

# Rainy-Day Gardens



Imaginative plantings that help capture and clean runoff are attracting the attention of home gardeners, landscape designers, and watershed managers.

BY MARYALICE KOEHNE

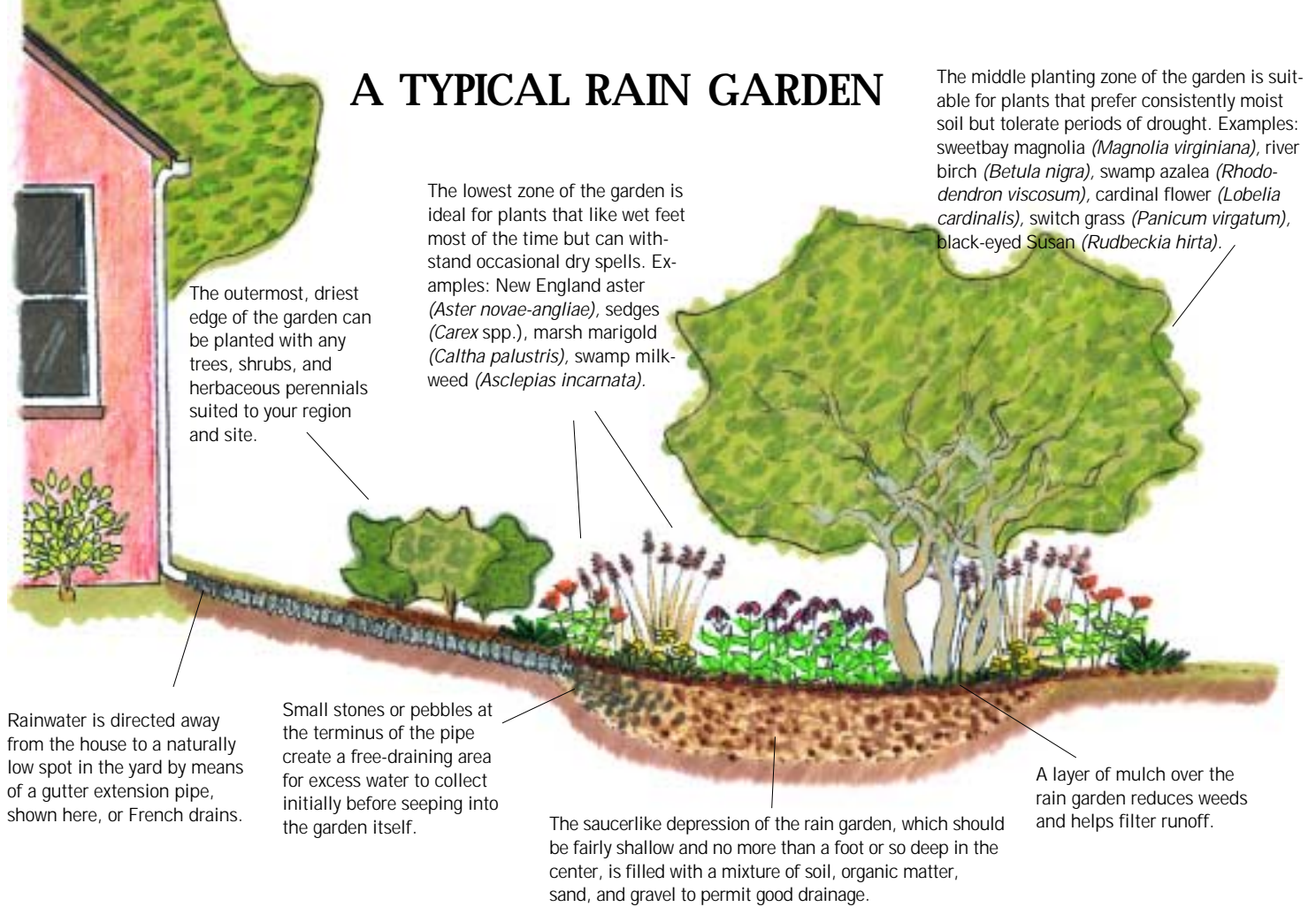
**A**N IDEA WHOSE time has come, rain gardens are storming the country, showing up in private gardens, arboretums, housing developments, parking lots, and along roadways from the Chesapeake Bay to Puget Sound. In Seattle, they're part of a "Salmon Friendly Gardening" program, while in Maryland they are being promoted as a way to "Save the Bay."

If you haven't heard of a rain garden before, the basic concept is quite simple—they are designed gardens or plantings that help capture and clean storm water runoff from gutters, driveways, lawns, and other impermeable or semi-permeable surfaces. This helps prevent soil erosion and reduces the amount of pollutants entering our rivers and ground water.

National interest in storm water management has been increasing exponentially because of the growing concern about non-point source (NPS) pollution, which the U.S. Environmental Protection Agency (EPA) now considers the leading cause of water quality problems

Above: Lorrie Otto used only native plants to create this rain garden in Bayside, Wisconsin.

# A TYPICAL RAIN GARDEN



in the United States. Unlike pollution that can be traced directly to one source—such as an industrial plant or a sewage treatment facility—NPS pollution is caused by a variety of manmade and natural pollutants that are picked up by runoff and then deposited into water bodies and water sheds. These pollutants include fertilizers, pesticides, oil, grease, de-icing salts, heavy metals, bacteria from animal wastes, and even sediment.

EPA studies indicate that as much as half of all pollutants in stormwater come from home landscapes, and some communities are now requiring home and business owners to find ways to avoid discharging stormwater into sewers. If you consider that a city block generates nine times more runoff than a woodland area the same size, it makes even more sense to plant rain gardens.

Rain gardens have been part of new housing developments and road construction projects for more than 20 years, but they have often been saddled with clunky and unromantic names such as bioretention

ponds, low impact developments (LIDS), infiltration basins, stormwater marshes, and even “wet gardens.”

Consultants to the Prince George’s County, Maryland, Department of Environmental Resources (DER) are credited with coining the term “rain gardens,” which helps convey the idea of relatively small, colorfully planted areas that collect rain water or snow melt. In home gardens, they are typically located near the downspouts of gutters, or in areas where water tends to wash off a sloping driveway. The water routed to these areas is filtered naturally by the garden’s plants and soils. As an added bonus, these plantings attract and provide habitat for birds, butterflies, and other beneficial wildlife.

## TAKING A CUE FROM NATURE

As with many successful ideas, the ecological model for rain gardens comes from nature, where vegetation, soil, and soil organisms slow down, filter, and store rainwater. Mature forests are particularly critical components of this process be-

cause over time they have developed a spongy litter layer that absorbs water and allows it to slowly percolate into the soil, where it replenishes watersheds and aquifers. According to the EPA, national forests alone are responsible for capturing and filtering the drinking water used by more than 60 million Americans.

“It’s not so much that this is a new idea,” says Carole Barth, an environmental planner with the Prince George’s County DER, “but we’re putting back water in the environment like Mother Nature did before we messed it up.”

Using the catchy slogan “From Rainbows to Rain Gardens,” the DER’s goal is to foster a million rain gardens to help protect the Chesapeake Bay through an outreach program that extends to Master Gardeners, garden clubs, local watershed groups, and schools.

In other words, rather than continuing to treat rainwater like a waste product by funneling it into stormwater sewer systems, it’s being valued as the precious natural resource that it is.

## FINDING A SITE

Late winter to early spring, when snows melt and rains fall, is the perfect time to evaluate your property to see if you can benefit from creating one or more rain gardens. Look for a low point in your yard where water tends to pool after storms, or an area along the street or driveway where you get a washout every time it rains. If you have had to add extenders to your gutters or install a French drain to route water away from the house, you may have perfect conditions for a rain garden.

There is no single formula for creating rain gardens—their shape, size, and plantings depend on many factors, including

where you live. But even a relatively small rain garden can help alleviate runoff problems. Consider starting with just one small plot that can easily be dug by hand, then extend it or add others later. If you have a steeply sloping lot or get a high volume of water flow during major storms, you may want to consult a landscape architect. Rain gardens should always be set well away from buildings, so there's no chance excess water could flow into the basement.

What rain gardens usually have in common is a relatively shallow saucer- or bowl-shaped depression where runoff initially collects. The soil in the bottom of this depression is often amended with a blend of organic matter, sand, gravel and

mulch to facilitate drainage. A slightly acidic soil—with a pH of 5.5 to 6.5—has been found to be ideal for the type of biochemical reactions that remove pollutants. Some rain gardens include an underdrain system or an overflow outlet to handle excess water during heavy storms.

The key is that the central basin shouldn't be so deep that water will stand in it long enough to kill plants or allow mosquitoes to breed in summer. If water overflows the depression during a heavy storm, it should be absorbed by plantings around the perimeter.

Before planting your rain garden, experts advise that you watch how the site handles two or three rainfalls. This will

## SOLVING PROBLEMS AT HOMES AND SCHOOLS

Rain gardens at three very different sites in and around Milwaukee, Wisconsin, illustrate how diverse such gardens can be and how they can be used both to solve drainage problems and to create beautiful, interesting plantings.

When Katie and John Clark were looking for something to replace the scraggly, balding lawn that underlay their wooded front yard, the idea of a meandering dry river bed seemed like a practical solution. But once runoff water began tumbling over small waterfalls in their new installation and woodland plants began to thrive, they realized that besides solving aesthetic problems, this new installation at their home in Elm Grove, a suburb of Milwaukee, boasted many advantages. During storms, when rainwater gushes down the driveway from the cul-de-sac that fronts their house, it now courses through the channel to a wooded area behind their house. As the runoff from their property and the street pools there, it soon infiltrates the soil and helps recharge and renew the groundwater.

At Indian Hill School in Brown Deer, a northeastern suburb, students routinely use a rain garden—as well as prairie and woodland plantings—as part of science lessons and projects. Begun in 1990, this verdant paradise fronting the modern, flat-roofed building was destined to become a formal garden before several mothers and local environmental activist Lorrie Otto lobbied the school board to install more naturalistic plantings. Water that flows through the rain garden eventually drains into a pond that hosts frogs, dragonflies, and other wildlife. "This is our outdoor classroom," said principal Rebecca Bell. "Each teacher uses it differently and ties it into the curriculum."

Otto has solved runoff problems in her own garden with what she calls "a drainage ditch that goes nowhere." This early version of a rain garden she created in the grass-clad drainage ditch that ran alongside the street in the front of her yard initially drew the ire of city officials. The city soon let her have her own way, however, and now stands of mature native plants such as white turtlehead (*Chelone glabra*), Indian grass (*Sorghastrum nutans*), and Joe Pye weed (*Eupatorium fistulosum*) edge a pond that collects filtered street runoff.

A lifelong environmental activist, this feisty 83-year-old is one of the founding members of Wild Ones—an organization that advocates naturalistic gardening—and is credited with fostering passage of legislation banning use of the pesticide DDT in Wisconsin in 1970, two years before Congress outlawed the pesticide nationally.

"I think there should be ordinances saying you must keep the rain water that falls on your property right there," says Otto. On this issue, at least, city officials around the country are finally beginning to see eye to eye with her. —M.K.



A rain garden at Indian Hill School in Brown Deer, a suburb of Milwaukee, Wisconsin, filters water that eventually drains into this pond. The rain garden and pond are integral parts of the school's outdoor classroom activities and science projects.

allow time for the amended soil in the basin to settle—if it settles too much, you may need to add more soil—and will let you see how long water stands in the basin. If you still have standing water after three days, you may need to improve the drainage.

Plants should be selected to fit the site chosen for the rain garden. Determining the exposure of the location—degree of sun or shade—is particularly important.

Rain gardens generally have two or three planting zones. The innermost planting zone in the bottom of the central basin should include plants that are happy having “wet feet” most of the year but that will also tolerate periods of drought—plants native to wetlands are good choices here. The second planting zone, on the sloping walls of the central basin, should include plants that tolerate periodic immersion and are also drought tolerant—plants native to the edges of streambanks are appropriate here. The third planting zone, around the perimeter of the basin, can include a variety of herbaceous perennials, shrubs, and even trees suited to your regional soil and climate.

Experts advise that all planting areas in rain gardens be covered with two or three inches of organic mulch. Research has shown that in addition to reducing weed problems, the mulch helps remove pollutants from the water filtering through it.

As the concept of rain gardens spreads rapidly, plant lists suited for different areas of the country are becoming available through regional university Extension agencies, departments of environmental protection, and some specialty nurseries (see “Resources,” page 41).

Usually, a minimal financial investment can yield an attractive addition to your landscaping.

## REDUCING SUBURBAN RUNOFF

Existing neighborhoods of major cities are also benefiting from rain gardens that slow the rush of storm water into municipal retention ponds and sewage facilities. For example, Seattle, Washington, claims that the innovative Street Edge Alternative (SEA Street), completed in 2000 by the Seattle Public Utilities and the Seattle Department of Transportation, is the first of its kind in the country. The project involved city agencies working directly with



In Seattle, severe runoff problems in one neighborhood were solved by creating rain gardens along the length of an entire street. Top: Before construction of rain gardens, runoff from this street flowed into a local creek. Above: Rain gardens not only absorb runoff but look great.

individual property owners in a three-and-a-half block area along a busy street in a 1950s subdivision that was built without curbs or gutters (see photographs above).

Previously, ditches along the edges of the properties carried a high volume of water that was contributing to the overload of Pipers Creek, a nearby waterway. Now, the flow is stemmed by a series of carefully designed plantings that run the length of the road. Each homeowner was able to choose from among six varieties of deciduous trees, five evergreens, 20 shrubs, 10 herbaceous perennials, two low-growing ground covers, and six types of wetland plants. While city workers did the planting, property owners are responsible for maintaining the gardens.

The prototype project has proven so successful that this technique is being applied to other streets that are subject to severe stormwater runoff.

Another innovative urban rain garden project is on display in the Swede Hollow neighborhood of St. Paul, Minnesota, where the neighborhood association joined forces with the city to help protect a restored wetland area along the Mississippi River from polluted runoff. Two vegetated swales funnel stormwater from a street into the 900-square-foot Maria Bates Rain Garden, designed by Barr Engineering.

Local elementary school students planted the garden, which features a diverse blend of native and adapted exotic plants such as big bluestem (*Schizachryium sco-*

*parium*), New England aster (*Aster novae-angliae*), blazing star (*Liatris aspera*), black-eyed Susan (*Rudbeckia fulgida* 'Goldsturm', and feather reed grass (*Calamagrostis x acutiflora* 'Karl Forster'). Neighborhood artists added a meandering walkway with signage that helps explain the garden's function, and benches encourage passersby to stop and savor the colorful plantings.



Above and top: At the Maria Bates Rain Garden in St. Paul, Minnesota, students from a local elementary school planted the garden with a mixture of native and adapted exotic plants.

The Seattle and St. Paul rain gardens are voluntary efforts to reduce stormwater runoff, but some municipalities are moving toward mandatory programs.

In Milwaukee, a new law will require 45,000 homeowners and businesses to disconnect downspouts from sanitary sewers served by the Milwaukee Metropolitan Sewerage District (MMSD) by 2007. An estimated 200 million gallons of rainwater that falls during heavy storms will thus be directed back to the ground, which should eliminate the city's need to dump diluted sewage into creeks, the Milwaukee River, or Lake Michigan every time three to five inches of rain falls quickly.

The district hopes to disconnect downspouts from 10,000 homes a year and will

pay homeowners \$50 per disconnected downspout beginning in 2004. By 2007, disconnections will be mandated. Besides rain gardens, green roofs, rain barrels, roof restrictors, and increasing the tree canopy are options the district intends to pursue.

### RESTORING PARADISE TO PARKING LOTS

Designing rain gardens in association with parking lots—which are major sources of both pollution and runoff—is something many municipalities, botanical gardens, and businesses are exploring. “We’ve installed a demonstration rain garden that catches runoff from the parking lot at the new Alterra Coffee House/Milwaukee Flushing Station on the lakefront,” says Kevin Shafer, executive director of MMSD.

Botanical gardens and arboreta see rain gardens as important elements of educational and environmental programs. In cooperation with the Virginia Department of Forestry, the Blandy Experimental Farm near Boyce, Virginia, installed a rain garden at its visitor's parking lot in 2001. And a rain garden is planned as part of new parking areas being constructed during renovation of the visitor center at the Minnesota Landscape Arboretum in Chanhassen.

As we look for ways to reconnect our gardens with the natural world around us, it's important to keep in mind that no gardens are truly natural. Wherever human settlement disrupts nature, problems develop unless people remember the words of conservationist Aldo Leopold: “The privilege of possessing the earth entails the responsibility of passing it on the better for our use.” Rain gardens are one way to reduce our own environmental footprint while at the same time creating a beautiful addition to our landscapes. ☺

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## Resources

**Environmental Protection Agency,**  
[www.epa.gov/cgi-bin/epa](http://www.epa.gov/cgi-bin/epa)

**Friends of Bassett Creek** (a private conservation group in Minneapolis, Minnesota), [www.mninter.net/~stack/rain/](http://www.mninter.net/~stack/rain/)

**GreenSpace Partners** (a community group in Minneapolis, Minnesota), [www.greeninstitute.org/GSP](http://www.greeninstitute.org/GSP)

**National Wildlife Federation's Backyard Wildlife Habitat Program,**  
[www.nwf.org/backyardwildlifehabitats](http://www.nwf.org/backyardwildlifehabitats)

**Natural Resources Defense Council,**  
[www.nrdc.org/water/pollution/grunoff.asp](http://www.nrdc.org/water/pollution/grunoff.asp)

**Prince George's County, Maryland, Department of Environmental Resources,** (301) 883-5852 / (301) 883-5834  
[www.co.pg.md.us/pgcounty/government/agencyindex/der/ppd/lid/bio/retention2.asp](http://www.co.pg.md.us/pgcounty/government/agencyindex/der/ppd/lid/bio/retention2.asp)

■ Offers booklet, new bioretention plant list of 150 hardy plant species.

**Seattle SEA Streets project,**  
[www.ci.seattle.wa.us/util/SEAstreets/default.htm](http://www.ci.seattle.wa.us/util/SEAstreets/default.htm)

**University of Wisconsin Extension Service,** Madison WI. (608) 262-3346 or toll-free (877) 947-7827.  
<http://clean-water.uwex.edu/pubs/>  
■ Offers publication titled *Rain Gardens: A Household Way to Improve Water Quality in Your Community.*

**Virginia Department of Forestry,**  
[http://state.vipnet.org/dof/rfb/riparian/rain\\_gardens.htm](http://state.vipnet.org/dof/rfb/riparian/rain_gardens.htm)

**Wild Ones,** [www.for-wild.org](http://www.for-wild.org)

**Wisconsin Department of Natural Resources,** Madison, WI. (608) 264-6217. [www.dnr.state.wi.us/](http://www.dnr.state.wi.us/)  
■ Offers pamphlet titled “Rain Gardens...Nature's Way to Control Runoff Pollution.”