Water and the Landscape

Justin Evertson, Nebraska Statewide Arboretum

Water—the giver of life, so preciously scarce and yet sometimes so abundant. As I write this in August 2008, much of Nebraska has seen above average rainfall for the year. At my home in Waverly, over 24” of rain has fallen since April 1st. That is nearly 6” above average. After several years of below average precipitation, that is a nice change of pace! Things are lush and green like we haven’t seen in years (although for the last several weeks we have been in a typical late-summer dry pattern). When it rains it pours and in some places of the Midwest, there was way too much rain. Just ask our neighbors to the east in Iowa who there was way too much rain. Just ask utilities, you’re paying attention. They’re or horticulturist, or if you work with city water—even as we’re drinking it bottled we’re rinsing dishes or a feeling of Except for a twinge of guilt when like dryness. So even during a wet year, the reality of drought and the value of water conservation should not be far from our minds.

Another aspect of water cycle and its relationship to the landscape that has become very important in recent years is that of stormwater management. Any community is made up of lots of hard surfaces (roofs and pavement) that reduce the amount of open ground that can absorb rainwater. In addition, much of the open ground is covered by short- cropped turfgrass that is a poor water absorber and which is typically graded to speed up stormwater runoff. Thus most towns or neighborhoods end up with more free-flowing water in storm events than do natural areas (woodlands or grasslands). This water has to go somewhere.

In designing and developing our communities and personal properties, we have up until now thought of stormwater as something we need to shed as quickly as possible. Thus our streets, storm sewers and drainage-ways have been designed to move stormwater at a fast flow out of the community and to the nearest streams or rivers. This “pushing” of the water, combined with less absorbability in the landscape, increases urban erosion and often increases the...
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commercial buildings. This won’t solve all our water problems, but each small effort gets part of the way in addressing city-wide stormwater problems at the source. That approach means that every property owner can make a difference. In selecting plants for a rain garden, regardless of whether they’re native or introduced, the most important factor is selecting deep-rooted plants. That’s especially true in new developments where the land has been graded and re-shaped. Over time, deeply-rooted plants will break through the upper several feet of compacted soil, creating channels that will almost act like big straws drawing the water down deeper into the soil.

Another simple concept we’re using is to grind down a section of street curb and then dig out the ground surface between the curb and sidewalk to create a small basin. This area is then planted with native rain garden species. Water running down the gutter flows into this area, rather than into the storm drain. By placing the curb cut on the uphill side of the storm drain inlet, the first flush of water from a rain goes into the green space rather than into the drain inlet. Since 93 percent of rainstorms produce less than 1” of precipitation, that’s the most important water to conserve and clean. Just as important is that it captures the majority of pollutants carried in rainfall. This is referred to as the “first flush” or “5-minute flush,” and it contains the highest percentage of pollutants like metals, petroleum and chemicals. Most rain gardens deal with the first 1” of rain or less, but that’s the most frequent and most polluted runoff and plants are good at capturing and treating those pollutants.

Conserving Rain Water

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Protection of water quality and quantity is an important issue we all face. Changing the way we look at rainfall is crucial towards doing our part to address water issues. Runoff water from rainfall and snowmelt is a beneficial resource. While it should be directed away from building foundations, and not be allowed to collect into stagnant pools, it can and should be utilized more for landscape irrigation.

When it rains and as snow melts, water runs across and off properties. This runoff water is referred to as stormwater. As stormwater flows across surfaces, it picks up pollutants such as sediment, nutrients, bacteria and heavy metals from many sources and deposits them into our surface water. This is called nonpoint source pollution and it is considered to be one of the leading sources of water pollution today.

To help address water issues, a new trend in property development and landscaping is to “capture and infiltrate” rain and snow rather than directing all of it off of a property. Such practices help conserve water, reduce water pollution and restore natural hydrology which benefits ground water supplies and protects rivers and streams. On a large scale, one of the ways we can conserve water is by preserving and restoring natural landscape features such as natural drainageways, forests, floodplains and wetlands with Low Impact Development or L.I.D. (www.lowimpactdevelopment.org).

Small scale approaches include:

- Reducing the amount of impermeable surfaces on a property by using porous pavement or other permeable surfaces, such as for driveways and patios, and by retarding or increasing planted areas.
- Installing properly designed rain gardens.
- Redirecting downspouts away from pavement and onto planted areas.
- Using rain barrels.
- Installing underground tanks to collect rainwater, often from rooftops; and then using this water for drip irrigation.

Because nonpoint source pollution is considered to be one of the leading causes of water pollution today, the Clean Water Act, through the Phase I and II Rules, requires urban communities with populations of 10,000 or greater to reduce nonpoint source pollution in stormwater and reduce the amount of stormwater discharged into surface water. While larger towns are being regulated to do this, everyone can do their part to protect and conserve water resources.

One way is to capture and reuse runoff water from rainfall and snowmelt. Rain gardens are becoming more popular as the need to conserve and protect water resources becomes increasingly important. If you are considering installing a rain garden, there are some key considerations from what has been learned to date:

- Rain gardens are slightly shallow gardens located where they will catch rainwater, where rainwater can be directed to them, usually from a roof, lawn or paved area.
- Rain gardens are not ponds. A properly located and installed rain garden will drain all rainwater in 24 to 48 hours, with 24 hours being ideal.
- Rain gardens are best NOT located where water already tends to pool and stand for longer than 24 to 48 hours after a rainfall. Such locations may have poorly drained or compacted soils. With proper site and soil preparation, along with good plant selection, it can be possible to use such sites for rain gardens.
- Soil preparation is important for any garden, but may be even more critical for rain gardens. Double digging or using a back hoe and incorporating compost is recommended.
- Native, herbaceous perennials are considered the best types of plants for rain gardens because they are deep rooted and their roots naturally die and re-grow, creating small tunnels in soil to improve water infiltration and percolation in the rain garden over time.
- Rain gardens are best located 10’ away from the foundation. If the basement is finished, 20’ is a better rule of thumb.
- Rain gardens should not be located beneath trees, over septic systems, within 25’ of wells, or in very sandy soils where the water table is shallow.

Everyone Has a Part

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One of the most common misconceptions about rain gardens is that they should be placed where there is the most runoff, like areas along property lines where small creeks are often formed during and after rainstorms. Many homeowners want to place it in back of their property where all the runoff from that property and often from several other properties pass through, but rain gardens are really meant to handle just the runoff from one home and not the 10 homes uphill from it. That means everyone has to take part to be truly effective.

In the first year or two, it’s all about the soil. Once plants are established, their root mass will improve water infiltration, but the first several years you have to depend on the soil. Good plant selection is essential in all areas of the garden, as all plants need to tolerate both wet and dry times of the year.

Residential rain garden in Lincoln. (Photo courtesy Amanda Meder)

I do soil testing for the City of Lincoln Rain Garden project, which is grant-funded from the Nebraska Environmental Trust. It’s surprising how much soils can vary from one side of the street another and even within a 6’ area on some properties. In areas of new development, it’s not unusual to have 1’ of good topsoil with compacted clay hardpan underneath.

We’ve found that a plant that does well in one rain garden may do poorly in another. There are many factors such as sunlight, amount of runoff, soil type, etc.

Most of our rain garden plans don’t use trees since they tend to absorb all the water and give too much shade, but we have placed rain gardens near existing trees with good success. Shrubs can work as long as they are not in direct sight lines near streets and driveways.

Another simple concept we’re using is to grind down a section of street curb and then dig out the ground surface between the curb and sidewalk to create a small basin. This area is then planted with native rain garden species. Water running down the gutter flows into this area, rather than into the storm drain. By placing the curb cut on the uphill side of the storm drain inlet, the first flush of water from a rain goes into the green space rather than into the drain inlet. Since 93 percent of rainstorms produce less than 1” of precipitation, that’s the most important water to conserve and clean. Just as important is that it captures the majority of pollutants carried in rainfall. This is referred to as the “first flush” or “5-minute flush,” and it contains the highest percentage of pollutants like metals, petroleum and chemicals. Most rain gardens deal with the first 1” of rain or less, but that’s the most frequent and most polluted runoff and plants are good at capturing and treating those pollutants.

Above: This rain garden absorbs parking lot runoff at the Iowa Natural Resource Conservation Service office.

Below: Vegetated drainage swale between parking lots at Bassa Pro Shops in Council Bluffs, Iowa. (Photos courtesy Steve Rodie)
Rain gardens and bioretention cells are small-scale measures scattered throughout the development site. Constructed green spaces, native landscaping and a variety of innovative bio-retention and infiltration techniques capture and manage stormwater on-site.

LID reduces peak runoff by allowing rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation and other beneficial uses. In areas with slow drainage or infiltration, LID captures the first flush before excess stormwater is diverted into traditional storm conveyance systems. The result is development that more closely maintains pre-development hydrology. Furthermore, LID has been shown to be cost effective or, in some cases, cheaper than using traditional stormwater management techniques.

Rain gardens are best suited to absorbing runs of less than 1”, which accounts for about 93 percent of rains in Nebraska. (National Weather Service)

More than 50 percent of outdoor water usage goes into watering lawns and gardens. (Environmental Protection Agency—EPS)

About 50 percent of commercial and residential irrigation water goes to waste through evaporation, wind, improper system design or overwatering. (EPS)

Stormwater runoff is the primary water quality problem in America. (EPS)

Drip irrigation is 90 percent efficient; traditional in-ground irrigation systems 50-70 percent efficient. (NebGuide G1859)

Roots make up about 70 percent of most prairie plants; some have roots 20’ in length. Most prairie species replace a third of their roots annually, enriching the soil and improving water-retention. (Prairie Nursery)

In cities, about 50 percent of rain water goes into storm sewers. (www.gardengatemagazine.com)

Runoff from a 1” rain may exceed 5,000 gallons—even from a 1,500 square foot house on a small lot. (Blue Thumb Guide to Rain Gardens)

Rain gardens can trap and retain as much as 99 percent of common pollutants. (University of Connecticut)

“Everyone can do something”

Besides using rain gardens, bioretention cells, swales, vegetated filter strips, permeable surfaces, green roofs, underground tanks or rain barrels, you can:

- Plant native or adapted plants resistant to drought, disease and pest damage.
- Avoid using turfgrass on slopes, in deep shade or in other difficult areas.
- Protect slopes with groundcover plants and aerate to improve water infiltration.

Minimize the use of fertilizers and pesticides and clean well after usage.

- Mow turf at proper heights (shorter in summer months).
- Keep in mind that frequent, shallow watering makes plants susceptible to wind, drought and temperature extremes.

Mulch rain gardens with shredded hardwood or shredded bark mulch (they are less likely to wash away than lighter weight mulches).

Rain barrels at Zuhrmuhlen residence in Bellevue. (Photo courtesy Justin Ervethoven)
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so fierce that all the grasses and forbs are shortened and nothing is allowed to be aggressive. Grasses will keep aggressive wildflowers in check through competition and prevent annual weed seeds from taking over any open areas. The leaves and flowering stems of grasses will also help slow down fast-flowing stormwater as it enters a swale or rain garden. Moreover, many spring and early summer wildflowers look great early in the season but can look tired and unattractive by mid-summer. Grasses hide the dormant stems of these spring-blooming wildflowers through summer and into fall, while offering their own colorful, showy seedheads.

Prairie grasses, sedges, spike-rushes and bulrushes are a must for creating a wet prairie meadow, offering a more natural look. These plants grow well in low-lying areas that can experience flooding during heavy spring rains. The surface of the soil might dry out in the heat of the summer, but the subsoil usually remains moist. They may need supplemental irrigation during severe drought conditions to stay lush and attractive. See the respective period mowing to maintain a tidy appearance. They will survive dry periods well and are an excellent candidate for water wise areas.

Don’t confine the many garden-worthy types of sedge with the weary thug, yellow nutsedge. Yellow nutsedge is in the same genus as Andropogon gerardii but not a true Carex; it was an introduced weed from Europe. Most of the Carex plants for the garden are native and form clumps, while others spread slowly as part of a managed turfgrass alternative. The following list of includes sedges, rushes and native prairie grasses that are very adaptable and suitable for many rain garden plantings.

Regional Native Grasses, Sedges & Bushes for Wet Soil
Andropogon gerardii, big bluestem
5-6' h, 2-3' w. Impressive native of the tall grass prairie. Rich, green leaves to 2' by late June. Seedheads resemble turkey’s foot. Reliable copper, burnt orange, and mahogany fall color; sun, wide condition range, drought-tolerant; rain garden, swales, wet meadows.

Carex behbhi, ‘Bebbi’s sedge’ 1-3'/h, 18” w.
A tufted plant with a dense mass of bright green grass-like leaves emerging early in the spring; the spike-like seedheads are not showy but will add variety to any planting; rain garden, swales, wet meadows.

Carex comosa, bristly sedge 1-2'/h, 18” w.
This wet-loving plant is noted for its arching habit and drooping bottle brush seedheads in late spring; easy-to-grow bunch-type plant for rain garden, swales, wet meadows, wetland.

Carex grayi, gray’s sedge 2-3'/h, 2” w.
A favorite sedge with arching, fawn-like habit; the unusual seedheads resemble spiky earrings. The bright green late leaves emerge in early spring and turn tan in fall; ‘Gold Bar’—yellow-striped; ‘Spiralis’, corkscrew rush; 1’ h, 1’ w. Clumps of grass-like leaves; small white flowers are impressive, top plants in July.

Carex hastata, crested sedge 2'/h, 18” w.
A striking ground cover, the needle-like leaves form an umbrella-like canopy; slow to reach maturity but well worth the wait; looks great with grasses.

Culcita nevadensis, sweet Indian rye 4-5'/h, 2’ w. Robust plant with large, triangular leaves; spreading plant best planted among grasses to contain; prefers moist soils and can tolerate standing water; small white flowers are not impressive, top plants in July.

Juncus interior, inland rush 2-3’ h, 2’ w.
The rushes are important components to the ecology of wet prairie meadows, but they also offer stiff, forest green stems that create strong vertical lines in the garden; rich brown flower clusters top each stem.

Juncus torreyi, Torrey’s rush 1-2’ h, 1’ w.
Distinctive clump-forming rush with dark green, stiff leaves and dense, rounded seedheads that turn reddish-brown in fall; wet meadows, wetland.

Panicum virgatum, switchgrass 5-7’ h, 2’ w.
This versatile grass will grow in about any soil and should be in every rain garden planting. Dark green, stiff stems and fine, airy seedheads all turn an attractive golden brown in fall; rain garden, swales, wet meadows.

Spergula auriculata, yellow burfest 3-5’ h, 2’ w.
Refined clump-forming species with dark blue-green foliage and slender flower stems topped with dark brown flower clusters; wet meadows, wetland.

Spartina pectinata, prairie cordgrass 4-5’ h, 2’ w.
King of wet prairies with graceful arching foliage that turns a bright yellow in fall; very aggressive and best planted in confined areas of this mowed turfgrass; for bank stabilization, swale plantings or wet prairie meadows.

Sorghastrum nutans, Indiangrass 6-8’ h, 2’ w.
Wider light green leaf turns reddish-yellow in fall and persists through winter. Golden seedheads are another attractive characteristic of this warm-season grass. Full sun, moist to dry soils.

Calamagrostis canadensis, green feather reedgrass
3-5’ h, 2’ w. Very dark green, stiff leaves and dense, round heads are not impressive, top plants in July. They will survive dry periods well and are an excellent candidate for water wise areas that may have standing water for a few days after a hard rain. Most of these plants do very well in damp soils, but can tolerate dry periods. The following wet meics plants are perfectly suited for rain gardens, wet prairie meadows, detention basins and most swales.

Plants for Wet or Dry Areas
Mesic plants are plants for moderately moist habitats. They tend to grow in areas that are excessively wet in winter, wet in spring and after heavy rains, but often dry out in summer. They do best around edges of ponds, lakes and in riparian areas that may have standing water for a few days after a hard rain. Most of these plants do very well in damp soils, but can tolerate dry periods. The following wet mesic plants are perfectly suited for rain gardens, wet prairie meadows, detention basins and most swales.

Acorus calamus, sweetflag 2-4’ h. Classic wetland species with bright green leaves reminiscent of flag; bruised foliage releases a pleasant scent; spreads by rhizomes to form colonies; very adaptable in wet or dry conditions.

Asclepias incarnata, swamp milkweed 3-5’ h, 2’ w. Clusters of pretty magenta flowers in early summer; one of the best butterfly plants and should be included in every rain garden planting; easy-to-grow and can tolerate wetland conditions to dry soils; ‘Ice Ballet’ has classy white flowers; rain garden, swales, wet meadows.

Aster novae-angliae, New England aster 2-6’ h, 2’ w. Popular wildflower has a showy display of violet to pink daisy-like flowers in fall; many outstanding rain garden worthy selections available; reseeding can become a problem if not given competition.

Aster umbellatus, flat-topped aster 4-6’ h, 4’ w. Strongly upright stems with stiff leaves and dark green foliage that remains clean all season; in a fall cloud of small creamy-white flowers top plants; a bee and butterfly magnet.

Baptisia australis, blue wild indigo 5-6’ h, 2-3’ w. Native prairie plant with blue flowers or white flowers with greenish-blue sepals; seedheads become a problem if not given competition.

Calamagrostis brachytricha, Korean feather reedgrass
3-5’ h, 2’ w. Native; glossy foliage with feathery pink flower heads in September. Prefers consistent moisture; easy-to-grow in most soils and tolerates some shade.

Miscanthus, maidengrass
Showy grasses of many shapes and sizes, ranging from 3-12’ tall; feathery plumes top plants in fall with new cultivars providing colorful foliage and better flowers; cut back to ground in spring; prefers full sun and will top out in shady conditions; rain garden, swales.

‘Autumn Red’—3—4’ early bloomer with reddish-purple fall color
‘Gold Bar’—heavy golden striping; compact, upright habit 3.5—3’ high
‘Morning Light’—white and green variegation; fine, narrow leaves; upright arching habit 3’ high
‘Spiralis’—yellow bands on foliage
‘Gracillimum’—reddish-pink seedheads; graceful arching habit; 3’ high
‘Giganteus’—grows to 12’ high
‘Variegata’—white and green variegation; strong arching habit; tolerates wet soil
‘Zebra’—bright yellow bands on foliage

Carex masquinongyi, palm sedge (above) 2-3’ h, 2’ w. Grass-like leaves radiate out from the stem. Light green foliage turns yellow with frost. Full to partial sun, very adaptable; tolerates dry conditions; a must for rain garden, swales, wet meadows, wetland.

Carex plantaginea, plantain-leaved sedge 1-2’ h, 1’ w. Attractive clump-forming sedge with brown, shiny evergreen leaves that are crinkled like seersucker ribbon. Best in moist soils and part shade, but tolerates dry soils in shade; rain garden, swales, wet meadows, wetland.

Carex scoparia, pointed broom sedge 1-2’ h, 18” w. Attractive bunch-type species for wet soils; spikelets are pointed and mature to a nice brown color in early fall; rain garden, swales, wet meadows, wetland.

Carex stricta, tussock sedge 1-3’ h, 2’ w
Noted for its fine texture and rich green color; very adaptable; it works well in swales, ponds or streams or in moist soil massed as a groundcover.

Carex vulpinoidea, foxtail sedge 2’ h, 1’ w.
This graceful sedge forms a fountain-like clump of bright green foliage early in the season; yellow-brown seedheads reminiscent of a foxtail add to fountain effect; easy-to-grow, not aggressive and very adaptable; rain garden, swales, wet meadows, wetland.

Chasmanthium latifolium, northern sea grass 3-4’h, 1’ w. Noted for its flat, out-like seedheads that turn from a translucent to rich brown in fall; aggressive reseeding plant is more manageable in shady situations and woodland edges.

Eleochoris acicularis, needle spike rush 6-12’ h. Very dark green, needle-like foliage; fine stems are topped with narrow spikelet; forms dense mats and is a great addition for the edges of wet meadow gardens, moist soils and shallow water; very attractive allowed to spread between landscape boulders in soggy soil.

Elymus canadensis, Canada wildrye 4-5’ h, 2’ w. Attractive nodding seedhead remains green all year, but often floods; with its coarse habit it’s best used only in large, naturalized areas; blue-green foliage emerges early in spring and turns tan in fall.

Equisetum hyemale, scouring rush
Classic wetland plant noted for its low-segmented stems, each marked with a gray band; bamboo-like plant remains evergreen in the winter; very aggressive spreader and will need containment.

Juncus effusus ‘Spiralis’, corkscrew rush 1’ h, 1’ w. A common rush with needle-like dark green foliage. Distinctly strong spirals form a corkscrew effect; easy and effective; wet meadows, wetland.
Cassia hebecarpa, wild senna 4-6' h, 2' w. Robust grower with attractive foli- age; bicolored pea flowers in spring; with bunches of yellow pea-like flowers in July and August, followed by brown seedpods; very adaptable to wet- land or mesic sites.

Chelone glabra, turtlehead 3-4' h, 2' w. A must for any rain garden planting with shiny, dark green foliage topped with clusters of creamy white flowers that resemble a turtle’s head; best in moist soils if planted in full sun; will tolerate some shade or wetland soil conditions.

Echinacea purpurea, eastern purple coneflower 3' h, 18" w. Showy, pink-purple cone-shaped flowers in July-August; numerous cultivars developed for flower quality and plant form. Can take over a garden; needs competition.

Eupatorium coelestinum, mistflower 1-3' h, 2' w. Spreads by rhizomes to form nice groundcover; slow to emerge in the spring, plants are topped with dense clusters of blue-purple Agastatherium-like flowers in late summer; wet or dry.

Eupatorium maculatum, Joe-Pye plant 5-7' h, 2-3' w. Impressive plant with flat-topped clusters of mauve pink flowers up to 1' across in late summer; a but- terfly favorite; handsome toothed foliage; the heavy spikes can resemble a turtle’s head; best in moist soils with clusters of creamy white flowers that

Filipendula ulmaria, Queen of the Meadow 3-5' h, 2' w. Elegant plant with creamy white, astilbe-like flowers blooming in early summer atop a clump of dark green serrated leaves; ideal companion with bee balm; full to part sun.

Liatris pycnostachya, thickspike gayfeather 5-6' h, 2' w. Lance-shaped lower leaves form a grassy-like clump; in sum- mer thick violet-purple flower spikes rise above the foliage; the heavy spikes can fall over so best combined with grasses.

Liatris spicata, mash gayfeather 3-4' h, 2' w Showy plant with clumps of grass- like leaves and purple pink flowers in summer; adaptable and easy-to-grow.

Lobelia siphilitica, great blue lobelia 3'-5' h, 2' w. Blue dark tubular flowers top plants in late summer; light green,长达-shaped foliage; will grow in rich, moist woodlands, but best in part shade and very wet soils; short-lived but reseed.

Monarda fistulosa, wild bergamot. Fragrant lavender flowers atop upright stems in mid to late summer; often loses its lower leaves mid-summer so best planted among tall grasses to hide bare legs.

Physostegia virginiana, obedient plant 3-4' h, 2' w. Lovely wildflower with stiff, upright stems and very showy bright pink flower spikes in late summer; provide intense competition by surrounding with grasses to prevent floating and keep from spreading aggressively.

Pycnanthemum virginianum, mountain mint 3' h, 2' w. Bushy plant with mint-scented dark green foliage and cluster- ing white flowers July-September; very adaptable; not a true mint and not aggressive like the common Mentha.

Rudbeckia laciniata, sweet black-eyed susan 4-6' h, 2' w. Big robust plant with attractive deep green foliage that remains blemish-free all season; deep yellow flow- ers have red-brown centers; best planted among tall prairie grasses to keep in check. 

Solidago riddellii, Riddell’s goldenrod 3-4' h, 2' w. Interesting, attractive lowland species of goldenrod with long, narrow leaves and stiff stems topped with flat-topped clusters of yellow flowers in fall. This clump-forming goldenrod is ideal for wet areas of prairies, meadows and native or naturalized areas.

Thalictrum dasycarpum, purple meadow rue 4-6' h, 2' w. Attractive clumpine- like foliage in spring; purple stems are topped by a cloud of snowy white flow- ers in early summer. Can be cut back after flowering. Best in rich, moist soils.

Veronicastrum virginicum, ‘Ice Dance’—cream leaf margins, to 12” h; ‘Evergold’—bright yellow variegation, 12” h.

Zizia aurea, golden aster

 Introduced Perennials for Wet Soils

Actaea arctica ‘Brunette’, brunette baneberry 5’ h, 2’ w. Beautiful bronze, deeply cut leaves and rosy-white flower spikes in mid summer; best in part shade or full sun in rich, moist soils; slow to mature so be patient!

Hibiscus species 3’-8’ h, 3’-4” w. Many choice selections that are win- ter hardy and easy-to-grow; vigorous and robust, they are slow to emerge in spring, then grow quickly in the summer heat; plate-sized flowers by mid-summer.

Lysimachia punctata ‘Alexander’, garden loosestrife 3-4’ h, 2-3’ w. Bushy, upright plant with variegated foliage and bright yellow, star-shaped flowers set in leaf axils; adaptable but best in consistent moisture; confine with grasses.

Solidago rugosa ‘Fireworks’, fireworks goldenrod 3’-6’ h, 3’-4’ w. Lacy, ra- diating bloom spikes are reminiscent of a golden shower of fireworks, only this firecracker blooms in September. Fantas- tic selection for wet areas.

Shade-loving Plants for Wet Soils

Anemone canadensis, meadow anemone 12-18” h. Great groundcover with handsome, deep green foliage; delicate white flowers in mid-spring; very ag- gressive runner so best planted in wet ditches, swales or prairie meadow gar- dens among grasses and sedges.

Carex species, sedge Many exciting yellow and white variegated forms and a wide variety in color, shape and size in these plants nat- ural to Japan and China. Best in wet or moderately dry soils and dappled shade. Combines nicely with hosta; great in containers too.

‘Ice Dance’—cream leaf margins, to 12” h; ‘The Beastes’—deep green ground cover 6’; ‘Evergold’—bright yellow variegation, 12” h.

Elymus villois, silky wildrye 2-3’ h, 2’ w. Graceful, shiny white foliage and reined rye-like seedheads early summer; very adaptable and will reseed readily; best in dappled shade and meadows.

Geranium maculatum, wild geranium 8” h, 18” w. Pink to lilac flowers in spring and early summer. Dark green foliage forms nice clumps and remains attractive all season; best in part sun and consistently moist soils but tolerates dry.

Hystrix punctata, bottle brush grass 1-3’, 1-2’ w. Briefly flowerheads above loose tufts of foliage in summer that last until winter. Full to part sun, but prefers dappled shade and moist soils.

Houttuynia cordata ‘Chameleom’ or ‘Plena’ 15” h. Bright pink, white and green leaves often revert to plain green in the heat of summer. Aggressive habit in wet soils and best used in confined areas or bordering mowed areas; I like ‘Plena’ for its dark green, heart-shaped leaves and complimentary small white flowers.

Iris pseudacorus, yellow flag iris 5’ h, 3’ w. Big, robust iris with long, sword-like leaves; bright yellow flowers in summer; use with caution because it often outgrows its space and wears out any welcome.

Iris ensata, Japanese iris 2-3’ h, 18” w. Unique, flattened flowers and attrac- tive, bright green foliage; adaptable and easy-to-grow in rich, moist soils; some cultivars have bright variegated foliage.

Ligularia denata ‘Othello’, leopard plant 3’-4’, 2-3’ w. Impressive plant with large, red-purple leaves and orange flow- ers in summer; plants often wilt in the heat of summer; best in part shade for relief from afternoon sun; can reseed ag- gressively so deadhead spent flowers.

Ligularia stenocephala ‘The Rocket’, leopard plant 3-5’ h, 3’ w. Large, jagged foliage and impressive bright yellow flower spikes in early summer. Will wilt in heat of summer unless given moist soils and afternoon shade.

Polemonium reptans, creeping Jacob’s ladder 1’ h, 1’ w. Light blue, bell- shaped flowers in loose clusters mid to late spring. Weak-stemmed. Prefers moist, rich, well-drained soil, part shade.

Solidago flexicaulis, zigzag goldenrod 2-3’ h, 2’ w. Attractive, serrated leaves that remain blemish-free all season; in fall, flower spikes top the stems zig-zag their way up to the top.

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Fireworks Continues Green Leadership Award
Winner of 2008 Environmental Leadership Award

The founders of Telesis, Inc. of Lincoln, which owns Lazo’s Brewery, Fireworks Restaurant and Empyrean Brewing Co., have always been conservation-minded. They have been leaders in restaurant recycling and have worked hard to conserve energy in their operations. At Lincoln’s new Fireworks restaurant, they have installed an in-ground heat pump system that greatly reduces energy consumption. In 2008, the company won a prestigious Environmental Leadership Award from Lincoln and Lancaster county for their many environmental efforts.

Led by Reba Schafer, the company recently decided to convert the landscape around their Fireworks restaurant in southeast Lincoln into a model of sustainability. Presently, the landscape is typical for such commercial sites in Lincoln. It is dominated by high-input cool-season turfgrass over much of the site. A few trees and some flower and shrub plantings have been scattered here and there, especially in parking islands and near the buildings. The landscape is not ugly, but it is not special. Schafer says “the landscape and the plantings look like just about any other new commercial site around.”

Not only is the landscape non-descript, it is wasteful. It is estimated that more than 100,000 gallons of water are pumped on the lawn each year, along with significant amounts of fertilizer and pesticides. The lawn is mowed and trimmed at least once a week, producing significant outputs of CO₂ emissions. So Schafer and company approached the Nebraska Statewide Arboretum to help create a new landscape vision for the site. They had some broad goals in mind:

- Make the landscape more environmentally sustainable as possible.
- Significantly reduce the energy inputs and carbon emissions needed to maintain the site.
- Plant trees or other plants that would help sequester carbon.
- Reduce, as much as possible the need for supplemental irrigation.
- Reduce the amounts of fertilizers and pesticides used on-site.
- Make the landscape more visually appealing and more fitting to Nebraska's significant impact on reducing stormwater flows and improving the quality of water flowing into the stream. As part of the plan, a storm sewer at the corner of the north parking lot will be plugged to divert even more of the stormwater away from the sewer and directly into the rain garden.

Because the rain garden sits directly adjacent to a public bike trail that runs along the east side of the property, it is anticipated that the garden will serve as a great educational resource for those utilizing the trail.

- Planting of as many trees as possible. Though the site is relatively small (about an acre), room has been found to plant more than 50 trees. The trees will significantly aid in reducing stormwater runoff and will be able to sequester up to 200,000 pounds of carbon per year as they mature. The trees will also add beauty to the site and help soften the parking and other hard surfaces.
- Conversion of turfgrass on the site to lower-input buffalograss. When the project is completed, more than 20,000 square feet of cool-season, high-input turfgrass will be converted to buffalograss. The conversion will help eliminate 90 percent of current irrigation needs, more than 200 pounds of fertilizer and greatly reduce pesticide usage. The conversion will also reduce mowing and trimming needs by up to 75 percent and thus reduce the amount of CO₂ output each year by up to 96,000 pounds.

Partners include Lincoln’s Parks and Recreation Department and the Watershed Management Division of the Public Works & Utilities Department, Campbell’s Nursery and the Nebraska Statewide Arboretum.

While they are still in the process of developing the full cost-benefit ratio, Schafer says being the first commercial property funded by Lincoln’s rain garden project offers many possibilities for educating the public about what can be accomplished through careful planning.

Wetland species grow well in soggy soils and standing water. These wetland or emergent plants are best planted in soils that are continually wet most of the year.

Wetland Grasses, Sedges & Rushes

- Carex comosa, bristly sedge
- *Carex gracilis, gray’s sedge
- *Carex hystericina, bottle brush sedge
- *Carex mowingensis, palm sedge
- *Carex plankensis, plantain-leaved sedge
- *Carex scoparia, pointed broom sedge
- *Carex stricta, tussock sedge
- *Carex vulpinoidea, foxtail sedge
- *Eriochorus acicularis, needle spike rush
- *Equisetum hyemale, scouring rush
- *Juncus effusus ‘Spiralis’, corkscrew rush
- *Juncus interior, inland rush
- *Juncus torreyi, Torrey’s rush
- *Scirpus atrovirens, dark green bulrush
- *Spartina pectinata, prairie cordgrass

Wetland Wildflowers

- *Acorus calamus, sweetflag
- *Asclepias incarnata, swamp milkweed
- *Aster novae-angliae, New England aster
- *Aster umbellatus, flat-topped aster
- *Cacalia suaveolens, sweet Indian plantain

Plants for Rain Gardens continued on page 5

Top: Landscape design for Fireworks.
Middle: This parking drain will be plugged to divert storm water to the rain garden.
Bottom: A rain garden is proposed for the drainage-way on the east side of the property, adjacent to a public-bike path. (Plan and photos courtesy Justin Everson)
Lawn care is a significant amount of time. (Sometimes high-input lawns can have an endless activity—wrestling with the kids, chasing the dog, pitching a tent, having a picnic, mowing the lawn, feeding the birds, and taking out the trash.), and is a significant annoyance to many people who have already relaxed about their lawns or have converted to low-input alternatives. Thankfully, more sustainable lawn development and care is a positive and growing trend across the country.

This article is not actually meant to be an attack on the lawn, but rather the wasteful way we often maintain it. I will be the first to admit that the lawn does serve an important purpose and in no way am I advocating that we do away with it completely. In fact the lawn (by lawn I mean the mowed landscape), is by necessity an important part of the landscape. There’s just no way around it—much of the greenspace of any city or town has to be regularly shorn to aid in visibility, cleanliness and attractiveness, to help prevent wildfires and to create open space for activity and commerce (living).

The lawn also has several utilitarian benefits. We very much enjoy its soothing greenness during the warmer months (anyone would have to admit that a lawn is much more comforting on a hot day than the paved areas of the city). Also, there is no better place for outdoor activity—wrestling with the kids, chasing the dog, pitching a tent, having a picnic, tossing the football or whacking a golf ball. Without turf, would we have Tiger Woods or the grand baseball of the game, or even better game of football? In addition, plants in the lawn provide oxygen, turf helps prevent erosion and a nice lawn can have a positive impact on property values. Above all, perhaps the biggest reason I maintain at least some turf is that my wife favors it, and since I favor my wife...the lawn is alive and healthy.

Relaxing the Lawn

If the lawn is both important and necessary, can we have both attractive, functional lawns and more sustainable landscapes? The answer is an emphatic yes! By modifying our perspectives a bit and by changing a few of our management practices, we can have lawns and landscapes that not only help conserve water but which also help keep water cleaner, improve our property values, make our landscapes more beautiful and give us all something to cheer about. Here are a few suggestions:

- Limit turfgrass lawns (especially the high-input variety) to where it is truly needed for play and activity.
- Convert the lawn to more drought-tolerant species. In Waverly, I have a fescue lawn that I rarely water and which has served me well for over 15 years. In addition, some warm season grass species such as buffalograss or blue grama (two native warm season varieties) are amazingly drought-tolerant and rarely need watering after establishment.
- Accepting some mid-summer dormancy or drabness would go a long way to helping curb our water lust. Just as the lawn goes dormant in the winter, we should also allow it to rest in the hottest and driest parts of the year—as it naturally wants to do. During the summer we should apply only enough water to keep the lawn alive (not lush), realizing it will green up again in the fall.
- Reduce the use of fertilizers and consider using natural alternatives. Many turf professionals now recommend fertilizing only once a year—in the fall. How nice of us. Low input fertilizers help limit weed competition and increases drought-tolerance during the summer.
- Consider using non-grass plants as turf. Yarrow, sedum, clover, sedges and many other plants have shown great potential. Use some of the lawn to plant trees, shrubs, flower beds, vegetable gardens, short-prairie meadows, rain gardens, etc.
- Put away the gas-powered leaf blowers and weed trimmers and consider using electric-powered alternatives. Our ears and lungs will greatly appreciate it.
- Modify weed management strategies. Try to spot spray or hand-pull as many weeds as possible. Broadcast spray for perennial weeds only in the fall when the kill rate is better and there is significantly less harm to the surrounding landscape. Never use ground stelants or products containing dicamba that can move through the soil and harm non-target plants.
- Leave grass clippings on the lawn. Perhaps the easiest thing to do is just relax and be happy with a less-than-perfect lawn. How liberating it can be! Sure, the lawn might have a bit of clover, a few dandelions, a rough spot or two. Who cares? In the grand scheme of things, does it really matter that a lawn doesn’t look like the 18th fairway at Augusta? A diverse landscape with a "relaxed" lawn is alive and healthy. It is full of fascinating and beneficial creatures including birds, butterflies, lady beetles, mantids, garden spiders and earthworms, among many others. Such a landscape can be more inviting, more beautiful, more sustainable, water conserving, safer to play on, but even done right, can greatly increase property values and neighborhood viability.

Thankfully, many people are now seeking ways to live "greener" lives and to help better the natural environment.

Poor irrigation practices can waste significant amounts of water, especially in areas adjacent to streets and sidewalks.

Such efforts don’t need to be reserved for parks and wildlands, but can take place right in our own back yards (and front yards). Relaxing with lawn care is one of the best ways to do just that! Just think about it: what other activity can help save millions of gallons of water, reduce our thirst for oil, eliminate significant amounts of pollution, greatly enhance the natural diversity in our communities, improve the health of our trees and help save significant amounts of time and money that could be spent on more rewarding pursuits? Sounds like a no-brainer to me.

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Rain gardens do not necessarily simple. Rain gardens are a complex system. For the majority of residential sites—where gardens and runoff amounts are relatively small, adequate distances from buildings can be maintained and complications are not evident—rain gardens are straightforward landscape features to design and build. Where sites are complex, however, it’s best to consult with design professionals licensed to practice grading and stormwater management since incorrect design can lead to significant health and safety issues in addition to poor garden quality.