

North Coast Rain Gardens



Capture rain and let the benefits flow

Rain gardens collect rain water and beautify a yard. They provide a simple form of rainwater harvesting, allowing homeowners to save valuable water from going down storm drains. Although more commonly found in wetter climates, rain gardens are beneficial in California's Mediterranean climate with our dry and wet seasons. Local rainfall does not meet water demand in the summer months and water is diverted from rivers, or pumped from wells to support local needs. Rain gardens offer an attractive and inexpensive way to conserve water.

Basically rain gardens receive rain that falls on a roof or other surfaces. The water is channeled, via rain gutters, pipes, swales or curb opening, into a depression in the yard where it soaks into the ground and waters vegetation. Contrary to what many people think, a rain garden is not a pond feature. A properly functioning rain garden holds water for only a short period of time. Most of the time, the bed of the rain garden is dry. The purpose is to retain water just long enough for it to percolate into the soil, recharging ground water. Ground water depletion is a concern in many areas.

Rain water has been collected by numerous cultures since ancient times, but the concept of a residential rain garden is recent. They were pioneered in Prince George's County, Maryland in 1990.

Rain gardens allow water to permeate the ground, and clean the water naturally. They also stop erosion and the damage silt borne water can cause to streams. They are basically home bioretention basins. They slow the flow of water, allowing it to percolate into the ground, where plants and soil microorganisms break down and remove pollutants such as phosphorus, nitrogen, heavy metals, and hydrocarbons. By keeping water on-site and preventing it from flowing onto the pavement, less contaminated water enters storm drains and local water bodies (rivers, streams, lakes, and/or the ocean). Damage to local aquatic ecosystems from erosion and pollution is avoided. Furthermore, rain gardens provide a host of other attractive benefits to homeowners: drinking water used for irrigation is decreased, less money is spent on landscape irrigation and if designed correctly, the likelihood of property flooding is reduced.



These plants will shade the ground more as they fill in, reducing weed competition and creating a lush look.

This publication provides rain garden information to get you started constructing a home rain garden. For more details and related information see the Resources section on page 6.



Planning a Rain Garden

Location, location, location...

To select a good location, observe your landscape during a rain storm and identify existing drainage patterns. Collect water from high points and let gravity move it. A downslope area that naturally receives water from a roof or over-land flow is ideal. Locate the rain garden in a natural depression or on a flat surface. The rain garden can be constructed on a hill but more digging will be necessary to produce a level bottom. Areas where the water table is high or the land is often water-saturated are not good options. Rain gardens should not be located over a septic system.

Remember, the idea is for water to soak into the ground and not pond. Be aware that any trees or large plants may not adapt well to a new watering regime. For this reason large tree roots should be avoided; also, they may be damaged during rain garden installation and can hinder the process. Furthermore, avoid any underground pipes or utilities. Lastly, if possible, site the garden in full or partial sunlight where plants will thrive.



To keep weeds down in the new raingarden, lawns or other pre-existing landscape plants may have to be let go, sheet mulched, or dug up.

Size and shape

Be creative when designing the rain garden: oval, round, long and narrow or kidney-bean shaped are all possibilities. Choose one complimentary to the layout of your yard. Determine the size of the rain garden based on the collection surface; it should be a minimum of 20% of the catchment area. For example, a 1000 square-foot roof top requires at least a 200 square-foot garden. As a rule of thumb the rain garden should be large enough to hold an inch of rain (this first-flush rain water carries the most contaminants). If the catchment area is a vegetated surface, such as a hillside where percolation will occur, then the rain garden can be much smaller relative to the catchment area. Refer to References and Resources on page 6 for more details.



The long stream bed keeps water flow rates down, letting it infiltrate the soil.

Catching and channeling the rain

Water is usually harvested from a roof, driveway or other impervious surface. Typically a gutter system and downspout are employed to direct water off the roof; rain chains are another decorative option. If the runoff from a roof directly hits the soil, cover the area with a bed of rocks to prevent soil erosion. For both roof and ground-level catchments, water is channeled toward the garden using downspout extensions (gutter pieces attached to the end of downspouts), pipes (often underground) or vegetated swales. If heavy water flow is expected, a ditch lined with rock is a good option. Also, swales can be fortified with landscape fabric and stones. Additionally, rock or stones are used to stabilize the area where water enters the garden and to prevent erosion. For good water flow channels should have a minimum 2% slope (1/4" per foot). The sides of



the channel should have a slope with a depth-to-width ratio of no more than 2:1 (for example if the swale is one foot in depth, its width should be no greater than two feet across). To hold rain water, the center of the garden should be between six and twelve inches at its deepest point in the center, with nine inches as a standard depth. The edges of the garden gently slope to the center with approximately a one-inch drop per foot to prevent erosion. Rain gardens on a slope will need a berm on the lower end to create a depression. On the down-slope side of the rain garden, use the soil removed from the center of the garden to make a berm three to six inches high and eight to twelve inches wide with gently sloping sides. The berm may be planted with drought-tolerant plants.

Overflow

Since most rain gardens are built to hold water from a one-inch rain event, they can handle water volume from the majority of California rain storms; it is, however, necessary to build an overflow route so when large storms hit, flooding does not occur. Often an overflow route can be directed off-site to a conventional stormwater drainage route (e.g., a driveway that drains to a storm drain in the street).



Reeds, sedges, and other riparian plants growing among the rocks also help to slow the water flow rate, while their roots provide avenues for it to soak into the soil.

Plant Selection

In California's Mediterranean climate there is no rainfall during six months of the year so, in the absence of irrigation, all plants will need to be drought tolerant. Native plants are a good option since they are well adapted to seasonal, short-duration water supply and long periods of drought. Different types of plants may be necessary for the rain garden. Those located in the bottom and on the sides of the garden will need selected species that can withstand complete inundation as well as extended drought conditions. Plants on the berm will not need to tolerate extended wet conditions, so this area can be planted with a variety of drought-tolerant or native plants including colorful annuals, grasses and herbaceous plants. You will find plant lists for California climate zones on the webpage <http://ucanr.edu/sites/RainGardens>. These lists will be reviewed periodically; additions and deletions will be made with new information.

We welcome you to add your experiences with certain species in the comment section.

Planting

Plant the rain garden when the soil is dry, preferably in the fall when the air temperatures are cooler, but the soil is still warm. Wet soil is more easily compacted, reducing permeability. Loosen the soil to a depth of approximately two feet to allow roots to grow and easier water seepage. Plant plants according to the needs of the particular species. Immediately after planting, but before mulching, water the garden thoroughly. Mulching is very important; apply two to four inches without covering small plants. Mulch should be re-applied each year until the plants have matured; use dense organic mulch that won't float away—shredded wood or coarse wood chips. Although the plants in the rain garden are drought-tolerant, you will need to water them during the first year while they are becoming established. After this, minimal or no watering is necessary.



Rain Garden Maintenance

Rain gardening is a dynamic process. It is important to test your system during a rain event. Observe if water is flowing where you want it to go and make necessary adjustments.

- Keep lowest areas free of debris
- Prevent erosion; block erosion trails
- Clean and repair channels, berms, and moats
- Dense shrub growth is desirable – generally, pruning is not necessary
- At the end of the rainy season remove accumulated sediment
- Collect seeds and cuttings from successful plants; use them next season
- Keep gutters and downspouts free of debris
- Continually reassess functionality

Despite a gardener's best efforts, creating a new garden disturbs soil, which may allow weeds to grow. While weeds may not initially seem like a problem, they can cause difficulties later such as growing profusely enough to block drainage channels, reducing the aesthetics of your garden, competing with more desirable plants for water and/or producing flammable debris during the dry season. Weed often during the first year or so while your plantings mature. As your plants establish themselves and grow larger, they will shade the ground beneath them, which along with mulch should reduce weed issues over time.



Getting help can make a large project both easier and more fun.

Site Selection Guidelines:

- **Down-slope rainwater collection surface**
- **Minimum five feet from structures without a basement; minimum ten feet from structures with a basement (check with your local jurisdiction for specific code requirements)**
- **Not over a septic system**
- **Not in a place that is already soggy**



Plants for Northern California Rain Gardens

Water Need: High	Water Need: Medium	Water Need: Low
Creeping Wildrye (<i>Elymus triticoides</i>)	Clustered Field Sedge S (<i>Carex praegracilis</i>)	Pitcher sage (<i>Salvia spathecea</i>)
Wild ginger S (<i>Asarum caudatum</i>)	Salt Grass (<i>Distichlis spicata</i>)	California Polypody Fern S (<i>Polypodium californicum</i>)
Torrent sedge (<i>Carex nudata</i>)	Common/Spreading Rush (<i>Juncus patens</i>)	Common Yarrow (<i>Achillea millefolium</i>)
Scouring rush (<i>Equisetum hyemale</i>)	Mexican Rush (<i>Juncus mexicanus</i>)	California Fuschia (<i>Epilobium canum</i>)
	Yerba Buena (<i>Clinopodium douglasii</i>) S	

***S** = can be used in shade

** Some of these plants might be challenging to locate: You may need to special order some species or visit a native plant nursery.

For more information, see the full Plant List for North Coast Rain Gardens at:

<http://cemarlin.ucanr.edu/files/200707.pdf>.

Benefits of Rain Gardens:

- Less imported water used for yard irrigation
- Lower water bills
- Reduces flooding and erosion
- Less polluted stormwater runoff
- Attractive yard features



The sinuous stream path and gravel bed help keep erosion down.

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Explore these References and Resources

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San Francisco Estuary Partnership

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Sonoma County Master Gardeners, University of California, Cooperative Extension

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www.raingardens.org



After a rain, water pools in the basin of this rain garden, allowing it to seep into the soil over the next few hours.

