



## Washita Battlefield National Historic Site

# 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 Washita Battlefield National Historic Site (NHS) includes both unpaved roads and trails over its full three-year rotation. In 2010, exotic plant monitoring occurred for 2.5 days in June. The vectors sampled were an unpaved maintenance road and two trails: a new trail and the South Loop Trail in the southwestern corner of the park. Seventy vector blocks were monitored, for a total of 1.75 linear kilometers sampled on both sides (Figure 1). In addition, 10 permanent transects within the landscape were sampled for a total of 50 4x1 meter plots.

### Results

Japanese brome (*Bromus japonicus*) was the most commonly found exotic species this field season (Table 1), followed by Johnsongrass (*Sorghum halepense*) and cheatgrass (*Bromus tectorum*). Japanese brome was found in 97% of the vector blocks sampled and 50% of the secondary transects. Johnsongrass was found in 89% of the vector blocks sampled and 50% of the secondary transects, with transect cover densities generally over 10% and as high as 55%. Both species were most frequently seen within 22 meters of the vector, and often observed running deeper into the landscape. Cheatgrass was present in 83% of vector blocks sampled. These three species of exotic grasses pose a major threat to the grasslands



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Johnsongrass (*Sorghum halepense*) was one of the most commonly found exotic species in 2010 at Washita Battlefield NHS.

at Washita Battlefield NHS, with the bromes filling the interstices between the native bunchgrasses.

Kochia (*Kochia scoparia*) was found in 67% of the vector blocks sampled and one secondary transect. It was consistently seen up to 12 meters into the landscape, and occasionally more than 22 meters into the landscape. While observed throughout the vector blocks in scattered patches, the area of the old homestead exhibited areas where kochia had become a matrix in the landscape. Kochia was present at 25% cover in one plot of the single transect. Yellow sweetclover (*Melilotus officinalis*) was found in 54% of the vector blocks sampled.

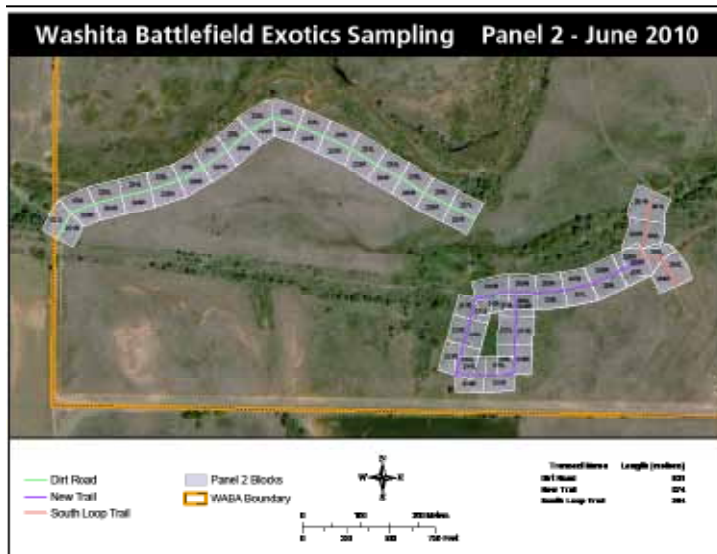


**Figure 1.** Individual vector blocks sampled, Washita Battlefield NHS, 2010.

Western salsify (*Tragopogon dubius*) was present in 49% of the vector blocks sampled, appearing on both vectors as a few plants to scattered patches. Siberian elm (*Ulmus pumila*) was found in 37% of the vector blocks sampled and 70% of the secondary transects. While observed at the old homestead, Siberian elm was most frequently found in scattered patches throughout the western restoration area.

Burr medic clover (*Medicago minima*) was found in 9% of the vector blocks in scattered patches along the trail. Prickly lettuce (*Lactuca serriola*) showed up in 6% of the vector blocks as occasional plants within the first 12 meters of the trail vector in one area along the railroad bed. This species has shown a creeping spread in other SOPN parks, so quick eradication of these plants should be considered. Tamarisk (*Tamarix chinensis*) was seen in three vector blocks in scattered patches over 12 m into the landscape. The largest patch was near the railroad bed, with an occasional plant found along the Washita River. Scattered patches of perennial ryegrass (*Lolium perenne*), a few plants of both black medic clover (*Medicago lupulina*), and dandelion (*Taraxacum officinale*) were found at the beginning of the trail and are prime candidates for eradication.

**Table 1.** Number and percentage of primary and secondary sample units where each species was detected, Washita Battlefield NHS, 2010.

| Scientific name              | Common name             | Primary sample units (n=70) |          | Secondary sample units (n=10) |             |
|------------------------------|-------------------------|-----------------------------|----------|-------------------------------|-------------|
|                              |                         | Total                       | % blocks | Total                         | % transects |
| <i>Bromus japonicus</i>      | Japanese brome          | 68                          | 97       | 5                             | 50          |
| <i>Sorghum halepense</i>     | Johnsongrass            | 62                          | 89       | 5                             | 50          |
| <i>Bromus tectorum</i>       | Cheatgrass              | 58                          | 83       | 0                             | 0           |
| <i>Kochia scoparia</i>       | Kochia                  | 47                          | 67       | 1                             | 10          |
| <i>Melilotus officinalis</i> | Yellow sweetclover      | 38                          | 54       | 0                             | 0           |
| <i>Tragopogon dubius</i>     | Western salsify         | 34                          | 49       | 0                             | 0           |
| <i>Cirsium vulgare</i>       | Bull thistle            | 33                          | 47       | 0                             | 0           |
| <i>Ulmus pumila</i>          | Siberian elm            | 26                          | 37       | 7                             | 70          |
| <i>Euphorbia dentata</i>     | Toothed spurge          | 11                          | 16       | 1                             | 10          |
| <i>Albizia julibrissin</i>   | Mimosa                  | 9                           | 13       | 0                             | 0           |
| <i>Medicago minima</i>       | Burr medic clover       | 6                           | 9        | 0                             | 0           |
| <i>Chenopodium album</i>     | Common lambsquarters    | 4                           | 6        | 0                             | 0           |
| <i>Lactuca serriola</i>      | Prickly lettuce         | 3                           | 4        | 0                             | 0           |
| <i>Tamarix chinensis</i>     | Tamarisk                | 3                           | 4        | 0                             | 0           |
| <i>Cynodon dactylon</i>      | Bermuda grass           | 2                           | 3        | 1                             | 10          |
| <i>Lolium perenne</i>        | Perennial ryegrass      | 1                           | 1        | 0                             | 0           |
| <i>Medicago lupulina</i>     | Black medic clover      | 1                           | 1        | 0                             | 0           |
| <i>Taraxacum officinale</i>  | Dandelion               | 1                           | 1        | 0                             | 0           |
| <i>Convolvulus arvensis</i>  | Field bindweed          | 0                           | 0        | 2                             | 20          |
| <i>Salsola tragus</i>        | Prickly Russian thistle | 0                           | 0        | 1                             | 10          |
| <i>Sonchus asper</i>         | Spiny sowthistle        | 0                           | 0        | 2                             | 20          |