



Lyndon B. Johnson National Historical Park

2011 Exotic Plant Monitoring

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 invasions.

Invasive exotic plants have been consistently ranked as a top vital sign for long-term monitoring as part of the NPS Inventory & Monitoring Program. During final selection of vital signs in 2006, invasive exotic plant monitoring was recognized across all Southern Plains Network (SOPN) parks as the most important shared monitoring need. The objectives of monitoring high-priority exotics in areas of high and low invasion probability are to: (1) detect exotic species introductions early, (2) determine changes in the status and trend (density, abundance, or extent), and (3) determine changes in species composition.

Methods

Overall sampling at Lyndon B. Johnson National Historical Park (NHP) occurs only on the unpaved Settlement Trail over its full three-year rotation. In 2011, exotic plant monitoring occurred at Lyndon B. Johnson in late May. Thirty vector blocks were monitored, for a total of 0.8 linear kilometers sampled on both sides (Figure 1). In addition, two permanent transects within the landscape were sampled for a total of 10 2x1 meter plots. Nine species of exotics were detected with primary and secondary monitoring. Exotics were detected in every vector block. The restoration area of the Johnson Settlement is the only unmowed semi-natural area of the park available for monitoring. Therefore, we depart from the standard three-year panel rotation and instead monitor this area every year. Of the nineteen exotic species detected over the last two years, eight have been found in <10% of the vector blocks.

Results

Long-term establishment of a suite of exotic species will make it very difficult to successfully control the invasions. The restoration area has been plowed and terraced in the past and has also served as a pecan orchard. Several efforts through the years to re-establish a mid-grass prairie have met with limited



KR bluestem (*Bothriochloa ischaemum*) was the most commonly found exotic species in 2011 at Lyndon B. Johnson NHP.

success. It has also been shown in many studies that the lack of prescribed fire can leave a grassland diminished and allow exotics to proliferate.

K.R. bluestem (*Bothriochloa ischaemum*) was the most dominant exotic found in 2011, appearing in 97% of the primary vector blocks and one secondary transect (Table 1). This perennial sod-forming grass is drought tolerant, a prodigious seeder, and responds favorably to mowing and burning. The basal growth becomes very thick and full of thatch, displacing native species and decreasing both plant and animal biodiversity. Left unmanaged, this grass has the potential to become a monoculture and adds to fire threat by providing abundant fine fuel.

Johnsongrass (*Sorghum halepense*) was the second most prevalent exotic found, detected in 77% of the vector blocks monitored. This is a perennial grass with a strong rhizomatous root system providing the capacity to colonize large areas and is most often found in disturbed and flooded bottomlands. Once established, Johnsongrass persists in the landscape despite eradication efforts, effectively displacing native grasses and forbs.

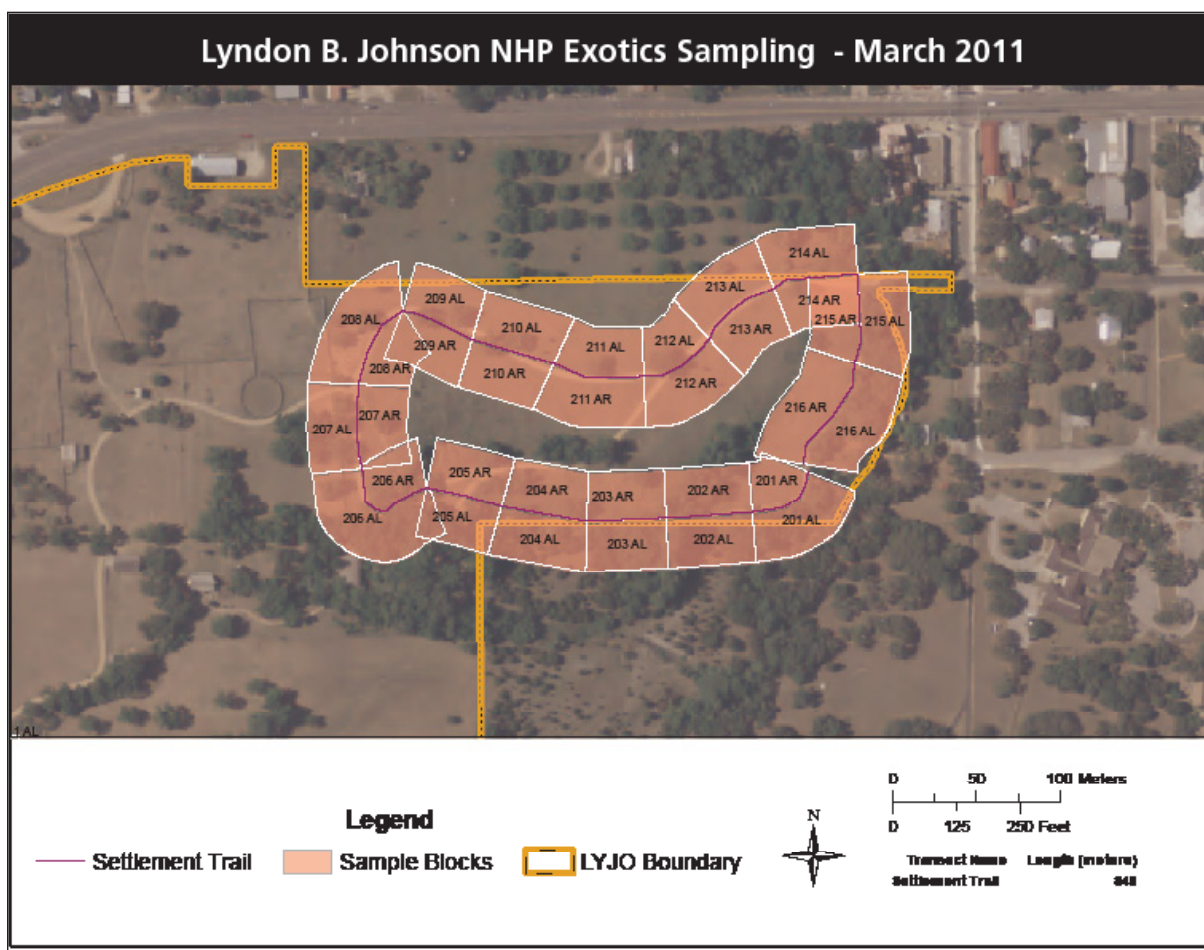


Figure 1. Individual vector blocks sampled, Lyndon B. Johnson NHP, 2011.

Table 1. Number and percentage of primary and secondary sample units where each species was detected, Lyndon B. Johnson NHP, 2011.

Scientific name	Common name	Primary sample units (n=30)		Secondary sample units (n=2)	
		Total	% blocks	Total	% transects
<i>Bothriochloa ischaemum</i>	KR bluestem	29	96.67	1	50
<i>Sorghum halepense</i>	Johnsongrass	23	76.67	1	50
<i>Medicago lupulina</i>	black medic clover	16	53.33	—	—
<i>Bromus japonicus</i>	Japanese brome	7	23.33	—	—
<i>Conium maculatum</i>	poison hemlock	5	16.67	—	—
<i>Cynodon dactylon</i>	Bermuda grass	5	16.67	—	—
<i>Convolvulus arvensis</i>	field bindweed	1	3.33	—	—
<i>Lolium perenne</i>	perennial rye	1	3.33	—	—
<i>Lonicera japonica</i>	Japanese honeysuckle	1	3.33	—	—