

Landscaping Recharge Areas to Increase Spring Flow

By Patricia Michael

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There is no quick fix or easy answer to how to landscape your property, particularly in a region of karst geography. It depends on the characteristics of the property and what you want to do with it. Of course, what you want to do will depend, in part, on the characteristics of the property, so the first thing is to observe what you are working with. You want to find out how your place interacts with the larger watershed. Here is a checklist of things to look for:

- ❑ Look for abandoned wells, caves, sinkholes and fractures. If you have any, you will need to get advice from an expert to care for them.
- ❑ Identify your surface flows. Where does the water flow?
- ❑ Identify your recharge areas, places where water goes into the ground.
 - Discrete – surface water enters at specific spots such as sinkholes.
 - Diffuse – surface water enters over a large area through small fractures or granular material.
- ❑ See if you have any discharge areas on your property, places where water comes out of the ground.
 - Discrete – specific springs or wells.
 - Diffuse – series of small springs or seeps.
- ❑ See if you have any estavelles, places that sometimes recharge and sometimes discharge. (This phenomenon is caused by changes in the water table.)
- ❑ Learn how to mark contours on your land and know what your slopes are. If you have a slope that is 30 degrees or steeper, work with a professional engineer.

Depending on the features you find on your land, there are a number of things you might want to do.

- Divert water (change its surface flow).
- Infiltrate water (hold it on the land so it will go into the ground).
- Clean the water to remove sediment and debris, making it less likely to stop up sub-surface flows.
- Use less water so you won't deplete the water table so much.
- Change the timing of delivery of the water, for instance to catch a sudden rainfall and disperse it over your land or into the ground over time.

Here are some ideas for achieving each of these goals. Many of the techniques accomplish several goals at once. (That's one of the fundamental principles of Permaculture: make each element serve many functions.)

Diverting surface flows

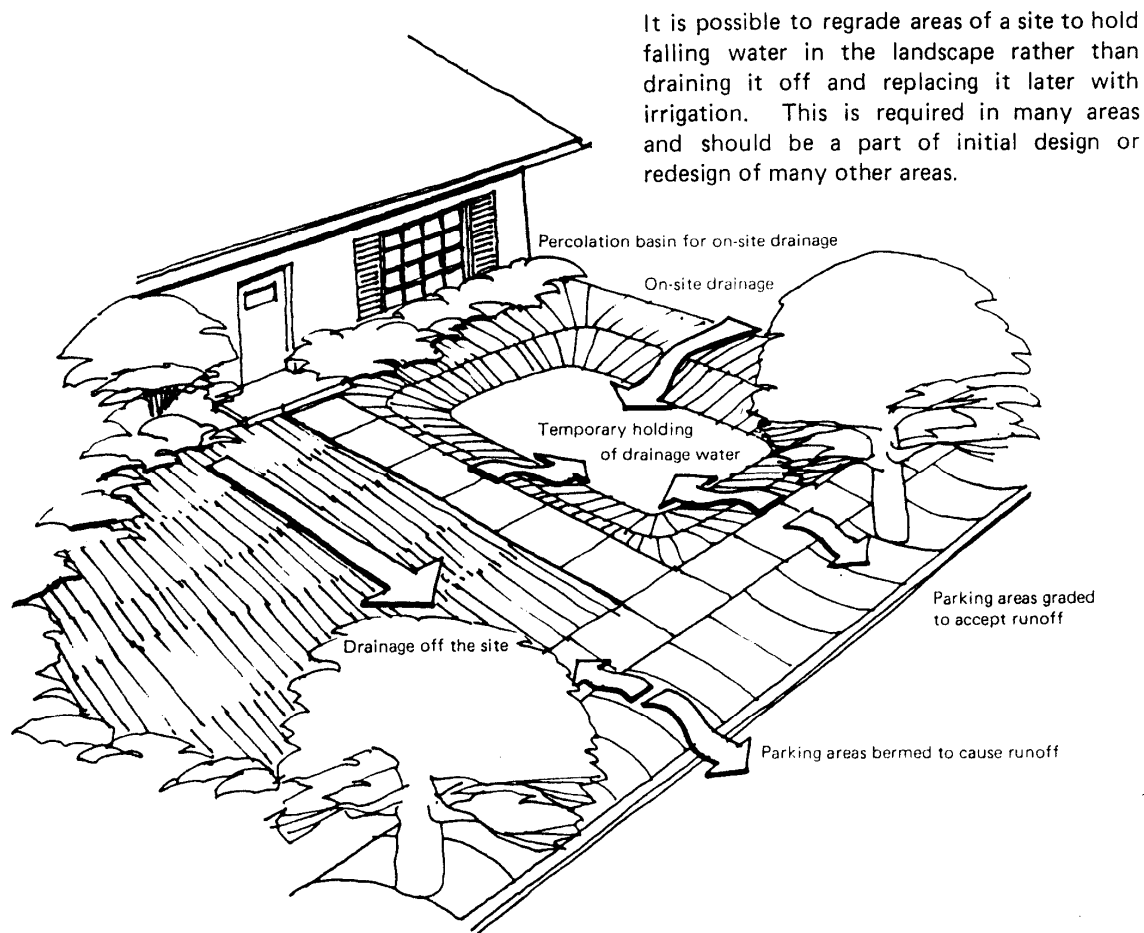
Build check dams to block the flow or slow it down.

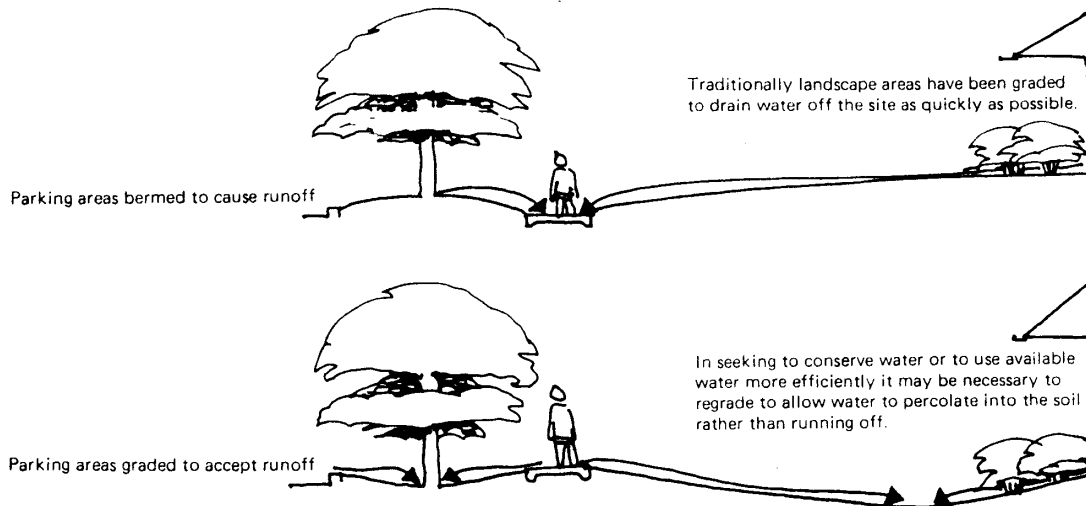
Build channels or ditches to divert it somewhere else. Berms, curbs and walls also change the direction of the flow.

Create impermeable ground cover, such as pavement on driveways or paths, to move rainwater quickly somewhere else.

Plant lawns to hold the soil but allow little water to soak in.

Here are some illustrations of how to divert surface flows:





Infiltrating water

Slow the flow of water over your land by building berms and swales on contour with the ends turned uphill. A *berm* is a raised mound of earth or other materials. A *swale* is a shallow place. If you dig a swale on contour, like a ditch, and place a berm just downhill from it, like a wall, water flowing down gets stopped. Since the swale and berm are on contour, the water does not flow out or around them. Instead, it infiltrates right there. This is a way of creating an intentional recharge zone.

Create permeable cover to allow water to seep into the ground where it is. For instance you can make a path out of washed river rock, stepping stones or mulch.

It is a good idea to make household scale sedimentation and infiltration basins both to increase the water available for vegetation on your property and to help recharge the aquifer. Diffuse recharge areas have a softer impact. Make a vegetated wetland basin to catch water and increase species diversity on your land.

Cleaning water

Filter the water to remove sediment and debris. There are number of plants you can use to remove impurities, such as Datura (cleans radiation and heavy metals), Chrysanthemum (cleans benzene), English Ivy (cleans xylene and benzene) or Tulip (cleans ammonia, formaldehyde and xylene). Also using berms and swales to slow water flow (see above, under Infiltrating water) also helps stop erosion, so soil stays on the ground instead of going into the recharge areas.

Plant low, multi-stemmed plants on contour to catch nutrients and sediment.

Do organic gardening and agriculture to reduce pesticides, herbicides and fertilizers in the ground water. Use Integrated Pest Management (IPM) to control unwanted insects through natural means.

Watch how you use acid-based products such as herbicides, bleaches, salts and detergents. The acid can leach into the ground and dissolve limestone to create new channels. Be sure you know where the underground channels currently go and see if you really want to risk creating new ones.

Watch your use of de-icing salts in winter. Does the salt leach into the ground? You may want to divert the salt to a retaining area.

Create filter strips on contour made of tree branches and twigs or rock such as crushed granite, limestone or sand.

Clean all the trash out of your sink holes.

Pick up animal droppings and compost them.

Reducing water use

Use plants that don't need much water. Plant species that are native to your area. Plant bottom-land species down low and higher-land species up high. Things that thrive in river bottoms generally need a lot of water, so don't plant them where you'll need to water them constantly.

Plant native evergreen perennials; they give more show for less water and labor.

Changing the timing

You can slow the flow of water by using berms and swales (see above, under Infiltrating water.) You can also slow it by breaking it up, for instance by putting rocks in a stream bed. Having slowed it, you can divert it to a holding pond, where you can regulate its discharge.

Planting on contour also slows the water flow. You can make berms of rocks or tree branches on contour.

Other things

Test your wells at least once a year to make sure you are getting clean water. If the water quality has changed from last time, figure out what has changed upstream from you.

When you are drilling wells, respect the location and the local regulations. Make sure the regulations are written for karst areas.

Plug old wells with sand and cement after you have removed the casing. This will reduce discrete recharge and make the water available for more diffuse recharge.

About Patricia

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