



## Pecos National Historical Park

## 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 Pecos National Historical Park (NHP) occurs on paved and unpaved roads and trails over its full three-year rotation. In 2010, exotic plant monitoring occurred for two days in July. The vector sampled was the unpaved Well Road through the Forked Lightning Ranch. Eighty vector blocks were monitored, for a total of 1 linear kilometer sampled on both sides (Figure 1). In addition, eight permanent transects within the landscape were sampled for a total of 40 4x1 meter plots.

### Results

Western salsify (*Tragopogon dubius*) was the most common exotic found in 2010 (Table 1), occurring in 91% of the vector blocks and 88% of transects. Salsify was found in varying numbers of plots in transects at 3% cover or less. Salsola (*Salsola tragus*) appeared in 69% vector blocks and one transect. A species tentatively identified as smallseed false flax (*Camelina microcarpa*) was detected in 66% of the vector blocks (further identification verification is needed). Yellow sweetclover (*Melilotus officinalis*) was found in 53% of the vector blocks as individual plants to scattered patches at least 20 meters into the landscape, occasionally deeper. Horehound (*Marrubium vulgare*) appeared in 45% of the vector blocks all located in the lower half of the vector. A



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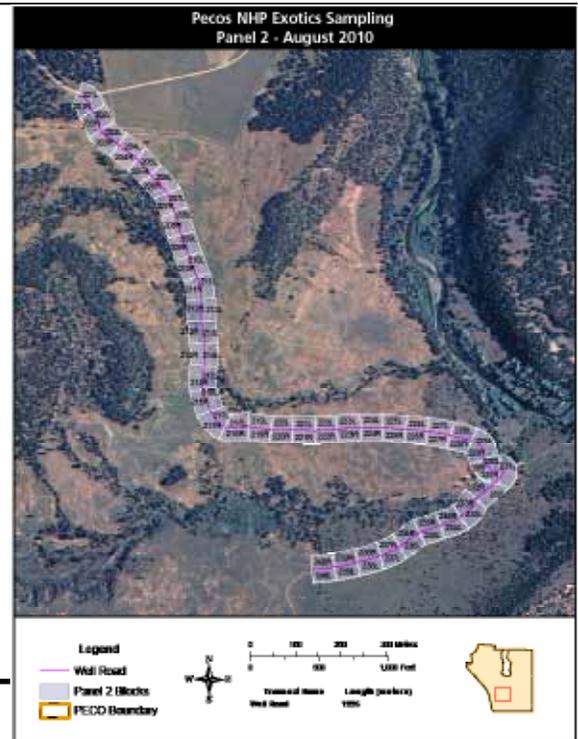
Western salsify (*Tragopogon dubius*) was the most common exotic found at Pecos NHP in 2010.

species of lambsquarters, possibly *Chenopodium album*, was found in 30% of the vector blocks (identification verification is also needed for this species). Kochia (*Kochia scoparia*) was seen in 26% of the vector blocks, primarily as individual plants within the first 12 meters of the vector. Japanese brome (*Bromus japonicus*) appeared in 25% of the vector blocks, throughout the lower two-thirds of the vector. Canada thistle (*Cirsium arvense*) was noted in 19% of the vector blocks—all located in the northern half of the vector. Meadow salsify (*Tragopogon pratense*) was found in 18% of the vector blocks as individual plants to scattered patches usually up to 12 meters from the vector. Mediterranean brome (*Bromus lanceolatus*) and mullein (*Verbascum thapsus*) were both found in 14% of the vector blocks. The brome was found in scattered patches within 12 meters of the vector, while mullein was seen as individual plants to scattered patches from the vector-side

to over 20 meters into the landscape. Garden asparagus (*Asparagus officinalis*) was seen in 10% of the vector blocks in the center section of the vector as individual plants to scattered patches occasionally up to 20 meters or deeper. Rush wheatgrass (*Thinopyrum ponticum*) appeared in 9% of the vector blocks in the first third of the vector as scattered patches up to 20 meters from the vector.

Several exotic species appeared in a minimal number of vector blocks. Orchardgrass (*Dactylis glomerata*) and alfalfa (*Medicago sativa*) were found in four vector blocks each. Field bindweed (*Convolvulus arvensis*), Canadian bluegrass (*Poa compressa*), and cutleaf vipergrass (*Scorzonera laciniata*) were found in three vector blocks each. Bull thistle (*Cirsium vulgare*) and annual sweetclover (*Melilotus indicus*) were found in two vector blocks each. Cheatgrass (*Bromus tectorum*), white sweetclover (*Melilotus alba*), and Siberian elm (*Ulmus pumila*) were found in one vector block each.

**Figure 1.** Individual vector blocks sampled, Pecos NHP, 2010.



**Table 1. Number and percentage of primary and secondary sample units where each species was detected, Pecos NHP, 2010.**

Scientific name	Common name	Primary sample units (n=80)		Secondary sample units (n=8)	
		Total	% blocks	Total	% transects
<i>Tragopogon dubius</i>	Western salsify	73	91	7	88
<i>Salsola tragus</i>	Prickly Russian thistle	55	69	1	13
<i>Camelina microcarpa</i>	Smallseed false flax	53	66	0	0
<i>Melilotus officinalis</i>	Yellow sweetclover	42	53	0	0
<i>Marrubium vulgare</i>	Horehound	36	45	0	0
<i>Chenopodium album</i>	Common lambsquarters	24	30	0	0
<i>Kochia scoparia</i>	Kochia	21	26	0	0
<i>Bromus japonicus</i>	Japanese brome	20	25	0	0
<i>Cirsium arvense</i>	Canada thistle	15	19	0	0
<i>Tragopogon pratensis</i>	Meadow salisify	14	18	0	0
<i>Bromus lanceolatus</i>	Mediterranean brome	11	14	0	0
<i>Verbascum thapsus</i>	Mullein	11	14	1	13
<i>Asparagus officinalis</i>	Garden asparagus	8	10	0	0
<i>Thinopyrum ponticum</i>	Rush wheatgrass	7	9	0	0
<i>Dactylis glomerata</i>	Orchardgrass	4	5	0	0
<i>Medicago sativa</i>	Alfalfa	4	5	0	0
<i>Convolvulus arvensis</i>	Field bindweed	3	4	0	0
<i>Poa compressa</i>	Canada bluegrass	3	4	0	0
<i>Scorzonera laciniata</i>	Cutleaf vipergrass	3	4	0	0
<i>Cirsium vulgare</i>	Bull thistle	2	3	0	0
<i>Melilotus indicus</i>	Annual sweet clover	2	3	0	0
<i>Bromus tectorum</i>	Cheatgrass	1	1	0	0
<i>Melilotus alba</i>	White sweetclover	1	1	0	0
<i>Ulmus pumila</i>	Siberian elm	1	1	0	0
<i>Lactuca serriola</i>	Prickly lettuce	0	0	4	50