

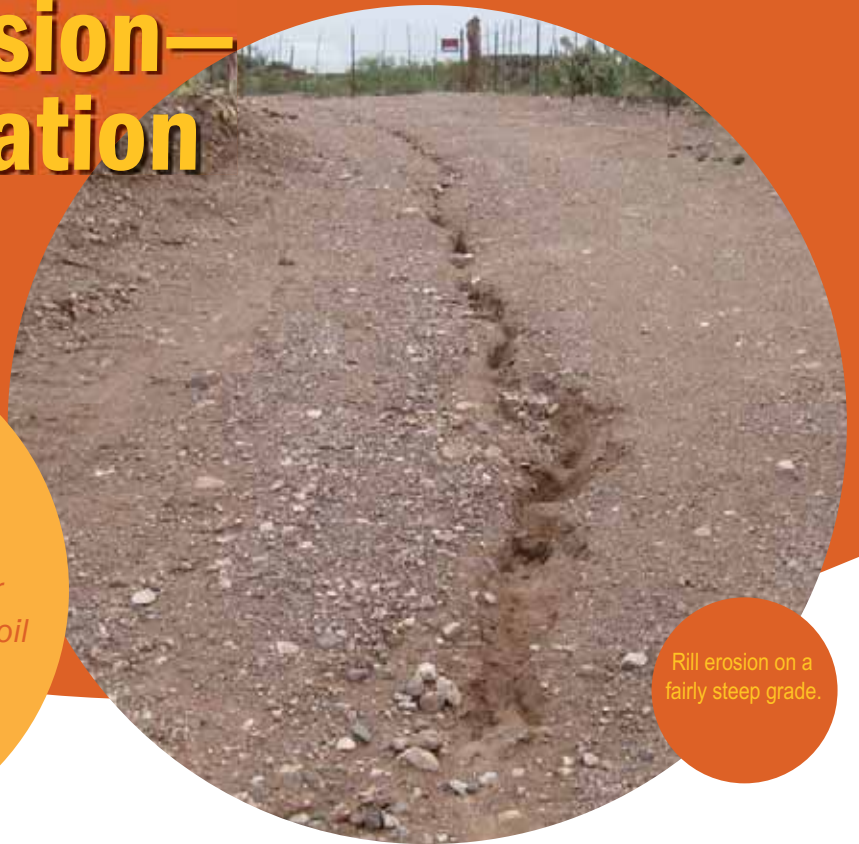
Backyard Erosion— a NIMBY Situation

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E*rode vt, to eat or
wear away, as soil by the
action of water

E*ro*sion n, action of water
and wind wearing away the soil
surface

Nim*bee n, not in my back
yard



Barbara Clark

Rill erosion on a
fairly steep grade.

Why would anyone think of erosion as something you wouldn't want in your backyard? As a matter of fact, who even thinks about erosion as something pertinent to everyday lives out here beyond the sidewalks? Erosion of what? Family values or faith in the stock market? Neither; the kind of erosion addressed here is much more basic than even those topics—and it has to do with the fundamental underpinning for our living world: the state of the soil. Perhaps we should say “The State of the Soil” because it is so basic to the health of the watershed. Uh-oh, a healthy watershed? New concept to you? Don't have a shed for water? Yes you do, and it's the soil in your backyard.

Your backyard is part of a larger watershed, which can be very simply described as the “land on which water falls from the atmosphere; this water may be stored within the soil, and, over a period of time, is released downslope to other locations.”¹ Every part of a watershed is important and so, your backyard is important not only to you, but to the larger landscape around it.

Most important to your backyard, conditions on the land determine how well the rainfall is absorbed into the soil and that in turn indicates how your backyard watershed is functioning. If you take the time to observe how rainfall behaves when it hits the soil on your property, or note the after-effects of a strong rainfall event, you will have taken the first step towards understanding if the soil in your backyard is acting like a sponge and absorbing rainfall or if the soil is being carried off in runoff as water flows over the land.

Soil erosion is a “non-point source pollutant” because we don't always know where it comes from, yet it impairs downstream water quality and can affect aquatic wildlife. Closer to home in our backyards, this stormwater runoff further degrades on-site soil conditions and causes a variety of annoying problems on your property.

There are actions that you can take to solve some of those erosion problems, but let's talk first a bit more about “The State of the Soil” since it is the foundation upon which our living world depends. You will be enhancing effective use of rainfall if you build soil sponge capacity and you will solve erosion problems on your site if water can infiltrate the soil instead of removing it by flowing overland in sheet flow, rills (small erosional rivulets), and those ever-expanding gullies.

In many of our desert backyards, soil structure has been negatively impacted by a variety of extraordinary disturbances. Perhaps unmanaged grazing has removed too much plant cover, construction has removed topsoil, or road excavation has changed drainage patterns. The above- and below-ground plant communities in semi-desert landscapes are well adapted to drought and wildfire, but very sensitive to additional disturbances, depending on the timing (when it happens), intensity (how severe it is), and frequency (how often it occurs). Sometimes these disturbances are so extreme that they are beyond what a desert ecosystem is adapted to handle and regenerate. The system loses its ability to recover (resiliency), because it lost the variety of elements (biodiversity) that contribute to a living soil.

¹ Nevada Association of Conservation Districts, 1995, *Nonpoint Source Management Program*



Headcut soil erosion is the start of gully formation.

So, walk around your backyard and take a good hard look at the soil conditions. Topsoil in our desert climate is typically less than four inches deep. It has plant roots, fungi, worms and insects and supports a variety of plants and small animals. Dead organic material (litter) covers and provides soil surface protection and as it decomposes, humus is produced by microorganisms. This provides spaces between the mineral particles of your soil which means that the soil structure can both absorb water and support more plant growth (cover).

Plants provide food and shelter to small animals, insects, and birds which in turn contribute their additions (manure, carcasses) to the process. The leaves and branches of plants also provide soil surface protection. They soften the impact of hard rainfall, which can further compact soil particles. They also provide shade for the soil, lowering evaporation rates and keeping moisture in the soil longer.

If you find that the soil surface does not have a living plant cover and/or a litter of dead plant material, chances are that its ability to absorb water has been seriously degraded. You may note that the top layer of soil is hardened or removed. Because of this “capping”, precipitation runs over the land surface instead of infiltrating into the soil. Without moisture, the soil’s ability to absorb water and sustain plant growth further declines.

To change this negative cycle of excessive rainwater runoff, we have to help the soil retain more water. To start that regenerative process, runoff must be slowed down. This gives the water more time to soften the hard soil crust, permeate the soil particles, and activate the soil fungi that help support plant roots. Rainfall that is captured on-site benefits the existing plant life, which in turn further protects the soil surface. Dormant seeds may get the opportunity to sprout. Plants also protect the soil from wind erosion (blowing dust) with both their leaves and roots as well as helping it stay in place when heavy rainfall events happen.

There are several ways to slow down stormwater runoff and stop erosion in your backyard. “Technically, erosion occurs when there is insufficient cover to protect the soil’s surface from raindrop impact or the shear stress of flowing water. Erosion worsens with increasing slope angle, slope length, and fragility of the soil.”² You will need to research these techniques and match the treatment to your site conditions. Basically, you will be trying to harvest rainfall to restore the sponge capacity of the soil.

As you assess your land, you may see patterns of soil loss that are called sheet flow (water running overland), rills (small rivulets), or gullies (deeper incised trenches). These will lead to washes or arroyos. Start to harvest water at the top of your watershed—the highest part of your property. Start small, where the water has not reached a larger wash. Don’t necessarily try to retain all the runoff; your goal is to slow it down, spread it out, and let some of it soak in. This way you can dissipate the erosive force of the flowing water and retain soil particles, organic material, and moisture. If you start small, you will have the opportunity to learn if what you did was effective and build on that, rather than having to deal with the unintended consequence of poorly designed or executed measures that might add to the problem.

Water harvesting on slopes can be done by placing barriers on the contours of your land. They can be made from locally available materials, including soil, rocks, straw bales, logs and branches, and straw wattles. Structures that slow the water down are rather low and meant to be breached. Some structures might be used to retain or divert storm water runoff and they are high enough to direct the overland flow to where it can be safely used. Applying mulch over the soil surface is always a very good start to healing the soil.

Water harvesting to heal gullies on flatter ground can be done with grade control structures, induced meandering, and revegetation. The speed and force of runoff is concentrated in gullies and grade control structures are low in profile to prevent the gully from becoming deeper and promote soil retention and subsequent plant growth. Directing the flow of water from side to side in a stream channel also slows erosive forces.

The purpose of this brief discussion on soil erosion is to acquaint you with the concept of protecting and nurturing our desert soils, the life-giving dirt in your back yard. Now that you can “see what you are looking at” when you walk your land, you are encouraged to look further into the many techniques available to help build soil capacity by restoring the sponge in your own backyard ‘shed!

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² Bill Zeedyk and Jan-Willem Jansens, 2006, *An Introduction to Erosion Control*