Parks and Pollinators: Taking Action and Advancing Sustainability

NRPA

NATIONAL RECREATION AND PARK ASSOCIATION

Male long-horned bees — easily identified by their extra-long antenna — can frequently be seen sleeping on flowers.
Photo courtesy of Matthew Shepherd, Xerces Society.

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Cover Image

A monarch butterfly sits on swamp milkweed, a rich source of nectar for adult monarchs and an essential food plant for their caterpillars. *Photo courtesy of Stephanie McKnight, Xerces Society.*

PURPOSE OF THIS RESOURCE

This resource is intended to help park professionals and like-minded individuals leverage their public engagement to grow support and partnerships that advance pollinator-supporting actions and sustainable practices. Community members can be engaged through community science, education and experiences in natural spaces — like the National Recreation and Park Association (NRPA) Parks for Pollinators BioBlitz.[1] Information shared throughout this resource builds upon existing best practices and other tools that advance this work through parks and local communities.

We acknowledge that each agency is entering into this work with different levels of experience. This resource is meant to serve as a starting place. Feel free to start implementing information from those sections that are useful and keep expanding on those areas you already are excelling in.

Introduction

Native bees, such as this pure green sweat bee, often defy widely held perceptions of what bees look like. *Photo courtesy of Sarah Foltz Jordan, Xerces Society*.

Why Are Pollinators Important?

Pollinators — animals that move pollen among flowers, thus ensuring that plants can form seeds and fruits — are at the heart of a healthy environment.

Sometimes the contributions that pollinators make to our lives can be measured in monetary terms. In the United States, farmers grow more than 100 crop plants that require pollinators. Insect-pollinated crops in the United States generate an estimated $34 billion per year in economic value.

But the benefits provided by pollinators cannot be truly measured in dollars. Pollinators support the plant communities that provide food and shelter for many other animals. Fruits and seeds derived from insect pollination serve as a major part of the adult diet of mammals, from red-backed voles to grizzly bears, as well as approximately 25 percent of birds. In addition, 95 percent of songbirds rear their young on insects. In some places, pollinator-supported plant communities bind the soil, thereby preventing erosion, keeping creeks clean for aquatic life and conserving an important resource. Pollinators enrich our lives through the flowers and trees in our parks and communities. Springtime flowers, summer berry picking, Halloween jack-o'-lanterns, and Thanksgiving pie all exist thanks to pollinators. Pollinators are fundamental to countless harvests gathered in backyards and community gardens.[2]

Around the world, bee and butterfly populations are declining due to habitat displacement. A United Nations report found that up to 40 percent of pollinators are at risk of extinction in the coming decades. In the United States, although only one species of bumble bee (rusty patched bumble bee, *Bombus affinis*) is protected under the federal Endangered Species Act.

[1] National Recreation and Park Association (NRPA). Parks for Pollinators BioBlitz. Retrieved from https://www.nrpa.org/our-work/Three-Pillars/conservation/parks4pollinators

[2] Frischie, S., Code, A., Shepherd, M., Black, S., Hoyle, S., Selvaggio, S., Laws, A., Dunham, R., and Vaughan, M. (2021). *Pollinator-Friendly Parks: Enhancing Our Communities by Supporting Native Pollinators in Our Parks and Other Public Spaces*. The Xerces Society for Invertebrate Conservation. Retrieved from https://xerces.org/sites/default/files/publications/21-038_02_Parks-Guidelines_web-screen.pdf

An assessment by the International Union for Conservation of Nature's (IUCN's) Red List found that a quarter of bumble bee species are at risk of extinction.[2] Butterflies may not be faring much better. Several long-term studies have shown that diversity and abundance of butterflies are in rapid decline. The plight of the monarch butterfly may be best known, with its populations declining by more than 80 percent in the eastern United States and more than 95 percent in western states. This decrease prompted IUCN to add monarch butterflies to its Red List in 2022.[3]

Pollinator habitat creates beautiful places for recreation. *Photo courtesy of Shepherd, Xerces Society.*

What Pollinates?

Pollinators are a greatly diverse group of animals and insects. This includes mammals (such as long- and short-nosed bats in the Southwest deserts) and birds, such as hummingbirds. However, the vast majority of pollinators are insects — such as bees, wasps, flies, beetles, moths and butterflies. Some are specialists focusing on specific jobs and relying on specific habitats, while others are generalists. All visit flowers to feed on nectar and/or pollen. While most of those groups are simply feeding themselves, bees actively collect and transport pollen and nectar to feed offspring in their nests — making bees the single most important group of pollinators.

Ensuring a vast diversity in both pollinator species and plants is vital for the survival of both groups, as well as the multiple benefits they provide our parks and communities.

Parks are Important to Pollinators

Park and recreation agencies manage open spaces and amenities in every community across the country — from vast open natural lands to small pocket parks. We know the importance of parks and open spaces for communities — providing spaces for recreation, gathering and rejuvenation, as well as a plethora of health and resiliency benefits.

Park and recreation agencies also make land management decisions that impact wildlife species and habitats. Pollinators are essential to the survival of our ecosystems. Through increased biodiversity and improved habitat, we can ensure future generations enjoy a natural environment that is healthier and more resistant to climate change. Both rural and urban landscapes can be well-maintained and still lack significant biodiversity. With intentional planning around native species

[3] International Union for Conservation of Nature, (2022, July 21). *Migratory monarch butterfly now Endangered- IUCN Red List*. Retrieved from https://www.iucn.org/press-release/202207/migratory-monarch-butterfly-now-endangered-iucn-red-list

and pollinators, biodiversity can thrive. In many places, we underestimate how many species parks support. In New York, community gardens in East Harlem and the Bronx supported more than 50 species of bees, and surveys of suburban gardens just north of New York found more than 100 species. In California, parks in San Francisco support diverse populations of bumble bees — more than 70 species of bees were recorded in the gardens of Albany and Berkeley. Fragments of desert scrub habitat in neighborhoods of Tucson, Arizona, were home to 62 species of bees. Even rare species like the rusty patched bumble bee can be found in gardens and green spaces of cities and towns in the upper Midwest. Clearly, urban green spaces are important for pollinators.[4]

Besides bolstering biodiversity, these practices also create economic benefits for agencies and their communities. In Quebec, Canada, they estimated a 36 percent reduction of public maintenance costs when decreasing their mowing regiment in low-use areas.[5] Additionally, while turf grass requires about one inch of water per week in the summer, native plants conserve water because they require little to no watering during summer months, allowing local governments to reduce overall water consumption.[6] The Environmental Protection Agency (EPA) found that the combined cost of installation and maintenance for natural areas over a ten-year period amounted to one -fifth of the cost for conventional landscape maintenance. They also found that native prairie cost 56 percent less than turf to install and can provide significant savings on maintenance costs over a five-year period, even with native prairie

A small carpenter bee forages on purple prairie clover. *Photo courtesy of Foltz Jordan, Xerces Society.*

expenses for installation and maintenance.[7] Native habitat used as green infrastructure also can help slow deterioration of existing pavement, saving money on street maintenance and reducing upkeep costs of city streets by anywhere from 15 percent to 60 percent, depending on the type of planting used.[8] Native plantings can act as a carbon sequestration tool, absorbing carbon dioxide from the air and storing it in vegetation and soil, thereby offsetting carbon emissions and mitigating climate change.[9]

Parks provide places for community members to gather and find respite in nature, so they are natural places for the community to learn about pollinators, pollinators' role in building healthy and resilient environments, and the importance of protecting pollinator habitats. Building awareness is an essential part of ensuring the adoption of pollinator safe practices; it also advances sustainability practices and actions that benefit your agency and community in much broader ways.

[4] Xerces Society for Invertebrates Conservation. (2021). *Pollinator-Friendly Parks: Enhancing Our Communities by Supporting Native Pollinators in our Parks and Other Public Spaces*. Retrieved from https://xerces.org/publications/guidelines/pollinator-friendly-parks

[5] Watson, Christopher J.; Carignan-Guillemette, Léonie; Turcotte, Caroline; Maire, Vincent; and Proulx, Raphaël. (2019). *Ecological and economic benefits of low-intensity urban lawn management*. Retrieved from https://www.sciencedaily.com/releases/2019/12/191219074744.htm

[6] U.S. Environmental Protection Agency (EPA). (December 2004). Archive: Landscaping with Native Plants. Retrieved from https://archive.epa.gov/greenacres/web/html/conf_knwldge.html

[7] EPA. (2016). *Green Landscaping: Greenacres*. Retrieved from https://archive.epa.gov/greenacres/web/html/chap2.html

[8] EPA. (2008). "Trees and Vegetation." *Reducing Urban Heat Islands: Compendium of Strategies.* Retrieved from https://www.epa.gov/heat-islands/heat-island-compendium

[9] Christin, Zachary and Kline, Michael. (2017). *Why We Continue to Develop Floodplains: Examining the Disincentives for Conservation in Federal Policy Earth Economics 27*. Retrieved from https://www.aswm.org/pdf_lib/discincentives_for_conservation_in_federal_policy.pdf

Types of Habitats for Pollinators

POLLINATOR GARDENS

These are small spaces (generally less than 1,000 square feet) that are located in areas readily accessible to park staff and visitors. These can be flower beds in parks/facilities, container plantings, and formal or informal spaces. Existing mulched beds also can be converted into these small gardens. While small in scale, these gardens can provide an important source of habitat. They also provide good opportunities for staff to educate visitors through interpretive signs or educational programming, allow visitors to see that pollinator gardens are attractive, and can be welcome landscape features in any yard.

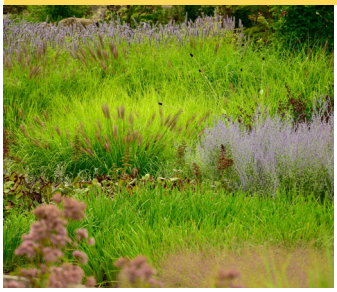
SMALL-SCALE POLLINATOR AREAS

Small-scale pollinator areas generally extend more than 1,000 square feet but less than one acre. Prime candidates are areas not heavily used by visitors because their shape, size or location make it difficult to till or mow. Identifying these areas can be done by geographic information system (GIS) analysis or staff familiar with the park or existing public property. After identifying and verifying areas as suitable from a park operations standpoint, actual site conditions can be assessed and developed into pollinator habitat.

LARGE-SCALE POLLINATOR MEADOWS OR PRAIRIES

Large scale pollinator meadows or prairies consist of land areas that exceed one acre. A variety of areas offer opportunities to create meadows or prairies, such as existing fields and mowed turf areas. The level of effort required to establish these types of pollinator habitats depends on the size of the area and the presence of other species established there. Creating these habitats could require a multiyear process of installation and maintenance.

Images depict pollinators and the various types of habitats in which they thrive. *Photos courtesy of Dreamstime.com.*

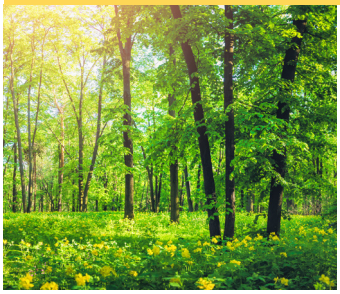


POLLINATOR EDGE HABITAT

Historically, these areas may have been maintained by regular mowing. Some of these areas can include food species for pollinators as well as the pollinator species themselves, so adopting “no-mow” practices is sufficient to create edge habitat. In other cases, these areas may need to be over-seeded or planted to create appropriate pollinator edge habitat.

GREEN INFRASTRUCTURE/STORMWATER AREAS

Green infrastructure/stormwater spaces — designed and constructed to capture, slow, hold and infiltrate water — are common additions to park areas. These include but are not limited to bioswales, rain gardens and retention areas. Maximize the benefits and uses of these spaces by installing native plants. Native plant species can stabilize the soil, help filter water and provide habitat. Using pollinator-friendly practices to create and maintain these spaces also ensures the protection of water quality and aligns with other important environmental practices.



FORESTS, NATURAL AREAS AND RIPARIAN ZONES

Forests, natural areas and riparian zones are equally important and provide early food sources, habitat and nesting areas for pollinators. These can be large habitat areas providing connection and corridors for pollinator migration. Incorporate pollinator-friendly practices to establish and maintain these areas, including: planting native tree/shrub/plant species, leaving nesting materials (leaves, dead trees, wet soil areas), removing invasives, etc.

UTILITY RIGHT-OF-WAY MANAGEMENT

Engagement with utility companies that maintain rights of way through public land is another opportunity for creating pollinator habitat. Limited spraying and removal of tree saplings will be conducted as necessary for meadow establishment and maintenance in accordance with pollinator-friendly practices.

CREATIVE SPACES

Park amenities can be co-managed to support pollinators. Some can be easy to spot, like community gardens, while others might not be so obvious, like replacing turf with flowering lawns or bee lawns. This can also include a wide variety of places like green roofs, container plantings, athletic fields, golf courses, sensory gardens and many more creative locations to incorporate pollinator-supporting habitat.

How This Work Benefits

Your Agency

This work benefits park and recreation agencies in a multitude of ways:

- Produces long term benefits including:
  - Utilizes perennial native plants rather than annual species
  - Lessens the need for maintenance/ use of equipment and other materials
  - Decreases the need for water/ irrigation (once established)
  - Reduces the use of fuel, fertilizers and chemicals
  - Saves cost
- Can be designed to fit any space ranging from vast acreage to pocket parks
- Provides beneficial habitat for all wildlife and supports overall biodiversity
- Creates spaces where communities can connect with nature, realize the benefits of spending time outdoors and engage in environmental education
- Expands green infrastructure and addresses climate change for your community, which produces multiple benefits such as:
  - Native plants strengthening landscapes' ability to respond to climate change
  - Deep root systems absorbing rain and reducing stormwater runoff
  - Healthy native plants storing more carbon than unmanaged habitats
  - Ensures successful propagation and regeneration of plants (e.g., through community gardens) in your parks
  - Creates healthier work environments for staff by reducing exposure to chemicals and needs for maintenance
  - Advances sustainability and adoption of climate adaptation and mitigation practices

Your Community

- Promotes healthy outdoor spaces for both wildlife and people:
  - Reduces chemical use in established native habitats and contributes to healthier public spaces, cleaner water and a healthier overall environment
  - Enhances beauty in open spaces with native habitat
- Encourages community members to understand and support native habitat, biodiversity, sustainability — and your parks!
- Provides nature-based solutions for climate change
- Educates about important environmental issues that impact the community
- Shares new practices, skills or ways people can support pollinators or sustainability efforts:
  - Demonstrates how to incorporate pollinator habitats in residential and commercial areas

Pollinator habitat at Spotswood Elementary provides a new outdoor classroom for students. *Photo courtesy of City of Harrisonburg, Virginia.*

Assess Your Work and Your Agency

Evaluate Processes, Partners and Supporters

Your agency is probably doing far more than you give yourself credit for. Whether it's through environmental education (like our Parks for Pollinators BioBlitz[1]), volunteer days or habitats in your parks, you likely have started to engage your community around the importance of these spaces. Through planning and outreach within your agency, you may have started to identify those individuals or departments that are aligned with this work or could be in the future.

Consider what your organization is doing with native habitat, tree programs, community gardens, environmental education, green infrastructure and other efforts that align with this work. To help start this process, we are offering a few ways to conduct a review.

1 Self-Assessment for Pollinator Friendly and Sustainable Parks

Review or complete NRPA's "Self-Assessment for Pollinator Friendly and Sustainable Parks"[10] to explore what your agency is already doing or areas where you might want to explore.

2 Identify Collaborators and Projects/Programs Chart

After using the self-assessment, review the program/projects/stakeholders who are already working to advance these efforts and list those in the chart on the next page.

Staff collaborate with teachers at Harrisonburg High School to introduce students to the city's pollinator corridor.
Photo courtesy of City of Harrisonburg, Virginia.

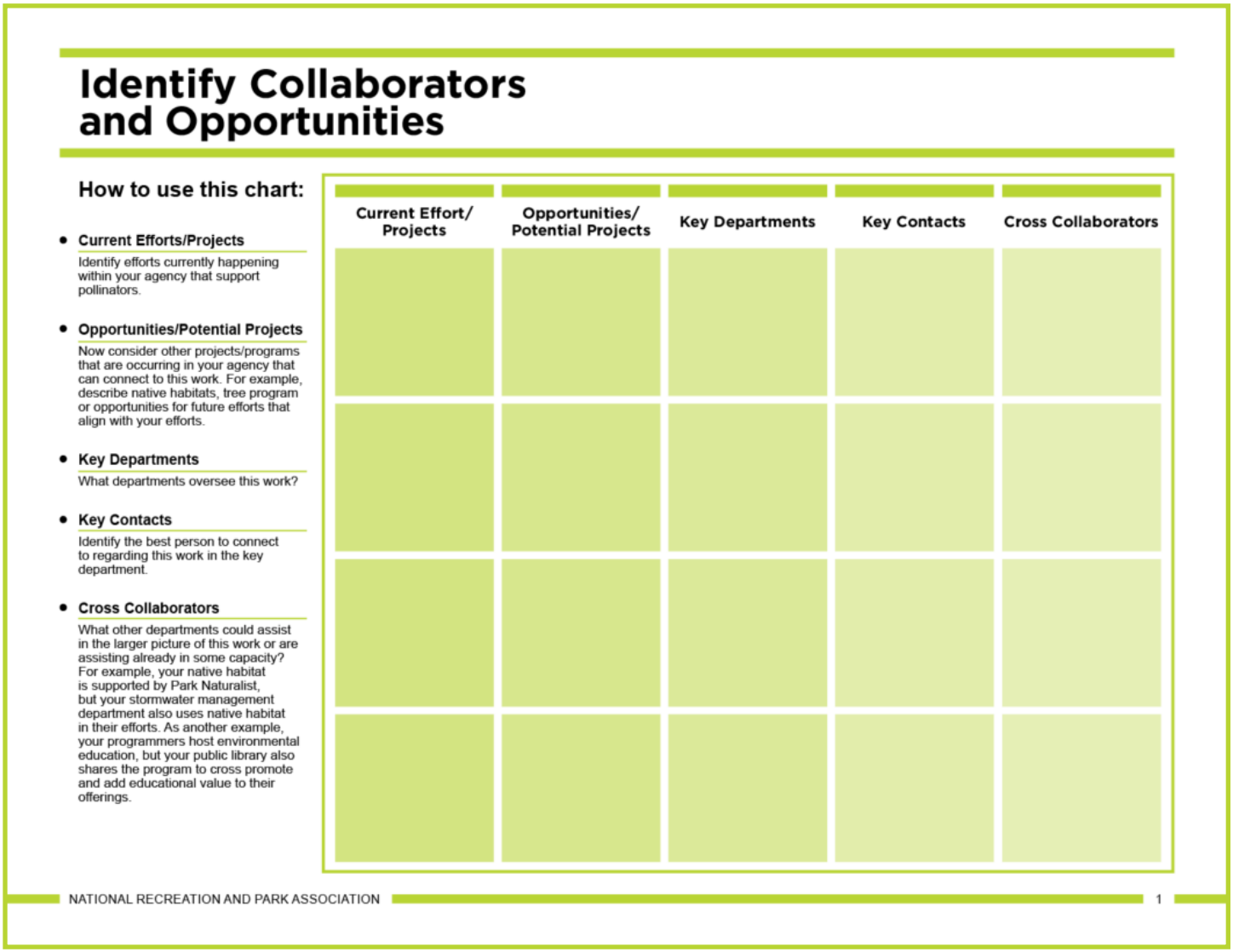
[10] NRPA. "Self-Assessment for Pollinator Friendly and Sustainable Parks." Retrieved from www.nrpa.org/globalassets/research/self-assessment-pollinator-checklist.pdf

Identify Collaborators and Opportunities

After taking the self-assessment, you can dive deeper into examining collaborators and opportunities that can be leveraged to support pollinators and sustainability efforts. Use the chart below to list current efforts and corresponding departments or key contacts across your municipality. This will allow you to create an inventory of work that is already occurring that can be leveraged and identify key individuals to include or partner with moving forward to support this work.

After this exercise, it would be beneficial to create an interdepartmental/interagency team (page 19) to explore the next charts of "Strengths, Gaps, Opportunities" and "Assessment of Potential Pollinator Habitat/Outreach," which will help to build a plan to advance efforts across your municipality. This is meant to be a reiterative process; if you wish to complete this process individually it can be revisited with a team at a later stage.

You can access larger versions of these worksheets online by clicking on the images below.



Identify Collaborators and Opportunities

How to use this chart:

- **Current Efforts/Projects**
  Identify efforts currently happening within your agency that support pollinators.
- **Opportunities/Potential Projects**
  Now consider other projects/programs that are occurring in your agency that can connect to this work. For example, describe native habitats, tree program or opportunities for future efforts that align with your efforts.
- **Key Departments**
  What departments oversee this work?
- **Key Contacts**
  Identify the best person to connect to regarding this work in the key department.
- **Cross Collaborators**
  What other departments could assist in the larger picture of this work or are assisting already in some capacity? For example, your native habitat is supported by Park Naturalist, but your stormwater management department also uses native habitat in their efforts. As another example, your programmers host environmental education, but your public library also shares the program to cross promote and add educational value to their offerings.

Current Effort/ Projects	Opportunities/ Potential Projects	Key Departments	Key Contacts	Cross Collaborators

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With understanding those individuals or departments that are key, consider creating an interdepartmental/interagency team (page 19) to assess your strengths and opportunities. Once listed, use the information above to identify where your strengths currently exist and where there are opportunities (or gaps). You can revisit and build upon this chart as you evaluate what you are doing and how to advance this work. Remember: this is just a starting place; it should be an iterative process that helps advance your efforts and identify future opportunities.

Strengths:

Gaps:

Opportunities:

Once you have identified opportunities, you can use the section below to start listing opportunities for advancing pollinator habitat, educational opportunities and programs.

Assessment of Potential Pollinator Habitat/Outreach

Natural Areas (Small and Larger Scale Habitats)			
Creative and Athletic Areas (Turf, Golf, etc.)			
Green Infrastructure/ Stormwater Management			
Pollinator Gardens/Flower Beds			
Reforestation Areas			
Edge Habitat			
Right of Ways			
Education/Signage			
Programs			

Educating Agency Staff and Other Departments

Following your assessment of current and potential opportunities to support pollinators, it is important to include additional stakeholders to help advance this work. Invite them to participate in the process so they can help advance these efforts more broadly.

MAINTENANCE:

Individuals who maintain outdoor open spaces are critical to the project's success. They maintain green spaces, mow, weed, administer treatments and see to the overall condition of our parks. Maintenance employees provide key insights to ensuring that best management practices (BMPs) are upheld for native habitat. Due to the nature of these jobs and their seasonality, ensuring best practices are used is important. Consider creating BMPs for staff.

MOWING PRACTICES

- Reduce mowing schedule or designate no mow areas
- Clean mowers
- Follow best practices for clippings, mulching and timing that minimizes impact to pollinators and habitat

INTEGRATED PEST MANAGEMENT (IPM) INVASIVE MANAGEMENT

- Use hand weeding or other methods, such as flame, foam, goats, etc.
- Be intentional with timing of work
- Decide the amount/percentage of invasives allowed and what percentage triggers management

INSTALLATION AND CARE OF NATIVE HABITAT

- Maintain established sites during fall/spring
- Use BMPs for installation and establishment
- Outline chemical use (herbicide, fertilizers)
- Create a region-specific list of native plants and promote a diversity of species with extended bloom times

PROGRAMMERS:

Environmental education is something that anyone can include in their programs. Lessons and activities are adaptable to different regions and age groups, and can inspire a local connection to nature. You also can lean on others in your agency to adapt a program or concept. It's a great way to expose your community members to the importance of nature and a new offering. You do not have to be a naturalist or biologist or be stationed at a nature center to do this work.

- Host workshops around environmental issues
- Enhance Out-of-School Time with curriculum about pollinators
- Host educational programming — like a BioBlitz[1]
- Share information with participants to educate them on what the agency is doing and how they can get involved
- Create partnerships with local master naturalists, extension offices, environmental nonprofits and local colleges
- Create interpretive signage to be installed at pollinator sites

LEADERSHIP:

Ensuring communities are resilient, climate-ready and sustainable is crucial for the future and should be a focus of park and recreation leaders. Connecting how this work supports these broader sustainability initiatives is key to communicating to park leadership. Practices that support pollinators, which we know the public supports,[11] also strengthen sustainability and prepare your parks and communities for the future. Many of these practices can be implemented by pivoting your current practices and have long term cost and health benefits.

- Create or update your agency/city sustainability plan or policies to incorporate native habitat and advance this work
- Ensure native habitat is included when creating or updating parks and amenities
- Advocate for pivoting resources and budgets to support efforts
- Consider equity in communities that may be more significantly impacted by climate change
- Champion this work at the agency/city level

PLANNERS:

As park agencies prepare their parks for future climate impacts, it is key to ensure these spaces provide nature-based solutions. Pollinators and native habitats do that naturally. Planners and designers have the ability to develop standards and design specifications that incorporate habitat in a vast array of places.

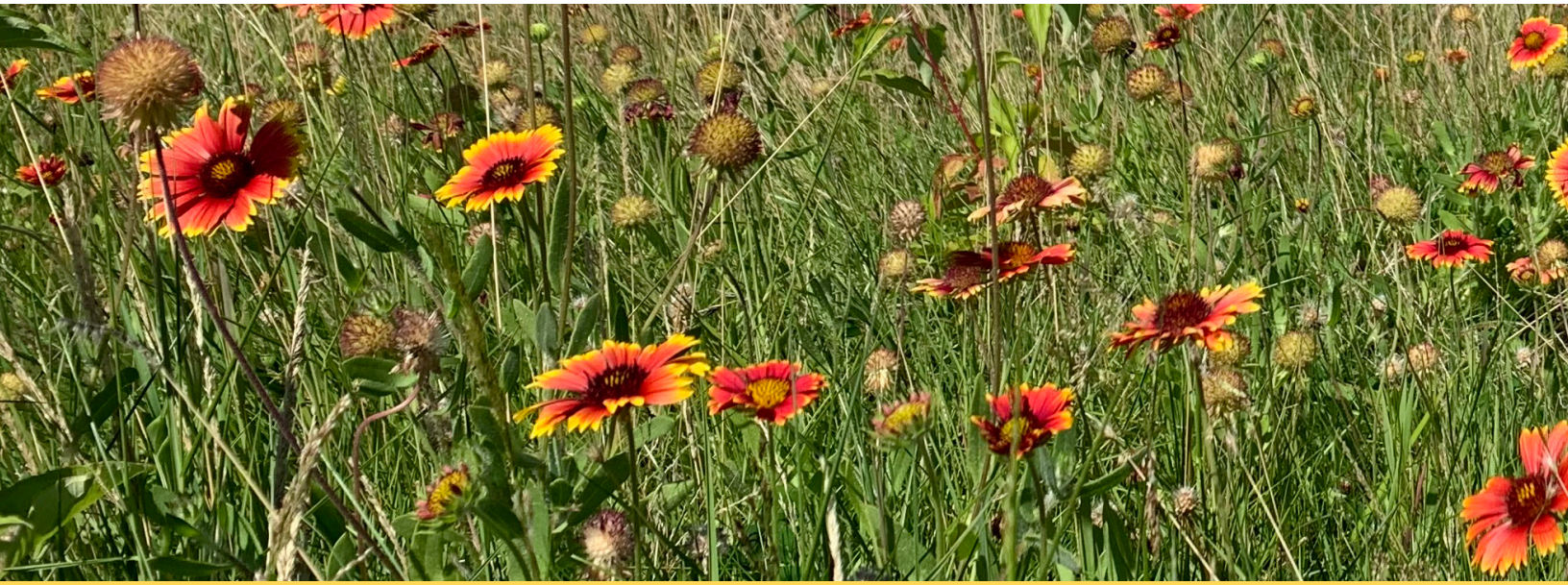
PLACES TO INCORPORATE HABITAT

- Community gardens
- Natural areas and riparian zones
- Right of way and parking lots (green infrastructure can help with stormwater runoff)
- Connecting zones — areas between amenities or park assets, such as fence rows, sports fields and areas not actively utilized
- Facility landscaping — planters, beds, etc.
- Stormwater areas — bioswales, rain gardens, etc.
- Flowering lawns and bee lawns
- Trees and shrubs
- Formal landscaping and gardens
- Traditional meadows or open spaces
- Turf area conversions

NATURAL RESOURCE MANAGERS:

Within park agencies, these stewards of open space should understand the importance of native habitat but might need help connecting with a broad section of those working in parks and recreation. Create a pathway for them to share their expertise in a clear and impactful way; partner with them for key events and projects and help them guide plans. These individuals could be in natural resources, urban forestry, stormwater or other areas that plan and manage natural spaces or resources.

[11] NRPA. (2019, January). Park Pulse Survey. “Parks Play a Vital Role in Saving Pollinators.” Retrieved from https://www.nrpa.org/publications-research/park-pulse/park-pulse-survey-parks-role-saving-pollinators



Benefits of This Work

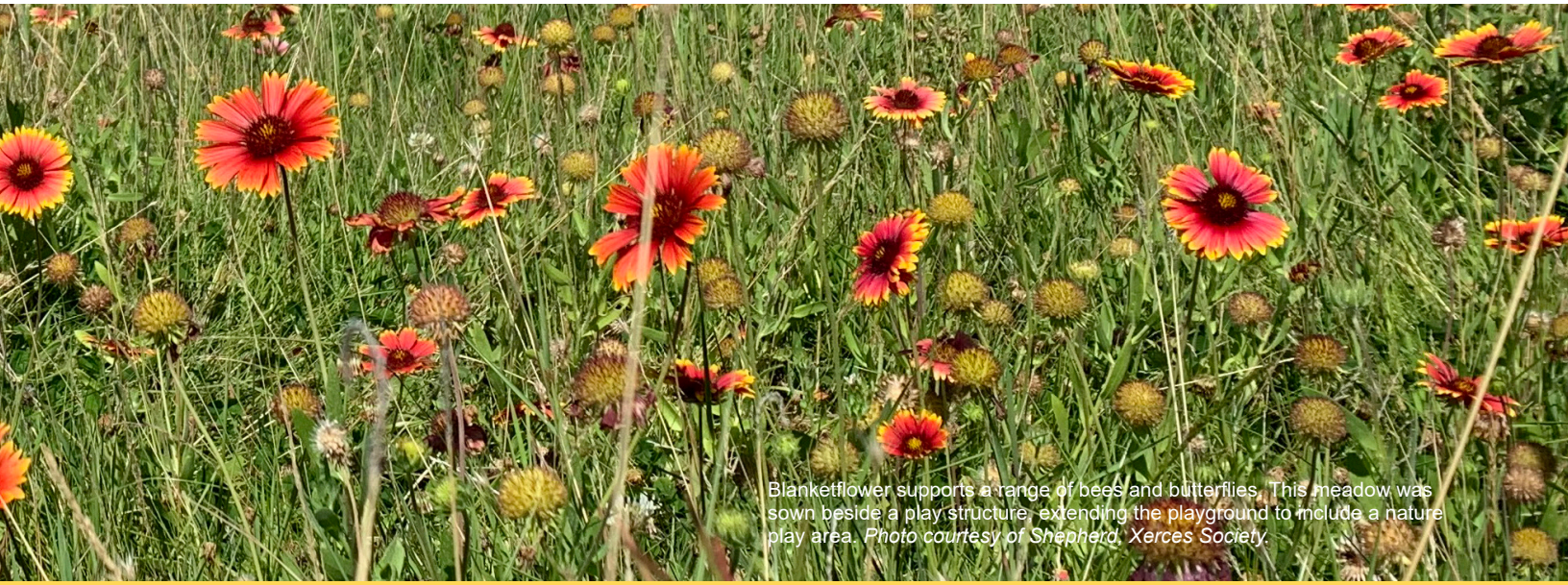
COST SAVINGS

While it might cost more upfront to transform spaces into healthy and successful native habitats, these spaces provide long-term cost savings from reduced mowing, reduced use of annual plants and reduced use of chemicals (e.g., pesticides, herbicides, fertilizers). Find specific data in the “Why Should Parks Care” section on page 6, and see “Other Resources” on page 33.

PIVOT OF RESOURCES

While these spaces still take time and attention, pivoting the time, money and labor that has been allocated to traditional green space can help with the management of converted spaces. While it may seem easier to convert smaller spaces — such as a small flower bed — into a pollinator bed larger habitats — like prairie or riparian sites — have been shown to decrease maintenance needs.

Circular images depict the ways that pollinator work can benefit communities. *Photos courtesy of Dreamstime.com.*



Blanketflower supports a range of bees and butterflies. This meadow was sown beside a play structure, extending the playground to include a nature play area. *Photo courtesy of Shepherd, Xerces Society.*

HEALTH

Pollinator spaces provide healthy parks for our community and create a healthier work environment for park employees. Reducing the use of chemicals increases the health of these spaces both for the community and your workforce.

PIVOT OF FOCUS

Communities can engage with newly vibrant and healthy parks, while the goals of an agency remain the same. Converting spaces for pollinators can be as simple as pivoting how agencies think and operate. These changes can benefit any agency without changing their scope of work or goals.

CAREER PATHWAY

The focus on ecologically balanced parks, green infrastructure and other environmentally friendly practices supports the growth of green jobs and the ecology field in parks and recreation, which also benefits the community at large.

This long-horned bee carries pollen back to its nest. *Photo courtesy of Mace Vaughan, Xerces Society.*

Grow Your Team With Supporters

What Can Each Take and Own?

As you consider those in your agency that support this work, think about their expertise or the areas they have influence over. This can be a pollinator focus or other areas that could be important to expanding this work.

For instance, a park and recreation programmer has the ability to connect with the community where they live and offer opportunities to engage in new things. They may not be who you typically think of working with to expand your efforts, but can make the perfect partner.

Other departments within your municipality may share the goal of advancing sustainability efforts but might not be considering pollinator habitat as a solution. See the list below for some examples.

Core Groups to Consider

- Stormwater and public works departments
- Watershed districts
- Board of soil and water resources
- Forestry department
- Planning — city/town wide (broader planning initiatives than your agency)
- City/Town administrator — public buildings and other avenues
- Sustainability or resiliency department
- Transportation — roadsides or areas that connect to park land
- Open space and community-based organizations (they can provide resources and expertise)

Nontraditional Groups to Partners With

- Cemeteries — many park and recreation departments oversee them
- Landfills/Solid waste divisions — some communities are adding habitat in these locations
- Libraries — they educate the community (science, technology, engineering, mathematics, environmental education, etc.)

Develop a Team to Plan, Strengthen Support and Take Action

Build Your Team

Consider creating an interdepartmental team to advance this work broadly. A vast array of departments or teams engage in this work. Coming together can strengthen efforts to advance pollinator-friendly policies for your agency.

Great examples of this can be found in Columbus, Ohio, and Houston, Texas. Columbus Park and Recreation Department has a cross-team leadership group. Houston's Green Infrastructure Coordination Committee includes representatives from the Parks and Recreation Department, Mayor's Office of Resilience and Sustainability, Public Works, and Planning and Development Department that meet monthly to coordinate, update and share resources.

Determine Members, Scope and Initial Goals of the Group

1. Revisit the section "Assess Your Work and Your Agency" on page 11. This can be a great tool to help identify team members, scope and goals. Also consider:
   - Areas of impact
   - Focus of work
   - How all team members will engage and benefit
   - How the community will benefit
2. Convene your team
3. Create a charter/goals for the group

Develop a Plan to Expand Native Habitat, Reduce Chemicals and Implement Best Practices

1. Revisit your analysis or other planning method to help assess opportunities and pull together key team members to build plans
2. Consider creating a plan for either a specific project/park or your overall agency
3. Consider policies you can enact to advance and solidify these efforts

Conduct an Inventory of Habitat and Pollinators

1. Host a BioBlitz[1] that you can expand and build upon — start with what you have and build
2. Inventory green spaces and how agencies are managing them

Evaluate Current Funding and Address Specific Funding Needs

1. Operations
2. Capital
3. Partnerships
   - Grants (regional and federal)
   - Budget contributions from public works/libraries/other departments
   - Grants from nonprofits (Pheasants Forever, Wild Ones, etc.)

Create and Implement Trainings and Resources

Creating your team and developing plans to expand pollinator work is key, but to achieve these plans, it is vital to conduct training on a variety of topics to bring your team members and community along with you. Training programs could include:

Importance of Pollinators and Native Habitat

- Why pollinators matter
- Benefits of native habitat
- Simple things that can be done to support pollinators

The distinctive yellow, black and white stripes of monarch caterpillars make them easy to identify — and warn predators that they taste bad. *Photo courtesy of Candace Fallon, Xerces Society.*

Establishment and Maintenance

- Habitat inventory/protection/creation
- Incorporate anywhere; create pollinator corridors where possible (read more in the call-out box to the right and on page 21)
- Reduction of chemicals/pesticides
- Reduction in invasive species
- Maintenance practices
  - IPM
  - Invasive species
  - Plant selection with the regional climate and microclimate in mind (climate-ready)

Community Engagement and Stewardship

- Community engagement to support pollinators
  - Cool Boulder campaign offers training for Pollinator Advocates[12]
- Volunteer programs to support work
  - Weed Wrangle is a volunteer program that addresses invasive plants while conserving or restoring native habitat[13]
  - Texas Master Naturalist Program offers great resources and models[14]
  - Chicago Community Steward Program connects community members to natural areas[15]

What Is a Pollinator Corridor?

A pollinator corridor is a pathway that offers contiguous habitat and forage to vulnerable native species. It can be achieved through having small pollinator habitats, like roadside flower beds and home gardens, that connect with bigger habitats, such as parks and meadows.[16]

[12] Cool Boulder Campaign. Pollinator Advocates Training. Retrieved from https://www.coolboulder.org/pollinator-advocate-training

[13] Weed Wrangle. Native Habitat Volunteer Program. Retrieved from https://www.weedwrangle.org/

[14] Texas A&M University. Texas Master Naturalist Program. Retrieved from https://txmn.tamu.edu/

[15] Chicago Park District. Chicago Community Stewards Program. Retrieved from https://www.chicagoparkdistrict.com/community-stewardship

[16] Youth4Nature USA Team. (2020). "Pollinator Corridors: World Bee Day Blog Series." Retrieved from https://www.youth4nature.org/blog/pollinator-corridors

Harrisonburg, Virginia Develops a Pollinator Corridor

In 2018, the City of Harrisonburg, Virginia, established a pollinator corridor as a multi-layer approach to its Pollinator Program in 2018. The idea for this program was prompted by NRPA's Three Pillars. Program staff decided to convert traditional landscape areas into perennial pollinator habitat at one of its most active parks. Outreach was a large component of this project and was conducted through a community event hosted at the recreation center. A pollinator corridor map was created and put on display to help relay the message of habitat work citywide.

The planned corridor supports the program in several ways:

- Staff use the map to coordinate annual work plans.
- Turfed medians are converted to pollinator habitat each spring/fall.
- Plantings are calculated in advance, so crews have enough resources to maintain each area (maintenance is a key element).

Another goal of the corridor is public outreach. Community members see the medians flourish with pollinators and want to replicate the initiative at home. Many homeowners have created a pollinator habitat in their own yards, increasing the corridor citywide. An additional goal of the pollinator corridor is to keep mowers out of the medians. More trees have been planted in medians since they are able to survive without encroachment from the mowers.

Budget for Pollinator Gardens and Habitats

An important step to any plan is budgeting the installation, maintenance and additional elements/needs of the space. Learn about a few key aspects to budgeting for pollinator gardens and habitats that may help you during this process below. Find additional tools in the “Other Resources” section on page 33. Some agencies may want to hire a professional to assist with development of plans, budgets, etc.

Site Evaluation

- Determine the size and location of your pollinator gardens and habitats (PGH) — both for initial establishment and future expansion. Larger sites require bigger budgets.
- Understand any regulations that are applicable to your site.
- Evaluate the site. Depending on the size of the site and your skill level, you may need to hire someone to assist. Your local soil conservation district (SCD) may be able to assist with developing a meadow plan.
    - Sun exposure: Determine how many hours of sun the site receives each season; the relative direction/path of the sun; and the trees and buildings that may shade the PGH.
    - Soil type: Consult with your local SCD for analysis of the soil.
    - Moisture: Watering is a pain, so knowing the baseline moisture levels of the site will be beneficial when you need to select plants.
    - Existing vegetation: Identify desirable plant species as well as undesirable species. Most PGH are dominated by herbaceous plants, but many pollinators also need trees and shrubs. Avoid removing established, desirable, native species.
    - Natural areas: Nearby areas might influence your PGH — perhaps as a source of native seeds and pollinators or as the source of non-native and invasive species.

Asters bloom in a bioswale on the edge of a parking lot. Such structures provide an opportunity to grow pollinator plants in developed areas of recreation facilities. *Photo courtesy of Shepherd, Xerces Society.*

Nodding beggartick is a late-flowering, wetland plant that can offer migrating monarchs a valuable source of nectar. *Photo courtesy of Shepherd, Xerces Society.*

Native Plant Material

- Select species that naturally occur in your region. Just because a species is native to your state does not mean it is native to your county or city.
- Plan your budget based on the number of species and number of plants.
    - Plant the entire site with a large diversity of species (larger native habitats could have 60 to 100 species).
    - Plant the entire site with a few common species and add diversity in future plantings.
    - Plant a small section with a few unique and striking plants and add diversity in future plantings.
        - Plant showy species along a public-facing edge so visitors see the flowers.
- Plan for a denser spacing of plants (when compared to typical landscaping gardens).
    - In a small PGH, place one plant in a quart pot per square foot or place plants in a gallon pot 14 inches apart.
        - Cost estimates (per square foot): $5 to $10 for herbaceous plants; $25 to $35 for shrubs or trees
    - In a larger PGH, consider using “plugs,” where seedlings are grown in small cells, approximately 2 inches wide and 5 inches long. These can be planted 8 to 10 inches apart.
        - Cost estimates (per square foot): $3 to $6
    - Dense plantings usually do not need mulch or other soil covers.
- If adding plants to an existing natural area, consider collecting seeds locally and growing these local species.
    - In natural areas, maintaining and managing existing diversity can save money on plants and seeds.
- Avoid planting rare, threatened or endangered species without consulting with your state natural resources department.
- Prioritize local ecotypes of the true species rather than cultivars or plants raised out of your areas.
- Sources for native plants are important. Find suggestions in the “Other Resources” section on page 33.

A camouflaged caterpillar sits on a daisy. *Photo courtesy of Derek Bryant, City of Santa Clara Parks & Recreation.*

Site Preparation

- If the site is small and relatively weed-free, minimal site preparation will be needed.
- Site preparation will depend on whether sowing seeds or using container grown plants or plugs, which could include:
  - Removal of undesirable plants and noxious weeds
  - Sowing seeds using seed drills or broadcasting by hand
  - Planting among existing vegetation or clearing the site of all vegetation before planting

This community garden incorporates a plot dedicated to pollinators that supports the crops grown in the garden and provides wider community benefits. *Photo courtesy of Shepherd, Xerces Society.*

Site Maintenance

“Low Maintenance” Does Not Mean “No Maintenance”

- Tightly spaced plantings protect the soil from erosion and can fend off undesirable plants and weeds.
- Plan for weed control.
  - Hand pulling can be done by volunteers, staff and contractors.
  - Selective and targeted herbicide use on invasives can only be done by certified professionals.
  - Mow frequently during the first growing season before weeds grow six to 12 inches tall.
    - In early years, native plants often are developing their root systems so they can tolerate mowing, especially if there are many weeds that may overshadow native species.
  - If appropriate, coordinate with your local forestry department to conduct controlled burns.
- Conduct seasonal site evaluations to determine which species are present.
  - Plan to install additional plants, especially of species that seem to do well at the site.
- Incorporate signage, volunteer work days and community events to promote your pollinator gardens and habitats.

Assess and Leverage Community Strengths

An ecology student observes a tomato caterpillar from the community garden. *Photo courtesy of City of Harrisonburg,*

Engage your community and build support that can advance your efforts.

Identify Existing Supporters

- Who did you engage with during a BioBlitz[1] or other pollinator outreach/education? How do they wish to continue to engage?
- Who is already engaged in events, education or volunteering that aligns with efforts?
    - Think broadly and outside the box.
    - Consider the cultural diversity in your community and become familiar with indigenous connections to nature that you may not be aware of.
- Community groups and partnerships
    - Consider groups that you or your agency may already be connected with, either in this work or other parallel efforts that would align.

Harrisonburg Pollinator Program interns connect with younger students about the importance of pollinators. *Photo courtesy of City of Harrisonburg, Virginia.*

Grow Community Engagement

Exploring other groups in your community to connect with can lead to new partnerships and support and stewardship opportunities. Taking a broad approach to this process can help you explore the vast possibilities. Consider asking your current supporters and groups to suggest others that you should connect with — they may have information or ideas that can help.

Groups to Consider

- Elected leaders
- Park users
- Community groups that have not historically been engaged
- Schools/Daycares/After-school groups and youth-focused groups
- Colleges and universities (broadly or certain key programs that would be interested)
- Community-based organizations (neighborhood groups, faith-based groups, etc.)
- Non-governmental organizations (NGOs) or other groups
    - Nature-focused groups: Garden clubs, naturalists, native plant groups, bee clubs, local sustainability groups, soil and water conservation district, local extension offices, farmers market organizations, etc.
    - Community-centered groups: Those vested in the improvement of their community could be health, equity, or other groups that could have interest

Communication and Outreach Plans

Conduct outreach to groups your agency hasn't engaged before.

- Consider how you will engage with new groups. This process should be done with some preparation and thought to make sure they are included, see their role in these efforts and can actively engage with you.
- Identify their interests and the ways these groups intersect with your efforts.
- Identify key leaders or contacts to start the discussions and build a relationship — make it mutually beneficial.
- Consider, identify and plan your approach, especially if you are engaging community groups that have not historically been included. Review NRPA's *Engaging Diverse Groups in Building Community Resiliency Through Stewardship*[17] resource for more information.
- Consider avenues to share information broadly through marketing strategies (and languages/approaches used) — social media, press outreach, online, etc.

Engagement Activities and Plans

- **Events:** These can be a great way to engage your community while showcasing the importance of this work. You can host many types of events to bolster your community engagement.
    - Host large scale community science campaigns (e.g., BioBlitz[1])
        - Helps your team collect information that supports your plans, enhances environmental education and shares your goals with the community
    - Leverage environmental days/events:
        - Pollinator
        - Earth Day
        - Arbor Day
        - Tree plantings and other volunteer days
        - Environmentally focused festivals
    - Leverage pop-up events or other events already held in your parks
    - Co-host events with partners (libraries, nurseries, community partners, etc.)
- **Public support/advocacy/policy:** Key community members or groups can help you garner support.
    - Tell your story and share the importance of your work
    - Elevate the importance of of these efforts with key figures and those who their voice can influence strategically

[17] NRPA. *Engaging Diverse Groups in Building Community Resiliency Through Stewardship.* Retrieved from https://www.nrpa.org/publications-research/best-practice-resources/engaging-diverse-groups-in-building-community-resiliency-through-stewardship

The Harrisonburg Department of Parks and Public Works hosts and annual NRPA BioBlitz every September. *Photo courtesy of City of Harrisonburg, Virginia.*

- **Volunteering/Stewardship:** Including communities in stewardship activities not only helps agencies, but also provides hands-on education, ownership and engagement. Providing a variety of ways to participate and engaging a diverse group of community members ensures that future stewards represent the communities we serve.
    - Habitat restoration — planting native species and removing invasive species
    - Seed harvesting
    - Plant propagation
    - Biodiversity surveys
    - Educational support

** If groups can't commit to stewarding sites continually, consider having a backup plan where your agency steps in to help.*

More than 500 observers participated in the 2022 community BioBlitz project in Harrisonburg. *Photo courtesy of City of Harrisonburg, Virginia.*

- **Education:** Another core effort is educating communities on pollinator protection and sustainability issues. This ensures they understand the important role they play as well as the steps they can take to help, whether that is supporting local parks or implementing actions at home. Below are some suggestions to consider when creating educational offerings and programs.
    - Creative partnerships (community centers, NGOs, nature professionals, master naturalists, nurseries/local businesses, etc.) — educate together and offer native plants to the community
    - Educational elements that are multi-generational and culturally sensitive
    - Active and passive outreach
        - **Educational signage:** Identify what habitat looks like; describe maintenance practices and why the space is different; and outline benefits of pollinators
        - **Events and workshops (in-person and virtual):** These can focus on community science; ways to support pollinators (native seed starting, pollinator gardening, etc.); and benefits pollinators provide (food, healthy ecosystems, etc.)
        - **Stories:** Share through various communications channels; engage those not out in natural spaces; and outline how people can support pollinators at home

Build Support for This Work and Change in the Community

Support for Pollinators, Native Species and Sustainable Actions

We know that communities support this work, but how does that reflect in changes made in communities, both to their public spaces and in the community at large? Building a variety of ways that pollinator protection and sustainable practices are solidified in practice and policies can help ensure these efforts are normalized and adopted in the long term. The lists below are not exhaustive, but a starting place to understand what these might look like in some communities. Please see "Other Resources" on page 33 for further examples.

Building Support

- **Community advocacy:** Support from the public and leadership during planning, public engagement or other avenues helps advance this work.
- **Types of policies could include:**
  - At park and recreation agencies
    - Pesticide, herbicide, native habitat and other policies to advance this work at the park or city level
    - Nature preserve ordinance
    - Native tree/plant lists for tree or plant ordinances
  - Community-wide policies
    - Ordinances that promote these efforts throughout the community
    - National designations[18]
    - Seasonal movements that help build awareness[19]
    - Chemical reduction/target use
    - Natural area ordinance for homeowners
- **Community education and activation:** Community members changing their actions at home or in their communities
  - Take lessons learned and applying them at home
  - Install native yards, pollinator gardens, etc.
  - Implement maintenance practices, composting, etc.
  - Help with efforts at your agency or in the community
  - Increase future park stewards and engagement in nature-based programs

[18] Bee City USA. Retrieved from https://beecityusa.org

[19] Seasonal movements. No Mow May. Retrieved from https://beecityusa.org/no-mow-may

Case Studies

Building Resiliency in Harrisonburg, Virginia

Many communities focus on climate change, but Harrisonburg, Virginia, takes a more broad-based approach. Harrisonburg's Sustainability and Environmental Manager likes to view environmental action policies as "Building Resiliency."

The city's Environmental Action Plan[20] was written with six focus areas that include buildings, energy, and water. However, of the focus areas, land use and green space remain high priorities. Strategies within this area promote more pollinator habitat and multifunctional perennial plantings. This also includes maintenance. Quality habitat provides a wide variety of ecological benefits for Harrisonburg. Their mission is diversity.

A major lesson was learned with the arrival of Emerald Ash Borer — a beetle that feeds on ash species and is responsible for the destruction of more than 100 million trees within the United States — in 2017. Harrisonburg Parks and Recreation was comprised of 14 percent ash trees. When Emerald Ash Borer arrived, staff were forced to remove more than 1,500 ash trees in the park system. One action step in Harrisonburg's Urban Forestry Management Plan[21] is to plant a new tree for every ash tree removed. The decision was made early to plant no more than 10 percent of any given species to create a more diverse tree canopy, including large trees, such as oaks. Additionally, large trees are extremely beneficial to pollinators. Many more native trees are planted each spring and fall to increase pollinator habitat throughout parks and public property. This continues to build a citywide pollinator corridor and are an important part of Harrisonburg's Pollinator Program.[22]

Policy change has encouraged staff to convert medians from turfgrass to pollinator habitat. A variety of plants are selected each year to overlap bloom time throughout the entire season. The pollinator program supports the installation of several thousand plants of every shape, size and color to support all pollinators. Milkweed and monarchs are good, however, a diverse variety of plants and trees that produce a variety of nectar and pollen throughout the growing season can serve many more pollinators. The new habitat in these medians also reduces mowing time. Collectively these efforts provide many benefits to the City of Harrisonburg.

[20] The City of Harrisonburg Virginia. (2022, June 16). Environmental Action Plan. Retrieved from https://www.harrisonburgva.gov/EAP

[21] The City of Harrisonburg Virginia. (2022, March 10). Urban Forestry Program. Retrieved from https://www.harrisonburgva.gov/urban-forestry-program

[22] The City of Harrisonburg Virginia. (2022, October 6). Pollinator Friendly City. Retrieved from https://www.harrisonburgva.gov/pollinators

Harnessing Community Action to Transform and Rewild Urban Landscaping in Boulder, Colorado

As cities become hotter, experience more severe and frequent extreme weather events, and see dwindling water supplies, improving ecological resilience to buffer these impacts is critical to protecting our communities. The city of Boulder, Colorado, launched a new community-based initiative, Cool Boulder,[23] to develop solutions to improve ecological resilience in partnership with individuals, organizations and institutions. Cool Boulder's major focus areas are diversifying and expanding urban canopy, creating pollinator pathways, and improving the carbon and water holding capacity of soils.

Lack of plant and tree diversity, particularly locally adapted native plants, leads to weakened and fragile ecosystems that leave communities more vulnerable — particularly lower income residents and people of color. Connected, biodiverse habitat not only strengthens ecosystems to improve resilience and public health but is also an important source of pollinator populations to help stem decline.

How can communities transition landscaping from thirsty turf grass and ornamental plants to locally adapted, predominantly native plant habitat, particularly with limited resources? The city and other organizations have provided education to residents about the importance of water conservation and native plant landscaping for years, but the majority of urban areas are still landscaped with conventional turf and non-native plants. Why haven't more people changed how they landscape?

Preferences for traditional landscaping, a lack of understanding and knowledge about native plant gardening, and shortages, as well as the high cost of plants and materials, are major obstacles. The City of Boulder's Pollinator Advocate program was launched in spring of 2022. It's designed to address these issues and kick-start community mobilization with a small budget, relying on a foundation of trust with community partners and residents to build and run the program.

Instead of starting from scratch, the city contracted with a local nonprofit organization, the Butterfly Pavilion, to adapt their Urban Prairies Master Naturalist Program[24] for urban habitat. The city works closely with community members who are passionate about habitat creation. Andrea Montoya, a resident of a downtown neighborhood, was successful at organizing her neighbors to build a pollinator pathway neighborhood. Community members like Montoya are invaluable. She developed and taught the curriculum and inspires and builds confidence in community members. Montoya describes the program in this video.[25]

[23] Cool Boulder Campaign. Community-Led, Nature-Based Climate Action website. Retrieved from https://www.coolboulder.org

[24] Butterfly Pavilion. Urban Prairies Project. Retrieved from https://butterflies.org/urban-prairies-project

[25] City of Boulder. "Andrea Montoya on Pollinator Gardens." Retrieved from https://player.vimeo.com/video/742856247?h=0e14eec1fe

Harnessing Community Action to Transform and Rewild Urban Landscaping in Boulder, Colorado (continued)

Pollinator Advocates was structured to identify committed community members willing to invest substantial time in classes and in-field trainings so they can be important community resources and connectors. The goal is to develop expertise and confidence about native plant habitat creation and maintenance, but more importantly about community organizing and engagement. The objective is to expand this program year after year to develop community capacity and change landscaping aesthetics through inclusive community connection and empowerment.

The first class of 18 Pollinator Advocates completed their core training in the fall of 2022. Several Pollinator Advocates are involved in community projects, continuing education and assisting with expanding the program. The city's ultimate goal is for every resident to have access to free or affordable native plants, and the support from neighborhood experts to transition one yard at time, one neighborhood at a time, to create high-quality ecological corridors.

Obstacles for Pollinator Advocate Programs

- Lack of knowledge
  - What, how and where to plant
  - Where to find or purchase plants
  - How to establish and maintain native plant gardens
- Native plant and seed shortages
- Cost of plants

2022 Pollinator Advocate Training

The training requirements for Boulder's Pollinator Advocates consisted of:

- Weekly two-hour classes for one month
- Minimum of 15 hours of additional in-field training and specialty classes throughout the summer
- Final exam — students assessed a site of their choice with a habitat score card; assembled an organic native plant kit (provided to them for free); and installed the native plant at site they assessed
- Commitment to continue learning, engaging with the other residents and mentoring the next class of Pollinator Advocates

Other Resources

We acknowledge that many others are engaged in pollinator habitat work and have knowledge and expertise that can assist you in a variety of ways. The information shared below is meant to provide you with some resources to continue your journey and discover a sampling of what others have done or what other tools are already out there.

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Best Practices

- Xerces Society: Pollinator Friendly Parks (https://xerces.org/publications/guidelines/pollinator-friendly-parks)
- University of Minnesota, IPM and Pollinator Conservation: Parks and Open Spaces BMPs (https://ncipmhort.cfans.umn.edu/ipm-bmp-cultural-control/parks-open-spaces-best-management-practices-pollinators)
- University of Minnesota Bee Lab: Bee lawn (https://beelab.umn.edu/bee-lawn)

Trainings/Resources

- **Native Plant Lists**
  - Pollinator-Friendly Native Plant Lists (https://xerces.org/pollinator-conservation/pollinator-friendly-plant-lists)
  - Native Plant Finder (https://www.nwf.org/NativePlantFinder)
  - Native Plants of North America (https://www.wildflower.org/plants-main)
- **Sample Seed Mix Matrix**
  - Cedar Rapids 1000 Acre Initiative, Pollinator Zone Seed Mix (https://tinyurl.com/nhzn5dak)
  - Creation and maintenance (University Extension Offices provide valuable, regionally focused information):
    - University of Minnesota Extension, Care After Planting (https://tinyurl.com/yy8kz8yf)
    - Local native plant trainings (http://www.ecosystemgardening.com/native-plants-certificate-programs.html)

Sources of Native Plants, Plugs and Seeds

- Regional lists of wholesale nurseries (check with your local extension office or research appropriate sources):
- Pheasants Forever, often can partner to help larger habitat projects (https://pheasantsforever.org)
  - PlantNative.org (http://plantnative.org)
  - Homegrown National Parks, Purchasing Native Plants (https://homegrownnationalpark.org/purchasing-native-plants)
- Invasive plant identification — pair what you find through your efforts with databases to determine non-indigenous species
  - Invasive.org, Invasive and Exotic Species of North America (https://www.invasive.org/index.cfm)
  - USDA, National Invasive Species Information Center (https://www.invasivespeciesinfo.gov/type/databases)

Engagement Resources

- **Building Community Advocates**
  - Monarch Joint Venture, Advocate for Monarchs (https://monarchjointventure.org/get-involved/advocacy)
- **Education**
  - Pollinator.org, Education (https://www.pollinator.org/learning-center/education)
  - National Pollinator Garden Network, Pollinator Education Resources (https://tinyurl.com/5au5wkt5)
- **Building Coalitions**
  - University of Kansas Center for Community Health and Development, Community Tool Box (https://ctb.ku.edu/en/table-of-contents/assessment/promotion-strategies/start-a-coalition/main)

Funding Resources

Many organizations and groups fund this work on national, regional and local scales. Use the following resource as a starting point when calculating costs and then looking for funding and additional resources.

- **Costs**
  - CNT, Green Values Stormwater Management Calculator (calculate the benefit of green infrastructure) (https://cnt.org/tools/green-values-calculator)
  - Commonwealth of Massachusetts, Sustainable Landscaping at State Facilities (calculate lawn to pollinator habitat conversion) (https://www.mass.gov/info-details/sustainable-landscaping-at-state-facilities)
  - Pennsylvania Department of Conservation and Natural Resources, Lawn Conversion (mowing calculator) (https://www.dcnr.pa.gov/Conservation/Water/LawnConversion)

- **Funding**
    - **National:** Keep America Beautiful, National Fish and Wildlife Foundation, Toyota, The National Environmental Education Foundation, Pheasants Forever, etc.
    - **Regional:** State and regional conservation organizations, natural resource departments
    - **Local:** Social clubs (garden, rotary, etc.), scouts, foundations and local businesses (especially in the plant trade)

Policies

- **Pesticides**
    - Xerces Society, Pollinator Protection Policies (https://xerces.org/pesticides/pollinator-protection-policies)
    - Google My Maps, Map of U.S. Pesticide Reform Policies (https://tinyurl.com/4xkjkjm9)
    - Integrated pest management (IPM) examples at the local level:
        - Stamford, Connecticut (https://tinyurl.com/3wfdmd6b)
        - Boulder, Colorado (https://bouldercolorado.gov/media/1055/download?inline)
        - Seattle (https://tinyurl.com/4avcuzus)
        - Eugene, Oregon (https://www.eugene-or.gov/638/Integrated-Pest-Management)
- **Native Plant Requirements**
    - The Elisabeth Haub School of Law Environmental Law and Policy Hack, *Native Plantings as a Strategy for Local Governments* (https://law.pace.edu/sites/default/files/Team%20%233%20Brief.pdf)
    - Eugene, Oregon, Native and Invasive Plant Policies (https://tinyurl.com/58e9brpd)
    - Town of Victor, New York, Native Plant Requirements (https://ecode360.com/8088346)
    - Westchester County, New York, Executive Order No. 10 of 2018 (https://www.westchestergov.com/images/stories/execorders/2018EO10.pdf)
    - New Castle, Delaware, Executive Order 2018–10 (https://www.newcastlede.gov/DocumentCenter/View/26671/Exec-Order-2018-10-Native-Species)
    - Somerville, Massachusetts, Ordinance No. 2021-05 (https://www.somervillema.gov/sites/default/files/native-planting-ordinance.pdf)
    - Newton, Connecticut, Native Plant Policy for Municipal Landscapes (https://tinyurl.com/j5duchrk)
    - Salt Lake County, Utah, Municipal Code: Water Efficient Landscape Design and Development Standards (https://perma.cc/YSY2-W842)

- **Weed/Mow Ordinances**
  - City of Greeley, Colorado, No-Mow Policy (https://greeleygov.com/docs/default-source/parks/nomowpolicy_revised.pdf)
  - Virginia Beach Parks and Recreation, *Meadow Management* (https://www.vbgov.com/government/departments/parks-recreation/parks-trails/Documents/landscape-mgmt/meadow-management.pdf)
- **Invasive or Nuisance Plant Policies**
  - City of Encinitas, California, Invasive Plant Policy (https://tinyurl.com/mr4f9cdm)
  - City of Eugene, Oregon, Invasive Species Prohibited Plant List (https://eugene-or.gov/DocumentCenter/View/53051/Invasive-Species-Prohibited-9_2020)
  - City of Portland, Oregon Environmental Services, Nuisance Plants Required Removal Program (https://www.portland.gov/sites/default/files/2020-06/nuisance-plant-removal-rules-20100701-2-301195.pdf)

Plans

- **Overall Plans**
  - City of Toronto, Pollinator Protection Strategy (https://tinyurl.com/czjj2tum)
  - Kansas City (Missouri) Parks and Recreation, Sustainability Plan (https://kcparks.org/wp-content/uploads/2019/04/KCMO-Parks-Sustainability-Plan-Recommendations.pdf)
  - Wild Ones Natural Landscapers, Native Garden (designs for residents) (https://nativegardendesigns.wildones.org)
- **Meadow Management Plans**
  - Montgomery Parks, Maryland
  - Seattle, Washington
  - Virginia Beach, Virginia
  - Columbus Ohio
  - Xerces resources:
    - Guidelines (https://xerces.org/publications/guidelines)
    - Mid-Atlantic Native Meadows (https://xerces.org/publications/guidelines/mid-atlantic-native-meadows)
    - Pollinator Friendly Parks (https://xerces.org/publications/guidelines/pollinator-friendly-parks)

Other Groups in This Work:

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- Cooperative extension
- Soil and water conservation districts
- Local universities

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Back Cover Image
A female long-horned bee forages for pollen and nectar in a garden sunflower. *Photo courtesy of Vaughn, Xerces Society.*

NATIONAL
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