



Washita Battlefield National Historic Site

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 Washita Battlefield includes both unpaved roads and trails over its full three-year rotation. In 2011, exotic plant monitoring occurred at Washita Battlefield in early June. The vector sampled was the entire boundary south of the river. Sixty-seven vector blocks were monitored, for a total of 3.35 linear kilometers sampled on one side only (Figure 1). In addition, nine permanent transects within the landscape were sampled for a total of 45 2x1 meter plots. Fifteen species of exotics were detected with primary and secondary monitoring (Table 1). There were no exotics detected in only one vector block. SOPN has now completed one full rotation of panels and re-visits will begin in 2012.

Results

The majority of the land at Washita Battlefield NHS is reclaimed agricultural field that still contains terracing and the scars of a one-time homestead. The hydrological regime is further altered by an abandoned railroad grade that effectively divides the uplands from the bottomlands across the park. These long-term disturbances provide ample microhabitats for the establishment and proliferation of exotic species.

Cheatgrass (*Bromus tectorum*) was the most frequently detected exotic in 2011, appearing in 69% of the primary vector blocks but no secondary transects. This cool-season annual produces dense

Cheatgrass (*Bromus tectorum*) was the most commonly found exotic species in 2011 at Washita Battlefield NHS.



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stands and abundant seed and has the capacity to alter native plant communities through displacement of natives and changes in fire regime. It should be noted that all monitoring in 2011 occurred along park boundary that had received new fencing within the past year. It is possible that this recent disturbance released an existing seedbank of cheatgrass. Care must be taken to prevent this noxious weed to infest the park interior.

Siberian elm (*Ulmus pumila*) was found in 58% of the primary vector blocks and 67% of the secondary transects. This is a fast-growing tree tolerant of a wide range of conditions and soil types. It efficiently competes for resources, produces abundant seed and has the capacity to greatly alter the native plant and animal communities. Siberian elm has been long planted in surrounding areas as a shelter-belt tree.

Johnsongrass (*Sorghum halepense*) was observed in 40% of the 2011 primary vector blocks and 33% of the secondary transects. 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.

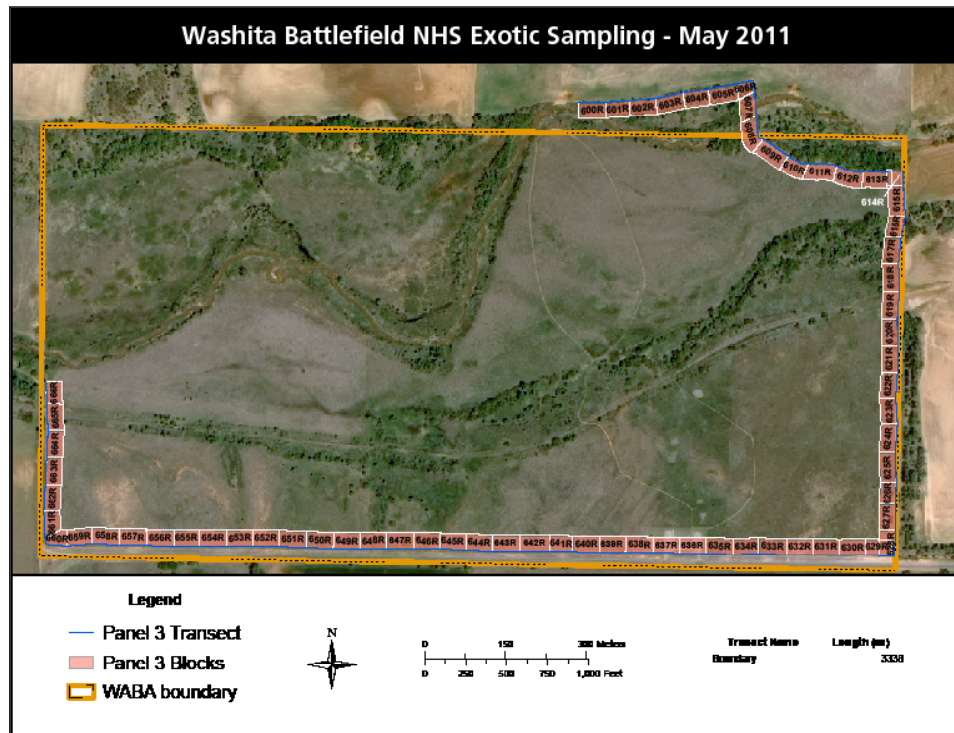


Figure 1. Individual vector blocks sampled, Washita Battlefield NHS, 2011.

Table 1. Number and percentage of primary and secondary sample units where each species was detected, Washita Battlefield NHS, 2011.

Scientific name	Common name	Primary sample units (n=67)		Secondary sample units (n=9)	
		Total	% blocks	Total	% transects
<i>Bromus tectorum</i>	cheatgrass	46	68.66	—	—
<i>Ulmus pumila</i>	Siberian elm	39	58.21	6	66.67
<i>Sorghum halepense</i>	Johnsongrass	27	40.30	3	33.33
<i>Kochia scoparia</i>	kochia	15	22.39	1	11.11
<i>Bromus japonicus</i>	Japanese brome	12	17.91	6	66.67
<i>Salsola tragus</i>	prickly Russian thistle	9	13.43	2	22.22
<i>Melilotus alba</i>	white sweetclover	7	10.45	—	—
<i>Cynodon dactylon</i>	Bermuda grass	4	5.97	1	11.11
<i>Meilotos officinalis</i>	yellow sweetclover	3	4.48	—	—
<i>Erodium cicutarium</i>	red stem storksbill	2	2.99	—	—
<i>Lolium perenne</i>	perennial rye	2	2.99	—	—
<i>Tragopogon dubius</i>	western salsify	2	2.99	—	—
<i>Convolvulus arvensis</i>	field bindweed	1	1.49	1	11.11
<i>Lactuca serriola</i>	prickly lettuce	—	—	1	11.11
<i>Medicago minima</i>	burr medic clover	—	—	1	11.11
None		1	1.49		