



Chickasaw National Recreation Area

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 Chickasaw National Recreation Area (NRA) occurs on paved and unpaved roads and trails over its full three-year rotation (see Figure 1). In 2011, exotic plant monitoring occurred at Chickasaw NRA in early June along the unpaved access roads in the east and west Guy Sandy area. One hundred twenty-eight primary vector blocks were monitored, for a total of 3.2 linear kilometers sampled on both sides. In addition, 12 permanent secondary transects within the landscape were sampled for a total of 60 2x1 meter plots. Twenty-eight species of exotics were detected with primary and secondary monitoring (see Table 1). Exotics were detected in every vector block. It should be stressed that, due to the large scale of the park, these monitoring results do not reflect an overall state of exotics.

Results

Chickasaw NRA is primarily a narrow band of land surrounding streams, floodplains and a reservoir, with a great amount of urban interface along its boundary. The numerous streams and drainages provide an invasion pathway for exotics from surrounding urban and agricultural areas and a moist environment for their establishment.

White sweetclover (*Melilotus alba*) was detected in 74% of the primary vector blocks this season but was not found in any secondary transects. A member of the legume family, the roots of annual/biennial sweetclovers fix nitrogen in the soil, displacing

White sweetclover (*Melilotus alba*) was commonly found in 2011 at Chickasaw NRA.



NPS

native nitrogen fixers. The sweetclovers are dispersed by wind and water and are often found in riparian areas following flooding events.

The second most commonly detected exotic was Japanese brome (*Bromus japonicus*) found in 73% of the primary vector blocks and 25% of the secondary transects. This cool season annual grass is a prolific reseeder with the capacity to modify native plant communities through early-season competition (to the detriment of native seedlings) and by adding considerably to the fine-fuel load.

Johnsongrass (*Sorghum halepense*) was found in 66% of the 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.

Sericea lespedeza (*Lespedeza cuneata*) was the exotic found in the most (50%) secondary transects. This perennial legume is a relict of past agricultural land use within the park boundary. It is a long-lived perennial legume that produces abundant seed, has a deep root system, and produces dense stands that out-compete native plants. It is drought-resistant, responds to favorably to fire and readily colonizes bottomland habitats.

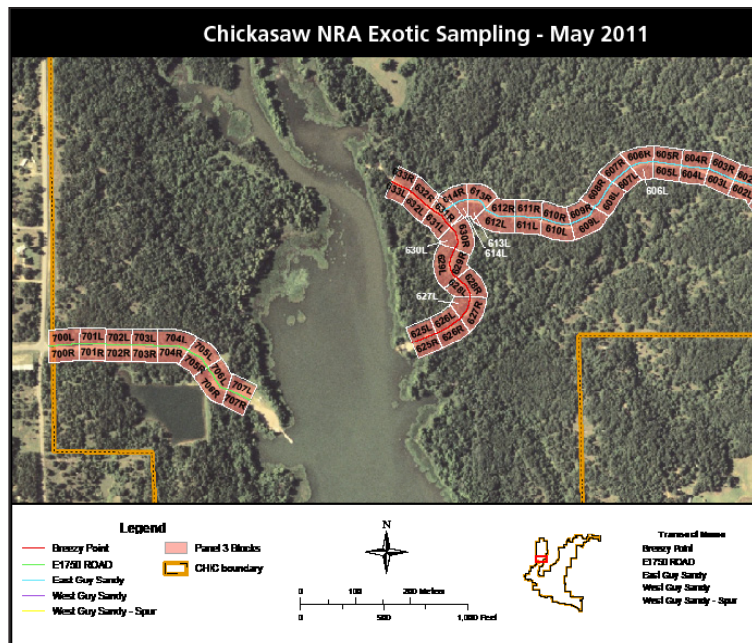
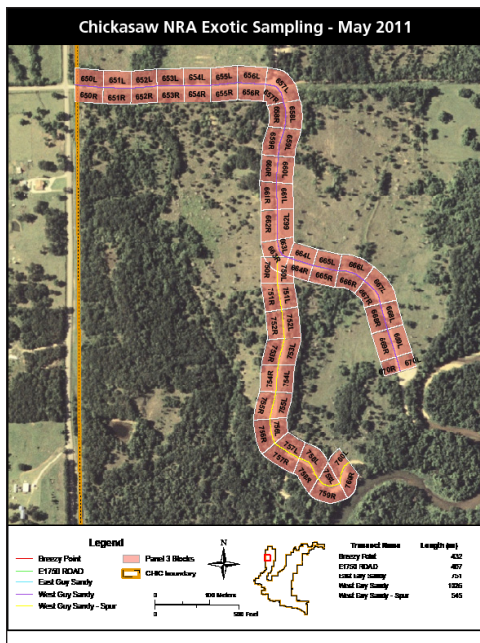


Figure 1. Individual vector blocks sampled (upper and lower transects), Chickasaw NRA, 2011.

Table 1. Number and percentage of primary and secondary sample units where each species was detected, Chickasaw NRA, 2011.

Scientific name	Common name	Primary vector blocks (n=128)		Secondary transects (n=12)	
		Total	% blocks	Total	% transects
<i>Melilotus alba</i>	White sweetclover	95	74.22	-	-
<i>Bromus japonicus</i>	Japanese brome	93	72.66	3	25
<i>Sorghum halepense</i>	Johnsongrass	85	66.41	4	33.33
<i>Bothriochloa ischaemum</i>	KR bluestem	71	55.47	2	16.67
<i>Medicago lupulina</i>	Black medic clover	67	52.34	-	-
<i>Lespedeza cuneata</i>	Sericea lespedeza	46	35.94	6	50
<i>Lonicera japonica</i>	Japanese honeysuckle	36	28.13	-	-
<i>Cynodon dactylon</i>	Bermuda grass	35	27.34	1	8.33
<i>Torilis arvensis</i>	Spreading hedgeparsley	35	27.34	2	16.67
<i>Medicago minima</i>	Burr medic clover	31	24.22	-	-
<i>Bromus tectorum</i>	Cheatgrass	29	22.66	1	8.33
<i>Tragopogon dubius</i>	Western salsify	25	19.53	-	-
<i>Meilotos officinalis</i>	Yellow sweetclover	20	15.63	1	8.33
<i>Lolium perenne</i>	Perennial rye	18	14.06	-	-
<i>Medicago sativa</i>	Alfalfa	9	7.03	-	-
<i>Kochia scoparia</i>	Kochia	8	6.25	-	-
<i>Lathyrus hirsutus</i>	Singletary pea	5	3.91	1	8.33
<i>Euphorbia davidii</i>	David's spurge	4	3.13	-	-
<i>Taraxacum officinale</i>	Dandelion	4	3.13	-	-
<i>Bromus catharticus</i>	Rescue grass	2	1.56	1	8.33
<i>Conium maculatum</i>	Poison Hemlock	2	1.56	-	-
<i>Lactuca seriola</i>	Prickly lettuce	2	1.56	1	8.33
<i>Coronilla varia</i>	Purple crownvetch	1	0.78	-	-
<i>Trifolium campestre</i>	big hop clover	-	-	2	16.67
<i>Broussonetia papyrifera</i>	paper mulberry	-	-	1	8.33
<i>Dianthus armeria</i>	Deptford pink	-	-	1	8.33
<i>Rumex crispus</i>	curly dock	-	-	1	8.33