



Lyndon B. Johnson 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 two long-term monitoring transects were established at Lyndon B. Johnson National Historical Park (NHP; Figure 1). No fire monitoring transects were established due to the exclusion of fire as a management tool at the park. The plant community monitored at Lyndon B. Johnson NHP is restored grassland. In 2010 and 2011, both transects were 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 noticeable changes in plant response. The restoration prairie at Lyndon B. Johnson NHP contains numerous perennial grasses with all but three being native. This area has been seeded repeatedly through the years but past land use and a lack of consistent follow-up maintenance has kept the prairie from reaching its full



Grassland plant community at Lyndon B. Johnson NHP.

potential. The most recent seeding took place in the fall of 2010; while germination was good, the following drought has impacted seedling establishment. It remains to be seen if any native seedlings persist. One varietal grass and two exotics are threatening the health of the grassland. The varietal “Alamo” switchgrass (*Panicum virgatum*) is a durable drought-tolerant switchgrass that dominates the prairie. There is a diverse mix of forbs present; the majority being short-lived or fully perennial and native.

The prairie area is threatened by the exotic grass K.R. bluestem (*Bothriochloa ischaemum*). This mat-forming grass outcompetes other natives and can successfully form

Lyndon B. Johnson NHP - 2011 Grassland/Fire Plots



Figure 1. Monitoring transects, Lyndon B. Johnson NHP, 2010 and 2011.

monocultures. Control is problematic and it appears to be limited only by hot summer fires. Johnsongrass (*Sorghum halepense*) is found in patches throughout the prairie but responds to treatment when administered. Additional herbicide control has been administered to the “Alamo” switchgrass but consistent treatment will be required to eradicate it from the site. Exotic species are discussed in greater detail in the Exotic Plant Monitoring Annual Report.

Prescribed burning is currently not an option at LYJO due to the urban location of the restoration prairie. No wildfires have occurred in recent history.