



## Fort Larned National Historic Site

# 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

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 resulted in noticeable changes in plant response. A total of seven fire-event transects and eight long-term monitoring transects were established at Fort Larned National Historic Site (NHS; Figure 1). The plant communities monitored are: restored grasslands consisting of smooth brome semi-natural herbaceous alliance and planted semi-natural restored grassland prairie, and a prairie dog town grassland complex. Prescribed fire is not a part of the management plan within the prairie dog town and the area does not require a fire-event transect. In 2010, four fire and all long-term monitoring transects were monitored at Fort Larned NHS during early June. In 2011, all long-term transects were monitored, but no fire transects.



Grassland plant community at Fort Larned NHS.

## Results

The grasslands at Fort Larned NHS consist, almost exclusively, of perennial graminoids, the majority of species being native grasses. However, exotic smooth brome (*Bromus inermis*) continues to be the most dominant grass with only small patches of native grasses present. Forbs are evenly divided between annual and perennial forms and show adequate diversity, but there are many exotic forbs established throughout the area, most of them annual species.

Prairie restoration efforts have been ongoing for several decades and the oldest areas of restoration show the most success, with fair stands of native bunch grass. Continued control efforts on smooth brome will help these areas recover but progress is expected to remain slow.

## Fort Larned NHS - 2010 Grassland/Fire Plots

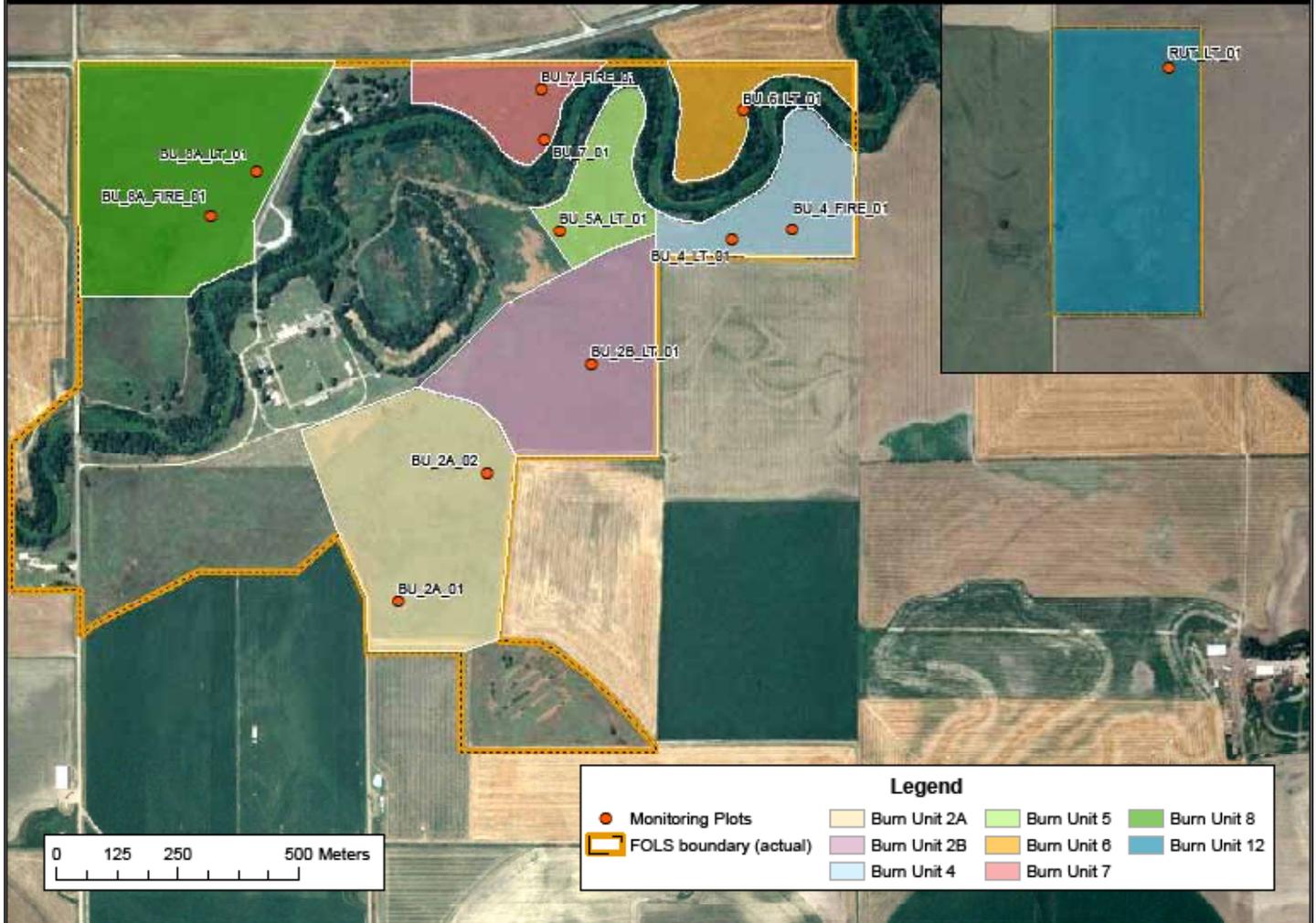


Figure 1. Monitoring transects, Fort Larned NHS, 2010 and 2011.

Exotic plants pose a severe threat, primarily due to the extreme past disturbance and the park being surrounded by agriculture. As mentioned earlier, smooth brome continues to greatly dominate the grasslands, while field bindweed is well established in areas of the park. Rainy years bring flushes of yellow sweetclover (*Melilotus officianalis*). Kochia (*Kochia scoparia*), poison hemlock (*Conium maculatum*), and dandelion (*Taraxacum officinale*) have all found their niches and flourish. The Ruts Unit contains the usual suite of exotics normally found in active prairie dog towns. Exotic species are discussed in greater detail in the Exotic Plant Monitoring Annual Report.

Fort Larned NHS is under the Midwest Region Fire Management Office and is not served by the Southern Plains Fire Group. Prescribed burns are carried out in cooperation with Quivera National Wildlife Refuge crew. Prescribed fire has been used since 1968, with intermittent breaks. In 2009, the park lands north of the Pawnee River were burned under prescription, while the area to the south of the Pawnee River was burned in 2010. Only a few wildland fires have occurred since the NPS took possession of the land, none of an extensive nature. At this time, we have no map of the fire history but hope to generate one from park records in the year ahead.