

Exotic Plants

2009

Importance

Invasive exotic plants have been consistently ranked as a top vital sign for long term monitoring as part of the NPS Inventory & Monitoring (I&M) Program. During final selection of SOPN vital signs in 2006, invasive exotic plant monitoring was recognized across all network parks as the most important shared monitoring need. Early detection is a key strategy for successful invasive exotic plant management. Therefore, the SOPN has incorporated the following objectives into its monitoring plan for Exotic Plants: (1) to detect the initial occurrence for any of a subset of high priority species in areas of high and low invasion probability, (2) to determine changes in the status and trend (density, abundance or extent) of a subset of high priority species in areas of high and low invasion probability, and (3) to determine changes in species composition of a subset of high priority species in areas of high and low invasion probability, taking into account any management treatments that occurred between sampling intervals. Following is an overview of results for the 2009 pilot monitoring season.

RESOURCE BRIEF



smooth brome (*Bromus inermis*)

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2009 Sampling

In 2009, exotic plant monitoring occurred at FOLS for two days in early June. The vectors sampled were a dirt main-



Figure 1. The 2009 panel (annual sample) at Fort Larned N.H.S. showing the individual vector blocks sampled.

Table 1. The number and percentage of primary (N=56) and secondary (N=15) sample units that each species was detected at Fort Larned NHS in 2009.

		Primary Sample Units		Secondary Sample Units	
Scientific Name	Common Name	No. Primary Vector Blocks	% Blocks Sampled (N=56)	No. Secondary Transects ¹	% Transects Sampled (N=15)
<i>Bromus inermis</i>	smooth brome	55	98	12	80
<i>Taraxacum officinale</i>	dandelion	55	98	0	0
<i>Bromus tectorum</i>	cheatgrass	44	79	0	0
<i>Kochia scoparia</i>	kochia	43	77	5	33
<i>Lamium amplexicaule</i>	henbit	42	75	0	0
<i>Setaria viridis</i>	green bristlegrass	42	75	0	0
<i>Conium maculatum</i>	poison hemlock	33	59	0	0
<i>Amaranthus retroflexus</i>	redroot pigweed	31	55	0	0
<i>Sonchus asper</i>	spiny sowthistle	31	55	0	0
<i>Capsella bursa-pastoris</i>	shepard's purse	24	43	0	0
<i>Convolvulus arvensis</i>	field bindweed	23	41	10	67
<i>Digitaria sanguinalis</i>	hairy crabgrass	21	38	0	0
<i>Chenopodium album</i>	common lambsquarters	15	27	1	7
<i>Tragopogon dubius</i>	western salsify	12	21	0	0
<i>Polygonum arenastrum</i>	prostrate knotweed	11	20	0	0
<i>Amaranthus blitoides</i>	prostrate pigweed	9	16	0	0
<i>Medicago lupulina</i>	black medik clover	8	14	0	0
<i>Melilotus officinalis</i>	yellow sweet clover	6	11	8	53
<i>Alliaria petiolata</i>	garlic mustard	6	11	1	7
<i>Rumex crispus</i>	curley dock	4	7	0	0
<i>Calystegia sepium ssp.</i>	hedge bindweed	3	5	0	0
<i>Cannabis sativa ssp.</i>	marijuana	2	4	0	0
<i>Tribulus terrestris</i>	puncturevine	2	4	0	0
<i>Elaeagnus angustifolia</i>	Russian olive	1	2	0	0
<i>Eragrostis cilianensis</i>	stinkgrass	1	2	0	0
<i>Cirsium vulgare</i>	bull thistle	1	2	0	0
<i>Cynodon dactylon</i>	Bermudagrass	1	2	0	0
<i>Descurainia sophia</i>	herb sophia; flixweed	1	2	0	0

tenance road and a mown-grass trail (Fig. 1). Fifty-six vector blocks were monitored for a total of 1,400 linear meters sampled on both sides. Additionally, 15 permanent transects within the landscape of FOLS have been monitored for the occurrence of exotic plants in a total of 75 1m² plots. FOLS comprises a heavily impacted historical site, degraded riparian area and previously plowed fields undergoing prairie restoration. In addition, the park is surrounded by miles of row-crop agriculture. The variety and density of exotic plants found at the park reflects these conditions.

Smooth brome (*Bromus inermis*) and dandelion (*Taraxacum officinale*) were found in almost every vector block monitored (Table 1). Smooth brome often forms a matrix wherever it

is not mowed and is ubiquitous in all areas of the landscape. Smooth brome was present in 60 interior plots for 80% of the total transects. Dandelion is found in scattered patches to even distributions only in frequently mowed areas. Cheatgrass (*Bromus tectorum*), henbit (*Lamium amplexicaule*), green bristlegrass (*Setaria viridis*) and kochia (*Kochia scoparia*) are also frequently found throughout the monitored vector. Cheatgrass occasionally forms a matrix deep into the landscape, but generally is evenly distributed in areas that are not mowed. Kochia often forms a matrix into the landscape, but is always found in areas that receive mowing treatments. Kochia was observed in nine of the 75 interior plots and in 33% of the transects sampled. Green bristlegrass and henbit are found only in and along the edges of mowed areas. Green bristlegrass

often forms a matrix along the vector, while henbit is found in scattered patches to even distributions.

Redroot pigweed (*Amaranthus retroflexus*) and poison hemlock (*Conium maculatum*) are prevalent in the landscape and are forming matrices where present. Poison hemlock is limited to riparian areas but appear to quickly colonize disturbed areas in the adjacent floodplain. Redroot pigweed is ubiquitous in open areas, including areas that are mowed. Spiny sowthistle (*Sonchus asper*) and field bindweed (*Convolvulus arvensis*) are frequently found in the vector blocks monitored. Both were spotted up to 30 meters into the landscape, often evenly distributed, although spiny sowthistle was predominately within the first 10 meters from the vector. It is known that field bindweed is found throughout the park landscape, as it was observed in 25 interior plots on 67% of the transects sampled. Shepard's-purse (*Capsella bursa-pastoris*) and hairy crabgrass (*Digitaria sanguinalis*) were observed primarily at the edge and within the mowed areas. Both species presented a scattered patchy to even distribution, seldom observed more than a few meters into the landscape.

Common lambsquarters (*Chenopodium album*), black medic clover (*Medicago lupulina*), prostrate knotweed (*Polygonum arenastrum*) and western salsify (*Tragopogon dubius*) were found in up to 30% of the vector blocks monitored. Western salsify was prevalent on both sides of the dirt maintenance road in scattered patches, and was found establishing itself in vector blocks 15 and 17 along the mowed trail. This new invasion would be easy to halt at this time, but will quickly spread into the new area within the next few years. Common lambsquarters, black medic clover and prostrate knotweed were observed primarily in the mowed areas in scattered patches, although knotweed and lambsquarters exhibited an even distribution in a few vector blocks. Lambsquarters also spread further into the landscape than the knotweed or clover and was observed on only one interior plot. Prostrate pigweed (*Amaranthus blitoides*), garlic mustard (*Alliaria petiolata*) and yellow sweetclover (*Melilotus officinalis*) were found in the same number of vector blocks but in very different areas of the landscape. Prostrate pigweed and garlic mustard were found in one group of blocks (except for one vector block at the fort), primarily in the mowed areas and in scattered patches. Garlic mustard was observed on only one interior plot of the secondary sampling. Yellow sweetclover was observed only over 20 meters into the landscape in even distributions to a matrix. It is known that this species is found in pockets throughout the park and it was detected in 18 interior plots on 53% of the transects sampled.

The numerous remaining exotic species were found in small numbers in a limited number of blocks and are prime targets

for control before they establish further. One Russian olive (*Elaeagnus angustifolia*) tree was observed at 20+ meters from the vector, on the edge of the riparian area. Bermudagrass (*Cynodon dactylon*) and puncturevine (*Tribulus terrestris*) were found only in the mowed areas. A few plants of bull thistle (*Cirsium vulgare*) were seen moving into the landscape from the vector. Marijuana (*Cannabis sativa*) was found in scattered patches along the edge of the mowstrip, while only a few plants of curly dock (*Rumex crispus*), hedge bindweed (*Calystegia sepium* ssp. *sepium*), herb Sophia (*Descurainia sophia*), and stinkweed (*Eragrostis cilianensis*) were found in this same area.