

## Biodiversity: More Complicated, and Perhaps More Important Than We Thought

Regular readers of these columns have probably read something along the lines of: “One of the most important characteristics of a healthy, sustainable, productive native habitat is that it is biodiverse.”

And there is certainly nothing wrong with that statement, as far as it goes.

When most people think about biodiversity, they think in terms of the number of plant and/or animal species that can be found on any given property or natural area—the more different species, the more biodiverse. But there is no single number of species that above that number is good biodiversity and below that number is not.

In general, high rainfall areas and warm temperatures favor higher numbers of plant and animal species than drier or colder areas. But land management also affects biodiversity. When European settlers moved into areas such as the Hill Country, their continuous grazing (overgrazing) of livestock reduced the numbers of native species.

When prairies or rangelands were plowed and planted in single crops, the biodiversity was almost totally destroyed. Cedar encroachment has replaced many different species with many fewer species. And modern man has introduced many non-native species which have crowded out natives, again reducing the native biodiversity.

One might ask, why do we need many different native species to have a healthy, sustainable, functioning native habitat? I hope I can answer that.

Think of whatever food you like to eat that is the most nutritious and “good for you.” You can probably buy it at your local grocery store or restaurant pretty much year around. But if you are a native animal, is there anything that you can eat that is good for you and is available year round in your native habitat? I think not.

Every herbivore must be able to find something to eat in its habitat that provides all the nutrients it needs for them all year around. That means not only in the spring, but also in the summer, the fall and the winter as well. Thus the habitat must have available different plants that produce different nutrients, not just for the survival of the herbivores, but for them to be able to reproduce and to nourish their young as well, so the species survives. In most areas, no one plant can do that—it takes a diversity.

Let’s think about quail. The primary food for quail is seeds of grasses and forbs. But what about when their brood hatches and their little 1-inch tall chicks dry off and begin to walk around looking for something to eat, especially having enough protein for them to grow to maturity. They need insects—little insects at first, then larger ones later.

Where do their insects come from? Native insects evolved along with various species of native plants and they all hatch and grow and reproduce at different times in different

micro environments. So it takes different species of plants to have different species of insects at different times to feed different species of birds and small animals, etc., etc..

One might think that the larger herbivores would not have the problems that quail or insects do to find all of the nutrients they need. But cattle also need to have nutritious food all year long. And their requirements change for cows during pregnancy and lactation, and the grasses in their pasture may not provide what they need all year.

An experiment was conducted where half of a herd was grazed on a monoculture of an introduced forage grass and the other half of the herd was grazed on a pasture with multi-species of native grasses and forbs. The results were that the herd on diverse native grasses had a significantly higher rate of conception and of calf weaning weights than the herd on the introduced, fertilized grass.

Everything I have said above relates to the diversity of plants above ground. But diversity of the microorganisms below ground is important too—one species of plant benefiting from the microorganisms associated with an adjacent plant species.

You can think of it as beginning from below ground up. Diversity in soil organisms helps to sustain diversity of plants which in turn helps in maintaining the diversity of insects, which helps maintain diversity of birds and small animals, and so on. And diversity of prairie plants benefits large herbivores by providing better mixtures of nutrients throughout the year.

Obviously all of this evolved to be this way until Europeans moved in and altered the Hill Country ecology to make it less diverse. But the good news is that we can mostly bring it back with time and effort, and many landowners have done, and are doing, so.

Until next time...

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