



Fort Union National Monument

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 Fort Union National Monument (NM) includes both paved and unpaved roads in both units over its full three-year rotation. In 2011, exotic plant monitoring occurred at Fort Union NM in July. The vectors sampled were unpaved maintenance roads from the maintenance yard to the fort ruins and the paved entrance road to the Visitor Center (see Figure 1). Sixty-eight vector blocks were monitored, for a total of 1.7 linear kilometers sampled on both sides. In addition, six permanent transects within the landscape were sampled for a total of 30 2x1 meter plots. Eight species of exotics were detected with primary and secondary monitoring (see Table 1). No exotics were found in seven vector blocks. SOPN has now completed one full rotation of panels scheduled and re-visits will begin in 2012.

Results

Fort Union NM has possibly the “healthiest” grasslands in the Southern Plains Network, yet vigilance will be needed to prevent the spread of new and existing exotic species from housing areas, wind, or machinery used on site. The exclusion of fire and grazing on the prairie also has the potential to

Prickly Russian thistle (*Salsola tragus*) was the most commonly found exotic species in 2011 at Fort Union NM.



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weaken the resilience of the native plant community, thus allowing exotics to spread.

Prickly Russian thistle (*Salsola tragus*) was detected in 76% of the primary vector blocks monitored in 2011, and four of the secondary transects. This drought-tolerant annual produces abundant seed and disperses them widely when it breaks from its roots and tumbles across the prairie. As long as it has access to sunlight, prickly Russian thistle is efficient at establishing in small bare-ground areas among existing vegetation in the landscape. The resulting widespread distribution makes it difficult to control.

Field bindweed (*Convolvulus arevensis*) was also prevalent, being found in 54% of the primary vector blocks and one secondary transect. This perennial taprooted exotic is drought tolerant and an abundant seeder, with the ability to establish from small bits of vegetative material. Field bindweed, ranked as “noxious” in Kansas and surrounding states, is an effective colonizer with the ability to blanket an area; it climbs over existing vegetation, intercepting rainfall and shading out other plants. Its deep taproot insures continued regeneration and it is very difficult to destroy.

A third species of exotic, Kochia (*Kochia scoparia*) was detected in 43% of the primary vector blocks and two

secondary transects. This drought-tolerant annual exotic produces abundant seed that are widely distributed as the spent plant breaks from its roots and blows across the prairie. Kochia is an early successional plant that readily establishes in sites with soil disturbance, outcompeting other native early

successionals and responding favorably to increased nitrogen in the soil. It persists in the landscape by developing dense stands and maintaining increased nitrogen levels through annual foliage shedding. Kochia can also increase the fine-fuel load leading to a more intense fire capacity.

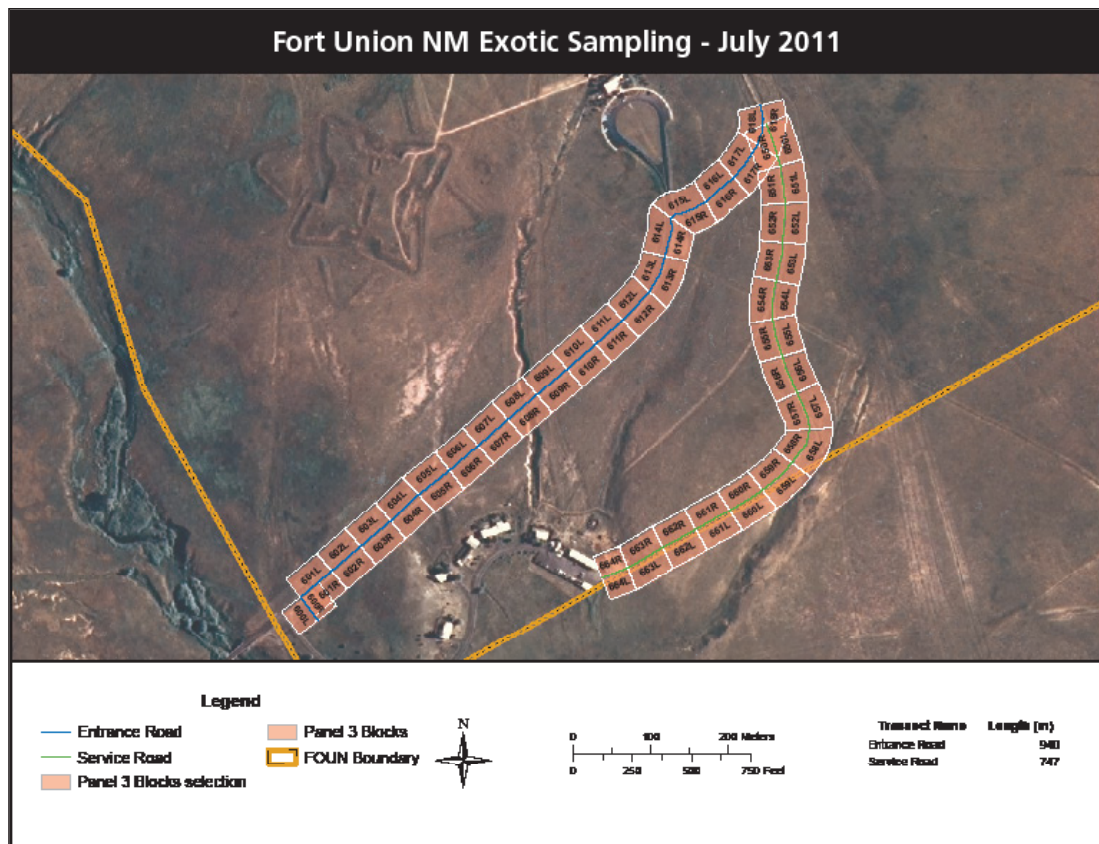


Figure 1. Individual vector blocks sampled, Fort Union NM, 2011.

Table 1. Number and percentage of primary and secondary sample units where each species was detected, Fort Union NM, 2011.

Scientific name	Common name	Primary vector blocks (n=68)		Secondary transects (n=6)	
		Total	% blocks	Total	% transects
<i>Salsola tragus</i>	prickly Russian thistle	52	76.47	4	66.67
<i>Convolvulus arvensis</i>	field bindweed	37	54.41	1	16.67
<i>Kochia scoparia</i>	kochia	29	42.65	2	33.33
<i>Erodium cicutarium</i>	red stem storksbill	11	16.18	—	—
<i>Melilotus alba</i>	white sweetclover	5	7.35	—	—
<i>Verbascum thapsus</i>	common mullein	4	5.88	—	—
<i>Meilotus officinalis</i>	yellow sweetclover	2	2.94	—	—
<i>Rumex crispus</i>	curly dock	1	1.47	—	—
None		7	10.29		