

Exotic Plants Monitoring

2009 PROJECT SUMMARY

Introduction and Background

Exotic plants represent one of the most significant threats to natural resources in national parks. Exotic plants are a concern due to their abilities to reproduce prolifically, rapidly colonize new areas, displace native species, alter ecosystem processes across multiple scales, and detract from the interpretive value of park resources. In the Great Plains, grasslands have been increasingly degraded and fragmented, which results in increasing chances of exotic plant species invasion. There is often a time lag between the initial establishment of an invasive exotic and its rapid expansion toward local carrying capacity. Therefore, early detection and subsequent eradication is essential.

Monitoring Objectives

Objective 1. Early Detection

To detect the initial occurrence for any of a subset of high priority species in zones of high and low invasion probability.

Objective 2. Status and Trend of Species X

To determine changes in the status and trend (density, abundance or extent) of a subset of high priority species in zones of high and low invasion probability.

Objective 3. Community Dynamics

To determine changes in species composition of a subset of high priority species in zones of high and low invasion probability, taking into account any management treatments that occurred between sampling intervals.

Methods

Each vector is divided into a series of 50 m blocks along its length, with separate blocks designated on either side of the vector (right (R) and left (L) sides) (Fig. 1). Within each block, a transect is walked parallel to the vector. This transect is set in from the edge of the vector and, when possible, located along the interior edge of the mow strip. Any topographic feature that precludes observation from the transect is noted as unobservable within each block.

Distance Class from the Vector

Distance from the vector provides an indication of whether a



Toothed spurge (*Euphorbia dentata*)

PHOTO CREDIT: TOMYE FOLTS-ZETTNER

given species has a tendency to invade the interior habitats or whether they tend to remain localized near the source from which they likely invaded. The greatest variety and density of exotic plants tend to be found closest to the vector and decrease with distance from the vector. Consequently, observations of a given species are recorded in each of five parallel distance classes (D1, D2, ..., D4) from the vector (Fig. 1). Distance Class 1 (D1) represents the distance between the vector and the transect. Distance Classes D2 – D3 represent 10 meter increments from the transect (10 and 20 meters), with D4 representing any distance over 20 meters.

Table 1. Number of primary and secondary sample units completed in 2009.

PARK	# of 50m Primary Vector Blocks	# of 1m2 Secondary Plots
BEOL	25	65
CAVO	26	10
CHIC	28	0
FOLS	28	75
FOUN	39	0
LAMR/ALFL	31	70
LYJO	9	10
PECO	30	0
SAND	26	65
WABA	28	65

Density Class

The density of a given species is recorded within each block and distance class, using four categories of density: less than five plants, scattered in patches, evenly scattered and forming a matrix.

Results and Discussion

During the summer of 2009, the Southern Plains I&M Network (SOPN) conducted a full pilot of their proposed Exotic Plant Monitoring in the full contingent of network parks. Based on a three-year monitoring rotation, a goal was set to survey up to two linear kilometers of high-priority vector per year for exotic plant invasion. This introduction-path data was augmented by plot data collected within the park's landscape through Grassland Monitoring efforts.

Two days of survey effort were conducted in each park by a two-man team. This allowed each team member to monitor a side of the vector scanning up to 30-meters into the landscape, in a series of 50-meter linear Vector Blocks. Efforts in four parks (CAVO, LYJO, SAND, WABA) were curtailed due to extreme weather events, including heat indexes over 100° C; monsoon rains; and extensive mowing due to extreme drought. Changes in our logistics (see below) should better facilitate meeting our annual objectives. The targeted vectors in the remaining SOPN parks were completed, although often the length of the vector was shortened due to unsuitable land use for monitoring purposes (maintenance yards, parking lots, cultural resources, etc.). We have adjusted our panels (annual sample) accordingly such that all are suitable for long-term monitoring. Secondary within-landscape data was not collected for three parks (CHIC, FOUN, PECO), while CAVO had only limited data collected.

Five Student Conservation Association (SCA) interns were trained over the course of the field season in exotic plant identification and monitoring techniques.

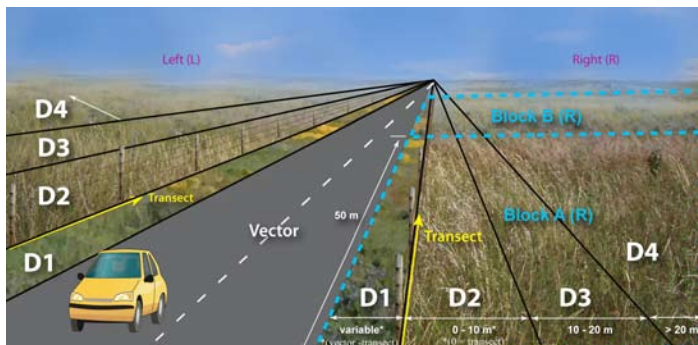


Figure 1. Fifty meter blocks are sampled on each side of a vector (e.g., roads and trails) in each of 4 distance classes from the vector.

Table 1 gives a summary of the number of primary 50-meter Vector Blocks and secondary within-landscape 1m² plots that were monitored in each park for this pilot study. A total of 270 50-meter Vector Blocks were monitored within the SOPN for exotic plants for a total linear length of 13.5 kilometers. Additionally, 360 1m² permanent plots within the landscape of the parks were monitored for the presence of exotics.

In general, the 2009 Exotic Plant Monitoring pilot was a success. Proposed changes to the protocol include only logistical considerations. This season SOPN's exotic and grassland monitoring was done in tandem. One exotic team member was pulled from the grassland monitoring crew at each park. This team member changed frequently to allow for all SCA interns to receive expanded training in monitoring techniques. This benefit for the intern also allowed for one-on-one training on identification of native plants encountered along the vector, which enhanced the grassland monitoring teams' identification knowledge. The drawback for this approach was the loss of valuable exotic monitoring time, as each new crew member had to be trained in monitoring techniques, as well as plant identification and development of search patterns. Once trained, however, exotic monitoring progressed well and subsequent assignment to the exotic team required only an update to any new exotic plants specific to that park.

In future years, team members will be permanently assigned to the exotic monitoring. This will allow for rapid progress along the designated vector and an accumulative approach to plant identification and search pattern development. This will also allow the exotics team to travel independently of the grassland team, which requires extended stays in each park. Additionally, adjusted scheduling for the possibility of a third partial-day's effort will allow completion of monitoring that may be curtailed due to weather conditions.

Starting in 2010, we will slightly increase our budget for exotic plant monitoring. Our intention is to maintain a desired three-year rotation while increasing the sample within a given year.

Project Contact

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Mullen (*Verbascum thapsus*)

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