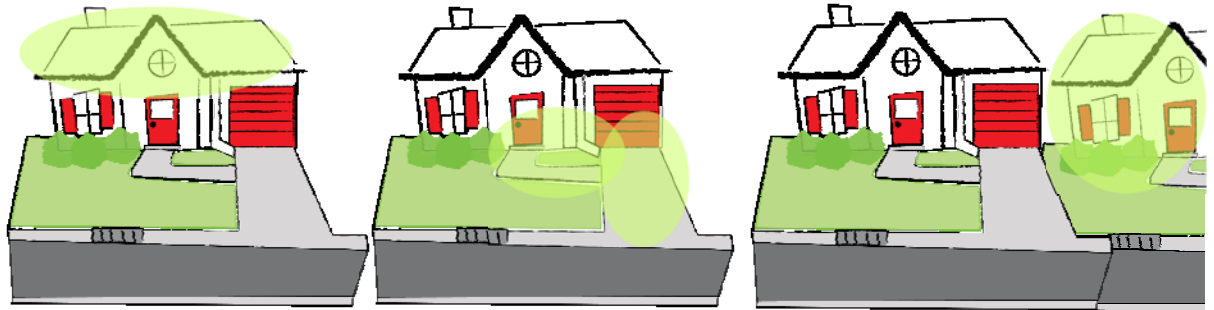


sources of runoff:



your roof

your driveway

your neighbor

determining your impervious surface:

Rain gardens are designed to hold runoff. Most of this runoff comes from the impervious surfaces at your home. Some even comes from your lawn, which is not as pervious as you might expect. That is why replacing lawn with conservation plants and rain gardens is such an effective stormwater management tool.

A rain garden is designed to hold water for a day or so. You may not have enough area to hold all the water you want and that is fine, as long as the overflow berm is stabilized with rocks and/or plants. The larger the rain garden area, the more runoff it will catch. The deeper the rain garden, the more runoff it will catch also. Any size rain garden is better than no rain garden.

So, how big do you need your rain garden to be? That depends on how much impervious surface area you have draining to it. In the example below, we will look at a simple roof with one peak.

Step 1: Calculate the area of your roof producing runoff you wish to capture in a rain garden.

The highest priority downspouts to capture in a rain garden are those that drain most directly to the stormwater system. The roof usually drains to a gutter and the gutter will run to downspouts. If you have two downspouts at either end of the gutter, you can assume half of the roof runoff goes to one and half to the other. Using our example on the next page, half the roof drains to the front yard and half of that drains to each downspout. We will direct runoff from one downspout to the rain garden.

The total roof area of a home is approximately the same square footage as your one-story home or the first floor of your multi-story home (although the roof area is actually greater than the area of the floor below it, because it is on an angle).

To calculate square footage, multiply length by width. Our example home has one peak in the middle of the house, so half the roof drains to the front and half drains to the back. So, you will divide the entire roof area by two. Now, you have the amount of water that will drain down the

front of your house. Because you have a downspout on each end, divide that number by two to get the amount of area that will direct rainwater to one of the downspouts and into the stream unless the rainwater is captured.

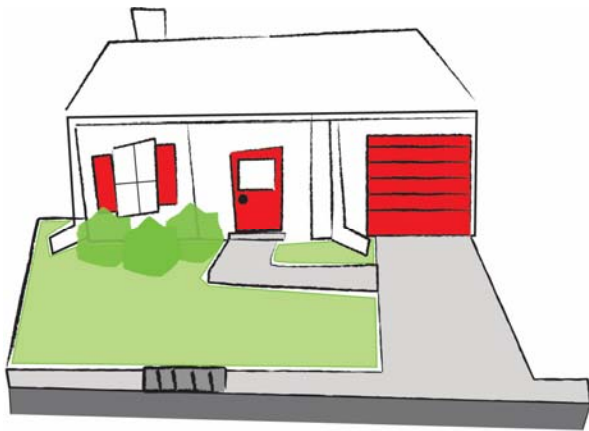
Step 2: Calculate the area of any concrete or other impermeable surface, such as driveway, walkways, out-building roofs, etc. that contributes to runoff leading to your rain garden. Multiple the length and width of each surface and add all the surfaces together.

Step 3: Add these two areas together. The area of the roof (Step 1) + the area of all the other impervious surfaces (Step 2) will give you the area in square feet that will contribute runoff to your rain garden.

Step 4: Convert the area from Step 3 into rain garden size. Use an average storm with 1 inch of rainfall. This means the rain garden should be sized to store and treat 1 inch of rain falling on the impervious areas leading to the rain garden. Construct your rain garden to be different depths, such as 3, 4 or 6 inches deep. The deeper it is, the smaller the surface area needs to be to hold the same amount of water (technically, we are determining the volume of the rain garden). The simplest way to determine the final area of a rain garden is to divide the area to be treated by the depth of the final garden. So, if you want to store and treat 600 square feet in a 6-inch-deep rain garden, divide the area from Step 3 by 6. That gives a 100-square-foot rain garden, which can be 10' x 10' or 5' x 20' or approximately 12' x 8'.

area of rain garden (sq ft) = area to be treated (sq ft) / depth of rain garden (in)

example:



Here is a roof that pitches in two directions. The problem area is in the front yard, where runoff quickly exits the property and flows into a storm drain.

- Total roof area = 1,000 square feet (sq. ft.)
 - Front half of roof = 500 sq. ft.
 - Driveway + Walkway = 400 sq. ft.
 - Total Impervious area = 900 sq. ft.
 - If one 6-inch-deep rain garden could capture it all, divide the impervious area by 6: $900/6 =$ a 150 sq. ft. rain garden
- A 150 sq. ft. garden could be 10' x 15', 5' x 30', approximately 12' x 12' or about a 14' circle.
 - BUT, this house does not drain all to the same place. Approximately half the roof drains to the left. You could build a rain garden for that 250 square feet of rainwater (half the front of the roof).

resources:

Three Rivers Rain Garden Alliance: raingardenalliance.org/right/calculator

NCSU Extension rain garden publications: chatham.ces.ncsu.edu/rain-gardens