

## Plant Succession: How Mother Nature Rearranges Her Landscape, and How We Are Involved

Think about a volcano emerging from the surface of the ocean and forming a new island, new land. At first there is no life of any kind on the island. Eventually, however, after the lava has cooled, there may be some bacteria and fungi begin to grow on the lava at the edge of the water, and these microorganisms begin a very long, slow process of breaking down the rock. Then algae can begin to colonize the rocks, growing on the decomposed rock material.

As the algae and other lower forms of life grow, die and decay, organic matter is added to the decomposed rock and we have the beginnings of soil. This is followed by the higher plants, some arriving at the island by sea, some in bird droppings. As the amount of vegetation increases, insects blown by the wind and other small animals arriving on drifting seaweed begin to colonize the island. The pace of change increases as larger and larger plants and animals become established and the amount of soil increases, and eventually you have Hawaii, or Trinidad or Puerto Rico, with trees and jungles.

This progression from small, short-lived plants to larger, longer-lived plants is typical as long as the amount of soil and rainwater is sufficient to grow the larger plants.

This natural process is called “plant succession”, and it has gone on and continues to go on everywhere. Plant succession is the natural process by which one group of plants succeeds or takes over from another group. When this process stops and the plant composition remains stable, it is sometimes referred to as the climax plant community. The climax plant community will continue until some major event (climate change or major human activity) occurs in the environment that changes which plant(s) are favored over others. If this occurs, plant succession will begin again and may take the community in a different direction.

Before Europeans arrived in large numbers in the Hill Country, we had more open grasslands with fewer trees than we do now. The grasslands were made up of a larger percentage of taller grasses, and these grasses were grazed by large herds of bison on an infrequent, basis. These grasslands also burned every few years, fires caused by either lightning or the Native Americans. This was the climax plant community prior to the early 1800s.

When the European settlers moved in, they brought livestock with them which grazed the same area constantly, thus greatly reducing the amount and species composition of the grass, and they fought fires with all their might. This changed the area from one where the grasses were denser and larger and burned every few years, and these fires killed small woody-plant saplings, to one of smaller, less dense grasses with fewer fires,

an environment more suitable for woody-plant growth. This human-induced change in the environment caused plant succession to take the Hill Country from one with many areas of open grasslands to more savanna-like areas with significant woody plant populations.

But it turns out that cedar is faster at expanding into this new fire-free environment than hardwoods are, and so the percentage of cedar has increased, relative to hardwoods. And to exacerbate things further, in more recent times, say the 1960s to the present, the significant increase in white-tailed deer populations, again caused by man's activities, has shifted the plant succession yet again to slow the population growth of hardwoods, (good deer food) but allow the cedar (poor deer food) to increase largely unchecked, thus our current cedar overabundance.

Prescribed burns are very effective in killing small (3' or less) cedar bushes and keeping once-cleared areas free of cedar.

In other words, man's activities caused the encroachment of cedar in the first place by altering the environment to continuously grazed frequent fire, allowing plant succession to take the landscape in a different direction, and now we are reversing the process by reintroducing fire where it had once been largely eliminated and again allowing plant succession to change the landscape more to our liking.

You may argue whether all of this is good, bad, or inevitable, but it does tell us a lot about how to manage land to achieve our desired result. Or as Aldo Leopold famously observed, habitat "can be restored by the creative use of the same tools which have heretofore destroyed it- ax, cow, plow, fire and gun."

I am available every Friday at Riverside Nature Center from 10 to 12 to talk one on one with anyone with questions or who just wants to talk about any issues related to nature.

Until next time...

Jim Stanley is a Texas Master Naturalist and the author of the books "Hill Country Ecology," "Hill Country Landowner's Guide" and "A Beginner's Handbook for Rural Texas Landowners." He can be reached at [jstmn@ktc.com](mailto:jstmn@ktc.com). Previous columns can be seen at [www.hillcountrynaturalist.org](http://www.hillcountrynaturalist.org).