



WITHOUT PLANTS WE'RE TOAST

From George Perkins Marsh to Barry Commoner and Carl Sagan through Neil deGrasse Tyson

A wonderful fabric can be woven from the work of America's first great conservationist, George Perkins Marsh (1864), to the legendary John Muir, Rachel Carson, and Barry Commoner connecting the first Earth Day on April 22, 1970, to Carl Sagan and Neil deGrasse Tyson and to everyone alive today and in the future. The individual threads of that fabric are composed of the **plants**, animals, ecosystems, and habitats that make the Earth habitable. It is a fabric we all must work to protect because without life-giving **plants**, pollinators, and biodiversity we couldn't survive.



Plants produce oxygen through transpiration that almost all organisms on our planet need for life. **Plants** are also the only organisms on Earth that transform the Sun's rays into metabolic energy in the form of the many different types of food that people and animals need for life. Using the energy of the Sun, **plants** are able to absorb carbon dioxide and generate their own food through the process of photosynthesis and as a result produce our life-sustaining oxygen. **Plants** also contribute to the formation of ozone that is produced by action of sunlight on oxygen. Ozone creates a layer in the atmosphere that protects all life on Earth from the Sun's potentially harmful ultra-violet rays.

Plants are also important sources of products that people use, including food such as meat and vegetables, beer and wine, wood for houses, pigments for colors, fiber for the clothes we wear, and even fuels. **Plants** create the products that animals use, including their food, shelter from the elements, nesting materials, and places to hide from predators. **Plants** help to assure healthy air, water, soil, and biodiversity.

Plants are critical to the advancement of science. They provide base materials for the development of medicines and pharmaceuticals; they are the foundation of the sciences of dendrochronology (study of tree rings) and palynology (study of pollen);

and in the form of ancient fossils they are used by geologists/paleontologists to date the age of rock formations. **Plants** and fungi also provide many biodegradable and sustainable products we use every day in our vehicles, homes, and offices.

Plants are the primary habitats for many thousand organisms, including the insects, arachnids (spiders), and bacteria that live in, on, or under **plants** from and through roots all the way to the tree-top canopies. **Plants** have extensive fibrous root systems that stabilize the soil and prevent erosion. When those roots die they become part of the soil and make it fertile and healthy. Leaves fall in forests and help maintain the forest floor and watersheds. According to the Soil and Conservation District of Saint Louis County, the State of Missouri has more than 515 soil types, including wetland soils in marshes and along rivers, unstable clay soils that shrink and swell, causing problems for building construction, and the fertile Menfro, the state soil of Missouri, in which grow crops like corn, soybeans, cereal grains, hay, and fruits and vegetables.

Plant habitats alter what are called micro-climates by providing shade that moderates temperature. They protect animals from storms of all types, including high winds, thunderstorms, lightning and hail, and sleet. On a larger scale, such as the tropical rainforests of Latin America, Africa, and Asia, **plants** influence temperature, humidity, and rainfall over large areas of the Earth's surface and pump millions of tons of oxygen into the atmosphere that are distributed across the globe.

Plants are important elements of the human world because of their incredible beauty! Orchids brighten our world with colorful majesty and diverse flora beauty!



Plants also help us define what is beautiful in our personal lives and what inspires us! Check out the beautiful Missouri primrose (top) and purple coneflower (left); they are native wildflowers that are well adapted to home gardens and yards.

Plants take many forms including the magnificent California redwoods, fruit trees that grow apples and oranges, trees that produce nuts like almonds and pecans, Saguaro and barrel cactus in southern Arizona, flowers like roses and marigolds, bushes as small as a football and taller than a two-story house, grasses that produce cereal grains like wheat and rice, vegetables we eat like carrots and onions, and herbs that we cook with like basil, cinnamon, and parsley.

Without **plants** we wouldn't have honey, bananas, peanut butter, jelly, or bread. Without **plants** we wouldn't have chocolate, orange juice, or toast. Without **plants** not only would we have no oxygen to breathe but we'd also have nothing to eat because all the animals that depend on **plants** would be gone. Without **plants**, life on Earth as we know it would be impossible because they provide food for humans, pets, and all wild animals.

Today, **plants** and the animal species they support are under great stress as natural habitats throughout the world are being transformed into cities, subdivisions, and cultivated land. Human development has been accelerating for more than 400 years and has made much of the Earth uninhabitable for wildlife and the species on which all life depends. As a result, hundreds of species of **plants** and animals have become extinct, are threatened with extinction, or have become so concentrated in small habitats they are less resilient and become less hardy and healthy.

The great news is that millions of Americans are actively taking part in the effort to create natural habitats in their yards and throughout their communities, habitats that attract and support birds, bees, butterflies, and many other types of wildlife! Creating small-scale, healthy natural ecosystems in yards and on public lands is not hard and only requires a little effort on the part of people who love seeing wildlife in natural settings.

Plants require a natural balance of nutrients on which all life as we know it depends. We now can easily help to restore natural world systems by planting native vegetation, respecting **plant** needs for soil, water, and sunlight around our homes, parks, and greenspaces, and by reducing our use of fossil fuels.

Simple Things the Average Person Can Do to Help the Earth

Important points to remember:

- Humans are part of our environment.
- Healthy **plants** in the right places produce healthy ecosystems.
- Chesterfield's community conservation model has gone "global" through the efforts of such great organizations as National Wildlife Federation, Missouri Botanical Garden, BiodiverseCity St. Louis, Conservation Federation of Missouri, and others.

Everyone can help protect native **plants** and animals and the Earth itself by taking a few steps. None of them are difficult though some may take a bit more effort than others. All you need to do is dedicate a little time to help restore those critical quality of life factors.

1. Make your yard biodiverse by planting native vegetation that birds and pollinators depend on for food, shelter, and nesting, like milkweed for Monarch butterflies; be sure to consider native trees/shrubs that produce berries that will attract birds to your backyard throughout the year. Here's a short list of

common native **plants** that birds and many pollinators love: American holly, blackberry, common chokecherry, cranberry viburnum, cup-plant (*Silphium perfoliatum*), dogwood, elderberry, juniper, New England aster, northern white cedar, shadbush-serviceberry, Staghorn sumac, and wild columbine.



Monarch feeding on butterfly weed (*Asclepias tuberosa*); photo by CCE member Jeanne Clauson in her yard, October 2006; Chesterfield, MO.

2. Help your family create a rain garden of native species in your yard.
3. Because roof rainwater runoff from downspouts can cause storm sewer overflows that damage local streams, learn how to combine a “downspout disconnect” program for your house with a rain garden and a small bioswale in your yard planted with native species.
4. Join your friends and family in an organization that will enable you to express your love for the Earth through actions that will benefit native **plants** and animals as well as help people who enjoy them.
5. Spray the weeds in your yard with vinegar instead of harmful chemicals that can kill other **plants** and insects like bees and bumblebees.
6. Install a hummingbird feeder in your yard in the summer and a wild bird feeder in the fall/winter that provides suet, seed cakes, Nyjer thistle seeds, and black oil sunflower seeds, etc.
7. Get outside, walk in the woods or along a riverbank, learn the names of local **plants**, like trees and shrubs that grow in your area, and animals like birds that only come in summer, those that are resting here in winter, and those that are here all year round!
8. Reduce, Reuse, Recycle, Remanufacture, Repurpose, Restore, Replenish. And consider donating before you throw away items that have useful life.
9. Bring reusable bags to the supermarket.
10. Use compact florescent or LED bulbs to save energy. Turn off lights when you leave a room. Students can check out online Chesterfield’s Blue Planet Green Challenge.
11. House cats annually kill many hundred millions of small animals, including birds, chipmunks, field mice, frogs, lizards, non-venomous snakes, and voles. So try to keep your cats from spending long periods of time outdoors unsupervised.

12. If your house has a landscape irrigation system, ensure it is "on" only in the morning when little water will be lost to evaporation and make sure the sprinklers do not water sidewalks or pavements.
13. Help your family build a composting bin and use the compost in your garden and landscape.
14. Adopt a local park or greenspace and volunteer to help remove invasive species, clean up visitor areas, maintain trails and exhibits, pick up litter, plant native species, or by becoming a visitor guide to park activities. Help keep Chesterfield's nationally-accredited park system healthy and join Friends of Chesterfield Parks (<https://www.chesterfield.mo.us/friends-of-the-park.html>).

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U.S. EPA:
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Youth Service America: Environmental Service Learning Projects:

<http://readwriteact.org/files/2013/01/55-Environmental-Service-Learning-Projects.pdf>

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