



Pecos National Historical Park

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 eight fire and eight long-term monitoring transects were established at Pecos National Historical Park (NHP; Figure 1). The plant community monitored at Pecos NHP is shortgrass steppe. In 2010 and 2011, all long-term transects were monitored. No fire-event transects were monitored during this time.

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 noticeable changes in plant response. The grasslands at Pecos NHP are primarily native perennial grasses dominated by blue grama (*Bouteloua gracilis*). Areas within our transects appear to be healthy with no exotic grasses present, although areas with exotic grass species are known to occur elsewhere in the park. The ground strata is evenly divided between litter and bare soil; it is often



Grassland plant community at Pecos NHP.

observed that bare soil areas are suffering from wind erosion, resulting in pedestaled grass bases. Roughly two-thirds of the forbs monitored are perennial and there is good diversity of species.

The two most frequently encountered exotics are prickly lettuce (*Lactuca serriola*) and western salsify (*Tragopogon dubius*), both annuals or biennials. Prickly lettuce was found in fewer transects but in higher numbers, while western salsify was widespread. These exotics have similar seed dispersal mechanisms (windborne) and will likely continue to increase until control measures are in place. Exotic species

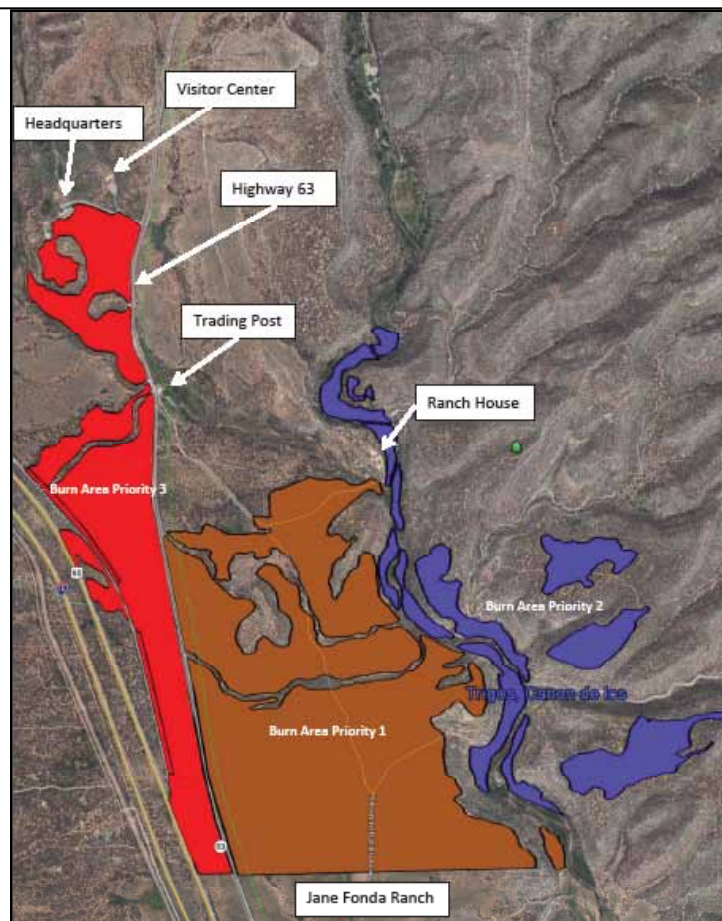
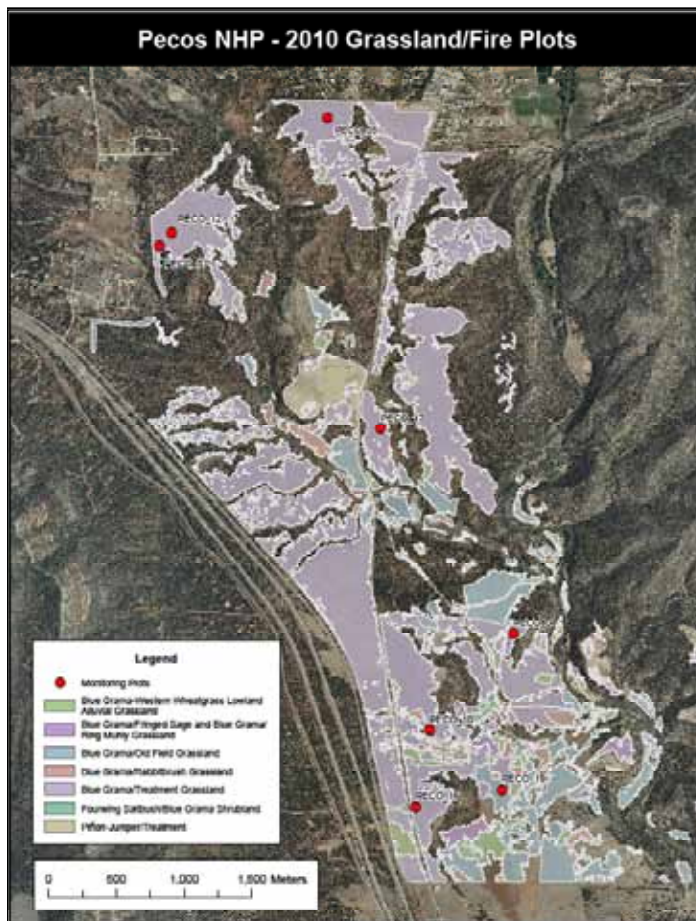


Figure 1. Monitoring transects, Pecos NHP.

Figure 2. Potential prescribed treatment or wildland fires, Pecos NHP.

are discussed in greater detail in the Exotic Plant Monitoring Annual Report.

Fire events at Pecos NHP are overseen by the Bandelier Fire Group, a separate unit from the Southern Plains Fire Group. An agreement to share monitoring data has been reached and will be implemented within the next year (see Figure 2 for potential prescribed treatment areas). Prescribed fire is actively used and a map of historic burns is being produced for reference. Prescribed burns were planned for 2011 but environmental conditions precluded activity until fall. There have been no wildfires in Pecos NHP within the past five years.