

2007

Landscape Analysis of George W. Pirtle Scout Reservation

David Kulhavy

Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, dkulhavy@sfasu.edu

Daniel Unger

Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, unger@sfasu.edu

Frank B. Shockley

Josh Bardwell

Follow this and additional works at: http://scholarworks.sfasu.edu/spatialsci_facultypres



Part of the [Forest Management Commons](#)

Tell us how this article helped you.

Recommended Citation

Kulhavy, David; Unger, Daniel; Shockley, Frank B.; and Bardwell, Josh, "Landscape Analysis of George W. Pirtle Scout Reservation" (2007). *Faculty Presentations*. Paper 17.

http://scholarworks.sfasu.edu/spatialsci_facultypres/17

This Conference Proceeding is brought to you for free and open access by the Spatial Science at SFA ScholarWorks. It has been accepted for inclusion in Faculty Presentations by an authorized administrator of SFA ScholarWorks. For more information, please contact cdsscholarworks@sfasu.edu.

LANDSCAPE ANALYSIS OF GEORGE W. PIRTLE SCOUT RESERVATION

David L. Kulhavy, Daniel R. Unger, Frank B. Shockley and Josh Bardwell

Arthur Temple College of Forestry and Agriculture

Stephen F. Austin State University

Nacogdoches, Texas 75962-6109

dkulhavy@sfasu.edu

unger@sfasu.edu

fshockley@sfasu.edu

ABSTRACT

To assist in detecting change over time for the forested landscape of George W. Pirtle Scout Reservation, Panola County, Texas, digital orthophotography imagery (acquired 1996 and 2004) were used to designate forest cover types and hazard rating for forest insects and diseases. Status of camp grounds was ascertained and recommendations made for management using the GIS database created for the camp.

INTRODUCTION

Landscape ecological analysis of George W. Pirtle Scout Reservation, Panola County, Texas, was conducted using spatial analysis of USDA National Agricultural Imagery Program imagery. Data collection were obtained using a Trimble ProXRS GPS unit, iPIX and digital photoquadrangle imagery, insect and disease hazard ratings systems, NRCS Panola County, Texas, Soil Survey within ArcGIS 9.2. The project team used social structure perspectives in conjunction with the overall integrated landscape management strategy with regard to landscape and cultural heritage.

“Landscape ecology is the study of the structure, function, and change in a heterogeneous land area comprised of interacting ecosystem types. Landscapes are comprised of patches, corridors, and the background matrix embedded in a mosaic.” (Forman, 1995). By applying and using these principles, problems can be formulated and solved. “The concept of a sustainable environment focuses on a time frame of human generations and the concurrent maintenance of basic human needs.” (Forman, 1995)

One of the basic concepts of landscape ecology is identifying and classifying the landscape features. The matrix is the background ecosystem of land-use type in a mosaic characterized by extensive cover, high connectivity, and/or major control over dynamics. At Pirtle, the matrix is a pine-hardwood mix.

A corridor is a strip that differs from the adjacent land on both sides. Although corridors are too narrow to be seen on the map, they provided for transportation of organisms and energy to different areas. The roads and trails around camp that lead to and form the central areas, outside of camp, and to the outlying areas are all examples.

A patch is a relatively homogeneous nonlinear area that differs from its surroundings. They come in the categories of disturbance (affected by human or natural causes), environmental resource (left due to difference from surroundings), ephemeral (caused by short-lived interaction and quickly disappear), introduced (long-term disturbance, including planting new species), regeneration (recovering disturbance patch), and remnant (original area left behind due to a disturbance).

Recognition and management of insects and diseases helps reduce significant impact and prevents spreading into larger management areas. Proper management for these will lead to a more sustainable environment and increased forestry income. These can be used to improve camp facilities and allow for greater camp population. Coupling the site index of pines and hardwoods and equipment limitation, the rangers and managers will be able to designate optimal areas for harvest and growth of loblolly (*Pinus taeda*) and shortleaf (*P. echinata*) to maximize camp income and maintain a sustainable environment.

Camping areas were rating for suitability of sites based on soils and forest stand structure. The area of current usage was located in the moderate camp site area. Recommendations were made to look at development of the area of slight for erosion and suitable soils (Figure 1). The areas of severe for camping were located in low areas prone to flooding.

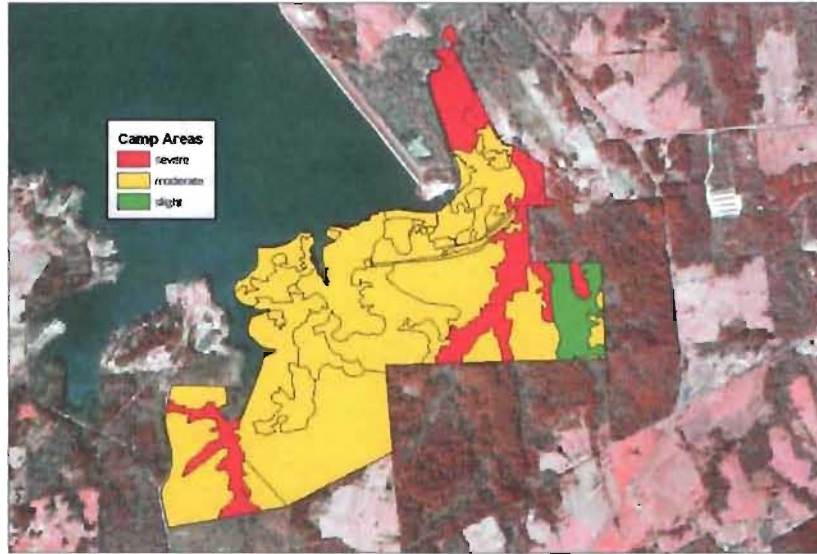


Figure 1. Camping areas suitability based on soils and cover. Recommendations include proposing development on the area of slight erosion.

Hazard rating the southern pine beetle, *Dendroctonus frontalis*, is based on basal area of pine, height of pine and landform. Rating for annosus root rot, *Heterobasidion annosum*, is based on soil characteristics including depth to clay and depth of sandy soil. For the areas of current campsite location, the area is rated high for annosus root rot and moderate for southern pine beetle (Figure 2). Care needs to be taken planning timber sales in these areas to lower hazard to southern pine beetle.

A complete diagnosis of George W. Pirtle Scout Reservation is presented in Figure 3. At the center of the image is a depiction of the cover types of the forest stands of Pirtle. The light green section indicates regenerated areas for pine harvest and represents change over time.

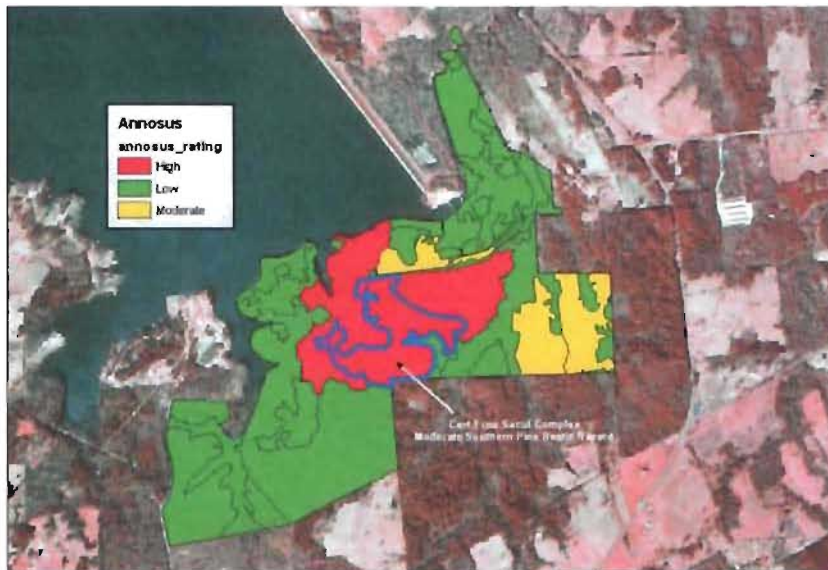


Figure 2. Annosus root rot hazard rating and moderate southern pine beetle hazard rating for George W. Pirtle Boy Scout Reservation.

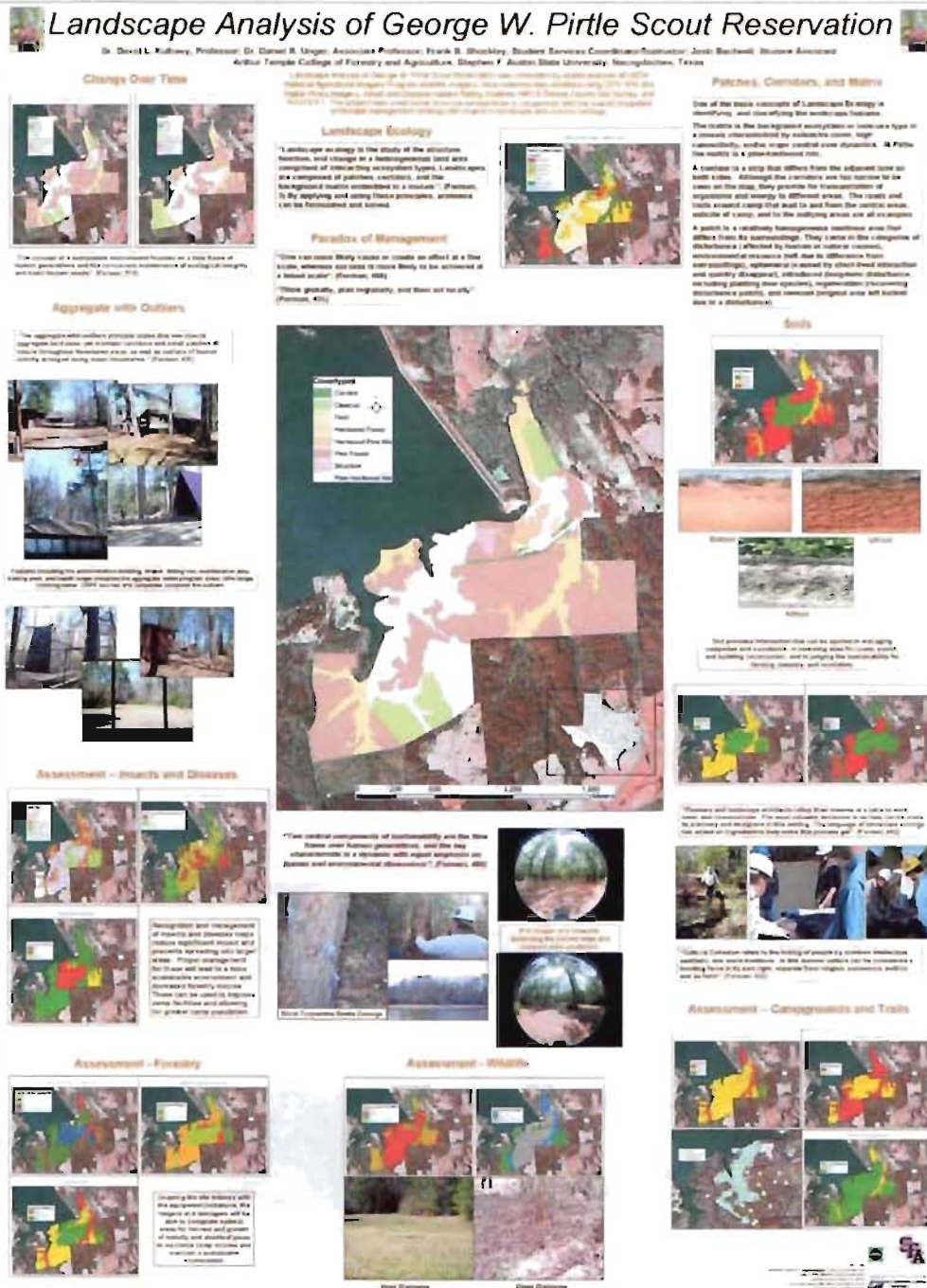


Figure 3. Landscape ecological analysis of George W. Pirtle Scout Reservation based on the tenets of R. T. T. Forman *Land mosaics, the ecology of landscape and regions*.

REFERENCES

Forman, R. T. T. 1995. *Land mosaics, the ecology of landscape and regions*. Cambridge University Press, Cambridge, United Kingdom. 632 p.