

The



*A Very Happy & Prosperous
New Year To All*



Dicerandra

Newsletter of the Dicerandra Chapter of FNPS, Highlands County Vol. 5 No. 5 January 1995

ARE OPEN PATCHES IN FLORIDA SCRUB CRUCIAL FOR RARE PLANTS?

Archbold Biological Station

JAN 4 1995

LIBRARY

Eric S. Menges
Plant Ecologist, Research Scientist
Archbold Biological Station

Those who rarely venture beyond the ever-expanding paved surfaces of Highlands County may see Florida scrub as featureless and monotonous wasteland. But those who learn about it and venture across it see a more complex reality: fascinating species, interesting views and vistas, and endless variety in texture and pattern.

Scrub ranges from forest-like to shrubby to open and airy, even during times between fires. Dense forests of sand pine can tower over oak thickets or over delicate scatterings of Florida rosemary and ground lichens. Shrubby areas on yellow sands may be punctuated by emergent small tree of turkey oak, scrub hickory, or scrub bay. Other shrubby areas may appear as a slightly undulating carpet of scrub oak and other oaks with slender stems of *Palofoxia* or scrub paw paw poking out. And open vistas of rosemary punctuated with flowering herbs, cactuses, and gopher apple top small hillocks, catching the slight but welcome summer breezes.

More dramatic still are the changes wrought by the leading actor in the Florida scrub drama: fire. Fire in scrub is often powerful, swift, even awesome. The blackened landscape left behind is sadly stark and beautiful. Blackened stems reveal a simple architecture once softened by leaves. Wind blows the ashes into hollows, creating a mottled black ash and white sand landscape a day or so after fire. The rapid and reaffirming re-growth of grasses, then palmettos, and finally shrubs over the few weeks following fire creates further patterns.

The spatial patterns found in scrub landscapes are probably crucial to the functioning of scrub ecosystems, and particularly so for its rare and endemic plants. Compared to forests, there is relatively little opportunity for small plants in shrublands to carve out a niche in the shade of larger individuals. There is simply not the space, either aboveground or especially belowground, where competition for water and nutrients may be fierce. Small plants have two choices: respond to the opportunity offered by fire, or fit in among the dominant shrubs. These two choices are not independent, but linked by the cycle of consumption and regrowth in burned landscapes.

It turns out that many of the endemic plants are diminutive woody sub-shrubs or herbs that cannot compete directly with oaks and *lyonias*. Some also seem to have special requirements for soil conditions. These specializations are not only interesting, but of great practical importance for effective management.

One of our most restricted scrub plants is *Eryngium cuneifolium*, found only in southern Highlands county. Not only is this plant specialized for rosemary scrub, but it is specialized within this habitat for large openings. As rosemary plants become larger and openings shrink, plants die and reproduce less, and populations decline. In fact, the healthiest populations of this plant are found in the first five years after fire or in large, artificial openings caused by mechanical disturbance. At Archbold, no plants are known from rosemary scrub unburned for more than 20 years.

In contrast, another endemic plant, *Polygonella basiramia*, is found in most patches of rosemary scrub and also in openings in scrubby flatwoods. It also requires openings but they can be smaller, and can be found even in long-unburned rosemary scrub. However, such openings become very scarce in scrubby flatwoods even a few years after fire, and thus *P. basiramia* is uncommon in scrubby flatwoods except following fire.

Various tendencies for open patches of habitat can be demonstrated for many of the scrub endemics. They are particularly well-developed in plants that cannot survive fire, such as *Polygonella basiramia*. Fire kills all plants, but the population can live on because dormant seeds survive fires in the sand, and find post-fire conditions favorable for germination and growth.

Fire is not a panacea for scrub management, however. Plants recovering from seed banks are sensitive to too-frequent fires, which can kill plants before seed banks are replenished; and too-infrequent fires, which can cause adult plants to disappear while dormant seeds slowly die out. Even the dominant resprouting plants can suffer from very closely-spaced burns or especially severe fires occurring in long-unburned scrub. However, very hot spots may be one of the main sources of open patches that provide refugia for rare plants in scrub.

Another danger is depending on fixed, invariant fire regimes. Each type of fire (frequent, infrequent, severe, mild) is likely to favor certain species and not others. Only fire regimes that vary over space and over time are likely to promote all components of biodiversity, and only reasonably large areas can provide the space for the range of fire types and for populations to function normally within fire patches. And only a range of fire types will likely provide the spatial variation, including the crucial open patches, that allow our fascinating scrub species to all coexist.

Next time you walk through Florida scrub, be alert to the variation you see from spot to spot, and think about what past processes may have contributed to the pattern you see today.