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Nature manages native plant communities

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Several things drive native plant communities: sunlight, soils, water, herbivory, fire and rest. They may be called processes, factors, cycles, tools,

practices, etc., but whatever the semantics, native plant communities require them. These things are interconnected and codependent. Without appropriate amounts of each, native plant communities change and decline. These are the means by which nature maintains plant communities, and we could learn a few things by paying attention. Most people understand the importance of sunlight, soils and water, but fewer recognize the importance of herbivory, fire and rest to native plant communities.

Sunlight is the primary energy source for most forms of plant life. Plants without adequate sunlight generally decline or die. We may not have any control over the amount of sunlight reaching our spot on Earth, but we can influence its impacts. Excessive grazing removes too much leaf material that is necessary for capturing sunlight. This weakens plants, reduces their root biomass and provides other plants competitive advantages. An appro-

priate balance of rest (absence of disturbance) and disturbance (e.g., grazing, fire, etc.) is necessary to allow plants to regrow leaves so they can adequately capture sunlight and store energy reserves. Inadequate fire frequency or long periods of rest release or encourage woody plants, which overtop grasses and forbs, and capture their sunlight. This can be good or bad depending on goals.

Without irrigation or moving soil, we do not control how much precipitation falls on our patch of Earth or the type of soil available on it; however, through proper management of disturbance and rest, we can influence soil health and the effectiveness of rainfall. Inadequate rest caused by excessive grazing removes most plant and mulch cover on the soil, which causes much of the rainfall to flow off the land rather than soak into the ground where it is more available to plants. Absence of plant and mulch cover exposes the soil surface, which increases erosion, evaporation and soil temperatures.

Herbivory involves many forms of plant consumption, whether it be by mammals, birds, insects, crustaceans, mollusks, etc. Although fungi and bacteria are not animals, they also consume plant parts through decomposition. Plant communities



Eastern red-cedar invading a prairie with inadequate fire frequency (photo courtesy of Dwayne Elmore)

require herbivory and decomposition for recycling nutrients and providing space for new leaves so plants can continue to grow on a site. Inadequate herbivory causes a plant community to change and typically decline.

Most upland native plant communities in temperate zones throughout the world require certain fire frequencies. Prairies and meadows depend on fire for long-term existence because without fire, plant succession changes them to woodlands or shrub lands. Even most upland shrub and tree communities depend upon fire. Fire favors certain species over others ►

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and, without fire, species composition changes, e.g., Eastern red-cedar replaces oaks and hickories in Cross Timbers woodlands; yaupon replaces diverse shrubs, grasses and forbs in Post Oak Savannah woodlands; shrubs and trees replace grasses and forbs in Pineywoods understory; etc. Fire recycles nutrients and provides space for new growth. Fire temporar-

ily improves palatability and forage quality of many plants, which can allow them to be appropriately impacted by and appropriately benefit herbivores. Some plant species depend on fire for germination.

Adequate rest from disturbances such as fire, herbivory, mowing, haying and herbicides is necessary to maintain and improve native plant

communities. Prolonged excessive disturbance changes species composition, generally favoring less productive and less diverse species that tolerate such disturbance.

Land stewards should try to understand and manage fire, herbivory and rest to successfully and efficiently manage the resources under their watch. ■