

Fort Chaffee-Maneuver Training Center Vegetative Communities Map and Classification System

CMI MLD R-18

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Executive Summary:

Vegetation is distributed across the landscape in a heterogeneous, sometimes chaotic manner, though within this heterogeneity there are certain recurring patterns. Identifying and describing these recurring patterns or assemblages is the essence of vegetation classification.

The purpose of the Fort Chaffee Maneuver Training Center (FCMTC) Vegetative Communities Map is to provide natural resource managers and researchers with current information regarding the composition of vegetation communities and their distribution within the boundaries of FCMTC. This information will increase the ability of military trainers and land managers to make knowledgeable decisions regarding natural resource management at FCMTC.

There were two overall goals for the development of the FCMTC Vegetative Communities Map: 1) develop an installation specific vegetation classification system that is equivalent to the "Alliance Level" of the National Vegetation Classification System and 2) use this installation specific system to map the distribution and occurrence of the vegetation communities at FCMTC. These goals were accomplished by producing a Federal Geographic Data Committee (FGDC) compliant vegetative communities map of FCMTC.

Delineation began in spring of 2002 using the true-color digital orthophotography. The vegetation polygons were delineated at a minimum mapping unit of 0.5 hectares. We used LCTA vegetation data collected in 2001 from 156 plots to develop preliminary vegetation classes and descriptions. The plant communities were identified and classified utilizing standard multivariate data analysis techniques. The final vegetative community types were summarized and named based upon the dominant species in the dominant strata.

The vegetative community types identified from LCTA data were summarized, and a dichotomous key to the community types of FCMTC was developed (Appendix A). The primary field verification took place in July of 2002. Initially, 500 field verification points were distributed in a GIS using a stratified random plot allocation (Krebs 1989). Field crews navigated to field verification points using Garmin 12 GPS units, military maps, and aerial photos. Once at the location, the actual point was recorded using the Garmin 12 with waypoint averaging. The observer used the key to the vegetative

communities to identify the vegetation type in a 0.5 hectare (minimum mapping unit) plot surrounding the point.

Of the initially distributed 500 field verification points, 386 points were visited in July of 2002. In addition detailed vegetation and site information was available from the 156 LCTA plots. Interpretation to FCMTC vegetation community type was performed by joining the field points to already delineated polygons and assigning a community type to these polygons. This community type was based on the field verification points, the LCTA information, and the physiognomic class that was initially assigned during delineation. Simultaneously, an aerial key to the visual elements of each vegetation community type was developed (Appendix B). This key was updated and redesigned throughout the process of field work and photointerpretation.

In April of 2003 an additional 383 field verification points were visited and integrated into the interpretation process. The aerial photointerpretation key was then used to assign a vegetation community type to all polygons based on aerial photo signature, elevation, slope, location of and adjacency to other vegetation polygons and natural features. An additional 256 secondary field verification points were used to verify the process of interpretation, for a total of 1,025 field points aiding in the interpretation process.

At Fort Chaffee the native grassland/herbaceous vegetative communities are the most ecologically significant because of their relative rarity in a regional context (Pell 1979). The occurrence of native grasslands and herbaceous communities at FCMTC is directly attributable to the use of prescribed fire and the effects of military derived disturbance such as wildland fire (Bragg and Hulbert 1976, Dale 1983, Jenkins et al. 1997, Batek et al. 1999).

We defined a shrubland as having canopy cover less than 10 % above 5 meters with woody vegetation comprising more than 25% of the vegetative cover. Shrublands at FCMTC are not the typical shrublands seen in the Western United States Great Basin Desert, which are dominated and characterized by a particular species such as Sagebrush (*Artemisia tridentata*). The shrublands at FCMTC are successional vegetative communities maintained in an early seral stage by physical disturbance from military training and fire (prescribed or accidental). Nevertheless, these communities have attained equilibrium with their disturbance regimen and occur in a definable pattern across the landscape. In fact, these communities cannot be described without also relating the types of disturbance that affect each community.

For the purposes of this project, woodlands were defined as having between 10 and 60% vegetative cover above 5 meters. There is substantial evidence that woodlands were the dominant upland physiognomic type prior to European settlement (Abrams 1992, Cutter and Guyette 1994, Batek et al. 1999). The prevalence of upland woodland communities was almost certainly the result of frequent fires ignited by lightning strikes or more so by Native Americans (Abrams 1992). As a result, most of the dominant species encountered in the upland woodland vegetative communities are adapted to frequent fire.

Forests at FCMTC were defined as vegetative communities that had vegetative cover > 60% above 5 meters. Many of the upland forest types identified at FCMTC are almost identical to their woodland counterparts. The primary difference is the intensity and frequency of fire. The forest types, by definition, will have higher vegetative cover in the tree stratum, which significantly impacts the composition of the herbaceous and shrub stratum.

Disturbance caused by military training results in a very dynamic landscape at FCMTC. Physical disturbance caused by military vehicles, wildland fire caused by live fire exercises and prescribed fire substantially impact the vegetation. Modification in land use patterns will alter the composition and distribution of vegetative communities. This results in a very heterogeneous landscape with the training areas at FCMTC. As a result, in a number of instances different communities occur within the same vegetation polygon because the area, which they encompass, is below the minimum mapping unit. In these cases we tried to identify both communities.

The vegetation map presented in this report is a snapshot in time of the distribution and composition of the plant communities at FCMTC. Vegetation is an inherently dynamic system. Therefore, the FCMTC vegetation map should be viewed more as a beginning to the study of vegetation ecology at FCMTC than an end.

Cite As:

Emrick, Verl R. and Jessica L. Dorr. 2004. Fort Chaffee-Maneuver Training Center Vegetative Communities Map and Classification System. Conservation Management Institute-Military Lands Division, College of Natural Resources, Virginia Polytechnic Institute and State University. CMI-MLD-2004-R18.