



Pollinators in Urban and Suburban Areas

Although West Virginia is thought to be a largely rural state, according to the 2010 census almost 49% of citizens lived in towns or cities with populations of 2500 or more. Almost half of counties showed increases in population, with most people moving into cities, towns, and newly constructed developments. Because of this population shift, an increasing number of areas in West Virginia have been experiencing urbanization: an increase in the number of people living and working in a city or town and the resulting development. Although this process may provide needed opportunities for West Virginia citizens, it also may eliminate areas of biodiversity. Of importance is providing habitat for pollinators and other wildlife.

Worldwide, pollinators are declining due to habitat loss, pollution, disease, and climate change with habitat loss the main driver in declines. World-wide, 35% of crops depend on pollinators to produce seed and fruit, with one out of every three mouthfuls of food we eat and drink dependent on insect pollination. Natural ecosystems depend on native plants to function, and most plants depend on pollinators to produce seeds. Other wildlife, including songbirds, reptiles, amphibians, and others that depend on insects and other invertebrates, depend on native plants to support the entire insect community.

Urbanization, even in West Virginia, has led to increasing numbers of small, fragmented areas that support fewer native species because of the loss of native plant diversity. An average suburban lawn consists of one to a few species of non-native turf grasses that are highly managed with mowing and chemicals.

The tree-line or hedgerow around that lawn probably has mostly native tree species, but likely will harbor no native shrubs and few native herbaceous plants. Homeowners instead will see aggressive non-native species such as tree-of-heaven, autumn olive, Japanese honeysuckle, Japanese barberry, and many small European weeds such as garlic mustard and crown vetch. The insect community that supports other wildlife, and the pollinators that help support agriculture, need native plants to thrive, and often even to survive. Backyard vegetation (trees, shrubs and flowers) that consists of at least 70% native species on average hosts 50% more native bird species, three times more butterfly species, and twice the number of native bee species.



Suburban development in Monongalia County

Although urban areas have traditionally been viewed as biological deserts, current research has documented many urban areas supporting diverse populations of pollinators, with the potential to contribute even more to their conservation. Residential areas, with parks, green spaces, and backyard habitat, can contribute significantly to these efforts.

Pollinator Habitat

Pollinators can find homes throughout the urban and suburban environment. Gardens, parks, woodlots, corporate and school campuses, edges of roads and median strips can all harbor habitat for these species. Pollinators need a few basic elements: blooms from which to collect nectar and pollen, an environment free of pesticides, and safe and appropriate areas for broods to develop and for adults or other life stages to over-winter.

A European honeybee on white clover; a common plant found in lawns that can help support pollinators in urban areas.



Nectar and Pollen

Pollinators, as the name implies, typically use nectar and/or pollen as food. During the collection process pollen is transferred to other blooms, pollinating the plant. Flowers are important for pollen and nectar, but not all flowers produce pollen and nectar, and not all pollen and nectar are created equal. Many horticultural varieties of common garden flowers, especially those with added petals or other embellishments, produce no pollen or nectar making them useless to pollinators. Similarly, exotic species may produce pollen and nectar that don't fulfill the nutritional needs of many native pollinators.

Excessive mowing meant to tidy property lines has impacted pollinators by reducing their food supply.



New Guinea impatiens, a popular bedding plant, provides no pollen or nectar for pollinators.

Pesticides

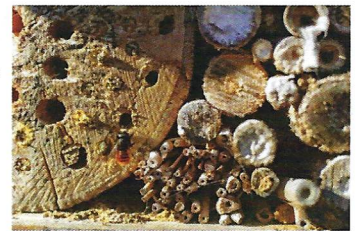


Plant label identifying neonicotinoid use

Because of the highly managed nature of urban and suburban landscapes, pesticides are commonly used to control perceived pests. Dandelions and clover in lawns, Japanese beetles on roses, and algae on roofs are all treated with various herbicides, insecticides, and fungicides. These chemicals, although effective, tend to be over-used and over-applied and may not be treated with appropriate caution. Insecticides are damaging to insect pollinators especially if improperly applied. Foraging adults are killed as well as immature bees if chemicals transported back to the hive or nest burrow with pollen or on the adult's body. The mixture of herbicides and fungicides in the environment can multiply the toxic effects of insecticides. Systemic insecticides, such as neonicotinoids, infuse the entire plant including pollen and nectar. This effectively poisons visiting pollinators and, if not causing death, may cause changes such as reduction in foraging behavior, harm navigation skills, and reduce longevity and the number and vigor of young produced.

Pollinator Brood Rearing and Overwintering

Pollinators need safe areas for broods to develop. Examples include an abandoned underground small mammal burrow at the edge of a woodlot for a bumble bee colony, a stand of elderberry with pithy stems for individual solitary bees to nest in, a constructed bee log, or a patch of milkweed for monarch butterfly caterpillars to eat as they mature. To be safe pollinators need to be undisturbed and free of pesticides. They also need to be within 200 or 300 feet of areas that provide pollen and nectar. Good areas include woodlots or unused edges of developed areas.



Constructed bee log.

Pollinators also need safe areas in which to overwinter. Depending on the species, they may over winter as eggs, in an immature stage, or as adults. Many overwinter in dead vegetation on or near the ground in leaf litter, grass tussocks, or under dormant plants. Some over-winter underground. These areas need to be undisturbed by mowing, fire, or clearing.


Pollinator habitat can fit in anywhere


Although large patches of pollinator habitat (more than 0.5 acres) are highly beneficial, this relatively large amount of area in urban environments can be scarce. Small areas scattered over the landscape, however, also support pollinator populations. Many of these efforts can be registered with local, regional or national programs that provide signage and other resources.


- Private homes can have a variety of gardens and landscaping to promote pollinators, from simple gardens to extensive plantings that include tree and shrub species that support pollinator communities.
- Church property, parks, and municipal buildings can harbor gardens planted with native species as a basic way to contribute to conservation efforts and to educate citizens.
- Islands and perimeters of parking lots at malls or other businesses and median strips on roadways can be planted with hardy native species instead of invasive non-natives plants.
- Corporate campuses can save money and effort spent mowing by converting turf grass into pollinator meadows. These actions are often appreciated by the community and by investors and stock holders.
- Schools, colleges, and universities can also convert lawns areas to pollinator habitat that beautifies the campus and provides a rich diversity of educational and research opportunities for students.


Recommendations

Municipalities


 Storm water runoff, a chronic issue in urban areas, can be alleviated by using porous surfaces including pollinator plantings in rain gardens. Mixed plantings that include native perennials with deep root systems tend to absorb more water than turf grass and other shallowly rooted species.


 Many national conservation programs and resources are available for municipalities to improve storm water management and citizen engagement by planning and establishing pollinator habitat on public lands. Some programs include the Mayors Monarch Pledge and Million Pollinator Garden Challenge. Locally in West Virginia, the Master Gardeners program, administered by West Virginia University Extension, and Master Naturalist program, administered by WV Division of Natural Resources, trains people in horticultural techniques or natural history, providing towns and cities with knowledgeable citizens to plan and implement pollinator projects.


 Municipalities should primarily plant native plant species for landscaping. This practice is an effective strategy to prevent the spread of non-native invasive plant species as healthy, intact native plant communities are more able to withstand incursion by non-native species.


 Unused lawn turf in parks and other public areas can be converted to native vegetation to reduce mowing and, with time, maintenance.


Landowners


 Native plants, once established, require less maintenance than non-native species. They are adapted to local environments and require less watering, fertilizing and pest control.

 An action homeowners can adopt is to reduce the amount and frequency of mowing on vacant lots to maintain pollinator food resources. Research has documented that mowing twice a year, early and late in the growing season, increased floral diversity and the abundance of pollinators. It is important to avoid mowing during vulnerable stages of life cycle of rare or declining species. For example, in the majority of West Virginia, to reduce harm to monarch butterflies, avoid mowing areas with milkweed and nectar producing plants from April 1 to November 1.

 Another beneficial action is to set lawn mower blades no lower than 4-6 inches. This will help turf grasses to stay healthier, help them resist drying out and becoming dormant in summer heat, and maintain low growing nectar plants. By eliminating or decreasing the use of lawn chemicals, you will allow the growth and bloom of these low growing herbaceous plants, such as dandelions and clover, and providing pollen and nectar in an otherwise sterile environment.

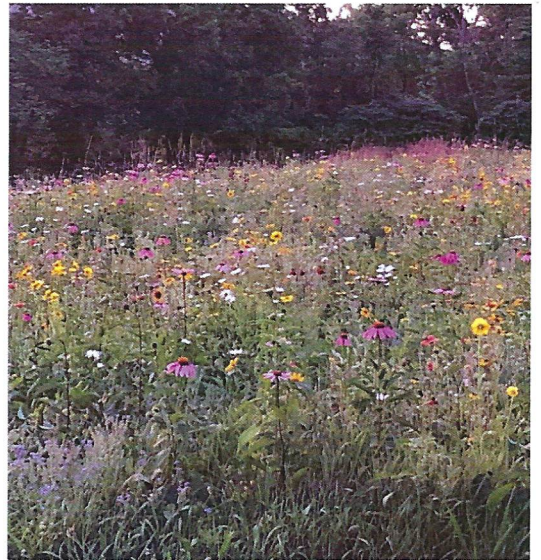
 If establishing a flower garden or a pollinator habitat, at a minimum follow The Rule of Three; plant at least 3 different species, with 3 different colors, and with 3 different flowering periods. This provides a food source from spring to fall.

 In addition to other native species, plant or encourage native milkweeds for conservation of West Virginia's imperiled state butterfly, the monarch.

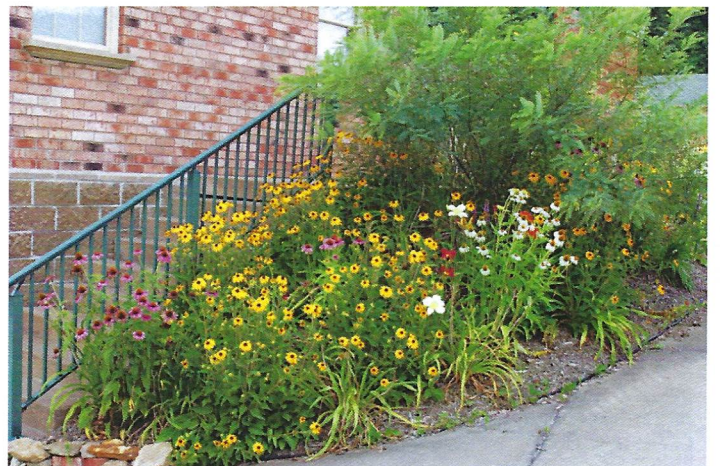
 Corporations, universities, and other entities with larger land holdings in communities can explore how unused areas may be managed for pollinator habitat. This goal may reduce maintenance costs and foster good will in the community.



A small rain garden in an Illinois neighborhood to address street rain runoff.



Pollinator meadow at Cacapon State Park, Morgan County, WV converted from turf lawn.



Small pollinator garden at the DNR District 1 office, Marion County, WV.

Additional Resources

Several good online websites provide accurate information and downloadable resources on pollinators. Highly regarded ones include: Xerces Society for Invertebrate Conservation (xerces.org), Pollinator Partnership (pollinator.org), Monarch Joint Venture (monarchjointventure.org), and Monarch Watch (monarchwatch.org). Below are materials related to this BMP. Additional information is available on their websites or others as indicated.

Wildlife Habitat Council (<https://www.wildlifehc.org/>): a non-profit organization that provides fee-based technical assistance, certification, and other resources to corporations and municipalities on natural resources including pollinators. They have a diverse library of webinars and other resources online.

Bee City USA (<https://www.beecityusa.org/>): Provides municipalities and campuses resources for pollinator conservation.

Several organizations are focused primarily on monarch butterfly conservation, but these resources can be easily expanded to include pollinators in general.

Mayors Monarch Pledge (<https://www.nwf.org/Garden-For-Wildlife/About/National-Initiatives/Mayors-Monarch-Pledge.aspx>).

Field Museum of Chicago Urban Monarch Conservation Program (<https://www.fieldmuseum.org/science/research/area/keller-science-action-center/science-action-chicago/monarchs-view-city>)

Million Pollinator Garden Challenge (<http://millionpollinatorgardens.org/>): A site administered by the National Pollinator Garden Network, a group of 50+ organizations to nationally promote creation of pollinator gardens. The website has many online resources.

Homegrown National Park (<https://homegrownnationalpark.org/>): A site dedicated to helping and encouraging homeowners and landowners to plant and maintain native plants to improve biodiversity and the insect and other wildlife species that depend on them.

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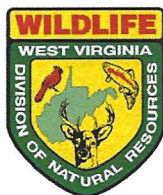
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