



Fort Union National Monument

2011 Grasslands and Fire Effects Monitoring

Grassland vegetation is the most widespread vegetation type occurring in the Southern Plains. Fire, along with climate, is the biggest determinant of whether grasslands preclude forests, and also is a critical natural process and a primary influence on the plant and wildlife communities of national parks. Monitoring grassland vegetation communities and the effects of fire will help Southern Plains park managers better understand the dynamic nature of these ecosystems and provide an early warning of abnormal conditions. This information can help managers make effective decisions, including planning of prairie restoration efforts.

The overall goal of monitoring Southern Plains grassland communities is to help park managers better understand the dynamic nature of grassland vegetation ecosystems and the processes that influence them. Specific objectives are to: (1) determine status and trends in plant species composition (richness and diversity) and community structure (relative abundance, frequency, distribution, ground cover) of remnant, disturbed, and restored grasslands; (2) document the location, extent, and timing of wildland and prescribed fires and management treatments; and (3) determine status and trends in soil structure (erosion potential, infiltration rate, compaction, texture, stability) and soil chemistry (bulk soil carbon to nitrogen ratios).

Methods

A total of six long-term monitoring transects were established at Fort Union National Monument (NM; Figure 1). No fire event transects will be established due to the exclusion of fire as a management tool at the park for safety reasons. The plant communities are comprised of shortgrass steppe fringed sage/blue grama dwarf-shrub herbaceous vegetation; blue grama-purple threeawn herbaceous vegetation; western wheatgrass-blue grama herbaceous vegetation; blue grama herbaceous vegetation; fringed sage/sleepygrass dwarf-shrub herbaceous vegetation; and fringed sage/hairy grama dwarf-shrub herbaceous vegetation. In both 2010 and 2011, all six long-term transects were established and monitored.

Results

These early monitoring results provide a baseline to measure future trends and should not be viewed as trends themselves. The extreme rainfall variation between the 2010 and 2011 field season has resulted in some change in plant



Grassland plant community at Fort Union NM.

response. The grasslands at Fort Union NM are comprised predominately of perennial grasses, with blue grama (*Bouteloua gracilis*) being most dominant. This is a fairly stable system but has undergone a full year of extreme drought, resulting in dormancy of most grasses. The monitoring crew experienced difficulty in determining cover of many of these grasses, and therefore gave a cover reading on “dead” or dormant grass. There is a fairly diverse mix of mainly perennial forbs throughout the transects, although many of the native annuals were not detected in 2011, likely due to drought conditions.

Exotic plant species are present primarily within the fort ruins, housing area, and along the entrance road, but a few are found in the prairie. Of greatest concern is field bindweed

Fort Union NM - 2010 Grassland/Fire Plots



Figure 1. Monitoring transects, Fort Union NM, 2010 and 2011.

(*Convolvulus arvensis*), a perennial that has the ability to impact the grasslands. Kochia (*Kochia scoparia*) and prickly Russian thistle (*Salsola tragus*) are ubiquitous within the park boundaries. During drought years, these three species of plants have exhibited continued growth and seed set, giving them a competitive edge over the native plants. Exotic species are discussed in greater detail in the Exotic Plant Monitoring Annual Report.