Photograph by: Dr. Nicholas Dorian

CITY OF SOMERVILLE, MA

Mayor Katjana Ballantyne

SOMERVILLE POLLINATOR ACTION PLAN

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Plan Contents

1 Acknowledgments

3 Letter from the Mayor

5 Section 1: Why Pollinators?

11 Section 2: How to use this Plan

17 Section 3: Pollinators in Decline

25 Section 4: Plan Goals

33 Section 5: Somerville's Pollinators

89 Section 6: General Recommendations / Best Practices

111 Section 7: Private Space Recommendations

117 Section 8: Landscape Services Recommendations

123 Section 9: Public Space and Policy Recommendations

139 Section 10: Recommendations for Learning

145 Section 11: Pollinator Pantry

239 Section 12: Community Outreach

249 Section 13: What's Next?

259 Closing Remarks

261 References

Appendix A – Methodology

Appendix B – Pollinator Species Catalog

Appendix C – Plant Associations

Appendix D – Outreach Materials

Appendix E – Best Practices Checklist

Appendix F – Pollinator Planting Signs

Appendix G – Additional Resources

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Photograph by: Cristian Umaña, Offshoots.

Volunteers converting a portion of the lawn outside of City Hall into a pollinator habitat demonstration garden, June 2024.

Letter from the Mayor

Dear Community Members,

I am proud on behalf of our community to release Somerville's Pollinator Action Plan, but more importantly, I am inspired and hopeful.

The plan is not only the first of its kind in a city as densely populated as Somerville, and not only does it break new ground and offer workable approaches: this community-driven plan embodies Somerville's determination to take on the crises we face. Our planet's pollinators – our bees, butterflies, beetles, flies, wasps, and other pollinating insects – are threatened with significant decline. But cities and individuals can work to change that course. Our Pollinator Action Plan plan provides a way for us to do just that, to help. It charts a vital path for our community to protect, nurture, and expand our pollinator species and create a city – and, we hope, ultimately a region – that is sustainable and resilient.

Pollinators – these tiny creatures that dot our landscapes – play the role of giants when it comes to securing our food supply, our agricultural goods economy, and the very stability of our ecosystem. We have always needed them, and now they need us. This plan reveals that there are a large number of pollinator species in the urban ecosystem and that we have an opportunity to serve as better stewards of the environment to support them.

This plan is unique. It takes a hyper-local approach to creating habitat and improving the ecosystem. The plan is science based and Somerville based. The consultant team and our staff collaborated closely with scientists and our dedicated Pollinator Action Plan Advisory Committee to create an approach based on data that can help pollinator habitats not only survive, but thrive, within Somerville's urban landscape.

Insects are facing the dual survival challenges of habitat loss and a changing climate. Our Pollinator Action Plan can now act as a roadmap for our conservation efforts, telling us which pollinator species are here, which ones are in danger of extinction, and exactly which plants they need to survive. To do this, we were meticulous. We believe the plan marks the first time that a city has analyzed every insect species documented within its borders (nearly 300) and the insect species that could be here if given the right environmental conditions (nearly 250 more).

Our Pollinator Action Plan also continues the important work we started alongside advocates and our City Council with Somerville's Native Species Ordinance and Tree Preservation Ordinance. It will help us achieve our community-driven goals in other City initiatives including our Open Space and Recreation Plan, Urban Forestry Management Plan, Somerville Climate Forward, and SomerVision 2040.

As we look towards the future, this plan will serve as our City's framework for creating science-informed plantings that create a richer and healthier habitat for our pollinators on both public and private lands. The pages that follow are a valuable guide for habitat creation at all scales, from the home gardener in Somerville to municipal parks planners in the greater metro-Boston region. It offers clear, easy steps anyone can take to help, be that planting just one pot of native plants or converting an entire expanse of lawn to a meadow.

My hope, and the City's hope, is for this information to travel beyond Somerville's borders to help protect pollinators throughout our region. We have created the plan as an "open source" document so other municipalities can use it as a resource. As with all important things, it will take many hands to lift up our pollinator species and help end the biodiversity crisis. But in Somerville, our Pollinator Action Plan is ready to lead.

Sincerely,

Katjana Ballantyne

Mayor Katjana Ballantyne

Section 1

WHY POLLINATORS?

Photo Source: BioBee, biobee.com

Key Ideas:

- There is a global biodiversity crisis.
- If the current trend continues, there could be a 30% decline in insects in the next 20 years.
- Pollinators are flower-visiting animals that have the capacity to transfer pollen between flowers.
- Pollinators include bees, butterflies, moths, flies, wasps, beetles, and birds.
- Nearly **90% of flowering plants need pollinators for reproduction.**
- One-third of the food you ate today likely needed animal pollination to reach your plate.
- Changes in urban areas like Somerville can make a difference.

Why Pollinators?

This Plan is a guide for creating a healthier home for pollinators in Somerville. In response to the worldwide biodiversity crisis, this document envisions a city that fosters nature in and among existing urban development—including residential yards, private developments, schools, and public parks. Before exploring the actions necessary to address these goals, we must understand the questions at the root of this crisis. This section will provide a primer on pollinators, explain why they are so valuable, and what is at stake if the pressures they face are not addressed.

What are pollinators and pollination?

Animals such as bees, beetles, and butterflies move between flowers to find food (nectar). In the process of moving between flowers, animals can transfer tiny grains of pollen from one flower to another. These animals are pollinators and this animal-mediated pollination results in fertilization of the plant and the production of seeds. Animals play a vital role in the reproduction of nearly 90% of flowering plants (Ollerton et al., 2011). Somerville is home to many species of pollinators that can be divided into six broad groups: bees, wasps, butterflies and moths, hover flies, beetles, and birds. For the purposes of this Plan, we considered **pollinators** to be **flower-visiting animals that have the capacity to transfer pollen between flowers**. Within these categories are a wide range of species with specific needs to keep their populations healthy.

One out of every three bites of food requires pollination including blueberries which are native to the northeast.

Why are pollinators important?

What did you have for lunch? **One-third of the food you ate likely needed animal pollination to reach your plate** (Xerces, 2024 -a). A reduction in pollinator populations directly impacts the plants you eat. It also impacts agricultural systems that rely on pollination for their crops, including those that feed livestock (Xerces, n.d. -a). Most people think of non-native honey bees as important crop pollinators, but countless other animals are also responsible for your nutritious (and colorful) diet, such as solitary bees, bumble bees, and hoverflies. In fact, scientists have found that "wild" pollinators are equally, if not more, vital to pollinating our agricultural crops as honey bees (Garibaldi, L.A. et al., 2013). For example, we can thank squash bees (*Peponapis pruinosa*) for the pumpkins we carve on Halloween. The squash bee is a solitary bee whose diet and habitat depend on squashes, gourds, and pumpkins (Shephard et al., 2024). This bee species is very effective at pollinating squash fields; without it, squash production would plummet even with the introduction of non-native honey bees. Squash bees are an irreplaceable pollinator for farms (Tepedino, 1981).

We also need pollinators to support other wildlife. Wild animals, including popular urban species like songbirds, rely on insects (including pollinators) for sustenance. Many feed directly on those insects or on the foods resulting from their pollination. Research indicates that **80% of birds studied rely on caterpillars to feed their young** (Kennedy, 2019). **Some species of birds**, including the downy woodpecker native to Somerville, **need thousands of caterpillars to reach adulthood** (Lawrence, 1967). The absence of insects and pollinators in our ecosystem can trigger a bottom-up biodiversity collapse that topples food chains and causes other animals to go extinct (Carrington, 2019; Sánchez-Bayo & Wyckhuys, 2019).

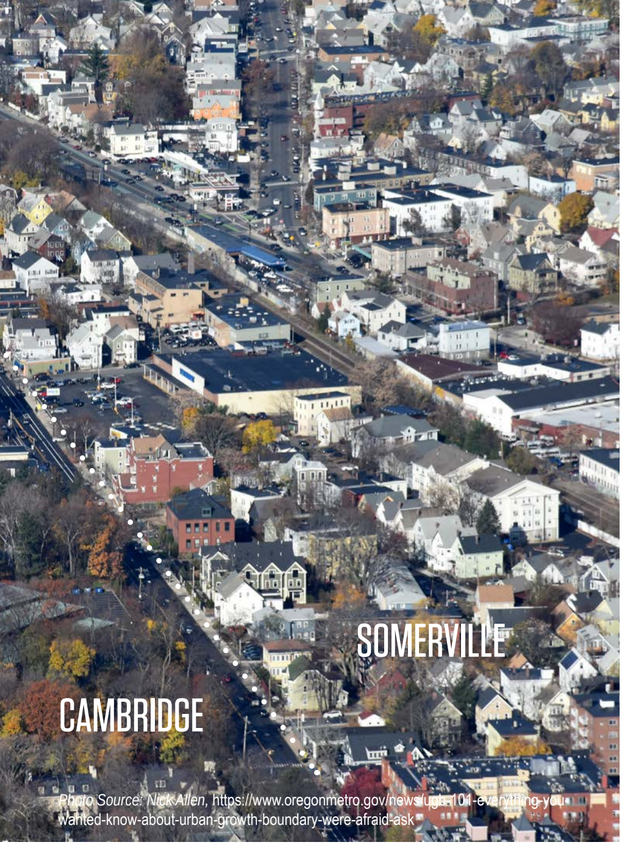


Photo Source: Nick Allen, https://www.oregonmetro.gov/news/urban-101-everything-you-wanted-know-about-urban-growth-boundary-were-afraid-ask

Somerville is a very densely developed and populated city where the collective actions of individuals can make a difference for local pollinators.

Pollinators also support plant diversity: nearly **90% of flowering plants rely on animals (compared to wind or water) for pollination and cannot reproduce without pollinators** (Ollerton et al., 2011). The resilience of our ecosystems requires biodiversity. When one or two species dominate plant communities and ecosystems, they become vulnerable to disease and pest outbreaks, which can lead to the infection of all organisms in that species. A variety of species can slow and prevent disease transmission, minimizing the impact of disease outbreaks. Protecting diverse pollinator populations supports diverse plant communities and this is essential to healthy and resilient ecosystems.

In addition to playing a vital role in our food and ecological web, **pollinators also provide many other human benefits, including joy!** Have you watched a butterfly flit between gardens, or seen a bumble bee harvesting nectar? When a ladybug lands on our arm and our friend says it's good luck, we are interacting with a pollinator and insect network. These moments spark happiness and wonder in people of all ages.

Why are pollinators in decline?

Around the world, insect pollinators are declining in both species and population abundance. North America has had a more than 28% decline in native bumble bees, and 19% of our butterflies are at risk of extinction (Ollerton, 2011). If the current trend continues, there could be a 30% decline in insects in the next 20 years (Xerces, n.d. -a). Scientists widely attribute this trend to habitat loss and fragmentation, pesticide use, land care practices, light pollution, invasive species, and climate change.

Several studies have shown sharp declines in some species of bumble bees and butterflies across the United States over the past several decades. However, these same studies also report that other species have either remained stable or increased in abundance over the same time period. This pattern—that some species of insects have responded negatively to environmental change, and others have responded positively—means that it will be most impactful to consider the food and shelter needs of both abundant generalist species (species that visit a variety of plant species and are not reliant on a specific species for survival) *and* at-risk species. Providing resources for all species is the safest path forward in the face of an uncertain future.

Our understanding of insect population decline is not balanced across all groups of pollinators. Whereas we have a good grasp on the declines of bumble bees and butterflies, we have a relatively poor understanding of the population trajectories of moths, wasps, hover flies, and beetles. This is because of a lack of long-term data on their occurrences and the difficulty of interpreting long-term natural history data collections. Due to their colorful appearance and presence, bees and butterflies have acted as charismatic symbols of pollinators that are appealing to monitor. To better understand population patterns of other pollinator types, we must increase the cultural recognition of those species. This Plan establishes a current baseline of research on Somerville's pollinators and outlines how to collect data in the future.

For a deeper understanding of this topic, refer to Section 3: Pollinators in Decline.

Can an urban area support pollinators?

Yes, it can, and we need to act on a city-scale! Landscapes are resilient. For pollinator habitats, small interventions can very quickly have a positive cumulative effect especially when they begin to build a network of support. Even in Somerville, a city that ranks as the most densely populated municipality in New England and the 19th most dense municipality in the country (Massachusetts Municipal Association, 2024), private gardens and trees, public parks, green infrastructure, and street trees can provide significant habitat for pollinators. Both public and private lands need to be an important part of the solution. In Somerville, most of the land is privately owned (nearly half is residential), therefore private landowners must be an important part of the equation (City of Somerville, 2021).

With guidance from horticulturalists, entomologists, conservation biologists, ecological landscapers, and city planners, this Plan's recommendations will help community members make a significant impact even with actions that seem small in scale. This Plan offers advice on city-wide planning initiatives, new plantings, and ongoing long-term maintenance techniques to maximize pollinator benefits. Small steps like choosing diverse native plants, reducing light use, and avoiding pesticides can contribute to a thriving, interconnected, public and private urban ecosystem. The Somerville Pollinator Action Plan can serve as a blueprint for our densely populated city to build ecosystem resilience and civic responsibility.

Section 2

HOW TO USE THIS PLAN

Photograph by: Cristian Umaña, Offshoots

Key Sections:

- **WHY are pollinators at risk?**
  Section 3: Pollinators in Decline, p. 17
- **WHO are the pollinators in Somerville?**
  Section 5: Somerville's Pollinators, p. 33
- **Manage a bit of private land?**
  (renters, homeowners, employees, business owners, property managers, & developers)
  Section 7: Private Space Recommendations, p. 111
- **Work in the landscaping industry?**
  Section 8: Landscaping Recommendations, p. 117
- **City staff or public official:**
  Section 9: Public Space and Policy, p. 123
- **Non-profits, schools, colleges, teens, and kids:**
  Section 10: Recommendations for Learning, p. 139

How To Use This Plan

This Plan is written for **everyone** in Somerville. We can all play a role in supporting pollinators. Homeowners, renters, business owners, developers, landscaping companies, the Department of Public Works (DPW), City officials, other public landowners (Massachusetts Department of Conservation and Recreation (DCR), Massachusetts Department of Transportation (MassDOT), etc.), academics, colleges, schools, and kids **can make a difference** with small actions that can be taken now. The Plan is broken down below to find the information most relevant for you.

Plan Overview

This Plan includes many resources and recommendations for action. Here is an overview of what you will find:

Section 3: Pollinators in Decline

An introduction to the global factors causing the worldwide decline of insects. This analysis directly informs the Plan's recommendations to support pollinator populations in the long term.

Section 4: Plan Goals

A description of the Somerville Pollinator Action Plan's specific goals.

Section 5: Somerville's Pollinators

An in-depth analysis of Somerville and the region's current pollinator species where they live, and how the data was collected. This section also includes information on which plants these pollinators visit most.

Section 6: General Recommendations

General actions the Somerville community can take to support pollinators and a deeper explanation of the rationale for each. The recommendations are broken down into three groups:

- Planting recommendations
- Landscape maintenance / management recommendations
- Non-landscape recommendations

Section 7: Private Space Recommendations

A short list of targeted suggestions for homeowners, renters, business owners, developers, and general citizens.

Section 8: Landscape Services Recommendations

Suggested maintenance routine changes for landscaping companies, DPW, janitors, and other entities offering landscaping services.

Section 9: Public Space and Policy Recommendations

A list of targeted actions the City (and other owners of public land in Somerville) can take to support pollinators, including:

- A ranking framework for prioritizing new plantings
- Public tree planting recommendations
- Policy suggestions

A monarch butterfly (*Danaus plexippus*) visiting a Joe-pye weed flower.

Many pollinators, including this eastern carpenter bee (*Xylocopa virginica*), flock to native *Clethra alnifolia*. Refer to the Pollinator Pantry and Comprehensive Plant List for other plants that benefit pollinators.

Section 10: Recommendations for Learning

A list of resources and educational tools for nonprofits, schools, colleges, young adults, and kids!

Section 11: Pollinator Pantry

A toolbox of planting resources that anyone can use to make changes in the landscape to support pollinators. It includes:

Top Pollinator Interaction Plant Lists

These are the top Somerville-specific trees, shrubs, and perennials that you can use to bring pollinators to your landscape and support the full life cycle of local pollinators. Plant these to start building habitat on your site or swap out your existing plants with species on these lists to better support pollinators.

Local Ecological Base-Plant Communities

Using locally observed natural plant communities as a guide, these lists provide a starting point for anyone interested in building habitat based on known local plant communities. These plants have evolved together and are often found growing in natural areas in and around Somerville.

Plant Lists by Pollinator

The Plan identifies six pollinator 'mascots' that community members can look for to monitor our city's progress. The Plan includes information on these species including specific plant lists to best attract and support each pollinating insect mascot. A supplemental 'Meet Your (Insect) Neighbors' video series providing instructions on how to identify these species can be viewed on the Somerville Pollinator Action Plan's SomerVoice page.

Planting Recipe Cards

The recipe cards include a wide variety of pre-planned garden designs that can be planted to support pollinators. All designs are backed by data on pollinator-flower interactions to maximize the value of each design. They are suited for a variety of home and landscape contexts. The recipe card scale ranges from Pollinator Pots (for patios and porches) to Pollinator Patches (scaled up in size to include trees and shrubs) for entire backyard conversions. Various specialty garden designs are provided, including pollinator bioswales, edible plantings, fence line designs, and tree medians for City implementation.

Recommendations are also provided for converting lawns to native grasses and flowers that better support pollinators. The planting designs are arranged by color, solar exposure (amount of sun), soil condition (dry or wet), and consider Somerville's specific urban conditions (like rabbits, road salt, and urban soils). The planting designs also consider aesthetics to ensure the gardens look attractive in all seasons.

Comprehensive Plant List

For those who would like to develop their own designs, there is a comprehensive list of all the plant species found to support native pollinators in Somerville. This searchable Excel plant database includes aesthetic characteristics, preferred growing conditions, and specifically identifies which pollinators each plant supports.

Appendix F - Pollinator Planting Signs

Signage is an effective way to communicate ideas and promote change. Signs can educate the public about the benefits of pollinator-friendly gardens and inspire others to take similar actions, fostering a community-wide effort to protect pollinators. Sample signs are included and display a QR code linked to more information on the Somerville Pollinator Action Plan and ways to get involved.

Section 12: Community Outreach

A summary of the outreach done during the development of this Plan and the findings to date. It also includes recommendations for future outreach and Plan promotion strategies.

Section 13: What's Next?

Includes an outline of actions and suggestions for keeping the momentum of this project in the years to come.

These are just some of the highlights of this Plan. Read on to learn so much more.

Photograph by: Dr. Nicholas Dorian

Section 3

POLLINATORS IN DECLINE

Key Ideas:

- **Habitat loss, pesticide use, landscape maintenance, light pollution, invasive species, and climate change** are causing pollinator population declines.
- Fragmented urban habitats isolate pollinators from essential resources.
- Pesticides like neonicotinoids are a large problem.
- Common landscaping practices, such as **mulching, frequent mowing, and leaf blowing destroy nesting sites.**
- Outdoor lighting and ambient light from buildings and streets disrupt pollinators.
- Climate change exacerbates population challenges, causing changes in plant and animal timing and **ecological mismatches.**

Pollinators in Decline

Pollinators are in decline worldwide. This loss is largely attributed to habitat loss and fragmentation, pesticide use, typical landscape maintenance practices, artificial light at night (light pollution), invasive plant species, and climate change.

Habitat Loss and Fragmentation

The loss of continuous natural areas is one result of development, especially in dense urban areas like Somerville. Rural areas experience similar impacts from suburban sprawl and large agricultural systems. Historically diverse landscapes have been replanted with a simplified list of species such as lawn grasses and non-native foundation plants, which provide few benefits to pollinating animals. The result is a fragmented network of habitat patches that isolate native pollinator species from the resources they need and prevent important interspecies interactions. Pollinators forage for resources, seeking nectar, pollen, host plant leaves and nesting materials from their surrounding environment. Travel between food sources and nesting sites varies between species from as little as a few hundred yards to a half mile or more. In order to ensure pollinators have the resources they need to survive, it is critical to consider resource corridor connectivity (*Threats & Conservation Efforts,* n.d.).

Organisms that have more specialized habitat needs and/or occupy higher trophic levels (see Key Term) are more sensitive to land use change. For example, birds that rely on the availability of insects as a food source (including in their larval form such as caterpillars) are also in decline. This decline may be linked to the decrease in insects' habitat due to development or the use of non-native species (Tallamy & Shriver, 2021). Additionally, many insect species require specific host plants to reproduce

Photo Source: Nursery & Floriculture News, UC ANR

Pesticides, which historically have been widely used in the nursery trade, by landscape practicioners and private land owners, pose a major threat to insects.

and survive. If these species are not in reach, the insects can disappear from our local ecosystem. These 'specialist' species need to be carefully considered along with the 'generalist' species (those that can utilize many types of plants) in urban contexts where habitat fragmentation is the norm rather than the exception.

Pesticide Use

Conventional landscape management often involves the use of pesticides (herbicides, fungicides, and insecticides) to keep properties weed- and insect-free. One of the most popularly used insecticide classes in the United States, neonicotinoids (neonics), is a "systemic" synthetic chemical. Once sprayed onto any part of a plant, it is absorbed into the plant tissue and spreads throughout the entire organism. This makes all parts of the plant highly toxic to insects that attempt to collect nectar, pollen, or other resources from the plant (Hopwood et al., 2016). Insects that come into contact with a plant treated with neonicotinoids experience "uncontrollable shaking and twitching followed by paralysis before eventually dying" (Lindwall, 2022). Alarmingly, it was discovered in the last decade that the standard neonic levels of just one corn seed have enough chemical active ingredient to kill over 200,000 bees (European Food Safety Authority, 2013).

The extended presence of neonicotinoids in plants raises a cause for alarm because the plant remains toxic long after application, killing any insects that come in contact with it. Importantly, 51% of plants labeled for sale as bee-friendly species at major U.S. retailers are found

Key Term: Trophic Levels

The different levels in a food chain or food web, where each level represents a step in the flow of energy and nutrients (e.g., a parasite who depends on a host, a predator who depends on prey).

Large areas of the U.S. light up at night. Can you find the Greater Boston area? Refer to Section 5 for more information on artificial light at night in Somerville.

to contain toxic levels of neonicotinoids at levels substantially higher than the maximum approved level for agricultural crops (Friends of the Earth, 2014; Malfi, 2024). In addition, the extended presence of active chemicals in pesticides results in contamination of water systems due to water runoff carrying soil particles exposed to and imbued with neonics (Lindwall, 2022). It is beneficial for many reasons to avoid using all pesticides, but especially neonicotinoids, as well as avoiding purchasing plants that have been treated with neonicotinoids. **Ask your local plant nursery what they carry that is neonic free.**

Landscape Maintenance Practices

Many urban landscapes consist of lawns, non-native plants, and mulched plant beds which are not rich habitats for pollinators. Additionally, typical landscaping practices like frequent mowing remove flowers (essential nectar and pollen sources). This reduces floral diversity and habitat quality (Lerman et al., 2023). Other common practices, such as leaf blowing, cutting perennials back in the fall, and applying bark mulch to plant beds, minimize how valuable these spaces are for pollinator nesting habitat in already-limited urban green areas.

Artificial Light at Night

In urban environments like Somerville, the amount of artificial light at night presents a significant challenge for pollinators. Artificial light sources, such as streetlamps or patio lights, and diffuse skyglow (light from nearby cities) negatively impact the foraging and reproductive behavior of nocturnal insects and pollinators. Those behavior changes are documented as insects perching underneath lights for "unclear reasons… stunned," or circling "around (the light source) until claimed by injury, exhaustion, or predation," (Owens, et al., 2020). On a broader scale, artificial light can impede large-scale migration patterns and increase competition for resources if insects that typically only forage during the day start foraging at night (Owens, et al., 2020). Research suggests that one-third of insects attracted to artificial light sources will die from exhaustion or predation before the morning. In addition, the presence of artificial light sources delays or eliminates the window of reproduction for some pollinators and insects, such as moths and firefly beetles (Owens, et al., 2020). These changes in behavior cause phenological mismatches (see Key Term) where the timing of natural events in the life cycles of interdependent species (like flowering in plants and pollination by insects) no longer align. This results in lasting effects on food webs, pollination, and species interactions. In cities such as Somerville where residents depend on public lights for safe transportation, following dark sky practices is a good first step at reducing light pollution.

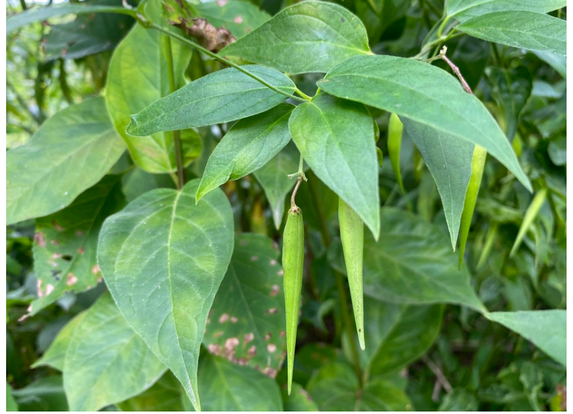
Invasive and Non-Native Species

Invasive plant species are plants not historically present in a region (non-native) that reproduce independently, invade natural or disturbed areas, and outcompete native plants (*Threats to Pollinators*, n.d.). Invasive species are defined by their harmful impact on a local ecosystem; a plant native to one region may be invasive in another.

Native plants and the specialist pollinators who forage from them have evolved together over thousands of years. Non-native and invasive species can negatively impact these pollinators. As native plants are displaced or damaged by invasive non-native species, specialist pollinators' vital

Key Term: Phenology

The study of the timing of natural events in the life cycles of plants and animals (e.g., when a flower blooms in relation to when an insect emerges in spring).



Black swallow-wort (*Cynanchum louiseae*) is one of several invasive plants commonly found in Somerville. For more information on this plant and how to join the "Pod Patrol" refer to the Somerville Garden Club flyer in Appendix G. For additional information on Somerville-specific invasive species, visit the City of Somerville's invasive species page.

resources diminish. As an example, the City of Somerville, alongside community groups like the Somerville Garden Club and the Cambridge Pod Patrol, is working to combat the spread of one invasive species: black swallow-wort (*Cynachum louiseae*), aka BSW. Originally native to Europe, today BSW is found throughout Somerville. It is a member of the same plant family as native milkweeds but spreads aggressively. While native milkweeds are a food source for the caterpillars of monarch butterflies, the toxins present in BSW are a "threat to [the monarch butterflies'] survival" (Somerville Garden Club, 2018). Due to the similarities between milkweed and black swallow-wort, monarchs sometimes lay their eggs on BSW, but the larvae cannot survive on these plants due to toxin levels in the leaves. This tricky invasive plant is just one example of the negative impact invasive species can have on the local ecosystem.

Preventing the introduction and spread of invasive species begins with educating ourselves, our community, and our plant nurseries on the species that are invasive in our area. The Massachusetts Invasive Plant Advisory Group (MIPAG) maintains lists of plants that are currently, likely, or potentially invasive. Nurseries may still sell invasive or aggressive non-native species that displace native plants. We may not even realize it! It is up to the consumer to choose wisely and ask questions of nursery staff to determine if a plant is suitable for Somerville.

Climate Change

Climate change has led to acute changes in temperature, precipitation, humidity, and the frequency of extreme weather events. These dynamics pose an alarming danger to pollinators by exacerbating existing threats

including habitat loss and creating more desirable conditions for the spread of invasive species. As climate change continues to alter weather patterns, pollinators face altered phenology (i.e., the timing of when plants flower in relationship to animal activities), changes in species interactions, changes in metabolism and physiological responses, and other combined stressors (Laws et al., 2019).

In just the past few years, scientists in Massachusetts observed five species of butterflies in flight "significantly earlier" than decades ago (Polgar et al., 2013). A different study conducted locally at Walden Pond in 2013 noted that many plants flowered two weeks earlier than they had 160 years ago when compared with Henry David Thoreau's careful observations (Ellwood et al., 2013). These examples illustrate the potential for ecological mismatches where an insect's emergence/activity timeline might not match up with the necessary window of a plant's growth (Primack, 2024). If insects that rely on early-season flowers emerge too late after plants flower, they face a lack of critical resources. Disruptions to migration patterns result in difficulty finding resources not only for pollinators and insects but also for migrating birds that rely on these insects as food sources in areas. In Somerville, this is compounded by the impacts of habitat loss and fragmentation reviewed previously.

Climate impacts are pressuring human residents of Somerville as well. According to data available from First Street Foundation, **Somerville could potentially see 35 days with temperatures above 90 degrees and 15 days above 97 degrees by the year 2054** (First Street Foundation, 2024). The Somerville Climate Change Vulnerability Assessment (2017, updated in 2023) identified potential climate risks and priorities throughout the city (see **Figure 1**). Large areas (especially in Wards One and Two) were identified as "high heat exposure, economic impact & vulnerable population neighborhoods." These areas should be prioritized for creative, long-term planning solutions to address both human cooling and wildlife needs. This Plan explores how new plantings can help mitigate the impacts of the changing climate and support the city's pollinators.

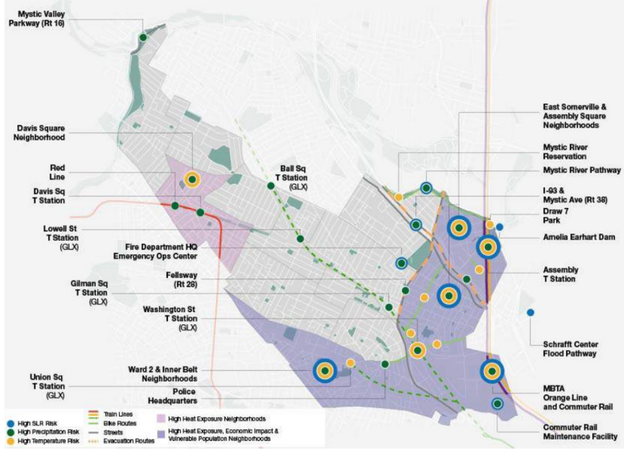


Figure 1: Key priorities for the City of Somerville as identified in the Somerville Climate Change Vulnerability Assessment, 2017.

Despite the factors contributing to insect decline, planning for the future is not a lost cause. Landscapes are resilient, and vegetative cover and plant composition can change quickly, especially in a city with an invested community. Individual residents can act on the information available and immediately see the results of even small contributions.

Read on for the overall goals this Plan is striving to meet.

Section 4

PLAN GOALS

Photograph by: Cristian Umaña, Offshoots

Key Goals:

1. Create more habitat in the city
2. Provide places for **pollinators and people**
3. Increase pollinator **diversity and abundance**
4. Encourage pollinator **patches and corridors**
5. Simultaneously work toward other citywide goals
6. **Educate and inspire**
7. Easy to use
8. Realistic, **actionable, and measurable**
9. Regional model and **shared municipal resource**

Plan Goals

The primary goal of this Plan is to support pollinator populations in Somerville and prevent future habitat decline. The Somerville Pollinator Action Plan (SPAP) strives to achieve the following:

1. Create more habitat in the city

At the core of this Plan is the need to establish more habitat for pollinators. In the face of global insect decline, providing food and nesting resources is the most substantial impact Somerville can make. This is a directive for all who live and work in this city as we need all hands on deck. To achieve this goal, the Plan identifies beneficial species to plant on private and public property, landscape maintenance practices that support pollinators, and methods to inspire and educate the public to reach as many people as possible.

2. Provide places for pollinators *and* people

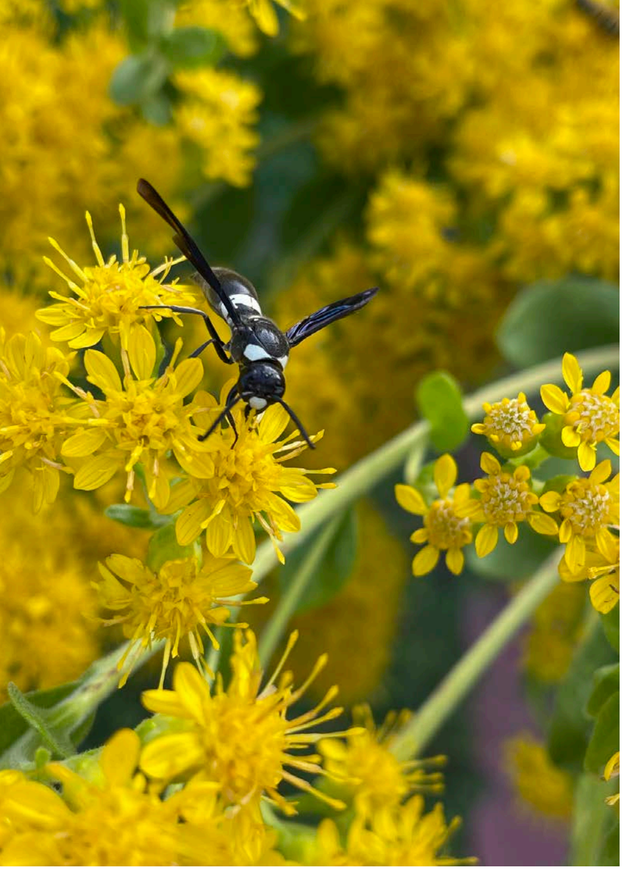
In urban areas, gardens designed for pollinators hold immense value, not only for the insects and birds they support but also for the people who interact with these spaces. Fostering an aesthetic appreciation of them encourages public engagement and a deeper connection to the urban outdoor environment. When residents engage with and appreciate these spaces, they are more likely to support and advocate for their preservation and expansion, creating a positive feedback loop that benefits both pollinators and the broader ecosystem.

The bicolored striped sweat bee (*Agapostemon virescens*) is a native bee found in Somerville. See Section 5 to learn more about this bee species.

Integrating environmentally beneficial elements into human-centric landscapes can be challenging if the resulting appearance does not align with aesthetic expectations. Plantings that are 'naturalistic' often let some plants reproduce spontaneously. The plants move around and these naturalistic gardens in public parks are sometimes associated with looking 'unkempt" and "neglected." This often prompts complaints to Somerville's 311 system.

To address this challenge, the Plan provides a balanced approach to both public and private plantings. Ideas for naturalistic plantings (for those who appreciate or are comfortable with more organic styles that allow plants to move around) are proposed alongside planting designs that prioritize conventional garden aesthetics and may look more formal or "designed." The Pollinator Pantry section of this Plan provides designs that cater to both audiences. Both of these types of gardens contribute to the ecological functioning of the city; each includes a base matrix of locally native plant species with high ecological value that can thrive within the urban environment. Repeating the base matrix of low-maintenance, locally native plants across the city creates an urban ecological network that supports pollinators and encourages community recognition of their appearance and value.

Over time, as more people become comfortable with more naturalistic pollinator habitat gardens (i.e., wilder spontaneous gardens, less mulch, with dead plant stalks and old wood left for nesting) more people may begin to appreciate the beauty in naturalistic planting styles and embrace a different aesthetic.



The four-toothed mason wasp (*Monobia quadridens*).

3. Increase pollinator diversity and abundance across all wards

This Plan aims to increase pollinator diversity and abundance through the establishment of habitat, as described above, not just in one or two areas but across all of Somerville. Pollinator species can be broadly categorized as either 1) generalists that use resources from a wide range of plants or 2) specialists who rely on specific plant(s) to complete their life cycle. To ensure Plan recommendations meet the needs of all local pollinator species, there is a focus on providing the necessary resources for both generalist and specialist species. Furthermore, to meet the needs of insects who travel only short distances over their lifetime, this Plan strives to increase the number of pollinators and species diversity across the whole city. Information and resources are needed to equip citizen scientists to report their findings across all wards and identify if Somerville is meeting this goal.

4. Encourage pollinator patches and corridors

Different pollinators forage for resources at different scales, varying from several hundred feet to hundreds of miles over their life span. It is important to provide safe and healthy systems to support these broad populations. Even small patches of new habitat can make important impacts when evenly distributed throughout an area (Donkersley et al., 2022). Establishing continuous habitat patches (or patches at strategic distances from each other) builds pollinator-friendly corridors that are crucial for some pollinator's survival. These connected ecosystems support a wider range of diverse species and build ecological resilience to the impacts of climate change. Green corridors in urban zones offer food resources, foraging opportunities, larval host sites, and shelter that may be lacking in surrounding areas. This Plan encourages every citizen to help build a citywide network of habitat and provides suggestions for ongoing monitoring to keep an eye on which areas of the city may need future habitat prioritization.

5. Simultaneously work toward other citywide environmental and social goals

The City of Somerville has defined many progressive social and environmental goals as part of City planning efforts, including, but not limited to: Climate Forward (Community Climate Action Plan), the Urban Forest Management Plan, Zoning Ordinance, Green Score, Open Space and Recreation Plan, Tree Preservation Ordinance, Vegetated Roof Ordinance (10.3.8) and the Native Species Ordinance. The Somerville Pollinator Action Plan seeks to complement the goals defined in these other plans. A few of these goals are emphasized here:

Citywide Environmental Goals

Increase Native Plant Biodiversity

Urban areas pose significant threats to species and ecosystems, but they also have the potential to offer a diverse array of unconventional habitats that support the native biodiversity of plants and animals. Intentional design and maintenance can ensure that cities retain native biodiversity and provide habitat to a range of species. Pollinator gardens aim to support a wide range of animals and plants that can increase biodiversity throughout the city.

Cooling the City

New pollinator-forward green spaces, with their diverse vegetation that include trees, can increase shade and enhance evapotranspiration, which in turn lowers surrounding air temperatures. Evapotranspiration is the process by which water moves from the land to the atmosphere. It involves two steps: evaporation, where water turns into vapor from surfaces like soil, water bodies, and plants; and transpiration, where plants release water vapor from their leaves. Together, these processes take heat from the environment. By reducing urban heat, pollinator gardens not only provide critical habitat for pollinators but also improve outdoor comfort for city residents (Shah, 2020).

Citywide Social Goals

Increase and Enhance Access to Open Space for Residents

As of 2024, the City of Somerville has just under 80,000 residents living in 4.12 square miles, making it the most densely populated municipality in New England (Massachusetts Municipal Association, 2024). Somerville includes 174.3 acres of open space currently, which equates to 9.5 sq ft of open space per resident. Recommendations on how to use that space must consider the needs of residents alongside any ecologically driven goals, including pollinator habitat. This is especially important in areas identified by the state as Environmental Justice neighborhoods. These areas experienced significant disinvestment in the past and access to environmentally rich open space must be prioritized in the future.

6. Educate and inspire

Everyone (from City staff to residents) is at different levels of familiarity with pollinator insects. Many people dislike interacting with them, fear being stung, and may not want to encourage their presence near parks or playgrounds. However, many pollinators are not able to sting and most are unlikely to. Education about pollinators and teaching residents about the wonders of our local ecology is critical to the success of this Plan. For relevant information on this topic, please see Section 6 for stinging insect and allergy awareness tips.

7. Easy to use

This Plan intends to meet users where they are. Community members can access tips for why, how, and what to do to make a difference with or without access to a garden. Section 11: Pollinator Pantry includes a wealth of easy-to-use resources, including lists of the top plants and pre-planned garden designs for a wide range of site conditions. These planting plans use a grid system to help new gardeners install the planting design easily. The Appendices include additional ready-to-use resources like SPAP branded signage for pollinator plantings and concise and clear maintenance infographics to help gardeners of all levels improve pollinator habitat throughout the city. Additional resources and documentation from the development of this plan are available to all on the SPAP SomerVoice page. There you also find an easy-to-read brochure that distills down the whole plan for those who just want to read the key takeaways and a list of all the website links used throughout the Plan.

8. Realistic, actionable, & measurable

To be as beneficial as possible, this Plan seeks to provide not only the best practices for pollinators but also realistic, actionable items for private and public spaces in the short and long term. The Plan identifies the current state of pollinators, opportunities for implementation, limitations and challenges, and provides recommendations for ongoing monitoring to measure the success of this work.

9. Regional model and shared municipal resource

This innovative and broad-reaching Plan was curated to meet the needs of Somerville's pollinators and guide City of Somerville staff and residents, but it can be used as a model for other urban communities to create a pollinator action plan in their area. The General Recommendations, 'Pollinator Pantry', and Comprehensive Plant List are all publicly available documents that can be used to develop pollinator habitats in this region. The replicable methodology used to understand the species present in Somerville can be found in Appendix A to create custom plans in other municipalities.

An American lady butterfly (*Vanessa virginiensis*) visiting a *Monarda fistulosa*.

Section 5

SOMERVILLE'S POLLINATORS

Photograph by: Dr. Nicholas Dorian

Key Ideas:

Pollinator observations in iNaturalist, eBird, EWA & Tuft's databases were aggregated and analyzed for **bees, butterflies, moths, wasps, flies, beetles, and birds.**

- **299 pollinator species** were identified in Somerville.
- **543 pollinator species** were identified regionally.
- **18 species of at-risk butterflies and moths** were observed in the region.
- Somerville's **pollinators** are active from March **through October.**
- **Highest** existing species richness was observed in **Wards 3, 5, and 6. Lowest in Wards 1,2, and 4.**
- **See page 79 for a list of the plants** that pollinators were observed interacting with the most.

Somerville's Pollinators

Somerville Pollinators 101

Six categories of pollinators are found in Somerville: bees, butterflies and moths, wasps, flies, beetles, and birds. Each category can be further divided into individual species with their unique active periods, habitat needs, and plant associations. It is beneficial to learn the basics about each overarching category before diving into which species live in Somerville. Refer to Appendices A-C for associated figures.

1. Bees

Bees (*Hymenoptera*) are among the most important pollinators in temperate ecosystems. As a group, they are vegetarian—pollen provides protein and nectar provides carbohydrates. Most people are familiar with a single species, the European honey bee (*Apis mellifera*), but Massachusetts has recorded nearly 400 species of bees (Veit et al., 2022). Native bees are incredibly diverse in size, shape, color, and habitat needs. Some, like bumble bees, are social and build a nest that requires food resources throughout the entire year. Others are solitary, meaning a single female builds one nest. Solitary bee species are typically active for only a few weeks each year, coinciding with suitable floral resources. Some solitary bees are highly specialized in their floral needs. These pollen specialists depend on one or a few plants for pollen throughout their lives.

2. Butterflies/Moths

Butterflies and moths (Lepidoptera) are conspicuous flower visitors in Somerville, even if their value as pollinators is not as substantial as bees. As a group, flower-visiting butterflies and moths consume nectar as adults. As larvae, butterflies and moths consume vegetation such as leaves and flower buds. The plants that provide these early development resources for larvae are known as "host plants." Approximately 60% of moths and butterflies in this region depend on specific host plants (Forister et al., 2014). Their needs can vary from highly restrictive, such as a particular genus of plants, to moderately restrictive, like a family of host plants. For instance, black swallowtails require umbellifers (*Apiaceae)* or violets (*Viola)*, while many skipper butterflies can feed on a wide variety of grasses (*Poaceae*). Other Lepidoptera are less restricted: some moths eat the leaves of woody plants (e.g., *Prunus, Quercus, Fraxinus, Vaccinium*); others consume various garden plants like corn, peppers, and legumes.

Most butterflies are day-flying, while most moths are night-flying, but exceptions exist. Some hawkmoths in the family *Sphingidae* are day-flying and are quite the sight on flowers.

3. Wasps

Wasps (*Hymenoptera*) are often overlooked as pollinators, but they are some of the most common flower visitors during the summer months in Somerville. Adult wasps visit flowers for nectar, which serves as a primary food source and fuels hunting and nest construction. As adults, wasps are herbivores, obtaining their nutrition from flower nectar. As larvae they are carnivorous, feeding on paralyzed insects. Most wasp species in Somerville are solitary, meaning a single female builds and provisions her own nest. Like bees, solitary wasps either nest below ground (such as digger wasps, *Sphex*) or above ground (such as grass-carrying wasps, *Isodontia*). Solitary wasps can seek highly specialized insect prey. In contrast, other wasp species hunt diverse insects such as crickets, spiders, flies, and even bees.

4. Flies

Flies (*Diptera*) are also typically overlooked as pollinators. In particular, hover flies (*Syrphidae*) are excellent pollinators of crops and wild plants. Many species of hover flies have a similar appearance to wasps and bees, with black and yellow striping. This superb mimicry is thought to make the flies less appealing to predators who avoid stinging insects with black and yellow stripes. But flies cannot sting! Flies tend to visit flowers with shallow floral parts, where they feed on nectar and pollen. Some adults lay eggs on leaves where the larvae consume aphids. Others lay eggs in rotting wood or shallow ponds where larvae develop.

5. Beetles

Beetles (*Coleoptera*) are among the oldest lineages of pollinators. Some of the showiest pollinators are the longhorn beetles, which have slender bodies and distinctively long antennae. Beetles are often attracted to white flowers with an intense, musty fragrance such as viburnums, dogwoods, ninebark, elderberry, and wild roses. When they land on flowers, they move slowly and chew flower parts as they seek resources. Their offspring tend to develop underground or in rotting wood.

6. Birds

The most visible bird pollinator in Somerville is the ruby-throated hummingbird. Orioles and some warblers also visit flowers opportunistically. Tiny ruby-throated hummingbirds visit flowers for nectar to sustain their fast flight, feeding often as they burn through their fuel quickly. They have co-evolved with nectar-rich native plant species such as red columbine (*Aquilegia canadensis*), which provides energy for their northward migration in May, and cardinal flower (*Lobelia cardinalis*), which fuels their southbound migration in August and September. Hummingbirds also rely on insects, especially during nesting season. These charismatic pollinators are not seen as often in Somerville as some other pollinators, but they can be spotted during spring and fall migration.

Pollinators Included in this Plan

Since the term pollinator is rooted in ecological function rather than taxonomy, the project team developed the list of pollinators for this Somerville Pollinator Action Plan to be as inclusive as possible. **Species were added to Somerville's pollinator list if they could potentially serve as pollinators** (i.e., observed on a flower). They were omitted from our list if no record of flower visitation could be found. That said, there are likely many additional flower-visiting insects in Somerville that could act as pollinators, there is simply no data on their flower visitation.

Pollinator Species Data

Before Somerville can begin to address the needs of pollinators throughout the city, there needs to be an understanding of existing pollinators, including 1) species currently present, 2) species in nearby landscapes but not present or observed in Somerville, and 3) regional pollinator species at risk of population decline. To that end, the project team reviewed multiple data sources to determine which species are present, when they are present, and what plants they use. Somerville is uniquely positioned to have access to a range of data from international citizen science platforms and hyper-local research organizations. This information establishes a starting point for developing citywide conservation goals and will be the baseline for ongoing monitoring to determine if pollinators benefit from changes made as a result of this Plan.

Somerville has access to three credible sources of data that the team used to develop a "Somerville Pollinator Species Catalog" of species currently observed within the city and/or regionally. These sources rely on a range of observation types: citizen science verified by experts (iNaturalist and eBird); trained observers from local non-profit Earthwise Aware (EwA) verified by experts; and surveys provided by local college students working under the review of academic experts through the Tufts Pollinator Initiative (TPI). Data collected from iNaturalist tells us where and when pollinators were observed and the data from TPI and EwA tells us which plants pollinators visit in Somerville. Regional data was only available through iNaturalist and provides a list of species that may also benefit from strategies employed in Somerville.

Refer to **Table 1** for sources of pollinator observations in Somerville that were captured in the data analysis.

The varied data sources reflect many years of collection throughout the city. However, it is important to note the potential for observer bias during interpretation in both the species collected and the distribution of

TPI scientist Maria Ostapovich collecting data from sunflowers (*Helianthus*) in Powderhouse Circle, July 2020.

Trained EwA naturalists collecting data on pollinator interactions.

data. For example, there might be:

1) under-representation of dull, small, or cryptic species or of species that are not typically considered charismatic, (e.g., flies)
2) over-representation of flashy, large, or conspicuous species
3) over-representation of slower-moving species that may be easier to photograph
4) under-representation of records at night when people are not looking for insects
5) under-representation of interactions in trees and shrubs above eye level
6) spatial biases towards places with gardens or residents that are already interested in nature-watching and/or nature-recording
7) temporal biases towards summer and fall months when people are outside

That being said, even with these biases, the available data gives us an excellent starting understanding of the almost 300 species within Somerville. The biases also identify avenues for future monitoring and research.

To further explore the methodology used in this study, please refer to Appendix A.

Table 1: Pollinator Observations

Source:	iNaturalist	eBird	Earthwise Aware (EwA)	Tufts Pollinator Initiative (TPI)
Years:	13	3	1	1
Observers:	267	7	22*	2
Records:	7081	8	423	1885
Type of Data:	Opportunistic crowd-sourced observations Provides time and date of observations	Opportunistic crowd-sourced observations	Repeated visits to focal areas by trained volunteers Provides insect-plant interaction identification Record absences during winter months	Repeated surveys of 4 focal gardens by scientists Provides insect-plant interaction identification

*Includes 5-11 regular observers as well as single-day guest observers

Pollinator Species Catalog

Somerville Species

There have been 299 taxonomic units of pollinators observed within the City of Somerville as seen in **Table 2.**

Table 2: Present and Potential Pollinators

A tally of pollinator species across groups for those recorded from Somerville ("present") and those which could occur in Somerville based on presence in eastern Massachusetts ("potential").

Pollinator Group	Present	Potential	Total
Bees	80	63	143
Beetle	34	16	50
Butterfly	24	32	56
Flies	35	42	77
Hummingbird	1	0	1
Moth	82	45	127
Wasp	43	46	89
Total	**299**	**244**	**543**

Mascot Species - Meet your Pollinator Neighbors

The following six pollinators were selected as representatives of the ecological diversity of pollinators in Somerville to help citizens get to know some local insects and help monitor their future populations. The specific recommendations for each mascot help ensure that the Plan meets requirements for a broad range of visitors; efforts to support these pollinators will benefit many other species too**. These six pollinators were selected because they are all visually striking and conspicuous, meaning they are easy to identify and could form the basis of future monitoring efforts by community scientists.** Read on to get to know these species, or watch the SPAP video series "Meet Your Neighbors" by Dr. Nick Dorian that teaches simple identification techniques and fun ecological facts.

Bicolored striped-sweat bee (*Agapostemon virescens*)

This is a bright metallic green bee with a black-and-white abdomen. It is common throughout Somerville from the end of May through fall, and it is easily found on aster family flowers like purple coneflower (*Echinacea purpurea*) and wood asters (*Symphyotrichum* spp.). This species nests in the ground and can be helped by leaving small patches of bare ground in the garden.

Two-spotted bumble bee (*Bombus bimaculatus*)

This is the earliest bumble bee to emerge in spring. The colony cycle (the stages of the development of a bumble bee colony, which each only last one year) lasts through the middle of summer, and this pollinator can be found on cherry trees (*Prunus* spp.), rhododendrons and azaleas, false indigo (*Baptisia australis*), blueberries (*Vaccinium* spp.), wild bergamot (*Monarda fistulosa*) flowers, among others. Look for a black and yellow fuzzy bumble bee with a "W" shaped patch of yellow on the abdomen.

Monarch butterfly (*Danaus plexippus*)

Monarch butterflies might be the best-known pollinator. This large butterfly species depends on milkweed (*Asclepias* spp.) plants to grow as caterpillars and nectar from flowers during the breeding season to fuel mating and flight. They migrate to Mexico in the fall, so fall-blooming flowers like goldenrods (*Solidago* spp.) and asters (*Symphyotrichum* spp.) are important to the species' survival. They can be seen in Somerville from late June through September.

Great black digger wasp (*Sphex pensylvanicus*)

Great black digger wasps are the pollinator-sports-cars of the skies. These fast, flashy wasps are quite gentle when foraging on flowers and fly away if disturbed. In mid-summer, they visit flowers to drink nectar and hunt

Transverse-banded flower fly
(Eristalis transversa)

Great black digger wasp
(Sphex pensylvanicus)

Banded longhorn beetle
(Typocerus velutinus)

Bicolored striped-sweat bee
(Agapostemon virescens)

Two-spotted bumble bee
(Bombus bimaculatus)

Monarch butterfly
(Danaus plexippus)

Four of the at-risk bee species found in Somerville.

katydids and crickets as prey, which they bring to their underground nests. Their favorite flowers include mountain mints (*Pycanthemum* spp.), goldenrods (*Solidago* spp.), swamp milkweed (*Asclepias incarnata*), and summersweet (*Clethra alnifolia)*. Because these wasps are solitary and have no colony to defend, they are not aggressive. Plus, like the majority of Somerville's 50+ species of solitary wasps, they never visit our backyard picnics.

Transverse-banded flower fly (*Eristalis transversa*)

Hover flies make an excellent living out of looking like wasps. These gentle, stingless flies provide two critical ecosystem services: pollination of flowers and nutrient cycling by breaking down soil organic matter for plants to use. To support *Eristalis transversa*, plant asters like lance-leaf coreopsis (*Coreopsis lanceolata*), purple coneflower (*Echinacea purpurea*), and wood asters (*Eurybia* spp.), which are coincidentally some of the most valuable plants for other pollinators in Somerville.

Banded longhorn beetle (*Typocerus velutinus*)

Banded longhorn beetles are easy to spot on flowers. These are large, slow-moving pollinators that do not sting. Look for them on fragrant white flowers like viburnums (*Viburnum* spp.), elderberry (*Sambucus* spp.), and shrubby dogwoods (*Cornus* spp.) during spring and summer. These beetles develop in decaying wood so consider leaving an old stump or a log pile in a shady spot in your yard to help them out.

Regional Species

Pollinators that could potentially occur in Somerville, based on their presence in similar habitats in eastern Massachusetts, are also included in the list of Somerville taxa. The list of potential pollinators is conservative in that we limited our search to field-identifiable species recorded on iNaturalist or noted in taxonomic research for eastern Massachusetts (predominately Middlesex, Essex, Suffolk, and Norfolk counties). We did not consider species that primarily occupy different eco-region types (e.g., northeastern highlands in the Berkshires or Atlantic coastal pine barrens on Cape Cod) as they require habitats that don't exist in Somerville. This research added 244 additional pollinators that could potentially occur in Somerville but have not been recorded to date (see **Table 2**).

At-risk butterfly species found in Somerville.

In total, the Somerville Pollinator Species Catalog includes 543 species of insect pollinators and 1 hummingbird pollinator. For a complete list of the observed species, please refer to Appendix B.

At-Risk Species

Trend data indicating which Massachusetts pollinator species are at risk of population decline are currently only available for bees and butterflies. Unfortunately, it is not known how most moths, flies, wasps, or beetles are faring in the context of rapid, global environmental change. Among the species found in Somerville, published population trends show declines in several species of bees and butterflies. For this report's purposes, these species are considered at-risk in that they occur in Somerville but are likely not as common as they used to be. Planting gardens that meet the habitat needs of these insects could contribute to increasing their abundance. It is worth noting that given the lack of historical data from Somerville, it is not possible to know the particular population trends of species within the city. Rather, these species are highlighted to encourage future monitoring efforts to document these species across Somerville more completely.

At-risk bees present in Somerville

- hawthorn miner bee, *Andrena crataegi*
- cloudy-winged miner bee, *Andrena nubecula*
- golden northern bumble bee, *Bombus fervidus* (Jacobson et al., 2018)
- half-black bumble bee, *Bombus vagans* (Jacobson et al., 2018)
- eight-toothed leaf-cutter bee, *Coelioxys octodentata,*
- orchard mason bee, *Osmia lignaria*
- Drury's long-horned bee, *Melissodes druriellus*
  (Based on Bartomeus et al., 2013 conclusions using data from northeastern North America)

At-risk butterflies present in Somerville

- common wood-nymph, *Cercyonis pegala*
- clouded sulphur, *Colias philodice*
- silver-spotted skipper, *Epargyreus clarus*
  (Based on Michielini et al. 2021 conclusions using Massachusetts data only)

distant miner bee
Andrena distans

short-haired dogwood mining bee
Andrena integra

striped hairstreak butterfly
Satyrium liparops

variegated fritillary butterfly
Euptoieta claudia

The species of bees and butterflies shown here are among the 18 species identified as being present regionally but not yet observed in Somerville. The actions taken in Somerville may be able to help support these species.

relative leafcutter bee
Megachile relativa

Delaware skipper
Anatrytone logan

Among the species found in eastern Massachusetts that are not present in Somerville, the following nine species of bees and eight species of butterflies are thought to be at-risk:

At-risk bees present in eastern MA but not yet recorded from Somerville

- eastern willow miner bee, *Andrena bisalicis*
- short-tongued miner bee, *Andrena brevipalpis*
- distant miner bee, *Andrena distans*
- red-bellied miner bee, *Andrena erythrogaster*
- short-haired dogwood mining bee, *Andrena integra*
- peaceful miner bee, *Andrena placata*
- Sigmund's miner bee, *Andrena sigmundi*
- short leafcutter bee, *Megachile brevis*
- relative leafcutter bee, *Megachile relativa*
- Maine blueberry bee, *Osmia atriventris*
  (Based on Bartomeus et al. 2013)

At-risk butterflies present in eastern Massachusetts

- striped hairstreak butterfly, *Satyrium lipaprops*
- silvery blue butterfly, *Glaucopsyche lygdamus*
- variegated fritillary butterfly, *Euptoieta claudia*
- California ringlet butterfly, *Coenonympha california*
- Delaware skipper butterfly, *Anatrytone logan*
- European skipper butterfly, *Thymelicus lineola*
- hoary edge butterfly, *Thorybes lyciades*
- Indian skipper butterfly, *Hesperia sassacus*
  (Based on Michielini et al. 2021)W

Temporal Distribution

The USA National Phenology Network defines phenology as "the study of the timing and cyclical patterns of events in the natural world, particularly those related to the annual life cycles of plants, animals, and other living things." The temporal data reviewed for this project provides insight into each species' phenology (**Figures 2-9**). **This analysis indicates that Somerville's pollinators are active across the entire growing season, from March through October** (during which weather conditions are suitable for plant growth in Massachusetts). Pollinator groups as a whole varied little in their activity periods, with flies and beetles tending to be active earlier in the season and butterflies and wasps tending to be active later in the season. Of note, bees were active across the entire growing season, from March through October, underscoring the importance of providing season-long resources for bees in urban pollinator habitats. Ruby-throated hummingbirds (*Archilochus colubris*) were not recorded breeding in Somerville as evidenced by the absence of records from June and July. Concentrated bursts of sightings in April-May and in August (9 total records) indicate that this species uses Somerville during spring and fall migration, respectively. **Providing nectar-rich floral resources for hummingbirds during these two migration periods will help them refuel in urban areas.** The species diversity of all urban pollinators peaked in summer months (Jun-Aug). Necessary resources include winter habitat when pollinators are no longer seen. For many, intact winter habitat means undisturbed soils, leaf litter around the bases of trees, and un-cut stems and grasses. To support the full lifecycle of our pollinators, they need resources throughout the year.

For the specific catalog of the species noted above, see Appendix B.

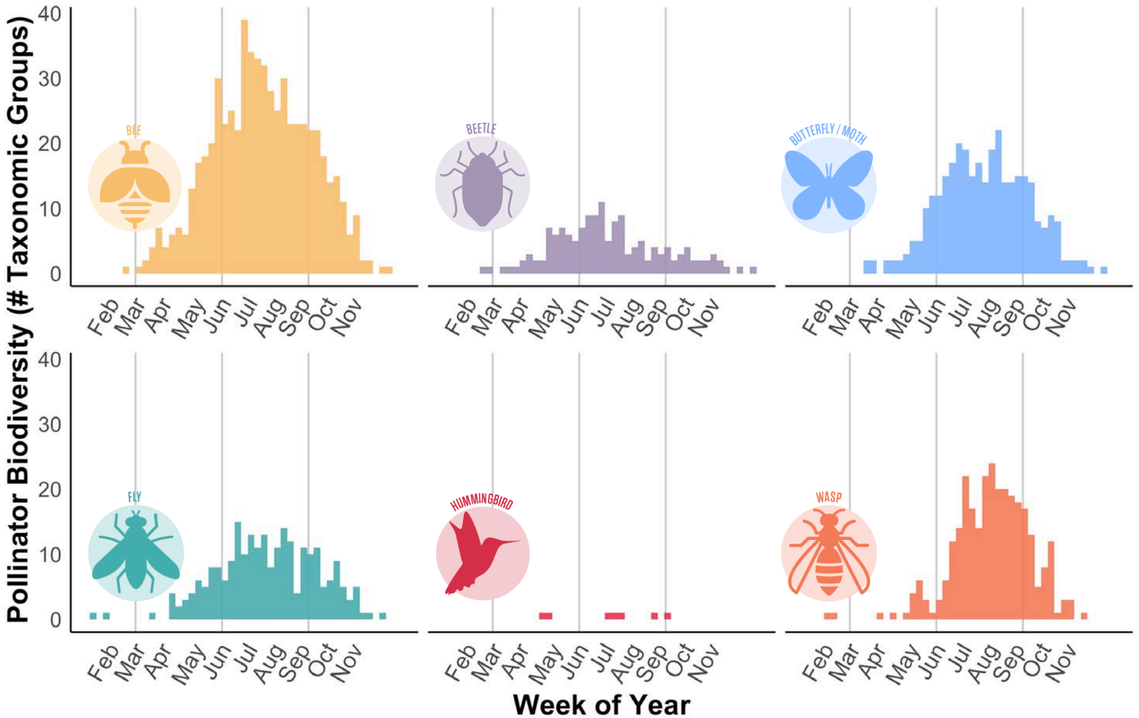


Figure 2: Pollinator activity throughout the growing season in Somerville. Bars represent the number of unique pollinator species observed in each week of the year. See Figures 3–9 for pollinator activity by species.

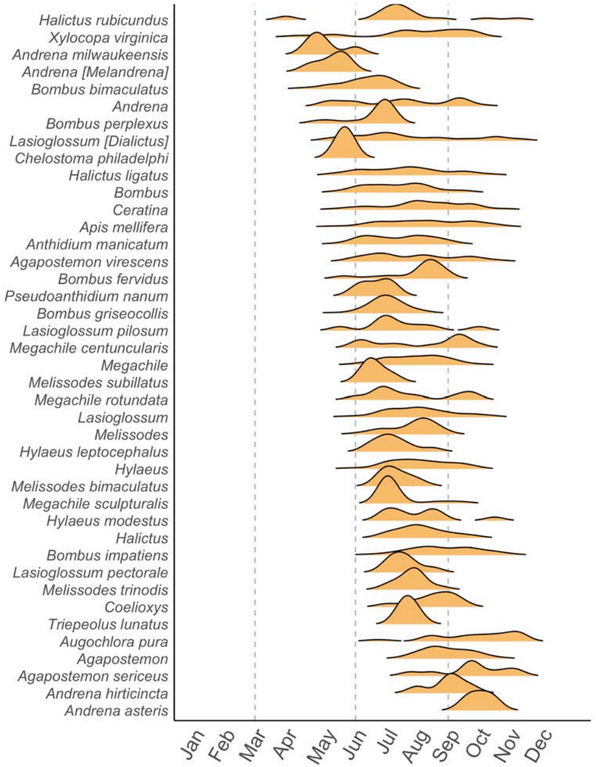


Figure 3: Bee species activity across weeks of the year.

Common eastern bumble bee
(Bombus impatiens)

Brown-belted bumble bee
(Bombus griseocollis)

Eastern carpenter bee
(Xylocarpa virginica)

Bicolored striped-sweat bee
(Agapostemon virescens)

Ligated furrow bee
(Halictus ligatus)

Two-spotted bumble bee
(Bombus bimaculatus)

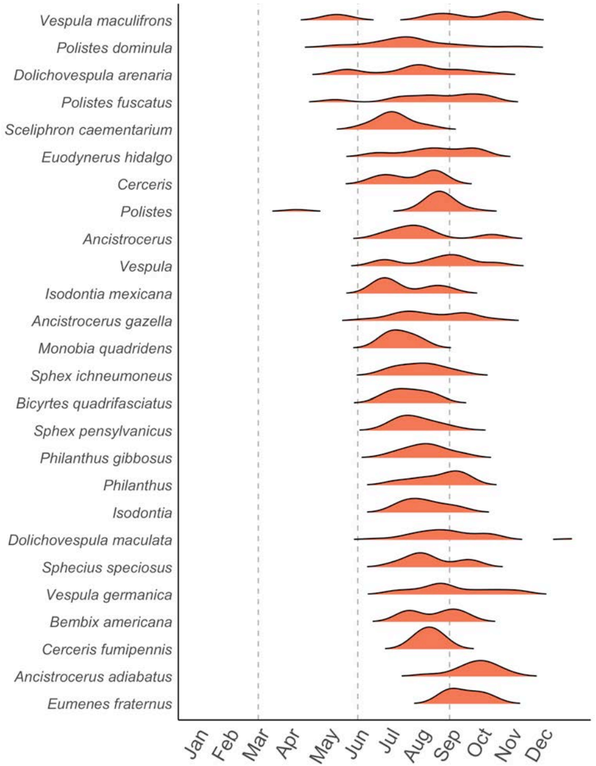


Figure 4: Wasp species activity across weeks of the year.

Eastern yellowjacket
(Polistes dominula)

Great black digger wasp
(Sphex pensylvanicus)

Hump-backed beewolf
(Philanthus gibbosus)

Bald-faced hornet
(Vespula maculifrons)

Great golden digger wasp
(Sphex ichneumoneus)

American sand wasp
(Bembix americana)

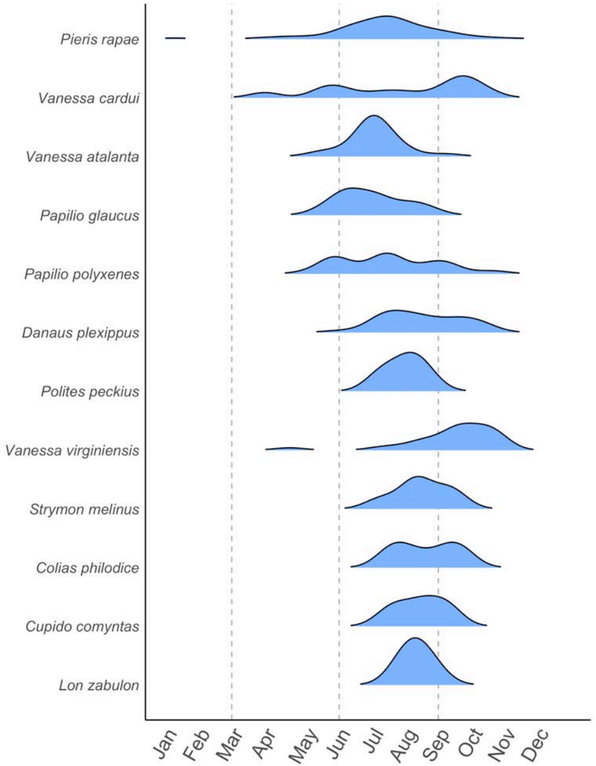


Figure 5: Butterfly species activity across weeks of the year.

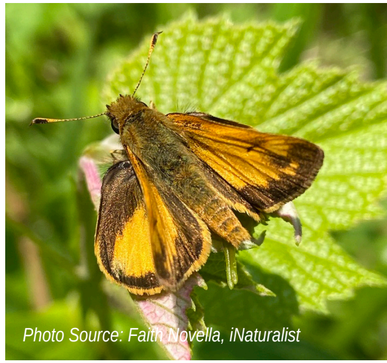
Monarch butterfly
(Danaus plexippus)

Small white butterfly
(Pieris rapae)

Red admiral butterfly
(Vanessa atalanta)

Black swallowtail butterfly
(Papilio polyxenes)

American lady butterfly
(Vanessa virginiensis)



Zabulon skipper butterfly
(Lon zabulon)

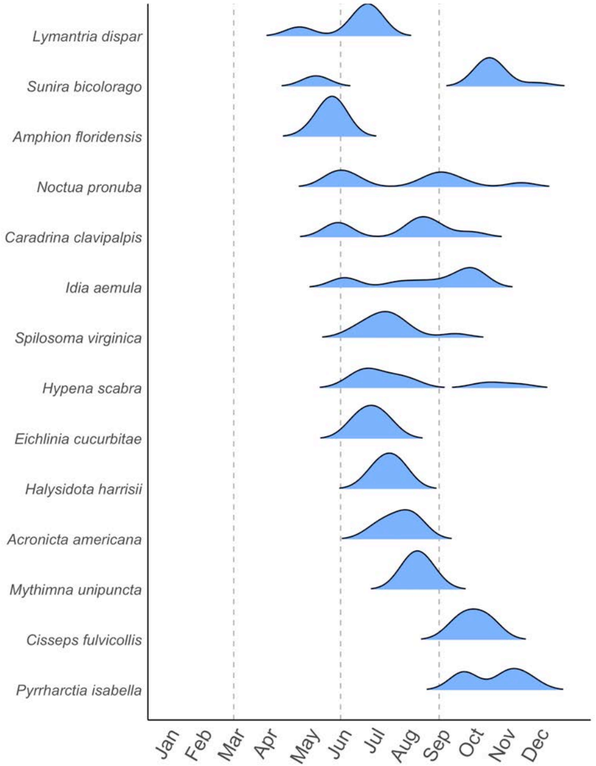


Figure 6: Moth species activity across weeks of the year.

Photo Source: EIW5, iNaturalist

Virginia tiger moth
(Spilosonma virginica)

Photo Source: Akilee, iNaturalist

Bicolored sallow moth
(Sunira bicolorago)

Photo Source: Teamontagna, iNaturalist

Green cloverworm moth
(Hypena scabra)

Photo Source: Akilee, iNaturalist

Pale mottled willow moth
(Caradrina clavipalpis)

Photo Source: Beesearcher, iNaturalist

Squash vine borer
(Eiclinia cucurbitae)

Photo Source: Americannaturalist90, iNaturalist

Large yellow underwing moth
(Noctua pronuba)

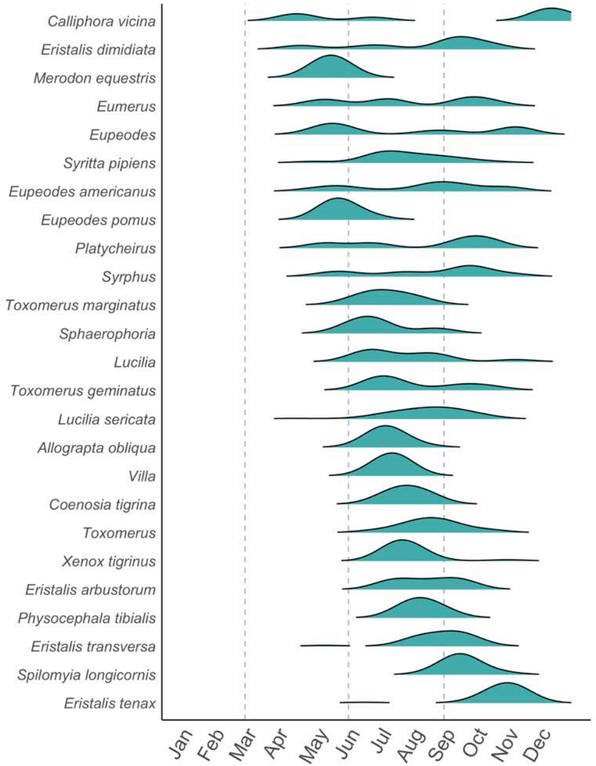


Figure 7: Fly species activity across weeks of the year.

Thick-legged hover fly
(Syritta pipiens)

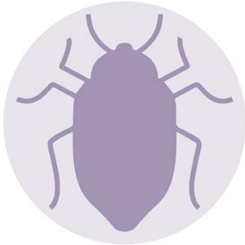
Margined calligrapher
Toxomerus arginatus)

Common drone fly
(Eristalis tenax)

Narcissus bulb fly
(Merodon equestris)

Oblique streaktail
(Allograpta obliqua)

Eastern calligrapher
(Toxomerus gerninatus)



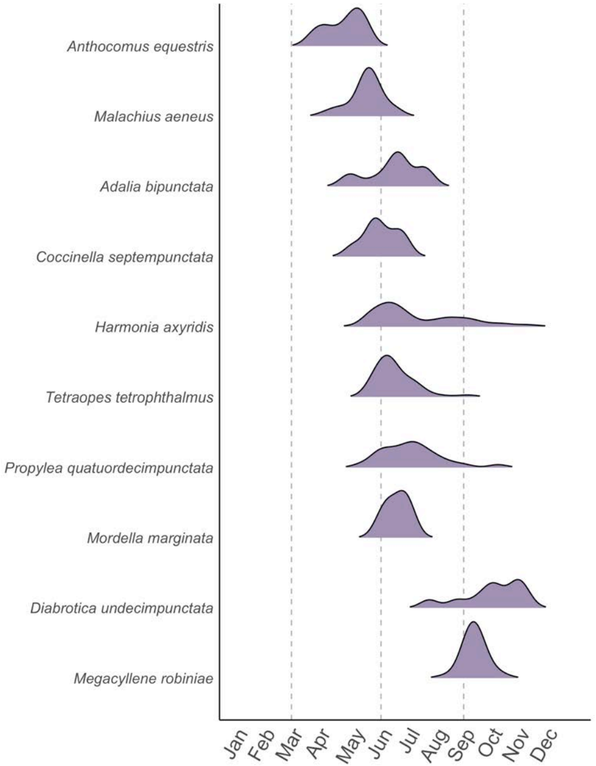


Figure 8: Beetle species activity across weeks of the year.

Asian lady beetle
(Harmonia axyridis)

Red milkweed beetle
(Tetraopes tetrophthalmus)

Varied carpet beetle
(Anthrenus verbasci)

Locust borer
(Megacyllene robiniae)

Fourteen-spotted lady beetle
(Propylea quatuordecimpunctata)

Spotted cucumber beetle
(Diabrotica undecimpunctata)

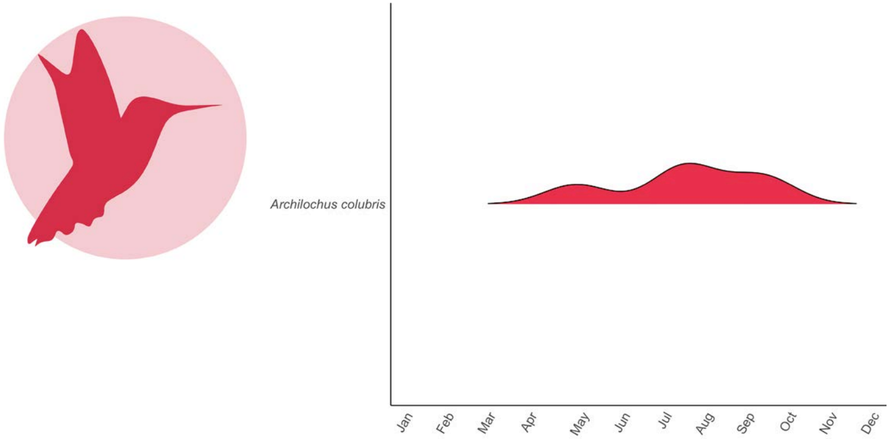


Figure 9: Bird species activity across weeks of the year.

Ruby-throated hummingbird
(Archilochus colubris)

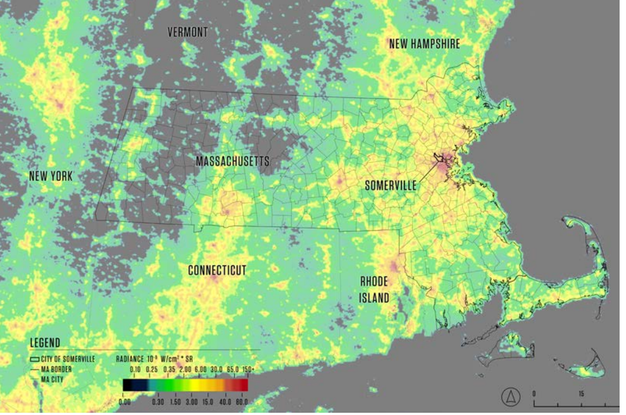


Figure 10: Artificial Light at Night, Massachusetts Light Pollution.

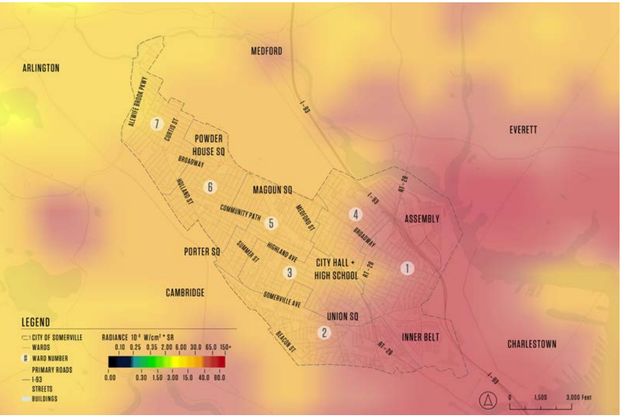


Figure 11: Artificial Light at Night, Somerville Light Pollution.

Spatial Context

A spatial analysis of Somerville was conducted using GIS data layers provided by the City and State of Massachusetts to develop a contextual understanding of existing ecological and urban conditions. The collected data combined physical resource layers, including land cover and land use, hydrography, City-owned trees, and man-made infrastructure data on buildings, roadways, and impervious surfaces. The team also reviewed publicly available data on light pollution and personal observations of existing pollinator gardens. These existing conditions were combined with US Census Economic Justice Communities data and climate change vulnerability data to understand overlapping ecological and social issues. This information is used in Section 9 to identify intervention priority areas to address pollinator habitat fragmentation.

Artificial Light at Night

Somerville's urban context is prone to high use of artificial lights at night. Using Visible Infrared Imaging Radiometer Suite (VIIRS) data collected by NASA and NOAA in 2023 (Stare, NASA), **Somerville and its neighbors throughout the greater Boston area are within the medium to high levels of light pollution** (light pollution: the excessive use or misdirection of artificial light that brightens the night sky and obscures stars and other celestial objects). The highest level of light pollution appears in Ward One and part of Ward Two (**Figures 10-11**) where it is theorized that the Inner Belt neighborhood, the interstate, and Assembly Row may all contribute to these increased light levels. However, a 2020 study in Tucson, Arizona found that street lighting provides a relatively small percentage (13%) of the light pollution visible from space (Kyba et al., 2020). **This suggests that in addition to city-scale lighting ordinances, individual actions by property owners and managers can contribute to reducing the light pollution in Somerville.**

Land Use

As seen in **Figure 12, the primary land use in Somerville is residential (46%), with the second highest use being rights-of-way (27%)** (City of Somerville, 2021). The remaining space is relatively evenly divided between mid- and high-rise districts (5%), commercial districts (9%), civic special districts (8%), and other special districts (6%). There is potential for city-scale implementation of pollinator initiatives, but **private landowners and residents can make a large impact by creating pollinator habitat** following the best practices outlined in this Plan.

Permeable Open Space

Somerville has one of the lowest proportions of open space per resident within its city limits, about 9.5 square feet of open space per resident (City of Somerville, 2024). Understanding the available open space is a critical step in learning how and where pollinators can be supported in the city. Impervious surface GIS data provided by the City of Somerville was inverted to create a data layer highlighting permeable land cover throughout the city. Parcel ownership data was used to categorize permeable land cover by city, state, private residential, or private commercial/industrial ownership to better inform and tailor intervention strategies to appropriate scales and levels of feasibility. This GIS analysis provides the following overall permeable land areas out of Somerville's total land area of 4.12 square mile:

Permeable Areas by Ownership Category:

City of Somerville:	0.09 Sq Miles
State (i.e., DCR, MBTA):	0.08 Sq Miles
Private (Residential):	0.45 Sq Miles
Private (Commercial / Industrial):	0.04 Sq Miles
Other*	0.14 Sq Miles
Total Permeable Area:	0.80 Sq Miles

*Educational Institutions, Places of Worship, Roadways, etc.

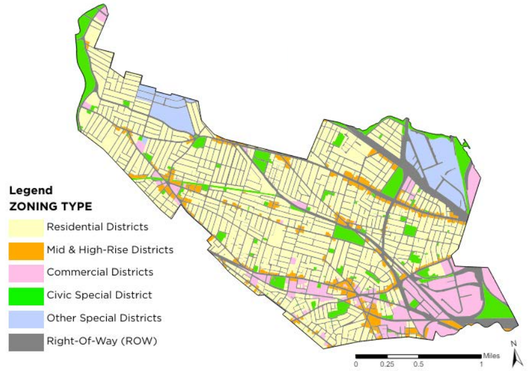


Table 1.3. Amount of Tree Canopy and Potential Plantable Space in Somerville by Zoning Type

Zoning Type	Zoning Type Acreage	Percent of Study Area#	Acres of Canopy	Canopy Cover (% of City)	Acres of Potential Plantable Space	Potential Plantable Space (% of zoning type area)
Residential Districts	1210.8	46%	227.0	18.8%	35.2	2.9%
Mid & High-Rise Districts	128.3	5%	10.6	8.3%	3.6	2.8%
Commercial Districts	234.3	9%	8.2	3.5%	6.0	2.6%
Civic Special District*	213.3	8%	50.1	23.5%	29.0	13.6%
Other Special Districts	148.0	6%	12.2	8.2%	17.8	12.0%
Rights-of-Way (ROW)*	708.5	27%	84.5	11.9%	20.3	2.9%

*Indicates zoning types for which the land is primarily City-owned
#Total land area of the City is 4.1 square miles

Figure 12: Type of Land Use in Somerville from the City of Somerville, Urban Forest Management Plan, 2021.

The total permeable area included is less than the sum of the categories above due to overlap between the data layers (**Figures 13-15**). This map provides a starting point for understanding the existing open space network and potential habitat opportunities in Somerville. The substantial difference between potential planting areas on private land versus City- or State-owned is striking. While municipal entities will play a part, residents can make a big impact. For more information on habitat creation throughout the city, refer to Sections 6-10 of this plan.

Somerville's Tree Canopy

The City of Somerville's 2020 tree inventory catalogs the nearly 14,000 trees that make up the City's publicly accessible canopy. Although a majority of Somerville's trees are located on private property, the City's tree inventory provides a thorough base point for understanding the city's canopy and the value it can serve for pollinators (**Figure 16**. Note that locations indicating vacant tree pits and dead trees were removed from the dataset). Based on the trees represented in the 2020 inventory, 80% of trees on public land are owned by the City of Somerville, 8% by the MBTA, 6% by DCR, 1% by MassDOT, and the remaining 5% are allocated to private owners. Most of these publicly owned trees are street trees (72%) which may have the potential to act as a pollinator-supporting corridor depending on the species included. Park trees were the second highest quantity (14%) and could potentially be paired with shrub or herbaceous planting in the future to create a layered resource area for pollinators. According to an analysis done as a part of the Somerville Urban Forest Management Plan (UFMP) in 2021, approximately 14% of the city is currently under canopy cover (this statistic is from 2018 so it has potentially changed in the last six years), with the least coverage occurring in Wards One (under 10%) and Two (10-15%) and the highest coverage occurring in Wards Six and Seven (more than 20%) as seen in **Figure 17**. The study also found through analysis of aerial photography that approximately 65% of the city's canopy cover comes from privately owned trees.

Figure 13: Permeable Open Space: City/State Owned.

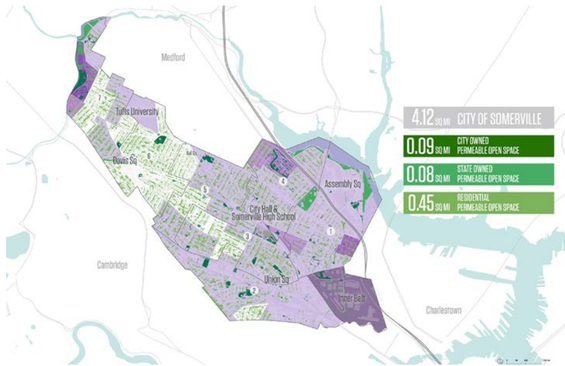


Figure 14: Permeable Open Space: Residential (see Figure 15 for legend).

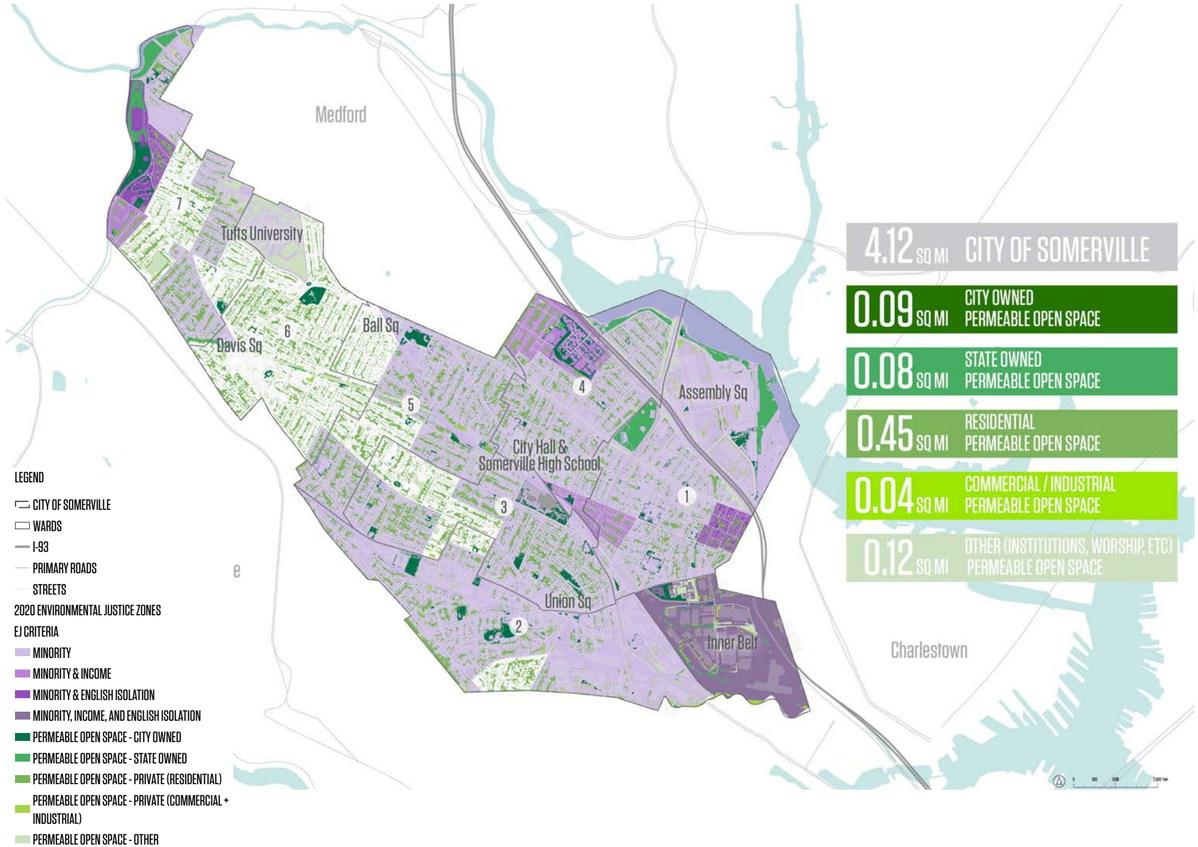


Figure 15: Permeable Open Space: Commercial or Industrial. Refer to section on environmental equity for more information.

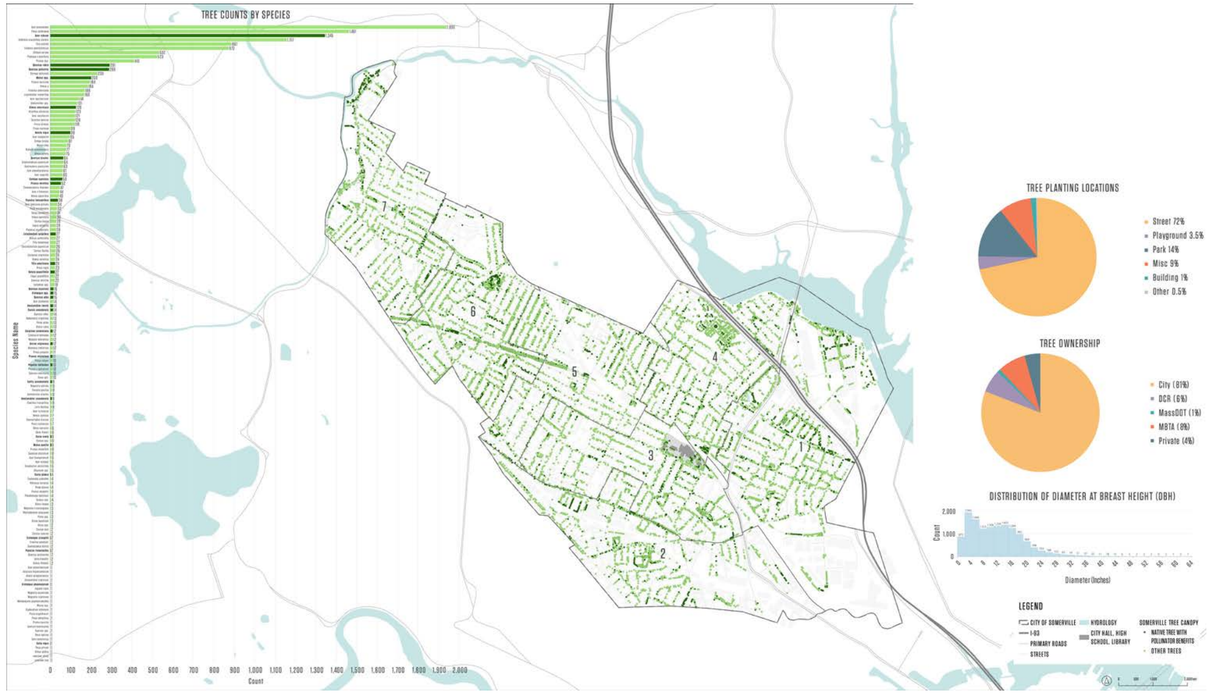


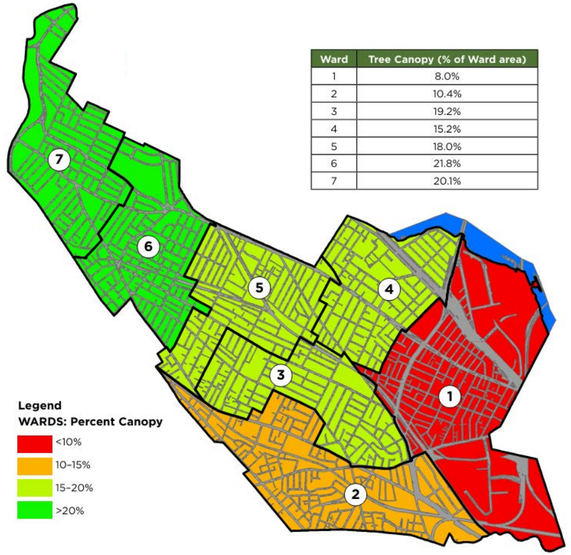
Figure 16: Somerville Tree Inventory Analysis. See Appendix G for full drawing.

City-owned trees are carefully selected to meet a wide variety of site conditions, to avoid infrastructure and utility conflicts, and to survive a changing climate. The UFMP indicates that approximately 44% of existing species in the 2018 inventory were native to New England. **Table 3** identifies which of the inventoried trees have potential pollinator value. In each pollinator category, an X indicates that the tree species provides nectar or pollen for adult insects. An X under larval host plant indicates that the larvae of butterflies or moths consume the vegetation of the tree during development.

The City as a Pollinator Garden

Effective pollinator habitat will not only consider the composition of food and nesting resources within a garden but also consider the connectivity of habitat patches across the city. For pollinators to benefit from habitat installations, they need to be able to travel between them. **Pollinators vary significantly in their ability to move, and consideration of the different ranges of urban pollinators is critical when optimizing habitat placement for urban connectivity.** To identify habitat opportunities with the greatest impact, we need to understand the current distribution of green space within Somerville.

The project team mapped known pollinator gardens within the city, focusing on gardens intentionally designed to benefit pollinators. The list of existing pollinator gardens was supplemented by data from the Mystic Pollinator Pathway Map. To expand this list, a community engagement effort was undertaken to crowd-source the locations of additional existing gardens in public and private spaces. The Community Map of Existing Pollinator Gardens (**Figure 18**) is a working compilation of known gardens around the city. The recommendations section of this report uses only the formalized gardens to identify key opportunities to create corridors (such as the Somerville Community Growing Center), however this map should be updated as new gardens arise.



Ward	Tree Canopy (% of Ward area)
1	8.0%
2	10.4%
3	19.2%
4	15.2%
5	18.0%
6	21.8%
7	20.1%

Figure 17: Tree canopy cover in 2018 by ward from the City of Somerville, Urban Forest Management Plan, 2021.

Table 3: Trees with pollinator value

Scientific name	Common name	QTY	Native/Exotic	Wasp	Bee	Butterfly or Moth	Fly	Beetle	Larval Host Plant	Value
Acer rubrum	Red maple	1345	Native	X	X	X	X			4
Amelanchier canadensis	Canada serviceberry	8	Native	X	X	X	X	X		5
Amelanchier laevis	Allegheny serviceberry	14	Native	X	X	X	X	X		5
Betula nigra	Black birch	98	Native						X	1
Betula populifolia	Gray birch	22	Native						X	1
Carpinus caroliniana	Hornbeam	12	Native						X	1
Carya spp.	Hickories	10	Native						X	1
Catalpa speciosa	Northern catalpa	59	Native		X					1
Celtis occidentalis	Hackberry	9	Native						X	1
Crataegus x	Hawthorn	15	Hybrid Exotic	X	X	X	X	X		5
Liriodendron tulipifera	Tulip poplar	27	Native	X	X					2
Malus x	Crabapple	206	Hybrid Exotic	X	X	X	X	X		5
Ostyra virginiana	Hop hornbeam	12	Native						X	1
Populus spp.	Poplars/Aspens	50	Native						X	1
Prunus serotina	Black cherry	52	Native	X	X	X	X	X	X	6
Prunus virginiana	Chokecherry	11	Native	X	X	X	X	X	X	6
Quercus alba	White oak	15	Native		X*				X	1
Quercus bicolor	Swamp white oak	64	Native		X*				X	1
Quercus coccinea	Scarlet oak	16	Native		X*				X	1
Quercus palustris	Pin oak	288	Native		X*				X	1
Quercus rubra	Red oak	291	Native		X*				X	1
Salix nigra	Black willow	1	Native	X	X		X		X	4
Tilia americana	American basswood	24	Native	X	X	X	X	X		5
Ulmus americana	American elm	126	Native						X	1

X – perceived to have pollinator value in Somerville based on SPAP data

X* – likely has pollinator value based on the work by Dr. Tallamy referenced throughout this report but needs further study to confirm benefit in Somerville

Although it is known that pollinators have maximum distances of travel, existing data on the distance each pollinator category can travel is limited. Native bees of various sizes are known to have a wide variety of ranges from a couple of hundred feet up to over a mile (Mader et al., 2011). The following approximate ranges are known as seen in **Figure 19** (Fisher & Bradbury, 2022; Gathmann & Tscharntke, 2022; Greenleaf et al., 2007; Kendall et al., 2022):

- bumble bee / monarch butterfly – 5,280 feet (1 mile) +
- medium to large solitary bee – 1,640 feet (.31 miles)
- small bee and small butterfly range – 820 feet (.16 miles)
- tiny bee – 300 feet (.06 miles)

As shown by these wide-ranging numbers, the ability of pollinator species to travel across the city is varied. Finding nesting and foraging sites within each species' individual reach is critical to their success, although challenging in a densely urban environment. Ideally, nesting and foraging sites would be within a few hundred feet of each other to meet the needs of the pollinators with the smallest range of travel. As seen in **Figures 18 and 19**, how these ranges stack up against the size of Somerville plays an important role in prioritizing new habitat installations in the city.

Pollinators employ different strategies to locate food in the city. Some, like butterflies, fly across the city from flower to flower throughout their lives. In contrast, others, like female bees and wasps, have a nest that is fixed in place. Each day, they travel away from this nest to gather food within their home range but return to it in between foraging trips and at night. Thus, for bees and wasps, access to flowers is limited by the nest's location. For solitary bees, farther flight distances are known to impose reproductive costs; bees flying farther to find food produce fewer offspring than bees flying shorter distances (Zurbuchen et al., 2010). For this reason, pollinator corridor creation is recommended.

Environmental Equity - Humans and Pollinators

Somerville is a densely populated urban area, home to a diverse group of people. To ensure that all residents benefit from the ecological and social advantages outlined in this Plan, it emphasizes the need to prioritize Environmental Justice Communities for pollinator habitat installation. Most of these communities were historically redlined and excluded from publicly sponsored open space improvements. These areas tend to have fewer street trees, less open space, and higher vulnerability to the effects of climate change and urban development (heat, flooding, pollution, and low air quality). By focusing on creating pollinator habitat plantings in these areas, the Plan aims to reknit a cooler, healthier, more resilient urban ecosystem, particularly in historically marginalized neighborhoods as the city undergoes rapid redevelopment.

According to the State of Massachusetts Department of Public Health:

> Environmental Justice (EJ) is based on the principle that **all people have the right to be protected from environmental pollution and to live in and enjoy a clean, healthy environment**. Various forms of discrimination and racism have created long-standing health inequities for people of color and lower-income individuals. **These populations have historically been excluded from meaningful participation in decisions that impact their communities' environmental health**. People of color and people with limited incomes are more likely to live near toxic waste sites, in areas with high air pollution, and in low-quality housing because of the inequitable distribution of high-pollution sites. Structural inequities result in fewer healthcare providers, limited access to transportation options, and limited access to health information in the community due to inaccessible health communications and lack of access for non-English speakers.

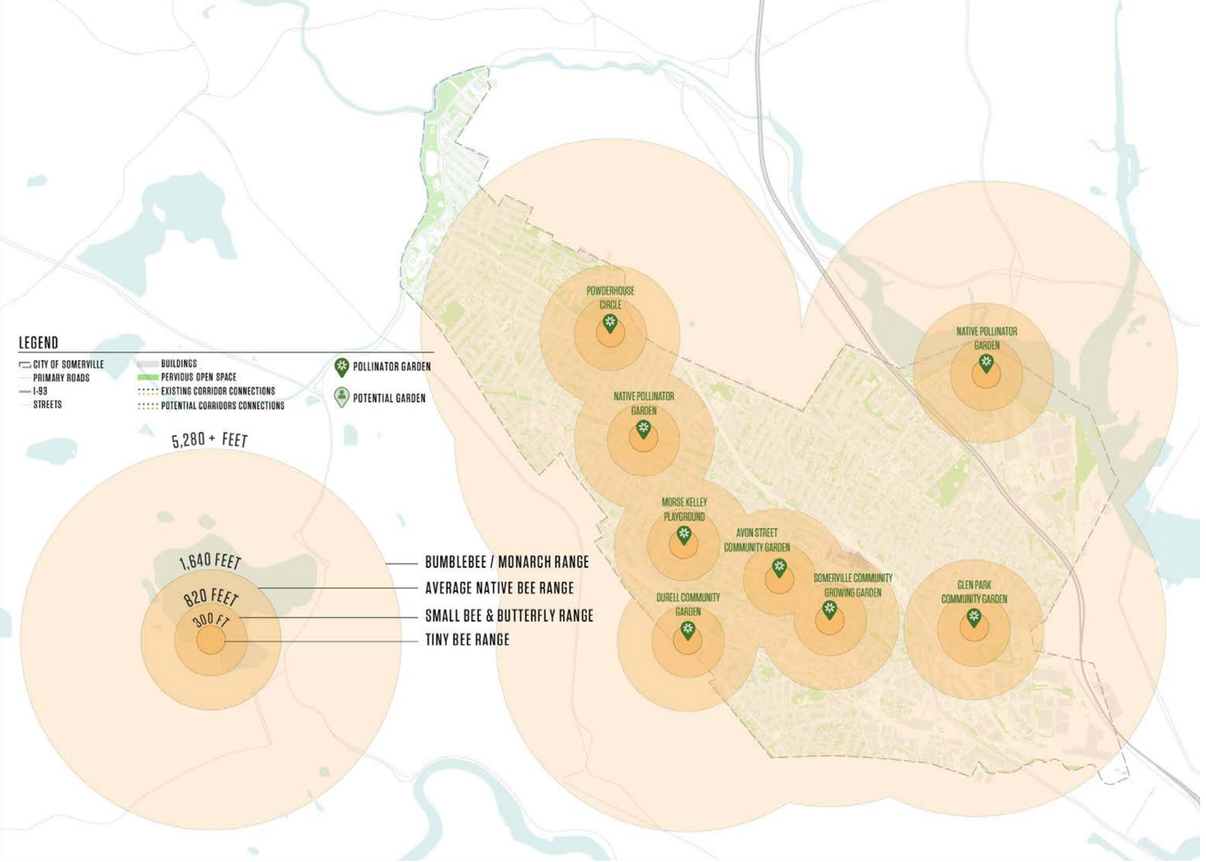
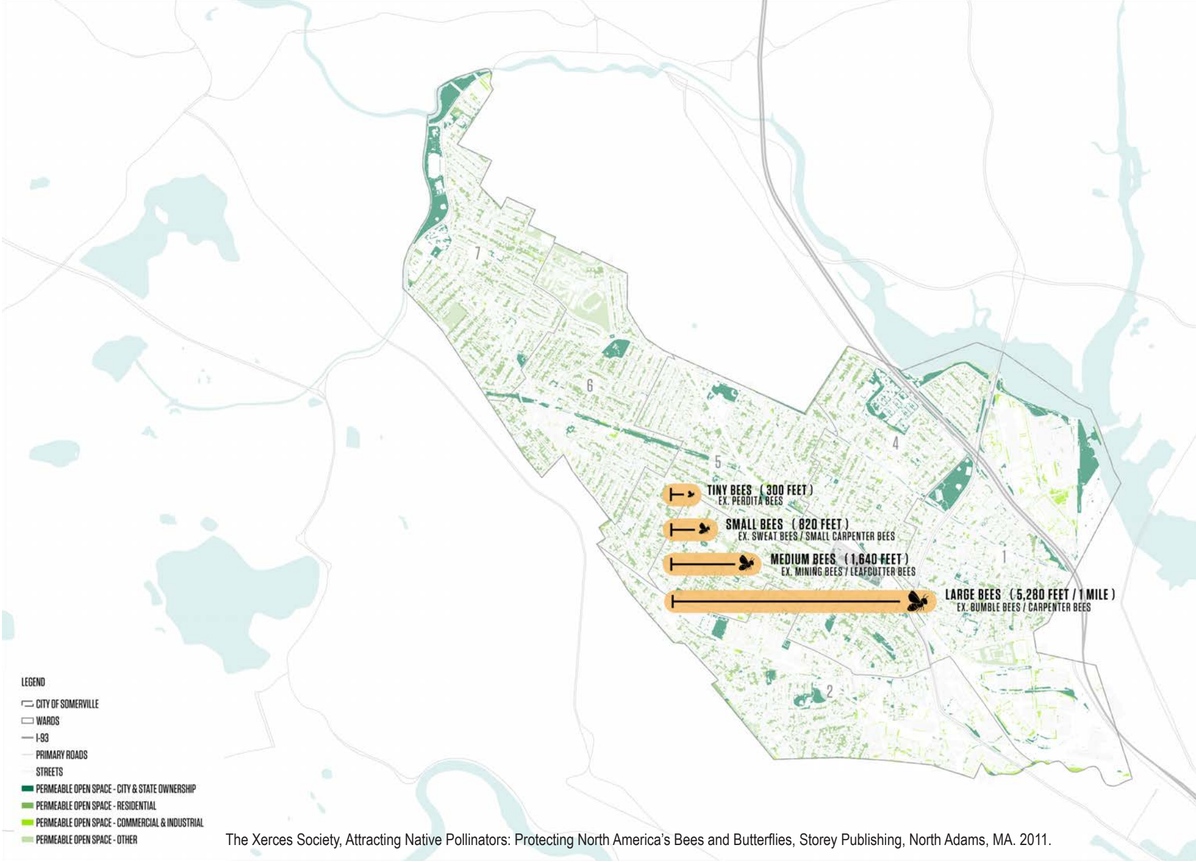


Figure 18: Connectivity of known pollinator gardens and average pollinator ranges. Some species have access to a larger available network than others.



The Xerces Society, Attracting Native Pollinators: Protecting North America's Bees and Butterflies, Storey Publishing, North Adams, MA. 2011.

Figure 19: Approximate range of native bees in Somerville, MA.

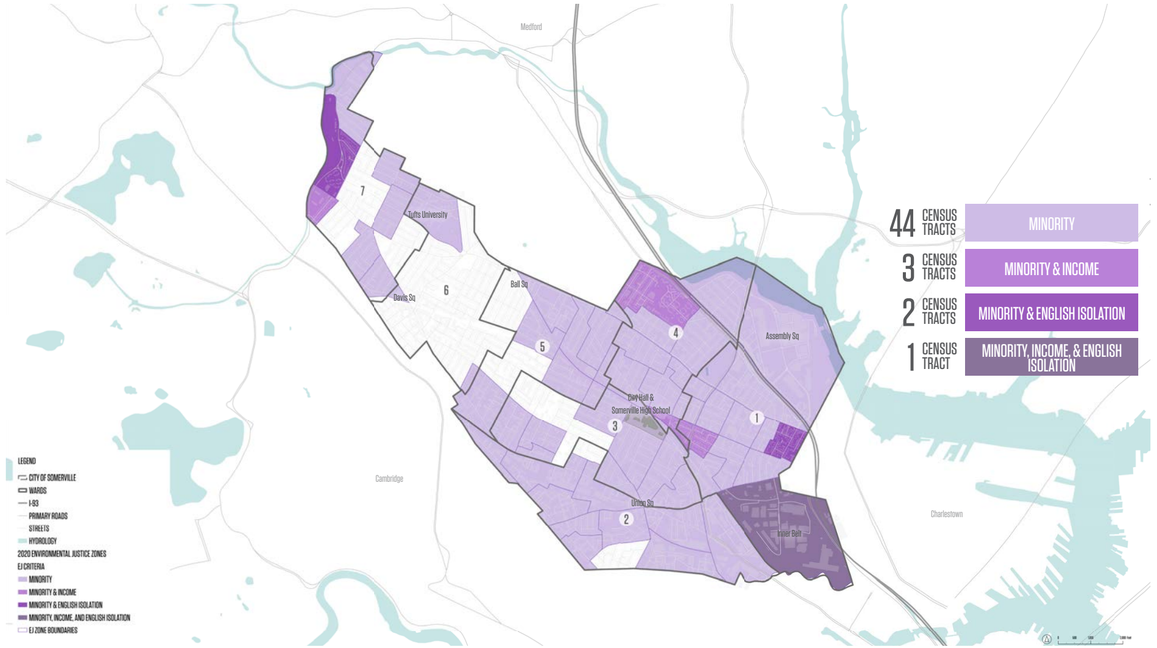


Figure 20: Environmental Justice Communities in Somerville, MA.

Massachusetts Environmental Justice Communities are located in all seven wards of Somerville (**Figure 20**). The communities include 44 census tracts for minority communities, three census tracts for minority and income, two census tracts for minority and English isolation, and one census tract for minority, income, and English isolation. While these communities are found in all seven wards, they cover the entirety of Wards One and Four, and only a small portion fall within Ward Six. It is important to link these historically underserved areas with new open space interventions, because no one community is more or less deserving of the environmental, recreational, and aesthetic benefits of urban open spaces. And there is a clear gap to fill based on the historic redlining of these areas. Layering those open space amenities with pollinator habitat provides an experience of nature for residents in a highly developed area, benefits to the insects, and helps to mitigate extreme weather conditions.

When combined with the permeable area data (i.e., areas able to infiltrate water that could be plantable), it is revealed that 75% of the permeable open space in the city is found within EJ Communities, approximately 0.60 square miles. Approximately 154.1 acres of Somerville's total 174.3 acres of parks and open space are also located in the EJ Communities. **18% of Somerville's citizens have access to 25% of open space areas, compared to the 82% of citizens living in EJ Communities with access to 75% of open space**. While there is no data available on how much of this space could be directly used for pollinator habitat, it may indicate that there is potential for implementation in EJ communities (see **Figure 13-15**). Connecting with residents in these areas to support pollinator habitat creation on private property and targeting City- or State-owned open spaces in these areas could help shift historic imbalances.

Open spaces provide many functions, including active recreation, so it is likely that not all of these spaces are suitable for conversion to pollinator habitat. Where habitat is possible, prioritizing the use of shade trees for both people and pollinators is critical, especially those known for their phytoremediation (pollution removal) properties. EJ Communities have a higher proximity to highways and major roads where air pollution can cause major health impacts (Li et al, 2017 and CAFEH, 2024). Adding densely vegetated green spaces between homes and the highway has the potential to block or reduce air pollution while also supporting pollinators. Several native tree species that benefit pollinators can also help to remove particulate matter from the air in the growing season or help mitigate flooding (with high transpiration rates) and improve stormwater or soil quality in the root zone of the plant (Kennen & Kirkwood, 2015). These species include birches (*Betula* spp.), poplars *(Populus* spp.*)*, sumacs *(Rhus* spp.*)*, basswoods *(Tillia* spp.*)*, hackberry *(Celtis laevigata)*, and American beech *(Fagus grandiflora)* (Kennen & Kirkwood, 2015). Recommended new plantings should be focused in EJ communities first to address human environmental equity in historically underserved neighborhoods especially as climate change makes the city hotter and wetter in years to come.

Spatial Distribution

The Species Catalog was layered over GIS data to map the spatial distribution of each observed species. Pollinators are spread across Somerville and are present in all seven wards (**Figures 24-27**). Our data compilation indicated that the most species of pollinators were observed within Wards Three, Five, and Six. The lowest number was observed in Wards One, Two, and Four as seen in **Table 4**.

Table 4: Pollinator Observations by Ward

Ward	Total number of Observations
1	254
2	132
3	4329
4	196
5	518
6	3503
7	461

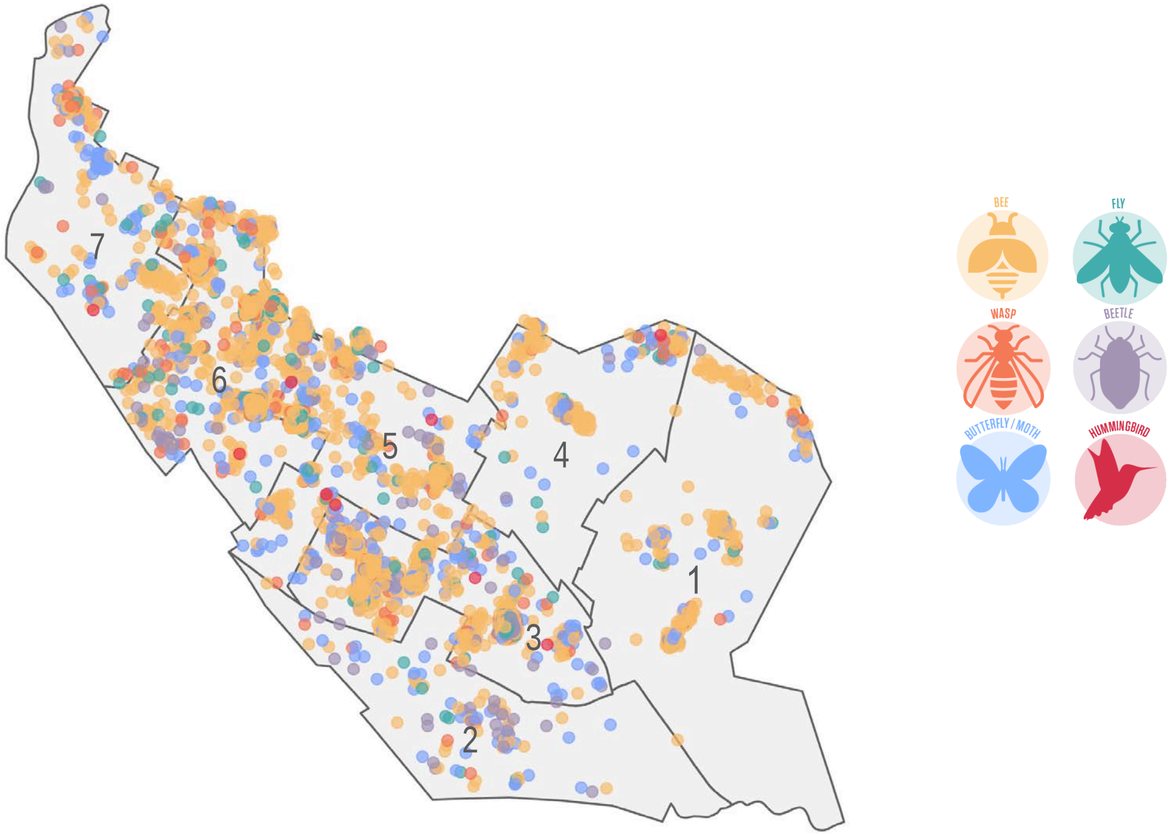


Figure 24: Pollinator observations across Somerville, MA wards by taxonomic group.

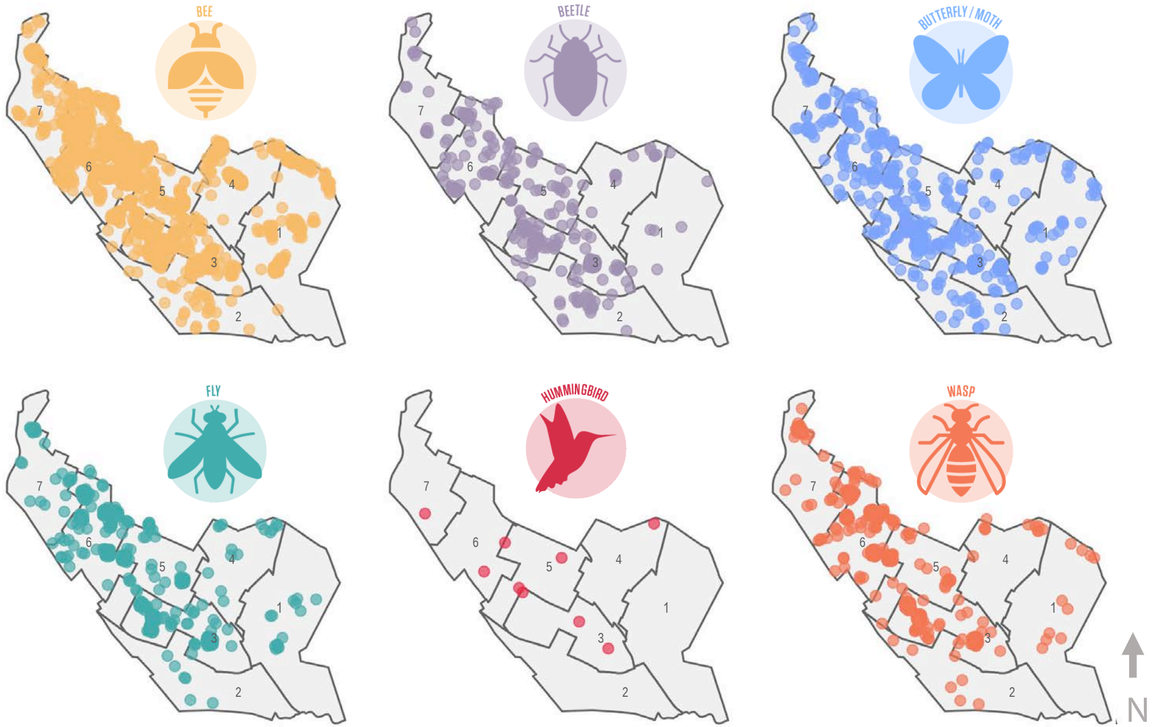


Figure 25: Pollinator observations categorized across Somerville, MA wards broken out by taxonomic group. Colored points represent the locations of records across the city, color coded by the pollinator group that the record belongs to.

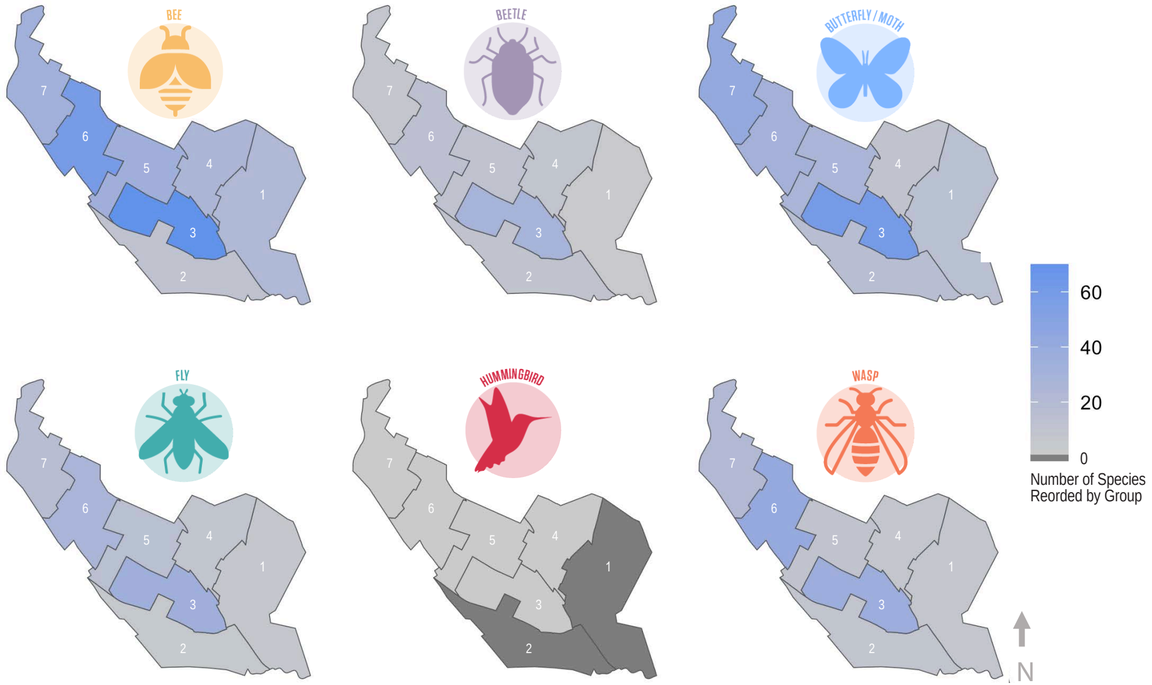


Figure 26: The number of species recorded in different wards for each pollinator group. Each map shows the number of species recorded in different wards for each polliantor group. The dark gray areas are where no records occur and the light gray areas for hummingbird simply means that one species was found in each of the wards.

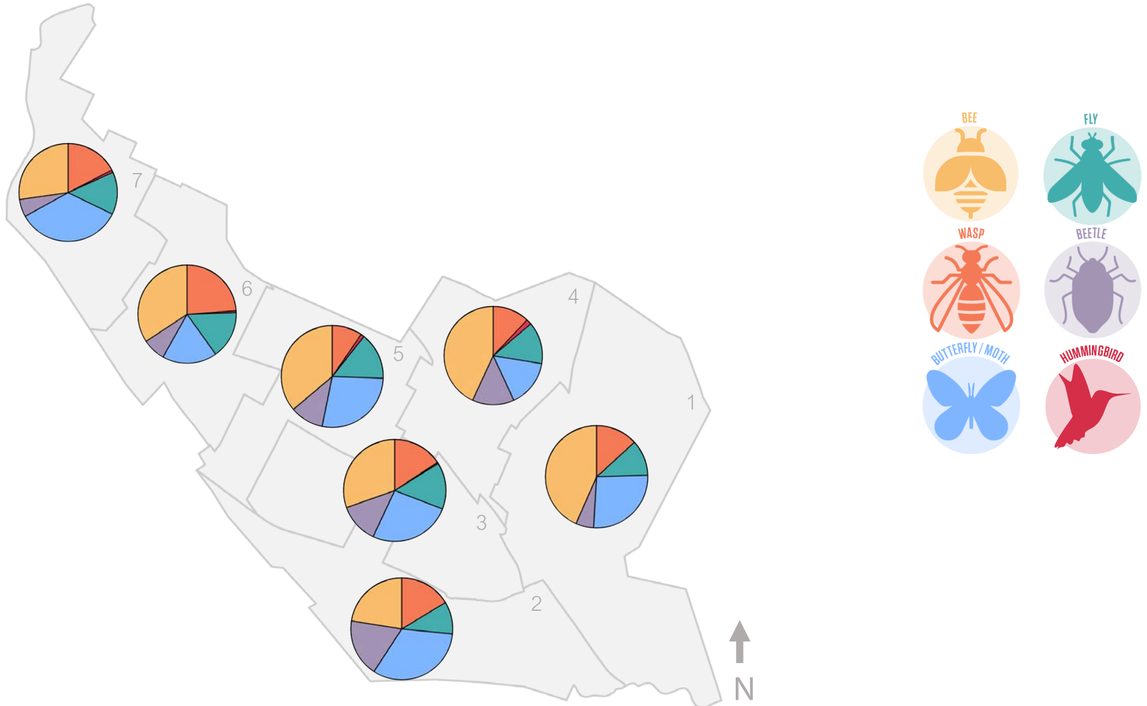


Figure 27: Total number of pollinator species recorded in a ward, broken down by pollinator group.

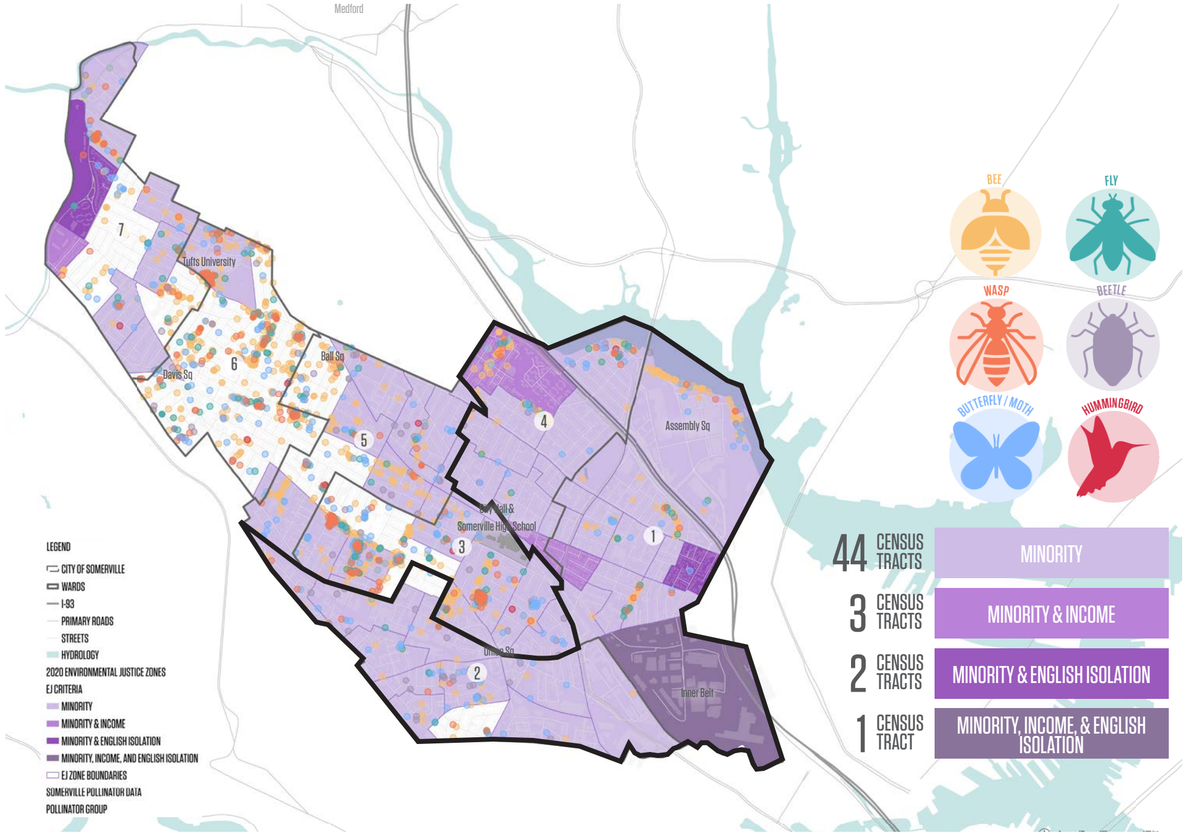


Figure 28: Combined map of pollinator observations and Environmental Justice Communities. Highest species richness was observed in Wards 3, 5, and 6. Lowest species richness was observed in Wards 1,2, and 4.

However, it is important to note that even if pollinators are not present on the map, they might still occur in that area. The absence could mean that a particular species is truly missing in Somerville, or it could be an issue with detection. The data indicates that pollinator observation effort was not evenly distributed across the city's wards, with Wards Three and Six having nearly ten times more pollinator records than Wards One, Two, Four, Five, and Seven. Therefore, from the available data, it is difficult to conclude whether certain areas of the city are indeed home to higher total species, or if the differences in species recorded across Somerville are due to differences in sampling, or both.

Laying the spatial distribution of pollinator species over the EJ Communities and artificial light at night maps highlights two potential reasons for fewer insect observations in Wards One, Two, and Four. First, these wards are all primarily EJ populations (**Figure 28**). Wards One, Two, and Four make up 52% (25%, 16%, and 11% respectively) of the total land area of Somerville, but **Wards One and Two contain only 18% of the permeable area**. This could potentially correlate to less existing habitat.

While Wards One, Two, and Four do contain Blessing of the Bay Park, the Glen Park Community Gardens, and Lincoln Park (which have logged pollinator observations), large swaths of Wards One and Two are zoned for commercial industry. Areas like Brickbottom and Inner Belt have substantially fewer residents to log observations, fewer houses with backyards, and less open space. While commercial or industrial development still poses opportunities for habitat creation, it is historically uncommon.

These areas with fewer observed species also fall within the highest levels of light pollution,. Since light pollution alters insect behaviors, it might be a cause for fewer insect sightings. It is important to note that these potential links between species distribution and GIS data are based on the observations that we have today. Additional surveys in these wards would provide further insight into whether these landscapes are truly less supportive of pollinators.

When the species data is added as an overlay over the permeable open space map (**Figure 29**), observed pollinator species richness is most recorded at the following locations:

- Blessing of the Bay Park (DCR/City of Somerville)
- Community Path Pollinator Garden at Highland Road (MBTA)
- Draw Seven State Park (DCR)
- Morse-Kelley Playground and Pollinator Garden
- Powder House Square
- Somerville Community Growing Center
- Tufts University

The same observers' bias must be acknowledged for this correlation. These areas are known for their plants or gardens and may appear to have more diversity simply because visitors are looking for pollinators in these locations. Conversely, the following examples of open space areas with few observations may be underrepresented by the data:

- Alewife Brook Reservation
- Foss Park (DCR)
- Trum Field

Further survey work is needed in areas of Somerville with limited data to understand what pollinators are present and where opportunities exist to expand habitat. Refer to Appendix A for the methodology used for this report and Sections 6 and 13 for recommendations on what should be done next.

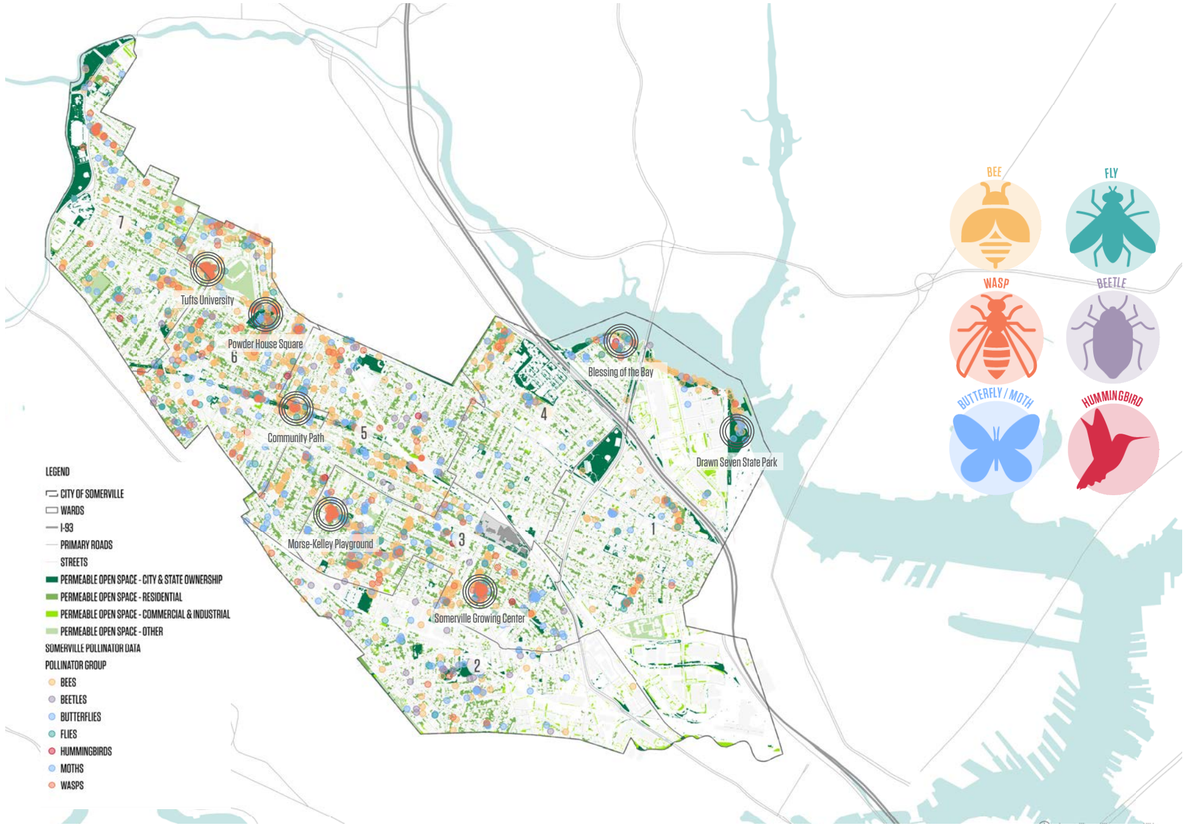


Figure 29: Combined map of pollinator observations and permeable open space areas. Highest species richness was observed in Wards 3, 5, and 6. Lowest species richness was observed in Wards 1,2, and 4.

Plant Associations

For each pollinator species either present in Somerville, or potentially occurring in the city, the project team gathered data on existing plant-insect interactions to understand which plants support the greatest numbers and types of insects in Somerville. The team collated data on insect-flower interactions from several sources, including EwA, TPI, iNaturalist data, scientific publications, and published textbooks specific to pollinator groups. For this analysis, an interaction was defined as a record of an insect visiting a flower (not necessarily performing pollination). Note that the list may be biased to plants more commonly observed or planted in gardens than others.

Individual interactions observed between each species of pollinator and plant species are represented in the association web in **Figure 30** and split out by individual pollinator category in Appendix C. These graphics highlight the vast number of connections that exist between pollinator species and the plants necessary to support them throughout the city.

Native Plants

Native plant genera with greater than ten observed interactions with unique species of flower-visiting insects are captured in **Table 5**.

Non-Native Plants

Non-native plant genera with greater than ten observed interactions with flower-visiting insects can be reviewed in **Table 6**.

Table 5: Number of Pollinating Insects on Native Plant Genera

Common Name	Plant Genus	Number of Pollinator Species in Somerville that visited plants
goldenrods	*Solidago*	49
black-eyed Susan	*Rudbeckia*	47
mountain mints	*Pycnanthemum*	28
coneflower	*Echinacea*	27
tickseed	*Coreopsis*	26
sneezeweed	*Helenium*	26
milkweed	*Asclepias*	23
sunflower	*Helianthus*	23
wood aster	*Symphyotrichum*	22
blazing star	*Liatris*	19
Joe-pye weed	*Eutrochium*	12
rose	*Rosa*	10

Table 6: Number of Pollinating Insects on Non-Native Plant Genera

Common Name	Plant Genus	Number of Pollinator Species that Visited plants
catmint	*Nepeta*	18
mint	*Mentha*	17
oregano	*Origanum*	13
plumbago	*Ceratostigma*	10
globe thistle	*Echinops*	10

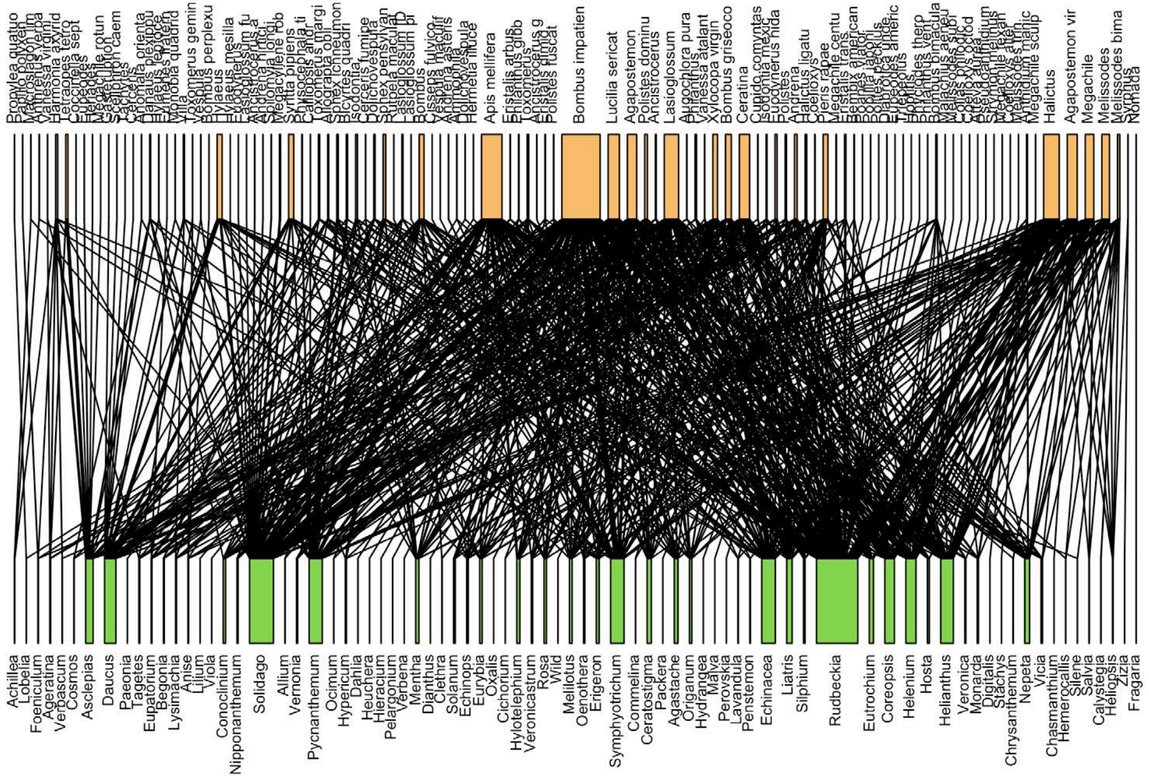


Figure 30: Association web between Somerville flower visiting insects and flowering plants. For webs broken down by individual taxonomic groups of pollinators, see Appendix C.

Solidago altissima

Species Interactions

To provide further insight into the benefit of these plant associations to pollinators—both pollinators within Somerville and those that could potentially occur within Somerville—we reviewed iNaturalist data for each insect pollinator taxon and recorded interactions between pollinator species and flowering plants. This data revealed the proportion of pollinator species that visited each plant genus. For example, of the 143 species of bees that are present in Somerville or could possibly occur in Somerville, 41 species (29%) have been recorded to occur on goldenrod (*Solidago*). The proportion can be interpreted as a rough index of pollinator value—the higher the number, the greater the value of that plant to local pollinator species. The following **Tables 7-12** include the top 10 native plant genera for each pollinator category. For complete plant association lists, including non-native species, please refer to Appendix C.

When this data is combined, the following genera of trees, shrubs, and perennials (**Tables 13-15**) are the top ten most-visited plants across all taxa.

Table 7: Bees – Native Plant Associations

Common Name	Plant Genus	Proportion of Taxa
goldenrods	*Solidago*	0.29
blackberries	*Rubus*	0.23
willows	*Salix*	0.21
milkweeds	*Asclepias*	0.17
mountain mints	*Pycnanthemum*	0.17
wood asters	*Symphyotrichum*	0.17
cherries, plums	*Prunus*	0.16
dogwoods	*Cornus*	0.14
sumacs	*Rhus*	0.13
blueberries	*Vaccinium*	0.13

Note: The most observed non-native plant visits were to *Malus*, apple/crabapple at 0.18.

Pycnanthemum virginianum

Table 8: Wasps – Native Plant Associations

Common Name	Plant Genus	Proportion of Taxa
goldenrods	*Solidago*	0.76
mountain mints	*Pycnanthemum*	0.54
wood asters	*Symphyotrichum*	0.42
bonesets	*Eupatorium*	0.40
milkweeds	*Asclepias*	0.39
sumacs	*Rhus*	0.35
steeplebushes	*Spirea*	0.34
beebalms	*Monarda*	0.33
sea hollies	*Eryngium*	0.30
black-eyed Susans	*Rudbeckia*	0.28

Note: The most observed non-native plant visits were to *Daucus*, Queen Anne's lace at 0.39.

Asclepias syriaca

Table 9: Butterflies – Native Plant Associations

Common Name	Plant Genus	Proportion of Taxa
milkweeds	*Asclepias*	0.68
Joe-pye weeds	*Eutrochium*	0.48
coneflowers	*Echinacea*	0.46
wood asters	*Symphyotrichum*	0.34
mountain mints	*Pycnanthemum*	0.32
blazing stars	*Liatris*	0.29
beebalms	*Monarda*	0.29
goldenrods	*Solidago*	0.29
blackberries	*Rubus*	0.25
black-eyed Susans	*Rudbeckia*	0.25

Note: The most observed non-native plant visits were to *Trifolium*, clover at 0.38.

Monarda fistulosa

Table 10: Moths – Native Plant Associations

Common Name	Plant Genus	Proportion of Taxa
goldenrods	*Solidago*	0.48
milkweeds	*Asclepias*	0.45
beebalms	*Monarda*	0.20
mountain mints	*Pycnanthemum*	0.18
bonesets	*Eupatorium*	0.14
Joe-pye weeds	*Eutrochium*	0.14
steeplebushes	*Spiraea*	0.14
wood asters	*Symphyotrichum*	0.14
buttonbushes	*Cephalanthus*	0.11
dogbanes	*Apocynum*	0.09

Note: The most observed non-native plant visits were to *Buddleja*, butterfly bush at 0.13.

Symphyotrichum cordifolium

Table 11: Flies – Native Plant Associations

Common Name	Plant Genus	Proportion of Taxa
goldenrods	*Solidago*	0.57
wood asters	*Symphyotrichum*	0.45
bonesets	*Eupatorium*	0.23
steeplebushes	*Spiraea*	0.22
dogwoods	*Cornus*	0.18
viburnums	*Viburnum*	0.18
blackberries	*Rubus*	0.17
plums, cherries, etc.	*Prunus*	0.16
yarrows	*Achillea*	0.14

Note: The most observed non-native plant visits were to *Daucus*, Queen Anne's lace at 0.28.

Cornus sericea

Amelanchier canadensis

Table 12: Beetles – Native Plant Associations

Common Name	Plant Genus	Proportion of Taxa
goldenrods	*Solidago*	0.28
dogwoods	*Cornus*	0.22
milkweeds	*Asclepias*	0.18
roses	*Rosa*	0.18
steeplebushes	*Spiraea*	0.18
yarrows	*Achillea*	0.16
plums, cherries, etc.	*Prunus*	0.16
California lilacs	*Ceanothus*	0.14
bonesets	*Eupatorium*	0.12
mountain mints	*Pycnanthemum*	0.10

Note: The most observed non-native plant visits were to *Daucus*, Queen Anne's lace at 0.27.

Table 13: Most Visited Trees (native and non-native)

Rank	Scientific Name	Common Name
1	*Cornus* spp. (syn. *Swida*)	dogwood
2	*Prunus* spp (some species native)	cherry, plum, etc.
3	*Salix* spp.	willow
4	*Malus* spp. (not native to US)	apple
5	*Ilex opaca*	American holly
6	*Crataegus* spp.	hawthorn
7	*Amelanchier* spp.	serviceberry/shad
8	*Acer* spp.	maple
9	*Cercis canadensis*	eastern redbud
10	*Liriodendron tulipifera*	tulip tree

Spirea alba

Solidago rugosa

Table 14: Most Visited Shrubs (native and non-native)

Rank	Scientific Name	Common Name
1	*Spiraea* spp.	meadowsweet
2	*Rubus* spp.	raspberry
3	*Rhus* spp.	sumac
4	*Cornus* spp. (syn. *Swida*)	dogwood
5	*Prunus* spp.	plum
6	*Salix* spp.	willow
7	*Ceanothus americanus*	New Jersey tea
8	*Viburnum* spp.	viburnum
9	*Clethra alnifolia*	sweet pepperbush
10	*Cephalanthus occidentalis*	buttonbush

Table 15: Most Visited Perennials (native and non-native)

Rank	Scientific Name	Common Name
1	*Solidago* spp.	goldenrod
2	*Asclepias* spp.	milkweed
3	*Symphyotrichum* spp.	aster
4	*Pycnanthemum* spp.	mountain mint
5	*Eupatorium* spp.	boneset
6	*Rudbeckia* spp.	black-eyed Susan
7	*Monarda* spp.	beebalm
8	*Echinacea* spp.	coneflower
9	*Achillea* spp.	yarrow
10	*Eutrochium* spp.	Joe-pye weed

Expert Interviews

During this Plan's data-collection phase, the project team interviewed researchers and advocates on the major factors contributing to the decline of insects worldwide: pesticide use, habitat fragmentation, climate change, and artificial lights at night. The interviews focused on how each individual's expertise could inform beneficial habitat resources in Somerville's very urban environment. The findings of these interviews are included throughout this report, and publicly available video recordings can be found on the SPAP SomerVoice page.

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The Rowland Institute at Harvard, Biologist/Entomologist

Kass Urban-Mead

Xerces Society, Pollinator Conservation Specialist

Kelly Gill

Xerces Society, Senior Pollinator Conservation Specialist

Dr. Richard Primack

Boston University, Professor of Biology, The Primack Lab

Dr. Rosemary Malfi

Xerces Society, Pesticide Program Specialist, Policy Lead

Susannah Lerman

UMass Amherst, Research Ecologist

Data Gaps

The following gaps in data have been identified and recommendations for ongoing monitoring and research are discussed in Section 13.

Temporal Gaps

Surveys earlier in the season are needed to better understand early spring pollinator activity and any potential floral resource gaps. To overcome this data limitation in the Plan, recommendations for Somerville include planting native trees and shrubs known to support early-season pollinators.

Spatial Gaps

Existing data reflects an uneven sampling of records from across Somerville wards, making comparisons of pollinator community composition across wards weak. Additional records from Wards One, Two, and Four are needed to establish baseline data on pollinators in those areas. Systematic monitoring of pollinators across the city, with data on sampling effort (time, number of observers, etc.) would be needed to more confidently assess differences in pollinator richness across the city.

Interaction Gaps

Trees and shrubs were largely underrepresented in interaction data compared to herbaceous perennials and annuals. There was also a lack of data on flower interactions for beetles and moths. To resolve this gap, the team gathered additional data from the broader regions to ensure the Plan covered these species' needs. Future monitoring efforts should prioritize early spring tree and shrub observations.

Species Population Trends

No information is available on how populations have changed over time or space in Somerville. This Plan includes the best available data from regionally relevant publications on species trends to guide the status of at-risk species. Systematic monitoring of pollinators in Somerville would be needed to understand trends in abundance through time. Notably, records of both the presence *and* absence of particular species (where they occur, but also information on where they do not occur) are needed to estimate these trends. The monitoring species approach highlighted in this Plan is a straightforward, tractable way for community members to begin this data collection effort.

Skip ahead to Section 13: What's Next to see recommendations for how Somerville could approach these data gaps and build off the research done in this project in the years to come.

Section 6

GENERAL RECOMMENDATIONS AND BEST PRACTICES

Photograph by: Dr. Nicholas Dorian

Key Ideas:

Planting Recommendations:

- Plant **native plants** (east of the Mississipi, north of Virginia).
- Plant **larval host plants** & 'keystone' species for trees.
- **Limit use of cultivars**.
- Consider urban conditions - rabbit tolerance, poor soils, salt, compaction. Include **trees and shrubs.**
- Have **flowers at all times from March–October.**
- Include **warm & cool season** grasses, sedges and rushes.
- Use a **base-matrix of local ecotype plants** adapted to urban conditions to fill in between flowering plants.
- Source plants grown **without neonicotinoids** (pesticides).
- Limit lawns, **add flowering plants** (or let flowering weeds grow!).

Landscape Maintenance Recommendations:

Spring Cleanup: Start **AFTER May 1st**

Bare ground: Leave patches without mulch in back of bed.

Mulch: Use composted leaf mulch, not bark mulch.

Dead hollow stems: Leave some 6-18" tall for 2 years.

Fall Cleanup:

Leave the leaves: Rake fall leaves into planting beds.
Don't cut back perennials: Leave entirely or cut to 6-18" tall.

Lawns: **Reduce mowing** to every 2 weeks or less often.

Overall: **Avoid pesticide use**.
Remove invasive species.

Non-Landscape Recommendations:

- Reduce outdoor lighting & pull shades at night
- Monitor pollinator sightings
- Be a pollinator advocate, spread the word!

General Recommendations and Best Practices

All Hands On Deck!

Somerville is in a unique position where the City is eager to partner with citizens to create the groundswell of change necessary to help pollinators. **Everyone can make a difference through small changes (closing your blinds) to big actions (installing and caring for a pollinator garden), and we need all hands on deck moving forward.** See **Figure 31** for a view of how this section will guide you through the general best practices and individual actions we can all take to help our pollinator neighbors.

Habitat Creation

The most effective way to support Somerville's pollinators is to offer the habitat (an area that provides the specific food, shelter, and water requirements for a given species) they need throughout their entire life cycle. While those needs vary from pollinator to pollinator, this Plan encourages practices that support as many species as possible.

There are three main types of habitats to consider: foraging (searching for food), nesting (creating a secure place to lay eggs), and overwintering

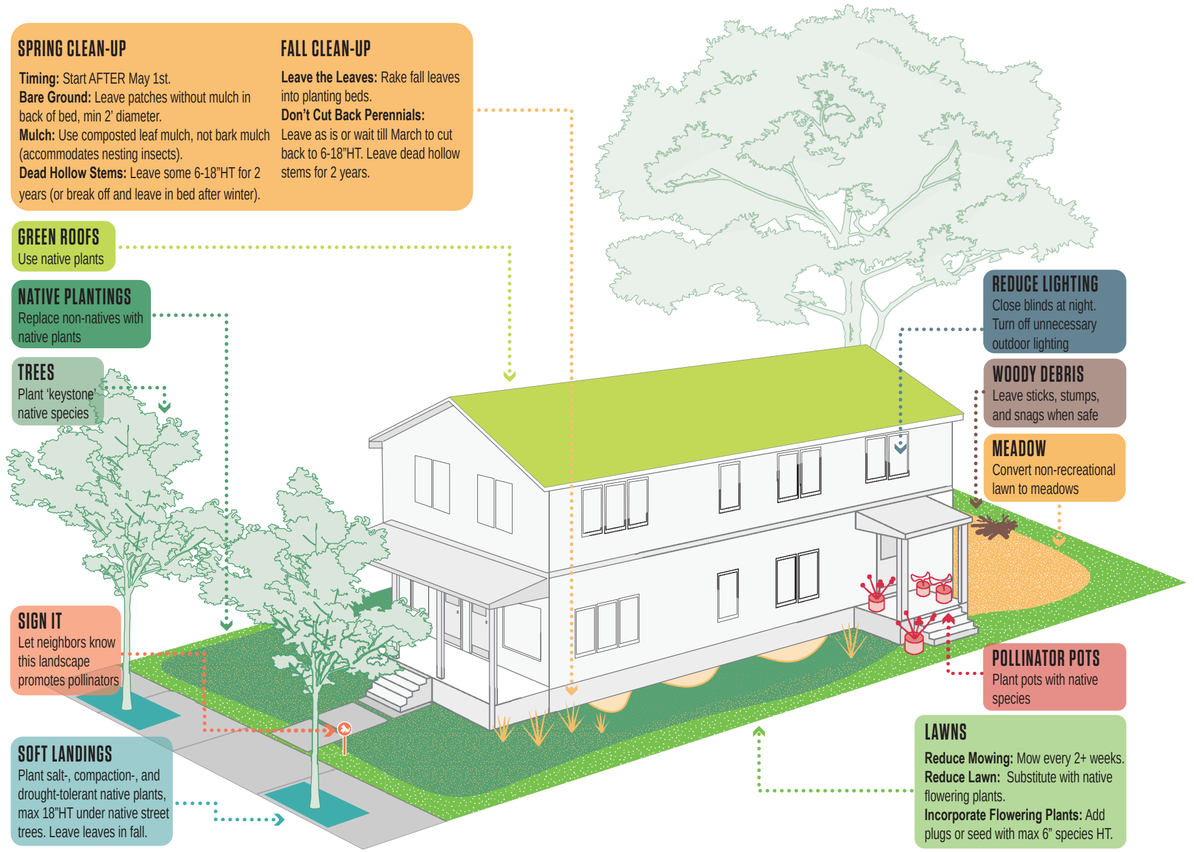


Figure 31: The general recommendations found in this section include landscape and non-landscape items that anyone can begin to incorporate.

(the process of surviving the colder months when food is scarce). By providing these, Somerville will be supporting pollinators throughout their life cycle, year after year. These types of gardens are explained in more detail later in this section. But first, some general guidelines on habitat creation for pollinators:

Foraging Habitat

We all need to eat, including pollinator adults and babies. Increasing the amount of foraging habitat by planting flowering plants in Somerville's fragmented urban environment directly supports pollinators. Pollinator adults are foraging for both pollen and nectar. Some are pollen specialists and require only very specific species of plants (approximately 15% of northeastern bees (Fowler, 2016)). Some are pollen generalists and can visit all plants. Some do not need pollen at all and are only looking for nectar. Many pollinator babies (i.e., larvae) need to eat the leaves of specific host plants to survive. This Plan provides recommendations for planting pollinator species that support all of the above. Plant lists for specific gardens that target foraging resources or larval host plants for specific pollinators, including at-risk species, are provided in Section 11: Pollinator Pantry (see Plant Lists and Monitoring Gardens) along with pre-designed garden plans (see Recipe Cards - Pots, Patches, Lawns) that provide an umbrella effect and benefit a wide range of species.

Nesting and Overwintering Habitat

To fully support Somerville's pollinators, gardens designed to support them must include not only flowering forage resources but consideration of the specific nesting and overwintering needs of the species present and desired. Pollinators spend only a portion of their life cycle in their recognizable adult forms and much of their time is spent out of sight. Their various nesting and overwintering needs can be accommodated through garden design and maintenance decisions and are incorporated into the Planting Considerations, Nesting Sites, and Landscape Management/Maintenance sections below.

Planting Considerations

Plantings for Multiple Benefits

Combine foraging and nesting habitat to ensure even the smallest pollinators, with the shortest range of travel, can find the food and nesting resources they need. The larger the pollinator garden you can provide, the better, but even small gardens and potted plantings will help support pollinators in the city. **No matter the scale, intentional plant groupings help pollinators forage efficiently.**

Provide Native Plants

Prioritize using east coast native plants (east of Mississippi and north of Virginia) **to support Somerville's pollinators**. These species coevolved with the diverse array of native pollinators found here and as such are uniquely suited to support them. A native plant is one that was found naturally in our area pre-European settlement (Rodomsky-Bish, 2018). Although some non-native species may provide food for pollinators, native plants generally attract more pollinators than non-native species (Seitz, van Engelsdorp, & Leonhardt, 2020; Salisbury et al., 2015), and provide essential nesting and overwintering habitat. Native plants are vital to supporting native insects, in particular the specialist pollinators, at the bottom of the food web. These **native plant and insect interactions are key to a functioning ecosystem.**

In Somerville, it is recommended to install plants native to the East Coast of the US and include a base matrix of plants that are locally native to the Boston Basin Ecoregion of Massachusetts (see **Figure 32 and 33**). It is worth noting that some of the plants historically suited to our soils and climate (Boston Basin Ecoregion) may not be well suited in the future. According to the 2022 Massachusetts Climate Change Assessment, with climate change and urbanization, the greater Boston area is getting hotter and wetter (EPA, 2016) and in 50 years is expected to be similar to the current climate of North Carolina (State of Massachusetts, 2022). By using a mix of local and regionally native plants, Somerville will develop a

A monarch (*Danaus plexippus*) on a butterlfy milkweed (*Asclepias tuberosa*). Monarch's rely on *Asclepias* as larval host plants.

network of habitat that can adapt into the future. The goal is to plan for changing conditions so that any efforts made now will benefit pollinators while also tolerating increased heat, precipitation and urban pressures such as salt, rabbit browsing, and poor soils. Many pollinators have large ranges, and native plants from outside our immediate ecoregion are suitable for urban conditions and support many pollinators.

Go Botany, created by the Massachusetts-based Native Plant Trust, is an excellent resource for looking up the native status of a plant. To learn more about each plant, refer to their Native Plant Finder.

Provide Larval Host Plants

Many species of pollinating insects must rely on specific larval host plants. Planting these species is vital to the survival of these specialist pollinators and will typically support the generalist pollinators too. A well-known example is how monarch butterflies must lay their eggs on milkweed (*Asclepias* spp.) for their larvae to feed on the leaves once they hatch. Milkweed flowers are an important foraging source for other pollinators as well. The host plants of our local and at-risk pollinator species have been included in the recommended plant lists and designed gardens (see Section 11).

Use Cultivars of Native Plants (Nativars) Sparingly

A cultivar, as defined by Becca Rodomsky-Bish (2018) of the Cornell Lab of Ornithology, is:

> A cultivated version of a plant bred by horticulturalists through cloning or hybridization, seeking to enhance an aesthetic quality or encourage disease resistance that can be maintained through propagation. This means these populations of plants may have different characteristics than what you would commonly find in the wild, even if they are still the same species.

You can identify that a plant is a cultivar when the scientific plant name is followed by a descriptive name in quotes (*Genus species* "Cultivar").

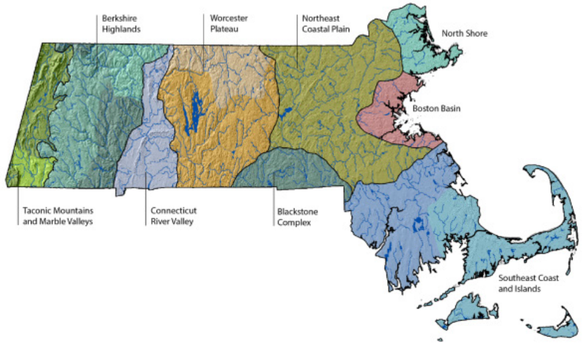


Figure 32: Ecoregions of Massachusetts (Grow Native Massachusetts, 2024).

Nativars, a term used to describe the cultivars of native plants, may be a cross of two more plants intentionally selected for desirable traits, or they may be a straight species of a plant collected from the wild and given a cultivar name (Rodomsky-Bish, 2018). For example, *Aster* 'Purple Dome' and *Solidago* 'Fireworks' are two native plants collected in the wild with desirable characteristics but sold under cultivar names (Caton, 2023).

Cultivars are produced by nurseries through various reproduction methods including growing by seed or clonal cuttings. Clonal cuttings are exact replicas of the parent plant and have lower genetic diversity. Seeded plants have the benefit of higher genetic diversity which may be helpful for plants adapting to local conditions if they reproduce spontaneously in the future (Caton, 2023). Because there is so much variability where native cultivars are found, bred, and propagated, there is wide variability in how beneficial they are to pollinators. Some cultivars support pollinators as well as their straight species counterpart, and some do not. The research is mixed, and the data available on this subject is limited (Baker, 2020; Erickson, 2020; Ricker, 2019; Torrez, 2023; White, 2016). Choose nativars that look the most like their straight species counterpart, prioritizing bloom color and flower shape.

In the nursery trade, nativars are often more available than the wild species. This is typically because there is demand for plants with specific traits such as a shorter height, flower color, longer bloom time, or double bloom.

Give preference to straight species (not cultivars) when they will thrive in a particular site's urban conditions since there is limited data on this subject and they are known to provide habitat for pollinators. However, where the straight species is not available, or if a site has challenging constraints like space and height limitations, the need for tolerance to rabbits, road salt, or specific aesthetic requirements, cultivars can be considered, especially if there is specific research that the cultivar may be supportive to pollinators. The Mount Cuba Center native plant trial garden reports and peer-reviewed scientific papers (Baker, 2020; Erickson, 2020; Ricker,2019; Torrez, 2023; White, 2018) are excellent resources for finding information on the pollinator benefits of specific cultivars. Carefully selected native cultivars are acceptable in a garden setting when their benefit to pollinators has been studied and documented. Any cultivar recommended in this Plan follows the rules above.

Where seed-grown straight species are available, they are preferred since they maintain the maximum genetic variability. Ask your local nursery how their plant stock is propagated.

Avoid Rare Native Plants

Avoid using native plant species that are considered rare. This may seem contradictory to biodiversity goals, but nursery plants may be sourced from a different region than ours. This would unknowingly introduce non-native genetics to the area. If the plants reproduce spontaneously, this can impact the genetic pool of the rare local ecotype (an ecotype is a group of plants, animals, or other organisms within a species that has adapted to specific environmental conditions).

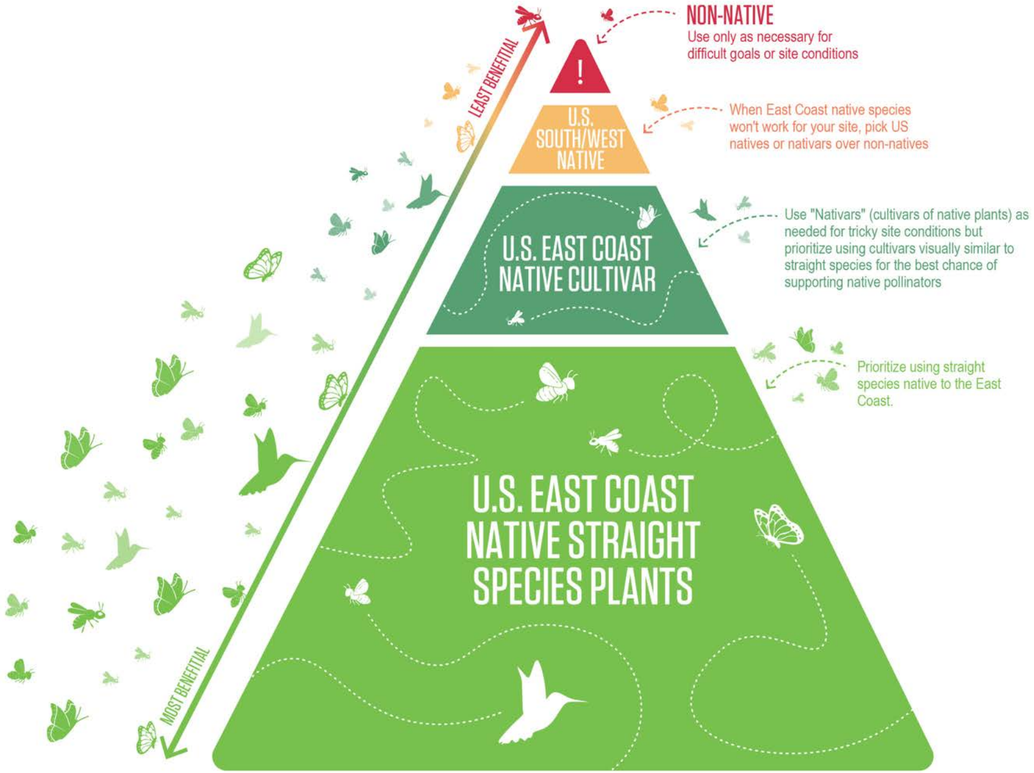


Figure 33: Native plant species are the most reliably benefical for pollinators and should be prioritized.

Right Plant, Right Place

A wide variety of trees, shrubs, perennials, and grasses can all provide pollinators food and shelter, but a successful planting strategy must be site-specific to assure survivability. For example, the City's street trees must be able to survive compacted, nutrient-poor soil, pet waste, small tree pits, and regular pruning to provide clearance for pedestrian and vehicular travel. Choosing trees based solely on their benefits to pollinators without considering their needs will not assure their survival, especially as the climate changes. Before selecting plants, consider the solar exposure, soil type, moisture level, and potential challenges (roadside salt or hungry rabbits, for example). Plants must be able to thrive to support pollinators. See the pre-planned garden Recipe Cards in Section 11: Pollinator Pantry to support pollinators in a variety of specific site conditions.

Poor Soil is Good Soil

When working with urban soils, instead of amending to make rich garden soils, consider using them "as-is" and select native plants that thrive in those site conditions. Many native plants prefer infertile (poor) soils and if planted with high organic matter, will look good at first and then flop or decline over time. Amending with rich organic matter, like compost, can often encourage weed growth. Do less, use infertile soil to your advantage, and target the plant selection to the existing conditions whenever possible. When installing new soils for large construction sites, consider creating manufactured soils from locally available materials and matching your plants to it, rather than bringing in rich garden soils that can promote weed growth (Weaner, 2019).

Prior to selecting plants, be sure to test soils for pH, nutrients, and soil texture to match plants to the resources available. Many urban soils are contaminated with lead and other pollutants, so also test for soil contamination. It is recommended that lead and metal contaminated soils be capped in an area and removed from human interaction. This

can often easily be accomplished by adding a layer of 6" of clean soil on top of contaminated soils and then pollinator plants can be installed in the new soil. Contaminants will not typically translocate into the above-ground plant parts during growth, therefore will not put pollinators at risk (Kennen and Kirkwood, 2015). However, with any contaminated soil found, consult the Environmental Protection Agency (EPA) Region 1.

Create Ecological Plant Communities

Strive to create communities of plants that will knit together in a tight network and thrive in similar conditions. Consider all levels of growth from low perennials to tall trees. Include fast-spreading groundcovers such as short sedges, grasses, and native *Violas* to fill in between plants and eliminate space for weeds to germinate. Plan for areas of bare open ground within the network of plants (see below, Nesting Sites)

Willows (genus *Salix*) are considered keystone plant species and provide benefits for many pollinators included some willow specialist species.

(see **Figure 34**). Consider emulating the native plant communities of Massachusetts that grow together naturally using Mass Wildlife's Natural Heritage & Endangered Species Program's Natural Community Fact Sheets and the base matrix locally native plant list provided in Section 11.

Consider Bloom Time & Plant Groupings

Install a variety of native plants that will bloom continuously from early spring through fall to feed pollinators throughout their active periods. For example, an ideal plant list will include three spring, three summer, and three fall blooming plants to ensure floral resources are available within all periods that pollinators may be active (see Section 5 for activity period by taxonomic group, and see Appendix B for species-specific activity periods). Within the selected plants, aim to have a diverse range of flower shapes (wide and flat like asters, deep tubes like lupines, etc.) to meet the needs and abilities of a wide variety of pollinators. Research indicates that laying out plants in clusters or swaths of single species at least 3 feet wide is beneficial when space allows (Mader et al., 2011). Planting a diverse array of native plants in this fashion provides ample foraging resources for pollinators, allowing them to feed efficiently and save energy for other activities necessary to thrive.

Plant Vines, Shrubs, and Trees

Include a variety of perennial flowers for foraging, but where space allows, add native vines, shrubs, and trees to provide food for lepidopteran (butterfly and moth) larvae, and early spring floral resources

Key Term: Keystone Species

Plants that support a large number of insect species, making them integral to the success and functioning of the entire food web. Ensuring these plants are present in Somerville is a key ingredient in supporting a healthy urban ecostystem.

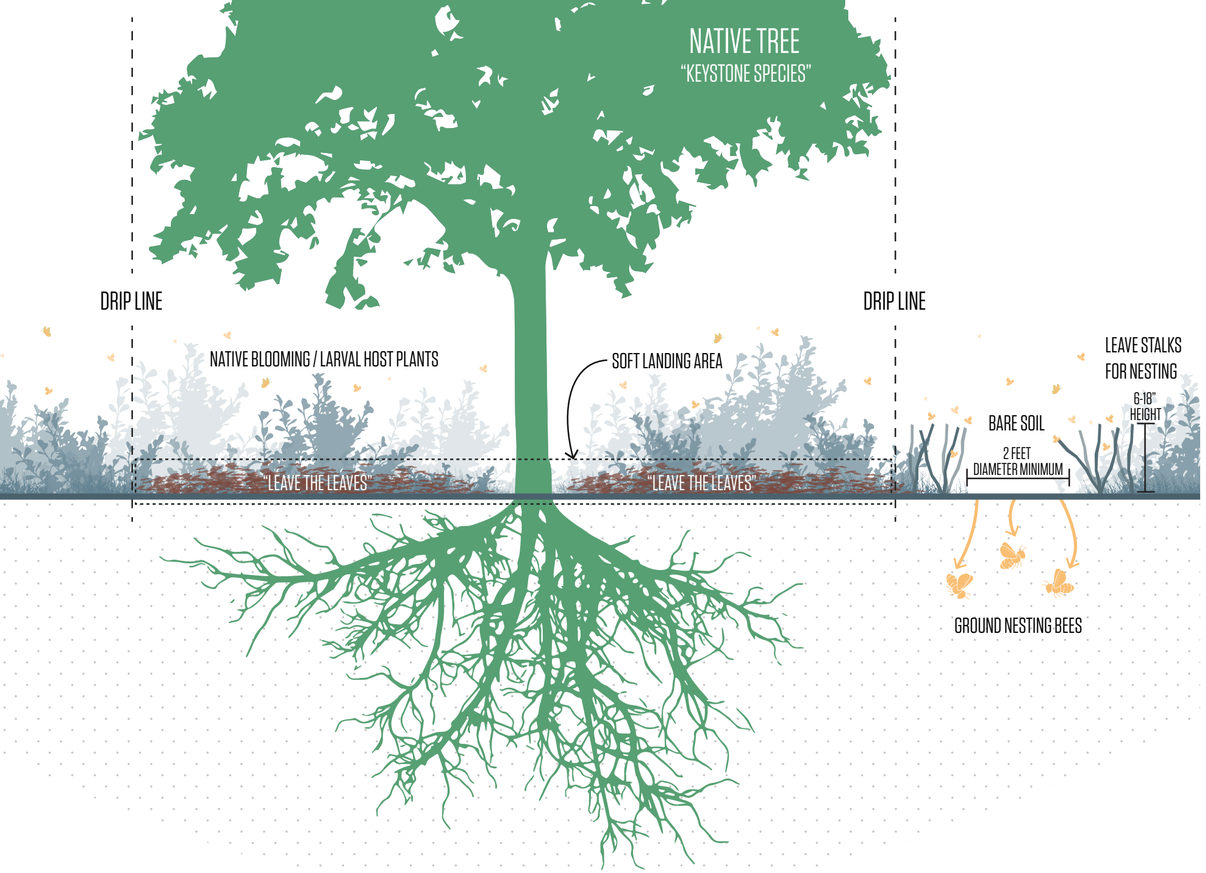
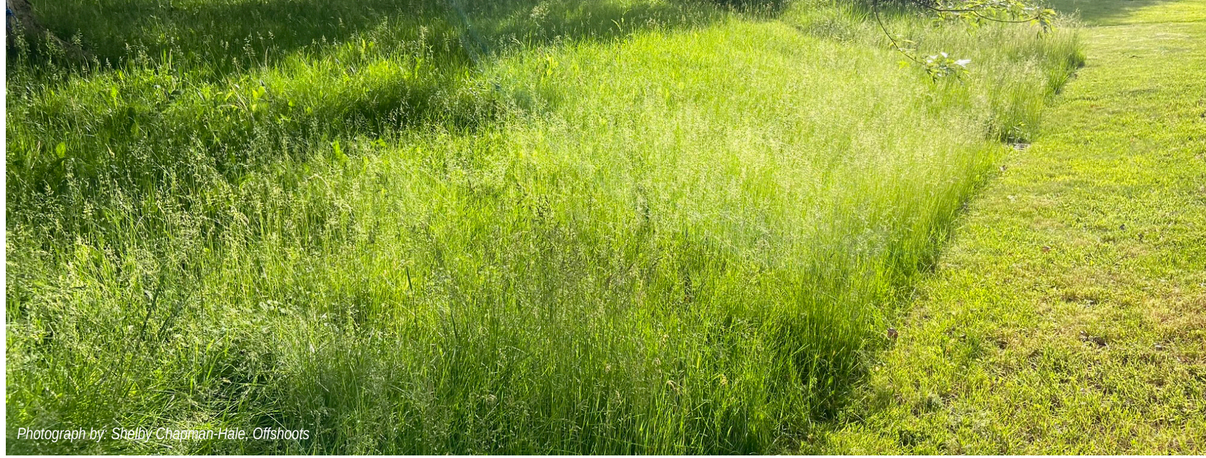


Figure 34: Minor adjustments in plant selection, layout, and maintenance can shift the urban landscape towards better supporting pollinators.



Letting all or part of your lawn grow long for at least the month of May can supplement the other actions described in this section by providing early resources.

for all pollinators. Native trees and shrubs have been shown to support 14 times as many species as ornamental woody plants, so these are important to include in any landscape (Xerces, 2011). Research suggests that 14% of native species (including native species of oaks, willows, cherries, pines, and poplars) support 90% of butterfly and moth species (Narango et al., 2020). Prioritize using these keystone species (see Key Term on prior page) when selecting trees and shrubs. Swap out existing non-native landscape plants with natives and integrate native shrubs and trees into new plantings where space allows. Refer to Section 11: Pollinator Pantry for suggestions on which plants to use in Somerville including larval host plants and keystone species.

For more information on keystone species, visit Homegrown National Park. For a list of species appropriate for use in Somerville, refer to the SPAP Comprehensive Plant List where there is an option to sort by keystone species.

Provide "Cues to Care"

Landscape architect Joan Iverson Nassauer's research on why people often respond negatively to more wild-looking landscapes, especially in urban and suburban communities, led to the commonly accepted concept of "cues to care." Nassauer theorized that people prefer recognizable landscapes that communicate a caring human intention or presence and are consistent with local cultural traditions or social norms for landscape appearance. Features such as well-maintained pathways, mown edges around wild-looking landscapes, seating areas, and informative signage can enhance the aesthetic experience while adding educational value (Li & Nassauer, 2020).

Providing "cues to care" can increase public acceptance and support for sustainable practices (Li & Nassauer, 2020). Thoughtful landscaping that uses a diverse array of colorful, blooming plants in layered swaths organized by height can attract not only pollinators but also human

admirers. By integrating beauty with functionality, urban gardens can create visually appealing spaces to learn about pollinators' vital role. Consider including educational signs and mown edges around plantings that have a naturalistic style to signal care and intention.

Plant Sourcing

Although sourcing native plants can be more difficult than common ornamental plants, especially in large quantities, New England is home to many native plant specialist nurseries. Grow Native Massachusetts, a non-profit focused on providing resources to help private land owners shift towards ecological planting practices, compiled a list of native plant nurseries and seed sources. They have partnered with Homegrown National Park, a national non-profit focused on native plant advocacy, where a national native plant resource directory has been developed. Source plants that have not been pre-treated with pesticides, especially neonicotinoids, whenever possible and request that your local garden center/nursery do this if they are not already. Additional information on pesticide use in nursery plants and seed sources is provided later in this section.

Re-think Lawns

In addition to garden beds, lawns can provide a floral resource when they contain non-grass species and are allowed time to bloom. Mowing less area and/or less often and adding native species to create a "poly-culture" lawn can provide a beautiful green lawn area that can be used while still providing pollinator benefits (a poly-culture lawn includes a variety of different plant species instead of just one type of grass). Refer to the Pollinator Pantry section of this report for suggested poly-culture lawn mixes that can be created with seed or live plants. Refer to the maintenance best practices for more information on lawn management.

Enhance Existing Gardens

Existing gardens and lawns should be updated over time to make a shift towards supporting pollinators. As time and resources allow, replace non-native plants with native plants. Remove sections of lawn and replace with meadows or plant beds or allow areas to grow long and increase in diversity. As additions are made, consider the best practices outlined above to develop a diverse range of bloom times, provide larval host plants, and create nesting sites. Each step taken will build on the actions of your neighbors and City staff to create a diverse patchwork of habitat that more holistically supports Somerville's pollinators.

Vegetable Gardens / Urban Agriculture

Vegetable gardening and urban agriculture are compatible with providing pollinator habitat. The keys are 1) to think about how commonly grown crops might be able to provide nectar and/or pollen resources for flower-visiting insects that occur within the city and 2) to be cognizant about how pest insects are controlled to make sure that pollinators are not harmed in the process. Recommendations to support pollinators in vegetable gardens and urban agriculture include:

- **Leave plants to bolt or flower to provide nectar resources.** This includes herbs such as oregano, thyme, mint, and dill as well as vegetables like arugula all of which are typically grown for their leaves. Letting a portion of these crops flower can help feed urban pollinators.
- **Intentionally grow crops that support specialist bees.** For example, zucchinis and summer squash (*Cucurbita pepo*) provide the only source of pollen for the specialist bee *Peponapis pruinosa*. And, cultivated tomatillos (*Physalis philadelphica*) provide the only source of pollen for two specialist bees within Somerville: the broad-footed cellophane bee (*Colletes latitarsis)* and the ground-cherry sweat bee (*Lasioglossum pectinatum)*.
- **Reduce the frequency and depth with which you till your soil.** In addition to disrupting valuable fungal networks in the soil, tillage can also disrupt pollinators that complete their life cycles within the soil. For example, many species of solitary bee nest directly in the ground and many nests occur within the top two feet of soil. Tillage that disturbs these dormant nests has the potential to destroy next year's bees.
- **Plant flowering non-crop plants near your crops to attract crop pollinators.** Many of the plant recommendations within this Plan can be grown alongside typical crop plants to increase the impact of your backyard agriculture and support robust harvests.
- **Identify gaps in bloom time in your yard and fill those gaps with non-crop flowering plants.** For example, if your crops do not start blooming until mid-July, aim to include early season flowering plants to support pollinators such as bumble bees that need season-long resources. Without access to early season flowers, these pollinators won't be available to pollinate your crops when they are needed.
- **Use non-chemical methods to control pests.** Planting a diverse array of flowering plants can help to attract predators of common garden pests. Opting for disease-resistant varieties can reduce the need to spray fungicides. For a community garden or urban agriculture setting, consider drafting an integrated pest management plan as a community to minimize the use of pesticides across the site.

Nesting Sites

In addition to the nesting habitat needs described above, consider the following opportunities for creating nesting sites:

Provide Warm & Cool Season Graminoids

Including both warm-season bunch grasses and cool-season sedges (graminoids) can provide additional larval host plants for butterflies and moths and nesting sites for surface-nesting species of bumblebees (Mader et al., 2011). Each recommended planting plan in the Pollinator Pantry (Section 11) has included these warm- and cool-season species.

Photo Source: Mining bee nesting, David Suzuki Organization

Photo Source: Naoshige Uchida, Mass Audubon

Pollinators have a range of nesting and overwintering strategies that can be accommodated by adjusting how landscaped areas are maintained (outlined in the next section).

Provide Soft Landings

When planting trees, especially keystone species, include a "soft landing" of native plants and leaf litter below the drip line (the edge of the canopy above) to allow caterpillars of moths and butterflies to drop down and access the soil below. If space does not allow for a soft landing below the full canopy, some is better than none. Providing native understory plantings (shrubs, grasses, or perennials appropriate for the site conditions) can boost the pollinator benefits even further by providing additional habitat. This is especially important below keystone tree species (Holm, n.d.).

Provide Ground Nesting Bee Zones

Ground nesting bees, which comprise approximately 70% of native species, need access to bare soil to form their nests in underground tunnels (Mader et al., 2011). Typically well-drained, sandy soils and areas with limited vegetation are ideal (Frischie et al., 2021; University of New Hampshire Extension, 2019). **Keep a two-foot radius of soil free of bark mulch**. **Do not till and keep soil disturbance to a minimum to protect the nesting site. Do not use weed barrier fabrics** because they make the ground impenetrable to bees. If necessary, only use mulch for the period of plant establishment, preferably composted leaf mulch (which bees can often dig through). Try to refrain from mulching in future years and let plants grow together. Alternatively, if mulch must be applied to plants, mulch the edges of the bed to create a maintained look, but leave the center open ground to provide nesting habitat.

Skip the Bee Boxes

Bee boxes or bee hotels are commonly marketed as tools for supporting native bee populations. The idea is that solitary bees that nest in cavities above ground (about 30% of species) will build their nests in hollow tubes provided by the bee hotel. Despite their appeal, it is recommended that you **do not install bee nesting boxes** to support native bees. There is high uncertainty about their benefit. Limited evidence suggests that boxes designed to support native solitary bees often do a better job of attracting non-native species that can outcompete native bees, as well as solitary wasps (which are pollinators, but not necessarily the intended target) (MacIvor & Packer, 2016; Geslin et al., 2020).

Provide Opportunity for Above Ground Nesting

To support above ground nesting bees, follow the Landscape Management/Guidelines that follow this section to offer nesting opportunities. Bumble bees will use a variety of site conditions for nests, from clump-forming grasses, piles of sticks and decaying wood, abandoned bird houses, or holes in the ground (Mader et al., 2011). Consider leaving some areas relatively undisturbed to provide these spaces for bumble bees.

Landscape Management / Maintenance

How habitat areas are maintained is the critical next step towards supporting our pollinators. The following practices will support the creation of nesting sites and demonstrate how a few small changes in management can protect pollinators from being harmed by widespread landscape practices. In many cases, we can do more for our pollinators by doing less.

Pesticides

Pesticide use is a major contributor to insect decline worldwide (Sánchez-Bayo & Wyckhuys, 2019) and should be avoided whenever possible. Pesticide is an umbrella term that includes insecticides, herbicides, and fungicides, which can each cause harm to insects (Xerces, n.d.). **Avoid using pesticides in the landscape** and try to purchase plants from growers who have pledged not to use them. Most seed suppliers will include information on any pre-treatment on the product information. However, sourcing live plants without pre-treatment of pesticides can be challenging and requires asking the grower to confirm. If a perennial plant has been pretreated with pesticides, it is best to snip off the blooms in the first year to avoid harming any insects that visit while the pesticides are still present. Trees and shrubs may continue to have systemic pesticides for several months to years in their biomass, so sourcing from growers that do not use pesticides is best (Xerces, 2021).

Pesticides are often considered an integral part of traditional garden and lawn management, especially when invasive species removal is involved, but there are other options available that limit harm to pollinators, wildlife, and humans. The least impactful option is to use mechanical removal, or hand-pulling, of any weeds. While labor intensive, this process avoids the use of potentially harmful chemicals. In some cases, such as invasive species removal, the benefits of carefully applied herbicides may outweigh the risks. Pesticides should only be applied with caution by a licensed professional and following all manufacturer recommendations.

Broad-scale use of pesticides to manage mosquitos or ticks is commonplace. Remember that these treatments will harm other insects (and food web) too. Consider alternative approaches to control, such as eliminating standing water (to break the mosquito breeding cycle), mowing or avoiding the edges between wooded areas and lawns (to minimize tick habitat), or other alternative approaches recommended by our local UMass Extension service.

Invasive Species Removal

Invasive plant species should be managed to limit further spread and make room for native plants that can support Somerville's pollinators. The Massachusetts Invasive Plant Advisory Group (MIPAG) maintains a list of invasive species and those that are likely to become so in the coming years. Whenever these species are present, it is best practice to remove them to the greatest extent possible. In some cases, where small

and manageable groupings of plants like black swallow-wort or garlic mustard pop up, eradication (full removal) may be the goal. In other instances, leaving a plant and simply limiting its spread might be best. For example, if a black locust (*Robinia pseudoacacia*, native to the US but not Massachusetts) exists on an abandoned site, it is providing shade and pollinator benefit through its flowers and to pollinators that specialize on pea family species, like Somerville's at-risk silver-spotted skipper (*Epargyreus clarus*). In this case, leaving the tree on site may be beneficial. Ecologically sensitive invasive species management is more nuanced than first meets the eye and a local expert or organization (like Green and Open Somerville who host invasive species removal events) can be a resource to help guide removal efforts.

Once the goal level of invasive species mitigation is determined, it is time to consider what management strategies to employ. Mechanical removal (removal by hand, string trimmer, smothering, etc.) is typically the most ecologically sound practice but will require time and patience to achieve results. Many invasive species experts consider a careful combination of mechanical and chemical (pesticides) control to be best practice for certain difficult species. In this case, easily controlled methods like cut-and-paint/dab (cut a woody stem and carefully paint it with herbicides) are preferred and spray applications are strongly discouraged due to increased risk of pesticide drift. It is recommended that pesticide applications be conducted by a Massachusetts Department of Agriculture-licensed pesticide applicator. Private landowners are urged to work with one of these professionals, or if that is not possible to ensure that they carefully follow any instructions on herbicide packaging. Prioritize use of mechanical methods before considering herbicide applications. As previously stated in this document, pesticides are a major contributor to the decline of pollinators and should not be used unless absolutely necessary.

Visit the MIPAG website additional information on invasive species removal including contractors that provide removal services.

Fall Cleanup

Fall is often a busy time for lawn and garden maintenance when practices center around preparing the landscape for winter. A widely accepted convention is to rake up leaves, cut perennials down to the ground, and bag up all the dead plant material to be sent off and composted off-site. This process misses the opportunity to renew existing soils with beneficial nutrients and create nesting and overwintering habitats for pollinators. The following small tweaks to the fall cleanup process are best practices for promoting pollinator habitat:

Leave the leaves:

Instead of raking up all the leaves, it is best practice to **leave at least some leaf litter** where it lands or mulch your garden beds with it to support overwintering and nesting pollinators. Walkways, patios, and other hardscape areas should be kept clear of leaves to reduce potential hazards, but these leaves can be moved into nearby planting beds. Avoid using a leaf shredder when possible as insects or their offspring may be a casualty. Using whole leaves from the site is the most beneficial for soil and wildlife, but it is still better to shred leaves on site than removing them entirely.

Leaving leaves below tree and shrub species can provide "soft landings" to help butterflies and moths complete their life cycles (Holm, 2024). Leave some bare ground in 2-foot diameter patches for ground nesting bees. For more information on leaving the leaves, check out the Fall Neatening Guide developed by the Somerville Urban Forestry Committee.

Keep perennial stalks, sticks, and dead wood:

Rather than cutting perennials down to the ground, **allow herbaceous plants to remain overwinter at their full height** (this is beneficial for wildlife habitat and for seed dispersal and native plant reproduction). Where cutting is necessary, **cut any hollow/open stemmed plants (such as iris flower stalks) to 6-18" height to provide potential bee**

Volunteers install a new pollinator habitat outside of Somerville City Hall. Skip ahead to Section 12 to learn more about the demonstration garden.

nesting sites. These stalks should be left in place for 2 years to allow a complete nesting cycle. Each new season's growth will cover up the old growth, so dead stems will be hidden once the garden grows in. Consider keeping a pile of woody debris (stems, branches) somewhere on site, as these can provide beneficial nesting sites for beetles, flies, and bees. Where grass and forb (herbaceous flowering plant) meadows are installed, keep plants at full height through the winter and only cut one time per year annually in late March. The texture of these plants can create a beautiful winter landscape to extend the beauty of the garden

Spring Cleanup

Wait until May 1st. Spring is a busy season for landscape maintenance and once again, one of the best ways to support pollinators is to do less, or at least wait until May when pollinators have woken from overwintering (about when the soils have consistently reached 50F), which gives time for many of the critters that are overwintering in the leaves and stems to emerge. It is typically safe to begin spring cleanup on May 1st.

Once spring landscape care is underway, the following best practices should be followed:

Leave leaves and some bare ground:

When mulching your garden, **leave some patches of bare ground**, ideally in areas with well-drained sandy soils (Frischie et al., 2021), to allow for ground nesting habitat. To support soil health, consider switching to composted leaf mulch or mulching the garden with leaves that fell nearby. Avoid using a leaf shredder. Inspect leaves throughout the year to keep an eye out for signs of common fungal diseases like anthracnose and black tar spot. Remove any leaves with noticeable signs of fungal diseases. Visit UMass Extensions Professional Disease Guide for help identifying signs of stress on your leaves. Using composted leaf mulch will improve soil slowly by providing a decomposing source of organic matter and nutrients (Naikwade, 2014), which can be especially beneficial for plants in urban conditions and help pollinator plantings continue to thrive.

Photo Source: K. Foresto, Mass Audubon

Leave some woody debris:

Woody plant debris, sticks, stumps, etc., can provide a beneficial habitat for a variety of insects, including pollinators. **Leave some dead pithy stems standing** (pithy stems have spongy cell tissue in the center like raspberries or hydrangeas) between **6-18" height for 2 years or more** to provide habitat for bees active in the summer and allow solitary bees to complete their nesting cycle. If some dead stalks must be removed for aesthetics, lay down the cut pieces on site around the base of existing plantings.

Skip the pesticides:

Avoid using pesticides (including insecticides, fungicides, and herbicides) in the lawn or garden.

Leave the cobwebs:

Leave outdoor cobwebs in place to support the potential for nesting ruby-throated hummingbirds who build nests by incorporating cobwebs (Cornell, 2024).

Mow Less

Lawn areas that do not need to be manicured for recreation or aesthetic purposes should be mowed less often or converted into habitat areas. In regularly mown lawns, allow the introduction of non-grass species (i.e., native flowering plants like violet, strawberry, and yarrow, or even common non-natives like clover) can contribute additional floral resources to support pollinators, especially in the early spring months when there are not as many options available. Massachusetts-based research has found that **mowing every two weeks is the ideal frequency for supporting pollinators where lawns are required and poly-culture lawns (with small flowering plants) are preferred** (Lerman et al., 2023). Mowing less provides the added benefit of reducing carbon emissions (or energy use), a goal outlined by the City of Somerville in the Climate Forward Plan. All mowing should occur during the day to limit impacts to insects (Owens, 2024), which is unfortunately the opposite of the EPA recommendation to mow in the evening to reduce formation of ground-level ozone (Osborne, 2018). Taking this all into account, mowing less space and less often (and with an electric mower) is the best option for pollinators and the climate.

Lawns should also be organically managed. Fewer applications of fertilizers will result in a slower-growing lawn with deeper roots, which is more drought tolerant. This kind of lawn will require less mowing and less watering to stay green.

Non-Landscape Recommendations

Reduce Light Pollution

Wherever possible, the amount of artificial light in the city should be reduced from dusk to dawn. Bees and butterflies do not have eyelids, and sources of bright artificial light alter their sleeping and seasonal patterns. In addition to bees and butterflies, moths and flies are nocturnal insects, and a light source directly over a garden will draw these insects away from the flowers that require pollination. One favorite summer insect, the firefly, is not a pollinator but has suffered from extensive light pollution. Firefly populations have decreased dramatically, and reducing artificial light will have the added benefit of supporting firefly populations (Owens, 2024).

When lighting is not required for safety, the best practice is to **eliminate lighting entirely. Where that is not possible, swapping in motion sensor lights or adding timers can help reduce light pollution.** When selecting lightbulbs, **look for warmer colors (golden/yellow)**, which will impact fewer wildlife species than colder (whiter/bluer) colors. **Lights should have full cutoff shields, which point light down instead of up toward the sky.** For additional information on best practices for outdoor lighting, refer to Dark Sky International.

In the garden, consider creating dark zones. Use shrubs, hedgerows, or fences to screen ambient light and create pockets of darkness to support nocturnal insects in the city.

Monitor Pollinator Sightings

The SPAP provides a snapshot of pollinator observations through 2023 and can be a base point for comparing future observations. The best way to continue to monitor the species present is for the Somerville community to photograph pollinator sightings and post them to iNaturalist. Pollinators added to iNaturalist within Somerville will automatically be tallied into the SPAP project and will contribute to the ongoing understanding of the state of pollinators in the city and the efficacy of efforts to help them. For additional information on ongoing monitoring goals, refer to Section 5.

Be a Pollinator Advocate

Knowledge is power. People in Somerville all have the ability to make change by learning about pollinators and sharing that knowledge with their community. Speaking to your landlords, neighbors, friends, colleagues, and kids about the importance of pollinators and how everyone can pitch in is a very valuable contribution. Consider signing up for the SPAP email list on the SomerVoice Page to receive project updates or get involved with one of the local organizations doing boots-on-the-ground pollinator advocacy:

- Earthwise Aware
- Green & Open Somerville
- Groundwork Somerville
- Grow Native Massachusetts
- Massachusetts Pollinator Network
- The Somerville Community Growing Center

Photograph by: Shelby Chapman-Hale, Offshoots

By asking your local garden center to carry pesticide-free, native, straight species plants, like northern spicebush (*Lindera benzoin*) seen above, you can help encourage them to increase the availability of these species over time.

Nursery feedback loop:

Help garden centers and plant growers understand the growing need for pesticide-free native plants. By calling or visiting area garden centers and asking for specific straight species of native plants, especially those grown without the use of neonicotinoids, community members can signal to growers that there is a market for those plants. Refer to Section 11: Pollinator Pantry and the Comprehensive Plant List for species. For talking points, the Xerces Society has excellent guides to Buying Bee-Friendly Plants. If you have 90 minutes watch their webinar, if you have 10 minutes read this guide, or if you have 2 minutes watch these short video clips to learn more.

Stinging insect and allergy awareness:

Many people are quite afraid of insects or have serious insect allergies to consider. This can raise concerns when discussing the implementation of pollinator gardens, especially at schools. However, it is important to note that many flower-visiting insects do not sting. **Of the pollinators in Somerville, only bees and wasps possess stingers, and only the females of each species can sting. Even more, the vast majority of species are unlikely to sting since they are solitary and do not defend a social nest.** When observing bees and wasps on flowers, there is an incredibly low risk of being stung if observed from a respectful distance. This means that planting flowers can be considered a safe activity even when it does attract bees and wasps to the garden. Education on this topic is important to convey to the community and educational signage should be included at all pollinator gardens.

It is recommended that you avoid approaching the nests of ground-nesting yellowjackets (social wasps) and aerial yellowjackets or bald-faced hornets (social wasps), which are the most aggressive stinging insects among Somerville's pollinators.

Local pollinator species can be identified using many web-based tools. To learn more about insect identification, we recommend Heather Holm's books "Bees" and "Wasps," Skevington et al.'s Field Guide to Flower Flies of Northeastern North America, online guides from Tufts Pollinator Initiative, and the website watchingbees.com.

Pollen allergies are another very common concern. Community members may worry that increasing pollinator gardens will increase the amount of pollen floating around the city. Many of the plants recommended require animal pollination versus wind pollination. Species that are major contributors to seasonal allergies are pollinated by wind. A common misconception is that native plants (like goldenrod) that bloom at the same time as wind pollinated plants (i.e., ragweed) are contributing to allergies. Planting pollinator-friendly plants will have little to no impact on seasonal pollen allergies.

Suggested Reading, Listening, and Watching

Ready to learn even more about pollinators and gardening? Check out these excellent resources:

Podcasts

The Joe Gardener Show by Joe Lamp'l

Bug Banter by the Xerces Society

Videos

We're Saving the Wrong Bees Ted Talk by Nick Dorian

Fundamentals of Pollinator Gardening by Nick Dorian

Let Your Garden Grow Wild Ted Talk by Rebecca McMackin

Pollinator Conservation 101 by the Xerces Society

PolliNation Podcast by Oregon State University Extension Service

Pollinator Books

Attracting Native Pollinators by The Xerces Society

Bees by Heather Holm

Butterflies through Binoculars by Jeffrey Glassberg

Pollinators of Native Plants by Heather Holm

Wasps by Heather Holm

Northeast Native Plant Books

A Northern Gardener's Guide to Native Plants and Pollinators by Johnson, Colla, and Sanderson

Native Plants for New England Gardens by Dan Jaffe

The Northeast Native Plant Primer by Uli Lorimer

Gardening How-To Books

The Know Maintenance Perennial Garden by Roy Diblick

Ecological Gardening Books

Bringing Nature Home by Douglas W. Tallamy

Garden Revolution by Larry Weaner and Thomas Christopher

Nature's Best Hope by Douglas W. Tallamy

The Nature of Oaks by Douglas W. Tallamy

Planting in a Post-Wild World by Thomas Rainier and Claudia West

Section 7

PRIVATE SPACE RECOMMENDATIONS

Photograph by: Cristian Umaña, Offshoots

Key Ideas:

Actions for Renters, Homeowners, Developers, Business Owners & Employees:

- **Plant native plants** wherever you can. Even small pots on porches make a difference. **Swap out non-native existing plants with natives.**
- **Use the 'Recipe Cards'** of pre-designed plantings of various sizes to install attractive, native gardens (see Section 11: Pollinator Pantry).
- **Change maintenance practices:** Doing less is doing more (see Section 6 for more details)!
- Use pollinator-forward maintenance contractors that understand sustainability and ecology.
- **Ask garden centers** for plants grown without pesticides and straight species.
- **Limit outdoor lighting:** Remove outdoor lighting when safely allows & pull your shades at night.

Private Space Recommendations

Approximately 90% of land in Massachusetts is privately owned. And while many parcels in Somerville are small, it is important to consider that each is a portion of a cumulative pollinator network. In this instance, the whole can be greater than the sum of its parts. Private landowners, managers, and renters can take the following steps to help pollinators. Refer to the previous section for more details about the best practices mentioned here.

Planting

Residents and owners of private spaces should prioritize adding or expanding pollinator plantings to support foraging and nesting habitats. These plantings can be any size, from pots on the porch/roof deck, or larger garden plots. Existing landscapes can be amended over time to increase pollinator value. Swap non-native plants out with native plants or consider a lawn conversion to include native flowering species, trees, or shrubs. Follow the best practices outlined in Section 6 and select plants that are suitable for the site. Even the most seasoned gardeners have failed many times; do not be afraid of experimenting to find out what works and what doesn't on your site. Plants do not read textbooks and they might surprise you!

If you are interested in providing a pollinator habitat but are not sure what plants to use, refer to Section 11: Pollinator Pantry for a broad list of pre-planned gardens. These gardens include a range of site conditions and sizes, so there is something for everyone and every space.

If you are ready to create your own custom garden, please refer to the Comprehensive Plant List in the Pollinator Pantry to inspire your plant palette.

It is recommended to include signage to inform your neighbors about your habitat creation. This can spark conversation and help the community begin to collectively understand the importance of pollinator habitat. Somerville Pollinator Action Plan signs are included in Appendix F and each sign includes a QR code for neighbors to link to additional information on the SPAP, resources, and ways to get involved.

Landscape Management

With or without adding native plant habitat, there are adjustments you can make in management that will positively impact pollinators.

Photo Source: Matthew Shepherd, The Xerces Society

Adding singage can signal that you leave the leaves to support pollinators.

If you have a lawn:

- Mow less often or mow less of your lawn.
  - Skip mowing part (or all) of your lawn for the month of May (or beyond) and let your lawn develop some plant species diversity (yup, weeds) to help feed the pollinators.
  - Starting in June, mow once every two weeks or less often.
  - Do not mow from dusk to dawn.
  - Set the mower at 3-4" height.
- Do not use pesticides.
- Consider overseeding a polyculture lawn mix (adding non-lawn species like yarrow or clover) to add biodiversity and floral resources to your lawn.

If you have a garden:

- Add a variety of native plants that will bloom throughout the year.
- Do not apply pesticides.
- Leave bare patches of soil; do not mulch all areas of all beds in the spring.
- Use composted leaf mulch rather than bark mulch.
- Do not use weed barrier fabrics.
- Leave leaves to create your own leaf mulch on-site.
- Do not cut perennials back in the fall; leave them till May 1st.
- Do not put clippings in yard waste, put it back in the bed (unless invasive or diseased).
- Leave some dead pithy stems at 6-18" height in the garden at all times.
- Leave decomposing wood or brush in an undisturbed location on your property.
- Remove any invasive plants.

Consider signing up with one of the existing pledges noted on the next page and adding signage to help spread the word and raise awareness about best practices for Somerville's pollinators. SPAP signs (shown above) are available in Appendix F to print or have printed as 17" diameter yard signs.

Non-Landscape Recommendations

Reduce Artificial Lights at Night

Private landscapes can help take steps toward reducing the amount of localized light pollution in the city. Somerville is 88% privately owned and 42% residential area, and the community and private businesses can take the simple steps outlined in Section 6 to reduce light pollution. Key takeaways include:

- Close blinds or curtains after dark to limit the amount of light spilling out from windows.
- Turn outdoor lights off or put on a timer.
- Shine lights down and use full cutoff fixtures to prevent light shining up.
- Use warm-colored light bulbs (3000 kelvin is ideal).

Become a Pollinator Advocate

The small actions of many build to make a big impact. Every resident can be an advocate for Somerville's pollinators by spreading the word about the importance of pollinators and the value of urban habitat. This can look like talking with neighbors about steps you're taking on your own property or asking plant nurseries for pesticide-free plants. Follow the steps outlined in Section 6 to learn how to advocate for Somerville's pollinators within the community, at local garden centers, and beyond. See Section 13: What's Next for ideas on how to keep the momentum going.

Log Insect Observations

This Plan relied upon data collected by volunteers and citizen scientists. To understand the efficacy of SPAP actions and to fill in gaps in the current data, all residents can take part in collecting observations of insects on flowers (Section 13 describes these data needs in more detail). Each individual record, be it in a park or backyard, builds a valuable

picture of Somerville's pollinator habitat. The web platform and app iNaturalist stores thousands of observations and community groups like Earthwise Aware train and organize residents to gather insect data across the city. This is a powerful way that everyone can pitch in.

Pollinator Pledge Opportunities

Commit to supporting pollinators and get your habitat on the map by signing the SPAP pollinator pledge and/or one of the following national pollinator network pledges. Click the links below or refer to Appendix G for the web addresses:

- Homegrown National Park – Biodiversity Map
- National Wildlife Federation – Certified Wildlife Habitat
- Pollinator Partnership – Bee Friendly Gardening
- Pollinator Pathway
- Wild Ones – Certified Native Habitat
- Xerces Society – Pollinator Protection Pledge

Tips for Renters

You do not need to be a landowner or manager to help pollinators! The majority of Somerville residents are renters and there is so much you can do to help. With the best practices outlined in Section 6 in mind, consider taking these steps:

- **Speak with your landlord, school, place of worship, and/or employer** about this Plan and see if they are willing to take steps to add pollinator habitat or adjust their current maintenance practices. Remember, the ask is typically: "can we do less?" This saves money and time, which is often well received.
- **Add native potted plants to your patio, balcony, or front steps** to help build a network of food resources throughout the city. A larger three-foot pot would be ideal, but groupings of smaller pots and individual small pots can all help—especially if many people make this shift.
- **Talk to your local garden center** and ask if they carry pesticide-free native plants. Ask to see their native straight species selection.
- **Help reduce nighttime light pollution** by closing your curtains or blinds.
- **Become a pollinator advocate** and get involved in helping spread the word about this Plan and the role we can plan in urban pollinator habitat with your friends, neighbors, and colleagues.
- **Identify insects around Somerville** to record which pollinators are in Somerville and whether our actions are making a difference. See above for more details.

With approximately 66% of housing units being renter-occupied throughout the city, there is a tremendous possibility for renters to contribute towards the goals of this plan (U.S. Census Bureau, n.d.).

For a simplified checklist of the recommendations in this section, see Appendix E.

Photograph by: Shelby Chapman Hale, Offshoots

Section 8

LANDSCAPE SERVICES RECOMMENDATIONS

Key Ideas:

Standard Practices Updates for Landscape Professionals:

Fall Maintenance:

Don't cut back perennials!

Leave fall leaves.

Avoid leaf-blowing when possible.

Spring Cleanup:

Wait until May 1st to start!

Eliminate the use of bark mulch, use composted leaf mulch.

Leave patches of bare ground.

Mow meadows only once in late March.

Lawns:

Mow every 2+ weeks & only mow where necessary.

Overall:

- **Avoid using pesticides**.
- Add **pollinator habitat signage.**
- New plantings/transition existing plantings to **native plants**.
  + See Comprehensive Plant List spreadsheet and pre-designed gardens in Section 11.
- **Educate** your clients!
- Create a demand for pollinator-friendly plants. **Ask your plant sources for pesticide-free native plants and straight species** (even if you know the nursery doesn't carry them).

Landscape Services Recommendations

Professionals in the landscaping industry have a huge impact on habitat for pollinators. Where these animals like it natural and wild, humans often like it ordered and neat. How can we change our management routines and the expectations of our customers to create landscapes that are more productive for all? In the case of pollinators, doing less gets us more.

Update Landscape Management Practices

Landscape professionals, including maintenance contractors, Department of Public Works (DPW) staff, janitors, and others performing landscaping services, can refer to the non-conventional best management practices detailed in Section 6 for lawn and planting areas. A short summary checklist of pollinator-friendly practices is provided below (see Section 6 for the "WHY" behind these recommendations). It is recommended that a management sheet (see Appendix E for a sample checklist) be printed and laminated as a reference for work trucks and shared with all staff and subcontractors.

For pollinators, less is more! If clients want a tidier look, recommend that they keep 6-18" perennial stalks and show them photos of how beautiful winter landscapes can be, like this planting in Charlestown, MA at Hood Park.

Fall Maintenance

- **Do not cut back perennials in the fall**. Leave at full height for the winter. Encourage your clients to appreciate the seed heads and winter texture. Where a neat appearance is required, cut back only plants along the edge of beds to 6-18" height, not to ground.
- **Leave fall leaves** to the greatest extent possible in existing beds. When a neat appearance is required, rake edges and leave leaves in the center of beds.
- **Avoid leaf blowing** to the greatest extent possible, especially with gas-powered blowers.

Spring Cleanup

- **Wait until May 1st** to complete spring cleanup and perennial cutbacks. Leave perennial stalks where possible—if trimming is necessary cut to 6-18" height, not to the ground.
- **Eliminate the use of bark mulch where possible.** When mulch is required, mulch with composted leaf mulch from a local, quality-oriented source, and only install as much as necessary to create neat edges. Where longer-term weed suppression is critical (such as in tree pits or infrequently maintained public bed edges), use natural pine bark mulch from a recycled source. Do not use dyed mulches.
- **Do not install weed fabric.** Unless there is a concern with potentially contaminated soils and it is being used as a barrier, landscape/weed fabric should be avoided.
- **Leave patches of bare ground** in plant beds for nesting habitat wherever possible. Where a clean edge is desired, mulch only bed edges and leave open ground between plants.
- **Mow meadows** only 1x annually in late spring (March or later).

A manicured edge provides a 'cue to care' for a low-mow lawn in France.

Lawn Care Practices

Do not start mowing lawns until as late in May as possible. Identify the lawns that are not athletic fields and mow those last. Where appropriate, shift mowing intervals to every two weeks or more.

- **Only mow where necessary** for passive and active recreational purposes (i.e., open lawns for gathering, sports fields, play areas, etc.). Let other areas grow out to meadow heights (approximately 18-36").
- **Convert non-recreation lawns to polyculture low- or no-mow** areas by aerating and overseeding in September and October with polyculture seed mixes. Convert lawns to meadow resources by letting them grow out and adding live plug plants as recommended in Section 11: Pollinator Planting - Lawn Conversions.

Signage

- **Install signage** at all plantings and lawns where pollinator-supporting landscape practices are used.

New Plantings

- **Use native plants**. Whenever possible, plant straight species that are grown from seed, rather than cultivars, and purchase plants from growers committed to growing without pesticides.
- Where annuals are required for continual summer color, plant annuals that best support pollinators, see Section 11: Pollinator Pantry.
- Where straight species of native plants get too tall later in the season, use the "Chelsea Chop:" cut the plant to half its size in late May to control the overall height of the plant. The plants will flower later in the season, but the height will be controlled.
- **Create plant diversity** by using a variety of native plants that bloom throughout the year.
- **Do not use weed barrier fabrics** in garden beds unless there is a potential for contaminated soil.
- **Leave bare ground** in a discrete portion of the garden bed approximately two feet wide.
- **Use composted leaf mulch** instead of bark mulch.
- **Avoid using pesticides of any kind.**
- **For plant lists and pre-designed gardens** that strongly consider garden aesthetics and pollinators, see Section 11: Pollinator Pantry.
- **Remove any invasive species present** on site using best management practices and avoid pesticides when other removal options are available.

Transitioning Existing Plantings

- **Amend existing plant beds following the best practices** and recommendations for new plantings, soils, mulch, and maintenance described in Section 6.
- **Supplement with beneficial native plants**. Consider the existing plants on a site and add species that provide additional bloom periods and/or are larval host species (see the Comprehensive Plant List or Section 11 for plant suggestions).
- **Add native shrubs and trees** for their early spring floral resources, especially larval host species. Use these additions to create dark refuge areas in the garden to support nocturnal pollinators.
- **Remove any invasive species present** on site using best management practices and avoid pesticides when other removal options are available.

Non-Landscape Recommendations

- **Educate your clients**. Promote pollinator best practices by speaking with clients about the benefits of following the above garden practices and reducing landscape lighting.
- **Ask your plant sources for pesticide-free native plants**. Requesting native plants grown without pesticides, especially neonicotinoids, will help growers and nurseries see that there is a growing need for these plants.
- **Ask your plant sources for your ideal pollinator-friendly plant list**, even if you know they don't carry them. Let the suppliers know there is a demand for those species.

For a simplified checklist of the recommendations in this section, see Appendix E.

Ask your clients if they would like you to install signs. It can help ease fears of properties looking unkempt if the neighbors know there is a reason behind these practices.

Photograph by: Chris Rycroft, Pathway in Prospect Hill Park, Flickr

Section 9

PUBLIC SPACE AND POLICY RECOMMENDATIONS

Key Ideas:

Actions for Public Land Management:

In Somerville, the City manages 52% of public land and the State manages 48%.

- Somerville has many progressive initiatives that are already making progress including: the Native Plant Ordinance, Climate Forward, Urban Forest Management Plan, form-based Zoning Ordinance, and the Tree Protection Ordinance.
- Continued collaboration between City departments and with State partners will be key to ongoing success of this work.
- The City should continue to prioritize planting native species and begin to consider the additional best practices outline in this report when creating habitat.
- Signage and education are key.
- The Mayor should consider signing the Bee City USA pledge.

Public Space and Policy Recommendations

Collaboration Across City Departments and Public Agencies

As of 2024, there are 174.3 acres of open space in Somerville (6.6% of the total land area). Of that, the City owns and manages 63.6 acres or 36.5% while the State of Massachusetts (including DCR, MassDOT/MBTA) owns 86.4 acres or 49.5%. The remaining portion is owned by private entities. Managing public lands is complex, but it becomes even more so when many public entities are involved. It requires local and state resources, specialized knowledge, and the understanding that complex considerations and liabilities are a factor. The public open space managed by the City of Somerville and the State of Massachusetts presents its own unique set of challenges. While acknowledging this, public entities should work together to implement the recommendations of this section on all public lands wherever appropriate and possible.

In reviewing existing Somerville City Ordinances, policies and guides, it is clear that much thought has been given to ecological and environmental goals and aspirations. More than most municipalities, Somerville has a number of environmentally forward initiatives: form-based zoning, a Green Score requirement, a Tree Preservation Ordinance, Native Species Ordinance, Dark Sky compliant lighting guidelines, and a guide for its Privately Owned Public Spaces. A number of measures in these

Pollinator meadow test plots at DCR's Blessing of the Bay Park, Somerville.

documents already support the creation of pollinator habitat and it would be great to see these replicated in other cities.

Shared Vision – Planning Documents

Somerville has made an active effort in recent years to carefully consider and plan for the City's future in the face of rapid social and environmental change. The goals of the following planning documents overlap with the goals of this Plan. As future implementation of these plans takes place, the City should review the proposals below to ensure social, environmental, and pollinator benefits are collectively addressed. Applicable zoning ordinance policies are reviewed later in this section.

Climate Forward

Climate Forward is Somerville's plan to create a strong, healthy community in the face of climate change while simultaneously reducing climate pollution, also referred to as greenhouse gas (GHG) emissions, and dependence on fossil fuels. The climate action plan takes a detailed look at GHG emissions from the community, local government, and school operations. The Plan identifies key overlapping goals with other City plans, including the Somerville Pollinator Action Plan. Climate Forward and the SPAP both identify an opportunity to consider the long-term ecological and social benefits of providing permeable, planted space and trees throughout the city. However, the embodied energy and emissions associated with conventional landscape management practices are not explicitly listed as a factor in Climate Forward. **According to the EPA, up to 5% of emissions in the US are likely due to gas-powered mowers which can produce more emissions running for an hour than an average vehicle will on a 500-mile road trip** (Osborne, 2018). A shift in City and community practices away from fossil fuel-based management (mowing, string trimming, leaf blowing, etc.) and towards a reduction in overall maintenance (reduce mowing, leave the leaves where appropriate, increase natural plantings) can help us achieve the goals and objectives outlined in Climate Forward.

Keep Cool Somerville Strategy Toolkit

The Keep Cool Somerville Strategy Toolkit, prepared by the Metropolitan Area Planning Council in 2021, reviews strategies Somerville can take to help cool buildings, neighborhoods, and communities in the face of rapid global environmental change. The following strategies for cooling can easily overlap with the best practices for pollinators by utilizing plant species with pollinator benefits (as outlined in this report) to provide social and ecological benefits:

- Develop cooling design standards and guidelines for parks and other civic spaces.
- Develop a connected network of cool corridors.
- Include cooling green infrastructure in routine streetscape upgrades.
- Expand, preserve, and maintain the urban tree canopy.

As these strategies are implemented, the City should consult this report to ensure both the longterm needs of residents and pollinators are met.

Urban Forest Management Plan

In 2021, the City published the Urban Forest Management Plan (UFMP), providing an analysis of the current urban canopy and visions for increased environmental and social benefits to support urban wildlife and combat the impacts of climate change (described in the Climate Forward and Climate Risk Assessment reports). The Plan outlines goals of increasing canopy and native plant species that overlap with this Plan and Climate Forward. The Comprehensive Plant List and recommended tree species in the SPAP can be used as a supplement to the findings of the Urban Forest Management Plan.

Create More Habitat

To promote pollinator foraging and nesting habitat, the City should continue to prioritize the use of native plant species in all parks and open spaces. In support of its 2021 Native Species Ordinance, this Plan provides a more nuanced tool to guide pollinator plantings in public spaces throughout the city. It should be used by planners and designers to create public spaces that support pollinators throughout their life cycle. In the long term, it would be ambitious but ideal to include and care for pollinator habitat in every feasible public park to build a robust habitat network. As seen in **Figure 35**, the following framework is recommended for prioritizing pollinator habitat in public spaces:

1. **Identify opportunities for planting in existing parks**. These interventions can prioritize plants with high pollinator value in existing planting beds and can be done over many years as funds become available. Pollinator plantings can also be mapped to understand their contributions to creating patches and corridors.

2. **Prioritize the creation of habitat in Wards One and Two.** These wards were observed to have the lowest number of pollinator species recorded in the city (which is potentially due to a lack of recorded observations in the area). They are also predominantly Environmental Justice Communities, identified as areas that would benefit from additional green space, high vulnerability to heat and flooding, less available permeable space, and the lowest current canopy cover. Therefore, the pollinator planting interventions would address numerous City goals in these areas. Due to the high levels of artificial light observed in these wards, new habitat should follow best practices for creating dark pockets for nocturnal pollinators.

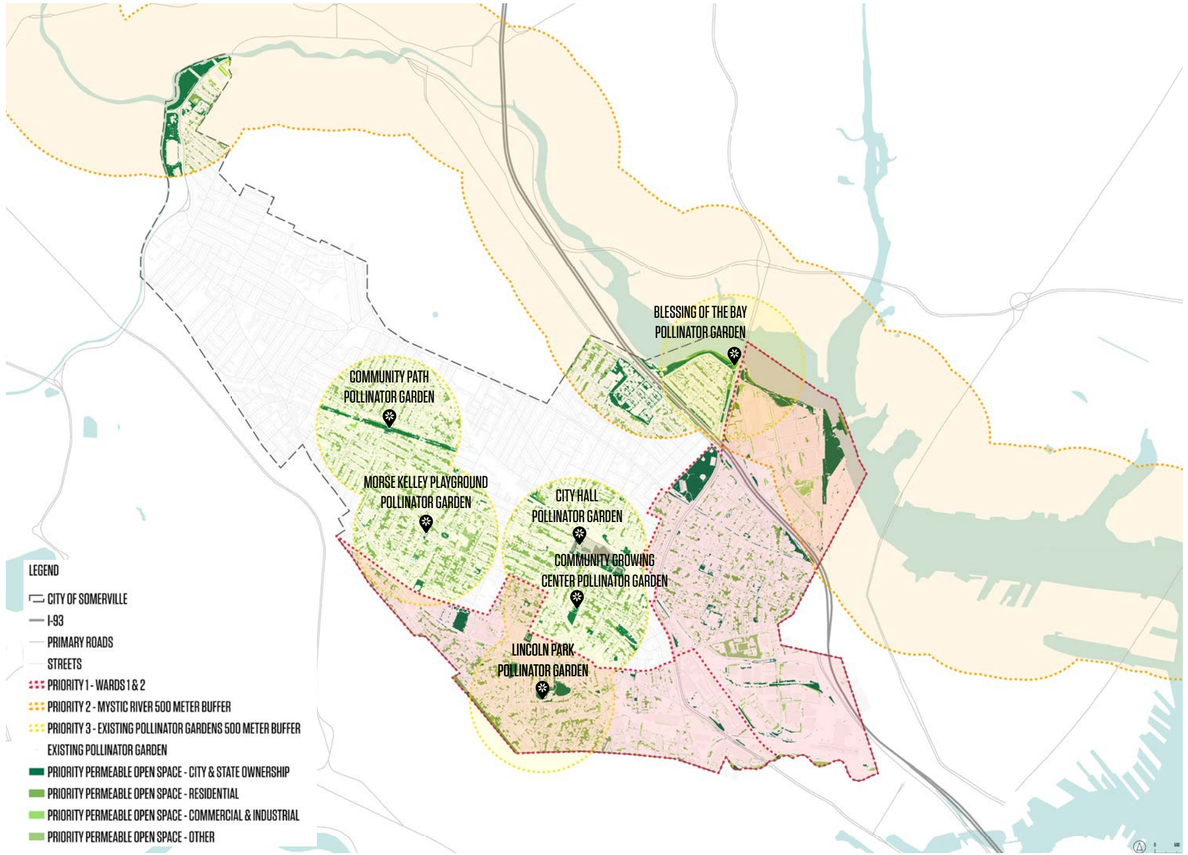


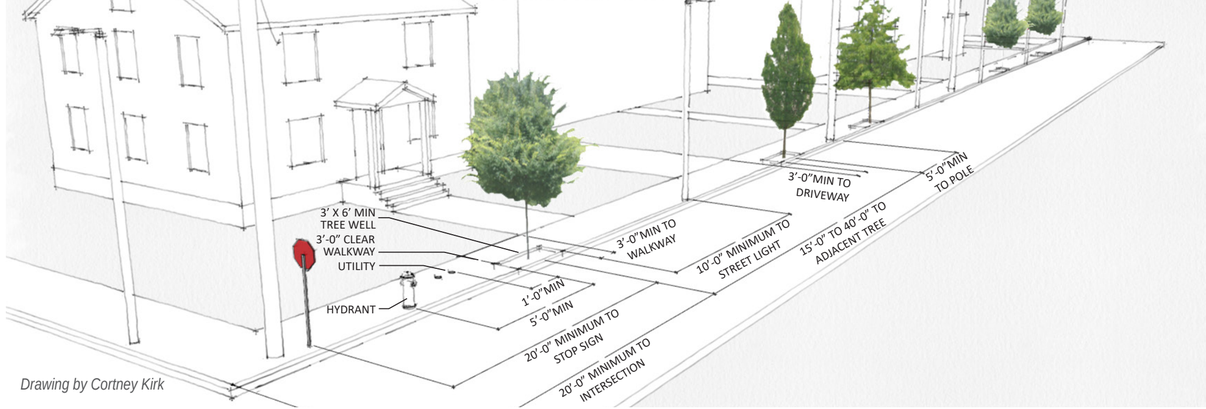
Figure 35: Prioritized areas for potential pollinator habitat in Somerville, MA.

Photo Source: Nigel Dunnett, Grey to Green

3. **Create habitat in areas near water bodies.** Increasing pollinator plantings in areas located along (or within 500 meters of) the Mystic River links pollinators to an extensive open space resource that has various types of existing habitat already in place (wooded riparian edge and meadows). Since this land is predominantly owned by DCR, the City should continue to partner with them to assure this vital riparian zone provides an abundance of habitat. Riparian zones are already required to be planted with 100% native species which is a huge first step towards this goal.

4. Recognizing how scarce land is in Somerville, the City should **identify opportunities for creating habitat in areas within 500 meters (1,640 feet) of an existing habitat area** (as identified in SPAP research or ongoing monitoring), research ownership and identify funding opportunities for the design, implementation, and maintenance of pollinator gardens in these areas. **Ideally, these gardens will be 30 square feet (sq ft) or greater** to be able to support a minimum of 3 sq ft for each plant species and provide species that bloom in each season (spring, summer, and fall - 3 ft x 3 ft x 3 ft = approximately 30 sq ft) using the best practices outlined in this section for foraging, nesting, and overwintering habitat. However, where this amount of space is not available, new habitat installation or amending existing plantings to include native habitat of any size is still beneficial and should be considered.

Over time, by following this framework, a network of pollinator habitats could be developed throughout Somerville. Any pollinator habitats in City-owned parcels should double as demonstration gardens and include signage explaining the planting and management strategy. They should follow best practices to create biodiverse pollinator gardens. These gardens can also be target areas for future species monitoring. As the City and community create new habitat, this prioritization analysis should be revisited and revised to meet the updated needs of pollinators in the area.



Drawing by Cortney Kirk

Figure 36: Urban street tree placement and species selection includes a complex analysis of site conditions including the site constraints shown above.

Consider Public Tree Opportunities

Public space and street trees pose a critical opportunity for the city to provide valuable pollinator resources. The following considerations should be added to the complex set of requirements for selecting street trees and public realm trees.

Selecting the appropriate tree to use at each individual site through the city is an incredibly complex task (see **Figure 36**). Taking these factors into consideration, the City plants native trees wherever appropriate (see the section on Native Planting Ordinance below for more information). Wherever appropriate site conditions exist, they should prioritize using trees listed in **Table 16** that are observed to have pollinator value in Somerville, especially those with spring blooms, to provide floral resources for early-season pollinators.

Throughout the city, consider the additional species listed in **Table 17** that are known to have pollinator benefits but have not yet been observed with pollinator interactions in Somerville.

If room and site conditions allow, create a soft landing below the tree (i.e., leaving the leaves below the canopy of both new and existing trees as described in Section 6). This practice is especially beneficial for the trees identified as top keystone species for butterfly and moth caterpillars in Somerville's ecoregion:

a. *Acer rubrum*, red maple
b. *Acer saccharum*, sugar maple
c. *Populus tremuloides*, quaking aspen
d. *Prunus americana*, American plum
e. *Prunus serotina*, black cherry
f. *Prunus virginiana*, chokecherry
g. *Quercus alba*, white oak
h. *Quercus rubra*, red oak
i. *Salix nigra*, black willow

(from Homegrown National Park, Dr. Douglas Tallamy)

Table 16: Recommended Trees with observed pollinator value

Scientific Name	Common Name
Acer rubrum	red maple
Acer saccharum	sugar maple
Amelanchier arborea	downy serviceberry
Amelanchier canadensis	Canada serviceberry
Amelanchier laevis	Alleghany serviceberry
Amelanchier laevis 'spring flurry'	spring flurry serviceberry
Benthamidia (Cornus) florida	flowering dogwood
Castanea pumila	chinquapin/dwarf chestnut
Cercis canadensis	eastern redbud
Crataegus spp.	hawthorn
Ilex opaca	holly
Liriodendron tulipifera	tulip poplar
Malus spp.	Crabapple
Prunus americana	wild plum/American plum
Prunus pensylvanica	fire cherry / pin cherry
Prunus serotina	black cherry
Prunus virginiana	choke cherry
Quercus alba	white oak
Quercus bicolor	swamp white oak
Quercus coccinea	scarlet oak
Quercus palustris	pin oak
Quercus rubra	red oak
Salix nigra	black willow
Sassafras albidum	sassafrass
Tilia americana	basswood/linden

Table 17: Additional Recommended Tree Species

Scientific Name	Common Name
Betula alleghaniensis	yellow birch
Betula lenta	sweet birch/cherry birch
Betula nigra	black birch
Betula papyrifera	paper birch
Betula populifolia	gray birch
Carpinus caroliniana	hornbeam
Carya cordiformis	bitternut hickory
Carya glabra	pignut hickory
Carya ovata	shagbark hickory
Carya tomentosa	mockernut hickory
Catalpa speciosa	northern catalpa
Celtis occidentalis	hackberry
Magnolia virginiana	sweet bay magnolia
Ostrya virginiana	hop hornbeam
Pinus rigida	pitch pine
Pinus strobus	eastern white pine
Populus deltoides	eastern cottonwood
Populus spp.	aspens
Populus tremuloides	quaking aspen
Quercus velutina	black oak
Ulmus americana	American elm

The top species recommended by Homegrown National Park for this region is *Acer rubrum* or red maple. However, according to the UFMP, red maple comprised 10% of Somerville's public trees at the time of the inventory (over 1,300 trees), so the use of other species is encouraged to establish diversity throughout the city. Where these and other keystone species exist already, the City should consider if there is potential to provide a soft landing if space, safety, and site programming conditions allow.

A note on boxelder (native to Somerville but often viewed as an undesirable invader, i.e., weedy) and black locust (native to the southeastern US but considered invasive by MIPAG): these species are not recommended for planting in Somerville. However, where they do occur it is worth noting that they do have pollinator benefit. Boxelder (*Acer negundo*) is considered a keystone species by the work of Dr. Tallamy and black locust (*Robinia pseudoacacia*) is a larval host plant. These species should be reviewed on an individual basis to determine if it is beneficial for them to remain where possible.

Refer to the SPAP Comprehensive Plant List for additional beneficial tree species, including additional keystone species.

Create Educational Opportunities

City-installed and managed habitats have a unique opportunity to provide information to the public about pollinators and urban ecology. A series of signs are included in Appendix F and can be used as a starting point for developing educational signage that explains why the plants and management practices are shifting in Somerville.

Update Public Landscape Management Practices

There are a number of considerations and user needs that the City must consider for management of its landscapes. For example, leaving leaves or piles of leaves could be unsafe because someone could slip on wet/frozen leaves and fall. Areas of the city must remain lit because of safety concerns. Athletic fields need to be mown. City departments such as Public Works (DPW), Public Space and Urban Forestry (PSUF), and Engineering should work collaboratively to identify and prioritize where these recommended management practices are appropriate and actionable. These updates should be worked into a revised set of citywide Standard Operating Procedures and specifications for soils, planting, seeding, and ongoing maintenance.

For a graphic summary of the management recommendations, refer to Appendix E. It is recommended that the management sheet be printed and laminated as a reference for relevant City staff including DPW and shared with all subcontractors.

Municipal Policy and Planning Recommendations

Zoning Development Standards and Ordinances

The Somerville Zoning Ordinance that was passed in 2019 lays the groundwork for an urban area that is ready to support pollinators. Many policies (including some added in the years since the initial adoption) provide an excellent starting point for the goals of this Plan. Future ordinances that consider planting or lighting of open spaces should refer to the recommendations in this document to further refine and home in on practices that support pollinators. The following existing policies have been reviewed for their compliance with best practices, and recommendations for potential adjustments have been proposed where relevant.

Native Planting Ordinance

In 2021, the City Council amended the Code of Ordinances to include an ordinance that applies to all plantings by the City. This ordinance supports the pollinator best practices for native planting by encouraging the use of straight species sourced from nurseries that do not use neonicotinoids (requirement beginning January 1, 2026) and requiring the following minimum native plant percentages for all new City plantings:

- 100% native planting in:
    - Riparian areas
    - The community path
- 50-100% native planting* in:
    - Bioswales
    - Plazas
    - Streetscapes (50% min. with goal to increase over time)
    - Other City-owned property
        * 100% preferred. Up to 50% non-native plant species only as necessary to meet difficult site conditions or use requirements.
- 75% minimum annual native planting in:
    - City parks
- No minimum requirement:
    - Community gardens (native encouraged where feasible)
    - Volunteer-planted flower bulb plantings
    - Lawns
    - Athletic fields
    - Holiday, seasonal, and annual decorative plantings
    - Extensive green roofs (native encouraged where feasible)

In addition to these requirements, which have been met every year since the ordinance was passed, the City should strive to achieve:

- 33% of native plants that typically bloom in spring (before June 15th), with most of these being trees and shrubs.
- 33% of native plants that typically bloom in the summer between June 15th and August 1st.
- 33% of native plants that typically bloom after August 1st.

Overgrowth - Ordinance No. 2011-03.

An amendment to Section 9-56: Vegetation and wood on private property made in 2011 includes several provisions that are potentially detrimental to the proposed landscape management adjustments made in this Plan. The ordinance states that properties adjacent to public right of way or sidewalks cannot leave "any overgrowth of grass, shrubs, and weeds growing in or around such sidewalk or public right of way." Additionally, it states that:

(c) No person in control of property shall store, place, or permit to be stored or placed any wood out of doors in a manner which may reasonably provide rodents or other animals with harboring places.

(d) No person in control of any property shall allow to remain any decayed, dead, or hazardous trees or tree limbs potentially injurious to the public health and safety or property.

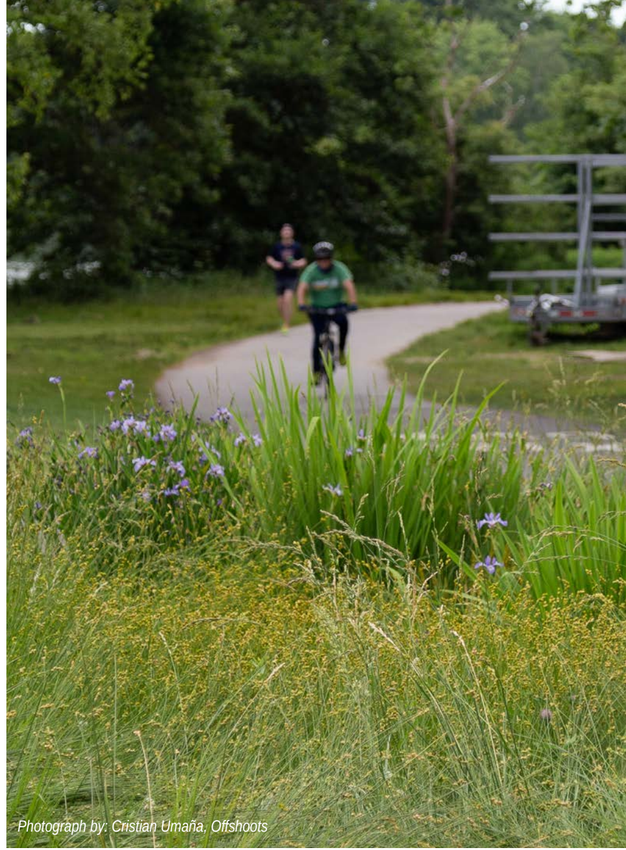
While these items may limit some of the best practices outlined in this Plan, they are intended as a preventative measure to limit neglect of absent property owners, including harboring rodents and creating obstacles on sidewalks. It is vital that the right of way remains clear and accessible to provide safe circulation for all Somerville residents.

In an effort to better support the goals of this Plan, the language of this ordinance could be adjusted to allow woody debris and unmanaged landscapes at a specific setback from public sidewalks and rights-of-way. A mown lawn or groundcover verge could be established as a standard requirement to allow a transition between pollinator habitat and public spaces. However, adjustment will require careful consideration of the many factors at play in a dense urban environment with very small front yards.

In the meantime, working closely with staff in the Inspectional Services Department (ISD) to clarify what they are looking for when they are enforcing this ordinance is a short-term and actionable objective. Through collaboration between Somerville's PSUF division and ISD, some minor adjustments may present themselves and can inform further action on the overgrowth ordinance.

Zoning Ordinance - 10.3 Landscaping

The landscape requirements outlined in Section 10.3 do not include habitat or sustainability goals. However, required Green Score calculations (10.4) do encourage the use of native plants and all plans are reviewed by PSUF. There is an opportunity to revise the purpose statement language



Native plantings in a green infrastructure system along the Charles River Greenway in Brighton, MA.

Prioritizing native plants doesn't have to stop at the ground floor as seen here at the Schuylkill Center for Environmental Education where flowering native plants were blended among ornamental plants to increase the plant diversity and wildlife value of this vegetated roof deck in Philadelphia, PA.

to include supporting habitat and adjusting landscape maintenance practices to reflect pollinator best practices where appropriate. Similar to the recommendation for Ordinance No. 2011-03, include leeway for pollinator habitat that is unmown and allowing dead wood to remain, as well as allowing or encouraging some bare ground for pollinator nesting habitat.

Zoning Ordinance – 10.3.8 Vegetated Roofs

The Vegetated Roofs development standards (10.3.8) require green roofs on 80% of the roof coverage for major renovations and new buildings with flat roofs in the "Mid-Rise, High-Rise, Assembly Square Mixed-Use, or Commercial zoning districts, except development subject to the Affordable Housing overlay district."

Vegetated roofs typically have difficult growing conditions. Structural requirements often dictate the use of shallow, lightweight soil which does not maintain adequate soil moisture for some plants. They can also be harsh and windy environments, especially in winter. Due to these conditions, many vegetated roofs require plants that can thrive in exposed, dry conditions with shallow soil. However, the Green Score bonus options can be edited to incentivize using native plants if a pollinator-friendly maintenance plan is in place and as site conditions allow (for example, extensive roofs on a shed, bus shelter, or low building story may be difficult to vegetate with native plants due to slim soil profile/dry soils). Vegetated roofs with a shallow soil profile may not provide beneficial ground nesting habitat for pollinators but can provide foraging habitat with the correct plant species diversity (Dusza et al., 2020). To provide foraging resources, native plants should be selected that provide diverse bloom times and can handle the unique site conditions on a case-by-case basis. If maintenance best practices are followed there is also potential for overwintering/nesting habitat in above-ground pithy stems. More research is needed to understand the benefit of green roofs for pollinators but prioritizing native plants that are suitable to the site conditions is a good first step.

Zoning Ordinance - 10.4 Green Score

The Green Score is intended to promote sustainable landscapes in Somerville and includes credits that support pollinator best practices. In addition to including a multiplier for native planting, it is recommended to amplify the benefits by promoting diverse seasonal bloom times. The City can add bonus credits or amend the minimum standards for the existing native plant credit to promote pollinator-friendly plantings. It could do so by including native plants that meet the criteria for the following bloom times:

- 33% of native plants that typically bloom in spring (before June 15th), with most of these being trees and shrubs.
- 33% of native plants that typically bloom in the summer between June 15th and August 1st.
- 33% of native plants that typically bloom after August 1st.

Additionally, the City should consider adding species to their list of high value trees based on the findings of this report. A list of high value non-tree species can be developed using the SPAP Comprehensive Plant List as a starting point.

Zoning Ordinance - 10.7 Outdoor Lighting

The existing outdoor lighting standards are in alignment with the proposed best practices for pollinators in this Plan. These standards follow dark sky guidance to include full cutoff or fully shielded fixtures, warm color temperature (3000 kelvin or less), and use of vacancy sensors and timers. However, the standards do not apply to "lighting within rights-of-way or easements for the principal purpose of illuminating streets, alleys, mid-block passages, or civic spaces" for safety reasons (Somerville Zoning Ordinance, 452). Civic spaces should seek to reduce light use wherever possible, following the best practices outlined in the Somerville Zoning Ordinance and this document, especially in areas where habitat is identified as a priority and safety concerns are not an issue.

It is recommended that Somerville consider adopting a Dark Sky Ordinance and/or a "lights out policy" to further benefit pollinators. These policies have been enacted in other US cities and can be tailored to Somerville's needs to ensure balance between public safety and the ecological benefits of reduced lighting.

Zoning Ordinance – 13.1 Public Realm - Civic Spaces

Standard Civic Space guidelines (13.1.2) present multiple opportunities to revise typical landscape practices to create more pollinator-friendly spaces.

Currently across all civic spaces, large trees are to be located within at-grade planted beds with mulch cover (except within an 8" ring at the base of woody plants). These areas offer an opportunity for 'soft landings' (refer to Section 6: General Recommendations/Best Practices) and patches of bare ground to promote pollinator nesting habitat. If the Native Planting Ordinance was also revised to encourage native plant strategies below trees and allow patches of bare ground where appropriate, civic spaces could provide improved habitat opportunities.

Areas with passive lawn spaces are good candidates for updating the species composition to be a polyculture lawn mix. Combined with altered mowing timelines (low-/no-mow May, and every two weeks through the summer), lawn spaces could provide an additional pollinator-foraging resource throughout the city.

Civic spaces are excluded from the lighting standards described in 10.6 Outdoor Lighting. While the civic space standards suggest "the indiscriminate use of bright lighting should be limited," there is potential to provide additional information and encourage dark areas around habitat zones where appropriate for public safety. This should be done with careful consideration of the International Dark Sky Association's guidance and best practices for safe public space design.

These spaces are required to have appropriate signage at entrances. It is recommended that supplemental pollinator signage be added to clarify habitat areas, which can be added to park signage standards without needing to amend the Zoning Ordinance. This will enable maintenance staff to easily identify habitat areas, ensure best practices are used, and provide a "cue to care" for the public.

13.1.3 Parks

Parks adhere to the civic space regulation standards and must follow additional guidelines centered around creating spaces for passive and active recreation. Within each park typology (Regional, Community, Neighborhood, and Pocket) there is a set minimum landscape area required to be planted with trees and shrubs as well as a minimum number of trees necessary per sq ft. Per the Native Planting Ordinance, these plantings are required to be 75% native.

Future renovations and new park designs should consider following the best practices outlined in this document to improve the quality of any potential habitat created. Creating soft landings below trees, providing a range of bloom times, and creating dark zones within plant beds are all well-suited practices for these larger public landscape spaces. These recommendations could be incorporated into the Design Guidelines for all parks.

13.1.4 Commons (Commons, Squares, and Greens)

Commons are spaces for gatherings and recreation. Open lawn areas in these zones that are used for passive recreation, gathering space, and even non-formal active recreation could all be candidates for low-mow polyculture lawn conversion and should be considered on a site-by-site basis for suitability. These recommendations could be incorporated into the Design Guidelines for all commons.

13.1.6 Civic Uses – Passive Space, Botanical Gardens

Pollinator gardens do not currently fall within the civic use categories outlined in this section. However, they could fit into the Passive Space category in addition to the Botanical Garden use. Passive paces are permitted in all civic space types but Botanical Gardens, defined as spaces

Native plantings in a large constructed gravel wetland at Longfellow Bridge in Boston, MA.

"designed specifically for the cultivation of specimen plants for scientific research, conservation, education, and public display," require a special permit. It is recommended that pollinator gardens be defined in the Zoning Ordinance and recognized as a Civic Use category in Somerville.

Zoning Ordinance – 13.2 Public Realm - Thoroughfares

Tree plantings included in thoroughfares do not always have enough room for groundcover planting or to create a soft landing. However, low-growing native plantings should be considered to create additional habitat benefits and leaves should be allowed to remain in the tree bed over winter, especially for keystone species street trees. The required 18" tree guard surrounding tree wells in new thoroughfares will help protect the pollinator benefits of the planting bed. If updated to include these elements, the Ordinance would need to define when this was appropriate (i.e., to avoid blocking travel sightlines). City trees on thoroughfares could provide an enhanced resource for butterfly and moth lifecycles in the city.

City Pledge Opportunities

In addition to the work the City is doing with this Pollinator Action Plan, there are opportunities to join cities around the world in pledging to protect pollinators. Mayor Ballantyne has already signed a pledge organized by the National Wildlife Federation. The pledge provides a list of Action Items that overlap with the recommendations of this Plan. It is recommended that Somerville consider signing the Bee City USA pledge organized through the Xerces Society in support of native bees to further solidify support for the wide range of pollinators observed throughout the city.

Section 10

RECOMMENDATIONS FOR LEARNING

Photograph by: Dr. Nicholas Dorian

Key Ideas:

Install demonstration gardens at academic institutions, libraries, places of worship, etc.

- Follow the best practices outlined in Section 6.
- Include signage.
- Plan educational opportunities and events.

Provide educational resources where people are.

- Share book list and this Plan with local libraries.
- Integrate curriculum about pollinators at schools.

Engage students of all ages in this work!

- Learning abut pollinators.
- Advocating for pollinators.
- Designing, installing, and maintaining habitats.
- Monitoring species.

Recommendations for Learning

In addition to following the best practices listed in Section 6, educators and those who manage educational landscapes should also consider the following opportunities:

Somerville Public Libraries

The public libraries are a common ground for a diverse array of Somerville residents. They have a unique opportunity to promote this Plan and educate the community on the importance of pollinators. Creating an annual display of pollinator resources for all ages would be an excellent supplement to providing printed copies of this report for residents to review (if you just checked this out of the library, this recommendation has been a success!). In addition to this Plan, the suggested reading lists below and in Section 6 could be put on display to provide additional resources for any residents interested in learning more about pollinators and gardening.

There is also an opportunity to provide on-site pollinator garden education through signage, events, and workshops at library gardens. The Central Library is home to a garden run by the Somerville Garden Club which presents an incredible opportunity to trial this idea. These spaces can showcase urban pollinators and demonstrate habitat needs to a large and diverse audience of all ages.

Pollinator habitat on Tufts campus.

College Campuses

Tufts University was the first campus in Massachusetts to sign the Bee Campus pledge through the Xerces Society, showing their dedication to protecting pollinators. The Tufts Pollinator Initiative (TPI), founded by SPAP project team member Dr. Nicholas Dorian during his time at Tufts, is an active participant in pollinator research and advocacy in Medford and Somerville. Tufts can continue to play an important role in supporting pollinators in the city through species monitoring, research, educational outreach, planting more habitat and modifying ongoing landscape management practices, and continued educational outreach and engagement through TPI. Additionally, they maintain a website full of excellent resources rooted in local knowledge, many of which were used to supplement this report.

K-12 Schools

Somerville schools should continue efforts to add pollinator habitat and stive for providing one as a living laboratory at each school. Ample opportunities exist to incorporate Science, Technology, Engineering, Art, and Math (STEAM) learning into the design, construction, maintenance, and monitoring of these spaces for students of every age. Maintenance and long-term care rise to the top of the reasons gardens may fail in academic settings and it will be fundamental to the success of any school garden initiatives to have ongoing support from the community. Continued partnership with local organizations, like the Green Team from Groundwork Somerville, will likely be necessary to support this mission. Additionally, the school district should consider collaborating with a local expert or non-profit organization working with pollinators to develop a Somerville Pollinator curriculum.

On school campuses and off, there is an opportunity for students to engage in this work through species monitoring. Age-appropriate training on how to use the iNaturalist app could be a great way to spark interest and get older students involved. See Section 13 for more information on proposed ongoing monitoring efforts.

For Teachers and Educators

The following resources are currently available to help teachers in Somerville help get the next generation of residents informed and excited about helping pollinators in their city.

Five Hundred Yard Field Trip Curriculum

Pollinator Partnership Curriculum

Educators are also invited to use the "Meet Your Neighbors" videos created by Dr. Nicholas Dorian to introduce some local pollinators to kids of all ages. They are available for use on the SPAP SomerVoice page.

For The Next Generation

Somerville's youth can participate in helping pollinators and learn to love our local ecology. By getting to know these important species, their role in ecological systems, and their habitat needs, the next generation can begin to embrace a view of the urban environment that includes their pollinator neighbors. The following resources offer a starting point for fun and engaging ways to include kids in the conversation.

Activities:

Maryland Department of Natural Resources Pollinator Activities

Xerces Society Education Resources

Books about Native Bees/Butterflies:

Begin with a Bee by Liza Ketchum, Jacqueline Briggs Martin, and Phyllis Root

The Bumblebee Queen by April Pulley Sayre

Butterflies are Pretty Gross! by Rosemary Mosco

Senorita Mariposa by Ben Gundersheimer

Videos:

Our Hungry Planet: Why Protect Pollinators, PBS Kids

Wild Kratts: Pollinators, PBS Kids

If the kids you know are ready for more, refer to the suggested reading, listening, and watching list in Section 6 for more options!

Photo Source: Tufts Pollinator Initiative

The Tufts Pollinator Initiative has been doing research in Medford and Somerville and provides resources on their website.

Section 11

POLLINATOR PANTRY

Key Ideas:

Use the Pollinator Pantry to find plants that benefit local pollinators. In this resource you will find:

Plant Lists for Regional Pollinators

- Top plants for foraging
- Larval host plants for moths
- Larval host plants for butterflies
- Plant lists for specific "mascot" pollinators
- Local ecological plant communities

A Comprehenisve Plant Database

- A list of 380 plant species to use in your habitat design.
- This list is specific to the pollinators found in this region.

Recipe Cards - Pre-Planned Garden Designs

- Sun/shade options
- Range of sizes
- Designed to benefit pollinators
- Include plants that will thrive in urban conditions
- Composed plant lists and layouts for a beautiful garden

Pollinator Pantry

This section provides a toolbox of planting intervention resources that anyone can use to make changes in the landscape to support pollinators. It includes:

Plant Lists

Top Plants for Foraging Habitat

These are the top Somerville-specific trees, shrubs, and perennials that can be used to bring pollinators to your landscape. Data collected in Somerville found these native plants to have the most documented pollinator interactions. Swap out your existing plants with plants on these lists that will better support pollinators. Using native plants can help reduce maintenance costs and time for gardeners as well since they are well-adapted to urban conditions. A win-win for gardeners and pollinators.

Larval Host Plants

These lists include the recommended native host plants for butterflies and moths observed in this region. Including these plants in your habitat is highly recommended to provide the foundation for supporting Lepidoptera (butterflies and months). Refer to the SPAP Comprehensive Plant List for regional keystone species (scroll to the "Keystone Genera" column and select "X" to see only keystone species).

Plant Lists by Pollinator - Mascot & At-Risk Species

The Plan has identified six mascot pollinator insect species in a "Meet Your (Insect) Neighbors" campaign. The Pollinator Pantry provides specific plant lists to best support each of these pollinating insects. The insect species chosen are vibrantly colored, docile, and easy to identify. This means that everyone can be a citizen scientist and discover how many monarchs, bumble bees, great black digger wasps, flower flies, and long-horned beetles visit their gardens. The data that residents collect can illustrate progress towards supporting pollinators in the future.

Native plants and pollinators have evolved together. This symbiotic relationship has ensured that pollinators can find and access necessary host plants, pollen, and nectar resources (if native plants are available). These plants in turn benefit from pollination. Providing the specific native plants needed by specialist pollinators is essential for maintaining these vital plant-animal interactions. This section incorporates these particular native plants, with blooms throughout multiple seasons, as well as host plants that provide food and shelter for larvae. Each of these plant lists supports the Plan's mascot species and five to six additional 'pollinator partner' insects that will also benefit from these plantings.

The data from this study shows that *Asclepias* are an important larval host and floral resource for pollinators. Swamp milkweed (*Asclepias syriaca*) shown.

Goldenrod (*Solidago*) was consistently at the top of the list for most-visited flowers in the Somerville data. Refer to the Comprehensive Plant List for recommended species native to the northeast.

Plant Lists by Plant Type

Additional plants by plant type are included as a quick start guide for anyone interested in adding annuals, spring ephemerals or vines to their garden.

Annuals

Annuals are commonly used for a pop of color in the landscape, but many of the popular and widely available plants do not provide rich resources for pollinators. Whenever possible, select from the list of native annuals ideal for seeding into the landscape. In areas where traditional annuals are regularly used, consider swapping in plants from the non-native list that offer more benefits to pollinators than other common non-native species. Alternatively, as site conditions and budget allow, consider using native perennials as they will provide pollinator benefit year after year.

Spring Ephemerals

Add spring ephemerals (plants that emerge briefly in the spring and then recede) to the garden to provide important early-season resources for pollinators. This list of native ephemeral species can also be supplemented by early-blooming trees and shrubs to provide additional benefit for hungry pollinators emerging in the spring. Layer with late-blooming species for year-round flowers.

Vines

Native vines provide valuable resources for pollinators and should be selected over non-native vines. The species on this list can create screening along a fence, form a whimsical arbor, or serve as groundcover. Before selecting a vine, double-check site constraints to ensure you have chosen the right plant for your space, as many vines can become large and sprawling over time.

Local Ecological Plant Communities

Using locally observed natural plant communities as a guide, these lists provide a starting point for anyone interested in building habitat based on known existing plant communities. These plants have co-evolved and are often found growing together in natural areas in and around Somerville. The lists are not rooted in pollinator observations found in the SPAP data section. Instead, they provide a foundation of native plants to support a broad range of ecosystem services that knit together. This grouping can be replicated across Somerville to create a citywide networked ecosystem.

Fells in the City

Interested in using a nearby native plant community as your guide? These lists are common plant communities found in the Middlesex Fells and can be a great jumping off point for developing your own ecological garden. Make sure to follow the best practices outlined in the report and reference the Comprehensive Plant List for site suitability when selecting for your specific garden location.

Somerville Rewind

What natural plant community might have been here if Somerville hadn't been developed? Local remnants of undisturbed natural plant communities can act as a guide for how to "rewild" Somerville and provide habitat for wildlife, including pollinators. Use this list of plants (with the majority under three feet tall) as a base matrix of local plants to provide broad ecosystem support in the city. This baseline species mix can be used to create unmown native grass areas that are easily adaptable in Somerville and repeat throughout the city. Additional flowering plants can be added to this list to enhance pollen, nectar, and host plant resources.

Comprehensive Plant List

For experienced gardeners and landscape designers who would like to develop their own designs, a comprehensive list of all the plant species found supporting native pollinators in Somerville is provided. A searchable Excel database of the plants includes aesthetic characteristics and preferred growing conditions and specifically identifies which pollinators each plant supports.

Choosing plants known to thrive-in and support the local ecosystem is crucial to creating successful pollinator gardens that maximize aesthetics, biodiversity, and support critical species. The Comprehensive Plant List, which predominantly features east coast native plants suited to local pollinators, is an excellent resource for developing a planting plan with species that have documented benefits and interactions with native pollinators. Developed with local scientists and horticulturalists, this plant list can be navigated based on growing conditions and personal preference. The variety of options ensures that all Somerville residents can contribute to the city's ecosystem according to their design preferences and site needs.

To download the Comprehensive Plant List visit the SPAP SomerVoice page.

Pollinator Planting Recipe Cards

The following recipe cards include 32 pre-planned designs for native plant gardens that can be installed to support pollinators. These gardens start small with "Pollinator Pots" (for patios and porches) and move up to larger installations (including trees and shrubs) for entire backyard conversions. They are arranged by color, solar exposure (amount of sun), soil condition (dry or wet), and consider what plants will grow well together as a well-knit plant community in Somerville's specific urban conditions. Plant choices take into account a range of challenges including rabbits, salt, poor soil quality, compaction, etc. Recommendations for converting lawns to better support pollinators are also provided, using both seed and live plants.

The recipe cards were created using the following methodology:

- The top plants for foraging habitat include native flowering trees, shrubs, and perennials with the greatest number of known pollinator interactions identified by the SPAP data analysis.
- Plants with similar flower and foliage colors were grouped together, and then separated into cards where plants thrive in the same cultivation conditions. For example, yellow plants that prefer sunny dry conditions were grouped together, white plants that prefer shady moist conditions were grouped together. Straight species of these plants were prioritized.
- A matrix of supporting larvae host plants was then added to each of the cards.
- At least one cool season graminoid (grassy species) and one warm season graminoid were added to each card.
- Additional layers of flowering native plants were then added to ensure that something is always blooming in the garden from early spring, through summer, and into the fall. Native straight species plants were prioritized.
- Aesthetics were then considered to ensure the gardens look attractive in all seasons. Height and flower color were carefully thought out. To achieve a balanced aesthetic, some of the straight species were switched to cultivars to create a more-carefully curated aesthetic. Where cultivars were used, Mount Cuba's research on plant trials of various native cultivars was referenced and cultivars with pollinator benefit were selected when the data was available. Cultivars are denoted with a symbol. All gardeners are welcome to select a straight species instead and the resulting aesthetic will be slightly more naturalistic in appearance or consist of taller plantings.

A well-thought-out and planned garden helps to achieve a beautiful balance of colors, textures, heights, and aesthetics, which can lead to greater community acceptance. Even shadier spots can become vibrant when the right plants are selected. Detailed plans for various conditions, from a street median to a fence line to a foundation planting, are provided.

Each recipe card design is divided into the following categories:

- **Structure** plants create the tall, vertical backbone for each planting design. This category often includes tall, native warm-season grass.
- **Seasonal Theme** plants are the mid-layer of each planting and focus on providing floral resources throughout the entire year.
- **Groundcover** plants are lower and positioned around the edges to create a neat border.
- **Grass Matrix** species often include a cool-season graminoid are also identified to be placed between the other plants to knit the plant community together and suppress weeds.

This approach was developed with horticulturalists, designers, and scientists to ensure that plants work together in an ecological plant community that also considers the aesthetics of the garden. These 'novel' plant communities (West & Rainer, 2015) are constructed with native plants that thrive in similar conditions but may not necessarily be found together in wild plant communities. The plants, however, are carefully selected to create a tight knit plant community that can withstand urban conditions, support pollinators, and provide a range of aesthetic experiences from more traditionally arranged gardens (ex: "Cloud Garden") to naturalistic thickets (ex: "Pioneer Plants"). The recipe cards include plants with a continuous bloom cycle—so that something is always flowering throughout the growing season—and larvae host plants for moths and butterflies. This approach maintains visual interest and supports local pollinators by providing them with both diverse and expanded food sources for the adults and larvae.

In each design, some bare ground should be left to allow for nesting sites for native ground nesting bees. It is recommended that 5-10% of the area of each garden be left as bare ground and can be left around the edges of the planting or in the middle, depending on aesthetic preference.

Provide keystone plant species, like swamp white oak (*Quercus bicolor*) like the one seen above in Lincoln Park, to support many species of pollinators with one plant. Add a soft landing below to further support the insect species using the tree.

1

Pollinator Pantry Plant Lists

SOMERVILLE POLLINATOR ACTION PLAN

Top Plants for Foraging Habitat

Larval Host Plants
- Moths
- Butterflies

Plant List by Pollinator - Mascots & At Risk Species

Plant List by Plant Type
- Annual Plants
- Ephemeral Plants
- Vines

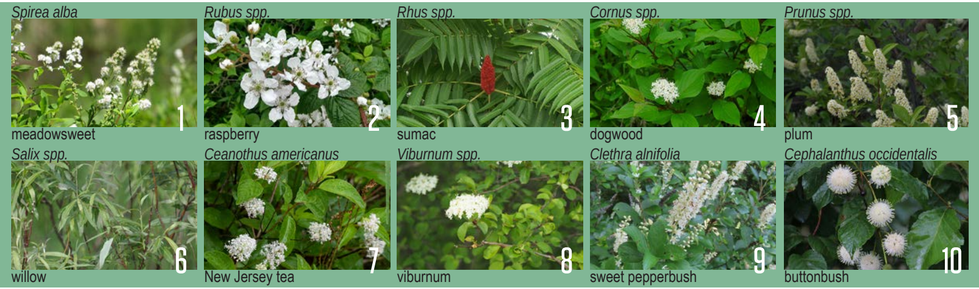
Local Ecological Plant Communities
- Fells in the City: Seeps/ Ravines + Woodlands
- Fells in the City: Pond Edges
- Fells in the City: Rock Outcrops (Dry/Sunny)
- Fells in the City: Ferns of the Fells
- Somerville Rewind

Comprehensive Plant List
- To download the Comprehensive Plant list visit the SPAP SomerVoice page

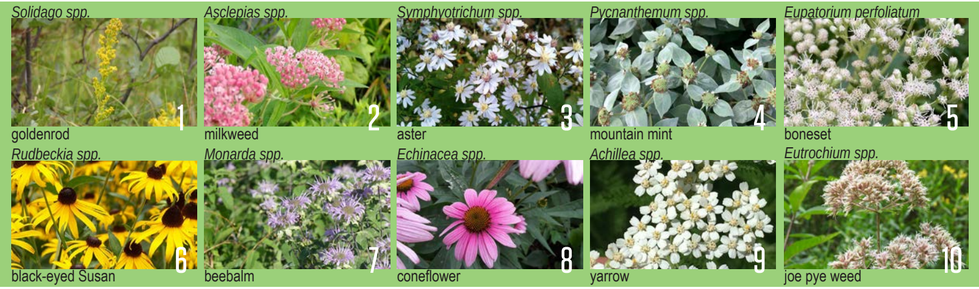
Top Plants for Foraging Habitat

TREES

SHRUBS



PERENNIALS



Larval Host Plants - Moths

Select native plant species from these plant genera to support local moths:

Host Plant Genus	Total # of Species Using Host Plant	Proportion of Species Using Host Plant
Abies	2	0.02
Acer	18	0.14
Achillea	1	0.01
Ageratina	1	0.01
Alnus	5	0.04
Amelanchier	2	0.02
Ampelopsis	1	0.01
Amsonia	1	0.01
Apocynum	1	0.01
Aronia	3	0.02
Azalea	1	0.01
Betula	12	0.10
Carpinus	2	0.02
Carya	10	0.08
Castanea	6	0.05
Ceanothus	1	0.01
Celtis	1	0.01
Cephalanthus	1	0.01
Cercis	3	0.02
Chaemaerion	1	0.01
Chionanthus	1	0.01
Chrysanthemum	1	0.01
Cirsium	3	0.02
Cornus	1	0.01
Corylus	2	0.02
Crataegus	9	0.07
Cucurbita	1	0.01
Diervilla	1	0.01
Erigeron	3	0.02

Host Plant Genus	Total Number of Species Using Host Plant	Proportion of Species Using Host Plant
Eupatorium	3	0.02
Eutrochium	1	0.01
Fagus	6	0.05
Fragaria	1	0.01
Fraxinus	11	0.09
Gallium	4	0.03
grasses	4	0.03
Helenium	1	0.01
Helianthus	4	0.03
Heterotheca	1	0.01
Hydrangea	1	0.01
Hypericum	4	0.03
Ilex	2	0.02
Impatiens	1	0.01
Iris	1	0.01
Juglans	6	0.05
Larix	1	0.01
Liatris	1	0.01
Limonium	1	0.01
Lonicera	2	0.02
Malus	15	0.12
Monarda	3	0.02
Nyssa	1	0.01
Oenothera	3	0.02
Ostrya	1	0.01
Parthenocissus	8	0.06
Physalis	1	0.01
Physocarpus	1	0.01
Phytolacca	1	0.01

Host Plant Genus	Total Number of Species Using Host Plant	Proportion of Species Using Host Plant
Picea	1	0.01
Pinus	3	0.02
Platanus	2	0.02
Polygonum	2	0.02
Polygonum	1	0.01
Populus	4	0.03
Prunus	21	0.17
Quercus	27	0.22
Rhododendron	1	0.01
Ribes	1	0.01
Rosa	5	0.04
Rubus	6	0.05
Rudbeckia	2	0.02
Rumex	6	0.05
Salix	19	0.15
Solidago	10	0.08
Sorbus	1	0.01
Spiraea	2	0.02
Stellaria	3	0.02
Symphoricarpos	1	0.01
Symphyotrichum	10	0.08
Tilia	8	0.06
Tsuga	1	0.01
Ulmus	9	0.07
Urtica	1	0.01
Vaccinium	13	0.10
Verbena	1	0.01
Viburnum	7	0.06
Viola	1	0.01
Vitis	7	0.06

Keystone Species

(Keystone Species Sources: NWF, Garden for Wildlife, Grow Native Massachusetts, Homegrown National Park Container Gardening Keystone Plant, Homegrown National Park Trees and Shrubs List)

(Species Sources: Host and Nectar Plants from The Alabama Butterfly Atlas, Butterflies of Massachusetts from The Massachusetts Butterfly Club, David Wagner's Caterpillars of Eastern North America. More information can be found in the resource section of the Comprehensive Plant List.)

Larval Host Plants - Butterflies

Select native plant species from these plant genera to support local butterflies:

Host Plant Genus	Total # of Species Using Host Plant	Proportion of Species Using Host Plant
Agrostis	1	0.02
Alnus	1	0.02
Amaranthus	1	0.02
Amelanchier	1	0.02
Amphicarpa	1	0.02
Amphicarpaea	1	0.02
Anaphalis	1	0.02
Andropogon	1	0.02
Antennaria	1	0.02
Apios	2	0.03
Asclepias	1	0.02
Baptisia	3	0.05
Betula	2	0.03
Boehmeria	1	0.02
Carex	3	0.05
Carpinus	2	0.03
Carya	1	0.02
Ceanothus	1	0.02
Celtis	2	0.03
Cercis	1	0.02
Cirsium	1	0.02
Cornus	1	0.02
Danthonia	1	0.02
Desemodium	1	0.02
Desmodium	1	0.02
Eragrostis	1	0.02
Eurybia	2	0.03
Fagus	1	0.02
Festuca	1	0.02
Fraxinus	1	0.02
Ilex	1	0.02

Host Plant Genus	Total # of Species Using Host Plant	Proportion of Species Using Host Plant
Juniperus	1	0.02
Leersia	2	0.03
Liatris	1	0.02
Lindera	1	0.02
Liriodendron	1	0.02
Ostyra	2	0.03
Panicum	6	0.10
Pinus	1	0.02
Poa	2	0.03
Populus	2	0.03
Prunus	3	0.05
Pseudognaphalium	1	0.02
Quercus	5	0.09
Rhus	1	0.02
Ribes	1	0.02
Ruta	1	0.02
Salix	4	0.07
Sassafras	1	0.02
Schizachyrium	6	0.10
Spiraea	1	0.02
Symphyotrichum	2	0.03
Tridens	4	0.07
Ulmus	3	0.05
Vaccinium	1	0.02
Verbena	1	0.02
Vernonia	1	0.02
Veronica	1	0.02
Viola	2	0.03
Zanthoxylum	1	0.02
Zizaniopsis	1	0.02
Zizia	1	0.02

Keystone Species

(Keystone Species Sources: NWF, Garden for Wildlife, Grow Native Massachusetts, Homegrown National Park Container Gardening Keystone Plant, Homegrown National Park Trees and Shrubs List)

(Species Sources: Host and Nectar Plants from The Alabama Butterfly Atlas, Butterflies of Massachusetts from The Massachusetts Butterfly Club, David Wagner's Caterpillars of Eastern North America. More information can be found in the resource section of the Comprehensive Plant List.)

Bicolored striped-sweat bee
(Agapostemon virescens)

Two-spotted bumble bee
(Bombus bimaculatus)

Great black digger wasp
(Sphex pensylvanicus)

Monarch butterfly
(Danaus plexippus)

Transverse-banded flower fly
(Eristalis transversa)

Banded longhorn beetle
(Typocerus velutinus)

SOMERVILLE POLLINATOR ACTION PLAN

Plant List by Pollinator Mascot Species Gardens

Mascot	Pollinator Insect Partners	
MONARCH GARDEN	- narrow-headed marsh fly - American lady - brown-belted bumble bee	- clouded sulphur* - red milkweed beetle - Eastern carpenter bee
BICOLORED SWEAT BEE GARDEN	- oblique streaktail - Zaulon skipper - banded longhorn beetle	- cloudy-winged mining bee* - hump-backed beewolf - ligated furrow bee
TWO-SPOTTED BUMBLE BEE GARDEN	- Eastern tiger swallowtail - Northern paper wasp - black-shouldered drone fly	- golden Northern bumblee* - hawthorn mining bee
GREAT BLACK DIGGER WASP GARDEN	- two-spotted longhorn bee - wedge-shaped beetle - gray hairstreak	- common wood-nymph* - four-banded stink bug wasp - golden digger wasp
TRANSVERSE-BANDED FLOWER FLY GARDEN	- aster mining bee - fraternal potter wasp - pearl crescent	- Drury's longhorn bee* - yellow-collared scape moth - Eastern hornet fly
BANDED LONGHORN BEETLE GARDEN	- silky striped sweat bee - four-toothed mason wasp - flower longhorn beetle	- silver-spotted skipper* - hummingbird clearwing

*species is at-risk pollinator

Six plant lists are provided on the following pages that meet the specific habitat requirements of the six selected 'mascot species' for Somerville. These plant lists also support five to six additional 'polinator partner' species including at least one at-risk species. Citizen scientists can be trained in identification of these pollinator neighbors in the Sommerville Community.

MASCOT SPECIES

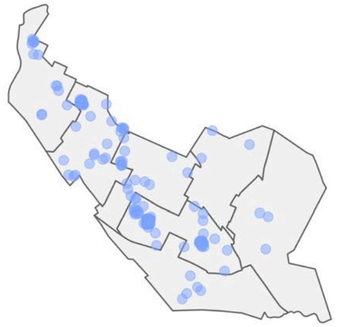
monarch butterfly
Danaus plexippus

HABITAT REQUIREMENTS

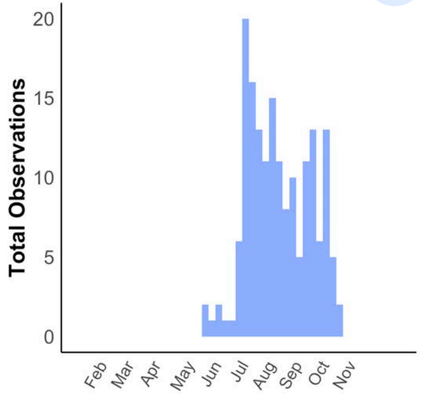
Common (7/7 Wards)

- **Flight period:** late Jun – Oct
- **Food:** nectar, larvae feed exclusively on Asclepias leaves
- **Nesting:** lay eggs in Asclepias species

SOMERVILLE ACTIVITY



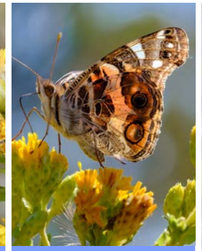
Location Observations



To learn more about this Somerville Pollinator Species, catch Meet Your Neighbors by Dr. Nicholas Dorian here:

POLLINATOR PARTNERS

narrow-headed marsh fly
Helophilus fasciatus

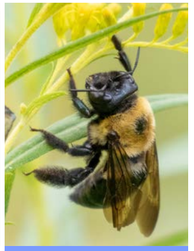


American lady
Vanessa virginiensis

brown-belted bumble bee
Bombus griseocollis

clouded sulphur
Colias philodice

red milkweed beetle
Tetraopes tetrophthalmus



Eastern carpenter bee
Xylocopa virginica

swamp milkweed
Asclepias inarnata
ES

common milkweed
Asclepias syriaca
MS

butterfly milkweed
Asclepias tuberosa
MS

blue vervain
Verbena hastata
MS

spotted Joe-pye weed
Eutrochium maculatum
MS-LS

showy goldenrod
Solidago speciosa
LS

dense blazing star
Liatris spicata
LS

New England aster
Symphyotrichum novae-angliae
F

smooth blue aster
Symphyotrichum laeve
LS

woodland sunflower
Helianthus divaricatus
F

wild bergamot
Monarda fistulosa
MS-LS

fox sedge
Carex vulpinoidea
SP-LS

Seasonality

SP	SPRING	LS	LATE SUMMER
ES	EARLY SUMMER	F	FALL
MS	MID SUMMER	AN	ANNUAL

Sun: FULL, PART, SHADE

Moisture: WET, WET/DRY, DRY

Pollinator

Rabbit Tolerant

MASCOT SPECIES

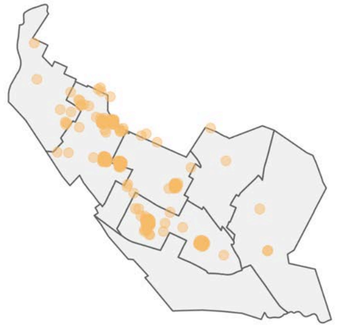
bicolored striped-sweat bee
Agapostemon virescens

HABITAT REQUIREMENTS

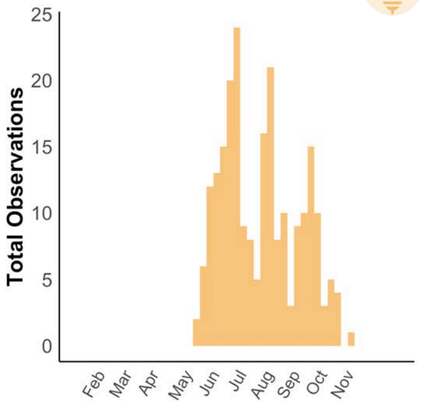
Common (6/7 Wards)

- **Flight period:** mid-May - July & late Aug - Sept
- **Food:** nectar and pollen from shallower flowers
- **Nesting:** ground and soil, within gardnes

SOMERVILLE ACTIVITY



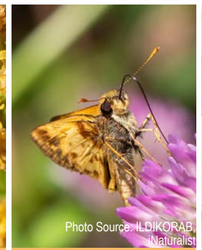
Location Observations



To learn more about this Somerville Pollinator Species, catch Meet Your Neighbors by Dr. Nicholas Dorian here:

POLLINATOR PARTNERS

oblique Streaktail
Allograpta obliqua



Zabulon skipper
Lon zabulon

banded longhorn beetle
Typocerus velutinus

cloudy-winged mining bee
Andrena nubecula

hump-backed beewolf
Philanthus gibbosus

ligated furrow bee
Halictus ligatus

purple coneflower
Echinacea purpurea
MS

lance-leaved coreopsis
Coreopsis lanceolata
SP-MS

joe-pye weed
Eutrochium fistulosum
MS-LS

false sunflower
Heliopsis helianthoides
LS

common sneezeweed
Helenium autumnale
MS-F

New England aster
Symphyotrichum novae-angliae
F

purple lovegrass
Eragrostis spectabilis
LS-F

goldenrod
Solidago spp.
F

blue wood aster
Symphyotrichum cordifolium
LS

dense blazing star
Liatris spicata
LS

clustered mountain mint
Pycnanthemum muticum
ES-LS

little bluestem
Schizachyrium scoparium
LS-F

Seasonality

- SP SPRING
- ES EARLY SUMMER
- MS MID SUMMER
- LS LATE SUMMER
- F FALL
- AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

MASCOT SPECIES

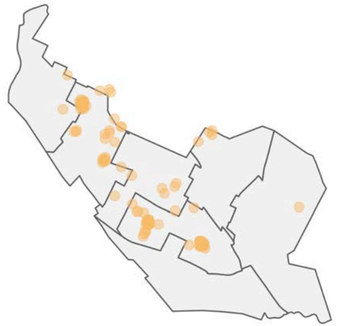
two-spotted bumble bee
Bombus bimaculatus

HABITAT REQUIREMENTS

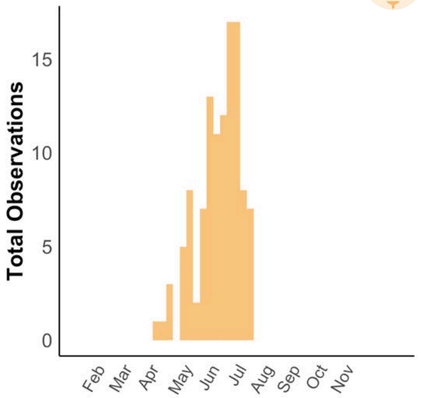
Common (6/7 Wards)

- **Flight period:** Early season, March-June
- **Food:** nectar and pollen
- **Nesting:** pre-existing cavities, bunch grasses

SOMERVILLE ACTIVITY



Location Observations



To learn more about this Somerville Pollinator Species, catch Meet Your Neighbors by Dr. Nicholas Dorian here:

POLLINATOR PARTNERS

Eastern tiger swallowtail
Papilio glaucus

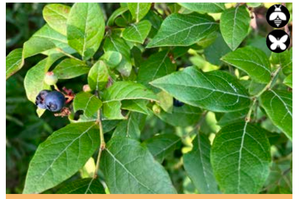
Northern paper wasp
Polistes fuscatus

black-shouldered drone fly
Eristalis dimidiata

AT RISK SPECIES

golden Northern bumblebee
Bombus fervidus

hawthorn mining bee
Andrena crataegi



highbush blueberry
Vaccinium corymbosum
ES-F

foxglove beardtongue
Penstemon digitalis
SP-ES

wild bergamot
Monarda fistulosa
MS-LS

St. John's wort
Hypericum spp.
ES

blue false indigo
Baptisia australis
SP

purple-flowering raspberry
Rubus ordoratus
MS

wild rose
Rosa virginiana
LS-F

white meadowsweet
Spirea alba
LS

black cherry
Prunus serotina
SP

Virginia bluebells
Mertensia virginica
SP

buttonbush
Cephalanthus occidentalis
MS

spotted joe-pye weed
Eutrochium maculatum
MS-LS

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY
Pollinator
Rabbit Tolerant

MASCOT SPECIES

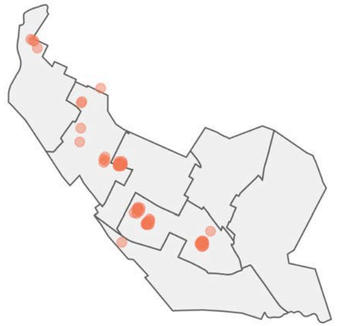
great black digger wasp
Sphex pensylvanicus

HABITAT REQUIREMENTS

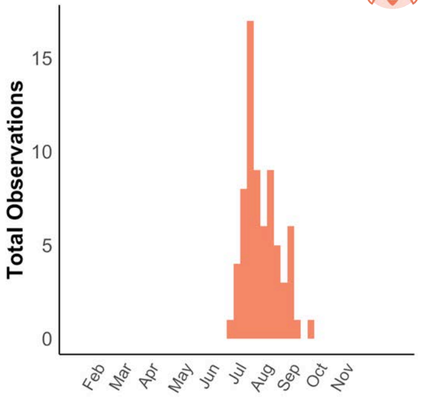
Common (5/7 wards)

- **Flight period:** Jun – Aug
- **Food:** nectar and katydids
- **Nesting:** lays eggs in underground nests, bare soil
- **Very gentle:** only stings if provoked

SOMERVILLE ACTIVITY



Location Observations



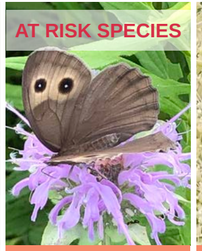
To learn more about this Somerville Pollinator Species, catch Meet Your Neighbors by Dr. Nicholas Dorian here:

POLLINATOR PARTNERS

two-spotted longhorn bee
Melissodes bimaculatus

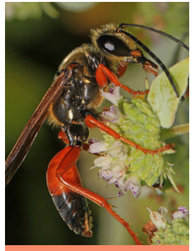
wedge-shaped beetle
Macrosiagon limbata

gray hairstreak
Strymon melinus



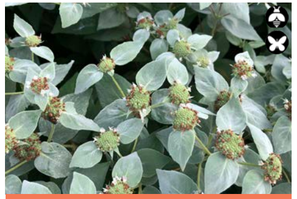
common wood-nymph
cercyonis pegala

four-banded stink bug wasp
Bicyrtes quadrifasciatus



golden digger wasp
Sphex ichneumoneus

showy goldenrod
Solidago speciosa
F



mountain mint
Pycanthemum spp.
SP-MS

swamp milkweed
Asclepias incarnata
ES

little bluestem
Schizachyrium scoparium
LS-F

meadowsweet
Spirea tomentosa
MS

rattlesnake master
Eryngium yuccifolium
LS-F

wild bergamot
Monarda fistulosa
MS-F

spotted beebalm
Monarda punctata
MS-F

summersweet
Clethra alnifolia
MS

silky dogwood
Cornus (Swida) amomum

redtwig dogwood
Cornus (Swida) sericea

oaks
Quercus spp.

Seasonality

- SP SPRING
- ES EARLY SUMMER
- MS MID SUMMER
- LS LATE SUMMER
- F FALL
- AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

MASCOT SPECIES

transverse-banded flower fly
Eristalis transversa

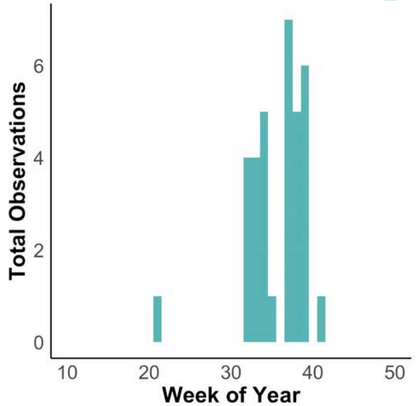
HABITAT REQUIREMENTS

Common (4/7 wards)

- **Flight period:** Jul-Oct
- **Food:** nectar and pollen
- **Nesting:** seeps, wet pools

SOMERVILLE ACTIVITY

Location Observations

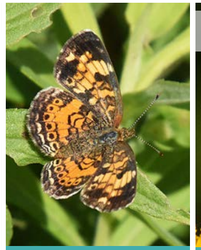


To learn more about this Somerville Pollinator Species, catch Meet Your Neighbors by Dr. Nicholas Dorian here:

POLLINATOR PARTNERS

aster mining bee
Andrena asteris

fraternal potter wasp
Eumenes fraternus

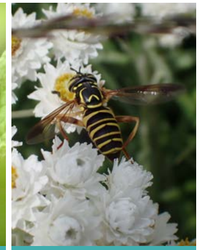


pearl crescent
Phyciodes tharos

AT RISK SPECIES

Drury's longhorn bee
Melissodes druriellus

yellow-collared scape moth
Cisseps fulvicollis



Eastern hornet fly
Spilomyia longicornis

coneflower
Rudbeckia spp. ES

ninebark
Physocarpus spp. MS

aster
Symphyotrichum spp. F

false sunflower
Heliopsis helianthoides LS

lance-leaved coreopsis
Coreopsis lanceolata SP-MS

willow
Salix spp. ES

choke cherry
Prunus virginiana ES

viburnum
Viburnum spp. F

sunflower
Helianthus spp. LS

showy goldenrod
Solidago speciosa LS

wood aster
Eurybia spp LS

joe-pye weed
Eutrochium fistulosum MS-LS

Seasonality

- SP SPRING
- ES EARLY SUMMER
- MS MID SUMMER
- LS LATE SUMMER
- F FALL
- AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

MASCOT SPECIES

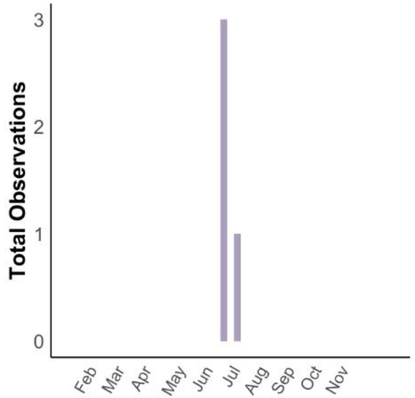
banded longhorn beetle
Typocerus velutinus

HABITAT REQUIREMENTS

Uncommon (1/7 wards)

- **Flight period:** Jun-July
- **Food: nectar and pollen**
- **Nesting: lays eggs in moist, decaying logs**
- **Very gentle. Cannot bite nor sting**

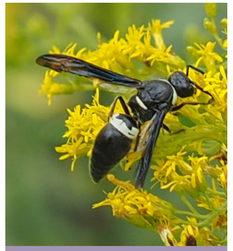
SOMERVILLE ACTIVITY



To learn more about this Somerville Pollinator Species, catch Meet Your Neighbors by Dr. Nicholas Dorian here:

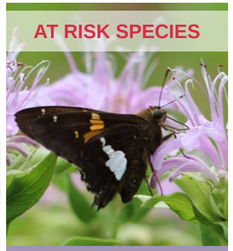
POLLINATOR PARTNERS

silky striped sweat bee
Agapostemon sericeus

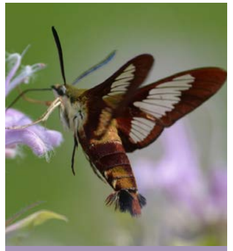


four-toothed mason wasp
Monobia quadridens

flower longhorn beetle
Strangalia famelica



silver-spotted skipper
Epargyreus clarus



hummingbird clearwing
Hemaris diffinis

red osier dogwood
Cornus sericea
MS

grey dogwood
Cornus racemosa
S

black cohosh
Actea racemosa
MS

goldenrod
Solidago spp.
F

white meadowsweet
Spirea alba
MS

mountain mint
Pycnanthemum spp.
SP-MS

meadowsweet
Spirea spp.
LS

Culver's root
Veronicastrum virginicum
LS-F

sunflowers
Helianthus spp.
LS

showy goldenrod
Solidago speciosa
LS

wood aster
Eurybia spp.
LS

goatsbeard
Aruncus dioicus
ES

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY

Pollinator
Rabbit Tolerant

TOP NATIVE ANNUALS

If you are looking for all-summer color and are interested in supplementing your native Pollinator Pot with annuals, consider picking from this list. Prioritize native species wherever possible!

NATIVE ANNUAL FORBS

partridge sensitive-pea — LS
Chamaecrista fasciculata

annual fleabane — MS
Erigeron annuus

Philadelphia fleabane — LS
Erigeron philadelphicus

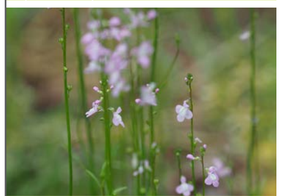
daisy fleabane — ES
Erigeron strigosus

spotted touch-me-not — MS
Impatiens capensis

pale jewelweed — MS
Impatiens pallida

Virginia dwarfdandelion — SP-LS
Krigia virginica

Indian tobacco — LS
Lobelia inflata



blue toadflax — ES
Nuttallanthus canadensis

common evening primrose — LS
Oenothera biennis

sweet everlasting — LS
Pseudognaphalium obtusifolium

black-eyed Susan — MS
Rudbeckia hirta

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL, PART, SHADE
Moisture: WET, WET/DRY, DRY
Pollinator
Rabbit Tolerant

TOP NON-NATIVE ANNUALS

Many annuals have no local pollinator value! Prioritize native species when possible, but if you are choosing from annuals at a nursery, consider picking from this list of plants that have some pollinator value.

NON-NATIVE ANNUAL FORBS

alyssum — AN, SP-F
Lobularia spp.

spider flower — AN, ES-F
Cleome spp.

cosmos — AN, ES-F
Cosmos spp.

creeping verbena — AN, SP-F
Glandularia spp.

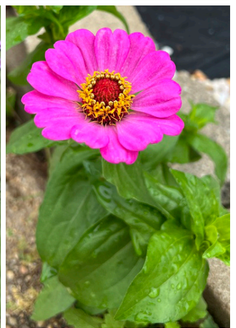
heliotrope — AN, ES-LS
Heliotropium spp.

lantana — AN, ES-F
Lantana spp.

sage — AN, ES-MS
Salvia spp.

sunflower — AN, MS-F
Helianthus annuus

purpletop vervain — AN, ES-F
Verbena bonariensis



zinnia — AN, ES-F
Zinnia spp.

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL, PART, SHADE
Moisture: WET, WET/DRY, DRY
Pollinator
Rabbit Tolerant

Spring Ephemerals

Scientific Name	Common Name	Size	Solar	Wetland Status	Soil Moisture
Aquilegia canadensis	columbine	1.5-2'	Sun/Part Sun	FACU	Dry, Moist
Claytonia virginica	spring Beauty	.5'	Sun/Part Sun	-	Moist
Dicentra canadensis	squirrel corn	0-1'	Part Shade	-	Moist
Dicentra cucullaria	dutchman's breeches	0-1'	Part Sun/Shade	-	Moist
Erythronium americanum	American trout lily	0-0.5'	Part Sun/Shade	-	Moist
Hydrophyllum virginianum	eastern waterleaf	1-2'	Part Sun	FAC	Moist
Mertensia virginica	bluebells	1.5-2'	Sun/Part Sun	FAC	Moist
Sanguinaria canadensis	bloodroot	.5'	Part Sun/Shade	FACU	Moist, Wet
Trillium grandiflorum	white trillium	1'-1.5'	Part Sun/Shade	-	Moist
Uvularia grandiflora	merry bells	1.5-2'	Part Sun/Shade	-	Moist
Viola rotundifolia	round-leaved violet	.25-.5'	Shade	FAC	Moist

Vines

Scientific Name	Common Name	Size (length)	Solar	Wetland Status	Soil Moisture
Adlumia fungosa	Allegheny-vine	13'	Part Sun/Shade	-	Moist
Apios americana	common ground-nut	15'	Shade	FACW	Moist/Wet
Aristolochia macrophylla	dutchman's pipe	20-30'	Part Sun	-	Moist
Clematis virginiana	virgin's bower	6-10'	Sun/Part Sun	FAC	Dry/Moist
Lonicera sempivirens	honeysuckle vine	8-15'	Sun/Part Sun	FACU	Moist
Mikania scandens	climbing hempvine	8-10'	Sun/Part Sun	OBL	Wet
Parthenocissus quinquefolia	virginia creeper	30-50'	Sun/Part Sun	FACU	Moist
Vitis labrusca	fox grape	20'	Sun/Shade	FACU	Dry/Moist

Fells in the City - Seeps/Ravines + Woodlands

Trees

Amelanchier spp.

serviceberry

*Carya spp. ***

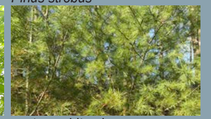
hickory

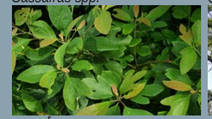
Ilex opaca

American holly

*Ostrya virginiana ***

hophornbeam

*Pinus strobus ***

eastern white pine

Sassafras spp.

sassafrass

*Quercus alba ***

white oak

Quercus bicolor

swamp white oak

*Quercus rubra ***

red oak

*Quercus velutina ***

black oak

Shrubs

Cornus amomum

silky dogwood

*Hamamelis virginiana ***

witch hazel

Ilex glabra

evergreen winterberry

*Ilex verticillata ***

winterberry holly

*Lindera benzoin ***

Northern spicebush

Forbs

*Eupatorium perfoliatum ***

common boneset

*Eurybia divarticata ***

white wood aster

*Eutrochium spp. ***

Joe-pye weed

*Geranium maculatum ***

wild geranium

*Monarda fistulosa ***

wild bergamot

*Packera aurea ***

golden ragwort

*Pycnanthemum muticum ***

clustered mountainmint

*Solidago spp. ***

goldenrod

Symphotrichum novi-belgii

New York aster

*Zizia aurea ***

golden Alexander

Graminoids

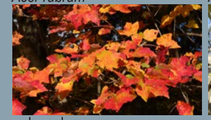
*Carex spp. ***

sedge

** Indicates plants observed as being present in the EwA Guide to the Plants of the Fells.
See Ferns of the Fells list for additional relevant plants.

Fells in the City: Pond Edges

Trees

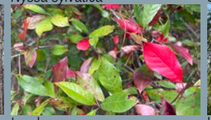
*Acer rubrum ***

red maple

Amelanchier spp.

serviceberry

Betula populifolia

grey birch

Nyssa sylvatica

tupelo

Salix nigra

black willow

Shrubs

Aronia spp.

chokeberry

*Clethra alnifolia ***

coastal pepperbush

Cornus sericea

red osier dogwood

Kalmia angustifolia

sheep laurel

Vaccinium corymbosum

highbush blueberry

Forbs

*Asclepias incarnata***

swamp milkweed

*Eupatorium perfoliatum ***

common boneset

*Eutrochium spp. ***

Joe-pye weed

*Iris versicolor***

norther blue flag iris

** Indicates plants observed as being present in the EwA Guide to the Plants of the Fells. See Ferns of the Fells list for additional relevant plants

Fells in the City - Rock Outcrops (Dry/Sunny)

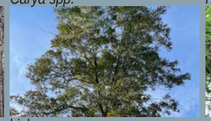
Trees

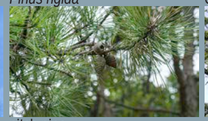
Amelanchier canadensis

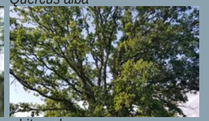
serviceberry

Betula populifolia

grey birch

*Carya spp.***

hickory

Pinus rigida

pitch pine

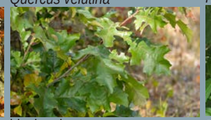
Quercus alba **

white oak

Quercus ilicifolia

scrub oak

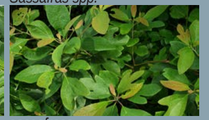
Quercus rubra **

red oak

Quercus velutina **

black oak

Rhus spp.

sumac

Sassafras spp.

sassafrass

Shrubs

Arctostaphylos spp.

bearberry

Gaylussacia baccata

huckleberry

Rubus spp. **

dewberry

Spirea tomentosa

steeplebush

Vaccinium angustifolium **

lowbush blueberry

Forbs

Corydalis sempervirens

rocky harlequin

Erigeron pulchellus

Robin's plantain

Fragaria vesca **

wild strawberry

Potentilla spp.

cinquefoil

Solidago nemoralis **

field goldenrod

Graminoids

*Carex appalachia**

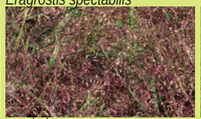
sedge

Carex pennsylvanica **

sedge

Deschampsia flexuosa

wavy hair grass

Eragrostis spectabilis

purple lovegrass

Schizachyrium scoparium

little bluestem

** Indicates plants observed as being present in the EwA Guide to the Plants of the Fells. See Ferns of the Fells list for additional relevant plants.

Fells in the City: Ferns of the Fells

Amauropelta noveboracensis **

New York fern

Athyrium filix-femina **

lady fern

Dryopteris intermedia **

intermediate wood fern

Dryopteris marginalis **

marginal wood fern

Osmunda claytoniana **

interrupted fern

Osmundastrum cinnamomeum

cinnamon fern

Onoclea sensibilis **

sensitive fern

Polystichum acrostichoides **

Christmas fern

Comptonia peregrina **

sweet-fern

** Indicates plants observed as being present in the EwA Guide to the Plants of the Fells

Plant list: Somerville Rewind

Shrubs

Arctostaphylos uvaursi

bearberry

Comptonia peregrina

(Sylvan Gardens)
sweet-fern

Spiraea tomentosa

steeplebush

Vaccinium spp.

blueberry

Graminoids

Agrostis spp.

bentgrass

Carex appalachia

(Mt Cuba Center)
Appalachian sedge

Carex pensylvanica

Pennsylvania sedge

Carex platyphylla

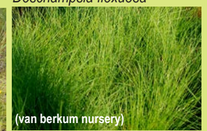
broad leaf sedge

Carex swanii

(Mt Cuba Center)
swan's sedge

Danthonia spicata

poverty oatgrass

Deschampsia flexuosa

(van berkum nursery)
crinkled hair grass

Eragrostis spectabilis

(Inland Bays Garden Center)
purple love grass

Juncus tenuis

slender rush

Schizachyrium scoparium

little bluestem

Forbs (Part 1)

Achillea millefolium

yarrow

Antennaria spp.

pussytoes

Asclepias syriaca

common milkweed

Asclepias tuberosa

butterfly weed

Panicum virgatum

switchgrass

Baptisia tinctoria

yellow wild indigo

Chamaecrista fasciculata

partridge pea

Cirsium pumilum

(Janis Stone)
thistle

Erigeron pulchellus

hairy fleabane

Erigeron strigosus

daisy fleabane

Plant list: Somerville Rewind

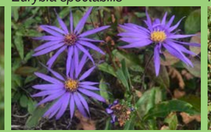
Forbs (Part 2)

Eurybia divaricata

white wood aster

Eupatorium hyssopifolium

hyssopleaf thoroughwort

Eurybia spectabilis

purple wood aster

Ionactis linariifolia

stuff aster

Krigia virginica

Virginia dwarf-dandelion

Maianthemum canadense

Canada mayflower

Nuttallanthus canadensis

figworts

Potentilla canadensis

dwarf cinquefoil

Pseudognaphalium obtusifolium

blunt-leaved rabbit-tobacco

Pycnanthemum tenuifolium

(Christopher David Benda)
narrowleaf mountain mint

Sibbaldia tridentata

three-leaved cinquefoil

Solidago bicolor

silverrod

Solidago puberula

downy goldenrod

Solidago caesia

wreath goldenrod

Symphyotrichum patens

spreading aster

Penstemon digitalis

foxglove

Viola sagittata

arrowleaf violet

Viola pedata

birdfoot violet

Viola sororia

blue violet

Zizia aurea

golden Alexander

2

Pollinator Pantry Recipe Cards

Pre-designed and highly aesthetic gardens to support pollinators in Somerville!

SOMERVILLE POLLINATOR ACTION PLAN

Smallest Gardens

Pollinator Pots

Pollinator Patches:
3' x 6' | 4' x 8' | 5' x 10' | 7.5' x 15'

Bio Swale
4'x 8'

Street Median (For City Use)
6' x 12'

Living Layers - Trees and Shrubs
12' x 24'

Lawn Conversions & Seeded Meadows

Largest Gardens

SOMERVILLE POLLINATOR ACTION PLAN

POLLINATOR GARDEN RECIPE CARDS

Size	Sun	Shade
Small		
POLLINATOR POTS	YELLOW SUNRISE, TANGERINE DREAM, PURPLE CHARM	SHADY SYMPHONY
POLLINATOR PATCHES 3' x 6', 4' x 8', 5'x10', 15'x17.5'	PURPLE SKY, SUNNY DAY, SILVER VEIL, SHORT & GRASSY, COOL RIVER, MELLOW YELLOW, MAGENTA MAGNET, MILKWEED MANIA, TOP 10 PERENNIALS	WHITE SHIMMER, SHADE RIVER
BIO SWALE 4'x 8'	SUNNY BIO	SHADY BIO
STREET MEDIAN 6' x 12'	VIOLET AND GOLD	
LIVING LAYERS 12' x 24'	LAYERED CANOPY, CLOUD GARDEN, PIONEER PLANTS, WATER & WONDER, EDIBLE THICKET, FENCE LINE	WOODY GLEN, TOP 10 WOODY
Large		

SOMERVILLE POLLINATOR ACTION PLAN

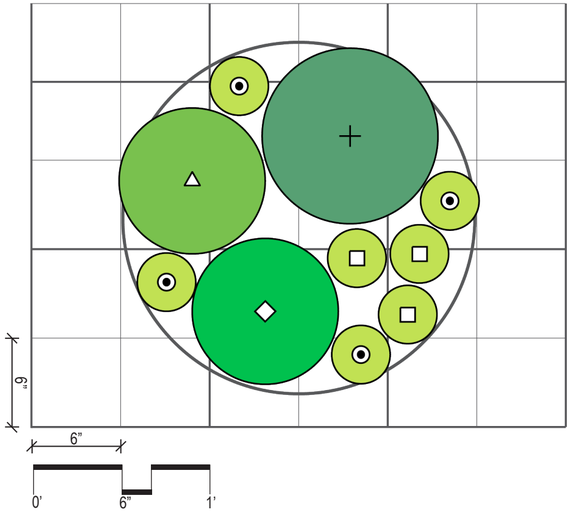
POLLINATOR GARDEN RECIPE CARDS

How to use the recipe cards:

1. Planting diagrams are **organized by size** of your installation! Choose the diagram best suited for your site!
2. Then choose a recipe card provided to use for species selection with that diagram. Recipe cards are organized by: **Color, Soil Type, Moisture, & Other Site Conditions.**
3. Each symbol = 1 Plant
4. Choose 1 **plant for each symbol** from the same Recipe Card.
5. Make sure it's **blooming in all seasons!**
6. You can substitute 'Seasonal Theme' for 'Groundcover' anytime.
7. Have fun!

YELLOW SUNRISE | TANGERINE DREAM | PURPLE CHARM | SHADY SYMPHONY

PICK YOUR OWN POLLINATOR POTS!



SCALE : 1 1/2" = 1'-0" GRID = 6" x 6"

24" Diameter Container

- ┼ Structure Plant
- △ Seasonal Theme
- ◇ Seasonal Theme
- □ Seasonal Theme
- ⊙ Groundcover Plant

See potential plant list options on the next page.

Feel free to pick one theme as a guide, or mix and match (making sure to keep one plant that blooms in each season!) to create your ideal garden.

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

SOMERVILLE POLLINATOR ACTION PLAN

To get involved, informed, or inspired, visit:
voice.somervillema.gov/somerville-pollinator-action-plan

Pick one theme or mix and match (within a bloom season) from the list below!

	YELLOW SUNRISE	TANGERINE DREAM	PURPLE CHARM	SHADY SYMPHONY
STRUCTURE PLANT	Photo: Scott Zona yellow wild indigo *Baptisia tinctoria* SP-ES ┼	Photo: Matt Lavin switchgrass *Panicum virgatum 'Cheyenne Sky'* LS-F ┼	Photo: John Winder pink muhly grass *Muhlenbergia capillaris* LS-F ┼	Photo: Selicyna black cohosh *Actaea racemosa* SP ┼
SEASONAL THEME	 black-eyed susan *Rudbeckia fulgida* LS △	Photo: Leonora Enking sneezeweed *Helenium 'Flammendes Kathchen'* MS △	Photo: Mary Keim spotted beebalm *Monarda punctata* MS-F △	 ostrich fern *Matteuccia struthiopteris* MS △
	Photo: Emily Bell lance-leaved coreopsis *Coreopsis lanceolata* SP-MS ◇	Photo: Cob Land yarrow *Achillea millefolium 'Terracotta'* ES ◇	Photo: Daniele La Rosa Messina purple coneflower *Echinacea purpurea* MS ◇	Photo: Patrick Standish American alumroot *Heuchera americana* ES ◇
	Photo: Aschellenberg blue fescue *Fetusca glauca* ES □	 butterfly milkweed *Asclepias tuberosa* MS □	 giant hyssop *Agastache 'Black Adder'* MS-F □	Photo: David J. Strang white wood aster *Eurybia divaricata* LS □
GROUNDCOVER	Photo: Krzysztof Ziarnek yarrow *Achillea x 'Moonshine'* ES ⊙	Photo: Calin Darabus white heath aster *Symphyotricum ericoides* LS ⊙	 common blue violet *Viola sororia* SP ⊙	 columbine *Aquilegia canadensis* ES ⊙

Seasonality
- SP SPRING
- ES EARLY SUMMER
- MS MID SUMMER
- LS LATE SUMMER
- F FALL
- AN ANNUAL

Sun: FULL, PART, SHADE

Moisture: WET, WET/DRY, DRY

Pollinator

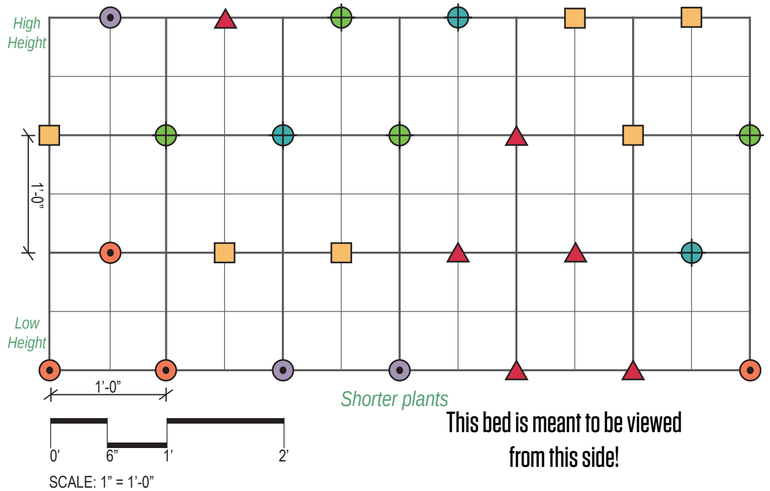
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

PURPLE SKY | SUNNY DAY | SILVER VEIL | SHORT & GRASSY | COOL RIVER | MELLOW YELLOW

MAGENTA MAGNET | WHITE SHIMMER | SHADE RIVER | MILKWEED MANIA | TOP 10 PERENNIALS

POLLINATOR PATCH
3'x6'



This bed is meant to be viewed from this side!

Pick 6 Plants!

Pick a Plant Palette!

Each garden is designed for a specific amount of sunlight, soil mositure, and height so be sure to pick the one that will work best for your site. Feel free to mix and match but aim to include plants that will bloom in every season!

Structure Plants

(3) (4)

Seasonal Theme

(6) (6)

Groundcover (or sub seasonal theme!)

(3) (4)

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

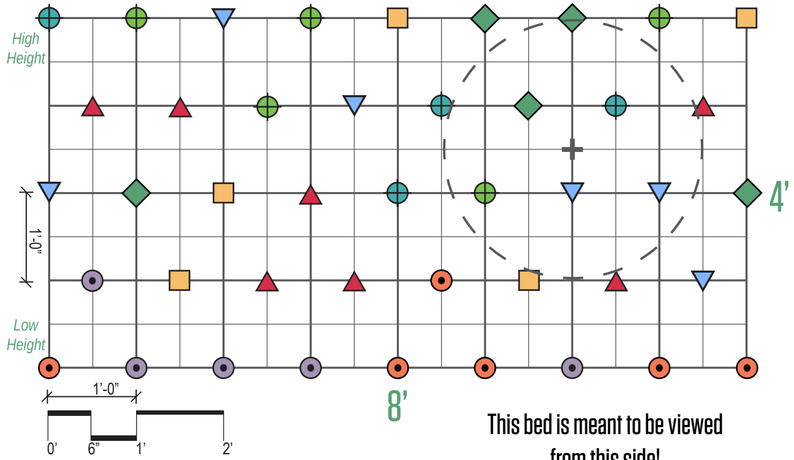
SOMERVILLE POLLINATOR ACTION PLAN

To get involved, informed, or inspired, visit:
voice.somervillema.gov/somerville-pollinator-action-plan

PURPLE SKY | SUNNY DAY | SILVER VEIL | SHORT & GRASSY | COOL RIVER | MELLOW YELLOW

MAGENTA MAGNET | WHITE SHIMMER | SHADE RIVER | MILKWEED MANIA | TOP 10 PERENNIALS

POLLINATOR PATCH
4'x8'



SCALE: 3/4" = 1'-0"

This bed is meant to be viewed from this side!

Pick 8 Plants!

Pick a Plant Palette!

Each garden is designed for a specific amount of sunlight, soil mositure, and height so be sure to pick the recipe card that will work best for your site. Feel free to mix and match but aim to include plants that will bloom in every season!

Structure Plant

(4) (5)

Seasonal Theme

(5) (7) (5) (6)

Groundcover Plants at 12" OC

(5) (6)

Optional Shrub

+

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

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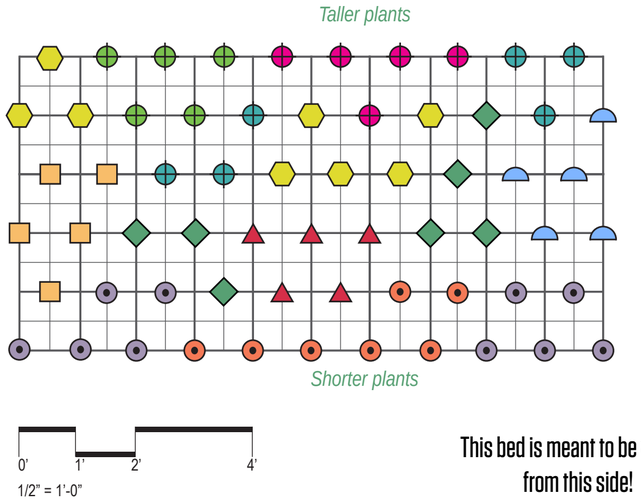
MAGENTA MAGNET | WHITE SHIMMER | SHADE RIVER | MILKWEED MANIA | TOP 10 PERENNIALS

POLLINATOR PATCH
5'x10'



This bed is meant to be viewed from this side!

Pick 10 Plants!

Pick a Plant Palette!

Each garden is designed for a specific amount of sunlight, soil mositure, and height so be sure to pick the one that will work best for your site. Feel free to mix and match but aim to include plants that will bloom in every season!

Structure Plants

(6) (5) (5)

Seasonal Theme

(5) (5) (7) (5)

Groundcover (or sub seasonal theme!)

(10) (7)

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

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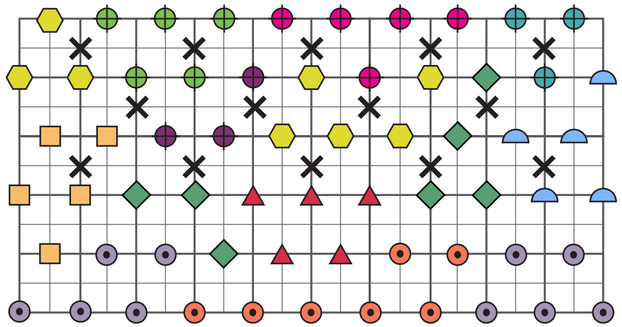
MAGENTA MAGNET | WHITE SHIMMER | SHADE RIVER | MILKWEED MANIA | TOP 10 PERENNIALS

POLLINATOR PATCH
15'x17.5'

Taller plants



Shorter plants

1" = 3'-0"

This bed is meant to be viewed from this side!

Pick 12 Plants!

Pick a Plant Palette!

Each garden is designed for a specific amount of sunlight, soil mositure, and height so be sure to pick the recipe card that will work best for your site. Feel free to mix and match but aim to include plants that will bloom in every season!

Structure Plants

(5) (5) (3) (3)

Seasonal Theme

(8) (7) (5) (5) (5)

Groundcover

(10) (7)

Grass Matrix (Plugs)

(14)

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

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PURPLE SKY

SUNNY | DRY | UNDER 4' TALL

STRUCTURE PLANT

Photo: Agnieszka Kwiecien

blue false indigo
Baptisia australis
SP

Photo: Dave Lage

switchgrass
Panicum virgatum 'Shenandoah'
LS

sweet Joe-pye weed
Eutrochium purpureum
MS

SEASONAL THEME

clustered mountain mint
Pycnanthemum muticum
ES-LS

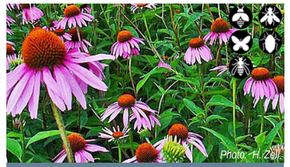


Photo: H. Zell

purple coneflower
Echinacea purpurea
MS

Photo: Tom Pottersfield

foxglove beardtongue
Penstemon digitalis
SP-ES

anise hyssop
Agastache foeniculum
LS

yarrow
Achillea 'Milly Rock Rose'
ES-MS

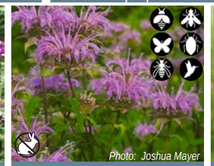


Photo: Joshua Mayer

wild bergamot
Monarda fistulosa
MS-LS

spotted bee balm
Monarda punctata
MS-F

Photo: Dan Mullen

northern blazing star
Liatris novae-angliae
LS-F

swamp milkweed
Asclepias incarnata
ES

GROUNDCOVER

Photo: Katja Schulz

purple lovegrass
Eragrostis spectabilis
LS-F

Photo: Harry Rose

copper-shouldered oval sedge
Carex bicknelli
ES

Photo: Drew Alvey

New England Aster
Symphyotrichum novae-angliae 'Purple Dome'
F

Seasonality: SP SPRING · ES EARLY SUMMER · MS MID SUMMER · LS LATE SUMMER · F FALL · AN ANNUAL

Sun: FULL · PART · SHADE

Moisture: WET · WET/DRY · DRY

Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

SUNNY DAY

SUNNY | DRY | UNDER 4' TALL

STRUCTURE PLANT

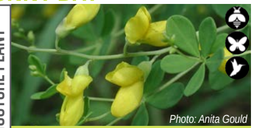


Photo: Anita Gould

yellow wild Indigo
Baptisia tinctoria
SP-ES

clustered mountain mint
Pycnanthemum muticum
ES-LS

Photo: Ellie Erking

switchgrass
Panicum virgatum 'North Wind'
LS-F

St. John's wort
Hypericum punctatum
ES-LS

SEASONAL THEME

Photo: David J. Stang

little bluestem
Schizachyrium scoparium
LS-F

Photo: Frank Mayfield

butterfly milkweed
Asclepias tuberosa
MS

black-eyed Susan
Rudbeckia fulgida
ES-LS

Photo: Emily Bell

lance-leaved coreopsis
Coreopsis lanceolata
SP-MS

Photo: Cob Land

yarrow
Achillea millefolium 'Terracotta'
MS-LS

Photo: Jack Pearce

sneezeweed
Helenium autumnale
MS-F

Photo: Katja Schulz

cutleaf coneflower
Rudbeckia laciniata
MS

Photo: David Stang

autumn goldenrod
Solidago sphacelata
LS

Photo: NC State Garden Extension

narrowleaf evening primrose
Oenothera fruticosa
SP

GROUNDCOVER

Robin's plantain
Erigeron pulchellus
SP

Photo: Harry Rose

copper-shouldered oval sedge
Carex bicknelli
ES

Photo: Joshua Mayer

barren strawberry
Waldsteinia fragarioides
ES

Seasonality: SP SPRING · ES EARLY SUMMER · MS MID SUMMER · LS LATE SUMMER · F FALL · AN ANNUAL

Sun: FULL · PART · SHADE

Moisture: WET · WET/DRY · DRY

Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

SILVER VEIL

SUNNY | DRY | UNDER 4' TALL

STRUCTURE PLANT

false indigo
Baptisia 'Ivory Towers'
SP

switchgrass
Panicum 'Niagra Falls'
LS

clustered mountain mint
Pycnanthemum muticum
ES-LS

OPTIONAL SHRUB

sweet pepperbush
Clethra alnifolia
MS

SEASONAL THEME

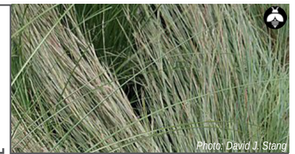


Photo: David J. Stang
little bluestem
Schizachyrium scoparium
LS-F

Photo: F D Richards
coneflower
Echinacea 'White Swan'
ES-F

Photo:Reinald Kirchener
yarrow
Achillea millefolium
MS-LS

white meadowsweet
Spirea alba
ES-LS

slender mountain mint
Pycnanthemum tenuifolium
SP-MS

boneset
Eupatorium perfoliatum
LS

Photo: John Newton
foxglove beardtongue
Penstemon digitalis
S-ES

white goldenrod
Solidago bicolor
LS-F

GROUNDCOVER

Robin's plantain
Erigeron pulchellus
SP

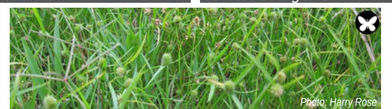


Photo: Harry Rose
copper-shouldered oval sedge
Carex bicknelli
ES

Photo: Acabashi
white heath aster
Symphyotrichum ericoides 'Snow Flurry'
F

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

SHORT AND GRASSY (SUB MORE SEASONAL THEMES FOR STRUCTURAL PLANTS!)

SUNNY | DRY | UNDER 4' TALL

SEASONAL THEME

Photo: Reinald Kirchener
yarrow
Achillea millefolium
MS-LS

slender mountain mint
Pycnanthemum tenuifolium
SP-MS

Photo: Mark Nenadov
blazing star
Liatris spicata
LS-F

whorled milkweed
Asclepias verticillata
LS

Photo: Audrey Zharkikh
aromatic aster 'October Skies'
Symphyotrichum oblongifolium
F

praire dropseed
Sporobolus heterolepis
LS

blue grama
Bouteloua gracilis
F

side oats grama
Bouteloua curtipendula
LS

GROUNDCOVER

Photo: Andrey Zharkikh
blue grama
Bouteloua gracilis 'Blonde Ambition'
ES-LS

Photo: Harry Rose
copper-shouldered oval sedge
Carex bicknelli
ES-LS

Photo: Mount Rainier National Park
pearly everlasting
Anaphalis margaritacea
ES-LS

pussytoes
Antennaria spp.
ES-LS

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

COOL RIVER

SUNNY | WET | UNDER 4.5' TALL

STRUCTURE PLANT

Photo: Staudengartnerei Forssman

switchgrass
Panicum virgatum 'Prairie Sky'
LS

Photo: Chris Rycroft

blue vervain
Verbena hastata
MS

Photo: Aaron Volkening

Joe pye weed
Eupatorium 'Baby Joe'
MS-F

Photo: Ben Frazier

culver's root
Veronicastrum virginicum
ES

SEASONAL THEME

Photo: Bill Stanley

great blue lobelia
Lobelia siphilitica
LS

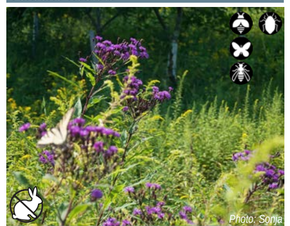


Photo: Sonia

ironweed
Vernonia lettermannii 'Iron Butterfly'
MS

Photo: Alvin Kho

New England aster
Symphyotrichum novae-angliae
F

swamp milkweed
Asclepias incarnata
ES

GROUNDCOVER

Photo: Kim Starr

sweet flag
Acorus americana
SP-MS

Photo: Matt Lavin

path rush
Juncus tenuis
ES

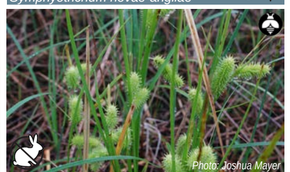


Photo: Joshua Mayer

shallow sedge
Carex lurida
SP

blue mistflower
Conoclinium coelestinum
LS-P

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL | PART | SHADE
Moisture: WET | WET/DRY | DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

MELLOW YELLOW

SUNNY | WET | UNDER 4.5' TALL

STRUCTURE PLANT

Photo: USDA NRCS Montana

cutleaf coneflower
Rudbeckia laciniata
LS-F

woodland sunflower
Helianthus divaricatus
F

shrubby St. John's wort
Hypericum prolificum
ES

OPTIONAL SHRUB

Photo: Kathy Kincaid, Naturalist

dwarf prairie willow
Salix occidentalis
SP

SEASONAL THEME

Photo: Ben Sorman

white turtlehead
Chelone glabra
F

Photo: Aaron Volkening

golden alexander
Zizia aurea
SP

garden phlox
Phlox paniculata
F

bog goldenrod
Solidago uliginosa
F

GROUNDCOVER

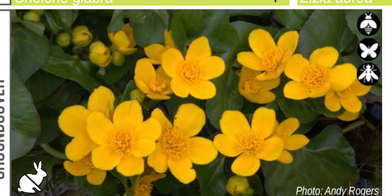


Photo: Andy Rogers

marsh marigold
Caltha palustris
SP

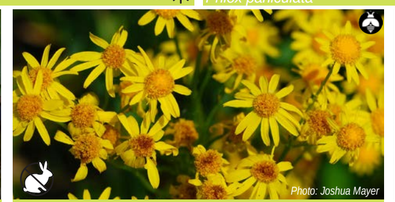


Photo: Joshua Mayer

golden ragwort
Packera aurea
SP-ES

Photo: Doug McGrady

anemone
Anemone canadensis
SP

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL | PART | SHADE
Moisture: WET | WET/DRY | DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

MAGENTA MAGNET

SUN | VAR.HEIGHTS

STRUCTURE PLANT

false indigo
Baptisia 'Decadence Pink Truffles'
SP

clustered mountain mint
Pycnanthemum muticum
ES-LS

Photo: Dave Lage

switchgrass
Panicum virgatum 'Shenandoah'
LS

SEASONAL THEME

yarrow
Achillea 'Pink Grapefruit'
ES-MS

Photo: Garden Crossings

wild bergamot
Monarda fistulosa
ES-MS

spotted bee balm
Monarda punctata
ES-MS

swamp milkweed
Asclepias incarnata
MS-LS

SEASONAL THEME

Joe pye weed
Eutrochium purpureum
MS-LS

Photo: US Perennials

new england aster
Symphyotrichum 'Vibrant Dome'
LS-F

purple coneflower
Echinacea purpurea
MS

GROUNDCOVER

Photo: Barry Rose

copper-shouldered oval sedge
Carex bicknelli
ES

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL | PART | SHADE
Moisture: WET | WET/DRY | DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

WHITE SHIMMER

SHADE | MOIST | UNDER 4' TALL

STRUCTURE PLANT

Photo: Joe Passer

goat's beard
Aruncus dioicus
ES

black cohosh
Actaea racemosa
MS

OPTIONAL SHRUB

mapleleaf viburnum
Viburnum acerifolium
ES

SEASONAL THEME

white snakeroot
Ageratina altissima
LS-F

Photo: Andrey Zharkikh

American alumroot
Heuchera villosa 'Autumn Bride'
LS-F

Photo: Thomas Quine

blue wood aster
Symphyotrichum cordifolium
LS

Photo: Fritz Flohr Reynolds

white wood aster
Eurybia divaricata
LS

Photo: Judy Gallagher

wild geranium
Geranium maculatum
SP

Photo: Cathie Bird

calico aster
Symphyotrichum lateriflorum
F

GROUNDCOVER

Photo: Joshua Mayer

wild blue phlox
Phlox divaricata
ES

Photo: Lydia Fravel

creeping phlox
Phlox stolonifera
SP-ES

Photo: Cranbrook Science

wild ginger
Asarum canadense
SP

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL | PART | SHADE
Moisture: WET | WET/DRY | DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

SHADE RIVER

SHADE | WET | UNDER 4' TALL

STRUCTURE PLANT

Photo: Native Bird

calico aster
Symphyotrichum lateriflorum F

solomon's seal
Polygonatum biflorum SP-ES

solomon's plume
Maianthemum racemosum SP-ES

sweet pepperbush
Clethra alnifolia MS

SEASONAL THEME

bluebells
Mertensia virginica SP

Photo: Peter Gombar

white turtlehead
Chelone glabra F

Photo: Joshua Mayer

smooth aster
Symphyotrichum laeve 'Bluebird' LS

plantainleaf sedge
Carex plantaginea

Photo: Harry Rose

copper-shouldered oval sedge
Carex bicknelli ES

GROUNDCOVER

Photo: Joshua Mayer

wild blue phlox
Phlox divaricata ES

Photo: Lydia Fravel

creeping phlox
Phlox stolonifera SP-ES

Photo: Cranbrook Science

wild ginger
Asarum canadense SP

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL, PART, SHADE
Moisture: WET, WET/DRY, DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

MILKWEED MANIA! | A combination of and bold leaf plants to create a naturalistic look

SEASONAL THEME PLANT

Photo: Tom Pottersfield

foxglove beardtongue
Penstemon digitalis SP-ES

Photo: USFWS Mountain Prairie

common milkweed
Asclepias syriaca MS

Photo: USFWS Midwest Region

swamp milkweed
Asclepias incarnata ES

Photo: Frank Mayfield

butterfly milkweed
Asclepias tuberosa MS

BOLD LEAF PLANTS FOR GARDEN ORGANIZATION

Photo: Lydia Fravel

gray goldenrod
Solidago nemoralis LS-F

Photo: Rosewoman

black-eyed Susan
Rudbeckia hirta ES-LS

Photo: F D Richards

garden phlox
Phlox panniculata F

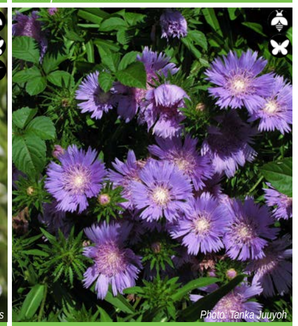


Photo: Tanka Juuyoh

aster
Symphyotrichum spp. MS-F

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL, PART, SHADE
Moisture: WET, WET/DRY, DRY
Pollinator
Rabbit Tolerant

TOP TEN PERENNIALS

goldenrod
Solidago spp.
F

milkweed
Asclepias spp.
MS

aster
Symphyotrichum spp.
F

mountain mint
Pycnantheum spp.
SP-MS

boneset
Eupatorium spp.
LS

black-eyed Susan
Rudbekia spp.
ES-LS

beebalm
Monarda spp.
ES-MS

coneflower
Echinacea spp.
MS

yarrow
Achillea spp.
MS-LS

Joe-pye weed
Eutrochium spp.
MS-LS

Seasonality
- SP SPRING
- ES EARLY SUMMER
- MS MID SUMMER
- LS LATE SUMMER
- F FALL
- AN ANNUAL

Sun FULL PART SHADE

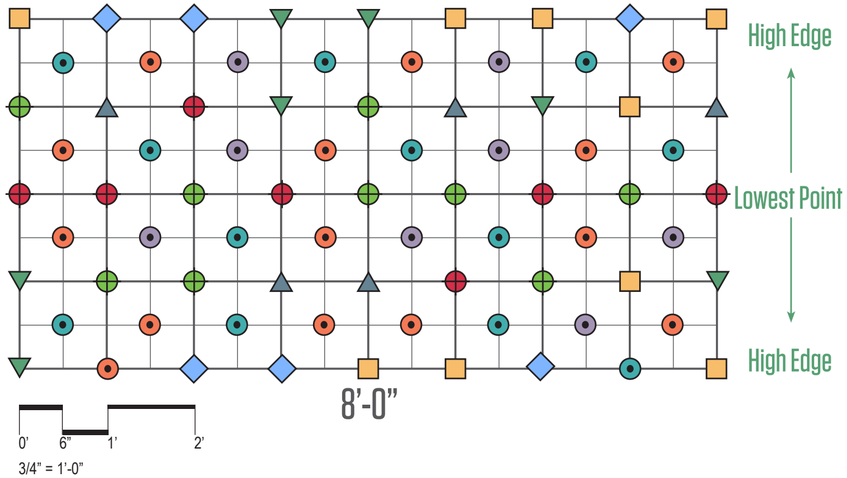
Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

SUNNY BIO | SHADY BIO

POLLINATOR PATCH BIOSWALE



4' x 8' Site, Plant Plugs

Structure Plant

(9) (7)

Seasonal Theme

(9) (5) (6) (7)

Groundcover Plant

(13) (8) (12)

Hint: Sub seasonal theme for groundcover interchangeably!

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

SOMERVILLE POLLINATOR ACTION PLAN

To get involved, informed, or inspired, visit:
voice.somervillema.gov/somerville-pollinator-action-plan

SUNNY BIO | BIOSWALE & RAIN GARDEN

DRY & FLOOD TOLERANT | SALT TOLERANT SUN | WET | UNDER 3.5' TALL

STRUCTURE PLANT

Photo: Arlington National Cemetery

switchgrass
Panicum virgatum 'Cape Breeze'
LS

joe pye weed
Eutrochium fistulosum
MS

SEASONAL THEME

Photo: Drew Avery

little bluestem
Schizachyrium scoparium
LS-F

Photo: Rusty Clark

blue flag iris
Iris versicolor
MS

swamp milkweed
Asclepias incarnata
ES

Photo: Reinhold Kirchener

yarrow
Achillea millefolium
SP-ES

Photo: Drew Avery

aster
Symphyotrichum novae-angliae 'purple dome'
F

ironweed
Vernonia lettermannii 'Iron Butterfly'
MS

Photo: Dan Mullen

northern blazing star
Liatris scariosa var. novae-angliae
LS-F

Photo: Katja Schulz

seaside goldenrod
Solidago sempervirens
LS-F

Virginia mountain mint
Pycnanthemum virginianum
LS

GROUNDCOVER

Photo: Katja Schulz

purple lovegrass
Eragrostis spectabilis
LS-F

Photo: Harry Rose

copper-shouldered oval sedge
Carex bicknelli
ES

Photo: Matt Lavin

path rush
Juncus tenuis
ES

Photo: Peter B. Tillman

little blue-eyed grass
Sisyrinchium angustifolium
MS

Seasonality

SP	SPRING	LS	LATE SUMMER
ES	EARLY SUMMER	F	FALL
MS	MID SUMMER	AN	ANNUAL

Sun: FULL | PART | SHADE

Moisture: WET | WET/DRY | DRY

Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

SHADY BIO | BIOSWALE & RAIN GARDEN

DRY & FLOOD TOLERANT | SALT TOLERANT SHADE| WET | UNDER 4' TALL

STRUCTURE PLANT

Photo: Matt Lavin

northern sea oats
Chasmanthium latifolium
MS

Photo: Thomas Quine

blue wood aster
Symphyotrichum cordifolium
LS

SEASONAL THEME

Photo: Fritz Flohr Reynolds

white wood aster
Eurybia divaricata
LS

Photo: Joshua Mayer

smooth aster
Symphyotrichum laeve 'Bluebird'
LS

Photo: Joshua Mayer

golden ragwort
Packera aurea
SP-ES

Photo: Aaron Volkening

golden Alexander
Zizia aurea
SP

GROUNDCOVER

fox sedge
Carex vulpinoidea
SP

Seasonality

SP	SPRING	LS	LATE SUMMER
ES	EARLY SUMMER	F	FALL
MS	MID SUMMER	AN	ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

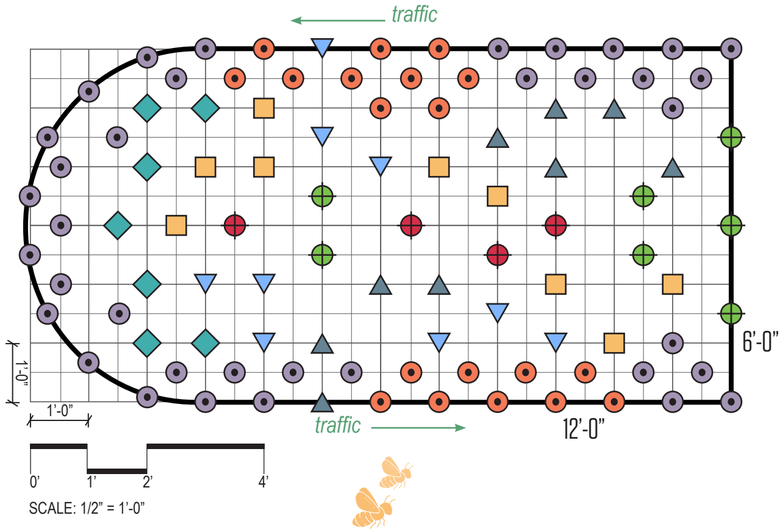
Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

VIOLET AND GOLD

POLLINATOR PATCH
STREET MEDIAN, 6'x12'



STREET MEDIAN - For City Use

Pick a Plant Palette!

Each garden is designed for a specific amount of sunlight, soil mositure, and height so be sure to pick the recipe card on the following pages that will work best for your site. Feel free to mix and match but aim to include plants that will bloom in every season!

Structure Plant

(7) (4)

Seasonal Theme

(9) (9) (9) (7)

Groundcover Plant (plant at 6" off center)

(19) (36)

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

SOMERVILLE POLLINATOR ACTION PLAN

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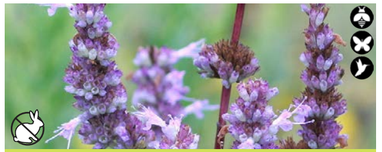
STREET MEDIAN | VIOLET AND GOLD

SUN | DRY | SALT TOLERANT | UNDER 3' HEIGHT

STRUCTURE PLANT

switchgrass
Panicum virgatum 'Niagra Falls'
LS



anise hyssop
Agastache foeniculum
ES-F

blue false indigo
Baptisia australis
SP

SEASONAL THEME

black-eyed susan
Rudbeckia fulgida
LS

lance-leaved coreopsis
Coreopsis lanceolata
SP-MS

salvia
Salvia farinacea 'Victoria Blue'
ES-F

clustered mountain mint
Pycnanthemum muticum
SP-MS

short bee balm
Monarda didyma 'Petite Delight'
MS-LS

blue star
Amsonia hubrichtii/tabernaemontana
S-ES

GROUNDCOVER

white heath aster
Symphyotrichum ericoides 'Snow Flurry'
F

crinkled hairgrass
Deschampsia flexuosa
ES-F

Seasonality

SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

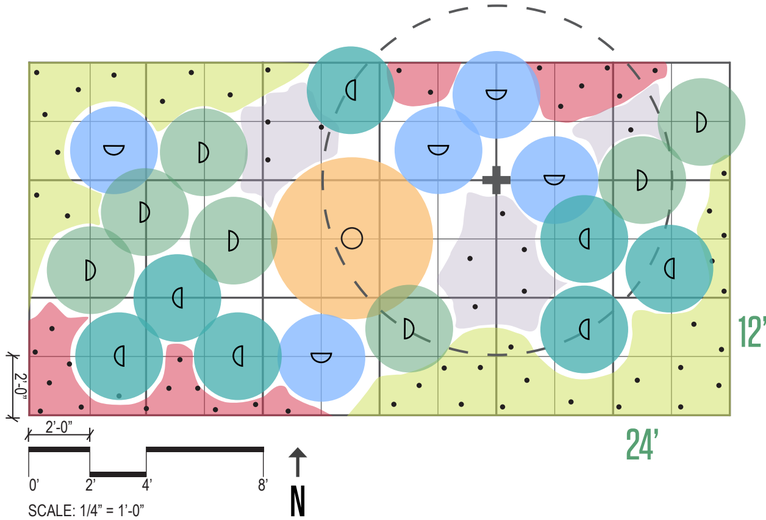
Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

LAYERED CANOPY | CLOUD GARDEN | PIONEER PLANTS | WATER & WONDER | WOODY GLEN

POLLINATOR PATCH
LIVING LAYERS, 12'x24'



Pick a Plant Palette!

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Tree

Shrubs

(1) (5) (7) (7)

Groundcover Plant

Hint: If you choose an evergreen for your tree, no plants underneath the canopy!

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

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Mayor Katjana Ballantyne

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LAYERED CANOPY

SUN/PART SUN | MOIST | VAR.HEIGHTS

TREE

Photo: Jeff Hart

redbud
Cercis canadensis
SP

GROUNDCOVER

Photo: Doug McGrady

anemone
Anemone canadensis
SP

wild geranium
Geranium maculatum
SP

SHRUBS

Photo: Puddin Tain

sweet pepperbush
Clethra alnifolia
MS

Photo: Jim Duggan

inkberry
Ilex glabra
SP

Photo: Michele Dorsey Walfred

hydrangea 'Mary Nell'
Hydrangea aborescens
MS

Photo: Joe and Jeanette Archie

chokeberry
Aronia spp.
SP-ES

flowering raspberry
Rubus odoratus
MS

GROUNDCOVER

Photo: Joshua Mayer

wild blue phlox
Phlox divaricata
ES

Photo: Lydia Fravel

creeping phlox
Phlox stolonifera
ES

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

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CLOUD GARDEN

SUN/PART SUN | VAR.HEIGHTS

TREE

Photo: F. D.Richards

hawthorn
Crataegus spp.
SP-ES

SHRUBS (FLOWERING)

sweet pepperbush
Clethra alnifolia 'Hummingbird'
MS

Photo: Michele Dorsey Walfred

smooth hydrangea
Hydrangea aborescens 'Haas Halo'
LS-F

GROUNDCOVER

Photo: Doug McGrady

anemone
Anemone canadensis
SP

Photo: Sharon K.

wild geranium
Geranium maculatum
SP

SHRUBS (EVERGREEN)

inkberry
Ilex glabra
SP

Photo: Jim Dougall

inkberry
Ilex glabra 'Strongbox'
SP

Photo: William Coville

inkberry
Ilex glabra 'Gembox'
SP

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

PIONEER PLANTS

INFERTILE SOILS | SUN | DRY | VAR. HEIGHTS

TREE

eastern red cedar
Juniperus virginiana
SP

Photo: Andreas Rockstein

black cherry
Prunus serotina
SP

Photo: B.G. Gaulke

gray birch
Betula populifolia
SP

Photo: Robert Taylor

staghorn sumac
Rhus typhina
MS

SHRUB

Photo: Plant Image Library

fragrant sumac
Rhus aromatica 'Gro-Low'
SP

beach plum
Prunus maritima
SP

Photo: Joshua Mayer

New Jersey tea
Ceanothus americanus
ES

GROUNDCOVER

Photo: Ninara

bearberry
Arctostaphylos uva-ursi
SP

Photo: Joshua Mayer

wild strawberry
Fragaria virginiana
SP

Photo: Joshua Mayer

barren strawberry
Waldsteinia fragarioides
ES

Photo: Fritz Flohr Reynolds

white wood aster
Eurybia divaricata
LS

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY
Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

WATER & WONDER

SUN/PART SUN | WET | VAR. HEIGHTS

TREE

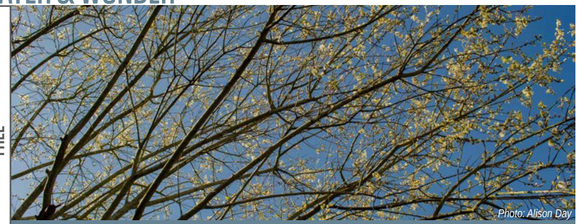


Photo: Alison Day

pussy willow
Salix discolor
SP

Photo: James Austin

serviceberry
Amelanchier spp.
SP

SHRUB

Photo: Malcom Manners

swamp rose
Rosa palustris
MS

Photo: Joe and Jeanette Archie

chokeberry
Aronia spp.
SP-ES

Photo: Plant Image Library

swamp azalea
Rhododendron viscosum
MS

SEASONAL THEME

Photo: Melissa McMasters

swamp mallow
Hibiscus moscheutos
LS

Photo: USFWS Midwest Region

spotted phlox
Phlox maculata
F

GROUNDCOVER

Photo: Doug McGrady

anenome
Anemone canadense
SP

Photo: Lydia Fraval

creeping phlox
Phlox stolonifera
ES

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

WOODY GLEN

SHADE | WET | VAR. HEIGHTS

TREE

Photo: Ian Martin

witch hazel
Hamamelis virginiana
F

Photo: Delaware Master Gardeners

pagoda dogwood
Cornus alternifolia
SP

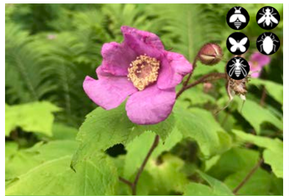
Photo: Katja Schulz

spicebush
Lindera benzoin
LS-F

SHRUB

Photo: Henry Gilbert

sweet pepperbush
Clethra alnifolia 'Sixteen Candles'
MS



purple flowering raspberry
Rubus odoratus
MS

dogwood shrub
Cornus spp.
MS

Photo: Thomas Quine

blue wood aster
Symphyotrichum cordifolium
LS

GROUNDCOVER

Photo: Fritz Flohr Reynolds

white wood aster
Eurybia divaricarta
LS

Photo: Aaron Volkening

golden alexander
Zizia aurea
SP

Photo: Joshua Mayer

phlox
Phlox divaricata
SP

Photo: Lydia Fraval

creeping phlox
Phlox stolonifera
ES

Photo: Cranbrook Science

wild ginger
Asarum canadense
SP

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

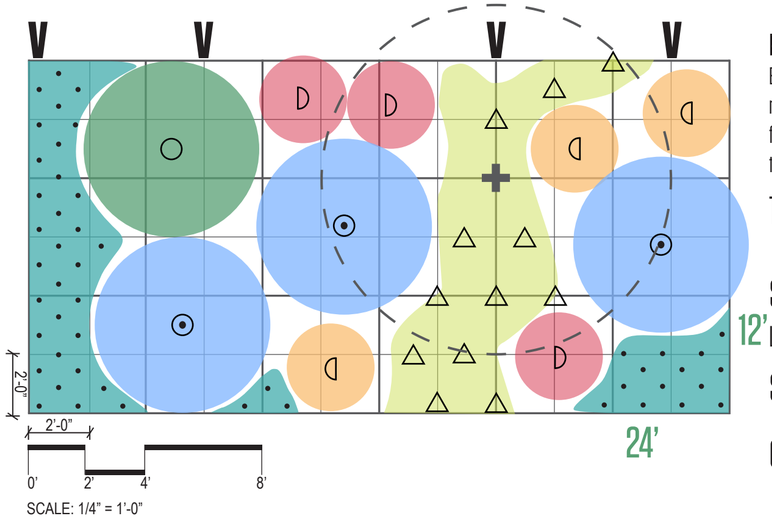
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

EDIBLE THICKET

FENCE LINE

POLLINATOR PATCH
LIVING LAYERS, 12'x24'



Pick a Plant Palette!

Each garden is designed for a specific amount of sunlight, soil mositure, and height so be sure to pick the recipe card on the following pages that will work best for your site. Plug & play with the plants on the recipe cards with the symbols included here!

Tree

Vine

Shrubs

Large Small

Seasonal Theme

Groundcover Plant

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

SOMERVILLE POLLINATOR ACTION PLAN

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EDIBLE THICKET

SUN | LOW PH | FENCE | NOT RABBIT TOLERANT

TREE

serviceberry
Amelanchier spp.
SP

VINE

native wild grape
Vitis vinifera sylvestris
ES

SHRUB - LARGE

elderberry
Sambucus canadensis
LS-F

high bush blueberry
Vaccinium corymbosum
ES-F

SHRUB - SMALL

huckleberry
Gaylusaccia baccata
LS-F

blackberry
Rubus spp.
ES-F

GROUNDCOVER

wild strawberry
Fragaria virginiana
ES

low bush blueberry
Vaccinium angustifolium
SP-ES

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

FENCE LINE

SUN/PART SHADE | DISTURBED SOILS | FENCE | RABBIT TOLERANT

TREE

Photo: BG Grishka

gray birch
Betula populifolia
SP

Photo: James Austin

serviceberry
Amelanchier spp.
SP

SHRUB - LARGE

ninebark
Physocarpus opulifolius
MS

nannyberry
Viburnum lentago
SP

VINE

Photo: Isabelle Blanchemain

virginia creeper
Parthenocissus quinquefolia
ES

SEASONAL THEME

Photo: DrewAvery

aster 'purple dome'
Symphyotrichum novae-angliae
F

black-eyed Susan
Rudbeckia hirta
ES-LS

GROUNDCOVER

Photo: Frank Mayfield

barren strawberry
Waldsteinia fragarioides
SP

Photo: Joshua Mayer

wild strawberry
Fragaria virginiana
ES

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

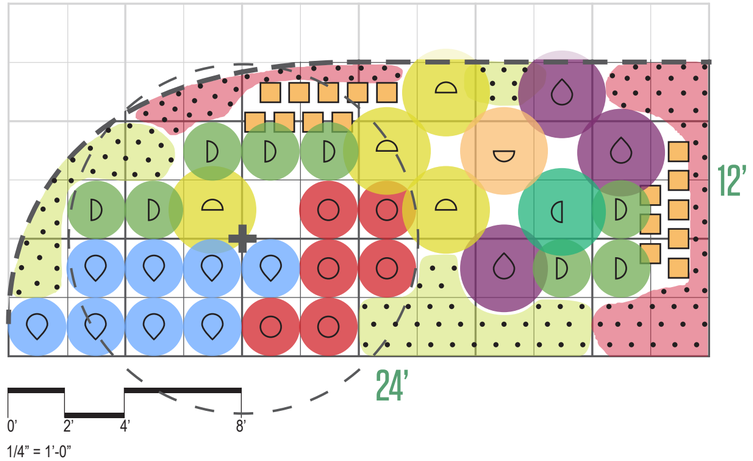
Pollinator

Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

TOP 10 WOODY

POLLINATOR PATCH
12'x24'



Tree
Cornus alternifolia

Shrubs
Ceanothus, Cephalanthus, Clethra, Cornus, Rose, Spiraea alba, Spiraea tomentosa

Seasonal Theme
Asclepias incarnata

Groundcover Plant
Geranium maculatum, Viola sororia

Plant sizes: Deep landscape plugs.
If using larger 1 gallon size plants, increase spacing to 18"

CITY OF SOMERVILLE, MA
Mayor Katjana Ballantyne

SOMERVILLE POLLINATOR ACTION PLAN

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TEN TOP PLANTS (WOODY!)

SUN | VAR.HEIGHTS

TREE

pagoda dogwood — *Cornus alternifolia* — SP

SHRUBS

red-osier dogwood — *Cornus sericea* — MS

New Jersey tea — *Ceanothus americanus* — MS

virginia rose — *Rosa virginiana* — MS

buttonbush — *Cephalanthus occ.* — MS

sweet pepperbush — *Clethra alnifolia* — MS

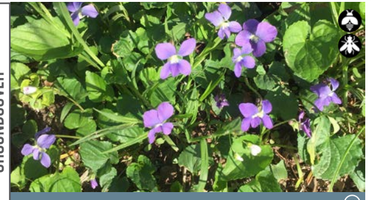
meadowsweet — *Spiraea alba* — MS

steeplebush — *Spiraea tomentosa* — MS

SEASONAL THEME

swamp milkweed — *Asclepias incarnata* — MS

GROUNDCOVER



common blue violet — *Viola sororia* — SP

wild geranium — *Geranium maculatum* — SP

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun: FULL, PART, SHADE
Moisture: WET, WET/DRY, DRY
Pollinator
Rabbit Tolerant

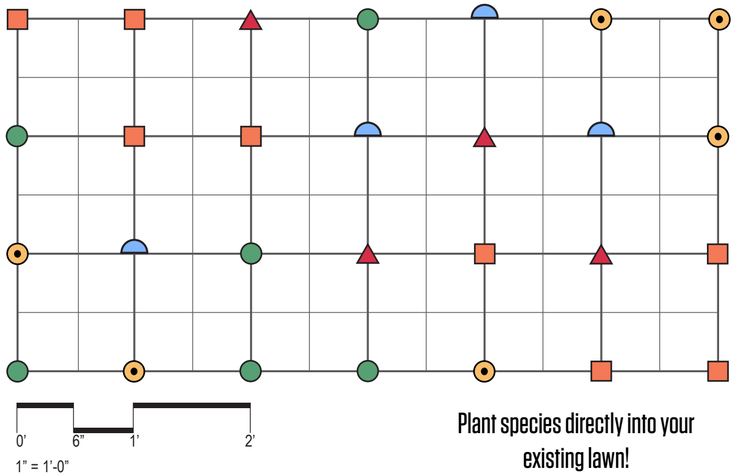
SOMERVILLE POLLINATOR ACTION PLAN

LAWN CONVERSION RECIPE CARDS

	☼ Sun		☀ Shade
CONVERT NON-LAWN INTO A GARDEN! **PLUGGED LAWN 3' x 6'**	SUNRISE (OVER MY LAWN!)	BLUE ESCAPE (FROM MY LAWN!)	YELLOW GLIMMER
THESE ARE MOWABLE GRASSES THAT ARE MORE BENEFICIAL TO POLLINATORS THAN BLUEGRASS! **SEEDED LAWN ALTERNAIVES (GRASSY)**	MOW-ABLE GRASSES		
THESE ARE MOWABLE GRASSES AND FLOWERS IF YOU ARE OKAY WITH A FREEDOM LAWN LOOK! **SEEDED LAWN ALTERNAIVES (FORBS)**	OCCASIONALLY MOW-ABLE FORBS		
THESE SEED MIXES CAN BE USED INSTEAD OF TRADITIONAL LAWN SEED TO PROVIDE GREATER POLLINATOR BENEFIT! **SEEDED MEADOW**	PRE-MIXED NATIVE MEADOW SEED MIXES		

SUNRISE (OVER MY LAWN!) | BLUE ESCAPE (FROM MY LAWN!) | YELLOW GLIMMER | MOW-ABLE GRASSES | OCCASIONALLY MOW-ABLE FORBS | PRE-MIXED NATIVE MEADOW SEED MIXES

POLLINATOR PATCH PLUGGED LAWN CONVERSION



Plant species directly into your existing lawn!

Lawn Plugs, 12" OC

Structural Plant Plugs

(6) (4) (7) (4)

Groundcover (or sub seasonal species!)

(6)

Pick a Plant Palette!

Plug your lawn with these plants to convert it into a pollinator meadow. For a more maintained look, manually remove all the grass first and then install plugs or plant directly into the lawn and let it grow our for a ma

CITY OF SOMERVILLE, MA — Mayor Katjana Ballantyne

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SUNRISE (OVER MY LAWN!) | Perennials to compete with rhizomatic lawn species!

SUN| DRY | LESS THAN 3'

STRUCTURAL PLANT

Photo: Aaron Volkening

golden Alexander
Zizia aurea
SP

Photo: Reinald Kirchner

yarrow
Achillea millefolium
MS

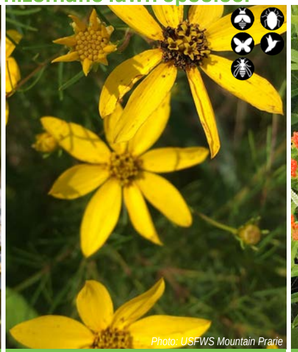


Photo: USFWS Mountain Prairie

whorled coreopsis
Coreopsis verticillata
LS

Photo: Frank Mayfield

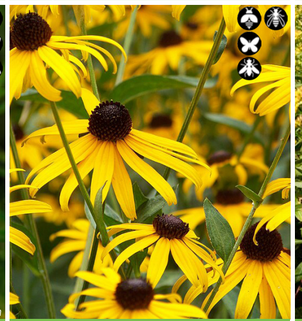
butterfly milkweed
Asclepias tuberosa
MS

Photo: Emily Belt

lance-leafed coreopsis
Coreopsis lanceolata
ES-LS

Photo: Dan Mullen

slender mountain mint
Pycnanthemum tenuifolium
SP-MS



black-eyed Susan
Rudbeckia fulgida
LS

Photo: Frank Mayfield

grass-leaved goldenrod
Euthamia graminifolia
LS

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY

Pollinator
Rabbit Tolerant

BLUE ESCAPE (FROM MY LAWN!)| Perennials to compete with rhizomatic lawn species!

SUN| DRY/MOIST | LESS THAN 4'

STRUCTURE PLANAT

Photo: Patrick Standish

hyssop
Agastache 'Blue Fortune'
ES-F

Photo: Mark Nenadov

northern blazing star
Liatris scariosa var. novae-angliae
LS-F

Photo: Reinald Kirchner

yarrow
Achillea millefolium
MS-LS

Photo: Joshua Mayer

wild lupine
Lupinus perennis
ES

Photo: Audrey Zharkikh

aromatic aster
Symphyotrichum oblongifolium
LS

GROUNDCOVER

Photo: Joshua Mayer

woolly blue violet
Viola sororia
SP

Photo: Peter D Tillman

little blue-eyed grass
Sisyrinchium angustifolium
SP-MS

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY

Pollinator
Rabbit Tolerant

Nativar included as an option is well-suited to urban sites. Swap in straight species as desired!

YELLOW GLIMMER| Perennials to compete with rhizomatic lawn species!

SHADE| DRY/MOIST | LESS THAN 3'

STRUCTURE PLANAT

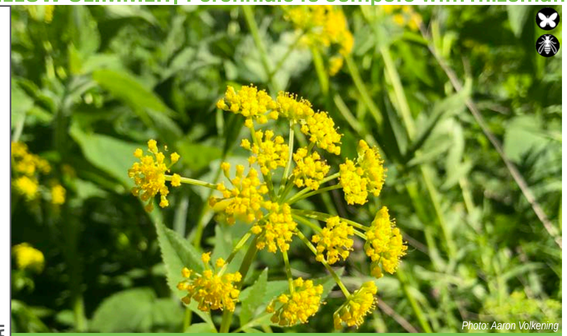


Photo: Aaron Volkening

golden alexander
Zizia aurea
SP

GROUNDCOVER

Photo: Fritz Flohr Reynolds

white woodland aster
Eurybia divaricatus
LS

Photo: Thomas Quine

blue wood aster
Symphyotrichum cordifolium
F

zigzag goldenrod
Solidago flexicaulis
LS

white snakeroot
Ageratina altissima
LS-F

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY
Pollinator
Rabbit Tolerant

LAWN ALTERNATIVES : MOWABLE | GRASSES | MEADOW CONVERSION

SUN | DROUGHT TOLERANT | LESS THAN 2.5'

GRASSES

Photo: Matt Lavin

hard fescue
Festuca brevipila
ES-MS

Photo: Matt Lavin

sheep fescue
Festuca ovina
ES-MS

Photo: Bat

sheep fescue var.
Festuca ovina var. duriuscula
SP

Photo: Andrey Zharkikh

blue fescue
Festuca ovina var. glauca
ES

Photo: Daryl Mitchell

chewing fescue
Festuca rubra subsp. commutata
SP-ES

Photo: Matt Lavin

path rush
Juncus tenuis
SP-F

Photo: Katja Schulz

purple lovegrass
Eragrostis spectabilis
LS-F

Photo: Barry Rose

roundseed panicum
Dichanthelium sphaerocarpon
ES-F

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE
Moisture WET WET/DRY DRY
Pollinator
Rabbit Tolerant

LAWN ALTERNATIVES : OCCASIONALLY MOWABLE | FORBS

SUN | DROUGHT TOLERANT | LESS THAN 2.5'

SEASONAL FORBS

Photo: Reinald Kirchener

yarrow MS-LS
Achillea millefolium

Photo: Cathie Bird

calico aster F
Symphyotrichum lateriflorus

Photo: Great Smoky Mountains National Park

Robin's plantain ES-MS
Erigeron pulchellus

Photo: Fritz Flohr Reynolds

Indian tobacco MS-F
Lobelia inflata

spotted bee balm MS-F
Monarda punctata

Photo: Tom Pottersfield

foxglove beardtongue SP-ES
Penstemon digitalis

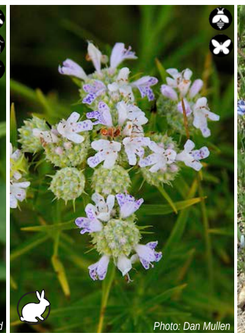


Photo: Dan Mullen

slender mountain mint SP-MS
Pycnanthemum tenuifolium

Photo: Doug McGlady

stout blue-eyed grass SP
Sisyrinchium angustifolium

Photo: Lydia Fraivel

gray goldenrod LS-F
Solidago nemoralis

Photo: Hunda

blue violet SP
Viola sororia

Seasonality
SP SPRING
ES EARLY SUMMER
MS MID SUMMER
LS LATE SUMMER
F FALL
AN ANNUAL

Sun FULL PART SHADE

Moisture WET WET/DRY DRY

Pollinator

Rabbit Tolerant

LAWN ALTERNATIVES SEED MIXES | NO MOW

Photo: 'No Mow Grass Unmowed', American Meadows, americanmeadows.com

No Mow Lawn Grass Seed | American Meadows

This mix of dwarf fine fescue grasses will grow to create a thick, deep green carpet of finely textured turf. The grasses grow densely with deep roots, creating a lawn that is durable and drought-tolerant, ideal for high traffic areas. Mow once a month or less.
5 lbs covers 1,000 sq ft.
10 lbs covers 2,000 sq ft.

https://www.americanmeadows.com/product/grass-and-groundcover-seeds/no-mow-lawn-grass-seed

This is a cool season grass mix, featuring six dwarf fine fescue grasses:
Jamestown Chewing Fescue, Quatro Sheep Fescue, Sea Link Slender Fescue, Sword Fescue, Aurora Fescue, and Kent Creeping Fescue

Photo: 'No Mow Lawn Seed Mix', Prairie Nursery, prairienursery.com

No Mow Lawn Seed Mix | Prairie Nursery

No Mow Lawn is a drought tolerant, low-maintenance grass that needs mowing only once or twice a year. Once fully established, No Mow requires very little water, due to a large dense root system. No Mow grows actively in spring and fall. Once fully established, No Mow requires very little water, due to a large dense root system. Moderate foot traffic is well tolerated and No Mow grows well in most soil types and light conditions. However, consistently moist soils and heavy clay soils should be avoided.

https://www.prairienursery.com/no-mow-lawn-seed-mix.html

A blend of cool-season fescue grasses - mature height of 6" to 1' if un-mown
(varieties not speficied)

LAWN ALTERNATIVES SEED MIXES | LOW MOW

Photo: 'Helia Nurseries', Lisa Vollmer Photography, helianativenursery.com

Native Low Mow Lawn Mix | Helia Native Nursery

This lawn mix is an ecologically-friendly version of the traditional American lawn, replacing exotic & resource-depleting species with non-invasive alternatives. Results in a beautiful lawn that requires less mowing, needs little watering, grows in full- to part-sun, & thrives without fertilizer.

Seed Proivider Installation Instructions: Remove all vegetation in the area you want to seed. Rake smooth & spread seed on bare soil. Tamp to ensure good soil contact. Do not rake; lightly cover with straw. Water the seeds lightly each day until they emerge. Water as needed, once wildflowers & grasses have germinated. Seeds can be spread any time of year, as long as they are consistently watered. Ideal times are Spring or Fall. Not all seeds will germinate the first year - some need a winter to cold stratify. Spread with Love & Enjoy!

https://www.helianativenursery.com/availability-and-price-list

Consists of:
Winter, Autumn, and Rough Bent Grass, Tall Fescue, Creeping Red Fescue, Chewings Fescue, and Purple Top.

Photo: 'Mowed and Unmowed Eco-Lawn', Eartheasy, eartheasy.com

Low Maintenance Eco-Lawn | Wildflower Farm

- Develops deep roots to source water and nutrients naturally
- Attractive erosion control on steep, unmowable slopes
- Rich dark green colour
- Salt tolerant
- Ideal low maintenance turf
- Naturally adapted to a broad range of soils and climates
- Fast germination and early spring green-up
- Highly drought tolerant, reduces irrigation 50-100%
- Slow growing - reducing mowing by at least 50%
- Grows well in full sun, part shade and even deep shade
- High levels of endophyte for increased insect resistance
- Little to no fertilizers required

https://www.wildflowerfarm.com/eco-lawn.html

Consists of:
Slender Creeping Red Fescue (Festuca rubra trichophylla)Creeping Red Fescue (Festuca rubra subsp. rubra) Hard Fescue (Festuca brevipila Sheep Fescue (Festuca ovina subsp. glauca)Chewings Fescue (Festuca rubra subsp. fallax)

Photo: '767 Eco Lawn Green Path at Lavendar Farm', PT Lawn Seed, ptlawnseed.com

767 Dog Park Eco-Lawn Mix| PT Lawn

This is the lawn alternative for dog owners and Parks & Rec departments (dog not required). Premium turf-type tall fescue varieties and Microclover® provide wear and drought tolerance. The tall fescues' rhizomatous 'self-repairing' growth patterns and Microclover's salt tolerance helps reduce the effects of pet urine. A bit of vigorous perennial ryegrass rounds out the mix. Dog Park is a great choice for any high traffic area where drought tolerance and Rhizomatous Tall Fescue attributes are desired. Full sun to dappled shade.
This lawn can be maintained at a 2 inch height for a manicured look or up to 4 inches to let the clover bloom in the summertime.
Features & Benefits: drought tolerant, wear tolerant, nitrogen-fixing, effective for overseeding of existing tall fescue sod.
Establish Dog Park in areas that get four or more hours of sun; once established Dog Park has some shade tolerance. For shadier sites that get less than four hours of sunlight, check out PT 769 R&R Eco-Turf Mix.

https://ptlawnseed.com/collections/drought-tolerance/products/pt-767-dog-park-eco-turf-mix

Consists of:
Rhizing Moon Tall Fescue - Festuca arundinacea 'Rhizing Moon', Bloodhound Tall Fescue - Festuca arundinacea, Foxhound Tall Fescue - Festuca arundinacea, Tetradark Perennial Ryegrass - Lolium perenne, Microclover® - Trifolium repens var Pipolina ssp Microclover

LAWN ALTERNATIVES SEED MIXES |GRASS WITH FORBS

Photo: '755 Fleur de Lawn Pro Time Lawn Seed', PT Lawn Seed, ptlawnseed.com

755 Fleur de Lawn | PT Lawn

Fleur de Lawn® is the original flowering eco-lawn seed mix, inspired by the natural lawns of the New England countryside. We collaborated with Oregon State University to develop this earth-friendly, time and water saving lawn alternative. Hand-mixed in small batches in our Portland shop.

Fleur de Lawn features perennial pink and white English daisies, both single and double petal. Enjoy blooms from late winter to mid-summer. Strawberry and Dutch white clovers and a special variety of dwarf yarrow add exceptional year-round green color. The clovers also naturally feed the lawn with nitrogen, eliminating the need for fertilizers. Beautiful but also durable and drought tolerant, Fleur outperforms grass-only conventional turf as a low-input and low-maintenance lawn.

Not recommended for over seeding into an established lawn. For best results plant on bare soil in areas that get 4+hours of direct sunlight. Do not topdress (cover) seed. Mow about once a month to keep plants in balance. Maintain as high as 5 inches for a mini-meadow look or 3 inches for a more manicured lawn.

https://ptlawnseed.com/collections/drought-tolerance/products/fleur-de-lawn?variant=141703872

Consists of: Perennial Ryegrass - Lolium perenne, Hard Fescue - Festuca trachyphylla, Quatro Tetraploid Sheep Fescue - Festuca ovina 'Quatro', White Yaak Yarrow - Achillea millefolium 'Yaak', White Clover - Trifolium repens , English Daisy - Bellis perennis, Sweet Alyssum - Lobularia maritima (annual), Baby Blue Eyes - Nemophila menziessii (annual), Strawberry Clover - Trifolium fragiferum

Photo: "Eco-tour: Exploring the Demonstration Meadows at Helia Native Nursery," ELA, ecolandscaping.org

Berkshire Meadow Mix | Helia Native Nursery

Up to 5'-0" High! Attracts a wide range of pollinators and needs full sun to part sun (at least 6 hours direct sun a day). Ideal for salt run-off areas, hot locations, poor soil and dry areas.

0.25 oz. will cover 45 square feet
1 oz. covers 175 square feet
1 lb. covers 2,000 square feet

https://www.helianativenursery.com/availability-and-price-list

Species included: Common Milkweed, Orange Butterflyweed, Nodding Bur Marigold, Blunt Broom Sedge, Partridge Pea, Showy Tick Trefoil, Purple Joe-Pye, Ox-Eye Sunflower, Vanilla Sweet Grass, Great Blue Lobelia, Wild Blue Lupine, Wild Bergamot, Spotted Bee Balm, Evening Primrose, Tall White Beardtongue, Black Eyed Susan, Little Bluestem, Showy Goldenrod, Smooth Blue Aster, New England Aster, Heath Aster, Purple Stemmed Aster & Golden Alexander.

Photo: "Native Northeast Wildflower Seed Mix," American Meadows, americanmeadows.com

Native Northeast Wildflower Seed Mix | American Meadows

Up to 5'-0" High! Long lasting blend of native Northeast wildflowers that will give color all season long. This mixture contains 18 different varieties including New England Aster, Red Columbine, Butterfly Weed and Joe-Pye Weed. Perfect for that hard to mow hillside or just wanting to turn your lawn into a meadow, this mix is a solution.

1/4 lb covers 250-500 sq ft.
1/2 lb covers 500-1,000 sq ft.
1 lb covers 1,000-2,000 sq ft.

https://www.americanmeadows.com/product/wildflower-seeds/native-northeast-wildflower-seed-mix

Species included: Eastern Red Columbine, Swamp Milkweed, Butterfly Weed, New England Aster, Partridge Pea, Lance-Leaf Coreopsis, Spotted Joe Pye Weed, Indian Blanket, Ox-Eye Sunflower, Blazing Star or Gayfeather, Wild Lupine, Wild Bergamot, Evening Primrose, Beard Tongue, Black-eyed Susan, Sweet Black Eyed Susan, Brown-eyed Susan, Rigid Goldenrod

LAWN ALTERNATIVES SEED MIXES | MEADOW SEED MIXES

Photo: "Pollinator Palooza Seed Mix Year 3," Prairie Moon Nursery, prairiemoon.com/pollinator-palooza-seed-mix

Pollinator Palooza Seed Mix | Prairie Moon Nursery

Praire Moon Nursery offers this seed mix in cooperation with the "Bring Back the Pollinators" campaign of the non-profit Xerces Society (https://xerces.org/). Designed for full-sun to partial-shade sites with medium soils, this mixed-height mix boasts grasses and most wildflowers at 3', with some flowers reaching 6' at full bloom. Bloom times progress spring through fall. Our Pollinator-Palooza Seed Mix moves beyond more common pollinator mixes by offering plants that appeal to a broad array of pollinating insects. Included in the 45 species are some not commonly available like Late Figwort and Hairy Mountain Mint.

https://www.prairiemoon.com/pollinator-palooza-seed-mix

Species included: Anise Hyssop, Nodding Onion, Rose Milkweed, Common Milkweed, Butterfly Weed, Whorled Milkweed, White Wild Indigo, Partridge Pea, Lance-leaf Coreopsis, Purple Praire Clover, Pale Purple Coneflower, Purple Coneflower, Rattlesnake Master, Biennial Guara, Cream Gentian, Showy Sunflower, Round-headed Bush Clover, Meadow Blazing Star, Prairie Blazing Star, Great Blue Lobelia, Wild Bergamot, Stiff Goldenrod, Wild Quinine, Foxglove Beardtongue, Hair Mountain Mint, Mountain Mint, Yellow Coneflower, Black-eyed Susan, Brown-eyed Susan, Early Figwort, Wild Senna, Early Goldenrod, Showy Goldenrod, Smooth Blue Aster, Ohio Spiderwort, Blue Vervain, Culver's Root, Golden Alexanders, Side-oats Grama, Field Oval Sedge, Canada Wild Rye, Dudley's Rush, Little Bluestem, Rough Dropseed, Prairie Dropseed.

Photo: "Native Perennial Wildflower Seed Mix," Vermont Wildflower Farm, vermontwildflowerfarm.com

Native Perennial Pollinator Wildflower Seed Mix | Vermont Wildflower Farm

A mixture of native wildflowers that provide food and shelter for pollinators. These native wildflowers are all perennials. They will come back year after year once established. Hand packed with 100% pure, fresh wildflower seed (non-GMO & neonicotinoid/chemical free) Mix of 22 perennials with long lasting bloom.
Other Features: Easy to grow, adapts to various soil conditions, excellent for all pollinators, low maintenance once established, long bloom time, cut flowers, mass plantings, drought tolerant, native.

1 lb covers 1,000-2,000 sq ft
15-20 lbs per acre

https://www.vermontwildflowerfarm.com/products/native-perennial-pollinator-mix

Species included: Lanceleaf Coreopsis, Butterfly Weed, Purple Coneflower, Tall White Beardtongue, Black-eyed Susan, Partridge Pea, Blue Vervain, Smooth Blue Aster, Blazing Star, Swamp Milkweed, New England Aster, Wild Seena, Ohio Spiderwort, Golden Alexanders, Wild Bargamot, White Avens, Narrowleaf Mountain Mint, Blue False Indigo, Roundhead Lespedeza, Boneset, Joy-Pye Weed, White Snakeroot.

Photo: "Pollinator Palooza Seed Mix Year 3" Prairie Moon Nursery, prairiemoon.com/pollinator-palooza-seed-mix

Mesic to Dry Native Pollinator Mix w/o Grasses | Prairie Moon Nursery

This mix contains native forbs common in the Northeast. Excellent for wildlife food and shelter, including pollinators. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

https://www.ernstseed.com/product/mesic-to-dry-native-pollinator-mix-w-o-grasses/

Species included: Purple Coneflower, Tall White Beardtongue, Blue Vervain, Lanceleaf Coreopsis, Blackeyed Susan, Oxeye Sunflower, Roundhead Lespedeza, Golden Alexanders, Partridge Pea, Wild Senna, Swamp Milkweed, Heath Aster, Blue False Indigo, Calico Aster, Browneyed Susan, Boneset, Wild Bergamot, Hoary Mountainmint, Common Milkweed, White Goldenrod, Gray Goldenrod, Early Goldenrod, Wrinkleleaf Goldenrod

Photograph by: Cristian Umana, Offshoots

Section 12

COMMUNITY OUTREACH

Key Ideas:

Community Engagement Goals:

To continuously devleop strategies for community awareness, collect data that is mesaurable, and foster a sense of ownership and action.

Intial outreach showed community support but engagement was very limited at the time of publication.

Tools and Methods:

- A 'Meeting in a Box,' is provided to spread the word at events - see Appendix D to access the materials.
- Demonstration garden at Somerville City Hall planted in June 2024.

Future Engagement Goals:

Expand efforts and encourage engagement to audiences not previously reached.

Community Outreach

Engagement Approach

The SPAP Advisory Committee and the project team collaborated on the community outreach approach. They agreed that it is vital to engage with community members who are not yet aware/involved with this topic, to go out into the community and meet them where they are, and to stay open to feedback. The engagement approach is two-pronged. Phase one, in the spring of 2024, coincided with Plan development. Phase two will concur with Plan rollout. This section will review the approach and findings of phase one. Recommendations for phase two can be found in Section 13: What's Next.

Outreach Goals

The following goals were generated for phase one in collaboration with the committee, PSUF, and community outreach specialist Harry Harding of Conditioning Leaders:

- Goal: Engage with informed/less informed/uninformed community members.
    - Objective – Develop strategies to reach each where they are.
    - Objective – Develop strategies that allow for ownership to evolve.
- Goal: Seek measurable data that can be gathered in a variety of ways.
- Goal: Root engagement in understanding what Somerville values.
- Goal: Provide education on why this project is happening, the importance of pollinators, and how we all can help.

The engagement process also tried to fill knowledge gaps in the data review. This included crowdsourcing information on existing residential garden types and locations, understanding what best practices the community is ready to take on, and gathering an initial understanding of the community's interest in pollinators.

Outreach Method

With the goals above in mind, the outreach package was designed to act as a "meeting in a box." The materials could be used by the City, the committee, or placed on display to garner feedback at many different events rather than at a singular outreach meeting (refer to Appendix D for these materials). Each individual outreach material explains how to use the information and includes a QR code linked to the SomerVoice page with digital versions of each form. A Google Form version of the questionnaire and an ESRI Storymap version of the mapping exercise were created to be filled out by residents online and were used to input data as it was collected. Using a standard set of questions allowed a 1:1 collection of responses across platforms. The meeting-in-a-box kit included the following components:

Informational Board and Flyer – "Why Pollinators"

These educational resources provide the basic foundation for why pollinators are important and why they are in decline, explaining the reason why Somerville is prioritizing this Plan. It also introduces the mascot species and links to the online video series "Meet Your Neighbors" to further educate the community on the local species they may see around town.

Informational Flyer – "How You Can Help"

A handout with a short list of recommendations for how the Somerville community can participate in helping pollinators. One page speaks to residents with gardens and the other to residents without space to plant. The goal is to communicate that everyone can participate in this effort, and we need "all hands on deck."

Map of Existing Gardens

To help understand the existing state of pollinator habitat throughout the city, residents can identify the location of any known existing gardens with a pin on a city map (fruit/vegetable, ornamental flowering, native flowering). A digital version is shared through a QR code and was used to compile all data points.

Questionnaire/Pledge

The questionnaire gives the community an opportunity to express their level of interest in providing for pollinators, to pledge actions they are ready to take, and to teach a little bit about what actions will help. A digital version is shared through a QR code and was used to compile all data points.

Outreach Process

From March through May 2024, the SPAP committee and PSUF staff attended 15 events throughout Somerville to spread the word about the Pollinator Action Plan. These events included a diverse group of Somerville residents, from K-12 students at Family Steam Night to the Council on Aging's bingo lunch. Outreach materials were developed during this time, and the meeting-in-a-box kit was rolled out in mid-April (see Appendix D).

Summary of Community Feedback

Figure 37 and 39 reflect the feedback received from the outreach questionnaire (See Appendix D for the original questionnaire).

As indicated by the charts, the responses received were overwhelmingly supportive of the Pollinator Action Plan. However, many events were environmentally focused, and the results may not reflect the feelings of the Somerville community as a whole. As of August 2024, only 55 community members have answered the questionnaire. Only 50 responses were recorded to the pledge and 38 to the interest level question. With a total population of approximately 80,000 residents, it is essential to continue this outreach and hear from more residents during the next phase of this project. The priorities and recommendations in this Plan should be revisited once more responses are available for analysis.

The Somerville garden mapping exercise (**Figure 38**) received 144 responses. The pins on the in-person maps are not precise enough to know exactly the address of each garden, but they do start to show existing habitat patches.

Open-ended text responses provided additional input from the community and were largely in support of this Plan. Key words used by responders are represented in the word cloud (**Figure 40**).

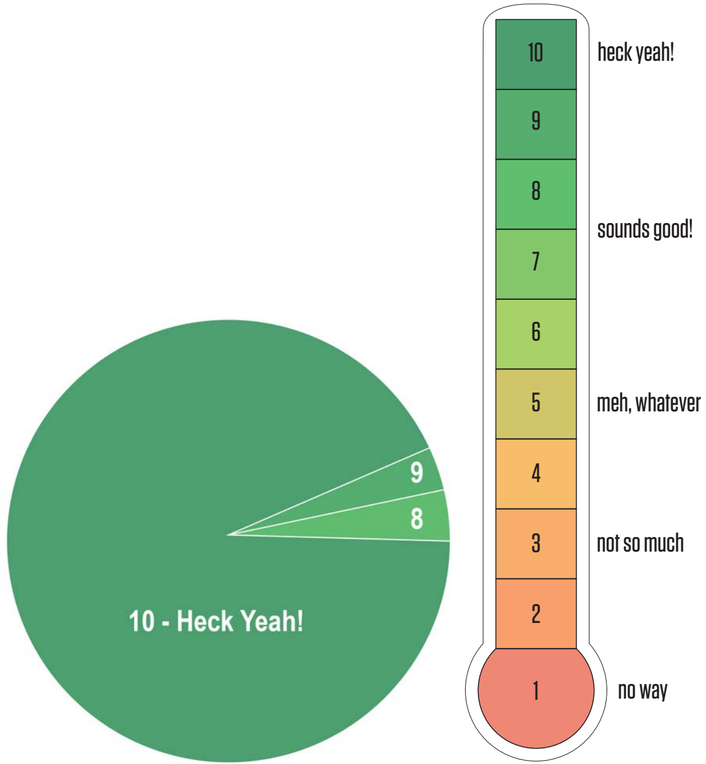


Figure 37: Results of community feedback and outreach asking the Somerville community to gauge their interest level in supporting more pollinators around town.

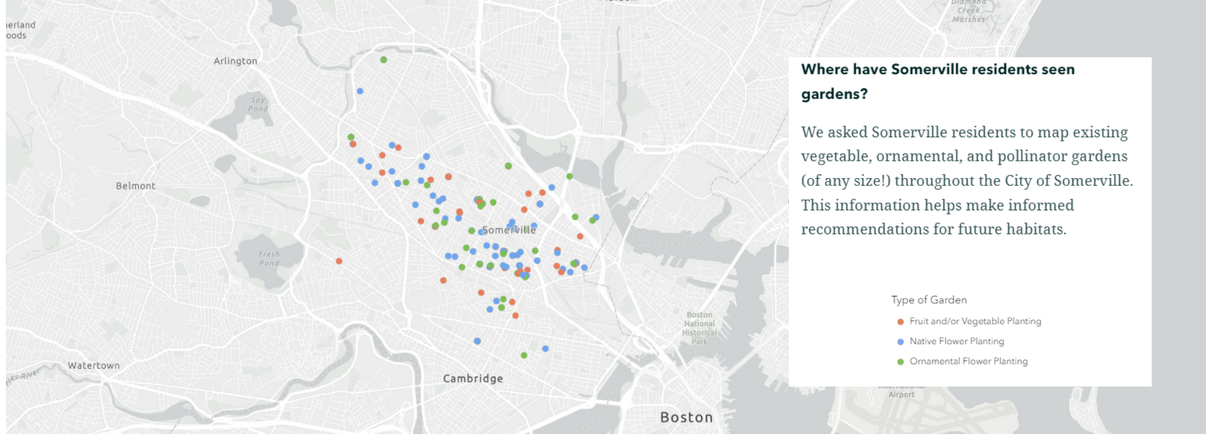


Figure 38: Results of community mapping exercise.

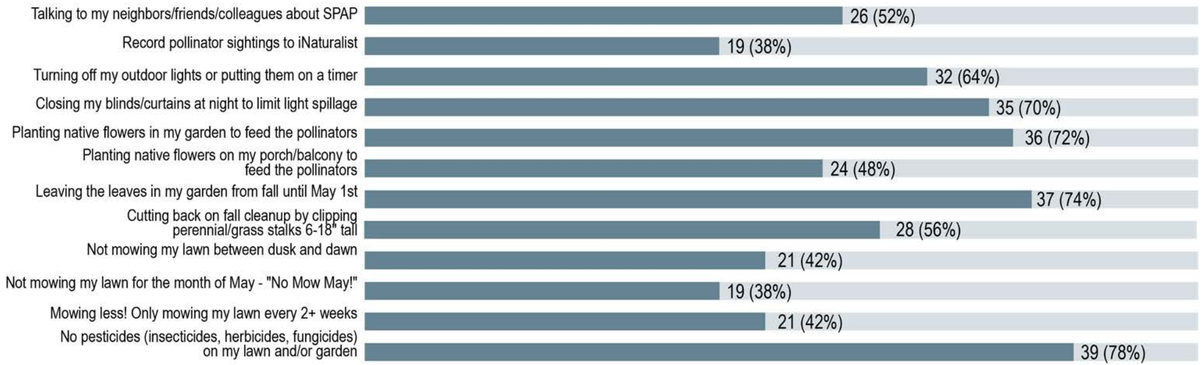


Figure 39: Results of SPAP pledge asking what ways the community would be able/willing to support pollinators (results over 3% shown).

At the time of publication the outreach materials are in the process of being translated but had not yet been disseminated. As phase one wraps up and phase two (Plan rollout) gets underway, sharing translated materials will be critical to ensure the whole community has access to these resources and information.

City Hall Demonstration Garden

As part of this Plan, a demonstration garden was constructed with a group of volunteers between June 26-28, 2024. The garden removes approximately 1,000 sq ft of lawn at City Hall and replaced it with three different plant palettes from the SPAP recommendations to support local pollinators. Plants were selected based on the floral resource requirements of Somerville pollinators, as indicated by our data analysis. The specific recipe cards used for this installation can be found in Section 11: Pollinator Pantry (Sunny Day, Purple Sky & Magenta Magnet).

The goals of the demonstration garden are to:

1) Support pollinators with larval host species and pollen and nectar resources.
2) Demonstrate maintenance practices that support nesting.
3) Create a beautiful garden that many community members will find aesthetically pleasing and use as inspiration for their own properties.
4) Provide a low-maintenance, easy-to-install garden that will survive hot, dry, and sunny site conditions, with only 9" of available soil, and tolerate rabbit browse.

The garden serves as an area not only to view plants but also as a location for future regular monitoring of pollinator visitors.

Photographs by: Cristian Umaña, Offshoots

Photographs by: Cristian Umaña, Offshoots

Volunteers working with Offshoots to install the demonstration garden.

Figure 40: Results of community feedback and Google Form outreach questionnaire.

The intention of this installation is to showcase the achievable balance between pollinator benefits and aesthetics. The plant palette highlights species that are predominantly native to MA and have the most pollinator interactions observed in Somerville. There are a handful of regionally native species (native to New York/PA) and nativars added to enhance the overall appearance of the garden throughout the year.

Ongoing Outreach Recommendations

Additional outreach is recommended to continue developing an understanding of Somerville residents' values around pollinators and habitat. What is the community's level of interest in pollinators? Are they ready to act and how are they willing to change their day-to-day behaviors? These findings can provide insight into whether there is a true groundswell of support for pollinators or a smaller group of community members who are actively engaged. This will help shape future outreach efforts.

In the short term, the outreach materials provided for the initial data collection can continue to be used throughout the Plan rollout phase to understand community interest and current habitat locations. Future engagement could include using multiple platforms such as social media, local newspapers, community bulletin boards, and even direct mail to ensure a wider reach. Hosting events at different times and locations across the city can also engage a broader spectrum of residents. Additionally, offering incentives for participation, such as small giveaways or entry into a raffle, might encourage more people to respond. By broadening the scope of outreach and employing diverse methods, the City can aim to gather more balanced and comprehensive feedback from its residents.

A key takeaway from the outreach collaboration between the project team and the Advisory Committee was that for the contents of this Plan to be successful, there needs to be a groundswell of support. One way to get the ball rolling would be to encourage a sense of ownership of this work that changes hands over time. By giving community groups, student groups, and residents the knowledge and skills needed to do the work of supporting pollinators, they can each pass along the message and encourage their networks to get involved. This sort of citywide community support could make a huge difference in the efficacy of this Plan. Advisory Committee members are perfectly poised to be some of those initial lines of connection. The SomerViva Office of Immigrant Affairs can also help spread awareness and resources into their existing networks of immigrant and non-English-speaking communities.

As the community aims to create a healthier environment for pollinators in Somerville and expand our shared understanding of their role in the urban ecosystem, it is vital to engage the community actively and intentionally. Engagement strategies should be creative, iterative, and adaptive. A commitment to collection and analysis of the efficacy of outreach strategies is critical. This will enable more informed engagement of residents and stakeholders. To optimize the impact of outreach, the City and its partners are encouraged to take action, learn, adjust, and repeat.

Refer to Section 13 for additional information on what is next.

Section 13

WHAT'S NEXT?

Key Ideas:

How do we keep up the momentum on our Pollinator Action Plan? Potential future recommendations include:

- Ongoing Pollinator **Species Monitoring**
- SPAP **Bio Blitz** (monitoring events)
- Five-Year **Monitoring Review**
- **Pilot Projects** (i.e., create more habitat)

Ideas for Sustained Community Engagement:

- Pollinator Ambassadors
- Pollinator Food Truck and/or DIY Garden Kits
- Awareness Campaign
- Landscape Service Industry Training

Early Action Items:

- See the To-Do List

What's Next?

Completing the Somerville Pollinator Action Plan is a big step. This Plan is supported by the excellent research the City has done on Somerville's climate vulnerabilities and urban tree canopy, along with ordinances seeking to increase habitat and green space. However, there is hard work to be done to ensure that this Plan is a success in the long term. This section outlines opportunities for the City and the greater Somerville community to continue the mission of this report in a meaningful and impactful way. The following suggestions will need community partners and residents' support to get them off the ground. These ideas are just the beginning of what could become a lasting culture of supporting Somerville's pollinators.

Species Monitoring

Additional expert surveys are recommended to fill in the identified data gaps (see Section 5: Somerville's Pollinators) and document the initial impact of SPAP plantings. While these may be beyond the scope and expertise of City staff, these recommendations could be accomplished through partnerships and collaborations with scientific, academic, and community partners.

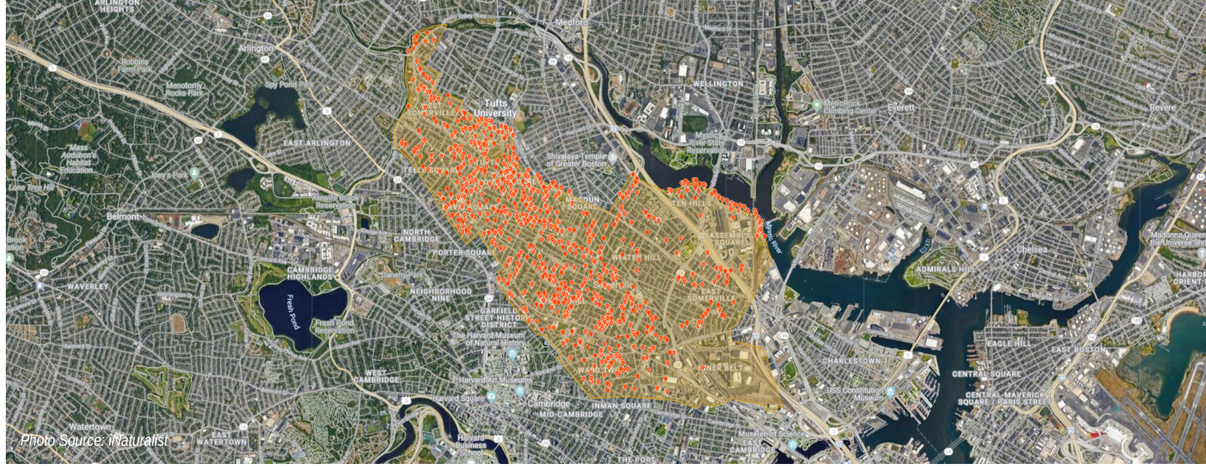
Data Gaps – Expert Survey

A two-year expert survey from early spring through the following spring is recommended and should include the following:

- Surveying pollinators in public green spaces during each season of activity with a focus on poorly sampled areas of Somerville.
- Specific focus on trees and shrubs to fill in gaps in early-season data. Two years of spring surveys are recommended.
- Key interactions with native plant species to guide citywide plantings.
- One training day in each fiscal year for citizen scientists on pollinator identification.
- Graphical and narrative report on data findings.

A one-year expert survey from spring through fall is recommended to study the nocturnal insects in the city and would include:

- Surveying nocturnal flower-visiting insects in public green spaces during each season of activity.
- Key interactions with native plant species to guide citywide plantings.
- One training day in each fiscal year for citizen scientists on nocturnal flower-visiting insect identification.
- Graphical and narrative report on data findings.



Visit iNaturalist to see the SPAP project and start adding your own observations. Ongoing monitoring by the community will help gauge the success of this work.

Ongoing additional expert surveys are recommended once every 3-5 years to document SPAP project impact and assess whether conservation goals need to be refined/updated. This monitoring will complement ongoing citizen science efforts to document pollinators using iNaturalist and Earthwise Aware (EwA). Part of this can include in-person training of citizen scientists to gather better data on pollinators.

Data Gaps – Citizen Scientists

Somerville residents will continue to play a vital role in monitoring pollinator species and their plant interactions. Posting observations to iNaturalist and EwA Buggy (when trained by Earthwise Aware) will provide supplemental species data and allow expert reviewers to monitor trends over time compared to the findings of this project.

Mascot Species

Section 5: Somerville's Pollinators identified six pollinator species that will act as community engagement mascots and be targeted for additional monitoring. These species can be an educational tool to emphasize the importance of building human to non-human community for healthy, sustainable cities. These six pollinators are representative of the ecological diversity of pollinators in Somerville, and efforts to support these six will benefit many other species. In addition, they are visually striking and conspicuous, meaning they are easy to identify for monitoring efforts by citizen scientists. To learn more about these species' ecology and identification, watch Dr. Nick Dorian's SPAP videos "Meet Your Neighbors!"

SPAP Bio Blitz

Local partners can help create buzz around monitoring by hosting a "Bio Blitz" event through the SPAP iNaturalist project. Promoting a short window of time for the community to get outside and track sightings would increase the number of observations and raise awareness. These events could be based around a time of year (e.g., to get additional early spring data), particular species (e.g., the mascot species), an area of the city (e.g., to fill in Ward One and Two data gap), or a time of day (e.g., to track nocturnal flower visitors).

Five Years From Now – What Would We Like to Know?

As a part of ongoing monitoring, the following questions should be reviewed at least every five years:

How are pollinators faring in Somerville?

Pick common, easily identifiable species (with less-common partner species) to monitor over time. This Plan has identified the first six mascot species to track. Over time the target species can shift based on identified trends or issues.

Did community members generate this knowledge?

Are Somerville citizens participating in the advancement of habitat and monitoring data? If not, can the City implement additional ongoing outreach to involve the community in this vital process?

Can the available garden designs be refined to support pollinators most in need?

As new information becomes available on pollinator trends, the City should refine and adjust the available documentation to meet the current species' needs. For example, if any of the regional species that are not currently found in Somerville begin to show up in the data, there would be an opportunity to provide residents/City planners with the information needed to support that particular group.

Are patches and corridors being established?

Are the known areas of habitat expanding and creating a network throughout the city? Is this occurring in some areas and not others? This information should be considered as the City reviews its prioritization metrics (see Section 9) and used to determine what area may need additional outreach support to work towards this goal.

Pilot Projects

Pollinator Patches

The City, in collaboration with partner organizations, should consider implementing demonstration gardens in public parks using the prioritization framework and best practices included in this report. These installations will expand existing habitat and should include signage to educate the community on planting and maintenance practices.

Pollinator Pots

Building off the work done by the Tufts Pollinator Initiative (TPI), the City and/or partner organizations could raise awareness by installing pots of attractive, pollinator-friendly plants at Somerville parks and at corners of major intersections. The pots would contain flowering perennials that bloom in their first year of planting and interpretive signage with a link to an online website where participants can learn more about the project. From TPI's experience doing ecological research with planters at parks throughout Somerville, dense plantings of highly attractive flowers draw the attention of curious community members as much as they do the attention of hungry pollinators. Based on the success of the TPI project, it is anticipated that Pollinator Pots would tap into a much broader and more diverse audience with relatively little effort. After the growing season, the flowers in the pots could be given out to community members to increase participation in urban pollinator gardening and reduce financial barriers. To further support the wards identified as having fewer observed pollinators, these could be placed in areas like East Somerville or around apartment buildings in Wards One, Two, and Four where residents do not have individual gardens.

Ongoing Engagement Opportunities

The recommendations of this Plan will only be successful if they are adopted. Continued City and community support to spread awareness about the importance of creating pollinator habitat will be critical to the success of this initiative. The following opportunities for ongoing outreach are recommended for local organizations, institutions, City partners, non-profits, etc.:

Photo Source: Tufts Pollinator Initiative

The DIY Pollinator Garden concept is inspired by the custom garden kits designed and sold by Hudson Garden Studio. *Photo Source: Hudson Garden Studio Instagram.*

The Native Plant Pollinator Food Truck is inspired by the work of Miridae on their Mobile Nursery, Sacremento, CA. *Photo Source: American Society of Landscape Architects.*

DIY garden kits and a pollinator "food truck" are two fun ways that community groups could help distrubte plants to the community. Visit Hudson Garden Studio's website to learn more about their garden kits and Miridae's website to learn more about the Miridae Mobile Nursery.

Pollinator Ambassadors Training

Somerville residents have diverse backgrounds in pollinator conservation, ranging from highly knowledgeable to novices who may be afraid of insects or intimidated by gardening. To engage all residents of Somerville, a local organization could facilitate an online training program called "Somerville Pollinator Ambassadors" (SPA). This program would train self-selected residents to be informed and capable advocates for pollinators in their community. By investing in education, trained residents ("ambassadors") could continue raising awareness for pollinator conservation and gardening at outreach events across the city.

The SPA training program would be an online course created by a consultant/partner that teaches the ecology and conservation of urban pollinators and trains participants in effective science communication. Dr. Nick Dorian has already piloted this program in spring 2023 with 12 undergraduates at Tufts University. Not only does this program model increase SPAP's impact and reach within the greater Boston area—making Somerville a hub of pollinator knowledge and expertise—but when your neighbor becomes your teacher, it also creates a culture of pollinator conservation centered entirely on community. SPA would equip ambassadors with a highly transferable set of public speaking and communication skills they can use to catalyze positive environmental change for years to come.

Pollinator Food Truck

A partner organization could host a "food truck" for pollinators by providing a mobile native plant nursery that sells plant species to support local pollinators. Trucks could be used as a pop-up pollinator education tool for public events and create a fun buzz (pardon our pun) around the Pollinator Action Plan. This would be a highly visible way to build support for the early adoption of SPAP concepts.

Photo Source: Tufts Pollinator Initiative

DIY Pollinator Garden Kits

This giveaway/sale idea would provide pre-mixed plant bundles that each contain the plants found in a specific recipe card designed for a particular set of site conditions. Similar to the "food truck" idea above, DIY garden kits could bring public outreach to farmer's markets and public events (or be sold on the food truck).

Pollinator Postcards & Sticker Campaign (Mascot Species)

A fun opportunity to expand the visibility of the mascot species (see Section 5: Somerville's Pollinators and Section 11: Pollinator Pantry for more information) is to create large stickers and pollinator postcards of each of the six mascot species. Imagine pollinator stickers flying around on every water bottle and bike in Somerville! The goal would be to raise awareness and help residents recognize these commonly seen and easily identifiable pollinators in Somerville. New species stickers and postcards could be added in the future.

Education for Landscape Companies

Private landscape companies manage a large portion of Somerville's landscapes. A new normal must be established to change commonplace landscape maintenance practices around the city. This will require educating landscape installers and maintenance companies to move away from conventional practices and towards the best practices outlined in this Plan. Getting companies to change these practices, including frequent mowing and mulching (which can bolster revenues), may be difficult. However, if Somerville residents and landowners ask for pollinator-friendly landscape services, there will be demand for contractors to shift in that direction. Some contractors will also be willing and ready now. To help facilitate that changing trend, the City could partner with a local non-profit to host workshops for landscapers, provide resources for those willing to become certified as pro-pollinator landscape contractors, or create an online directory of contractors who provide these services to help the Somerville community connect with them.

SPAP To-Do List

Looking ahead, the following action items can be the first small steps towards putting this Plan into action. This list should evolve as additional outreach efforts are completed and as new data becomes available.

Somerville Residents

- Plant a pollinator garden in your yard or in pots on your porch/balcony.
- Suggest planting a pollinator garden to your employer, landlord, school, or community group.
- Follow the maintenance and lighting practices outlined in this Plan.
- Ask your local nursery about the native plants they offer, the straight species they sell, and if any of their plant stock was propagated from wild, local seeds.
- Participate in citizen science to count pollinators in Somerville by posting observations to iNaturalist or attending a training with Earthwise Aware.
- Advocate for pollinators in Somerville and against the use of neonicotinoids more broadly with local and state government.
- Get involved with local community organizations to find community and support for this work.
- Share information and resources with your friends, family, neighbors, and community. Be an advocate, spread the word, and keep the momentum moving forward for pollinators!

Community Organizations

- Collaborate with the City to initiate the actions outlined in this section:
    - Host species monitoring and bio blitz events.
    - Develop how-to pollinator gardening guides.
    - Provide training events.
    - Offer a plant kit/seed giveaway or sale.
- Continue outreach efforts and spread the word about Somerville's pollinators and this Plan to your network and regional organizations.
- Advocate for State and Federal legislation that bans the use of neonicotinoids.
- Organize plantings with your organization/network and develop planting and maintenance plans based on the information in this report. When ordering plants, ask your local nurseries about the native plants they offer, the straight species they sell, and if any of their plant stock was propagated from wild, local seeds.

City of Somerville

Mayor's Office

- Consider signing the Bee City USA pledge.

City Councilors/Legislation

- Consider adopting a Dark Sky Ordinance and/or a "lights out policy."
- Collaborate with the Inspectional Services and PSUF on Overgrowth Ordinance.

Department of Public Space and Urban Forestry

- Develop a comprehensive map of existing pollinator plantings (defined as having a high percentage of native plants) in public parks. Use this map to determine areas of opportunity for adding pollinator plants in existing or new beds based on the priorities outlined in this Plan.
- Update the prioritized and potential habitat map (see **Figure 35** in Section 9: Public Space and Policy Recommendations) when new data becomes available.
- Develop partnerships with scientific, academic, and community partners to address monitoring needs.
- Secure funding for additional pollinator plantings.
- Collaborate with the Department of Public Works on creating a revised set of maintenance specifications for City staff and landscape and horticultural contractors working on public spaces throughout the city.
- Work with State partners to identify opportunities for pollinator habitat and adjusting management practices on State-owned land throughout the city.
- Develop a pollinator garden signage/certification program for private properties.
- Collaborate with the Planning, Preservation, and Zoning on potential adjustments to the Green Score requirements and bonuses.
- Work with City Council to review applicable ordinances.
- Collaborate with community organizations on implementation, outreach, and Plan rollout as outlined.
- As more responses to outreach materials come in, review the Plan's recommendations to confirm that they match community needs. Update as necessary.
- Provide the Somerville Public Library system with at least one copy of this Plan for each location.

Photograph by: Shelby Chapman-Hale, Offshoots

Photograph by: Cristian Umaña, Offshoots

Mayor Ballantyne, Somerville PSUF staff, SPAP Advisory Committee members, Offshoots design team, and the community gathered to celebrate the launch of the Somerville Pollinator Action Plan in July 2024.

Closing Remarks

The Somerville Pollinator Action Plan has been years in the making. This effort has taken the work of advocates, City employees, a dedicated advisory committee, partner agencies, skilled consultants, and the support of the City Council and Mayor Ballantyne's administration. It is through the many conversations, debates, analyses, edits, and more edits that we reach this inspiring point today. Not a project end, but a jumping off point.

What has become apparent is that there is a part for all to play in creating habitat in Somerville. Whether you have a small porch with pots to grow in or own the huge swaths of land along the Mystic River, you can support pollinators and wildlife.

This kind of work is unique in that way. It does not require an advanced degree, a career in restoration, or a large property. It can and must be done by the broadest variety of residents possible. Unlike cities with acres of conserved land at their disposal, Somerville has to build an impact through many small actions. Each front yard, each street tree, each collection of garden pots combines to create a city of pollinator-friendly corridors. In this way, we act as a group, not as individuals.

This plan is a road map that residents, City staff, and other municipalities can follow. It is not for Somerville alone, though it speaks directly to Somerville residents and staff. These materials are available for anyone to learn from and act on. We will make more of a difference if this work, as many pollinators do, crosses municipal borders. This Plan was driven by all the dynamic energy that characterizes Somerville, but it is a call to action for us all. We can only hope that in ten years' time we will see these efforts build upon one another, creating a vast urban ecology that we all can be proud to have taken part in creating.

Thank you for joining us.

Sincerely,

Alison Maurer

Ecological Restoration Planner

City of Somerville

Photograph by: Dr. Nicholas Dorian

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