



**OUTDOOR POWER EQUIPMENT
INSTITUTE**

LIVING LANDSCAPES MATTER

Fact Book

Why living landscapes are important

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LivingLandscapesMatter.com



LIVING LANDSCAPES MATTER

Living landscapes have become the scapegoat for drought and unwise water use in drought-stressed areas like California, Georgia and the Northeast. Some are asking: what are lawns and landscapes good for anyway, besides taking water? *Plenty.*

Grass, trees, shrubs and flowering plants comprise a balanced, living landscape that can provide valuable wildlife habitat and a safe place for kids and pets to play. Living landscapes are also critical to the health and well-being of people. Living Landscapes

- produce oxygen,
- absorb carbon to combat the greenhouse gas effect,
- reduce heat islands (and temperatures),
- capture and filter rainwater,
- prevent soil erosion, and
- capture dust and particulate matter.

And, if that's not enough, numerous scientific studies have shown that being exposed to green space improves memory, lowers stress and anxiety, and in general makes people happier.

We don't live in a wild environment. We live in a man-made environment.

We must have green space to offset the miles of concrete, buildings and roadways in our communities. Good environmental stewardship starts with making wise choices about green space, not having less of it. Yet, governments continue to seek a one-size-fits-all approach to managed landscapes. Even in California – with its very real, detrimental drought – officials didn't take into consideration that Northern California's climate zone is very different from Southern California's. Instead, too many local governments paid homeowners across the state to rip out their lawns – converting them to decomposed granite, mulch, rocks or artificial turf. Los Angeles stopped allowing artificial turf in its turf removal program as of September 2016¹, but not before 46 million square feet of grass was removed from residential and commercial properties in the city.

Drought and lack of information are making communities across the country unfairly label grass, in particular, a water-guzzling "luxury." Drought-stressed communities must understand the perils of knee-jerk responses to water restrictions, as well as the environmental and societal benefits of maintaining water-wise, living landscapes.

The enclosed third-party facts and figures are provided for your research and reporting. Kris Kiser, president and CEO of the Outdoor Power Equipment Institute (OPEI), spent time in California in 2015 and 2016 and has seen first-hand "yard conversions gone bad." Mr. Kiser is available to share what he's seen in drought-stressed communities, including how some families regret ripping out their living landscapes.

For more information visit: LivingLandscapesMatter.com



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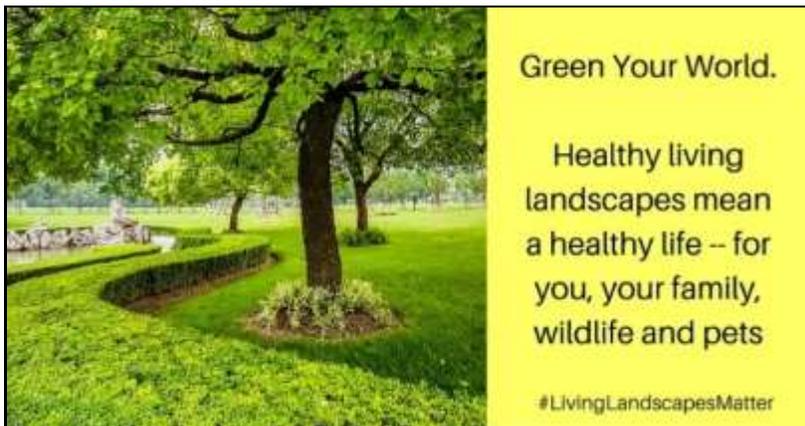


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Saving the Planet One Yard at a Time

Even in a drought, you can have a living landscape.

You just need to have the *right* lawn and landscape.

- **Remember nature starts at your backdoor.** Your yard, our parks, schoolyards and other community green space are vital to the world's ecosystem.
- **Choose the appropriate living landscapes.** Find your plant hardiness zone on the [USDA Plant Hardiness Zone Map](#) to determine what types of turf, trees, shrubs and plants will thrive in your location. Remember, one size does not fit all when it comes to living landscapes.
- **Get educated.** According a recent survey conducted by the National Association of Landscape Professionals,² 74% of Americans believe they know how to care for their lawn each season and 68% are confident in their lawn care knowledge. But 64% of respondents falsely believe all grass needs to be fertilized in the spring, and 57% falsely believe if a lawn is not green it is not healthy. Nearly 1/3 of respondents admitted they aren't sure how often a lawn should be watered. If you choose to maintain your lawn yourself, do the research. Or, ask a professional to ensure the right approach.
- **Mix native plants with adaptive plants and grasses.** We don't live in a native environment – most people today live in man-made cities and suburbs where we must incorporate plants into an area with a lot of concrete, asphalt, people and traffic. You need both native plants and drought-resistant adaptive species that can survive these conditions.
- **Incorporate pollinator plants** for bees, butterflies and hummingbirds.
- **Plant to slow and capture water.** Water sheets off hard surfaces, asphalt and other hardscapes in cities and suburbs. Grass and plants slow down and capture this water, recharging underground aquifers.
- **Select the right grass.** Hundreds of varieties of turfgrass exist, and some of them are perfect for drought conditions. For instance, established Buffalo and Bermuda grasses require very little water.
- **Plant grasses that are traffic-ready.** Buffalo and Bermuda grasses are just two species that are drought-tolerant options that also will survive foot traffic, children's play and pets.
- **Water wisely.** Only water your yard when it is necessary. Install watering solutions – like smart controllers on irrigation systems – that help you use less water, but still ensure a living landscape.
- **Understand too much water is bad for grass.** Over-watered grass sends its roots horizontally, making it lazy. With just a little water, grass will send its roots deeper – vertically – seeking water. Working harder makes grass do a better job of sequestering carbon and releasing oxygen.
- **Know that brown is okay.** In drought-challenged areas, we must get out of the mindset that all plants must stay green all the time. Grass will turn brown when it goes dormant, but it's not dead. Grass is resilient and will green up again when rains return.
- **Save your clippings!** Grass clippings contain 80-85 percent water and decompose quickly.³





CALIFORNIA CASE STUDY

Water restrictions and policies to remove landscaping were imposed in California, but their effectiveness is now questioned.

- Research shows the California drought could last hundreds of years, creating an aridity that is the “new normal.”⁴
- California imposed mandatory water restrictions in June 2015. It has since been determined that landscape water use accounts for only 9% of total statewide water use.⁵ Lawns are estimated to use only a portion of that 9% (40%-60%), or just 3.5%-5% of total statewide water use in California.⁶
- The Metropolitan Water District (MWD) spent \$340 million on its turf rebate program⁷. As of March 2015, nearly 5,000 households had participated in the program and replaced, on average, 1,600 square feet of turf.⁸
- An MWD internal audit showed the agency did a “less than satisfactory” job administering the program because of “inadequate planning, execution and follow-up.”⁹
- One key mistake Los Angeles (L.A.) made was including artificial turf in a rebate program that paid homeowners to rip out their lawns. L.A.’s Turf Removal Program was modified in September 2016 to exclude artificial turf because fake grass causes runoff, sending water to sewer drains instead of to underground aquifers.¹⁰ L.A.’s Department of Water & Power now focuses on capturing and getting rainwater into the ground and planting drought-tolerant plants that will use it wisely.
- As part of a settlement with local environmental groups, L.A. County will spend \$4 million to stop storm water runoff from reaching beaches and the ocean. One of the mitigation tactics includes planting new landscaping.¹¹
- If every lawn in L.A. were removed, daytime temperatures would rise 1.3°F because of lost irrigation and the fact that lawns act like air conditioners for the city, especially with climate change.¹²
- A recent study suggests California could save up to 14 million acre-feet of untapped water – more than all of California’s cities use in one year – by aggressively implementing water-saving practices to reuse water and capture lost storm water.¹³
- Extreme heat is expected to have a negative effect on poor communities in L.A., which lack green space and where residents are less likely to have air conditioning or access to transportation to go somewhere cooler.¹⁴
- A Houzz study, concluded nearly half of respondents are reducing or removing their lawns to deal with water shortages. Those doing so are in the West and are replacing their lawns with hardscape, ground cover, mulch and more. The study found fewer people are installing synthetic lawns than in the previous survey year, down from 8% to 6%.¹⁵



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HEAT ISLANDS

Turfgrass dissipates the heat island effect in urban areas.

- According to the Environmental Protection Agency (EPA), on a hot, sunny summer day, roof and pavement surface temperatures can be 50–90°F hotter than the air.¹⁶
- Called the “heat island effect,” air temperatures in cities, even after sunset, can be as much as 22°F warmer than air in neighboring regions.¹⁷
- Turfgrasses dissipate radiant heat through a process called evapotranspiration. Planting vegetation and grass, or installing green roofs, are among the strategies the EPA recommends to mitigate the heat island effect.¹⁸
- There is a direct relationship between surface temperature and the cooling effect provided by turfgrass. In one research study of surface temperatures, from 7 a.m. to 7 p.m., natural turf had the lowest average temperature of 78°. Concrete and bare soil had average temperatures in the mid-90s. Asphalt had an average temperature of 98° and artificial turf (also known as plastic grass) came in at a scorching 117°!¹⁹
- Lawns can be 31 degrees cooler than asphalt and 20 degrees cooler than bare soil.²⁰
- Research has found that L.A. has the highest urban heat island effect in California.²¹
- Experts note that the temperature benefit linked to turfgrass is especially important in California, the second-most urbanized state in the U.S., where temperatures have been increasing since 1940.²²
- Eight average-sized front lawns can provide the cooling equivalent to air-conditioning for 18 homes.²³



AIR QUALITY

Turfgrass improves air quality.

- California already has the worst air quality in the nation.²⁴
- Research has shown that turfgrasses remove "atmospheric pollutants such as carbon dioxide, ozone, hydrogen fluoride and perosyzacetyte nitrate from the air."²⁵
- Grass also plays a vital role in capturing dust, smoke particles²⁶ and other pollutants that harm people.²⁷
- Without the oxygen-producing boost that plants such as grass, trees and shrubs offer, air quality levels will get even worse in drought-stressed areas that have programs promoting the removal of living landscapes.

OXYGEN PRODUCTION

Our living landscapes are incredible oxygen-making machines.

- A 25-square foot area of turf supplies enough oxygen to support one person for a day.²⁸
- A turf area 50' x 50' produces enough oxygen to meet the daily needs of a family of four.²⁹
- Two mature trees provide enough oxygen for one person to breathe over the course of a year.³⁰
- A 100-foot tree, 18" diameter at its base, produces 6,000 pounds of oxygen.³¹
- In L.A. alone, trees remove nearly 2,000 tons of air pollution each year.³²



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CARBON SEQUESTRATION

Turfgrass is a carbon sink.

- Carbon sinks absorb the greenhouse gas carbon dioxide from the atmosphere. Plants absorb carbon dioxide from the atmosphere to use in photosynthesis. Some of this carbon is transferred to soil as plants die and decompose.³³
- The dense canopy and fibrous root system in a lawn sequesters carbon so well that it outweighs the carbon used for maintaining the grass by as much as seven-fold.³⁴
- Grasses remove about six tons of carbon dioxide per acre per year from the atmosphere.³⁵
- Scientists have found that recycling grass clippings on lawns (or grasscycling) will sequester even more carbon.³⁶
- An average-sized home lawn in the United States has the potential to sequester 20.3 to 163.4 kg C/lawn/year.³⁷
- Strategies for reducing water use that alter urban land cover can result in significant atmospheric responses that must be considered to ensure efforts to mitigate climate warming are not reversed.³⁸



NOISE POLLUTION

Living plants helps control noise pollution.

- The World Health Organization (WHO) concluded that noise pollution is a threat to our wellbeing.³⁹
- The average community noise level is four times higher than it was 20 years ago.
- Grassy areas absorb noise, which cut down on excessive sound, a growing problem in urban areas, where hardscape and pavement reverberates sound.
- Grassy slopes alongside lowered expressways reduce noise 8-10 decibels.⁴⁰
- Scientists found that green roofs have the highest potential to enhance quietness in courtyards and may be able to reduce noise by up to 7.5 decibels.⁴¹



RAINWATER HARVESTING & STORMWATER RUNOFF

Living landscaping captures and filters rainwater, reducing runoff and allowing precious rainwater to recharge underground aquifers.

- Rain water “sheets off” hard surfaces, like hardscapes, artificial turf, parking lots, driveways and roads. Instead of going into the ground, rain water becomes fast-moving storm water runoff, which pollutes water.
- Grassy areas mitigate storm water runoff. Acting like a sponge, grass slows down and absorbs runoff, cleanses water of impurities and dust, and recharges groundwater aquifers.
- The biology of turfgrass makes lawns a nearly ideal medium for the biodegradation of all sorts of environmental contamination.⁴² Research has shown that turfgrasses are excellent at filtering excess nutrients and sediment.⁴³
- The grass filtration system is so effective that rain water filtered through a healthy lawn is often as much as 10 times less acidic than water running off a hard surface.⁴⁴
- Turfgrasses can remediate contaminated soil by cleaning it; grasses are more effective at cleansing contaminated soil than trees or shrubs.⁴⁵
- Replacement of turf with other vegetation will not provide the cleansing capabilities of grass.⁴⁶
- Per the American Society of Landscape Architects, “green infrastructure” can help protect communities from natural disasters, including drought.⁴⁷



SOIL EROSION

Plants control soil erosion.

- Grass helps control erosion by slowing down water runoff. Water running off a sodded area will take 28-46 times longer than if the water was on five popular erosion-control materials. Grass slows down the water runoff; thus, less soil erodes.⁴⁸
- Turfgrass controls erosion through its natural, dense and fibrous root system, which holds soil in place.⁴⁹
- Tests show that a dense lawn is 6 times more effective than a wheat field and 4 times better than a hayfield at absorbing rainfall.⁵⁰
- Sediment losses from sodded areas are 8 to 15 times less than for tested man-made erosion control materials and 10 times less than for a straw covered area.



FIRE BREAK

Turfgrass is a natural and effective fire break.

- 1.8 million homes across 13 Western states are at "extreme or high risk" of damage from wildfires, and the cost to repair them is estimated at \$500 billion. 27 million additional properties in those states face some risk of damage and would cost about \$6.7 trillion to repair⁵¹.
- Living grass is the best natural fire break. Healthy turfgrass can be a significant deterrent to wildfires and can help protect property.⁵²
- Green grass retards the spread of wildfires because of its low fuel value, and it provides a defensible space around structures where firefighters can work effectively.⁵³



PLASTIC GRASS, ARTIFICIAL OR SYNTHETIC TURF

**Plastic grass is an environmental villain
and does not provide habitat or support biodiversity.**

- Putting plastic propylene sheets in place of a living lawn destroys urban habitat for birds, insects and animals. It is, in essence, plastic grass.
- Plastic grass – a petroleum product – is not more environmentally friendly than real grass.
- Plastic grass does not last forever and much of it is non-recyclable. Many recycling service providers will not accept artificial turf. The Association of Synthetic Grass Installers has said that surface fibers can be cut away from the backing and recycled, but the backing itself cannot be recycled.⁵⁴
- Plastic grass is hot. A 2002 Brigham Young University study revealed that synthetic-turf surface temperatures were 37 degrees higher than asphalt and 86 degrees hotter than natural turf.⁵⁵ A 2012 Penn State study found it not uncommon for temperatures to surpass 150 degrees and can reach up to 200 degrees.⁵⁶
- Plastic grass may not "use" water to sustain itself, but it must be cooled with water and washed off with water to remove dust, dirt and pet waste. The runoff of the dirty and unsanitary water contributes to water pollution. The L.A. Department of Water & Power attracted negative attention in September 2016 when it was discovered to be using water to clean artificial turf once a week to remove dog waste.⁵⁷



BIODIVERSITY & WILDLIFE

Living landscapes support biodiversity and wildlife.

- Urban environments are largely responsible for the loss of biodiversity. Increasing natural habits for birds, insects and other animals with living landscapes can help combat this problem.⁵⁸
- Your yard, our parks, schoolyards and other community green space are vital to the world's ecosystem. Nature starts in your own backyard.
- Grass, trees and shrubs and other plant life provide food and habitat for birds and small mammals⁵⁹. Insects, spiders and worms live among the grass blades and below the surface in the turf.
- Xeriscaping or hardscaping forces birds, squirrels and other animals to forage for food elsewhere. If we eliminate living landscapes from urban and suburban life, birds and wildlife will lose their habitat.
- The drought is negatively impacting many species who rely on green space for food and shelter. Small mammals are more likely to be impacted than large mammals that can simply move elsewhere to find food, water and shelter.⁶⁰

DROUGHT & TREES

In times of drought trees need water, too.

- People who stop water lawns also do not water their trees, leading them to dry out and become vulnerable to disease and pests. Losing mature trees not only hurts the urban ecosystem and wildlife diversity, it also can cause local temperatures to rise and home values to drop.⁶¹
- A staggering 102 million trees have died in California because of drought.⁶² The dead trees cause a very real fire threat.⁶³
- Letting landscapes go dry greatly impact trees, leading to dropping branches. Dying trees can cause significant property damage and possible injury to people or death.⁶⁴
- Tree roots go where the water is, so those planted in lawns tend to develop a system close to the surface. If your tree has been competing with grass for sprinkler water and then you stop watering the lawn because of drought, you'll likely need to drip irrigate.⁶⁵



OUTDOORS & PLAY SPACE

Grass provides a safe place for children and pets to play.

- An outdoor play area provides a safe place for children and pets to play, while providing an outdoor living area for the entire family to enjoy.
- Outdoor play increases fitness levels and builds active, healthy bodies, an important strategy in helping the 1 in 3 American kids who are obese get fit.⁶⁶
- Research shows that children reap numerous health, social and personal benefits from spending time outside playing.⁶⁷
- Combined, trees and grass foster activities such as recreation, which is important for child development.⁶⁸

LIVING LANDSCAPES & CHILDREN'S HEALTH

Exposure to greenspace benefits children in several ways.

- Exposure to natural settings may be widely effective in reducing ADHD symptoms.⁶⁹
- Children's stress levels fall within minutes of seeing green spaces.⁷⁰
- Children gain attention and working memory benefits when they are exposed to greenery.⁷¹
- Researchers found that Barcelona school children who had more exposure to the outdoors performed better on cognitive testing. The effect was greatest when both home and school environments provided "green" time.⁷²



OUTDOOR SPACES & OVERALL WELL-BEING

Living landscapes are a key part of the outdoor lifestyle that Americans enjoy.

- A systematic research review concluded that “the balance of evidence indicates conclusively that knowing and experiencing nature makes us generally happier, healthier people.”⁷³
- Researchers in England found that people moving to greener areas experienced an immediate improvement in mental health that was sustained for at least 3 years after they moved. The study also showed that people relocating to a more built-up area suffered a drop in mental health.⁷⁴
- People who live within a half mile of green space were found to have a lower incidence of 15 diseases by Dutch researchers — including depression, anxiety, heart disease, diabetes, asthma and migraines.
- A 2015 study found that people living on streets with more trees had a boost in heart and metabolic health.⁷⁵
- Studies show that tasks performed while under the calming influence of nature are performed better and with greater accuracy, yielding a higher quality result. Spending time in gardens can improve memory performance and attention span by 20 percent.⁷⁶
- People who gardened for at least 30 minutes a week had lower body mass indexes (BMIs) – a measure of body fat – as well as higher levels of self-esteem and better moods overall. They also reported lower levels of tension and stress.⁷⁷
- Mycobacterium vaccae in soil mirrors the effect on neurons that drugs like Prozac provide. The bacterium stimulates serotonin production, which makes you relaxed and happier.⁷⁸
- Walking or running in green spaces, instead of synthetic environments, led to decreased anger, fatigue and feelings of depression, while increasing attention levels.⁷⁹



FINANCIAL BENEFITS OF LIVING LANDSCAPES

Green spaces offer financial paybacks by reducing energy costs and increasing property values.

- Cost/benefit analyses show that landscaped plants are worth the investment in resources, especially water. Selecting drought resistant plants, coupled with proper management and irrigation, allows lawns and landscapes to flourish while still saving water.⁸⁰
- Living landscapes are good for property values. A beautiful landscape improves curb appeal and can increase home values by as much as 17%⁸¹.
- Each front yard tree adds 1% to a homeowner's sale price, while large specimen trees can add 10% to property values⁸².
- According to the Urban Forest Coalition, 100 million mature trees around U.S. residences save approximately \$2 billion annually in reduced energy costs⁸³.
- Strategically placed trees save up to 56% on annual air conditioning costs. In the wintertime, evergreens that block winter winds can save 3% on heating.⁸⁴
- In tree-lined commercial districts, people shop more frequently, take longer shopping trips, and are willing to spend 12% more for goods⁸⁵.
- According to a British study of people who exercise in nature, outdoor exercise delivers an estimated £2.2bn of health benefits to adults in England each year⁸⁶.
- Consumers can use the National Tree Benefit Calculator (TreeBenefits.com/calculator/) to estimate the economic and environmental value trees provide on an annual basis.

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