Williams College

Environmental Planning Workshop

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Williamstown Lawns-to-Meadows

Environmentally Friendly Lawn Policies

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Table of Contents

List of Figures

1 Land Acknowledgement

It is with gratitude and humility that we acknowledge that we are working and gathering on the ancestral homelands of the Mohican people, who are the indigenous peoples of this land. Despite tremendous hardship in being forced from here, today their community resides in Wisconsin and is known as the Stockbridge-Munsee Community. We pay honor and respect to their ancestors past and present, as we commit to building a more inclusive and equitable space for all.

2 Project Scope

Building upon the work of the Bee Friendly Williamstown organization and past ENVI 302 students, our project was to spread awareness about the benefits of converting lawns to pollinator meadows in Williamstown, MA, create a set of proposals to convert the Town Green to meadow, and make Williamstown lawn care more pollinator friendly. This project focuses primarily on institutionally and publicly owned land and creates a proposal for Bee Friendly Williamstown and other stakeholders.

3 Introduction

We currently believed to be in the age of the Anthropocene, or the past 2.6 million years on Earth classified as the time when collective action of humans has been the driving force of environmental and geological change on the planet.

Today, as many as 30 to 50% of all species on the planet are heading towards extinction over the next 30 years. More than half of the native bee species in North America are threatened with extinction, insects could vanish within a century at their current rate of decline, and 1 in 4

birds in North America have already vanished during the past 50 years.[1] Across the globe and in North America, we are currently facing a period of mass extinction of animals and insects that is fundamentally altering the food systems.

Pollinators are insects and animals that are necessary for many plants to grow seeds, fruit, and reproduce. Pollination occurs when pollen from the stamen of one flower is moved to the stamen of another (or the same) flower when an insect or animal is feeding on the flower. Native pollinators are incredibly important to native plants (and vice versa) as many plant species coevolved with specific pollinator species and one cannot survive without the other.

The loss of pollinators including honeybees, natural bees, insects, and birds, has been a well-documented global issue, although the extent of loss differs in different parts of the world.[2] In Massachusetts, beekeepers reported an annual loss of 55.75% of the honey bee colonies over the 2015-2016 season alone.[3] The Massachusetts Natural Heritage & Endangered Species program has listed 19 species butterflies and moths and nine species of beetles as endangered, threatened, or of special concern.[4] The loss of habitat and native plants due to the growth of suburbia, expansive agricultural fields, and climate change are the main drivers of this decrease in native plants and thus pollinators.

[1] "Designing Biodiversity in the Age of the Anthropocene" with Evan Abramson
[2] Gretchen Vogel, "Where have all the insects gone?" Science Magazine, 10 May 2017
[3] Apiary Program Working Group Division of Crop & Pest Services. (2016). Massachusetts Pollinator Protection Plan. Massachusetts Pollinator Action Network. (6-7) https://www.mass.gov/doc/massachusettspollinator-protection-plan/download
[4] Apiary Program Working Group Division of Crop & Pest Services. (2016). Massachusetts Pollinator Protection Plan. Massachusetts Pollinator Action Network. (8) https://www.mass.gov/doc/massachusettspollinator-protection-plan/download

4 Why are Lawns Bad?

The negative effects of lawns are well documented. Lawns, along with the maintenance practices that encompass them, are detrimental not only to the surrounding environments but also to the health of animals and even humans.

One of the inherent qualities of a lawn is that it is mowed frequently to maintain a low, uniform height. This frequent mowing has many damaging effects. From an ecological perspective, frequent mowing can cause the disappearance of native plant and animal species as well as decrease biological diversity. Joan Edwards, a professor at Williams College, has done research over the years on optimal mowing patterns for flowering plants in a meadow in Hopkins Memorial Forest. Her research has shown that mowing every year rather than every other year helps curtail invasive species take over, and that mowing in the fall rather than the summer is better for floral abundances for pollinators. Late-mown plots typically show significantly more flowering stems, and the flowers from plots that were mown later have more pollinator visitors in the spring than flowers in plots mown earlier.[5]

Additional research has also shown the various deleterious effects of lawns and mowing. A 2015 federal study on mowing practices found that raising mowing height to at least 2.5 inches, mowing only every 2-3 weeks, and minimizing pesticide use can increase flower abundance by 70-300%.[6] Susannah Lerman and Joan Milam, researchers at the University of Massachusetts Amherst, performed an urban-suburban lawn study in Springfield, Massachusetts in 2014 and found that mowing at no lower than 3 inches, changing the mowing interval from once a week to

[5] Knoedler et al., "Pollinator Protection in Williamstown, MA" p. 15
[6] U.S. Forest Service. Pollinator-Friendly Best Management Practices for Federal Lands. U.S. Dept. of Agriculture, Forest Service. Web. 2015.

every two weeks, and leaving lawns untreated with herbicides provided a diversity of "spontaneous" flowers, such as dandelions and clover, that offer nectar and pollen to bees and other pollinators.[7]

Maintaining a lawn has many other negative effects in addition to those discussed above. Increased mowing frequency leads to higher costs, as one must pay for a lawnmower and the gas that powers it, or pay for landscapers to mow. Mowing also increases fossil fuel emissions, as most lawn mowers are gas-powered. They also often lack newer technology like catalytic converters that reduce emissions. It has been shown that the amount of air pollutants emitted by gas-powered leaf blowers and lawnmowers is greater than that of many large automobiles. Using a gas-powered lawnmower for an hour emits approximately the equivalent amount of carbon dioxide as driving a car for 100 hours.[8] Additionally, a 2011 study "Leaf Blower's Emissions Dirtier than High-Performance Pick-Up Trucks" found that a leaf blower emits 300 times more air pollutants than a pick-up truck.[9]

Further research into fertilizers typically used on American lawns shows more deleterious effects on carbon emissions. In an article titled "Energy Consumption and Greenhouse Gas Emissions in Fertilizer Production" published by the International Fertilizer Association, it is estimated that fertilizer production consumes approximately 1.2% of the world's energy and is responsible for 1.2% of total greenhouse gas emissions. For every ton of fertilizers manufactured,

[7] University of Massachusetts Amherst Research Next. Keeping it Natural. Web.
[8] American Chemical Society. "One Hour Of Grass Cutting Equals 100 Miles Worth Of Auto Pollution." ScienceDaily. www.sciencedaily.com/releases/2001/05/010529234907.htm (accessed October 23, 2021).
[9] Edmunds. (2011, December 6). Leaf Blower's emissions dirtier than high-performance pick-up Truck's, says Edmunds' insideline.com. Edmunds. Retrieved December 7, 2021, from https://www.edmunds.com/about/press/leaf-blowers-emissions-dirtier-than-high-performance-pick-uptrucks-says-edmunds-insidelinecom.html.

two tons of carbon dioxide are produced.[10] Water use is another huge negative to maintaining a lawn. In the U.S., the typical family uses about 320 gallons of water per day, and a staggering 30% of that is devoted to outdoor uses like watering lawns.[11] In total, every year lawns consume 3 trillion gallons of water.[12] A final negative effect of lawn care is noise pollution. The World Health Organization recommends that general daytime outdoor noise levels should not go above 55 decibels. According to Lawn and Landscape Maintenance, however, the average leaf blower produces 70-75 decibels at 50 feet.[13] With all of these negative externalities that are from to lawn maintenance, it is clear that an alternative to lawns must be implemented for the improvement of society and the environment.

5 Benefits of Pollinator Meadows

Pollinator meadows provide a broad set of benefits. Pollinator meadows have incredible ecological benefits, help mitigate climate change at a local level by decreasing the emissions from lawn care equipment used for maintenance and by sequestering more carbon than regular lawns, support local agriculture through native pollinators assisting in agricultural pollination, and are good for human health because of their natural beauty and reduced use of mowers and blowers.

[10] One Team. (2018, October 3). Grass Lawns are an Ecological Catastrophe. ONE Only Natural Energy. Retrieved December 7, 2021, from https://www.onlynaturalenergy.com/grass-lawns-are-an-ecologicalcatastrophe/.
[11] Water Sense. (n.d.). Outdoor Water Use in the United States. EPA. Retrieved December 7, 2021, from https://19january2017snapshot.epa.gov/www3/watersense/pubs/outdoor.html.
[12] Talbot, M. (2016, September 30). More sustainable (and beautiful) alternatives to a grass lawn. NRDC. Retrieved December 7, 2021, from https://www.nrdc.org/stories/more-sustainable-and-beautifulalternatives-grass-lawn.
[13] One Team. (2018, October 3). Grass Lawns are an Ecological Catastrophe. ONE Only Natural Energy. Retrieved December 7, 2021, from https://www.onlynaturalenergy.com/grass-lawns-are-an-ecologicalcatastrophe/.

Ecological Benefits

As discussed earlier, many native plant species coevolved with specific pollinators, and neither can survive without the other. Worldwide, 23% of native plant species are in decline due to decreasing populations of their specialist pollinators. Planting pollinator meadows with native plants allows for greater connection between different pollinator and plant species, which assists in reversing the trend of declining biodiversity of native plants in the Northeast and provides habitat for insects, native bees, birds, and other important creatures. Modern lawn practices have created large patches of disconnected monoculture habitats, or habitats planted exclusively with a single type of plant. In the Northeast, Kentucky Bluegrass is the monoculture plant of choice. Monoculture habitats decrease connections between pollinators and plants, while pollinator meadows offer habitats that provide many more opportunities for plants and pollinators to connect to each other.

Carbon Sequestration

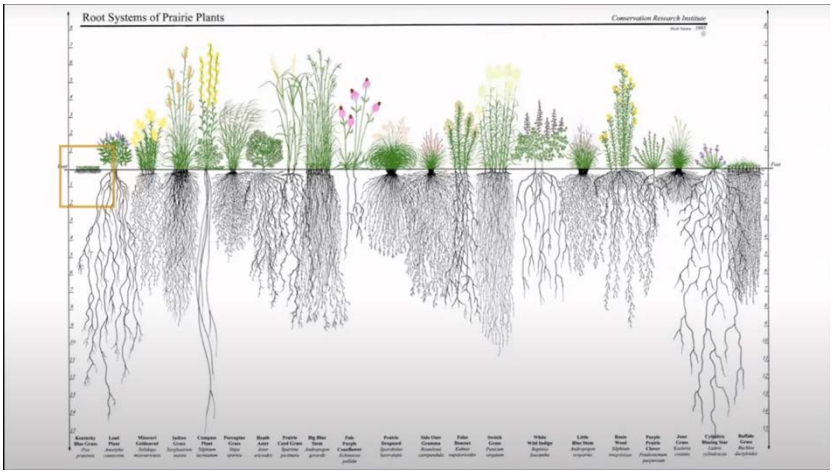


Figure 1: Depiction of the difference in root depth between Kentucky Blue Grass (on the right) and native plants from Evan Abramson's talk "Designing Biodiversity in the Age of the Anthropocene"

Pollinator meadows also help to fight climate change. The root systems sequester carbon and unlike forests, when fires burn down pollinator meadows, the majority of the carbon remains sequestered in the ground, not re-released into the air. The root system of meadows can be very extensive, growing 5-15 feet deep and regenerating every 3-4 years. The roots help to increase soil fertility and organic matter and can also provide a habitat for insects and other

wildlife.[14] Globally grasslands and meadows hold 20% of the carbon stock and 1/3 of the land-based sequestered carbon. Protecting and conserving grasslands and meadows in the US could prevent as much as three times the carbon emissions as conserving forests.[15] Converting lawns to meadows will also decrease the carbon emissions from lawnmowers and leaf blowers.

Local Agriculture

Agriculture relies on pollinators just like native plants. One out of every three bites of food that we eat was pollinated by a pollinator. In Massachusetts, over 45% of agricultural commodities rely on pollinators, mainly wild and domesticated bees, for pollination. While it is hard to determine an exact economic value for pollinators in the agricultural system, it is estimated that pollinators contribute about an additional $1,200 per acre in crops because of their ability to fertilize plants, leading to fruit with greater size and higher yield.[16] Increasing pollinator habitat in Williamstown will improve the growth of both native and agricultural plants in the Williamstown region.

Human Health

Converting lawns to pollinator meadows can also improve human health and quality of life in Williamstown. As discussed in the section on lawns, manicured grass that we see as "lawn" is created through the use of weedkillers, insecticides, and neonicotinoids, and incessant lawn mowing and leaf blowing. Switching to meadows and decreasing lawn maintenance will

[14] Rothbart, P., & Capel, S. (n.d.). Chapter 3. Maintaining and Restoring Grasslands (14). http://www.dem.ri.gov/programs/bnatres/fishwild/grasspdf/4.pdf
[15] Abramson, E. "Designing Biodiversity in the Age of the Anthropocene." Massachusetts Pollinator Network. https://www.nofamass.org/event/mapn-seminar-series-evan-abramson/
[16] Apiary Program Working Group Division of Crop & Pest Services. (2016). Massachusetts Pollinator Protection Plan. Massachusetts Pollinator Action Network. https://www.mass.gov/doc/massachusettspollinator-protection-plan/download

significantly decrease noise pollution, lower carbon emissions, and the use of harmful chemicals. Meadows, with native flowering plants, grasses, and the influx of colorful butterflies, birds, and insects that inhabit them, are beautiful, and living around them will increase the quality of life for the people of Williamstown.

6 Project Definition

Williamstown lacks adequate pollinator meadows to support a diverse and robust population of native bees and other pollinators in the local area. Efforts to add pollinator meadows to Williamstown are underway, spearheaded by new plantings at the Spruces Park and pollinator-friendly sidewalk strips on Southworth Street, but that is not nearly enough to prevent the loss of pollinator habitat. The Williamstown Town Green runs through the middle of town, past the Town Hall, Library, Spring Street, and Water Street, and through Williams College's campus. This greenspace represents the perfect location to continue the implementation of pollinator meadows in Williamstown, due to its visibility and lack of use currently. The problem is therefore finding a way to begin to phase out the lawnscape that currently is the Town Green and phase in pollinator meadows, which will be home to native flowering plants, grasses, and pollinator species.

Figure 2: Town Green abutting Williams College across from Spring Street

7 Town Green

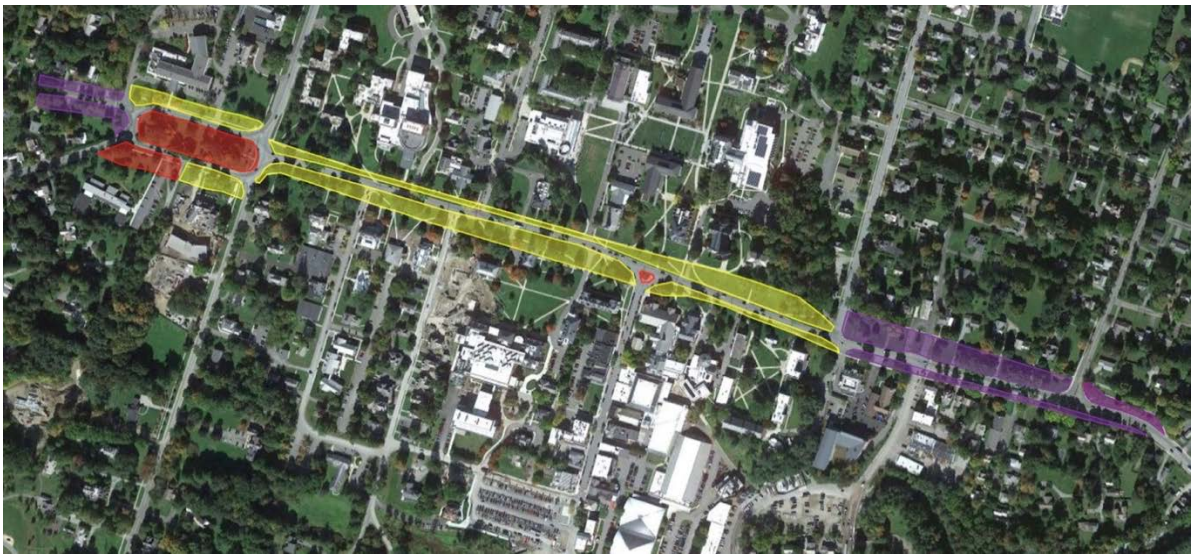


Figure 3: Williamstown Town Green labeled by who abuts it at which position; green represents private residents, and the blue represents institutional abutters, specifically Williams College

The "Town Green," or Village Green, is a staple of New England towns. Originating in medieval England, these sorts of Commons are widespread across England and New England. Town greens come in all sorts of shapes and sizes, from large squares surrounded by residences to many smaller squares within a town, to long, thin strips along a roadway.[17] Why greens were created in the first place is not certain. In the Middle Ages, they may have been started as a place for large markets or fairs. They may have also started as a protected space where people could let their cattle and other livestock graze and live without fear of dangerous wild animal attacks. Or, they may have served as [18]We do know that greens and commons came out of the English institution of common law, where land is in common use, and use is governed by common-sense

[17] Rob, S. Village greens of England: A study in historical geography. Durham University Theses, (13) https://www.etheses.dur.ac.uk/6120/1/6120₃473.PDF?UkUDh:CyT.

[18] Rob, S. Village greens of England: A study in historical geography. Durham University Theses, (13) https://www.etheses.dur.ac.uk/6120/1/6120₃473.PDF?UkUDh:CyT.

laws, not specifically written ordinances. This may be the basis for why there are no laws governing the Williamstown Town Green, which is discussed further in the Interviews section.

Today, the Williamstown Town Green runs on either side of Route 2, from Field Park on the west side of the town, straight through Williams College campus and past the Cole Avenue-Route 2 intersection on the east side of the center of town. It is slightly wider on the north side of the road than on the south. The town owns the land on the Town Green, but it is maintained (for the most part) by the private residents, institutions, and businesses that abut it. The map to the right shows which entities manage the Town Green, with yellow being Williams College, which manages about 5.75 acres, the purple being private residents, who maintain about 3.30 acres combined, and the red being the section Williamstown Department of Public Works (DPW) manages. The Williamstown DPW manages Field Park, the lawn at the public library, and the triangle of grass under the Welcome to Williamstown sign at the top of Spring Street.

8 Williamstown Net Zero Resolution

Williamstown passed the "Citizens' Petition for Town of Williamstown Net Zero Resolution" at the June 2021 Town Meeting.[19] This petition states that Williamstown will work to be a net zero town, meaning that

NOW THEREFORE be it resolved that the Town of Williamstown pursue **a Net Zero greenhouse gas (GHG) emissions goal** committing to achieving net-zero GHG emissions by 2050 and **develop and begin implementing a comprehensive climate action plan** by 2023 in collaboration with the community whereby we:

(a) Take action to support clean, efficient, affordable, renewable technologies and approaches to heating, cooling and powering our homes and businesses; fueling our vehicles; minimizing and disposing of waste; and other activities to achieve a Net Zero GHG emissions goal;
(b) Include consideration of our Net Zero GHG emissions goal and climate change impacts in all municipal decisions and planning and procurement activities;
(c) Take action to prepare for the impacts of a changing climate;
(d) Ensure that our climate actions recognize the needs of vulnerable members of our community and are inclusive and equitable.

Figure 4: Operative Clause of the Williamstown Net Zero Resolution.

[19] Citizens' Petition for Town of Williamstown Net Zero Resolution, 1 (2021). https://d20a94b2−b2ec−41c7−b45f−d5e742bf51ca.filesusr.com/ugd/498b91_f1459b4c0c1940089d2bd82c15aae4b5.pdf

it will get as much energy from renewable sources as it uses. The town will reach this goal through a combination of energy efficiency, local clean energy production, and buying renewable energy.[20] The net zero petition, originally proposed by the Williamstown COOL (CO2 Lowering) Committee, the town's climate action committee, builds upon past petitions in the town to reduce greenhouse gas emissions. These past efforts have included the Select Board emission reduction goals in 2001, the Town Meeting resolution to reduce GHG in 2008, and the 2002 Master Plan's mention of renewable resources and its net zero waste goal. The town now must develop and begin implementing a Climate Action Plan by 2023 to meet its new net zero goal.

The Williamstown Net Zero resolution is also in line with the work of the Commonwealth of Massachusetts. Specifically, Governor Baker signed a bipartisan-supported bill into law on March 26, 2021, stating that Massachusetts will achieve net-zero emissions by 2050.[21] This statewide bill gives the Secretary of Energy and Environmental Affairs the power to establish emission limits in the buildup to 2050, with an emission reduction of nothing smaller than 50% by 2030 and no less than 75% by 2040.[22] To reach these goals, the state has created a "2050 Decarbonization Roadmap," which sets strategies for renewable energy implementation, decreasing use of fossil fuels for transportation,

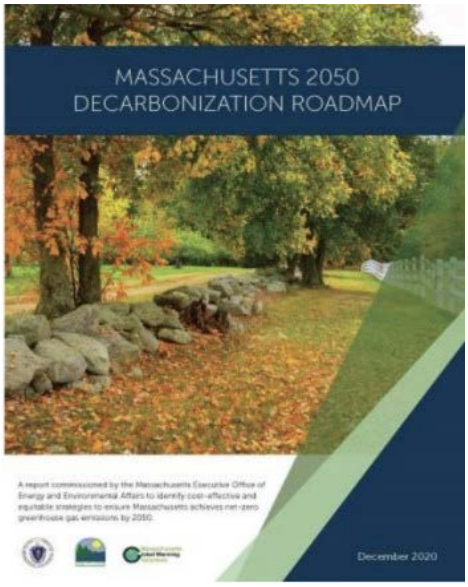


Figure 5: Massachusetts 2050 Decarbonization Roadmap

[20] Nylen, N., & Boyd, S. (n.d.). Williamstown Net Zero Resolution. https://docs.google.com/presentation/d/1EpQktxKHsS0MZSWaREtFlCkzTwhXXzr7o6Pgc1DDVE/edit#slide=id.gc491ead39e_0_
[21] An Act creating a next-generation roadmap for Massachusetts climate policy, S.9. https//:www.malegislature.gov/bills/192/S9
[22] Boston Real Estate Times. (2021, July 7). Legislative Update: Massachusetts Law Commits to Achieve Net Zero Emissions by 2050 [Boston Real Estate Times]. *https : //bostonrealestatetimes.com/legislative− update − massachusetts − law − commits − to − achieve − net − zero − emissions − by −* 2050/

and increasing energy efficiency, flexibility, and carbon sequestration. [23] Forests and other natural land uses, such as native meadows, are important for enhancing carbon sequestration while supporting and building healthy and resilient ecosystems.[24]

Increasing the abundance of pollinator meadows and decreasing the amount of lawnscape in Williamstown should be part of the solution for getting the town to net zero emissions by 2050. The implementation of pollinator meadows will both decrease the amount of greenhouse gases emitted from the use of gas-powered lawn care equipment, and sequester more carbon than lawns currently do. It also fits into the Pollinator Friendly Community Resolution passed in 2017.[25] While the town may argue that emissions from the upkeep of the Town Green should not be counted for its municipal levels as the town does not maintain those lawns, that land is town-owned. Williamstown has been placing both the physical and financial burdens of maintaining this land unfairly on residents for generations and should be forced to count emissions from the maintenance of that land as its own land. Therefore, pollinator meadows would be a superb option for the Town Green, as it will both sequester more carbon, allow the town to emit less carbon, and maintain its own property without greatly increasing the workload of its already very busy DPW.

[23] Executive Office of Energy and Environmental Affairs. (n.d.). Massachusetts 2050 Decarbonization Roadmap. urlhttps://www.mass.gov/info-details/ma-decarbonization-roadmapfinal-reports-
[24] Executive Office of Energy and Environmental Affairs. (n.d.). Massachusetts 2050 Decarbonization Roadmap. 30 *https : //www.mass.gov/info − details/ma − decarbonization − roadmapfinal − reports−*
[25] "TOWN OF WILLIAMSTOWN MASSACHUSETTS 2017 Annual Report." 2017 Williamstown, MA. https://williamstownma.gov/wp-content/uploads/2020/11/ATR2017.pdf.

9 Williams College Landscape/Grounds Work

Williams College has committed itself to become more environmentally friendly in a multitude of ways. The Williams College Climate Action Plan (CAP) is still in progress, with version 2.0 being released in November 2021, and is meant to be a guiding document for the College until the campus Energy and Carbon Master Plan is finalized in late 2022.[26] While there is no current publicly stated reduction goal, Williams College is targeting an 80% reduction on Scope 1 and 2 emissions by 2035 compared to 1990/1991 levels, according to Tanja Srobotnjak, Director of the Zilkha Center for Environmental Initiatives. Mowers and blowers are part of the College's Scope 1 emissions, attempting to work towards a carbon-neutral future. The CAP states that its "Action 10" is to "Reduce GHG

Figure 7: Williams College Campus Zones from the "Campus Landscape Survey"

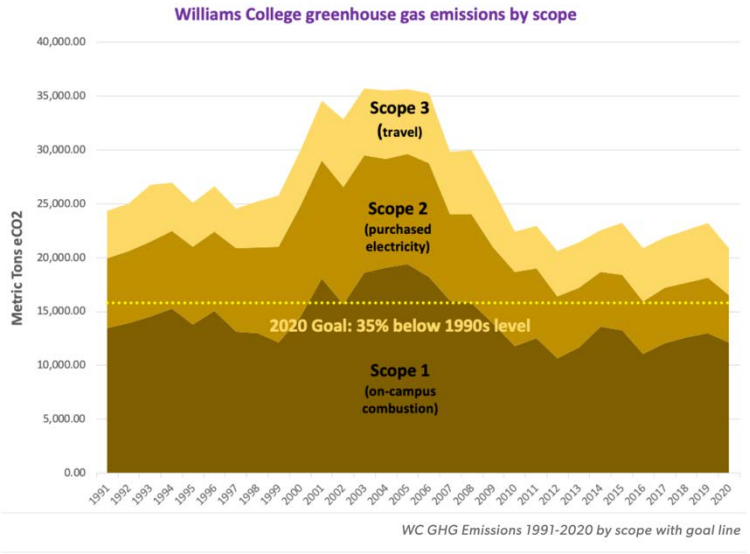


Figure 6: Williams College's greenhouse gas emissions by category from 1991-2020

[26] Final Report:Williams LandscapeStudy. (2020). *https://drive.google.com/file/d/1PmVxv0B4j7GvCI982Db2Nkoq7thoTHr/view*

Emissions from grounds maintenance and landscaping." This points to the possibility of the College changing its lawn care equipment from gas-powered engines to electric battery powered. Changing lawns to pollinator meadows at the College is also both important for making the town more pollinator-friendly and fulfilling the College's Climate Action Plan, as it will decrease the need for GHG emitting lawn care equipment.

On this front, the College has been working to change its landscape and landscaping practices to be more environmentally friendly, but still has a way to go. Currently, the grounds crew mows most lawn areas (not including the athletic fields which are held to different standards due to NCAA rules) once per week to keep a height of around 2 inches.[27] Organic fertilizer used to be applied once per year in the fall, but this has been changed due to the amount of fertilizer required per acre to support the lawn through the year. Now, the College uses two applications of a product called NatureSafe, consisting of bone meal and turkey by-products, which is a slow-release fertilizer, providing the correct amount of nitrogen for a healthy lawn throughout the year.[28] College lawns are also not watered.

The College completed a "Campus Landscape Survey"[29] undertaken by the consulting firm Reed Hilderbrand in January 2020. This survey looked at how Williams College's campus, buildings, and landscapes have evolved over time, and what might be the next step in bettering the campus environmentally and in terms of accessibility and functionality. This plan split the campus into three zones: the campus core, middle ground, and ecological edge. The campus center includes many of the academic building, dormitories, and Town Green, running directly through its center.

[27] Landscape and Grounds. (n.d.). Williams College Sustainability. https://sustainability.williams. edu/grounds/
[28] Williams College Climate Action Plan. (2021). https://docs.google.com/document/d/1rbF3knDxPEw2yPk4AetG3urH1HSvTh8HBPmXtgTJYQ/edit
[29] Landscape and Grounds. (n.d.). Williams College Sustainability. https://sustainability.williams.edu/grounds/

In the campus core, the survey calls for the College to find projects that will "enhance the legibility of the campus,"[30] establish a structure for joint Williamstown-Williams College initiative, [31] and make the campus feel "interconnected and whole." [32] The survey specifically states that "restoring the Town Green is a key project which directly influences the identity of the College and the Town."[33] While it is important to keep much of the campus core as lawn plantings to allow for large gatherings and recreational activities, part or all of the unused land that makes up the Town Green that the College maintains is a perfect location for the College to create a joint structure with the town and connect the campus core with the ecological edge, where there are already meadows established.

Figure 8: The Williams College campus current landscaping from the "Campus Landscape Survey"

10 Policy Options

Town Green Conversion Policy Ranking Explanation

There are a few different options converting the Town Green from lawn to pollinator meadow, each with different benefits and drawbacks. The entire Town Green could be converted, only the north side, only the south side, or there could be a 5-foot strip on both sides of the road

[30] Landscape and Grounds. (n.d.). Williams College Sustainability. https://sustainability.williams.edu/grounds/
[31] Landscape and Grounds. (n.d.). Williams College Sustainability. https://sustainability.williams.edu/grounds/
[32] Landscape and Grounds. (n.d.). Williams College Sustainability. https://sustainability.williams.edu/grounds/
[33] Landscape and Grounds. (n.d.). Williams College Sustainability. https://sustainability.williams.edu/grounds/

converted from lawns to meadows. Comparing the size of each portion of the Town Green is important before discussing the ranking system of the policy alternatives. The entire Town Green is about 11.33 acres large, including the 1.39 acres of Field Park. The north side, both the part maintained by the College and the local residents, is 5.09 acres. The South Side, both the part maintained by the College and the local residents, is 4.85 acres.[34] The Town Green is roughly 4,700 feet along based on a Google Earth measurement, therefore if a 5-foot strip was created on both sides, that would be about 47,000 feet squared meadow on both sides combined, or 1.08 acres. The table on the next page ranks the possible conversion policies and the second table explains the rationale behind the rankings given to each possible conversion tactic.

[34] The measurements for the entire Town Green, the north side, and south side are found by using the software at https://www.mapdevelopers.com/area_finder.php

Town Green Lawns-to-Meadows Conversion Proposal Alternatives:

Alternatives	Environmental	Visibility	Conversion Cost	Long-Term Maintenance Cost and Manageability	Public Opinion	Educational Value	Total
Entire	1	1	2	2	3	1	**10**
Only North Side	1.5	1.5	1.5	3	2	1.5	**11**
Only South Side	1.5	1.5	1.5	3	2	1.5	**11**
5 Foot Strip on Both Sides	2	1.5	1	2	1	1.5	**9**

1 (highest) - 3 (lowest)

Rankings Explanation for Town Green Lawns to Meadows Conversion Policies

Ranking Explanation	Environmental	Visibility	Conversion Cost	Long-Term Maintenance Cost and Manageability	Public Opinion	Educational Value	Total
Entire	- 11.33 acres will be converted to pollinator meadow	- Directly surrounding Route 2, main street, through downtown Williamstown and Williams College	- Most costly of the different options because it is the most area	- Need to mow border around meadows on both sides of the road - Mow entire Town Green only once per year after frost	- Uniform across the entire Town Green - Worries over safety and messiness on both sides of the road	- Ample space for native plants, pollinators and signage	**10**
Only North Side	- 5.09 acres will be converted to pollinator meadow	- Directly off of Route 2 running through downtown Williamstown and Williams College - Only on half of the lawn	- Less expensive because it is only about half the land of the entire Town Green	- Need to mow border on one side of road - Mow about half Town Green only once per year after frost - Most about half Town Green as much as normal lawn	- Not uniform across the entire Town Green - Worries of safety on only one side of the road	- Some but less space for native plants, pollinators and signage	**11**
Only South Side	- 4.85 acres will be converted to pollinator meadow	- Directly off of Route 2 running through downtown Williamstown and Williams College - Only on half of the lawn	- Less expensive because it is only about half the land of the entire Town Green	- Need to mow border on one side of road - Mow about half Town Green only once per year after frost - Most about half Town Green as much as normal lawn	- Not uniform across the entire Town Green - Worries of safety on only one side of the road	- Some but less space for native plants, pollinators and signage	**11**
5 Foot Strip on Both Sides	- 1.08 acres will be converted to pollinator meadow - Minimum size of strip necessary to provide adequate habitat to pollinators	- Directly surrounding Route 2, main street, through downtown Williamstown and Williams College - Less visible because less area converted	- Least expensive option, because only 1/11 of the land of the entire Town Green converted - Do need to convert to completely separate sides of the road	- Mow only 1 acre once per year after the frost - Mow other 10 acres of Town Green on regular schedule for lawn	- Many of the residents interviewed were interested in starting small - Uniform across the entire Town Green - Less worry over safety because smaller size	- Some but less space for native plants, pollinators and signage - While smaller acreage than the other options, more spread out so opportunities for more types of plants/pollinators	**9**

The lower the number, the better ranked the policy alternative is.

Other Environmentally Friendly Policies

The other set of policies that are proposed by this report are not specifically meant to increase the number of pollinator meadows in Williamstown or on Williams College campus, but instead intend to change lawn maintenance means and methods to make them safer for the people that perform them, decrease their impact on the planet, and lead to more growth of native and noninvasive plants in the Williamstown area. It is difficult to accurately rank each of these policies in a similar fashion to the cost-benefit ranking system devised for the different ways of converting the Town Greens lawns into pollinator meadows, due to the fact that these policies were not specifically asked about in surveys and interviews completed. These policies were not included in survey questions or the interviews as many of them were only decided as possibilities after researching case studies – what other towns in Massachusetts and beyond have done to make their lawn care practices more environmentally friendly. Therefore, the rankings below are significantly more up to one's own opinion than the Town Green lawns-to-meadows conversion, and the report will explain our reasoning for the given rankings in the second table. An important point for the following set of policies is that they are not mutually exclusive, like the policies dealing with converting the Town Green from lawns to meadows; all of the "other environmentally friendly" policies could be enacted at the same time.

Other Environmentally Friendly Lawn Care Policy Alternatives:

Alternatives	Environmental	Cost	Social/Equity	Public Opinion	Feasibility	Enforceability	Total
Ban the use of gas powered lawn equipment:	-	-	-	-	-	-	-
In Williamstown	1	3	1	1	2	3	**11**
At Williams College	1	3	1	1	2	1	**9**
Native/Non-Invasives only on Town Property	1	2	1	2	2	1	**9**
Regulation on Mowing Amount and Time of Year on Town Property	1.5	1	1	3	1	1	**8.5**

1 (highest) - 3 (lowest)

Rankings Explanation for Other Environmentally Friendly Lawn Care Policies

Ranking Explanations	Environmental	Cost	Social/Equity	Public Opinion	Feasibility	Enforceability	Total
Ban the use of gas powered lawn equipment:							
In Williamstown	- Decreases greenhouse gas emissions and noise pollution - Would be more even environmentally friendly if the electricity comes from renewable sources - Fits in the Williamstown Net Zero Pledge	- Will be costly until more reasonably priced technology is developed (which should occur once California's ban goes into power in 2022) - Cost cannot be exorbitant as that might be unfair to lower-income families	- Gas-powered lawn equipment is not safe for lawn care workers - Decrease CO2 and other emissions and loud noises	- As long as electric-powered equipment works just as well as gas-powered, there is little reason to expect pushback	- Currently not very feasible due to the need for technological advancement - Very feasible as soon as technology meets need	- Difficult for the town to check all private residents equipment - California's ban includes the public keeping their neighbors on top of enforcement with strikes (which could work in Williamstown) - Checking up on lawn care companies will likely be easier	**11**
At Williams College	- Decreases greenhouse gas emissions and noise pollution - Part of the Williams College Climate Action Plan	- Will be costly until more reasonably priced technology is developed (which should occur once California's ban goes into power in 2022)	- Gas-powered lawn equipment is not safe for lawn care workers - Decrease CO2 and other emissions and loud noise - Fits perfectly into the Williams College Climate Action Plan	- Believe that students would be very happy if the college switched lawn equipment to electric-powered - Should be no pushback from administration, faculty, or staff either	- Currently not very feasible due to the need for technological advancement - Very feasible as soon as technology meets need	- Easy to enforce, as only the Williams College landscaping/grounds team works on Williams campus	**9**
Native/Non-Invasives Plant Ordinance on Williamstown town property	- Provides habitat and food for pollinators and other animals that might not have been available from lawns or other nonnative plants	- May be more expensive than usual plantings due to needing to find and buy native/non-invasive seeds and bulbs - Once planted, these plants usually require less work or insecticides	- Can lead to more flowering plants and beautification of town lands - Require less insecticide use to upkeep	- Needs to be exceptions for athletic fields, gardens, holiday plantings - Might face some pushback due to changes in usual optics of town land	- Would need to be phased in and only occur to new plantings - Williamstown DPW should be able to make sure plantings fit this ordinance	- Easy to enforce as the Williamstown DPW takes care of the majority of the town land - Would be easy to see if local residents and the college are following these rules on the Town Green	**9**
Regulation on Mowing Height and Time of Year on Town Property	- Decreases the use of large mowers throughout the year - Allows plants to grow taller and possible flower, providing food for pollinators - May naturally lead to larger diversity of plants	- Lower the cost of the town's lawn maintenance as less mowing would be required	- Less opportunity for lawn care workers to be exposed to negative effects of mowing - May lead to more flowering plants and a beautification of town lands	- Worries over the town property looking messy or unkempt - Worries about providing habitat for bees, wasps, and ticks (all of which are unlikely to harm humans)	- Simple to do if actually chosen, just have to mow less and set the mower height to a specific number	- Easy to enforce as the Williamstown DPW takes care of the majority of the town land - Would be easy to see if local residents and the college are following these rules on the Town Green	**8.5**

The lower the number, the better ranked the policy alternative is.

11 Interviews

Throughout the project, numerous semi-structured interviews were completed with community stakeholders including Williamstown residents and groups, Williams College faculty, staff, and students, and outside experts from other communities around Williamstown and Massachusetts. The interviews were conducted in person whenever possible, although some were held over the phone or through Zoom. The interviews were conducted to gather information directly from people that the project would affect, those whose approval and support may be needed for the project to succeed, and pollinator experts across Massachusetts. In some instances, those interviewed knew important information about what a project involving an entire town could entail. In other instances, interviews were completed in order to gauge a local resident or group's initial interest in our project, as they would both play a big part in whether or not the project could come to fruition. During the project, 15 people and/or groups were interviewed. These interviews provided a vast amount of helpful information for not only the proposal at the end of this report, but also for general knowledge about the town. These interviews are summarized below.

11.1 Andrew Groff - Williamstown Town Planner

Andrew Groff is the Williamstown Town Planner. Mr. Groff was able to tell us that there are no laws in place currently governing the maintenance of the Town Green, meaning conversion of the lawns into pollinator meadows is allowed. However, he warned of community backlash in trying to change the Town Green from lawn to meadow, as people have become accustomed to its aesthetic. He also told us that it is legally possible to ban gas-powered lawn equipment, certain fertilizer, and weed killer practices, yet there would be some difficulties in enforcing such bans.

Mr. Groff was able to give us solid insight into the legal framework for this project, and after this meeting, we moved to learn more about implementation.

11.2 Laura Bentz

Laura Bentz is a member of Bee Friendly Williamstown. Laura is extremely knowledgeable about pollinators and different plants. She is particularly keen on native plants. She took us on a trip to Mountain Meadow Reserve, where she pointed out some of the native grasses and flowering plants that could be used in our project. On conversion of lawns in downtown Williamstown to pollinator meadows, Laura believes that the best way would be to completely kill all of the non-native lawn grasses present first before seeding or planting bulbs of native plants.

11.3 Shira Lynn Berg

Shira Lynn Berg is another member of Bee Friendly Williamstown who we interviewed. Like Laura, she has ample experience in the pollinator field and a lot of information to pass along. Unlike Laura, however, Shira is a proponent of not killing the grass at first, and instead proposed letting it grow out before planting natives and other insect-pollinated plants throughout the new growth. Laura is less worried about grasses killing the planted native species and instead believes in trying to plant in the existing grass to see what will take hold.

11.4 Lydia von Schwanenfluegel (’23)

Lydia von Schwanenfluegel is a fellow Williams College student and the President of the William’s Gardening Club. She worked with Bee Friendly Williamstown during the summer of

2020, and has continued working during the fall 2021 semester on a proposal for Williams College to become a “Bee Campus USA.” Bee Campus USA is a certification through the Xerces Society and promotes pollinator-friendly spaces on college campuses across the United States. The aim of the certification is "to conserve native pollinators by increasing the abundance of native plants, providing nest sites, and reducing the use of pesticides." Her proposal includes points on sustainability, pollinator habitats, pesticide use, emissions reductions, and much more. Lydia was able to give us a lot of information on pollinator meadows. While Lydia has not focused on the Town Green in her project, we hope that we can support her work and build upon her momentum.

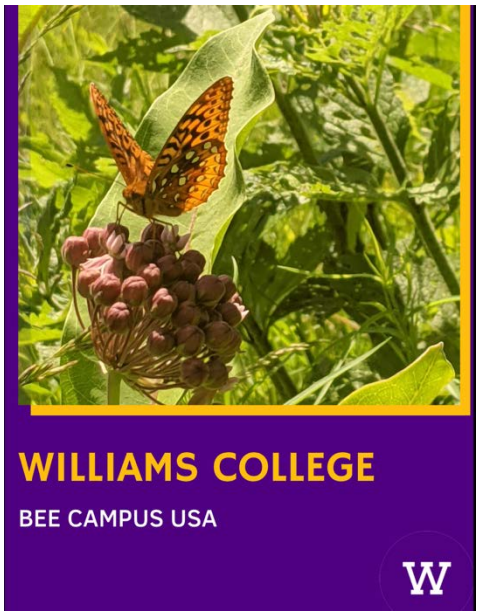


Figure 9: Lydia's Bee Campus USA Proposal for Williams College

11.5 Professor Joan Edwards - Samuel Fessenden Clarke Professor of Biology

Professor Joan Edwards is the Samuel Fessenden Clarke Professor of Biology at Williams College, specializing in Ecology and the interaction of plants and pollinators. Professor Edwards came to speak to the entire Environmental Planning Workshop class about the sixth mass extinction and the integral connection between plants and pollinators.

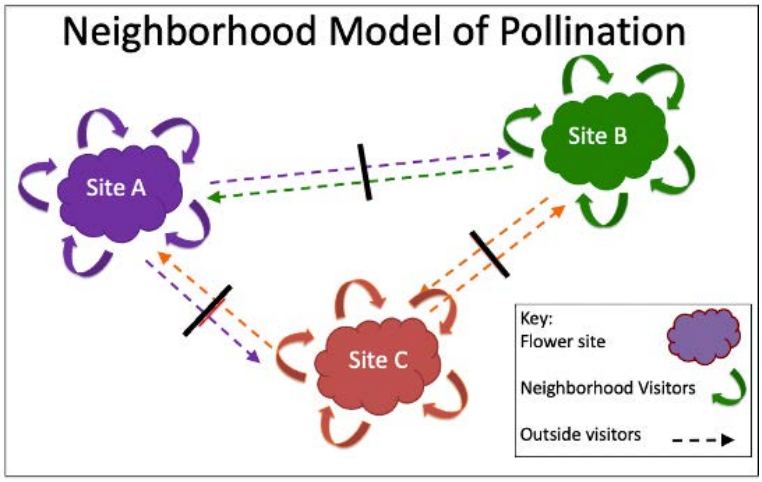


Figure 10: Professor Edward's Visualization of the Benefit of Multiple Pollinator Habitat Sites

Professor Edwards emphasized that any and all pollinator meadow sites are important in

supporting pollinator populations in an area, as each site, even if the same makeup of plants, attracts different sets of pollinators. Diversity of flowers and pollinator-friendly sites begets diversity for pollinators, which is what we want to create in Williamstown. Professor Edwards also talked with us about what mowing timing best supports the growth of pollinator meadows. From her extensive research on the effects of mowing on native plant growth in Hopkins Memorial Forest, she recommended that mowing only occur once a year, in late October after multiple frosts. This mowing schedule will increase the number of flowering stems, provide more food sources for overwintering pollinators, and attract more insect visitors

11.6 Chris Lemoine - Director of Williamstown Department of Public Works

Chris Lemoine is the director of the Williamstown Department of Public Works (DPW). Mr. Lemoine was able to explain some of the difficulties of converting the Town Green from lawn to meadow. Mr. Lemoine told us that the town government has never mowed any of the Town Green and the DPW is not planning on doing so in the future due to the lack of time and funds. The Williamstown DPW currently maintains parks and recreational fields, cemeteries, Field Park, and the Spruces. Mr. Lemoine was adamant that Field Park was off-limits to change because of the 1753 House Museum and important war memorials that are located there.

The town agreed to take on maintenance of the Spruces a few years ago and has been doing so without any increase in funds. The response to converting much of the Spruces from lawn to meadow was mixed. Some people were upset because they believed that their dogs would get ticks when wandering. To relieve some of these concerns, Williamstown DPW has kept the front lawn of the Spruces as a lawn and has mowed a buffer zone along every roadway and walking path.

Based on his experience with the Spruces, Mr. Lemoine expects a lot of pushback on trying to change the aesthetics of the Town Green. For safety reasons, he recommended we consider the visibility of intersections and driveways entrances, possibly mowing buffer zones of up to 25 feet from either and from the roadway. Lastly, Mr. Lemoine wondered what role Williams College is willing to play in this Town Green conversion project. The College currently maintains all of the Town Green from Southworth Street to North Street, which makes up the majority of the Green.

11.7 Catherine Hill

Catherine Hill is a private resident living along the Town Green and former Williams professor. Our conversation with Ms. Hill focused on the possible safety issues with a pollinator meadow and who would pay for the conversion. Ms. Hill is worried that turning the Town Green lawns into pollinator meadows would lead to increased danger at intersections and driveways, with taller plants blocking the line of sight for pedestrians and oncoming traffic. (Mowed edges to meadows solve this problem.) She also wanted to know who would pay for the initial conversion and who would be in charge of maintenance and mowing, as she was skeptical of private residents' interest in doing either. Lastly, she questioned whether the greater Williamstown community would ever allow for the Town Green to be covered by cardboard for 8 to 10 months, even if that was the form of conversion that was agreed upon by Bee Friendly and the abutters.

11.8 Alexis Dekel

Alexis Dekel is a private resident that lives along the Town Green. She is in support of turning at least part of the Green into a pollinator meadow but wanted to express her concerns. Ms. Dekel is worried about uniformity along the Green. As there are no laws governing its maintenance, it is solely a community obligation and therefore it may be more difficult to make

sure that maintenance is uniform across the many properties. She wants us to make sure that whatever occurs, it looks good, looks clean, and someone will maintain it.

Ms. Dekel is having trouble imagining what the proposed changes would look like and recommends that we find pictures of other towns that have performed similar transformations so that people in Williamstown can imagine the change better. Smaller changes first, such as pocket meadows or strip meadows, might be the perfect first step to show the Williamstown community the beauty of pollinator meadows and act as a springboard for increased plantings on the Town Green and in other places around town.

11.9 Sherwood Guernsey and Lauren Stevens - First Congressional Church Members

Mr. Guernsey and Mr. Stevens are two board members of the Williamstown First Congregational Church, located along the Town Green in what is essentially the center of the Williams College campus. The church owns a significant portion of the Town Green, so it was important that we hear their opinions on the possibility of a lawn-to-meadow conversion. Much to our pleasure, Guernsey and Stevens were already looking to reduce their amount of lawn by putting in a pollinator garden. They currently have a small garden in the front of the building facing the street, which is meant to act as an example planting for the community to show people something that they can do to help pollinators. A big part of our conversation centered around how we could make our project more marketable to the public. The church is such a visible location that it would make a great spot for a pilot project to spread the word to people about pollinator meadows. The main concern Mr. Guernsey raised was with invasive species takeover if the lawn was let to grow out on its own, and how this could be prevented.

11.10 Williams College Grounds and Landscaping Team: Timothy Roberts, Manager of Horticulture and Grounds, Felicity Purzycki, groundskeeper, Lisa Remillard, landscape gardener, and Andrew Bernardy III, groundskeeper

Timothy Roberts, Manager of Horticulture and Grounds, Felicity Purzycki, groundskeeper, Lisa Remillard, landscape gardener, and Andrew Bernardy III, groundskeeper, represent the head of Williams College grounds maintenance and three out of four members of the grounds/landscaping team that is in charge of caring for the College's gardens, trees, and other non-lawn plantings. The landscaping team responded positively to continuing to increase meadows and pollinator-friendly spaces on campus but were critical of the Town Green being the space for future pollinator meadows.

Williams College has already been working to expand the number of different pollinator friendly species and ecosystems on campus. In recent years, they have planted perennial flower beds at the Kellogg House and Meers House, added more and different plants to the newly created buildings (North Science, South Science, Garfield, Horn, and the Center for Development Economics), and are planting new pollinator-friendly trees along Route 2 as part of the work to re-canopy the Town Green. They also plan to re-landscape many of the older buildings over the next few years that are currently planted poorly.

The Williams landscaping group had a list of concerns with meadows in general and specifically meadows on the Town Green. The group expressed that meadows tend to get invasive species unless weeded, which is difficult for the College as there are only 17 people in the department and they are already overworked. After planting the old Williamstown Inn site as a

meadow at the request of local residents and the Williams College Center for Environmental Studies, Williams College Grounds/Landscaping received some negative press from the local NPR station for the site's unkempt appearance.[35] They also said that Hank Art spent most of the summer weeding underneath the solar panels by the Environmental Center, which we doubt the validity of but can neither prove nor disprove. If these invasive plants are left to seed and bloom, then they will show up in other flower beds in future years, making the ground crew jobs more difficult in the future. They also were concerned about people being allergic to bees and the fact that it takes three years to convert a meadow correctly from a lawn, a process that people are usually too impatient to wait for.

The grounds/landscaping teams were concerned about placing meadows on Route 2 because it might hurt the aesthetic look of the open campus and instead might look messy/unkempt. The College is very concerned about prospective students' initial reaction towards Williams when they visit. They said that they use a study that found that prospective students and their families specifically care if the campus looks clean and put together, safe, and open. A meadow on the main street might hurt this initial view of campus for prospective students and returning. There was also a safety concern that plants could grow up to 6 feet tall and block the view of cars from pedestrians, as well as the meadows attracting deer and other animals closer to the busy street. (Our proposal includes a mowed buffer around all pollinator meadows which should mitigate this issue.)

Lastly, on the discussion of converting to electric lawn equipment, Mr. Roberts was specifically in favor of the idea as long as the equipment was to a usable level. Unfortunately,, equipment has not yet reached that level. Williams would need electric backpack leaf blowers that

[35] Landes, J. (2021, October 20). Williams College to build new art museum where Williams Inn once stood. https://www.wamc.org/news/2021-10-20/williams-College-to-build-new-art-museum-wherewilliams-inn-once-stood

can last up to 6 hours from a battery charge, and an electric lawnmower that is 10 feet wide to cover its needs. They do own an electric handheld chainsaw and a handheld leaf blower and are getting an electric device for pruning, but their battery power only lasts about 20 minutes. They believe that the California law to ban gas-powered lawn equipment should expedite the process of creating electric-powered lawn equipment, but it is not there yet. They did mention that they cannot simply leave all of the leaves on the ground or mulch them, because there are too many that would kill the grass, block drains in rainstorms, and create muddy slipping hazards during snowstorms.

11.11 Evan Abramson - Landscape Interactions

Evan Abramson is an ex-regional planner, landscape designer, farmer, community organizer, documentary filmmaker, photojournalist, and the founder and principal of Landscape Interactions. Mr. Abrasmson and Landscape Interactions worked on both the Great Barrington and Lincoln Pollinator Action Plans. He was able to speak on the best process to go through when beginning to create a pollinator action plan for a local area and give his expertise on dealing with people that really enjoy the aesthetic of green lawns.

Mr. Abramson told us that the Town Green may be the hardest part of any New England town to try to convert to pollinator meadow because of its tradition and history. He recommended either starting with some other location, such as how Bee Friendly Williamstown has done at Spruces Park, to show that a pollinator meadow will work and look nice, and then consider further lawn conversion. For the Town Green controlled by local residents, Mr. Abramson recommended that we have a plan in place that describes how the conversion would be paid for, what kind of conversion process would be needed, and who would maintain the meadows. He said that he would be willing to make this plan if hired.

For Williams College, Mr. Abramson had the same concerns that were discussed by the College's landscaping and grounds team – that the College is likely concerned about the aesthetics of the campus for alumni and for prospective students and their families. The Town Green running directly through campus means that it is of special interest for the College to look "good," and may even have an endowment to keep its lawns in "good" condition, similar to what Colleges such as Vassar have. Mr. Abramson recommended that we work on outreach at the College to get other students on board, and maybe convince a donor to pay for converting the Town Green.

Finally, Mr. Abramson advised that we frame this project in the light of climate change, the biodiversity crisis, and how solving the climate change crisis depends on biodiversity in part. He also was open to being hired for a future iteration of this project, once the College, town, and abutters are on the same page and ready to think about actually converting the Town Green and/or other spaces around the town.

11.12 Rosemary Malfi - Massachusetts Pollinator Network Coordinator

Rosemary Malfi is the Massachusetts Pollinator Network Coordinator and Northeast Organic Farming Association, Massachusetts Chapter (NOFA/Mass). Ms. Malfi was able to provide many examples of other projects around Massachusetts that may act as good case studies, capable of showing the beauty of pollinator meadows and native plants. She told us that in her experience, it was common for people to believe that pollinator gardens and native plants look gross and unmaintained. Therefore, she thought that it was important to convey a maintenance plan when talking with a town, so that they will know that a planting will never become "gross" or overgrown. She also talked about the circular problem that she often experiences when talking to people who want to try to convert lawns to pollinator meadows. This circular problem is that people want to use past conversions as examples to convince others that creating meadows is good,

but no one will be the first to convert lawns to meadows. In a well-educated community like Williamstown, maybe it can be a selling point that the town can be a leader in the state.

Ms. Malfi was very interested in the Williamstown Lawns to Meadows project and did not know of another example of a project quite like this project because of the substantial set of publicly owned property through a downtown area that the plan could theoretically convert. She had also never heard of a stakeholder layout like the functioning of the Williamstown Town Green, with the town owning the land but the College and local residents in charge of the maintenance. Some of the other cities and projects that Ms. Malfi told us about included the North Hampton Pollinator Pathway, that is creating anchor plantings on private residents land through downtown and hopes to connect to private and public anchor plantings in the future and is led by Peggy McLeod, the director of the Western Mass Pollinator Network, Lunenburg, Maynard, the Mystic Charles Pollinator Pathway Group, which is encouraging homeowners and local residents to change lawn practices to create pollinator pathways at a smaller level and hoping that it will spread to a community level, the Hungry Ghost Bakery in North Hampton, and the Department of Conservation and Recreations and Department of Agricultural Resources in Massachusetts' "Growing Wild Campaign."

11.13 Elizabeth Kolbert

Elizabeth Kolbert is a Williamstown resident and the author of the Pulitzer Prize-winning book *The Sixth Extinction: An Unnatural History.* Pollinators and many plant species are a part of this mass extinction event, so Ms. Kolbert had a lot of knowledge to offer us. The first thing she emphasized, similar to many other people we interviewed, was that tackling the economics of the project would be a very beneficial method to getting people on board. A lot of our conversation also centered around how people in this smaller community can make a difference in the bigger

picture issue of the extinction event. She said that the lawn conversion to meadows is a way for community members to restore pollinator habitat without taking away from food production, unlike things like reforestation of agricultural land. Additionally, it is something that everyone can play a part in, as it is much easier for the College and residents to help these pollinators that are dying off here in Williamstown rather than other species that we cannot directly influence.

11.14 Vivian Orlowski

Vivian Orlowski is the Chair of the Agricultural Commission in Great Barrington, Massachusetts. As chair, she oversaw the Commission's collaboration with other entities to form the “Great Barrington Pollinator Action Plan: Connecting Habitat & Community,” discussed later in the report. Vivian had many helpful points for our project, specifically on how to get the town and its residents on board with such a project. Vivian emphasized getting support from local and regional leaders who are already recognized in the field, as well as getting people to serve on the town’s boards and committees that we are connected with to have a more inside-out approach. She also expressed that making the argument from an economic standpoint will always be productive and emphasizing that increasing local pollinators numbers will contribute to the local agriculture economy and provide ecosystem services of immeasurable value. Reducing mowing and pollution essentially also cuts costs for both institutional and private landowners. Finally, she made it clear that we can’t expect to do everything at once, and that change takes time. She is of the opinion that taking a longer approach to conversion can be more productive in the long run.

12 Survey

We created a survey for the private residents, businesses, and the college abutting the Town Green in order to better understand their attitudes towards and concerns about converting the Town Green from lawn to pollinator meadow. We created a list of questions that covered the abutters' personal opinions towards the conversion, their aesthetic preferences and expectations, and other questions. We believed a survey would be the best way to garner information on residents' feelings towards our project, which was important for us to know as the change would have to be approved by these residents for the project to happen at all. A full list of questions is in Appendix A. To pass this survey out to the different property owners, we walked up and down the Town Green on Thursday, November 4, 2021, placing a set of sheets in each house's mailbox. The combination of sheets placed included a flyer that described the benefits of pollinator meadow and the downsides of typical lawns (Appendix B) and a letter explaining the project, which had a QR code that linked to the Google Form (Appendix C). After this initial distribution, we originally received nine responses out of the 29 private residents that abut the Town Green. Following this initial wave of responses, we went out to homes that did not respond to the first inquiry and delivered another sheet with a handwritten note to the resident asking them if they'd be willing to answer the survey. This second round of reaching out brought five more responses to our survey,

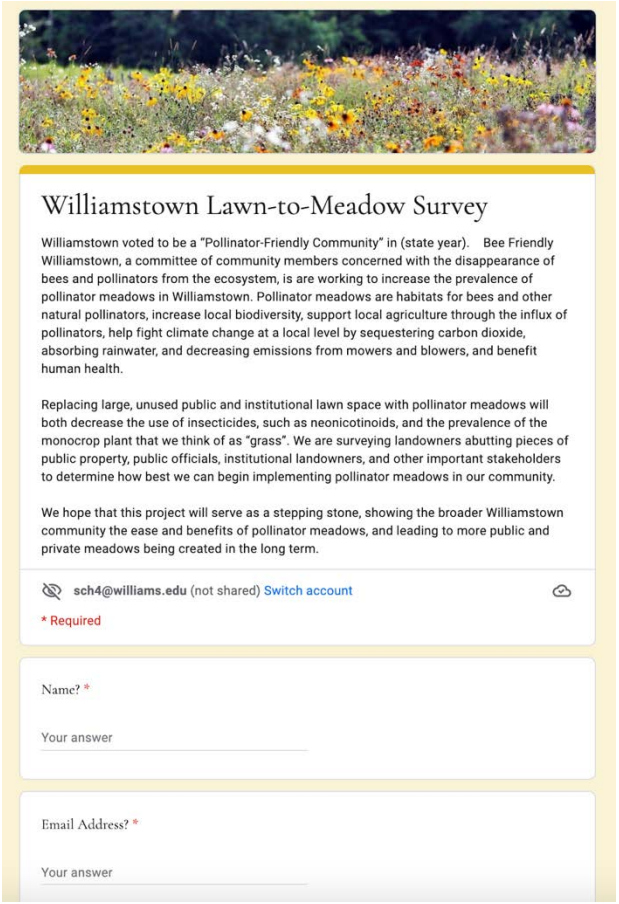


Figure 11: Stakeholder Survey introductory page on Google Forms

bringing the total to 14 respondents from 12 different households. A map of the location of the respondents (Appendix D) shows that the majority of the respondents to the survey congregate on the north side of Route 2 to the east of Williams College. This is the largest privately managed part of the Town. The list of respondents is below:

Survey Respondents

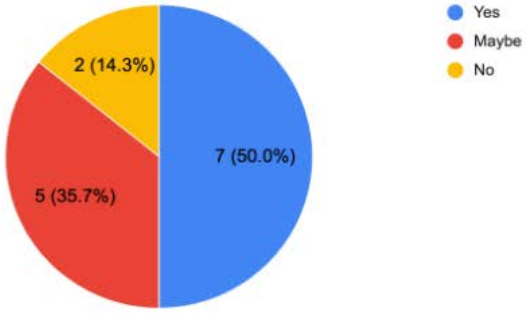
- Cynthia D. Payne at 762 Main Street
- Catherine Hill at 742 Main Street
- Ann McCallum at 716 Main Street
- Alice Bradley at 668 Main Street
- Allen Pope at 668 Main Street
- Joe Bergeron at 796 Main Street
- James Cart at 1139 Main Street
- Alexis Dekel at 788 Main Street
- Beth Carlisle at 1130 Main Street and 96 Bulkley Street
- Keith McPartland at 12 Grundy Court
- Catherine McKeen at 12 Grundy Court
- Erryn Leinbaugh at 711 Main Street
- Rocio Carrera at 732 Main Street
- Mary and George Ferger at 1191 Main Street

An interesting piece of information from the survey respondents is that at 668 Main Street, both spouses responded to the survey separately, and two different people who live at 12 Grundy Court responded.

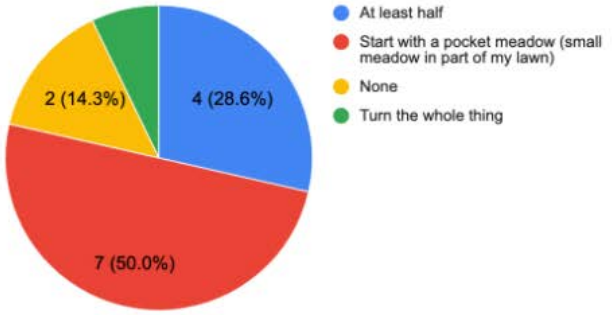
Survey Results

The results of our survey were promising for a number of reasons. Most notably, 12 out of 14 people said that they were willing to or at least would consider turning some or all of their lawn into a pollinator meadow. Of these 12 people, seven of them stated that they would prefer for the conversion to begin with a smaller pocket meadow rather than the entire thing. This could be due to some remaining hesitancy regarding changing the lawn aesthetic. Respondents may not be sure they want to commit to the entire lawn in case the operation fails. Another positive sign was that all but one person stated they would prefer their meadow to be a mix of wildflowers and grasses rather than a uniform single species meadow. This was slightly surprising given that the traditional lawn is one species. It is productive to know the residents are not attached to this idea. Separate open-ended questions in the survey revealed a few general concerns by the residents, including how ticks and other pests would be handled, who would be paying for the conversion and long-term maintenance, and if there would be uniformity across the Town Green between houses. However, overall, the survey results showed that there is significant interest in the community on converting lawns to pollinator meadows. We use these survey results to inform our proposal and decision-making moving forward.

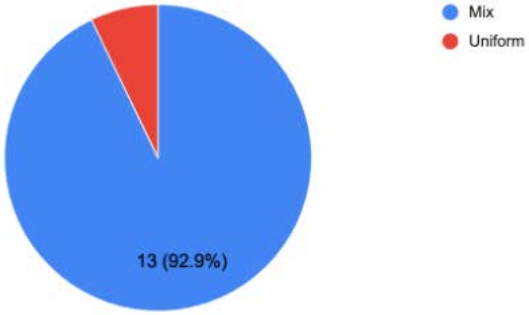
Are you willing to turn some or all of your lawn (or the lawns you have control over) into pollinator meadow?



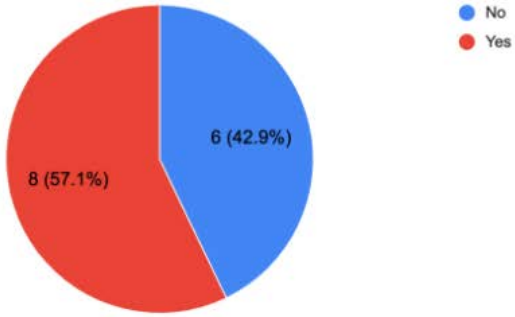
How much of your lawn are you willing to turn into a pollinator meadow?



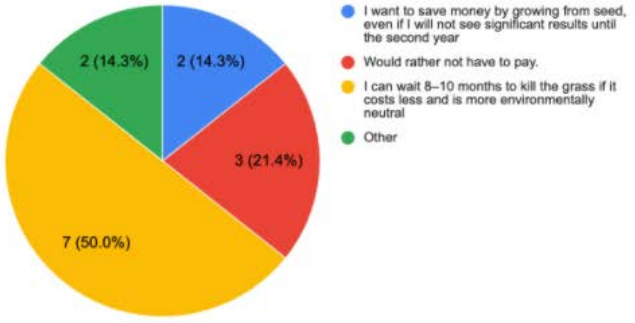
Would you like a mix of native plants (wildflowers, grasses), or the uniformity of a single species?



Is it important to you to add features (mown paths & edges, decorative fencing, signage) to balance the…



There are a few ways to begin the conversion of lawn to meadow, each taking different lengths of time and requiring d…



13 Case Studies

We analyzed numerous case studies in order to gain a better understanding of what pollinator friendly projects are already occurring other communities in Massachusetts and around the country. There are a large number of projects taking place right now in communities around Williams College. The case studies provide examples of possible policies and ways of incentivizing pollinator meadow and pollinator friendly lawn care practices that we considered for use in Williamstown. From the case studies, we have concluded that Williamstown and the College are already falling behind peer cities and towns by not yet undertaking their own large-scale pollinator friendly projects. We heard about many of these case studies through our interviewees as well as through our client. Many of the case studies were extremely in-depth with many steps and backgrounds of their own, and consequently, the following section only provides a brief overview of them to the best extent we could encompass the plan concisely.

13.1 Great Barrington Pollinator Action Plan

The town of Great Barrington's Department of Public Works, the Great Barrington Agricultural Commission, and the Conway School collaborated in the winter of 2018 to create the "Great Barrington Pollinator Action Plan: Connecting Habitat & Community," a plan to increase pollinator spaces across Great Barrington, MA.[36] As the first town in New England to pass a Pollinator-Friendly Community Resolution in 2016, Great Barrington has a history of supporting pollinator species and native plants. It is a good town to compare to Williamstown, as it hosts a lot

[36] Abramson, E. Great Barrington Pollinator Action Plan: Connecting Habitat & Community. https://www.townofgb.org/sites/g/files/vyhlif636/f/uploads/greatbarringtonpollinatoractionplan2018.pdf

of tourism, a large festival each year, the Berkshire International Film Festival, and is a gathering space for art and cultural programming. Great Barrington is also settled in a fertile river valley, the Housatonic, and has a long history of farming, similar to Williamstown.

The Pollinator Action Plan focuses on projects that satisfy three categories: visibility, scalability, and manageability. The goal of the Great Barrington plan is primarily to connect pollinator-friendly habitats in rural areas surrounding the town by creating multiple pathways of pollinator habitat within the town center. Ideally, pollinator strips are 5 feet wide and 300 feet apart.

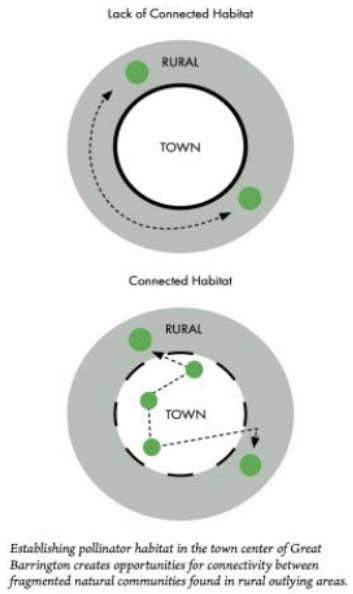


Figure 12: Connecting Pollinator Habitats in Great Barrington

The plan recommends that private residents commit to not using insecticides and neonicotinoids, avoid planting flowering plants that need to be treated with systemic herbicides or insecticides, and plant more pollinator friendly species. Public feedback was for the plan to prioritize municipal properties by creating contiguous demonstration sites, using the existing natural resources as a basis, and improving education.

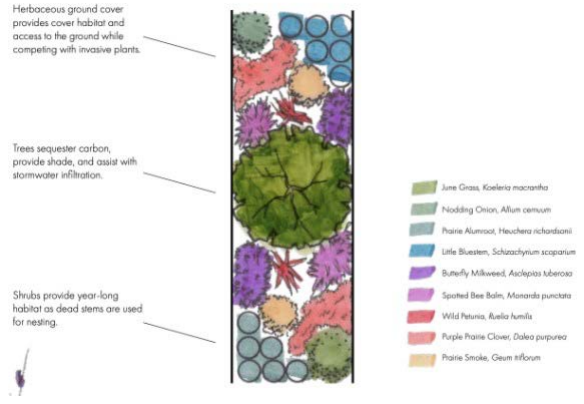


Figure 13: Example of sidewalk strip pollinator design from the Great Barrington Pollinator Action Plan

The plan also focused on using roadways as linear forms of not only cars but also as habitat connectivity. Roads in the northeast are significant contributors to pollution and salinization of waterways, specifically because of the use of salt during winter months. Conversion

of road-side strips also called a hell strip, or a berm. Hell strips are used as a first step because of its low costs, erosion control, and invasive species reduction capability by stopping plants and seed from coming off of vehicles and germinating because they decrease runoff from roads since the native plants have deeper roots and increase water infiltration, and they strengthen habitat connectivity downtown. The image to the right is an example plan of converting a sidewalk strip to a meadow with a mowed buffer zone.

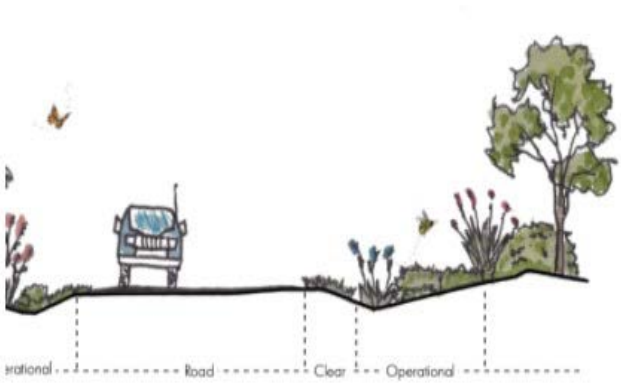


Figure 14: Example of pollinator habitat on the side of a roadway from the Great Barrington Pollinator Action Plan

To limit tick exposure, Great Barrington recommends maintaining a wide, well-mowed edge between the meadow and the place people walk. The plan also suggests keeping the habitat sunny and dry as ticks prefer moist, shady areas, installing bat houses to predate on ticks, and ensuring that there is no barberry, which is the main habitat of ticks carrying Lyme disease.

13.2 Lincoln Pollinator Action Plan

The Lincoln Land Conservation Trust (LLCT) worked with Evan Abramson to create a plant for increasing pollinator habitat in Lincoln, MA.[37] Lincoln is located in the northeastern portion of the state and therefore has a slightly different set of native plants and pollinators in Williamstown. The plan that Lincoln created and implemented, combining municipal conversion

[37] Abramson, E. Lincoln Pollinator Action Plan: Planting for Biodiversity and Climate Resilience. *https://www./lincolnconservation.org/wp−content/uploads/*2021/03*/LandscapeInteractionsLincolnPollinatorActionPlanwebfinal.pdf*

with assisting residents to create their own private pollinator habitats, could still be beneficial in Williamstown.

Lincoln has planted a few different types of pollinator meadow sites so far. The town converted an old woodlot into a meadow, and has been working to increase accessibility to and educational programming at the site by taking down parts of the large fence that surround it, adding gathering spaces, and finding a way to add a water feature. An old grassland that was used for sheep grazing is also in the process of being converted to a native pollinator meadow, beginning with a prescribed burn of the existing non-native plants. The Birches School, one planting site similar to the Williamstown Town Green, is a residential space that is being converted to a meadow. The LLCT recommends beginning a residential or urban lawns to meadows conversion by planting on parking lot islands and sidewalk strips, as they are unused pieces of land in the residential setting.

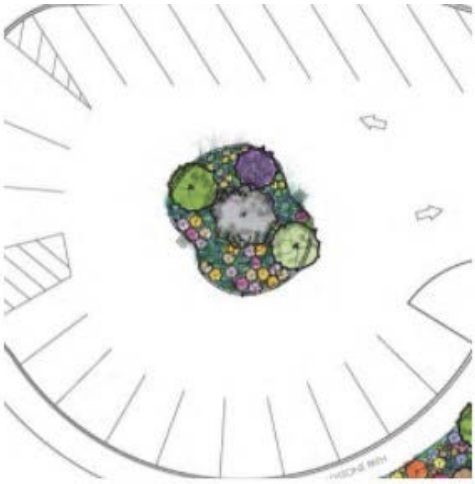


Figure 15: Example of Pollinator Design for Parking Lots from the Lincoln Pollinator Action Plan

An interesting program that the LLTC supported was pollinator planting kits for the public. The LLTC members researched, created, and sold planting kits to members of the public. These kits came with explicit instructions and recommendations and act as a starting place for residents to plant their own pocket meadow on their property. This program is meant to expand on the amount of pollinator habitat in the town past the initial corridor.

13.3 Northampton Pollinator Pathway

The town of Northampton, Massachusetts is home to a pollinator pathway that began in 2018 and will run through the center of the city. The pollinator pathway is comprised of anchor plantings, which are patches of pollinator meadow that decrease the distance that bees, bugs, and other pollinators must travel before needing food and shelter. These anchor plantings allow for pollinators to move through the city more safely. The picture to the right shows the proposed pollinator meadow pathway through Northampton.

Figure 16: Proposed Northampton Pollinator Pathway

The Northampton Pollinator Pathway depends on volunteers. Dozens of volunteers have designed, planted, and maintained five pollinator-focused anchor plantings on city properties [38] Today, volunteers are still in charge of the meadows' maintenance and the further development of the pollinator pathway. For example, Owen Wormser, landscape designer from Local Harmony, volunteered to help create and install plants in a rain garden at Pulaski Park in 2015, planting 150 pollinator-friendly plants from plugs grown in the city's central meadow.[39] In September 2019, volunteers designed and installed gardens at the Senior Center and Forbes Library.[40] Most recently, in 2021, volunteers have begun planting a meadow on a steep slope in the city that was almost impossible to mow.[41]

[38] MacLeod, P. (2020, April 28). Peggy MacLeod: Building a pollinator corridor. https://www.gazettenet.com/MacLeod-letter-34443958
[39] History of Northampton's Pollinator Pathway. https://www.wmassbees.org/northampton
[40] History of Northampton's Pollinator Pathway. https://www.wmassbees.org/northampton
[41] History of Northampton's Pollinator Pathway. https://www.wmassbees.org/northampton

To build on the efforts of this community-led programming, the city of Northampton has now commissioned Evan Abramson to create a toolkit for further meadow-fication.[42]

13.4 "Growing Wild Massachusetts" by Department of Conservation and Recreation and the Massachusetts Department of Agricultural Resources

In 2021, the Massachusetts Department of Conservation and Recreation (DCR) partnered with the Massachusetts Department of Agricultural Resources to create the "Grow Wild Massachusetts" Initiative. Grow Wild is an initiative that aims to promote and support pollinators throughout the state. The main part of this initiative is that the state has partnered with local nurseries across the state to create and distribute pollinator habitat starter kits. These starter kits include live plants and packs of native seeds, a trowel, a Growing Wild sign, information about native plants and pollinators, and a journal to track seasonal plant growth and pollinator activity. The starter kits began to be available at local nurseries on June 2, 2021. The DCR will also provide educational resources on its website and social media channel.[43] As part of the state's new push to get private residents to create pollinator-friendly habitats on their own property, the state also came out with a guide:

Figure 18: Growing Wild Massachusetts Logo

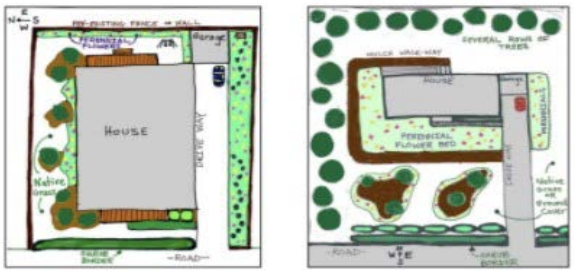


Figure 17: Pollinator Friendly Yard Design from Grow Wild Massachusetts

[42] Abramson, E. Pollinate Northampton: Replicable and Scalable Landscape Design Toolkits to Support Pollinator Species at Risk in the Connecticut River Valley of Massachusetts. Landscape Interactions. https://drive.google.com/file/d/1ksadTZt5bHFdS-X0pfdNHKC3OzigGnkH/view

[43] Department of Conservation & Recreation. (2021, June 2). State Environmental Agencies Launch Campaign to Promote Pollinator Habitat. https://www.mass.gov/news/state-environmental-agencies-launchcampaign-to-promote-pollinator-habitat

"More Than Just a Yard: Ecological Landscaping Tools for Massachusetts Homeowners" to help educate the public on the importance of pollinator spaces and give a step by step plan for converting part, or all, of residential lawn to pollinator-friendly habitats.[44]

13.5 Somerville, MA Native Planting Ordinance (No. 2021-05)

Somerville, MA has created a first-of-its-kind ordinance to protect native vegetation, promote ecological restoration, and combat climate change in its native planting ordinance.[45] This ordinance, which was voted into law on March 25, 2021, states that a certain percentage of newly planted trees and plants by the city or any third-party hired by the city must be native species, with an expectation that the percentage will grow to 100% over time. There are exceptions in the ordinance for special holiday plantings, athletic fields, green roofs, and gardens.

The ordinance does not apply to already existing trees or plants, except for invasive species. No invasive species are allowed to be planted by the town and all existing invasive species are supposed to be removed. Starting in 2026, no native plants sourced from locations in which they have been treated with neonicotinoids are allowed to be planted. This ordinance is a great example of phasing in change and making a city greener and more pollinator-friendly without rash changes that might cause unnecessary worry or anger among residents.

13.6 California Ban of Gas-Powered Lawn Care Equipment (AB No. 1346)

The California bill SOREs, passed in the general assembly, bans gas-powered small off-road engines starting in 2022.[46] The ban will only become effective if, by July 1, 2022, there are

[44] More Than Just a Yard: Ecological Landscaping Tools for Massachusetts Homeowners. Executive Office of Environmental Affairs. https://www.mass.gov/doc/more-than-just-a-yard-ecological-landscaping-tools-
[45] Somerville, MA: Native Planting Ordinance, Pub. L. No. Ordinance No. 2021-05 (2021).
[46] Somerville, MA: Native Planting Ordinance, Pub. L. No. Ordinance No. 2021-05 (2021). https://www.somervillema.gov/sites/default/files/native-planting-ordinance.pdf

cost-effective and technologically feasible regulations for new small off-road engines also adopted by the State Air Resource Board. Therefore, the implementation of the law may be delayed depending on the technological feasibility and accessibility. There are 30 million dollars already allocated to assist in the transition and development of new electric lawn care technology. This law will be part of the state's Health and Safety Code.

While the EPA has federal jurisdiction to set air quality standards and emissions standards, it is within the rights of a state or jurisdiction to set restrictions that are stricter than that of the national government. California has a history of setting more stringent emissions standards for cars than the federal government and is simply building upon that legacy in banning small gas-powered off-road engines. Although, if the EPA decides to set standards for new small off-road engines, their standards would be superseded those of the state of California if more restrictive.

California is not the first jurisdiction to ban the use of some form of gas-powered lawn equipment. In the District of Columbia, Mayor Muriel Bower signed a bill banning the use of gas-powered leaf blowers in 2018, which will go into effect in 2022.[47] In fact, 100 different cities across the country have already passed regulations to ban or restrict the use of gas-powered lawn equipment, including Newton, MA.[48]

[47] Resources and guides for the 2022 D.C. Phase-Out Law. Quiet Clean D.C. *https://www.quietcleandc.com/transition − guide*

[48] This Massachusetts city responded to 320 leaf blower complaints after seasonal ban sought to protect "basic right to enjoy peaceful lives." (2019, June 7). https://www.masslive.com/news/boston/2017/10/leafblowerdebacleplagueswe.html

14 Proposed Plan

The Williamstown Town Green runs directly through the center of Williamstown and Williams College. Therefore, the process of converting the Town Green from grass lawns to pollinator meadows will not be an easy task. This proposal is bound to face pushback from community members and College leadership who are worried that meadows will ruin the aesthetic of the town, and be unsafe. Therefore, the proposed plan needs to be strategic by phasing in pollinator meadows to the Town Green, not simply calling for a full conversion in 2022. The phased approach discussed below will allow community members and College leadership to see the benefits of pollinator meadows first-hand, beginning at a smaller scale, and to understand that their concerns are overblown. The three-phased plan calls for Williamstown to (1) create anchor pollinator meadows that can serve as a pollinator pathway through downtown Williamstown and be examples of the benefits of pollinator meadows without creating too large of a change; (2) connect anchor meadows with a 5-foot-wide pollinator meadow strip on both sides of the Town Green; and (3) convert the entire Town Green to pollinator meadow. At every step of this conversion process, there will be buffer zones of grass mowed around the edges of the pollinator meadows to separate them from people and dogs, make the meadow look more maintained, and decrease deer, tick, and other safety concerns.

Phase 1

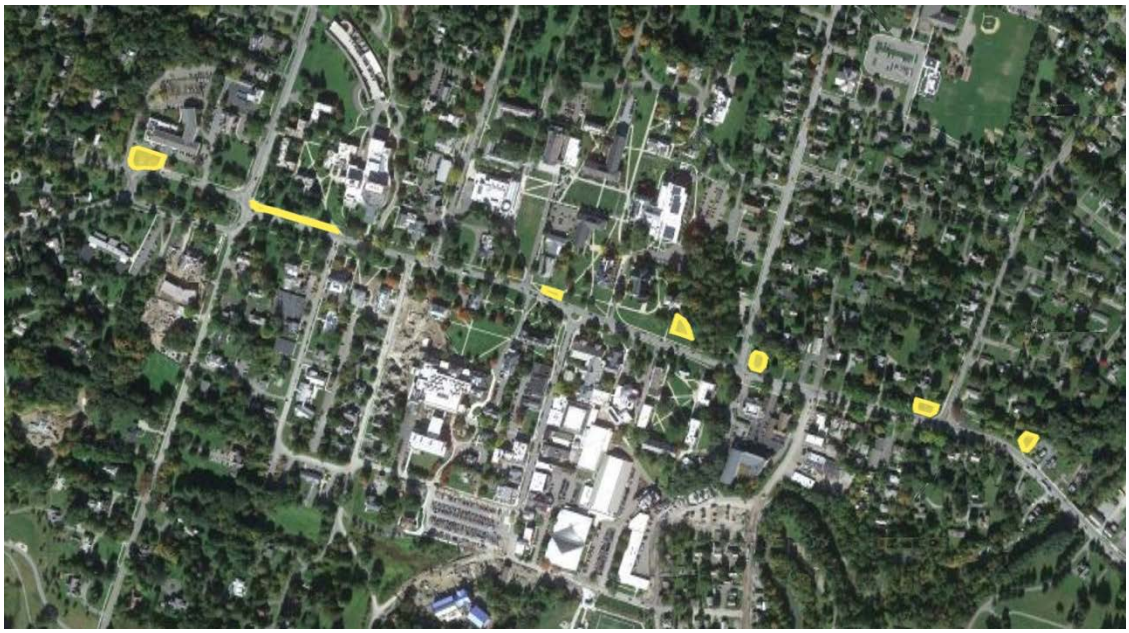


Figure 19: Anchor Pollinator Meadows Proposed in Phase 1

Plant anchor pollinator meadows along the north side of the Town Green. Anchor plantings were used in the creation of the Northampton pollinator pathway as small islands of pollinator meadows that pollinators could travel between, forming a safe set of habitats for pollinators as they moved across the city. These will be less expensive to create and are easier to get approval compared to larger area conversions because they are smaller and might feel more like a large garden of flowers. The anchor pollinator meadows will be mowed around the edges and have signage within them. The hope is that these pollinator meadow anchor plantings will be able to begin to be created when new trees are added along the Town Green in the spring of 2022. We are proposing seven different anchor planting sites: three on Town Green

Figure 20: Pollinator Friendly Habitat in Williamstown after Phase 1, points from the Bee Friendly Williamstown August 2021 map and proposed anchor sites.; purple represents existing sites and yellow represents proposed sites

maintained by private residents very excited by the idea of converting the Town Green to pollinator meadow, Joe Bergeron at 796 Main Street, Ann

McCallum at 716 Main Street, and Alice Bradley at 668 Main Street (the three farthest right patches on the map above), one in front of the First Congregational Church, which has already been discussing the part of the Town Green that it maintains with Bee Friendly Williamstown, and three by Williams College on the Town Green to the east of Griffin Hall, on the Town Green in front of Greylock Quad, and at the Old Williams Inn site. While it is especially difficult to estimate when Williams College might be open to creating anchor pollinator meadows on its part of the Town Green, we hope that these seven sites can be planted by the end of 2023 so that by 2025/2026 they can be full meadow sites.

Phase 2

The second phase of our proposal entails the creation of a 5-foot pollinator meadow strip on both sides of the Town Green, running the length of the Town Green and connecting the anchor meadow plantings to one another. By 2025, we hope that Williamstown residents and Williams College will have had the opportunity to see the beauty and benefits of pollinator meadows due to the anchor plantings. This will make it easier to get widespread approval to convert more of the Town Green to pollinator meadow. Converting a 5-foot strip earned the best ranking of possible lawns-to-meadows conversion on our ranking rubric due to its lower expense of initial conversion and longer-term malignance and the public opinion from our survey, where residents said that they want to start small and scale up from there. We hope to next convert only a strip instead of the entire Town Green, because it would allow the town and College to continue to slowly change its aesthetics and hopefully avoid any major community backlash. The pollinator strip would once again include mowed boundaries and signage to ensure that it looks well maintained. We propose

that this process would begin in 2025, meaning that the pollinator meadow strip connecting the anchor habitats would be fully grown come 2028.

Phase 3

Beginning in 2027, Phase 3 would radically change the aesthetics of the Town Green and the center of Williamstown and Williams Campus for the better. In phase 3, the entire rest of Town Green that has yet to be converted to pollinator meadow would be converted, meaning that all about 11 acres would be pollinator-friendly habitat. By 2027, we hope that the pollinator meadow aesthetic has come to be enjoyed and appreciated by residents and College leadership as there will have been a year of fully grown anchor pollinator meadows and a few years of the meadow strip conversion already completed. The final step would work to finalize the Town Green conversion and make Williamstown and Williams College look more unified and pollinator-centric. As with the other steps, there would be borders around the pollinator meadows mowed to ensure the safety of pedestrians and cars with the many intersections, keep the meadows looking well-kept, and maintain space on the side of the road for people to watch parades. This final step would create a beautiful array of flowers, native grasses, and pollinators throughout the downtown area of Williamstown, with pollinator meadows fully-grown by 2030.

15 Report Summary and Recommendations for Future Work

Williamstown, MA, and Williams College have an incredible opportunity to be local and national leaders in creating pollinator-friendly habitats in public and institutional spaces. While there have been plans created and pollinator meadows installed in other towns, such as Great Barrington and Northampton, there has yet to be a project that tackles such a large portion of public

land and deals with stakeholders spread as broadly as the Williamstown Town Green, from a town, College, and local residents. This is where the opportunity for Williamstown to be a leader lies.

Converting part, or all, of the Town Green from lawns to meadows and either having private residents continue to maintain the Town Green or turn the responsibility of maintaining the town's land over to Williamstown DPW, will create upwards of 10 miles of pollinator habitat, connecting habitats on the outskirts of town to one another and giving pollinators a pathway by which they can safely travel through Williamstown. This conversion will decrease the amount of greenhouse gas emissions by the town and College, fitting perfectly into the Williamstown Net Zero Resolution and Williams College Climate Action Plan, and improve carbon sequestration, decrease noise pollution from loud lawn equipment, and make the town a healthier place for humans and non-human creatures alike. We understand that the Town Green is steeped in centuries of tradition dating back to medieval Europe, and generations of Williamstown families have grown accustomed to the lawns that dominate it. These both make the Town Green a difficult location to convert to pollinator meadows and an exciting one, as it would truly change the aesthetics of Williamstown and be a basis on which future projects can spawn. We believe that Williamstown and Williams College are full of environmentally-oriented people who are ready for a change from the outdated lawn aesthetic of the Town Green and will support making our downtown more pollinator friendly.

Other environmentally and pollinator-friendly lawn care policies, such as a native plant ordinance, a ban of gas-powered lawn equipment, and requiring certain mowing practices, have been implemented in other towns across the country and in Massachusetts. As a highly educated town that cares deeply about the environment and the health of its people, each of these lawn care policies would make sense to enact in Williamstown. We believe that these can be enacted in a

much shorter time period than the conversion of the Town Green to pollinator meadows due to the extensive scientific research on their benefits and examples of the laws and how well they work in other Massachusetts towns. Therefore, we recommend that these policies are given a hard look, to serve as both a stopgap as larger lawn care practices are changed, and lawns are continued to be changed to pollinator meadows.

Future research and action in Williamstown are already underway, with residents living on Southworth Street working to add pollinator meadows to their sidewalk strips, pollinator friendly trees being planted along the Town Green in the near future, and work to get Williams College accredited as a Bee Campus USA. There is a window of opportunity to enact pollinator-friendly ordinances right now at Williams College and in Williamstown as both embark on creating Master Plans and look to fulfill their climate pledges. Future places for action in Williamstown were more fully explored in a past ENVI 302 report on possible pollinator friendly spaces in Williamstown.[49] These spaces include the two golf courses, where pollinator-friendly habitat could be installed between fairways in current dead space, Field Park, and at the local public schools. We also believe in supporting Lydia von Schwanenfluegel's ('23) work to make Williams College's campus more pollinator friendly.

Finally, there may also be an opportunity to accompany the discussed policies to force implementation of pollinator friendly habitat with programs to promote more pollinator friendly habitat on private properties. This might be by utilizing the Massachusetts "Growing Wild" campaign and buying their premade pollinator habitat starter kits or by having Bee Friendly

[49] Knoedler, Molly, Natasha Baranow, Kathryn Dix, and Bridget Spann. 2017. "Pollinator Protection in Williamstown, MA," 59.

Williamstown create and sell kits of their own. More work should be focused on ways to promote pollinator habitat in the future to accompany work to mandate it.

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17 Appendix

17.1 Survey Questions

Raw Survey results can be found at: *https://docs.google.com/forms/d/1sHMYAJycdK_AIp8Z_1Tx0liriKXkZfrmpcdBFFKbF5Y/edit?usp=sharing* (please do not delete survey responses).

(Uses the word "you," but general means the property owner or current resident of the property abutting the Town Green)

Email Address?

Street Address:

Why might you be interested in the Williamstown "lawn to pollinator meadow initiative"? (checkbox question) Live in a property abutting the town green

- Would like to mow less often
- Want to see more native pollinators in Williamstown • Lawn care is vital to my profession
- Other:

What group do you work for/represent? (multiple choice question)

- Municipal (Town Official)
- Local Business
- Institution with large lawn • Private Resident
- Other:

Are you willing to turn some or all of your lawn (or the lawns you have control over) into a pollinator meadow? (multiple choice question)

- Yes
- No
- Maybe
- Other

How much of your lawn are you willing to turn into a pollinator meadow?

- None
- Start with a pocket meadow (small meadow in part of my lawn)
- At least half
- Turn the whole thing

Would you want low-growing native plants that won't require mowing, but will look somewhat like a grass lawn? (checkbox question)

- Yes
- No
- Maybe

How high would you like the tallest plants in your meadow to be? (on a scale of 1 to 6 feet)
Would you like a mix of native plants (wildflowers, grasses), or the uniformity of a single species? (multiple choice question)

- Mix
- Uniform

Is it important to you to add features (mown paths & edges, decorative fencing, signage) to balance the "wild" aesthetic of a meadow? (multiple choice question)

- Yes
- No

There are a few ways to begin the conversion of lawn to meadow, each taking different lengths of time and requiring different amounts of work and expense. The existing grass must be eliminated, and new plants started from seed or small starter plants. Which of the following statements would you most agree with? (multiple choice question)

- I need the conversion to happen quickly, no matter the expense
- I can wait 8-10 months to kill the grass if it costs less and is more environmentally neutral
- I want to save money by growing from seed, even if I will not see significant results until the second year
- Other:

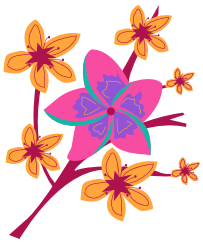
Is there anything specific you would want to see from Bee Friendly Williamstown as part of this process?

Do you have any other concerns about having a pollinator meadow?

Do you have any other questions about converting Williamstown lawns to pollinator meadows? '

17.2 Lawn-to-Meadow Factsheet

Lawn-to-Meadow Factsheet



We are in an ecological crisis. Native plants and pollinators depend on one another. Pollinators are bees, birds, insects, and small animals that spread pollen from one flowering plant to another to help them reproduce. Today, 23% of native plant species are in decline, native and domesticated bees are dying, and 19 species of butterfly and moth and 9 species of beetle are listed as endangered, threatened, or of special concern by the Mass. Natural History & Endangered Species program.

Negatives of a "Typical" Lawn

20% of Massachusetts is lawn!

- The most common lawn grass in Williamstown is Kentucky Bluegrass, a **monocrop** that requires regular mowing, fertilization, chemical application, and watering. Lawns have little ecological value.
- Insecticides and neonicotinoids that are applied to lawnscapes are highly **toxic** to invertebrate species, have led to decreases in pollinator populations, and can persist in soil for years, **contaminating water** sources through runoff.

15% of water use nationally is for lawn maintenance!

- Using a gas-powered lawnmower for an hour emits the equivalent amount of pollution as driving a car for 100 hours. The average leaf blower produces 70-75 decibels, well above the 55 decibels recommended by the WHO for outdoor noise.

Positives of Pollinator Meadows

- Native plants have a more extensive root system than lawn grass. This increases soil fertility, organic matter in the soil, and **sequesters carbon**!
- 45% of all agricultural commodities in Massachusetts depend on pollinators.
- The **maintenance** of pollinator meadows is incredibly **simple and inexpensive**. They do not require insecticide, herbicide, or fertilizer, need less water, and are mowed significantly less than lawns.
- Pollinator meadows mean more flowering plants and beautiful insects, butterflies, and other creatures living in front of your house! **See the back side of this sheet for examples of pollinator-friendly plantings!!**

Images above are of the Demonstration Pollinator Plantings at The Spruces, 60 Main Street, Williamstown, MA from beefriendlywilliamstown.org

The image above is an example of pollinator-friendly planting at a home. Photo credit: Xerces Society, www.xerces.org

17.3 Explanation of Project Letter

Dear Resident Abutting the Town Green, November 2 ,2021

Hello! We are seniors at Williams College working with Bee Friendly Williamstown, the native plant and pollinator advocacy group, to increase pollinator meadows in Williamstown. This work is part of our Environmental Planning Workshop with Professor Sarah Gardner.

In the "Lawn-to-Meadow" project, we are focusing on the Town Green and nearby properties in addition to Williams College's lawnscape, and the local golf courses, for transitioning lawns to pollinator meadows and less chemical-dependent landscapes We believe that these spaces are great starting points for bringing more native plants and pollinators back into the town's ecosystem. For more information on the benefits of pollinator meadows and downsides of "typical" lawns, and why we believe that converting lawns to meadows is important, please look at the fact sheet attached.

We are reaching out to you because your property is abutting the Town Green. We would like to know your thoughts and opinions on converting some or all of the Town Green that abuts your property from lawn to meadow. There is currently no ordinance governing the maintenance of the Town Green and we have confirmed with Town Hall that it is legal for it to be converted to meadow.

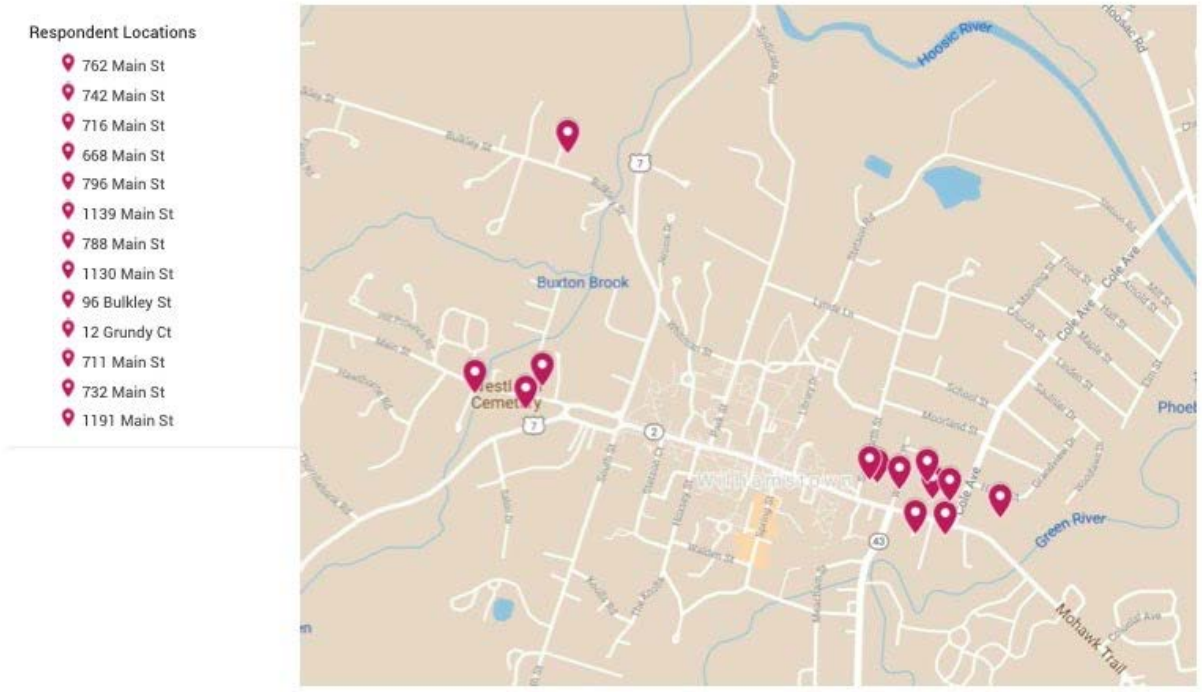
We would be grateful if you would be willing to take 5 minutes this week to fill out the form attached by QR code to the right so that we can better understand your interests and concerns with converting lawn to pollinator meadow! If you are unable to use the QR code, please email us for an online link.

Thank you so much for your time and consideration. If you have any further questions or would like to meet with us in person (which we would love to do, to talk more about pollinator meadows and native species), please feel free to contact us before Nov. 12.

Happy Fall!

Aaron Stanton and Sam Holmes
ais5@williams.edu and/or sch4@williams.edu.

17.4 Location of Survey Respondents



17.5 Images of Peer Community Pollinator Projects

Figure 21: Conversion of sidewalk strips in the Seattle Pollinator Pathway

Figure 22: Proposed Pollinator Meadow and Path in Great Barrington

Figure 23: Beautiful Pollinator Meadow along the outside of a Golf course at Oregon State University in Corvallis, Oregon

17.6 Images of Peer College Pollinator Projects

Figure 25: Smith College Pollinator Friendly Habitat in its Arboretum

Figure 24: Langara College Pollinator Friendly Habitat next to a Campus Building

Figure 27: Tuft University Campus, a Bee Campus USA.

Figure 26: Swarthmore College's Campus dotted with flowers and pollinator friendly habitat