

Grasses, Soil, Erosion, Water Catchment--All Connected

Native bunch grasses are a critical component of our Hill Country habitat, so much so that it is hard to have a discussion about any issue associated with our native habitat without discussing grasses. And a discussion of any of these issues necessarily begins with a discussion of the characteristics and growth processes of grasses.

Native bunch grasses germinate from seed by producing a single green blade, at the base of which is a tiny root. As the plant grows, more blades of grass and more roots are formed in an ever-enlarging circle, or "bunch", with the mass of roots below ground resembling the above-ground leaves.

Our native grasses evolved to be grazed periodically by migrating herds of herbivores, but when the grasses had been grazed, the herds moved on and would not return to any given location until the grass had grown back. So even though the migrating herds ate the grass down, it was not "overgrazed" in the sense of the health of the grass, as long as the remaining leaves could carry out enough photosynthesis to make all the necessary carbohydrates for new leaves and roots and restore the grass plant to its original condition.

When European settlers moved in with their livestock, which were not migratory, but grazed the same piece of land continuously, the grass never had time to recover. And as the above-ground leaf area was reduced its ability to supply the roots with the necessary carbohydrates was diminished and the result was that the grass plants became smaller and weaker.

The smaller and weaker grass plants not only meant there was less above-ground vegetation but also less below-ground root systems, and all of the micro- and macro-organisms that live in a symbiotic relationship with the plant roots were also reduced as well as the total organic matter content of the soil. So continuous grazing not only reduced the amount of available forage above ground, but it also reduced the health of the soil and its fertility and future ability to grow more grass.

Soil is a mixture of finely eroded rock of different textures from large-particle sand to fine-particle clay. In addition, healthy soil has organic matter, both living bacteria, and fungi, nematodes, earthworms, beetles, ants, etc., but also dead, decaying organic matter such as dead roots and leaf litter. The other components of soil are air and water.

In the Hill Country, the component of soil most lacking is organic matter. Dead organic matter contains components the living plants need for healthy growth, and it also gives the soil a lighter texture which makes it more porous for water to infiltrate. And the greater the amount of organic matter, the greater the amount of water the soil can hold, all else being equal.

So healthy grasslands have healthier soil which not only is capable of growing more new vegetation, but it can also hold more soil moisture. The soil under native grasses is

more porous than that under bare ground, so more water soaks into the ground and less runs off in healthy grasslands than on land with sparse grass cover and more bare ground. Furthermore, dense grass cover slows down the flow of water, giving it more time to soak in and to drop any sediment the water might be carrying.

Erosion usually starts with raindrops striking bare soil, dislodging tiny particles of soil and carrying them off. Good stands of native grasses not only reduce the amount of bare ground, thus preventing as much soil from being dislodged, but by slowing down the flow of water across the land and making a porous soil these grasses greatly reduce the amount of erosion and store more water in the soil.

So, healthy grasses make for healthy, fertile soil which can grow more vegetation; grass as well as forbs and woodies. It also reduces the amount of erosion from both wind and water, and allows for the infiltration of water into the ground to both nourish vegetation but to also seep deeper underground to replenish local water tables and even sometimes an aquifer.

Excessive mowing or grazing reduces the ability of native grasses to function as discussed above, and thus leads to poorer soil, more erosion and less soil moisture. Well-managed land with low stocking rates and rotational grazing can give the grasses time to recover and function as they have historically.

Until next time...

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