

EPA REGION 7 HEADQUARTERS LANDSCAPE

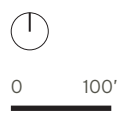


Lenexa Regional Office Facility Educational Material



EPA Native Grass-land Ecosystem Learning Center

Raingardens



RESTORATIVE NATIVE LANDSCAPING

LANDSCAPE

The landscape design for the EPA Region 7 Headquarters incorporates a restorative approach to the site. Many native species utilized throughout the 31-acre site minimize maintenance, fertilizer and water requirements while offering a painted landscape with year-round interest.

Throughout the site, landscape plant material including prairie grass stands, trees and shrubs, provide for natural views and create positive connections between the parking lots and building entrances.

A majority of the open areas within the property incorporate buffalograss (*Buchloe dactyloides*) as the low drought-tolerant lawn area. Buffalograss is the only grass native to North America that is used widely for turf. Fossils discovered in Kansas show that buffalograss existed in this region at least 7 million years ago and was the principle forage grass for the American bison, hence the name. Buffalograss is well adapted to the dry lands of the western prairies and plains, and in recent years new varieties have been developed to extend its natural area of adaptation. This low maintenance groundcover requires minimal water and mowing. As an established lawn area, it is only mowed twice per year.

Buffalograss grows best in full sun, but acceptable turf can be grown with 6-8 hours of direct sunlight per day. Buffalograss is one of the most drought and heat-tolerant turfgrass species. During extended dry periods without moisture, buffalograss goes dormant to avoid drought stress and will remain dormant until moisture is available again. This means buffalograss will still turn brown like any other turf during extreme drought but will require less coaxing to resume growth. Taller stands of native grass, such as side oats grama, little bluestem and prairie dropseed, add a rich and bio-diverse habitat as well as promote a sense of place to the employees and visitors.

The plant materials throughout the site are not irrigated with supplemental irrigation equipment. Temporary irrigation was originally included for areas near entrances, adjacent to the building, and within the exterior courtyards but has since been disconnected from the potable water supply.

Adjacent to the building on the east side are three exterior courtyards, each with a unique character, that extend the uses of the building outside into the natural environment. They all promote a relaxing outdoor environment with choices for retreat options, entertainment areas, or an extended work place for the users. Trees within the courtyards include a Ginkgo and Flowering Crabapple in the northern courtyard, Red Sunset Maple in the central courtyard and a line of bamboo in the southern courtyard creating a baffle between the walk and outdoor rooms/seating areas. Each courtyard includes sustainable design strategies and promotes a greater connection to the landscape surrounding the building. Views from the courtyards and building overlook the ponds, walking trail and business park beyond. Public spaces are connected to the adjacent public sidewalks and business park trail system.

Each courtyard incorporates at least one raingarden to filter runoff from the building roof prior to conveyance to the adjacent ponds. A large raingarden is located west of the main entry to the building, which collects runoff from the neighboring parking lots. The plant species attract butterflies, song birds and other living organisms.

EPA NATIVE GRASSLAND ECOSYSTEM LEARNING CENTER

“Our house on the prairie was like a little white ship at sea. Not a tree, not a bush to be seen; just an endless tall grass that billowed in the wind like the waves of an ocean.”

From Brett Harvey's My Prairie Year: Based on the Diary of Elenore Plaisted.

When the first European explorers ventured into America's heartland they were met with an unrelenting swath of treeless land. This vast sea of grasses, sedges, and flowers had no counterpart in Europe and early settlers, originally from the forested regions of Europe, found the grasslands in the middle of America to be both remarkable as well as terrifying. The name used to describe these grassland areas was “prairie,” which was derived from Old French word “prairie” for “meadow.” Today, we know this area of the central United States as the Great Plains, with many different grassland types being called “prairie.”

Due to the lack of tree cover on most grasslands of the Great Plains, many early settlers at first considered the prairies to be infertile. However, Great Plains grasslands rank among the most biologically productive of all plant communities in North America. The grasslands of the Great Plains contain the majority of the continent's native grasslands. These grasslands evolved in the rain shadow of the Rocky Mountains, where seasonal precipitation occurs mostly during the spring and summer and brutal extremes of temperature occur during both winter and summer.

With the retreat of the last glaciers approximately 8,000 years ago, the grasslands of the Great Plains expanded throughout the North American continent from Canada south to the Texas gulf coast. These grasslands were bordered on the west by the coniferous forests of the Rocky Mountains and on the east by oak savanna. Variations in the numerous environmental and biological factors found throughout the Great Plains, including soil type, bedrock, rainfall, animal grazing, fire, summer drought, and spring flooding, all played important developmental roles in the distribution and composition of native grasslands. This variation of distribution and composition of plant species resulted in a mosaic of differing grassland habitats throughout the Great Plains that includes tallgrass, mixed-grass, and shortgrass prairies.

The Native Grassland Ecosystem Learning Center at the U.S. Environmental Protection Agency's Region 7 Office, has several goals. First, the Center provides an educational opportunity for the public to observe and experience firsthand the prairie grasslands that once covered most of the four states in Region 7. Secondly, the Center illustrates the beneficial use and utility of native plants in the home landscape. Native prairie plants are ideal as home garden and landscaping plants as they are specifically adapted for the harsh environmental conditions of the Great Plains without requiring chemical pesticides and fertilizers or additional watering. Lastly, the Center wishes to showcase the incredible biological diversity, as well as the extreme beauty, of our native plant communities found throughout the grassland habitats of the Great Plains.



LEARNING CENTER HORTICULTURAL DESIGN CONCEPT

The Water, Wetlands and Pesticides Division at Region 7 planned the Native Grassland Ecosystem Learning Center to facilitate environmental education related to watershed planning, protection of wetlands and streams, water quality and drinking water protection, integrated pest management, native pollinator preservation, and green infrastructure. The gardens of the Native Grassland Ecosystem Learning Center were designed by members of the Watershed Support, Wetlands, and Stream Protection Section, who were inspired by early descriptions of the Region's prairies as "oceans of grass". This horticultural design theme of "grasses as water" was used to unite each unique habitat or demonstration garden of the Native Grassland Ecosystem Learning Center. The design team utilized native grass species characteristic of each specific habitat and arranged them into a curving, meandering "River of Grass" thereby capturing the graceful flowing nature of our Great Plains grassland communities. The design theme continues with the "River of Grass" slowly evolving and giving way to true aquatic grassland plantings in the form of riparian and wetland prairie gardens, thus providing the visitor with a glimpse of these rare grassland gems. Finally, original design theme concludes with an abrupt transition from wetland prairie to the driest examples of grasslands in Region 7, demonstrating the stark habitat contrasts of the Playa Lakes Region in the western reaches of Great Plains.



A STORY OF COLLABORATION

At the time of the first structured development at this site, (completed in 2007) the City of Lenexa and the office park development standards required that the site be fully irrigated. The design team and owner proposed a landscape strategy to the city and office park that would greatly reduce future water use. Dialogue with the City’s planners and the office park representatives resulted in an approach that dramatically altered the irrigation requirements. The combination of a reduction in irrigated areas and a planting pallet of drought tolerant and native species reduced the water demand from the LEED version 2.2 baselines of 2,528,286 gallons to 470,899 gallons annually.

In 2012 as the EPA began its move to this site, further reduction in irrigation water demand was planned and in early 2013, a proposal was made to the city to remove the irrigation requirements by changing the landscaping in prior irrigated areas to match the existing drought tolerant and native species. This forward-thinking view of the City’s planners has resulted in the opportunity to eliminate the irrigation and in the spring of 2013 the landscaping will be changed. After the new landscaping undergoes an establishment period using temporary irrigation into mid-summer of 2014 the temporary irrigation system will be removed and the site will no longer be irrigated.

PLANT MATERIALS

Root Growth: Buffalo grass turf, wildflower and prairie grass are the basis for perimeter plantings for the EPA campus. These plants have deep rooting systems that require no fertilizers or pesticides, minimal mowing, and minimal watering after the establishment period.

This diagram shows a few native grasses and associated depth of roots. On the far left is fescue grass with a root structure of less than six inches in depth. Traditional corporate campuses predominately use this high-input fescue turf, which requires intensive watering, mowing and maintenance.

| PLANT LIST | | |
|------------------------|--|---------------------------------------|
| | BOTANICAL NAME | COMMON NAME |
| Trees | <i>Malus</i> spp. var. <i>Prairie Fire</i> | Prairie Fire Crabapple |
| | <i>Malus</i> spp. var. <i>Snowdrift</i> | Snowdrift Crabapple |
| | <i>Taxiodium distichum</i> | Bald Cypress |
| | <i>Cercis canadensis</i> | Easterr Redbud |
| | <i>Acer rubrum</i> var. <i>Red Sunset</i> | Red Sunset Maple |
| | <i>Acer rubrum</i> var. <i>Red Sunset</i> | Red Sunset Maple |
| | <i>Quercus imbricaria</i> | Shingle Oak |
| | <i>Quercus alba</i> | White Oak |
| | <i>Pyrus calleryana</i> var. <i>Aristocrat</i> | Aristocrat Pear |
| | <i>Picea pungens</i> | Colorado Green Spruce |
| | <i>Picea pungens</i> | Colorado Green Spruce |
| | <i>Betula nigra</i> | River Brch |
| | <i>Platanus x acerifolia</i> var. <i>bloodgood</i> | Bloodgood London Planetree |
| | <i>Juniperus virginiana</i> var. <i>Canaertii</i> | Canearii Juniper |
| <i>Ginkgo biloba</i> | Ginkgo | |
| Shrubs and Grasses | <i>Cornus alba</i> var. <i>Bailhalo</i> | Ivory Halo Dogwood |
| | <i>Euonymus alatus</i> var. <i>Compactus</i> | Dwarf Winged Burning Bush |
| | <i>Viburnum x juddii</i> | Judd Vburnum |
| | <i>Buxus microphylla</i> var. <i>Wintergreen</i> | Wintergreen Boxwood |
| | <i>Juniperus chinensis</i> var. <i>Sea Green</i> | Sea Green Juniper |
| | <i>Vinca minor</i> | Periwinkle |
| | <i>Miscanthus sinensis</i> | Dwarf Maiden Grass |
| | <i>Pennisetum alopecuroides</i> | Dwarf Fountain Grass |
| | <i>Panicum virgatum</i> var. <i>Heavy Metal</i> | Heavy Metal Switchgrass |
| | <i>Liatris spicata</i> | Marsh Blazing Star |
| | <i>Echinacea purpurea</i> | Purple Coneflower |
| | <i>Iris versicolor</i> | Blue Flag Iris |
| | <i>Rudbeckia missouriensis</i> | Missouri Black-eyed Susan |
| | <i>Calamagrostis x acutiflora</i> | Feather Reed Grass var. Karl Foerster |
| | <i>Euonymus fortunei</i> var. <i>Coloratus</i> | Wintercreeper Euonymus |
| | <i>Fargesia rufa</i> | Rufa Bamboo |
| | <i>Sedum spurium</i> | Two Row Stonecrop |
| | <i>Pennisetum setaceum</i> var. <i>Compactus</i> | Dwarf Furple Fountain Grass |
| | <i>Pontederia cordata</i> L. | Pickere Weed |
| Rain Garden | <i>Iris versicolor</i> | Blue Flag Iris |
| | <i>Equisetum hyemale</i> | Scouringrush Horsetail |
| | <i>Juncus effusus</i> | Common Rush |
| | <i>Sporobolus heterolepsis</i> | Prairie Dropseed |
| | <i>Phyllostachys aereosulcata spectabilis</i> | Spectabilis Bamboo |
| | <i>Physostegia virginiana</i> | False Dragon's Head |
| | <i>Carex vulpinoidea</i> | Fox Sedge |
| | <i>Lobelia cardinalis</i> | Cardinal Flower |
| | <i>Scirpus fluvialifis</i> | River Bulrush |
| | <i>Monarda bradburyana</i> | Bee Balm |
| | <i>Carex stricta</i> | Tussock Sedge |
| | <i>Rudbeckia missouriensis</i> | Missouri Black-Eyed Susan |
| | <i>Lobelia siphilitica</i> | Blue Lobelia |
| | <i>Aster oblongifolium</i> | Aromatic Aster |
| <i>Liatris spicata</i> | Marsh Blazing Star | |

DESIGN PERFORMANCE METRICS

SITE AREA

30.72 acres

or

1,338,161 sq.ft.

THE VEGETATED SPACE

equals

888,984 sq.ft.

or

66% of the site.

IRRIGATION

84%

Reduction in water used for irrigation.

Design changes scheduled for 2013 will eliminate irrigation.

100%

Reduction in water used for irrigation.

The amount of water used for irrigation calculated for the LEED version 2.2 baseline - First structured development.

2,528,286 gallons annually

or an average of

6,926 gallons per day

To understand the approximate magnitude of irrigation water savings because of a corporative effort to reduce the irrigation, we can compare to the average American family of four which uses roughly 400 gallons of water per day, 146,000 per year at home (EPA Water Sense). The amount of water used for irrigation from the LEED version 2.2 baselines of 2,528,286 gallons is enough water to supply over

17

homes per year.

Registered with the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, the EPA's Region 7 Headquarters is on track to achieve LEED 2009 Gold level certification for New Construction and LEED 2009 Platinum level certification for Existing Building Operations and Maintenance.



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