



GREEN AND BEAUTIFUL

CLIMATE RESILIENT LANDSCAPES

 *Wild Ones*[®]
NATIVE PLANTS, NATURAL LANDSCAPES





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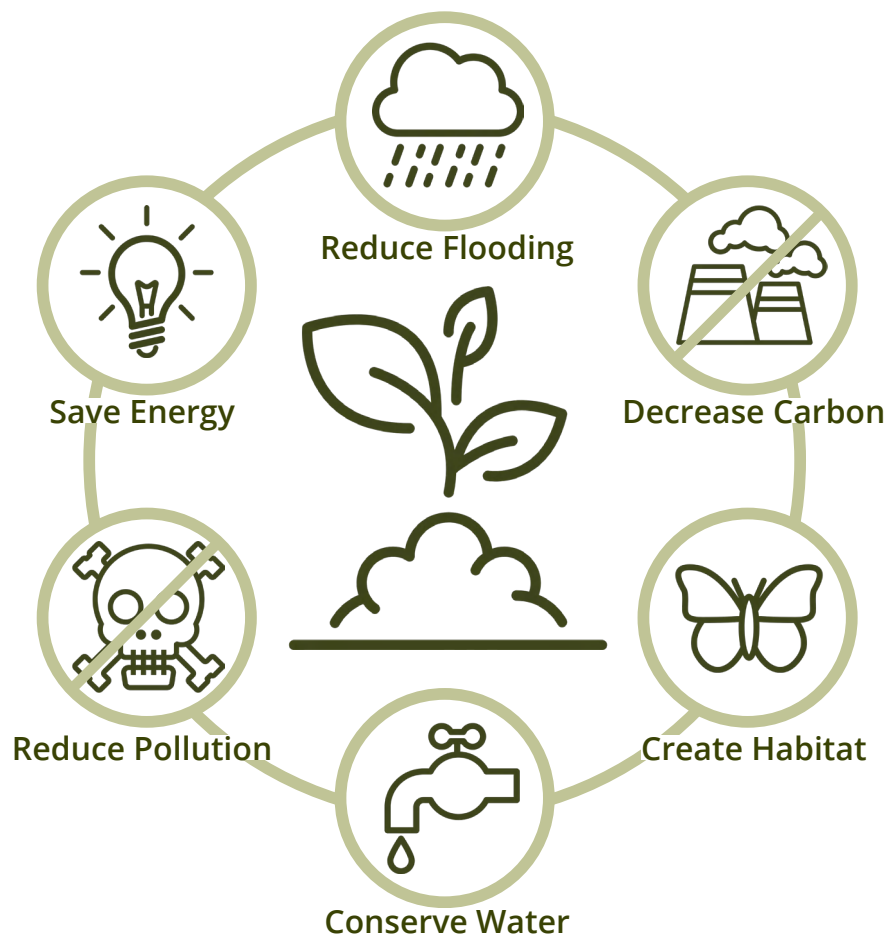
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**A list of sources cited in this guide is available at: <https://nativegardendesigns.wildones.org/sources/>*

**Many of the photos featured in this guide are courtesy of Wild Ones members.*



CLIMATE RESILIENT NATIVE PLANTS



Are you looking for something you can do to help slow down climate change, promote climate resilience and fight biodiversity losses all at the same time? Fill your garden with native trees, shrubs, grasses, and flowers! Native plants pull carbon from the atmosphere and keep it safely stored in soil. A well-designed native garden can help manage

flooding and stormwater runoff – or conserve water if you’re facing drought. These beautiful plants also reduce polluting toxins, lower energy consumption, and provide habitat for threatened species. Here’s how you can put their earth-healing powers to work in your garden.



Photo Credit: Tom Torkelson

PLANT TREES AND SHRUBS

Native shrubs and trees offer huge benefits. These hard-working “woodies” provide shade to lower home energy costs and reduce the heat island effect of urban areas. Trees improve air quality, create habitat for wildlife and remove CO₂ from the atmosphere. Depending on age and size, a typical hardwood tree can sequester as much as 48 pounds of carbon per year. That’s one ton of carbon removed from the atmosphere by the time the tree is forty years old!



ACCORDING TO THE U.S. FOREST SERVICE, URBAN TREES IN THE UNITED STATES REMOVE 784,000 TONS OF AIR POLLUTION ANNUALLY.

LOSE YOUR LAWN

There are 50 million acres of lawn in the US. Maintaining all this turf requires trillions of gallons of water, 200 million gallons of gas (for mowing) and 70 million pounds of pesticide per year. All those inputs take a big toll on

the environment – and your budget. When you switch from turf to native plants, you can put those power tools, pesticides, and sprinklers away. Instead, you can sit back and enjoy the birds, bees and butterflies flocking to your yard.



Photo Credit:
Lisa Olsen

STORE CARBON IN YOUR GARDEN

Like native trees and shrubs, deep-rooted native grasses, sedges, and forbs (flowering plants) store carbon below ground where it can stay locked up for centuries in the soil. Together, plants and soil microbes

(mycorrhizae) can absorb an estimated 30% of the CO₂ emitted by human activities yearly. Planting many different species multiplies this effect, increasing the amount of carbon stored by microorganisms in the soil.

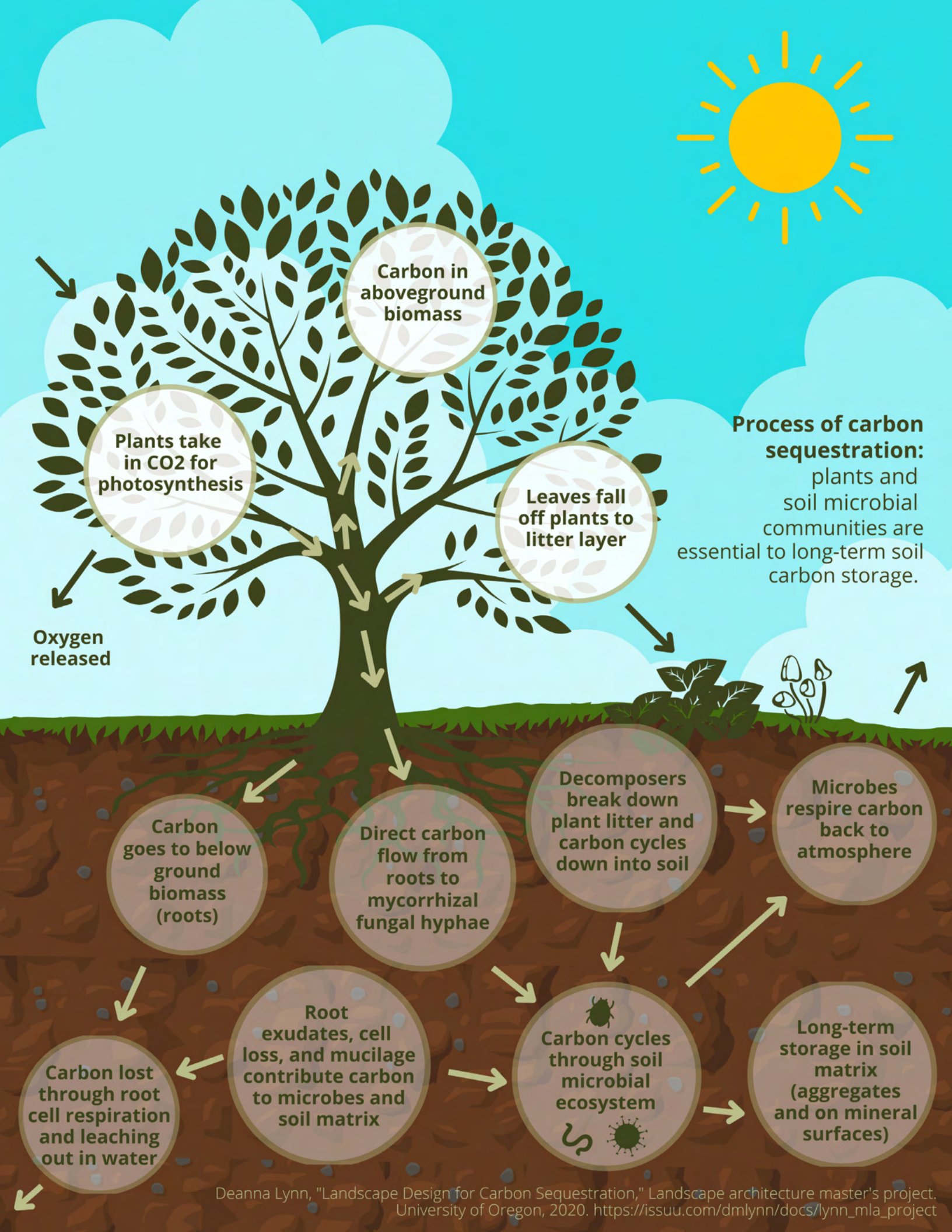
USE STRAIGHT SPECIES

Planting straight native species grown from seed, rather than “nativars,” optimizes genetic diversity. Native plants have the genetic diversity needed to adapt to changes in climate, including extreme fluctuations in temperature, wind, rain, and snow. Nativars are selected for

specific characteristics and may not have the same ability to adapt. You can read Wild Ones’ Position Statement on Nativars on our website: <https://wildones.org/position-statements/nativars/>.



Photo Credit: Kenton Seth



Carbon in aboveground biomass

Plants take in CO₂ for photosynthesis

Leaves fall off plants to litter layer

Oxygen released

Process of carbon sequestration: plants and soil microbial communities are essential to long-term soil carbon storage.

Carbon goes to below ground biomass (roots)

Direct carbon flow from roots to mycorrhizal fungal hyphae

Decomposers break down plant litter and carbon cycles down into soil

Microbes respire carbon back to atmosphere

Carbon lost through root cell respiration and leaching out in water

Root exudates, cell loss, and mucilage contribute carbon to microbes and soil matrix

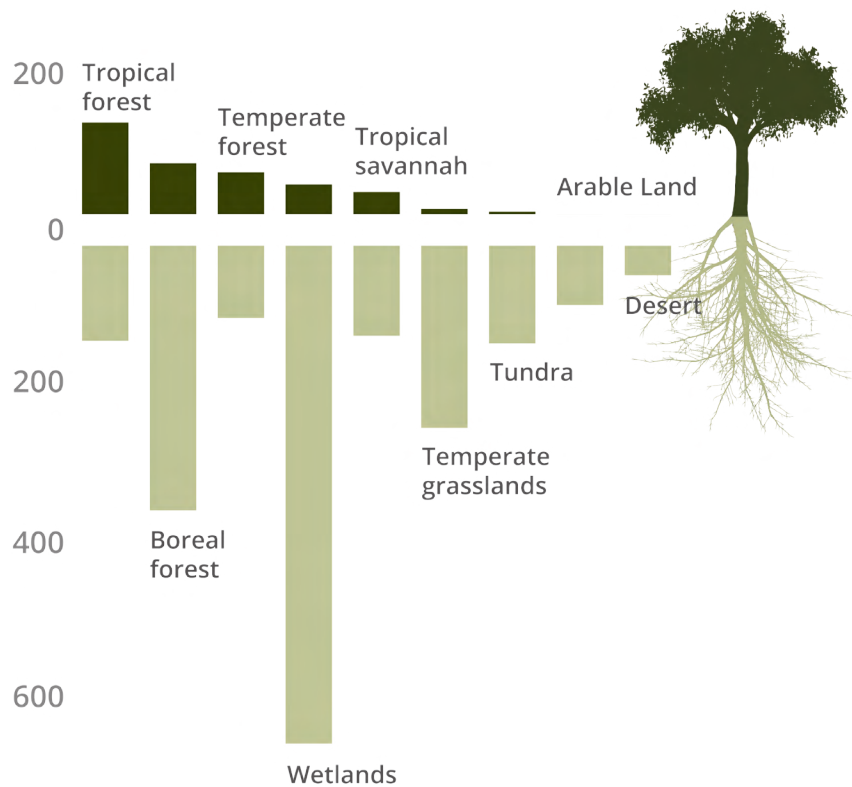
Carbon cycles through soil microbial ecosystem

Long-term storage in soil matrix (aggregates and on mineral surfaces)

LEAVE YOUR LEAVES

Keeping soil covered by planting dense ground layers is important to retain both water and carbon in the soil. You can also use natural mulch, such as compost or leaves, which breaks down slowly, feeding microorganisms including mycorrhizae, which are the beneficial fungi associated with plant roots that are responsible for 50%-75% of the carbon stored in soil. If the mulch is left in place from year to year, soil is conserved, plants are supplied with nutrients, and carbon stays safely stored (sequestered) underground.

CO₂ storage: Flora overvalued, soils undervalued



Average stored carbon in tons per hectare at a ground depth of one meter

Source: World Climate Council (IPCC)



GIVE YOUR SOIL – AND YOURSELF – A REST

When soil is disturbed, carbon is released. Farmers use no-till methods to keep carbon in the soil. You can use no-till methods, too! If much of your garden is devoted to permanent plantings of native trees, shrubs, and perennials, you're already practicing a form of no-till horticulture.



CULTIVATED SOILS HAVE LOST 50%-70% OF THEIR ORIGINAL CARBON STOCK, MUCH OF IT OXIDIZED UPON EXPOSURE TO AIR TO BECOME CO₂.

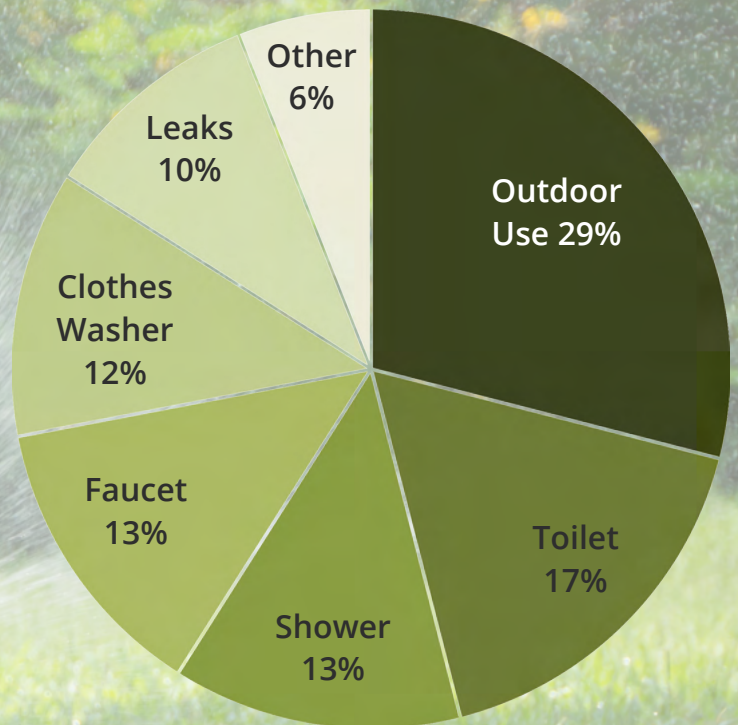
USE WATER WISELY

Of the estimated 29 billion gallons of water used daily by households in the US, more than 8.5 billion, or 30%, is devoted to outdoor water use. In dry climates, a household's outdoor water use can be as high as 60%! The majority

of this is used for landscaping. Native plants are a water-wise solution. Once established, native plants selected for your climate and soil type require little water other than normal rainfall.



How much water do we use outdoors?



Source: DeOreo et al., 2016
and Dieter, et al., 2015

AVOID RUNOFF

Too much rain can be as big a problem as too little. When rain falls too fast or for too long, runoff carries trash, bacteria, heavy metals, and other pollutants like gasoline, oil and even asbestos from roadways through storm sewers into local waterways. Flooding can also erode shorelines, stream beds and river banks. Stop

runoff using “green infrastructure.” Plant rain gardens (shallow sunken areas with plants), shrubs, and trees to hold and absorb water. You can also address runoff using permeable paving and collect rainwater using rain barrels, cisterns and other capture systems as state and local water laws allow.



Photo Credit: John Magee

DON'T BE TOXIC

Native plants are adapted to local soils and climatic conditions and they rarely require the addition of fertilizers. That's good news because synthetic fertilizers disrupt the relationship between soil microorganisms and plants, speeding up the release of carbon into

the atmosphere—and the runoff from fertilizers and pesticides pollutes our waterways. Emissions from manufacturing and shipping fertilizers and pesticides make them a triple threat.



REDUCE RISKS FROM FIRE

Heat and drought will increase the risk of wildfires as much as 57% by the end of the century, according to a recent UN report. Invasives increase fire risks. But native plants can reduce both risk and damage from wildfires. Fire-resistant landscaping emphasizes low-growing, deep-rooted, moisture retaining

plants. Plant trees and shrubs away from buildings. Hardwood trees (maple, poplar, cherry) are less flammable than conifers. Live oaks in the fire climax communities of the west block flying embers from wildfires and form a good buffer against fire for buildings.



NATIVE GARDEN DESIGNS

Wild Ones publishes free, professional garden designs for the public that are achievable for gardeners of all skillsets in terms of scope and budget. Each design includes a digital plant list featuring color photos of each native plant incorporated in the design. The design PDFs and accompanying plant lists are easy to

print for quick reference while selecting plants at a local native plant nursery and planning a yard layout. To see a growing list of native garden design plans for regions in the United States, as well as a list of nurseries that Wild Ones partners with, visit nativegardendesigns.wildones.org.




JOIN WILD ONES

Connecting with the native plant community through a Wild Ones chapter in your area can prove invaluable on your native garden journey.

Wild Ones is a non-profit organization that provides educational resources and online learning opportunities with respected experts

like Wild Ones Honorary Directors Neil Diboll, Heather Holm, Doug Tallamy and Larry Weaner. Wild Ones also publishes a quarterly *Journal* and awards Lorrie Otto Seeds for Education Program grants to engage youth in caring for native gardens. To learn more and become a Wild Ones member, visit: wildones.org.



CLIMATE CHANGE IS A BIG ISSUE. BUT GIVEN THAT THERE ARE MORE THAN 135 MILLION ACRES OF RESIDENTIAL LAND IN THE US, OUR NATIVE GARDENS CAN MAKE A BIG, BEAUTIFUL DIFFERENCE!

Photo Credit: Lisa Olsen



"Healing the Earth, one yard at a time."

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