



## Lyndon B. Johnson National Historical Park

# 2010 Exotic Plant Monitoring

Exotic plants represent one of the most significant threats to natural resources in national parks 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. Prevention and early detection are the principal strategies for successful invasive exotic plant management.

Invasive exotic plant monitoring was recognized across all Southern Plains Inventory & Monitoring 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 on the unpaved Settlement Trail over its full three-year rotation. In 2010, exotic plant monitoring occurred for one day in May. Thirty-two 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 4x1 meter plots.

### Results

Black medic clover (*Medicago lupulina*) was the most commonly found exotic species this field season (Table 1) and was found in 94% of vector blocks sampled, but not in the secondary transects. Black medic clover was found in scattered patches primarily up to 10 meters into the landscape, though occasionally found deeper. Johnsongrass (*Sorghum halepense*) was found in 81% of vector blocks sampled and both of secondary transects. Densities varied from just a few plants to areas of evenly distributed patches and it was found from trailside to over 20 meters into the landscape. In the secondary transects, Johnsongrass was found in one to two plots per transect, but one plot had 30% cover.

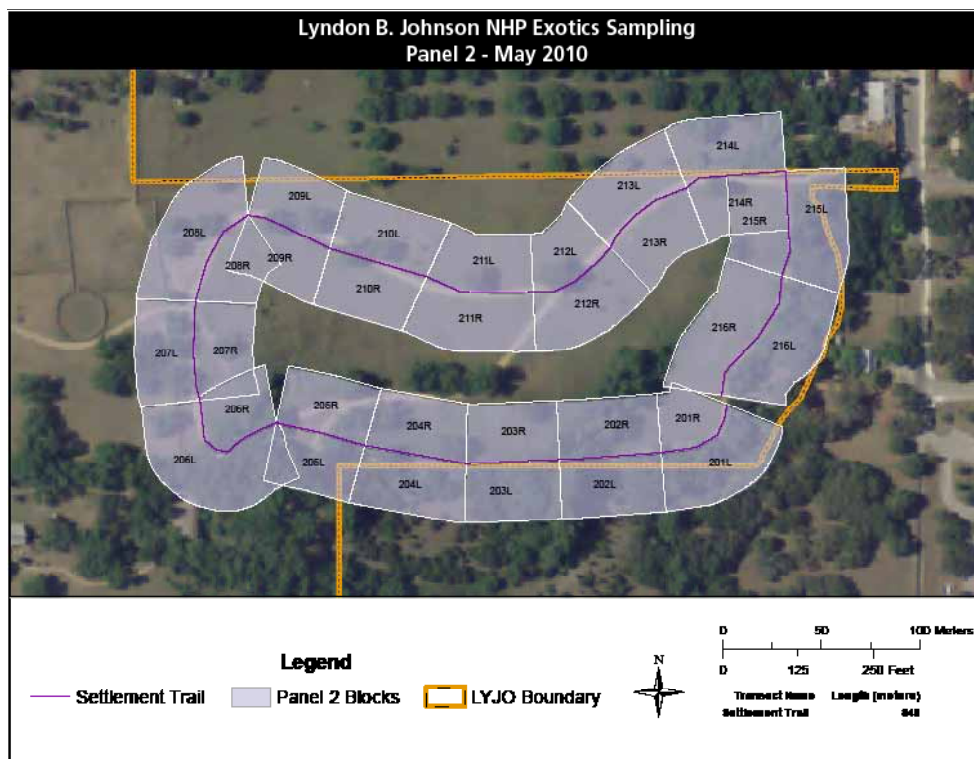
Dandelion (*Taraxacum officinale*) and spreading hedgeparsley (*Torilis arvensis*) were found in 69% of vector blocks sampled but no secondary transects. Spreading hedgeparsley was found in scattered patches within 20 meters of the vector,



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Black medic clover (*Medicago lupulina*) was the most commonly found exotic species in 2010 at Lyndon B. Johnson NHP.

with one area of evenly distributed patches along the north side of the trail. Japanese brome (*Bromus japonicus*) and perennial ryegrass (*Lolium perenne*) were found in 53% of vector blocks sampled. KR bluestem (*Bothriochloa ischaemum* var. *songarica*) was present in 44% of vector blocks sampled and both of secondary transects. KR bluestem was found as scattered patches up to 20 meters into the landscape. It was found on three and four plots of each transect with covers of 30% and up to 60%, becoming a major dominant grass. Kleberg bluestem (*Dichanthium annulatum*) was present in 34% of vector blocks sampled. It was found in scattered to evenly distributed patches on the north side of the loop up to and beyond 22 meters. Lamarck's bedstraw (*Galium divaricatum*) and tall fescue (*Lolium arundinaceum*) were present in 28% of vector blocks sampled. Burr medic clover (*Medicago minima*) was present in 25% of vector blocks sampled. Burr medic clover was found in scattered patches



up to 12 meters into the landscape, primarily on the north and east sides of the loop.

A number of exotic species were found only along the vector. Cheatgrass (*Bromus tectorum*), Maltese starthistle (*Centaurea melitensis*), Japanese honeysuckle (*Lonicera japonica*), Vaseygrass (*Paspalum urvillei*), and garden vetch (*Vicia sativa*) were all found in 16% of the vector blocks monitored. Toothed spurge (*Euphorbia dentata*) was found minimally on both transects with a cover of less than 1%, while Bermuda grass (*Cynodon dactylon*) was found in one plot of one transect at a cover of 5%.

**Figure 1.** Individual vector blocks sampled, Lyndon B. Johnson NHP, 2010.

**Table 1.** Number and percentage of primary and secondary sample units where each species was detected, Lyndon B. Johnson NHP, 2010.

| Scientific name                                     | Common name            | Primary sample units (n=32) |          | Secondary sample units (n=2) |             |
|-----------------------------------------------------|------------------------|-----------------------------|----------|------------------------------|-------------|
|                                                     |                        | Total                       | % blocks | Total                        | % transects |
| <i>Medicago lupulina</i>                            | Black medic clover     | 30                          | 94       | 0                            | 0           |
| <i>Sorghum halepense</i>                            | Johnsongrass           | 26                          | 81       | 2                            | 100         |
| <i>Taraxacum officinale</i>                         | Dandelion              | 22                          | 69       | 0                            | 0           |
| <i>Torilis arvensis</i>                             | Spreading hedgeparsley | 22                          | 69       | 0                            | 0           |
| <i>Bromus japonicus</i>                             | Japanese brome         | 17                          | 53       | 0                            | 0           |
| <i>Lolium perenne</i>                               | Perennial ryegrass     | 17                          | 53       | 0                            | 0           |
| <i>Bothriochloa ischaemum</i> var. <i>songarica</i> | KR bluestem            | 14                          | 44       | 2                            | 100         |
| <i>Dichanthium annulatum</i>                        | Kleberg bluestem       | 11                          | 34       | 0                            | 0           |
| <i>Galium divaricatum</i>                           | Lamarck's bedstraw     | 9                           | 28       | 0                            | 0           |
| <i>Lolium arundinaceum</i>                          | Tall fescue            | 9                           | 28       | 0                            | 0           |
| <i>Medicago minima</i>                              | Burr medic clover      | 8                           | 25       | 0                            | 0           |
| <i>Bromus tectorum</i>                              | Cheatgrass             | 5                           | 16       | 0                            | 0           |
| <i>Centaurea melitensis</i>                         | Malta starthistle      | 5                           | 16       | 0                            | 0           |
| <i>Lonicera japonicus</i>                           | Japanese honeysuckle   | 5                           | 16       | 0                            | 0           |
| <i>Paspalum urvillei</i>                            | Vaseygrass             | 5                           | 16       | 0                            | 0           |
| <i>Vicia sativa</i>                                 | Garden vetch           | 5                           | 16       | 0                            | 0           |
| <i>Euphorbia dentata</i>                            | Toothed spurge         | 0                           | 0        | 2                            | 100         |
| <i>Cynodon dactylon</i>                             | Bermuda grass          | 0                           | 0        | 1                            | 50          |