



Bent's Old Fort 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 Bent's Old Fort National Historic Site (NHS) occurs on paved roads over its full three-year rotation. During 2010, exotic plant monitoring occurred at Bent's Old Fort for 2.5 days in July. The 2010 vectors sampled included the unpaved maintenance roads on the south side of the Arkansas River and a portion of the unpaved maintenance road/loop trail in the north bank riparian area (Figure 1). One hundred and six vector blocks were monitored, for a total linear effort of 2,650 meters (sampled on both sides of the road). These vectors are scheduled for monitoring again in 2013. Thirteen permanent transects within the landscape were also sampled, for a total of 65 4x1 meter plots.

Results

Field bindweed (*Convolvulus arvensis*) was the most commonly found exotic species this field season, followed closely by prickly Russian thistle (*Salsola tragus*) (Table 1). Field bindweed was found most heavily in and around the prairie dog towns and in areas that underwent historic disturbance on the south side of the Arkansas River. When field bindweed was found in the five secondary transects (38%), it was found in most plots and at cover rates up to 30%.



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Field bindweed (*Convolvulus arvensis*) was the most commonly found exotic species in 2010 at Bent's Old Fort NHS.

Western salsify (*Tragopogon dubius*) was present in 35% of the vector blocks sampled in scattered patches on all vectors. This plant seems to be slowly spreading out from its initial invasion points, indicated by a few plants appearing in vector blocks adjacent to patches. White sweet clover (*Melilotus alba*) appeared in 28% of the vector blocks. Densities within these areas were generally scattered patches that appear to emanate from denser, evenly distributed patches deep into the landscape. A related species, yellow sweetclover (*Melilotus officianalis*) was present in 13% of the vector blocks, almost exclusively on the East Road in scattered patches that show signs of expanding.

Kochia (*Kochia scoparia*) was found in 27% of the vector blocks sampled and 11 secondary transects (85%). Cheatgrass (*Bromus tectorum*) was detected in 21% of the vector blocks almost always in scattered patches. Only a few vector blocks

on the south side of the river contained cheatgrass, indicating an opportunity for pre-emptive control. A related field brome (*Bromus arvensis*) was detected along the East Road only (10% of the vector blocks), but when found patches often reached an even distribution and ran over 20 meters into the landscape. It should be noted that no bromes of any kind were detected in the secondary transects.

The prairie dog towns on the south side of the Arkansas River were the sole locations for two exotics, toothed spurge (*Euphorbia dentata*) and puncturevine (*Tribulus terrestris*). Both appeared in scattered patches, but the toothed spurge tended to run deeper into the landscape, while the puncturevine was associated with the roadside. Rush wheatgrass (*Thinopyrum ponticum*; 8%) and Canada thistle (*Cirsium arvense*; 2%) were also detected only in vector blocks south of the river. A few scattered patches of rush wheatgrass exhibited expansion into the landscape. Canada thistle appeared as a limited number of plants in one vector block each on the Tamarisk and East Roads, allowing for rapid extermination of a problem plant.



Figure 1. Individual vector blocks sampled, Bent’s Old Fort NHS, 2010.

Table 1. Number and percentage of primary and secondary sample units where each species was detected, Bent’s Old Fort, 2010.

Scientific name	Common name	Primary vector blocks (n=106)		Secondary transects (n=13)	
		Total	% blocks	Total	% transects
<i>Convolvulus arvensis</i>	Field bindweed	66	62	5	38
<i>Salsola tragus</i>	Prickly Russian thistle	57	54	7	54
<i>Tragopogon dubius</i>	Western salsify	37	35	1	8
<i>Melilotus alba</i>	White sweetclover	30	28	2	15
<i>Kochia scoparia</i>	Kochia	27	25	11	85
<i>Bromus tectorum</i>	Cheatgrass	22	21	0	0
<i>Asparagus officinalis</i>	Garden asparagus	19	18	0	0
<i>Melilotus officinalis</i>	Yellow sweetclover	14	13	0	0
<i>Bromus arvensis</i>	Field brome	11	10	0	0
<i>Euphorbia dentata</i>	Toothed spurge	10	9	2	15
<i>Amaranthus retroflexus</i>	Red-root pigweed	8	8	0	0
<i>Chenopodium alba</i>	Common lambsquarters	8	8	0	0
<i>Thinopyrum ponticum</i>	Rush wheatgrass	8	8	0	0
<i>Cirsium arvense</i>	Canada thistle	2	2	0	0
<i>Lactuca serriola</i>	Prickly lettuce	0	0	6	46
<i>Rumex crispus</i>	Curly dock	0	0	4	31