

RAIN GARDENS FOR THE SOUTHWESTERN US

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What is a Rain Garden?

A rain garden is an area designed to use the rainwater from your roof; the extra water collected can create an attractive landscape feature that receives significantly more “rainfall” than the surrounding landscape. The depression for the collection of the runoff is a small “pond” in which storm water is naturally filtered and runoff from your property is reduced.

A rain garden typically uses native plants; these are species that are indigenous to a specific region. Plants in our small trial garden at the Community Nature Center are native to the Central AZ Highlands. Unlike many nursery species, these plants are adapted to the local soil and climate. Once established, native plants will require less water and less maintenance than non-native species; they will not need fertilizer. Importantly, these natives will not spread and harm our natural areas and they provide the best habitat for our local plants and animals.

How to Build a Rain Garden

Any homeowner can add a rain garden to their yard and keep more water on their site. Basically all you need to do is direct your home rooftop runoff to a shallow, excavated area. The sizing for this area is included in the instructions below. The garden size for a single-family home will typically range from 150 to 400 square feet. Add some native plants, or wait to see what emerges and select out invasive, non-native species.

Here are some steps to get you started:

1. Find a location. You should try to choose a naturally occurring low spot and a location where your downspouts can be easily tapped to direct rainwater into your garden. So first, observe your roof and drainage to find an area that is near to the downspouts you wish to use. Remember that more than one downspout could be connected and drain to one larger garden, or you could create more than one garden with water from different downspouts.

Rain gardens should be placed at least 10 feet away from your home to move the extra water away from your foundation. Do not locate the garden over a septic field.

2. Estimate the area of the rooftop that will drain into the garden. Since you have already determined the part of the roof you will use, now calculate the area. This will help determine the size of your garden. To find the area in square footage of this roof section, multiply width by length. If you are directing the water from any paved areas into the rain garden, add that square footage as well.

3. Use roof area and soil type to plan the size of the garden. A rain garden is designed to drain within four hours after a 1” rain. If your soil is decomposed granite, or is sandy,

water will drain through quickly. If your soil contains a lot of clay, or there is caliche, water will sit for a time, sometimes more than 24 hours! If this is your situation, a successful rain garden will require a lot of time and money. Information on establishing a rain garden in clay soils is available on-line, but will not be included here.

For sandy soil or decomposed granite, your rain garden dimension should be 20-30% of the area of roof you are draining. For example, our Community Nature Center cabin roof is 500 square feet. Our granite soils are well drained, so our rain garden is 100 – 150 square feet. To determine size for loam, use 30-35% of the roof area for your calculation. These numbers will ensure that the garden will hold the runoff from a 1" rain.

4. Design and layout your garden; choose your plants. Now that you know the general size you need, lay out your shape on the ground. Use a fitting to connect a 4" Flexline or PVC pipe from the downspout -- adapters may be available at your plumbing or irrigation store. Continue either type of pipe underground exposing it at the high point of the garden.

Once you have a shape you like and water to it, measure it and sketch it on paper. Your layout should be to scale, and should include the mature sizes of plants. As noted, native plants are suggested for rain gardens because they are best adapted for our climate. Included below is a list of plants that we are trying at the Nature Center; you may wish to try others. Some local nurseries do carry Natives. Plants selected for the edges of the garden should be more tolerant of dry conditions; plants lower in the basin should be more adapted to floodplain conditions. Many riparian edge species are particularly well suited to the extreme environments of rain gardens.

5. Dig the garden

Dig your garden approximately 4-8 inches deep. Use the soil to build a berm around the lower garden edges. The berms can be seeded with native grasses to soften the boundary. If you are adding other soil or compost, now is the time to mix it in.

Before you start digging be sure to locate underground utilities.

6. Plant and mulch the garden

Follow the design you created and place your plants in the approximate positions. Step back and look at the garden – you may want to adjust some of the plant placement. Remember to consider the mature size of shrubs and trees. Note that perennials can be placed close to young shrubs and trees. As these reach their larger sizes, perennial locations will have naturally changed, but this will give a nice look with which to start. Once you are satisfied you can start planting.

After planting is completed, add coarse, fibrous, shredded woodchips that will not blow away. Apply this layer about 2-3 inches deep. This will help to keep the moisture in and the weeds out. In the Prescott area, locally produced chippings are available for free (load yourself) at the City of Prescott transfer station. Chippings will float up when the basin fills, but settle back down as it drains.

7. Water

Here in the southwest, it is best to plant your garden just before the rainy season of summer, after humidity begins to rise. After you plant, make sure the soil retains consistent moisture. This may mean soaking it every 2-3 days if the weather is hot and dry. You may consider using a drip system until plants are established. Full establishment can take a few years and your garden will always need supplemental water during the months each year that we receive no rain. This supplemental water will diminish over time, but will always be necessary on the driest years to help plants in the late spring and early summer. In any case, plants located in or near your rain garden will have significantly more water during any year than those in surrounding areas. Enjoy your small, lush oasis!

Community Nature Center Garden

As noted above, the rain garden by the cabin at the Community Nature Center is sized to collect the flow from our 500 square foot cabin roof during a 1" rain event. Notice that the downspouts draw water from both sides of the roof and are connected to 4" PVC pipes that run underground to one end of the garden.

For our first trial at the Community Nature Center, we will be adding native species that occur in local riparian areas with seasonal water flow. We will initially put a few perennials, grasses and shrubs around the perimeter. Our "island" in the center holds trees that were already there: a pinyon pine, a New Mexico locust and an oak. It will be interesting to see how they grow with this supplemental water! We will also try some perennials and annuals tolerant of both wet and dry conditions in the basin. Our nearby drip system will be extended to the rain garden area for initial establishment, or for supplement on extremely dry years. All plants will need this supplement at first, the list below makes note of species that will be most sensitive to dry conditions.

As noted, there is a lot of information available about the creation and use of rain gardens in other parts of the country. We will include our experiences about this and other local rain gardens as we learn and grow! Check in at the Community Nature Center site; we will also keep information updated on this document link.

A Preliminary Plant Palette for Highlands Rain Gardens

<u>Scientific name</u>	<u>Common Name</u>	<u>Location</u>	<u>Notes</u>
		Well-drained	
Perennials:			
<i>Anisacanthus sp.</i>	Mexican Fire	basin	Plants
<i>Aquilegia chrysantha</i>	AZ Columbine	basin	Seed
<i>Eupatorium sp.</i>	Eupatorium	edge	
<i>Geranium spp.</i>	Wild Geranium	edge	
<i>Linum lewisii</i>	Blue Flax	edge	Seed
<i>Mimulus sp.</i>	Monkey-flower	basin	

<i>Monarda menthifolia</i>	Bee balm	basin	
<i>Penstemon strictus</i>	Rocky Mtn. Penstemon	edge	Needs drainage
<i>Phlox sp.</i>	Phlox	edge	
<i>Solidago spp.</i>	Goldenrod	edge	
<i>Stachys coccinea</i>	Texas Betony	basin	Will need suppl. H2O
<i>Viola sp.</i>	Violet	basin	Shade only

Native annuals can be seeded throughout the area

Grasses/ Sedges:

<i>Aristida purpurea</i>	Purple Three-Awn	any	Well drained
<i>Carex geyeri</i>	Elk Sedge	any	
<i>Carex spp.</i>	Sedge	basin	
<i>Hilaria mutica</i>	Tobosa	basin	Heavy clay, flooding
<i>Muhlenbergia emersleyi</i>	Bullgrass	any	No heavy clay, drought tol
<i>Muhlenbergia rigens</i>	Deergrass	basin	Large, suppl. H2O needed
<i>Panicum virgatum</i>	Switchgrass	any	
<i>Sporobolus cryptandrus</i>	Sand dropseed	basin	Most soils-prefer drainage

Most native grasses would work as seed on edges

Trees / shrubs:

<i>Amalanchier utahensis</i>	Serviceberry		Afternoon shade
<i>Amorpha fruticosa</i>	Indigo Bush		Best w/ shade
<i>Cercis canadensis</i>	Western Redbud		Afternoon shade
<i>Celtis reticulata</i>	Hackberry		
<i>Chilopsis linearis</i>	Desert Willow		
<i>Fendlera rupicola</i>	Fendler bush		
<i>Fraxinus velutina</i>	AZ Ash		
<i>Holodiscus dumosus</i>	Rock Spirea		Afternoon shade
<i>Juglans major</i>	Walnut		
<i>Rosa fendleri</i>	Wild Rose		Best w/ shade
<i>Sambucus caerulea</i>	Elderberry		

Trees & shrubs likely best at margins, all will need supplemental water to establish & during dry periods