



# Saving Natural Areas in Cities

**TREE CITY USA®  
BULLETIN**

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*Natural areas in cities may sound like a contradiction of terms. However, joining the two is as essential to the quality of life in urban areas as playgrounds, bike paths, swimming pools, or other components in the fabric of a community.*

Henry David Thoreau once wrote, “A town is saved, not more by the righteous men (and women) in it than by the woods and swamps that surround it. A township where one primitive forest waves above while another primitive forest rots below — such a town is fitted to raise not only corn and potatoes, but poets and philosophers for the coming ages.”

Philosophy aside, wooded areas in and around our communities offer recreation, health benefits, a refuge for wildlife, and myriad environmental services. Whether they are small parcels on scraps of unbuildable land or large forested areas such as Bellevue’s Urban Forest near Seattle, their importance is immense — and too often undervalued.

Like Thoreau, landscape architect Frederick Law Olmsted understood the value of nature in the city. He incorporated touches of a rural environment into his design of New York’s Central Park and other projects he pioneered throughout

the United States. Early in the 20th century there were even “scenic cemeteries” and a nationwide Nature Study Movement. More recently, the focus on nature in our cities has taken a back seat to other important needs and issues. But that is changing.

A notable call to action was Richard Louv’s 2005 book, *Last Child in the Woods*. He reawakened the nation to the importance of introducing children to nature in an urbanizing world. Today, a new movement is taking place that champions the cause of protecting and managing the remnants of nature in our urban areas. In 2017, New York City’s Natural Areas Conservancy initiated the Forest in Cities program to promote and advance healthy forested natural areas in cities across America. Central to this effort is science, management practices, partnerships, and communication. The program has created a coalition of scientists, local governments, and academic institutions to address the needs of natural areas in urbanized areas.

In this issue of the bulletin, you will see some of the results from this work and, hopefully, be inspired as a tree board or an individual to champion the natural areas in your community.



A new emphasis is needed to save or enhance the remaining natural areas in America’s communities of all sizes. A fringe of woodlands along this waterway in Austin, Texas, provides numerous environmental and social benefits.

# Where Are Natural Areas?

Natural woodlands are found in communities of all sizes. Just across the Potomac from our nation's teeming capital, 43 acres of verdant forest can be found in Alexandria, Virginia. In little Nebraska City, Nebraska, ancient oaks and tenacious berry bushes grace the edges of Table Creek, much as they did when Arbor Day was first celebrated there in 1872. Tracts of woods can be found almost everywhere, occupying the land so unobtrusively they are too often virtually ignored and taken for granted.

In your community, look for natural areas in places like these:

- **MUNICIPAL, COUNTY, AND REGIONAL PARKS.** These are the most common locations of community natural areas.
- **RAVINES AND STEEP SLOPES.** Trees and understory vegetation on these sites are often protected by virtue of difficult terrain. In turn, they hold soil in place and protect waterways from siltation.
- **BUFFERS.** These are usually found around zoos, industrial sites, and other large public or private facilities.
- **ARBORETUMS.** Managers who value native vegetation as well as exotic trees will make an effort to grow both.
- **PAPER STREETS.** These are publicly owned easements marked out on maps for possible use as streets in the future.
- **EDGES OF RIVERS AND CREEKS.** A plant community here is called riparian habitat and often contains a unique assemblage of life.

- **WETLANDS.** These include estuaries, marshes, and swamps.
- **ABANDONED INDUSTRIAL SITES.** Vegetation quickly reclaims the site, particularly along rivers.
- **RESIDENTIAL PROPERTY.** Old estates slated for subdivision and new areas planned on former farmland are particularly rich in woods.
- **GOLF COURSES.** Older courses are often fringed or divided with woodlands. In Ocean City, Maryland, when a new golf course was developed, the owners saved 90 acres of woods and wetlands on a 200-acre site. Their goal was to demonstrate environmental responsibility, and their reward has been booming business from golfers who appreciate the beauty and serenity of the natural scene.
- **SCHOOL PROPERTY.** In some cases, innovative teachers convert the woodlands on their own grounds into marvelous outdoor laboratories.
- **GREENWAYS.** Flood plains, old railroad beds, and utility rights-of-way offer recreational pathways, often adjacent to natural strips of vegetation. In China, "bamboo beltways" are planned to link panda preserves; in the United States, greenways could just as easily link communities.
- **LANDFILLS.** With the passage of time, the waste piles of humanity can support rich areas of vegetation. Near Toronto, excavated materials dumped at the edge of Lake Ontario became so natural-looking that there was an outcry from citizens when development was suggested for waterfront recreation.



Small parcels of the wild can be found in most communities. Some, like the famous river banks of Niagara, are an integral part of the community's visual identity. Others are more easily overlooked but are just as important.

# Important Benefits



*Frederick Law Olmstead said the benefits of nature “touch us so quietly that we are hardly conscious of them.” He believed these benefits were “too complex, subtle, and spiritual” to be studied. Today, scientists are confirming what were once only intuitive observations, and they are providing the value of natural areas in our cities. Here are a few of the benefits, separated into categories, although all are interrelated.*

## ENVIRONMENTAL

The concentration of trees of varying ages in a natural area make them increasingly important as “carbon sinks.” In a carbon sink, more atmospheric carbon is sequestered than released. Healthy trees, as well as the soil in a natural area, do this and make important contributions to countering climate change. For example, in New York City, natural area forests make up 25% of the total tree canopy, but account for the majority of carbon stored by the city’s trees. In addition, natural areas cool and freshen the air. On steep slopes, roots anchor the soil, helping to prevent landslides and keep waterways clean.

Remnants of the natural environment serve as lifelines for mammals and many birds — from warblers or other migrating species that need woods for rest and food to cavity-nesters that need year-around homes. Whether for plants or animals, natural areas are the final refuge that can ensure biodiversity. They are a way we can share this planet and sustain life in all its forms.

## SOCIAL

Natural areas provide an aesthetic backdrop in any community or housing development. They make neighborhoods more livable and nearby property more valued. They buffer highway noise and provide opportunities for social interaction during bird watching activities or volunteer maintenance projects.

## PERSONAL

Scientific literature is now rife with research results showing how trees and natural areas improve, restore, or maintain mental and physical health. For children, getting outdoors and acquainted with nature provides the kind of pleasant memories that lead to adult attitudes and actions supportive of environmental stewardship. For old and young alike, walks in the woods and fresh air can reduce health problems and even extend life.

Stress reduction seems to be the key to the health benefits. In a publication of *The Coalition for Education in the Outdoors*, Denise Mitten offered this list of benefits from spending time in natural settings:

- Attention restoration
- Improved mood states
- Reduction of depression
- Reduction of anger and anxiety
- Enhanced feelings of pleasure
- Increased mental acuity
- Reduced mental fatigue
- Improved problem-solving ability
- Improved concentration
- Improved body image
- Increased feelings of empowerment
- Encouragement of nurturing characteristics
- Decreased risk of seasonal affective disorder (SAD)
- Mitigation of the impact of dementia

# Managing Natural Areas

*It may seem incongruous to suggest management for something that is considered natural. But whether a large western wilderness area or a small patch of woods in the city, their very existence is the result of human decisions. Beyond that, what happens in and to them depends on conscientious planning and management actions. Here are some of the ways management can be used to maintain or upgrade natural areas.*

## ASSESS

As in all urban forestry work, the first step is to know what you have and in what condition. Mapping existing natural areas may be necessary in larger communities. But whether large and scattered, or only one or a few, an evaluation should be made of issues such as native and non-native species, invasive species, crowding, soil erosion, tree conditions, and current uses. Gaining political support and the appreciation of residents are also important.

## PLAN

Based on assessment data and resulting priority needs, concise long-range and shorter-term action plans should be developed, put in writing, and approved. Of course, who is responsible and has authority depends on local government structures. For example, it may be the parks department, the tree board, or some combination. For maximum effectiveness, planning should also include partnerships with neighborhood groups or other volunteer organizations.

## DO THE WORK

Each natural area is different and has different management needs. Here are some of the more common practices used to restore, manage, and protect urban natural areas.

### Invasive Species Removal

Because of earlier cutting and neglect, most urban natural areas are plagued with invasive species. Removal is never an easy undertaking, and methods will depend on local conditions. Techniques include hand-pulling, spraying, use of grazing goats, and controlled fires. Expert advice is essential.



Volunteers with Maryland's Friends of Sligo Creek remove invasive species.

## HOW NATIVE AND NON-NATIVE SPECIES FILL OPEN SPACES

### NATIVE COLONIZERS

#### First Generation

Example: Wild cherries

- Sun-loving, shade-intolerant
- Short-lived
- Allow a diverse mix of other native species

#### Next Generation

Shade-tolerant natives, such as oaks or sugar maple



### INVASIVE WEED\* SPECIES

#### First Generation

Example: Norway maple

- Sun-loving and shade-tolerant
- Longer-lived
- High numbers of seeds with high rate of germination; a dense monoculture is formed

#### Next Generation

More Norway maples



\* A weed is any plant in the wrong place.

### Protection from Soil Compaction

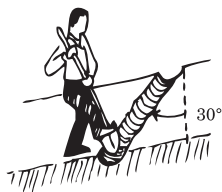
Some natural areas get “loved to death.” Public use at attractive sites often results in soil compaction. Remedies include:

- Redesign facilities and roads or trails to avoid fragile sites. Dense plantings can also help.
- Direct pedestrian travel.
- Move picnic facilities away from shorelines and stream banks.
- Aerate and mulch around native trees near heavy-use sites.
- Close sites on a rotating basis for rest and restoration. Always use an interpretive sign to explain closures and rehabilitation sites.
- Consider restricting motor vehicles and bicycles.

### Erosion Control

Planting disturbed sites on hillsides and plugging eroding gullies with discarded Christmas trees are worthwhile projects. Water bars on trails are important devices that divert rain runoff before water can gain enough volume and speed to cause erosion. Here is a way to install effective water bars that stay in place.

1. **DIG A TRENCH** across path at 30-degree angle.



2. **PLACE LOG** or waste lumber in trench, extending it beyond the path in both directions.



3. **PLACE ROCKS** and/or stakes on downhill side.



4. **FILL IN ANY SPACE** in trench so finished cross section looks like this.



### Thinning and Planting

Forest stand improvement methods that are part of traditional forestry can be modified and used to improve stand conditions in urban natural areas. The most common needs are thinning overly dense sites and planting native species in understocked areas. Under the guidance of experts, the best spacing of trees can be determined. Local wildlife needs should be considered when selecting tree or shrub species. Leaving some dead trees (snags), where they do not present a hazard to visitors, is important for woodpeckers and other animals that need deteriorating trees and cavities.

### Monitor

Observations and measurements in plots or other methods of monitoring change should be part of any plan and work schedule. Annual monitoring will reveal the success of restoration projects or the need for more work, such as invasive species removal or replanting.

### Public Safety

Crimes and dumping are often issues surrounding natural areas. Some deterrents include:

- Increased patrols by law enforcement personnel.
- Patrols by volunteers (with clear identification, such as vests and hats).
- Appropriate signage.
- Fencing in some cases or specific areas.
- Dusk to dawn closures.

### Educate

Natural areas cannot survive without local support. Gaining such support depends on residents being aware of the benefits provided by wooded areas, understanding how they function ecologically — or *should* function — being assured of visitor safety, and knowing how they can help. Some ways of gaining this support include:

- Programs in local schools, churches, youth organizations, service clubs, and others.
- Arbor Day celebrations and accompanying media publicity.
- Inviting media representatives on private tours.
- Interpretive signs and materials.

“

WE CAN'T RESPECT WHAT  
WE DON'T UNDERSTAND.

—William A. McLean, Toronto and Region Conservation Authority

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# Communities in Action

*More than 100 cities responded to a nationwide survey conducted by New York City's Natural Areas Conservancy in partnership with The Trust for Public Land and the Yale School of Forestry and Environmental Studies. While some communities are neglecting the woods within their borders, the survey found that others are taking action and providing ideas and inspiration about what is possible.*



Estuaries are an important part of the natural areas in the vicinity of New York City.



Wooded parcels share the park with running and bicycling trails, a golf course, and other constructed features in St. Louis' popular Forest Park.

## A MODEL OF ASSESSMENT AND MONITORING — NEW YORK

It may surprise some readers, but New York City has 10,500 acres of forested natural areas and another 10,000 in wetlands and grasslands. In 1984, the Department of Parks and Recreation created a Natural Resources Group to manage these vast and valuable areas. One of the unit's first accomplishments was to map, inventory, and create a system of monitoring the wooded natural areas. They took a quantitative approach to understanding the condition of New York City's forests by examining the soil quality, species composition, tree health, and other features in more than 1,100 plots. They also established 250 permanent plots to gain a better understanding of long-term changes in the forests. These plots are used to help set goals and prioritize work projects, while rapid site measurements are used to direct work and understand its effectiveness.

## FORESTRY PRACTICES IN THE CITY — ST. LOUIS

St. Louis, Missouri, provides examples of a number of aggressive management practices intended to restore neglected or degraded wooded parcels scattered within 1,300-acre Forest Park, the sixth most visited urban park in the nation. The goal is ecological health, species diversity, soil stabilization, and public safety. With technical support and grant funds from the Missouri Department of Conservation, forest stand improvement methods include thinning to proper stocking levels, the introduction of natural openings, and planting native species. The removal of invasive species has, of course, been part of the projects, but the goal is to use the forestry practices to let nature control the invasives and reduce the need for recurring, short-term control methods.

Carefully designed prescribed fires have been another management tool. Public education and communication/cooperation with fire and police departments have been extremely important, and the fires have been successful in reducing dead material, improving soil nutrients, and providing a means for native species to out-compete invasive species.



Natural area management can help qualify for a Tree City USA Growth Award.

## A LINK TO CLIMATE CHANGE — HOUSTON

Houston's Parks & Recreation Department has shown how trees are one solution to adverse climate change through carbon storage and energy savings. Using Forest Service data, department personnel were able to link natural area creation and protection to the city's Climate Action Plan. The city's riparian zones were prioritized, and work was outlined in a Riparian Restoration Program. The planned work was shown to provide even more benefits through flood mitigation and reduction of water pollution. An example of the results is that 10 acres of previously mowed park land were planted to create forest habitat, and a total of 70 parks were identified as having areas adjacent to a bayou or tributary where a riparian buffer could be enhanced or created.

## RESTORATION OF A COTTONWOOD FLOOD PLAIN — BILLINGS

Billings, Montana, has evolved from a hub of railroad, agricultural, and mining activities to a major center of commerce, education, and medical services. With the change of demographics has come a demand for amenities. This, in turn, has led to what has been called "the rediscovery of the (Yellowstone) river as an ecological and recreational gem." When gravel pits and other industrial use of the riverside land were abandoned, Riverfront Park and the Montana Audubon Center were created. The park has been formally designated by the city as a natural area. Now, work is progressing to make the area a showcase of a riparian cottonwood forest functioning as naturally as possible. With help from students at nearby Rocky Mountain College, plots for monitoring are being established, invasive species are being removed, and interpretive materials are being developed. The goal is to make the restored natural areas in Riverfront Park the epicenter for research and an opportunity for the public to experience an intact, fully functioning riparian cottonwood forest ecosystem.

## NO WOODS ARE TOO SMALL — BALTIMORE

Katie Lautar, executive director of Baltimore Green Space, defines a wooded area as being more than 10,000 square feet. Baltimore has more than 1,000 such natural areas and 3.5-acre Springfield Woods is one of them. For a long time, this place was only a dumping area until a local resident, who used to play in the woods as a boy, spearheaded an effort to restore and preserve Springfield Woods. To gain attention to the site as something beneficial and enjoyable, a fundraising event was organized called "Monster of Springfield Woods Haunted Trail." With the help of Loyola University students dressed in scary costumes, a good time was apparently had by all. This, along with community cleanup events and invasive vine removal, has garnered public appreciation for this wooded parcel and similar areas in Baltimore's parklands and conservation areas.



The skyline of downtown Houston, Texas, from a bridge over the Buffalo Bayou within Eleanor Tinsley Park.



The restoration of Riverfront Park in Billings not only protects an area needed by cottonwood trees to function as a unique ecosystem, but it has also led to greater public appreciation of nature.



Students from Loyola University join with Friends of Springfield Woods to clean up trash and help restore the small, wooded area in Baltimore.

# Forging a National Perspective



Participants gather in a 2019 four-day “Forest in Cities National Workshop.” This event brought together urban forestry leaders from across the country to explore opportunities for collaboration and to strategize on ways that urban natural areas can be part of the climate solution.

With the creation of the Forest in Cities program, New York’s Natural Areas Conservancy confirmed there is national interest in forested natural areas and their management needs. Findings from the survey mentioned on page 6 can be summed up as follows:

- Forested urban natural areas are critical places to improve the quality of life for city residents, but these areas need management intervention to thrive and sustain.
- Invasive species removal is both the most commonly conducted management activity and the top challenge organizations face.
- The survey respondents collaborate locally, but less than half participate in a regional or national network.
- There are opportunities to strengthen connections with the fields of public health, urban planning, and climate resilience.

The Forests in Cities coalition has worked to generate knowledge about natural areas, raise awareness about their value, and build a community of practice through networking. In early 2020, this group documented the early impacts of COVID-19 on urban natural areas visitation and care in 12 U. S. cities. They found that 83% of the organizations noted an increase in visitation to natural areas. These special places were — and are — proved to be invaluable resources for millions of residents. They provide space for socially distanced activities and a way to reduce stress and improve moods.

Despite the importance of natural areas, the pandemic has added another layer of concerns for protection and management. The survey found:

- 72% of the organizations have had impacts on their budgets.
- 94% saw a decrease in volunteer events.
- Only 17% were confident in their organization having adequate funding in 2021.

## FOR MORE INFORMATION

For quick links to additional information about the content of this issue of the bulletin, including citations and authorship of material that is summarized, please visit [arborday.org/bulletins](http://arborday.org/bulletins).

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