probably have sandy or loamy soil that drains well. If it takes over a day, your soil probably has lots of clay.

Making Amendments

To improve the drainage and increase the available nutrients in your soil, amend it with local compost and sand. Use a flat-edged spade to scoop up the soil and mix in the amendments to at least six inches for smaller plants and up to 18 inches for trees and shrubs. This can be done in the fall before planting so the soil is fully mixed by spring. Also consider getting your soil tested to see what kind of nutrients are already in your soil.

WHEN YOU PLANT

Plant in Layers

Weeds grow where they see an opportunity to grow. Covering bare ground by layering ground cover species with upright and mounding plants creates a fuller, richer garden while also reducing the amount of space where weeds can grow.

Accent Plants

While this planting design shows plants in distinctive patches, it's a good idea to add some accent plants with a contrasting texture or color to make your garden really pop.

A FEW SUGGESTIONS INCLUDE:

Blazing star

Liatris spicata

Anise hyssop

Agastache foeniculum

Purple coneflower

Echinacea purpurea

Orange coneflower

Rudbeckia fulgida

AFTER YOU PLANT

Live & Let Live (Or Die)

A successful garden requires plants that can thrive in your yard. So if you plant something and it dies, don't try to resuscitate it. Do a little research as to why it didn't survive and try a new plant. Conversely, if a particular species is doing well and spreading past its original area, let it happen. It's clearly quite content in your yard.

A FOUR SEASON TASK CALENDAR

FALL

Site Analysis

Observe your yard's existing conditions and make a map of the environmental factors that will impact your plant choices. (Where is it sunny, wet, shady, dry, etc.)

Check the Soil

Test your soil's pH and percolation to see what kind of plants will thrive in your yard.

Get the Beds Ready

Mark out your beds with twine and stakes, dig up the turf, and amend the soil as needed.

Identify generally how you want to lay out your plants to get a sense of how many plants you want to buy.

SPRING

Buy & Plant your plants!

The number of plants you need will depend on the type and size of the stock. Typically, you will buy landscape plugs or containers. Many nursery websites have recommendations for how far apart to space your plants.

Adding a 1.5 to 2-inch layer of mulch after planting can retain more soil moisture and prevents weeds from taking over your new bed. Just keep the mulch away from stems and trunks to prevent rotting.

WINTER

Start designing

Use the Lawn Gone Native templates as a starting point and modify to fit your yard and personal goals

Find Your Plants

Scout out nearby nurseries that carry native plants. You may not be able to find every plant you're looking for, but that's just an opportunity to find some new plants!

SUMMER

New Garden Maintenance

Newly planted plants often need regular watering until established. This is especially important in the summer as heat puts additional stress on a plant while trying to establish its root system.

Observe Your Growing Garden

Watch how your garden grows. Remember that plants are living things that grow, change, and spread. They aren't going to stay exactly where you put them. And if you see a nibble on a leaf, get excited because that means your garden is part of the local ecosystem!

GARDEN PRIDE

Show off your new garden with an official sign!

POLLINATOR HABITAT SIGN **Xerces Society**
Xerces.org/pollinatorhabitatsign

CERTIFIED WILDLIFE HABITAT SIGN **National Wildlife Federation**
Nwf.org/CertifiedWildlifeHabitat

Figure 21. Appendix B: Four season task calendar

INFORMATION SOURCES

Missouri Botanical Garden

Missouribotanicalgarden.org/plantfinder

Good for looking up the basic qualities of many native plants that are also found in PA

North Creek Nurseries

Northcreeknurseries.com

A Pennsylvania native plant nursery with some information on species

New Moon Nursery

Newmoonnursery.com

Has a wonderful comprehensive description of most herbaceous perennial flowers, grasses, and grass-like

Ladybird Johnson Wildflower Center

Wildflower.org/plants/

Another great resource with helpful information on many species

IMAGE SOURCES

IMAGES FROM FLICKR.COM

Anise hyssop (*Agastache foeniculum*)
Chipmunk_1, Flickr.com

Wild blue phlox (*Phlox divaricata*)
Eruturon, Flickr.com

Blue false indigo (*Baptisia australis*)
Suzanne Cadwell, Flickr.com

Eastern red cedar (*Juniperus virginiana*)
Su5, Flickr.com

Oxeye sunflower (*Heliopsis helianthoides*)
Joshua Mayer, Flickr.com

Sideoats grama (*Bouteloua curtipendula*)
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Wild lupine (*Lupinus perennis*)
Steven Katovich, USDA Forest Service, Bugwood.org

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LAWN GONE NATIVE

Growing the suburban wild, one yard at a time

AN HONORS THESIS PROJECT

By

Zoe Roane-Hopkins

Major in Landscape Architecture, Minor in Geography
Graduating in May 2019

Honors Advisor
Larry Gorenflo

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COLLEGE OF ARTS & ARCHITECTURE
SCHREYER HONORS COLLEGE
THE PENNSYLVANIA STATE UNIVERSITY

Figure 22. Appendix B: Back cover

Appendix C

Lawn Gone Native Website Link

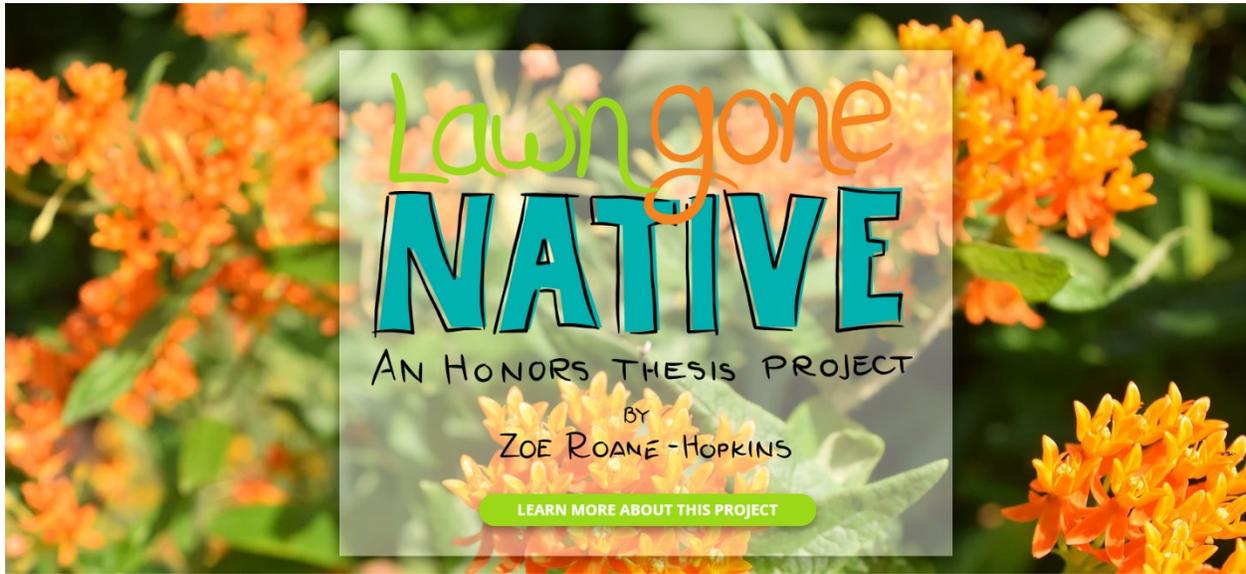


Figure 23. Appendix C: Lawn Gone Native homepage

The website can be accessed from the following link:

<https://zroanehopkins.wixsite.com/lawngonenative>

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Work Experience

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Landscape Architecture Intern

Worked on planting designs and renderings for various local projects

Navarro & Wright Consulting Engineers, Inc. New Cumberland, PA

Craig Bachik

Summer 2017

Landscape Design Intern

Worked with DCNR head landscape architect and Pennsylvania Governor's Residence staff to design and install rain gardens on the Residence grounds

Pennsylvania Department of Conservation and Natural Resources and the Pennsylvania Governor's Residence

Andrew Evans

Summer 2016

Agroforestry Intern

Worked with Pennsylvania agroforestry coordinator to create informational pamphlets about edible buffers.

Pennsylvania Department of Conservation and Natural Resources

Tracy Coulter

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