# APPENDIX E

## PRESCRIBED BURNING TO MAINTAIN FIRE DEPENDENT ECOSYSTEMS ON THE HERCULES GLADES WILDERNESS

On October 19, 1976, President Ford signed Public Law 94-557 which designated 12,315 acres of National Forest land as the Hercules Glades Wilderness.

The glades have historically supported a tall grass prairie plant community which produces picturesque openings in the surrounding oak-hickory forest. Big bluestem, little bluestem, Indiangrass, switchgrass, prairie dropseed and sideoats grama are typical grasses and are associated with prairie forbs, such as blackeyed susan, coneflower, goldenrod, and various prairie clovers. South facing slopes may be almost desert-like and are inhabited by such animal species as the collared lizard (mountain boomer) and the roadrunner more commonly at home in the arid Southwest. Many of these species are found in the Ozarks only in the glade country because of their relation to the prairie grass communities. Some of these species such as the Bachman Sparrow are dependent on the openness and diversity created by the prairie glade grass community. The fringe tree, smoke tree, blue ash, and supplejack are characteristic woody plants found on the glades, but uncommon in the rest of the Ozark Region. These plants, along with their associated insects, rodents, reptiles, amphibians, birds and mammals go together to make the glade a unique fire dependent ecosystem.

The first written description of the area was provided by Henry Rowe Schoolcraft in his 1818 and 1819 travels through the White River country of the Ozarks:

> "The country ... presented a character of unvaried sterility, consisting of a succession of limestone ridges, skirted with a feeble growth of oaks, with no depth of soil, often bare rocks upon the surface, and covered with coarse wild grass; and sometimes we crossed patches of ground of considerable extent without trees or brush of any kind, and resembling the Illinois prairies in appearance, but lacking their fertility and extent. Frequently these prairies occupied the tops of conical hills, or extended ridges, while the intervening valleys were covered with oaks, giving the face of the country a very novel aspect, and resembling, when viewed in perspective, enormous sand-hills promiscuously piled up by the winds."

The open glades, or "balds", as they are referred to by the local residents, attracted the early day livestock raiser. William Monk, in his writing about life in the Southern Missouri Glade country in the 1860's stated,

> "The people then generally gave their time to growing stock especially horses and cattle ... a man could raise all the stock in the way of horses and cattle that he could possibly look after. The only expense was salting and caring for them - didn't have to feed, winter or summer, except the horses in use and the cows used for milking purposes."

From the late 1800's until the 1950's, any area not fenced was considered "open range" and the glades were heavily grazed by large numbers of horses, cattle, and hogs.

Physical changes occurred in the Ozarks such as cultivated fescue pastures, roads, plowed fields, and overgrazing which prevented natural grassland fires starting on the Springfield prairie area from spreading into the glade country. These same type man-made fire breaks prevented natural fires that began in adjacent woodlands from entering into the glades. In addition, in the late 1800's and early 1900's vast logging operations completely changed the age structure of the surrounding and intermingling woodlands. This logging eliminated most of the "old lightning rod-tinder box" type snags common in an old growth timber stands. Removal of these snags made ignitions by lightning much more unlikely. Because of these changes and contrary to popular belief, fire frequency decreased in this area after settlement in the 1860's and decreased dramatically after the Civil War when the population increased and grazing of livestock became predominant. The mid 1930's marked the beginning of United States Forest Service administration and fire protection. Natural fire occurrences interrupted late in 1800's with settlement were now controlled as quickly as possible thus eliminating their impact on the ecology of the area.

The fire regime (from 1730 until 1980) for the Southwest Missouri prairie glades has been established (using dendrochronological methods) and documented by Richard Guyette of the North Central Forest Experiment Station in a paper written for the Missouri Academy of Science. In the abstract of the paper, Guyette stated, "The past fire history of an Ozark glade was reconstructed using scars from trees of Eastern redcedar (Juniperus Virginiana L.). Fires were found to be more frequent before 1879 during pre-settlement times. Fires, as marked by tree scars, were present somewhere on the study area every 3.2 years. After 1870, the frequency of scarring drops to 22 years."

Since the creation of the National Forest in Missouri, lightning fire occurrence has been insignificant on the District as a whole. Only one lightning fire has been recorded within the 273,566 acre fire protection boundary within the 10-year period prior to 1980, and no lightning fire occurrences have been recorded in what is now the Wilderness since records became available in the 1940's.

The glades, as did all natural grasslands, evolved with fire and are dependent upon fire as its primary decomposition agent and nutrient recycler. Grassland plants create fuel conditions that make fire almost inevitable and only plant species that are extremely fire tolerant or fire dependent persist there.

Through direct action (fire control) and indirect action (land development, grazing and logging) natural fire occurrence has been for all practical purposes eliminated. When a natural element of an ecosystem is removed an unnatural reaction occurs. Fire removed from a natural grassland community results in fire-sensitive species such as Juniperus Virginiana or Eastern redcedar quickly invading the grassland and fire dependent species such as the prairie legumes and tall grass species losing vigor and dominance; some of the species actually phase out of the communities.

Eastern redcedar, since pre-settlement, has changed from a little noted species in the glades to the most dominant tree species found there. In his 1818 and 1819 journals Schoolcraft's written descriptions of the glades did not mention the species as even being present. Although some individual Eastern redcedars as old as 460 years old can be found in the glades, mature cedar occurrence is so infrequent that no examples of the species over 50 years old have been recorded

in compartment examination which was completed for the entire glade area from 1976-1984. The recent invasion of Eastern redcedar has best been illustrated in the North Central Forest Experiment Station paper "Change in Woody Cover on Limestone Glades Between 1938 and 1975" by Vicki L. Kinmel and George E. Probasco published by the Missouri Academy of Science. This study showed, "in 1938 approximately 50% of the glade cover was in the 0-15% cover class. This had decreased to 16% by 1975. The 50-100% cover class changed from 20% of the total glade area in 1938 to 51% of the total area in 1975. Corresponding changes in wildlife habitats are discussed."

Man has interfered with fire by eliminating the opportunity for it to fulfill its natural role in the environment of the glade and by doing so has allowed a biological community to evolve that would not have occurred in nature. If this situation is allowed to persist or further regress, it is very probable that the ecology of the area will be so changed that it will be virtually impossible to restore fire to its natural role without first going through a catastrophic fire and then a significant period of time. This is supported by the theory of most fire ecologists that in a natural fire dependent ecosystem fire occurrence can only be interrupted, not eliminated.

In order to restore and maintain the unique characteristics of the glade ecosystem originally perpetuated by natural fire, planned ignition must be introduced to the Hercules Glades Wilderness. A plan has been developed to burn four areas in the Wilderness on a five-year frequency under conditions that would allow control compatible to Wilderness values. This would not be as frequent an occurrence as in pre-settlement period of every 3.2 years, however, it is believed that this frequency will in time recover the vegetative characteristic of the pre-settlement era. Because the area has been protected from fire for the past 50 years, it will probably be the third or fourth cycle before this is accomplished.

The four designated burning areas are 794 acres, 126 acres, 1,683 acres and 979 acres in size. This provides for a total burning impact on 3,582 acres or 29% of the Wilderness area.

Prescribed burning prescriptions have been developed for each of these areas. These prescriptions are documented in the planning record. Upon approval of the Forest Plan they will be submitted to the Regional Forester for approval.