

## Don't Blow Life Away – Leave the Leaves

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*Photo Credit: Jean Epiphan*

Have you heard about all the benefits leaves provide to our landscapes? There are also many downsides to removing leaves. The wide-spread practices of blowing and transporting leaves degrade our environment and quality of life. They pose serious threats to human health, soil health, plant health, insect and ecosystem health, as well as the health of our planet as the following outlines.

### HUMAN LIFE

When you choose to leave leaves, you help improve human health and quality of life of your entire neighborhood especially high-risk populations: children, pregnant women, and landscape workers. Removing and moving leaves usually involves gas leaf blowers which have no pollution controls and pose significant health risks:

- **Harmful toxins and carcinogens:** Carbon monoxide, hydrocarbons, nitrogen dioxide, formaldehyde, benzene, 1,3-butadiene, acetaldehyde, and volatile organic compounds are released by gas-powered leaf blowers. These air pollutants can worsen respiratory issues, increase asthma risk, neurological effects, as well as contribute to heart disease, dementia, and cancers like lymphoma and leukemia.
- **Contaminant dust and particulates:** Leaf blowers kick up dust and particulates that contain pollen, mold, pesticides, and other contaminants, which can exacerbate allergies and respiratory problems.
- **Noise pollution:** Gas-powered leaf blowers exceed safe noise levels, which can cause permanent hearing damage. Noise pollution also increases stress hormones, increases anxiety, and decreases quality of life.

## SOIL & PLANT LIFE

Plant and soil ecosystems have evolved for millennia to feed themselves and stay healthy through the natural process of leaves decomposing and returning organic matter to soil and plants. When leaves are removed, the natural processes that keep our plants and soil healthy are removed too. Chemical fertilization and store-bought mulches are no match for all the benefits leaves provide soil and plant life:

- **Essential nutrients:** As leaves decompose, essential nutrients are returned to the soil naturally. Beneficial microbes, like fungi and bacteria, make up a healthy soil and break down leaf organic matter and convert the nutrients into forms that plants can absorb (Figure 1).
- **Soil structure and function:** As leaves break down, they help improve soil structure by increasing its porosity. This allows roots to penetrate more easily and enhances air and water movement through the soil. It also improves water holding capacity. This is a natural way to restore compacted soils after damage by machinery, mowers, and foot traffic.
- **Natural mulch effects:**
  - **Soil moisture retention** reduces evaporation and decreases the need for irrigation.
  - **Insulation** provided by leaf litter keeps soil cooler in the summer and warmer in the winter; this protects plant roots from extreme temperatures.
  - **Weed Suppression** of leaf litter blocks sunlight from reaching weed seeds, thus reducing competition for resources like water and nutrients.
  - **Erosion control** is performed by leaves left as mulch, especially during rainstorms.



**Figure 1:** Last year's oak leaves slowly decomposing with the help of small pinwheel mushrooms (*Marasmius rotula*). Photo credit: Jean Epiphan.

## INSECT LIFE

Beneficial insects, like butterflies, moths, fireflies, and native bees, require leaf litter to survive (Figure 2). They are critical components of our ecosystem and responsible for native plant pollination, consuming harmful pests, as well as serving as food sources for other wildlife in our ecosystem. When leaf litter, especially of native origin, is regularly removed, beneficial insect populations plummet, which greatly harms healthy ecosystem function. Leaf litter serves as vital habitat for beneficial insects in many ways:

- **Microhabitats:** Leaf litter creates and maintains a stable, moist environment, which is ideal for insects like ants and beetles, as well as arthropods like pill bugs and centipedes. Many of these creatures rely on the native leaf litter for egg laying sites, larval development, food, shelter, and protection from predators. For example, fireflies live the majority of their lives in leaf litter as larvae, it is essential for their survival. Leaf litter removal is one of the main reasons why firefly populations are diminished in New Jersey.
- **Overwintering:** Insects utilize leaf litter as protective cover during winter months for hibernation in various life stages (eggs, larvae, pupae, or adults) such as the luna moth caterpillar (*Actias luna*) that spin their cocoon in leaf litter to overwinter. Leaves also insulate the ground so insects that burrow in soil can hibernate. For example, bumble bee queens (*Bombus* spp.) seek out leaf litter to make burrows to survive the winter and start a new colony. Removing leaves removes beneficial insect life from our ecosystem.

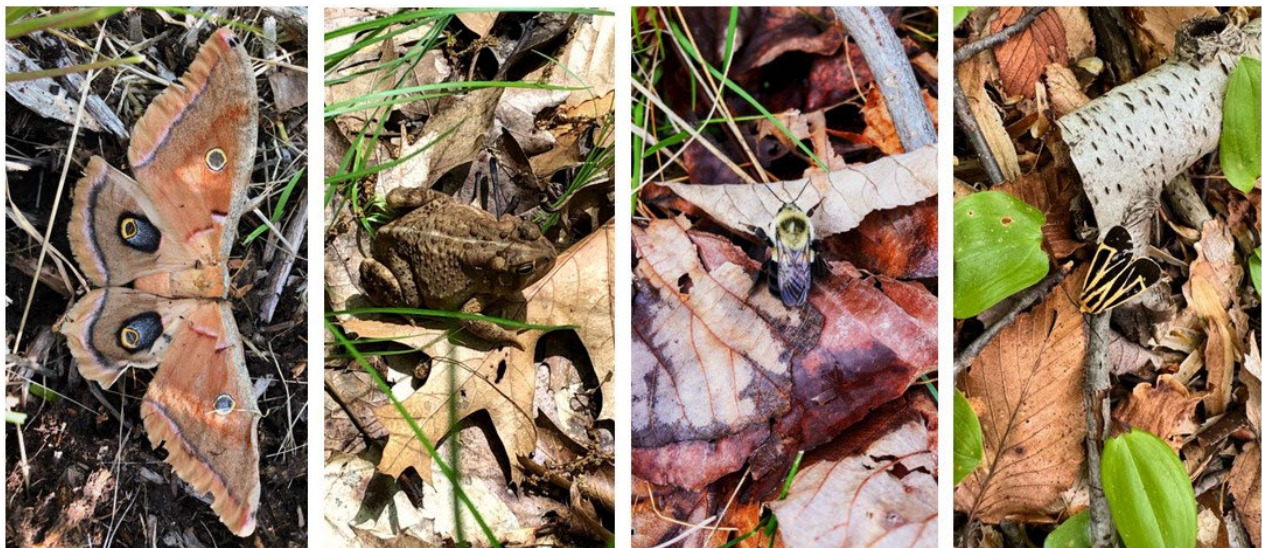


**Figure 2:** Critters that require leaf litter for their microhabitats, overwintering, or camouflage. From left to right: Polyphemus moth (*Antheraea polyphemus*), American toad (*Anaxyrus americanus*), eastern bumble bee (*Bombus impatiens*), banded tiger moth (*Apantesis vittata*). Photo credits: Jean Epiphan.

## WILDLIFE

Leaves and leaf litter are also important for higher order wildlife such as reptiles, amphibians, birds, and mammals. If leaves are not left, native wildlife disappear with them (except for our over-abundant white-tailed deer). Leaves are part of our ecosystem and are vital components of healthy habitat for our local fauna:

- **Forage:** Birds, chipmunks, racoons, shrews, and many other animals forage for food (insects, arthropods, and seeds) in leaf litter. These animals also disperse seeds in the leaf litter.
- **Shelter:** Many species of wildlife, like the American toad (*Anaxyrus americanus*), least shrew (*Cryptotis parva*), and eastern chipmunks (*Tamias striatus*), spend a large portion of their life in leaf litter, and use it as camouflage to help avoid predators.
- **Nesting material:** Squirrels, chipmunks, and several species of birds use leaf litter to build their nests. Ovenbirds build their nests in leaf litter layers on the ground.
- **Overwintering:** Many animals make burrows under leaf litter that help to insulate them and camouflages their entrances. Some species like the wood frog (*Lithobates sylvatica*) and the eastern box turtle (*Terrapene carolina*) overwinter under leaf litter.

## OUR PLANET

Leaves help protect our planet; decomposing leaf litter stores carbon in the soil, which helps fight climate change. The processes of blowing and transporting leaves are harmful to our planet and contribute to climate change.

- **High emission rates:** Small two-stroke engines used in many gas-powered leaf blowers are inefficient and emit large amounts of greenhouse gases. These engines lack catalytic converters and emit pollutants.
- **Carbon dioxide (CO<sub>2</sub>):** Using a gas-powered leaf blower for one hour can emit as much CO<sub>2</sub> as driving a car for over 1,000 miles, depending on the specific model and type of blower.
- **Nitrous oxide and methane:** Gas-powered leaf blowers also release nitrous oxide and methane, which are potent greenhouse gases with higher global warming potential.
- **Fuel consumption:** Transporting collected leaves to composting facilities, landfills, or other disposal sites requires trucks that typically run on diesel or gasoline. This contributes to greenhouse gas emissions, depending on the distance and frequency of trips.
- **Emissions from landfills:** If the leaves end up in a landfill, they can produce methane as they decompose anaerobically. Methane is a greenhouse gas much more potent than CO<sub>2</sub>, with a higher impact on global warming.

## HOW TO LEAVE LEAVES

Leaving the leaves benefits our environment and health in numerous ways; lives literally depend on it. However, removing leaves is so commonplace in our society, how does one make the switch?

- **Leave leaves in garden beds:** Move leaves from lawns and walkways into your garden beds or forest with manual rakes or electric leaf blowers (see figure 3 for example garden beds).
- **Increase garden bed area:** Reduce lawn area that requires raking and replace it with native garden beds, that benefit from leaves as mulch.
- **Do not shred leaf litter:** Shredding leaf litter shreds insects and their habitat.
- **Excess leaves:** If you have excess leaves or non-native leaf litter (less useful to native flora and fauna), use them in your compost pile.
- **High winds:** If leaves blow around your property too much, there are a couple strategies that can help:
  - Do not cut down perennial stems; instead leave them erect and in place during dormancy to help hold leaves in beds.
  - Add fine woody debris (twigs and sticks) to weigh down leaves, they also provide habitat and breakdown to improve soil and plant health.
  - For a tidier appearance, place a light layer of natural (not dyed) mulch above your leaf litter to keep it place.
- **Signage:** Install a “Leave the Leaves” sign or other message to your neighbors that let them know you care about the environment and that the leaves are intentional. This will help promote leaving the leaves in your community.

Leaving the leaves is an easy way to help protect our planet, your plants, soil, and all the little creatures that depend on our healthy landscape choices to survive. Life evolved with leaf litter, so spend less energy on removing them and more time enjoying the wildlife it supports.



**Figure 3:** Various garden beds mulched with leaves. From left to right: great Solomon's seal (*Polygonatum commutatum*) flourishing among leaf litter, *photo credit:* Jean Epiphan; vibrant moss phlox (*Phlox subulata*) and golden ragwort (*Packera aurea*) among leaf litter in native perennial bed, *photo credit:* Jean Epiphan; native perennial stems left in place throughout winter among leaf mulch in a formal garden display at Van Vleck Gardens, Montclair, NJ, *photo credit:* Deb Ellis.

## RESOURCES

National Wildlife Federation

[www.nwf.org/Magazines/National-Wildlife/2015/OctNov/Gardening/Leave-the-Leaves](http://www.nwf.org/Magazines/National-Wildlife/2015/OctNov/Gardening/Leave-the-Leaves)

[blog.nwf.org/2023/10/seven-species-that-need-you-to-leave-the-leaves](http://blog.nwf.org/2023/10/seven-species-that-need-you-to-leave-the-leaves)

[blog.nwf.org/2024/09/leave-the-leaves-to-save-fireflies](http://blog.nwf.org/2024/09/leave-the-leaves-to-save-fireflies)

U.S. Department of Agriculture

[www.usda.gov/media/blog/2022/10/17/fall-leave-leaves](http://www.usda.gov/media/blog/2022/10/17/fall-leave-leaves)

Xerces Society for Invertebrate Conservation

[xerces.org/leave-the-leaves](http://xerces.org/leave-the-leaves)

[xerces.org/blog/leave-the-leaves](http://xerces.org/blog/leave-the-leaves)

[xerces.org/blog/five-ways-to-support-queen-bumble-bees-this-spring](http://xerces.org/blog/five-ways-to-support-queen-bumble-bees-this-spring)

Mount Sinai Institute for Climate Change, Environmental Health, and Exposomics

[mountsinaisexposomics.org/gas-leaf-blowers-are-health-hazards/](http://mountsinaisexposomics.org/gas-leaf-blowers-are-health-hazards/)

Coalition for a Healthy & Safe Environment

[chasesantacruz.org/impacts-of-leaf-blowers](http://chasesantacruz.org/impacts-of-leaf-blowers)