

SPONGE LADDERS

A Water Harvesting Method for Establishing Perimeter Shelterbelts on Sloped Sites

By Chris Meuli

Many of the water harvesting concepts in drylands permaculture assume a sizable amount of land. Some of us are blessed with modest-sized parcels in the one-quarter to ten-acre range. The smaller the site the more the edge effect is emphasized, because the ratio of the perimeter to the total area of the site increases as the site gets smaller.

Our neighbors are close. There is little space to modify the vectors that affect zones one and two on our small sites. Fortunately, perimeter shelter belts of trees and shrubs can be extremely useful translators in the landscape, and sponge ladders for water absorption can help establish these vital shelter belts.

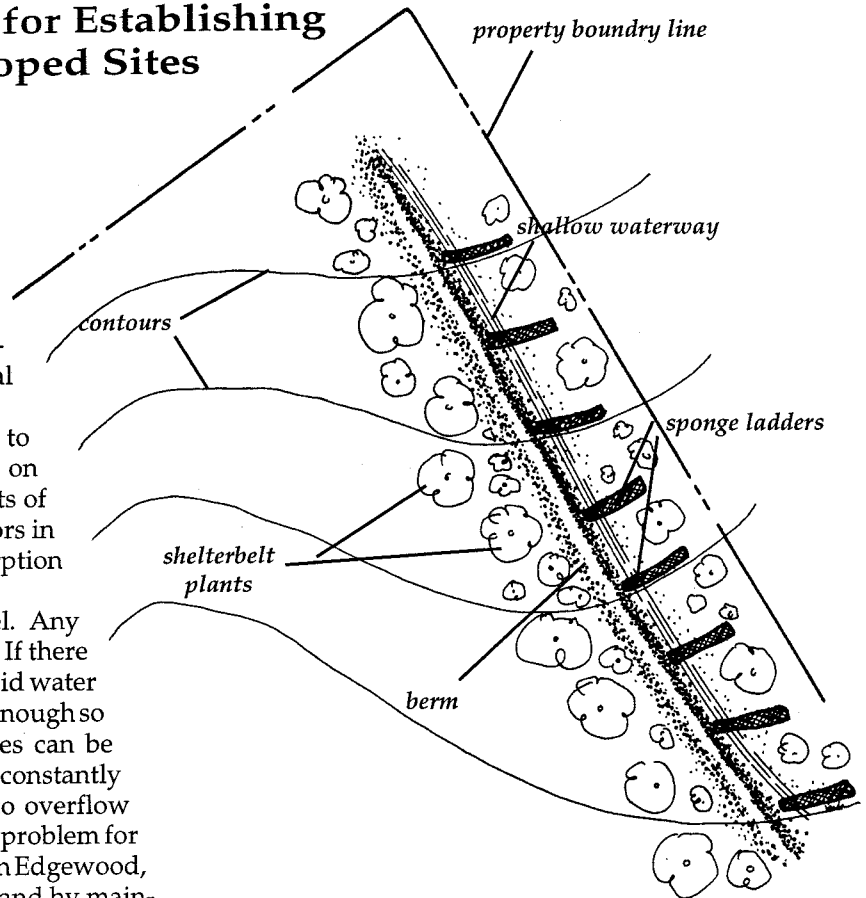
The challenge is that very few sites are level. Any perimeter shelter belt is unlikely to be on contour. If there is any significant slope, it is difficult to hold the rapid water runoff from infrequent but heavy rain events long enough so the water can soak into the soil. Fishscale swales can be useful, but they have to be carefully monitored and constantly reworked so they don't silt in, allowing water to overflow away from the shelter belt. I've struggled with this problem for over a decade on a moderately steep eight-acre site in Edgewood, New Mexico. Through many small interventions and by maintaining close observation, the sponge ladder solution has evolved.

The sponge ladder uses a series of very short, deep swales to collect and store water along a shallowly dug waterway that runs off contour. The waterway guides the water parallel to the property boundary so it can soak into the shelter belt soil. Sponges placed at 6 to 15-foot intervals along the waterway slow down and absorb water, making it available to the living soil and the nearby plants. The "sponges" are trenches dug on contour to a depth of 15" - 20" that are 10" - 15" wide and 2 to 6 feet long. They are packed with straw, leaves, grass clippings or any type of organic material that will quickly soak up water and slowly release it over time.

The top of the fully mulched sponge is even with the bottom of the waterway; this allows all surplus water to run down the waterway to the next sponge. This greatly increases the absorption of water along the edge of the property and facilitates the establishment of the perimeter shelter belt.

I dig sponge ladders with a shovel, using the soil to form a berm that parallels the waterway. They may be redug and remulched every 3-5 years to renew their absorptive capacity. This rich loam can be used as a soil dressing in the shelter belt or elsewhere.

Using sponge ladders can help us establish perimeter shelter belts of trees and shrubs that require little care or added water. These shelter belts act as permeable barriers for a variety of natural vectors such as water, wind, sound, animals and light. They also attenuate our exposure to local manmade nuisance vectors like noises, odors, dust and nocturnal light pollution. They attract a variety of birds and animals and help us harvest detritus and water from our up slope neighbors. They should be pleasant and beautiful and can further increase the amount of edge on our site. They are easy to establish and provide a great opportunity to observe water flow patterns over time.



Sponge ladders are dug on contour. Shelterbelt plants on this site (at 6700' altitude) include austrian pine, scotch pine, rocky mountain juniper, eastern red cedar, apache plume New Mexico privet (forestiera), and a possible invader species, black locust.

Chris Meuli is a physician, the grandson of a conservation rancher, and a lifelong resident of New Mexico. His inherited interest in the land led him to permaculture literature in 1981; he is a graduate of the 1992 design course in Eldorado, NM.