

RESPONSE OF FOUR LAKE WALES RIDGE SANDHILL SPECIES TO REINTRODUCTION OF PRESCRIBED FIRE WITH AND WITHOUT MECHANICAL PRE-TREATMENT

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ABSTRACT

Restoration of endemic-rich but long-unburned sandhills on the Lake Wales Ridge (LWR) of peninsular Florida poses a considerable challenge to land managers and plant conservationists. Decades of fire suppression have led to the development of an extensive oak-dominated subcanopy and a concomitant loss of graminoid fine fuels and herb diversity. Two major objectives of LWR sandhill restoration are 1) protection of the sparse longleaf pine (*Pinus palustris*) canopy, which provides an irreplaceable source of fine fuels through annual needle-drop; and 2) promotion of the many plant species ($n > 15$) endemic to this globally imperiled ecosystem. As part of a larger experiment to investigate the recovery dynamics of a long-unburned LWR sandhill following the reintroduction of fire with and without prior chainsaw-felling of the subcanopy (saw + burn versus burn-only treatments), we conducted pre- and post-treatment censuses of 228 longleaf pines and of hundreds of individuals of three species of federally listed plants: scrub plum (*Prunus geniculata*), a multistemmed shrub; and two herbs, scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*) and Lewton's milkwort (*Polygala lewtonii*). We found that 1) longleaf pine mortality was significantly higher in the saw + burn treatment, most likely due to higher fire temperatures relative to the burn-only treatment; 2) scrub plum post-burn resprouting rates were independent of treatment (and largely independent of fire severity); 3) scrub buckwheat appears to have benefited most from the higher fire intensity and more complete fire coverage in the saw + burn treatment, demonstrating higher rates of seedling recruitment and flowering than in the burn-only treatment; and 4) Lewton's milkwort seedling recruitment and survival were significantly greater in burned versus unburned quadrats. These results suggest that while some sandhill endemics benefit from the mechanical pre-treatments used to facilitate the reintroduction of fire, care must be taken to prevent loss of longleaf pines, particularly in pre-treated areas with their greater fire intensities.

Citation: Weekley, C.W., E.S. Menges, and M.A. Rickey. 2007. Response of four Lake Wales Ridge sandhill species to reintroduction of prescribed fire with and without mechanical pre-treatment [abstract]. Page 103 in R.E. Masters and K.E.M. Galley (eds.). Proceedings of the 23rd Tall Timbers Fire Ecology Conference: Fire in Grassland and Shrubland Ecosystems. Tall Timbers Research Station, Tallahassee, Florida, USA.