Regenerating Longleaf Pine on Hydric Soils: Short- and Long-Term Effects on Native Ground-Layer Vegetation

Background:

Restoring longleaf pine habitats is essential for managing rare species and protecting the natural biological diversity of the region. Natural longleaf habitats range from well-drained uplands to poorly drained sites, the latter noted for extraordinary levels of species richness. Traditional methods to establish longleaf pines in plantations are intensive and adversely affect ground-layer vegetation. There is currently little information available on the effectiveness of methods to establish longleaf pine seedlings on wetter sites and the effects of these methods on ground-layer vegetation.

Objective:

In this project, researchers will quantify the immediate and short-term effects of site preparation methods in wet mineral soil sites on longleaf pine survival and early growth and on ground-layer vegetation. Researchers will also describe the persistent long-term effects of plantation establishment on a range of mesic to wet soils. The project couples the traditional field experiment approach of forestry research with the vegetation sampling and multivariate analytical approach of plant community ecologists. Combining research approaches will provide an ecological perspective for developing habitat restoration protocols in landscapes managed for multiple uses, including military training.

Summary of Process/Technology:

Short-term effects of management treatments on ground-layer vegetation and on longleaf pine establishment and early growth will be evaluated with a controlled field experiment at Marine Corps Base, Camp Lejeune in Onslow County, NC. Experimental plots will be established on hydric soils. Sites will be chosen from among those where the canopy trees have already been harvested. Various treatments, representing a range of site preparation options currently used at Camp Lejeune, will be applied to each plot. Container-grown longleaf pine seedlings will be planted by hand in all treatments. Long-term effects of plantation establishment will be investigated by quantifying vegetation composition and structure in mature plantations and relating conditions to known treatment histories and to the vegetation in high-quality natural areas. Current vegetation data will be combined with site environmental and land use history data, and multivariate methods will be used to model relationships among vegetation, environmental, and land use variables.

Benefit:

The results of this work will provide a scientific foundation to evaluate methods for managing longleaf pine and associated species on the landscape. The successful establishment of longleaf pine stands that furnish habitat for threatened and endangered species on wet, poorly drained sites will give managers flexibility in simultaneously maintaining defense-oriented training and fulfilling Department of Defense obligations to preserve endangered species.

The above photo shows a forest area that has been recently clear-cut. After timber harvest, some native grasses and herbs persist. Intensive site preparation practices used to establish the next longleaf forest will further disrupt the residual native plant community.

Accomplishments:

This project began in FY 2002. Accomplishments will be noted upon completion of the project.

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