



Exotic Plant Monitoring in the Southern Plains Network

Project Report 2012

Natural Resource Technical Report NPS/SOPN/NRTR—201X/655



ON THE COVER

Cheatgrass (*Bromus tectorum*) at Washita Battlefield NHS. Photo: NPS - Dick Zahm

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Authors

Tomye Folts-Zettner
Heidi Sosinski

Southern Plains Network
100 Ladybird Lane
P.O. Box 329
Johnson City, TX 78636

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Executive Summary

Globalization of commerce, transportation, human migration, and recreation in recent history has introduced invasive exotic species to new areas at an unprecedented rate. For the National Park Service (NPS), the consequences of these invasions present a significant challenge to the management of the agency's natural resources "unimpaired for the enjoyment of future generations." National parks, like other land-management organizations, are deluged by new exotic species arriving through predictable (e.g., road, trail, and riparian corridors), sudden (e.g., long-distance dispersal through contaminated off-site equipment and material deliveries), and unexpected anthropogenic pathways (e.g., weed seeds in restoration planting mixes).

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 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 strategy of early detection requires resource managers to: (1) detect invasive exotic species early (i.e., find a new species or an incipient population of an existing species while the infestation is small—less than one hectare), and (2) respond rapidly (i.e., implement appropriate management techniques to eliminate the invasive plant and all of its associated regenerative material). As a complement to this strategy, 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.

In 2012, the SOPN conducted a fourth season of exotic-plant monitoring to continue to test the methods and results of the network's proposed Exotic Plant Monitoring Protocol. A total of 824 vector blocks (each 50 m long) were sampled along high-invasion-probability vectors (primary units) in SOPN parks. These vectors consisted of paved and unpaved roads, trails, and boundaries. As part of the SOPN grassland and fire monitoring effort, a total of 580 individual 2 x 1-meter plots on 116 transects in areas not considered high-invasion probability (secondary units) were also sampled. Overall, 62 species of exotic plants were observed in SOPN parks. Some species (e.g., *Kochia scoparia*) were widespread among parks, whereas others were found in only a few parks. Results of the 2012 sampling for each park are presented in this report.

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We sincerely appreciate and thank the dedicated efforts and hard work of our 2012 field team; Jonathin Horsley and Maria Jesus for the effort they have contributed to the collection of exotic plant location data. We also wish to thank the combined efforts provided by the Chihuahuan Desert Network and the Sonoran Desert Network as part of the Southwest Network Collaboration effort with the Southern Plains Network in developing the digital data collection application that was used in this year's monitoring effort. Without everyone's efforts, this report would not have been possible.

Chapter 1: Introduction

Globalization of commerce, transportation, human migration, and recreation in recent history has introduced invasive exotic species to new areas at an unprecedented rate. Biogeographical barriers that once restricted the location and expansion of species have been circumvented, culminating in the homogenization of Earth's biota. Although only 10% of introduced species become established and only 1% become problematic (Williamson 1993; Williamson and Fitter 1996) or invasive, nonnative species have profound impacts worldwide on the environment, economies, and human health.

Invasive species have been directly linked to the replacement of dominant native species (Tilman 1999), the loss of rare species (King 1985), changes in ecosystem structure, alteration of nutrient cycles and soil chemistry (Ehrenfeld 2003), shifts in community productivity (Vitousek 1990), reduced agricultural productivity, and changes in water availability (D'Antonio and Mahall 1991). The damage caused by these species to natural resources is often irreparable, and our understanding of the consequences incomplete. Invasive species are second only to habitat destruction as a threat to wildland biodiversity (Wilcove et al. 1998). Consequently, the dynamic relationships among plants, animals, soil, and water established over many thousands of years are at risk of being destroyed in a relatively brief period.

For the National Park Service (NPS), the consequences of these invasions present a significant challenge to the management of the agency's natural resources "unimpaired for the enjoyment of future generations." National parks, like other land-management organizations, are deluged by new exotic species arriving through predictable (e.g., road, trail, and riparian corridors), sudden (e.g., long-distance dispersal through cargo containers and air freight), and unexpected anthropogenic pathways (e.g., weed seeds in restoration planting mixes). Nonnative plants claim an estimated 4,600 acres of public lands each year in the United States (Asher and

Harmon 1995), significantly altering local flora. For example, exotic plants comprise an estimated 43% and 36% of the flora of the states of Hawai'i and New York, respectively (Rejmanek and Randall 1994). Invasive plants infest an estimated 2.6 million acres of the 83 million acres managed by the NPS.

Despite diligent efforts to curtail the problem, more NPS lands are infested daily. Impacts from invasive species have been realized in most parks, resulting in an expressed need to control existing infestations and restore affected ecosystems. Additionally, there is a growing urgency to be proactive—to protect resources not yet impacted by current and future invasive species (Marler 1998). Invasive exotic species will continue to be a management priority for the NPS well into the foreseeable future.

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 the vital signs selection process in 2004–2005, Southern Plains Network (SOPN) national parks recognized the need for exotic-plant monitoring (Perkins et al. 2006). All eleven network parks identified invasive exotic plants as among their most important management issues. SOPN parks include Alibates Flint Quarries National Monument (NM), Bent's Old Fort National Historic Site (NHS), Capulin Volcano NM, Chickasaw National Recreation Area (NRA), Fort Larned NHS, Fort Union NM, Lake Meredith NRA, Lyndon B. Johnson National Historical Park (NHP), Pecos NHP, Sand Creek Massacre NHS, and Washita Battlefield NHS. During final selection of vital signs in 2006, invasive exotic-plant monitoring was recognized across all network parks as the most important shared monitoring need.

Prevention and early detection are the principal strategies for successful invasive exotic plant management. While there is a need for long-term suppression programs to address high-impact species, eradication efforts are most successful for infestations

of less than one hectare in size (Rejmanek and Pitcairn 2002). Eradication of infestations larger than 100 hectares is largely unsuccessful, costly, and unsustainable (Rejmanek and Pitcairn 2002). Costs, or impacts, to ecosystem components and processes resulting from invasion also increase dramatically over time, making ecosystem restoration improbable in the later stages of invasion. Further, in their detailed review of the nonnative species problem in the United States, the U.S. Congress, Office of Technology Assessment (1993) stated that the environmental and economic benefits of supporting prevention and early detection initiatives significantly outweigh any incurred costs, with the median benefit-to-cost ratio being 17:1 in favor of being proactive. Although preventing the introduction of invasive exotic plants is the most successful and preferred strategy for resource managers, the realities of globalization, tight fiscal constraints, and limited staff time guarantee that invaders will get through park borders. Fortunately, invasive exotic plants quite often undergo a lag period between introduction and subsequent colonization of new areas. Managers, then, can take advantage of early detection monitoring to make certain invasive exotic species are found and successfully

eradicated before populations become well established.

This strategy requires resource managers to: (1) detect invasive exotic species early (i.e., find a new species or an incipient population of an existing species while the infestation is small—less than one hectare), and (2) respond rapidly (i.e., implement appropriate management techniques to eliminate the invasive plant and all of its associated regenerative material). As a complement to this strategy, 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.

Chapter 2: Methods

In 2011, the SOPN conducted a third season for exotic-plant monitoring to test the methods and results of the proposed protocol. Sampling was carried out from May through July.

2.1 Primary sampling methodology

The methodology employed in this monitoring is based on a generalized linear model. Fifty-meter sections (vector blocks) of both sides (right [R] and left [L]) of a vector were sampled (Figure 2-1). The transect ran parallel to the vector but was set into the roadside along the interior edge of the mow strip.

Distance classes from the vector were set as follows:

- D1 = Roadside-transect (mowed area, approximately 2 m)
- D2 = Transect-10 meters
- D3 = 10-20 meters into the landscape
- D4 = >20 meters into the landscape

Within each 50-meter length, the occurrence of an exotic species was noted only once, but its detectable presence in each distance class (D#) and its density (distribution within a given block) were recorded. This allowed for a rapid assessment; thus, we were able to cover more distance along the vector, as well as a greater sampling area. While a detailed location of a given population is lacking, the

presence of any exotic within a 50-meter sample block, in conjunction with the distance class, can be reasonably relocated by management teams. Additionally, the presence of a major species of concern can trigger a more thorough search of the area for additional occurrences.

Density classes were used to describe exotic species populations (Figure 2-2). A population is distributed within a block in one of four ways: (1) less than five plants, (2) scattered throughout the block in a patchy or clumped manner, (3) scattered throughout in an even distribution, or (4) forming a matrix. This distribution equates to an initial introduction, establishment, spread and complete invasion of the habitat, and will allow for the future monitoring of gross changes to exotic populations.

Detection of some exotic species, particularly low-growing and rosette-stage species, decreases with distance, while other large-mass or tall growing species can easily be seen at a great distance. This limitation should always be taken into consideration when management actions are planned. The presence of a species of concern in any given area should trigger a more thorough search prior to eradication efforts. At times, topographic features, such as rises and depressions, will screen the visual field. These disruptions are noted in each sample block

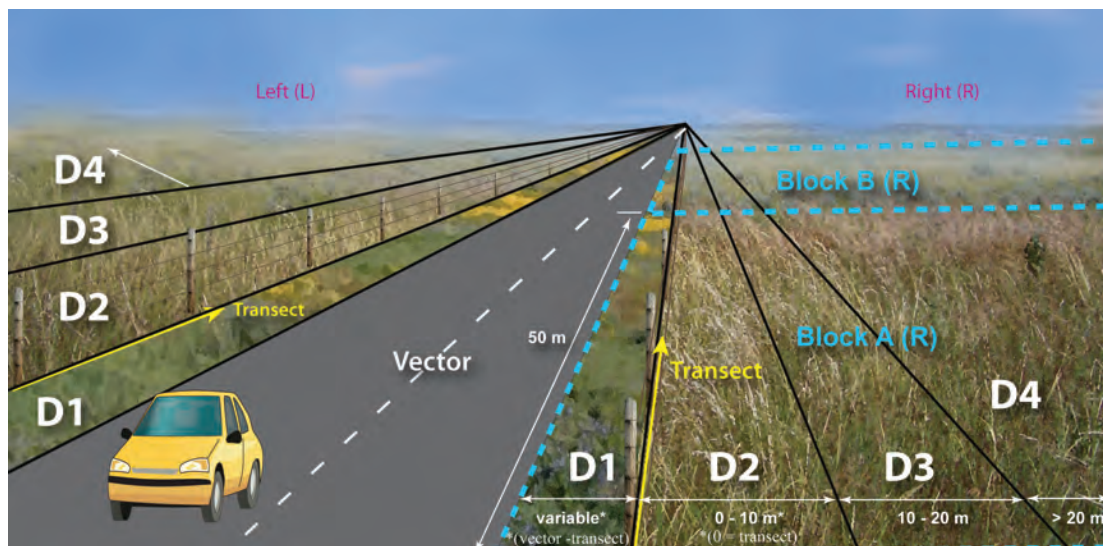


Figure 2-1. Fifty meter blocks are sampled on each side of a vector (e.g., roads and trails) in each of four distance classes from the vector.

Density Classes

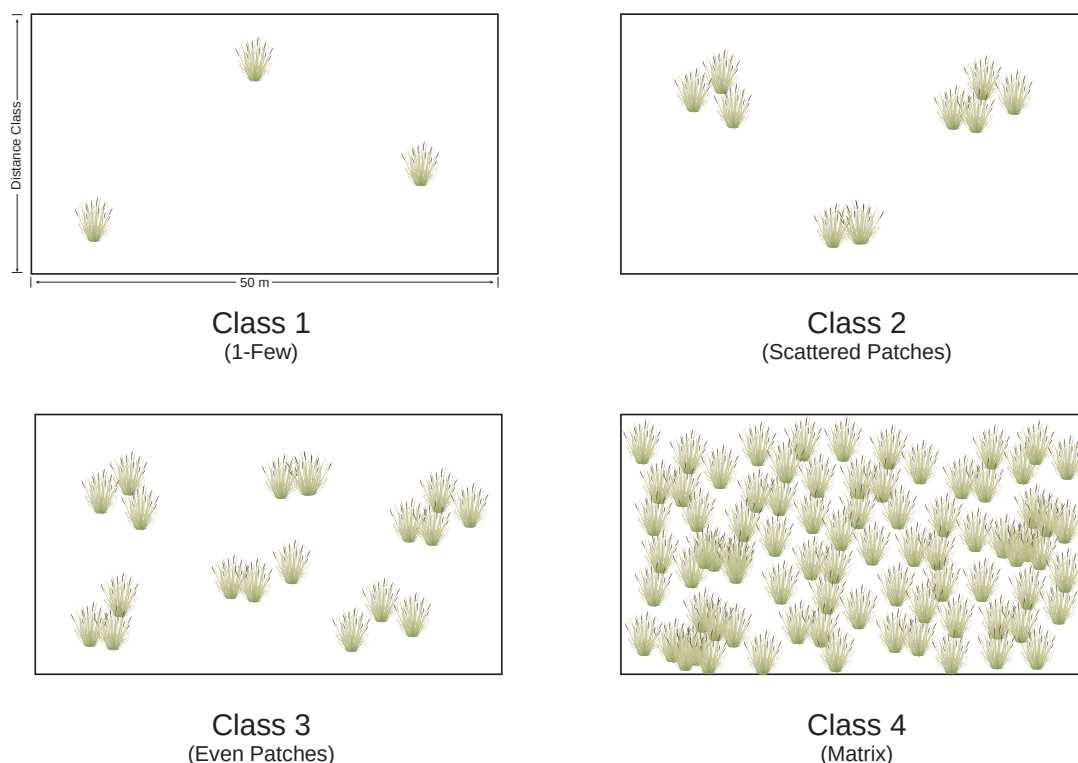


Figure 2-2
Diagram of four density classes used in describing the distribution of exotic plant species within each 50-meter block

in the appropriate distance class as “no data available,” to distinguish from areas where no plants were detected.

2.2 Secondary sampling methodology

Secondary exotic-plant monitoring was accomplished for lower priority (interior landscape) areas in conjunction with the

Grassland Monitoring efforts. This monitoring consists of collecting plant occurrence and cover data from five 2 x 1-m nested quadrats along a 50-meter permanent transect. This was the third year for establishing permanent transects and not all transects were established across the network. Secondary data was collected at each park.

Chapter 3: Results

During 2012, we sampled a total of 824 vector blocks along high-invasion-probability vectors (primary units) in SOPN parks (Table 3-1). These vectors consisted of paved and unpaved roads, trails, and boundaries. As part of our grassland and fire monitoring effort, we also sampled a total of 560 individual plots on 112 transects in areas not considered high-invasion probability (secondary units).

Overall, 62 species of exotic plants were observed in SOPN parks (Table 3-2). Some species, for instance Russian thistle (*Salsola tragus*, see photos) were widespread among parks, whereas others were found in only a few parks. Results of the 2012 sampling for each park are presented below.

Table 3.1 Number of primary (high invasion probability) and secondary (low invasion probability) units sampled during 2012

Park unit	Total vector blocks	Primary sample units					Secondary sample units
		Roads		Trails		Boundary	Total Transects ¹
		Paved	Unpaved	Paved	Unpaved		
Bent's Old Fort NHS	86	18	32	–	–	36	14
Capulin Volcano NM	52	–	8	–	44	–	11
Chickasaw NRA	96	96	–	–	–	–	13
Fort Larned NHS	92	–	10	–	46	36	11
Fort Union NM	114	–	78	–	–	36	6
Lake Meredith NRA/ Alibates Flint Quarries NM	82	–	82	–	–	–	29
Lyndon B. Johnson NHP	32	–	–	–	32	–	2
Pecos NHP	102	–	102	–	–	–	8
Sand Creek Massacre NHS	86	–	54	–	–	32	12
Washita Battlefield NHS	82	–	–	–	82	–	11

¹ For each secondary sampling unit (transect), five individual plots were sampled.



Salsola tragus seedling, flowers, and leaves.

Table 3-2. Exotic plant species observed in specific parks during 2012 SOPN exotic plant monitoring

Scientific Name	Common Name	Species Code	Lifeform	Duration	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR/ALFL	LYJO	PECO	SAND	WABA
<i>Achillea millefolium</i>	common yarrow	ACHMIL	Forb	Perennial			•							
<i>Amaranthus blitoides</i>	prostrate pigweed	AMABLI	Forb	Annual									•	
<i>Arundo donax</i>	giant reed	ARUDON	Grass	Perennial	•									
<i>Asparagus officinalis</i>	garden asparagus	ASPOFF	Forb	Perennial	•									
<i>Bothriochloa bladhii</i>	Australian beardgrass	BOTBLA	Grass	Perennial				•						
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	BOTISC	Grass	Perennial			•			•	•			•
<i>Bromus arvensis</i>	field brome	BROARV	Grass	Annual								•		
<i>Bromus catharticus</i>	rescuegrass	BROCAT	Grass	Annual							•			•
<i>Bromus inermis</i>	smooth brome	BROINE	Grass	Perennial	•	•	•	•	•			•		
<i>Bromus japonicus</i>	Japanese brome	BROJAP	Grass	Annual		•	•	•		•	•	•		•
<i>Bromus tectorum</i>	cheatgrass	BROTEC	Grass	Annual	•	•	•	•			•	•	•	•
<i>Cannabis sativa</i>	marijuana	CANSAT	Forb	Annual				•						
<i>Chenopodium album</i>	common lambsquarters	CHEALB	Forb	Annual	•	•		•	•	•		•	•	•
<i>Cirsium arvense</i>	canada thistle	CIRARV	Forb	Perennial	•									
<i>Conium maculatum</i>	poison hemlock	CONMAC	Forb	Biennial				•						
<i>Convolvulus arvensis</i>	field bindweed	CONARV	Forb	Perennial	•	•		•	•			•	•	
<i>Cynodon dactylon</i>	Bermudagrass	CYNDAC	Grass	Perennial	•		•	•			•			•
<i>Cyperus esculentus</i>	yellow nutsedge	CYPESC	Grass	Perennial							•			
<i>Datura stramonium</i>	jimsonweed	DATSTR	Forb	Annual			•							
<i>Descurainia sophia</i>	flixweed	DESSOP	Forb	Annual	•									•
<i>Eragrostis cilianensis</i>	stinkgrass	ERACIL	Grass	Annual	•					•			•	
<i>Erodium cicutarium</i>	redstem stork's bill	EROCIC	Forb	Annual								•		•
<i>Euphorbia davidii</i>	Dauids spurge	EUPDAV	Forb	Annual					•					
<i>Euphorbia dentata</i>	toothed spurge	EUPDEN	Forb	Annual			•							
<i>Galium divaricatum</i>	Lamarcks bedstraw	GALDIV	Forb	Annual							•			
<i>Kochia scoparia</i>	kochia	KOCSCO	Forb	Annual	•	•		•	•	•		•	•	•
<i>Kummerowia stipulacea</i>	Korean lespedeza	KUMSTI	Forb	Annual			•							
<i>Lactuca serriola</i>	prickly lettuce	LACSER	Forb	Annual	•	•		•		•		•		•
<i>Lactuca tatarica</i>	blue lettuce	LACTAT	Forb	Biennial	•							•		
<i>Lamium amplexicaule</i>	henbit	LAMAMP	Forb	Annual										•
<i>Lespedeza cuneata</i>	sericea lespedeza	LESCUN	Forb	Perennial			•							
<i>Lolium perenne</i>	perennial ryegrass	LOLPER	Grass	Perennial				•			•			
<i>Lonicera japonica</i>	Japanese honeysuckle	LONJAP	Vine	Perennial			•				•			
<i>Marrubium vulgare</i>	horehound	MARVUL	Forb	Perennial		•			•					
<i>Medicago lupulina</i>	black medick clover	MEDLUP	Forb	Annual			•				•			•
<i>Medicago minima</i>	burr medick clover	MEDMIN	Forb	Annual			•				•			•
<i>Melilotus alba</i>	white sweetclover	MELALB	Forb	Perennial	•		•		•			•	•	•
<i>Melilotus officinalis</i>	yellow sweetclover	MELOFF	Forb	Annual	•			•	•			•	•	•
<i>Onopordum acanthium</i>	scotch thistle	ONOACA	Forb	Biennial			•					•		
<i>Panicum miliaceum</i>	proso millet	PANMIL	Grass	Annual	•									
<i>Paspalum dilatatum</i>	dallisgrass	PASDIL	Grass	Perennial			•				•			
<i>Poa pratensis</i>	Kentucky bluegrass	POAPRA	Grass	Perennial				•			•		•	
<i>Polygonum arenastrum</i>	prostrate knotweed	POLARE	Forb	Annual				•						
<i>Polygonum aviculare</i>	yard knotweed	POLAVI	Forb	Annual								•		

Table 3-2. Exotic plant species observed in specific parks during 2012 SOPN exotic plant monitoring (continued)

Scientific Name	Common Name	Species Code	Lifeform	Duration	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR/ALFL	LYJO	PECO	SAND	WABA
<i>Populus alba</i>	white poplar	POPALB	Tree	Perennial	•									
<i>Rumex crispus</i>	curly dock	RUMCRI	Forb	Perennial	•			•	•					
<i>Rumex obtusifolius</i>	bluntleaf dock	RUMOB	Forb	Perennial	•									
<i>Rumex patientia</i>	patience dock	RUMPAT	Forb	Perennial				•						•
<i>Salsola kali</i>	prickly Russian thistle	SALKAL	Forb	Annual				•						•
<i>Salsola tragus</i>	prickly Russian thistle	SALTRA	Forb	Annual	•	•		•	•	•		•	•	•
<i>Setaria pumila</i>	yellow bristlegass	SETPUM	Grass	Annual				•						
<i>Sonchus asper</i>	spiny sowthistle	SONASP	Forb	Annual			•				•			
<i>Sorghum halepense</i>	Johnsongrass	SORHAL	Grass	Perennial			•				•			•
<i>Taraxacum officinale</i>	common dandelion	TAROFF	Forb	Perennial	•		•	•	•		•			•
<i>Thinopyrum ponticum</i>	rush wheatgrass	THIPON	Grass	Perennial	•									
<i>Torilis arvensis</i>	spreading hedge parsley	TORARV	Forb	Annual			•				•			
<i>Tragopogon dubius</i>	western salsify	TRADUB	Forb	Annual	•	•		•	•	•		•		•
<i>Tribulus terrestris</i>	puncturevine	TRITER	Forb	Annual	•			•						•
<i>Triticum aestivum</i>	common wheat	TRIAES	Grass	Annual				•						
<i>Typha angustifolia</i>	narrowleaf cattail	TYPANG	Grass	Perennial	•									
<i>Ulmus pumila</i>	Siberian elm	ULMPUM	Tree	Perennial										•
<i>Verbascum thapsus</i>	common mullein	VERTHA	Forb	Biennial		•		•				•		

3.1 Bent's Old Fort NHS

Overall sampling at Bent's Old Fort includes most of the roadways and some trails within the park over a three-year rotation (Figure 3.1-3 presents an updated 3-panel map). During 2012, exotic-plant monitoring occurred at Bent's Old Fort in late June. The 2012 vectors sampled included the unpaved maintenance road on the north side of the Arkansas River, the paved entrance road and trail leading to the fort, and, for the first time, the western park boundary (Figure 3.1-1, 2012 vector block map). Eighty-six (86) primary vector blocks were monitored, for a total linear effort of 2.15 linear kilometers (sampled on both sides of the roads and trail, and one side of the boundary). These vectors are scheduled for monitoring again in 2015. Fourteen (14) permanent (secondary) transects within the landscape were also sampled, for a total of 70 2 x 1 meter plots. Thirty (30) species of exotics were detected with primary and secondary monitoring in 2012. Exotics were found in every vector block monitored in 2012.

Kochia (Kochia scoparia) continues to be the most frequently encountered exotic in both the primary vector blocks and the secondary interior monitoring, with scattered to evenly distributed patches throughout. In general, density appears to be decreasing slightly, but it does appear to be spreading into the landscape. 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 successional 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.

The second most frequently detected plant in both primary and secondary monitoring continued to be field bindweed (*Convolvulus arvensis*). It too appears to be spreading

into the landscape. The perennial taprooted bindweed is also drought-tolerant and an abundant seeder, with the ability to establish from small bits of vegetative material. Field bindweed, ranked as “noxious” in Colorado 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 is very difficult to destroy.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in late July, one month later than 2012 monitoring. This change in monitoring time may have affected the detection of stinkgrass (*Eragrostis cilianensis*). The vectors monitored in 2009 did not include the western boundary. Forty-nine (49) individual vector blocks were monitored for total linear effort of 1.25 kilometers (sampled on both sides of the roads and trail). Thirteen (13) permanent (secondary) transects within the landscape were also sampled, for a total of 65 1-m² plots.

Table 3.1-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.1-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New

vector blocks monitored in 2012 are notated separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table A-1 in Appendix A contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

Areas of disturbance at BEOL will continue to be invaded by exotics because native competition has been reduced. Mowed areas allow established low-growing exotics access to sunlight, stimulating their expansion while reducing the vigor of native plants. Prairie dogs continuously disturb the soil, eliminate all but low-growing plants and maintain an early successional state – all prime conditions for the spread of field bindweed. Riparian areas are frequently impacted by seasonal flooding, providing more mesic habitats enjoyed by a suite of exotics and fresh propagules from upstream exotic populations. Disturbance factors combined with reintroduction from visitors, routine maintenance and surrounding uncontrolled areas will require vigilance on the part of park staff. The improvement and maintenance of healthy grasslands and understory vegetation to facilitate succession will greatly assist in limiting the potential for exotic invasion.



JOHN M. RANDALL, THE NATURE CONSERVANCY, BUGWOOD.ORG

Mexican-fireweed (*Kochia scoparia*) was the most commonly found exotic species in 2012 at Bent's Old Fort NHS.

Bent's Old Fort NHS Exotics Sampling Panel 1 - 6/29 - 7/2/2012

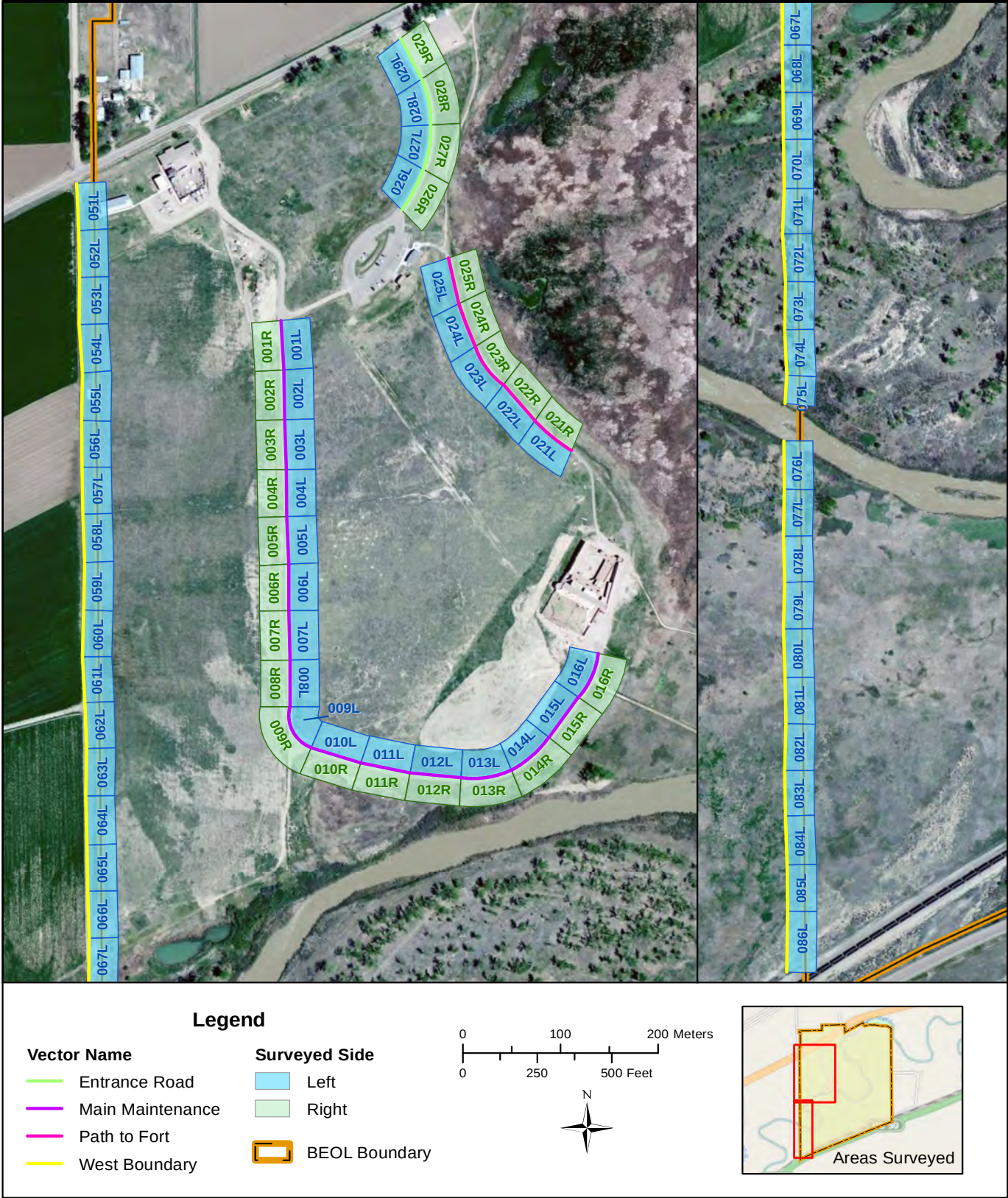


Figure 3.1-1. Individual vector blocks sampled, Panel 1, Bent's Old Fort NHS, 2012.

Bent's Old Fort NHS - Secondary Exotics 2009 vs. 2012

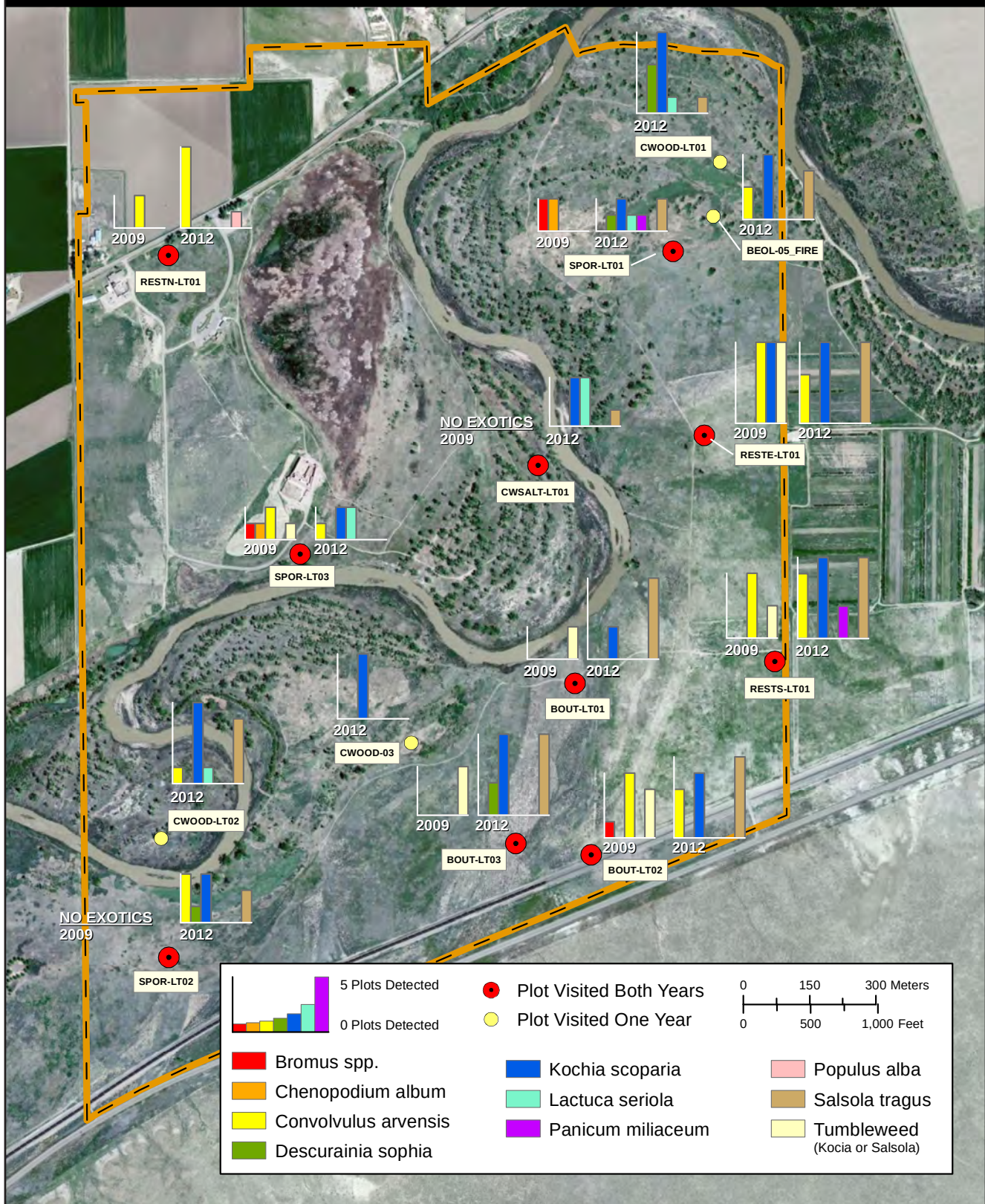


Figure 3.1-2. Secondary sample locations, Bent's Old Fort NHS, 2009 vs. 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Bent's Old Fort NHS Exotic Monitoring Blocks

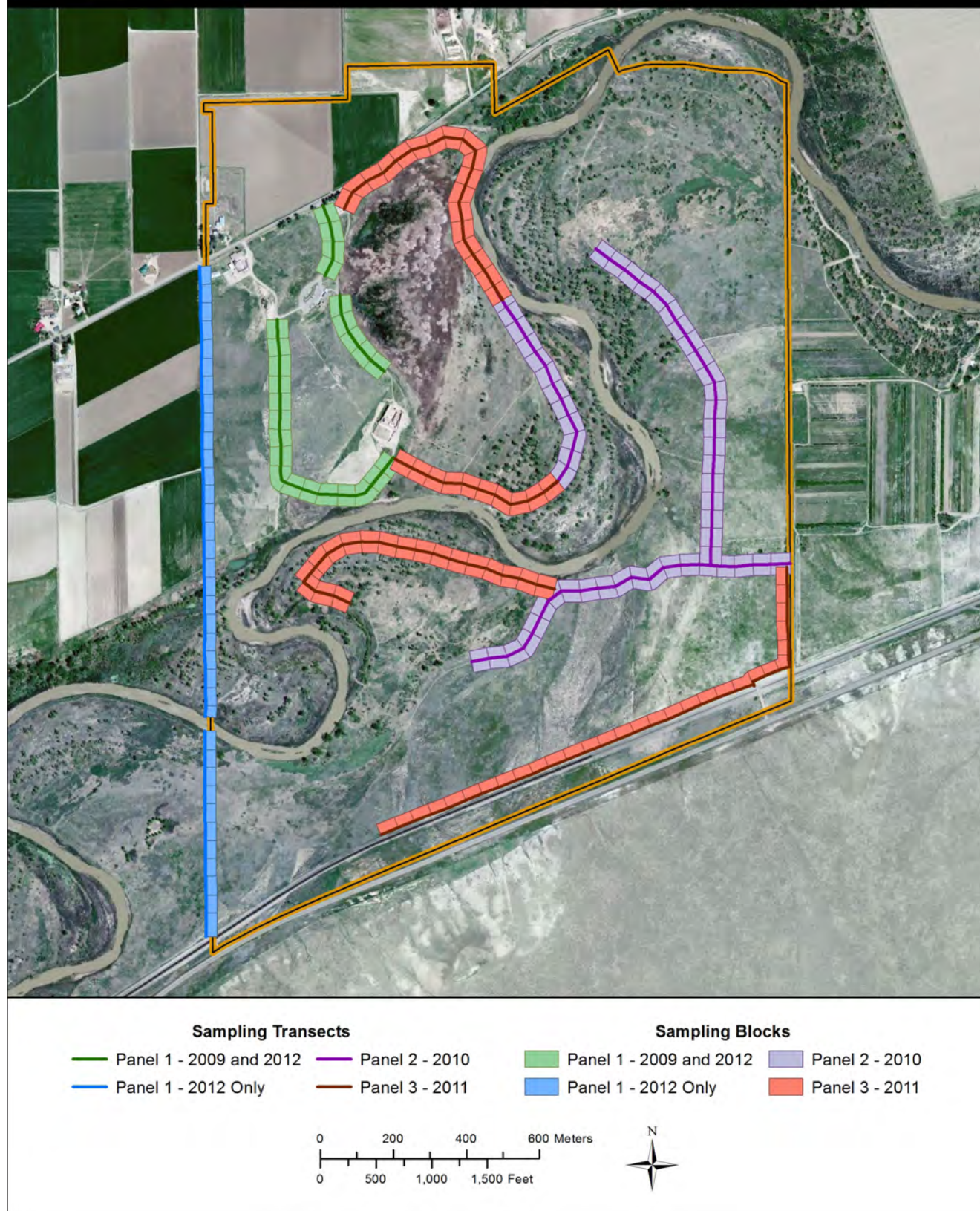


Figure 3.1-3. Overall sampling scheme for panels (annual samples) at Bent's Old Fort NHS for a full three-year rotation.

Table 3.1-1. Number and percentage of primary and secondary sample units where each species was detected in Panel 1 rotation, Bent's Old Fort NHS, 2009 vs. 2012.

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=49)		Primary vector blocks (N=86)		Secondary transects (N=13)		Secondary transects (N=14)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Amaranthus retroflexus</i>	redroot amaranth	2	4.1	–	–	–	–	–	–
<i>Arundo donax</i>	giant reed	–	–	4	4.7	–	–	–	–
<i>Asparagus officinalis</i> ¹	garden asparagus	–	–	5	5.8	–	–	–	–
<i>Bromus arvensis</i>	field brome	24	49.0	–	–	–	–	–	–
<i>Bromus inermis</i>	smooth brome	–	–	12	14.0	–	–	–	–
<i>Bromus tectorum</i>	cheatgrass	–	–	52	60.5	–	–	–	–
<i>Chenopodium album</i> ¹	common lambsquarters	–	–	6	7.0	–	–	–	–
<i>Cirsium arvense</i>	canada thistle	7	14.3	8	9.3	–	–	–	–
<i>Convolvulus arvensis</i>	field bindweed	31	63.3	69	80.2	6	46.2	8	57.1
<i>Cynodon dactylon</i>	Bermudagrass	–	–	1	1.2	–	–	–	–
<i>Descurainia sophia</i>	flixweed	–	–	–	–	–	–	4	28.6
<i>Eragrostis cilianensis</i>	stinkgrass	–	–	4	4.7	–	–	–	–
<i>Euphorbia dentata</i>	toothed spurge	4	8.2	–	–	–	–	–	–
<i>Kochia scoparia</i>	Kochia	49	100.0	82	95.3	7	53.8	13	92.9
<i>Lactuca serriola</i>	prickly lettuce	5	10.2	25	29.1	–	–	5	35.7
<i>Lactuca tatarica</i> ¹	blue lettuce	–	–	3	3.5	–	–	–	–
<i>Melilotus alba</i>	white sweetclover	2	4.1	3	3.5	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	–	–	1	1.2	–	–	–	–
No Exotics	No Exotics	1	2.0	–	–	–	–	–	–
<i>Panicum miliaceum</i>	proso millet	–	–	–	–	–	–	2	14.3
<i>Phalaris arundinacea</i>	reed canarygrass	1	2.0	–	–	–	–	–	–
<i>Populus alba</i>	white poplar	–	–	2	2.3	1.0	7.7	1	7.1
<i>Rumex crispus</i>	curly dock	1	2.0	4	4.7	1	7.7	–	–
<i>Rumex obtusifolius</i>	bluntleaf dock	–	–	3	3.5	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	11	22.4	62	72.1	2	15.4	11	78.6
<i>Setaria viridis</i>	green bristlegrass	2	4.1	–	–	–	–	–	–
<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	1	7.7	–	–
<i>Taraxacum officinale</i>	common dandelion	–	–	2	2.3	–	–	–	–
<i>Thinopyrum ponticum</i> ¹	rush wheatgrass	–	–	5	5.8	–	–	–	–
<i>Tragopogon dubius</i>	yellow salsify	3	6.1	9	10.5	–	–	–	–
<i>Tribulus terrestris</i>	puncturevine	–	–	17	19.8	–	–	–	–
<i>Typha angustifolia</i>	narrowleaf cattail	10	20.4	12	14.0	–	–	–	–

¹ found only in new transect

Table 3.1-2. Number of Vector Blocks and Density of exotic species recorded for BEOL in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Amaranthus retroflexus</i> redroot pigweed	1	1	–	–	–	–	–
	2	1	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Arundo donax</i> giant reed	1	–	–	1	–	–	–
	2	–	–	1	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Asparagus officinalis</i> garden asparagus	1	–	–	3	–	–	2
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus arvensis</i> field brome	1	2	–	–	2	–	–
	2	6	–	–	7	–	–
	3	3	–	–	11	–	–
	4	–	–	–	–	–	–
<i>Bromus inermis</i> smooth brome	1	–	–	2	–	–	1
	2	–	–	5	–	–	6
	3	–	–	–	–	–	1
	4	–	–	–	–	–	–
<i>Bromus tectorum</i> cheatgrass	1	–	5	–	–	1	2
	2	–	12	5	–	27	12
	3	–	1	–	–	–	–
	4	–	–	–	–	–	–
<i>Chenopodium album</i> common lambsquarters	1	–	–	3	–	–	1
	2	–	–	–	–	–	2
	3	–	–	2	–	–	1
	4	–	–	–	–	–	–
<i>Cirsium arvense</i> canada thistle	1	–	1	1	2	–	–
	2	1	2	–	4	1	1
	3	–	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Convolvulus arvensis</i> field bindweed	1	5	7	4	4	2	1
	2	15	36	21	5	22	18
	3	6	1	–	12	–	–
	4	–	–	–	–	–	–
<i>Cynodon dactylon</i> Bermudagrass	1	–	–	–	–	–	–
	2	–	1	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Eragrostis cilianensis</i> stinkgrass	1	–	–	–	–	–	–
	2	–	4	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.1-2. Number of Vector Blocks and Density of exotic species recorded for BEOL in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Eragrostis cilianensis</i> (cont.)	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Euphorbia dentata</i> toothed spurge	1	–	–	–	4	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i> kochia	1	5	3	3	3	5	2
	2	20	29	19	14	33	29
	3	20	8	9	15	–	1
	4	–	–	–	2	–	–
<i>Lactuca serriola</i> prickly lettuce	1	1	4	4	1	2	1
	2	2	7	8	2	8	6
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Lactuca tatarica</i> blue lettuce	1	–	–	1	–	–	1
	2	–	–	2	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus alba</i> white sweetclover	1	–	–	–	2	1	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus officinalis</i> yellow sweetclover	1	–	–	–	–	–	1
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Rumex crispus</i> curly dock	1	–	–	2	–	–	1
	2	–	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Rumex obtusifolius</i> bluntleaf dock	1	–	–	–	–	–	1
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	3	6	1	–	4	2
	2	6	32	20	5	26	18
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Setaria viridis</i> green bristlegrass	1	1	–	–	–	–	–
	2	–	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.1-2. Number of Vector Blocks and Density of exotic species recorded for BEOL in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Taraxacum officinale</i> common dandelion	1	–	2	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Thinopyrum ponticum</i> rush wheatgrass	1	–	–	4	–	–	1
	2	–	–	1	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tragopogon dubius</i> yellow salsify	1	–	1	3	3	2	6
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tribulus terrestris</i> puncturevine	1	–	8	–	–	–	–
	2	–	9	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Typha angustifolia</i> narrowleaf cattail	1	–	–	–	–	1	–
	2	–	–	1	–	–	2
	3	–	–	–	1	1	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.2 Capulin Volcano NM

Overall sampling at Capulin Volcano occurs on paved and unpaved roads and trails over its full three-year rotation (Figure 3.2-3). In 2012, exotic-plant monitoring occurred at Capulin Volcano in early July. The vectors sampled were the north and west Lava Trail, the southern leg of the Boca Trail, and the Water Tank road; all vectors sampled are unpaved. Fifty-two (52) primary vector blocks were monitored, for a total of 1.3 linear kilometers sampled on both sides (Figure 3.2-1). In addition, eleven (11) permanent secondary transects within the landscape were sampled for a total of 55 2 x 1 meter plots. Twenty (20) species of exotics were detected with primary and secondary monitoring. Exotics were detected in all of the vector blocks.

Japanese brome (*Bromus japonicas*) was the most frequently detected exotic during 2012 monitoring, appearing in approximately three-quarters of the primary vector blocks

and secondary transects. Most exotic bromes are dead during the monitoring timeframe, making it problematic to identify species with certainty, although all of these species have similar impact on the landscape. This cool season annual grass is a prolific reseeders 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.

Prickly Russian thistle (*Salsola tragus*) was the second most frequently detected exotic during 2012 monitoring, appearing in approximately two-thirds of the primary vector blocks and 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.

Common mullein (*Verbascum thapsus*) continues to persist in the plant communities at CAVO, found occasionally during primary monitoring in more than half of the vector blocks surveyed but never as more than a few individual plants. Population density has definitely lessened since 2009, and while environmental condition may play a small role in fewer recruits, active management of mullein shows in these results. Mullein is a biennial plant spending its first year as a low rosette, thus making detection difficult. The large coverage of a mature plant and prolific seeding allows mullein to crowd natives out of the surrounding area, while a large and deep taproot makes eradication very difficult.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in late July, three weeks later than the 2012 monitoring. This change in monitoring should not have affected detection of any exotic species. The vectors monitored in 2012 were the same as those done in 2009, although only two permanent secondary transects were included in 2009 monitoring.

Table 3.2-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.2-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table B-2 in Appendix B contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

The steep and easily erodible slopes of the volcano cone at CAVO present a unique set of problems for detection and control of exotic plants, resulting in a propagule pool within the park allowing for recurring infestation of the lands below the cone. Wind-borne seed find hospitable bare-ground among the native short grass and igneous rock outcroppings. It is likely that many of these exotic species have been present in the park for quite some time as they are well established in many surrounding areas. The curtailment of historic grazing may have had an impact on the present exotic population densities.



BOB HARMS - UNIVERSITY OF TEXAS

Japanese brome thistle (*Bromus japonicus*) was the most commonly found exotic species in 2012 at Capulin Volcano NM.

Capulin Volcano NM Exotics Sampling Panel 1 - 7/6/2012

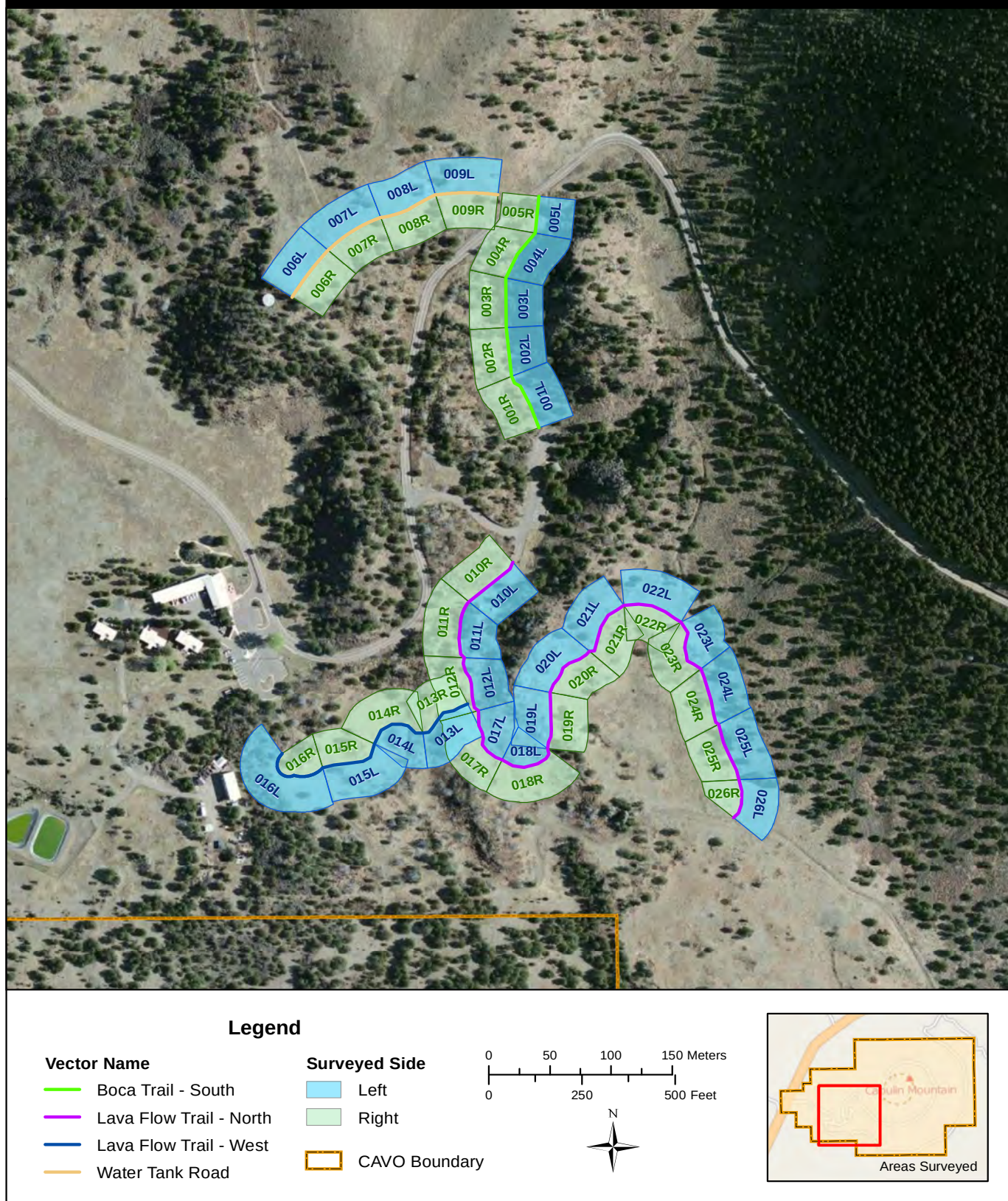


Figure 3.2-1. Individual vector blocks sampled, Panel 1, Capulin Volcano NM, 2012.

Capulin Volcano NM - Secondary Exotics 2009 vs. 2012

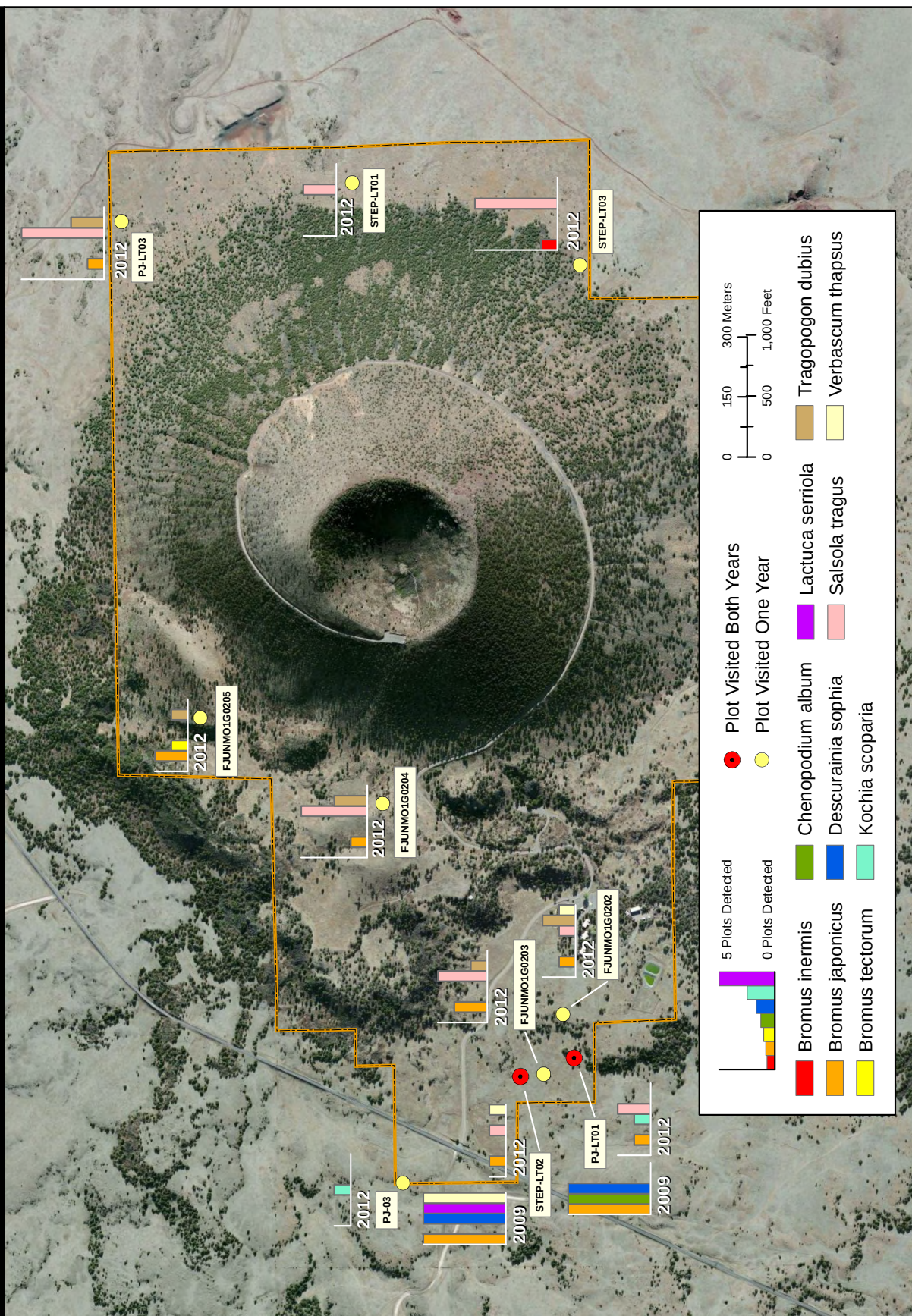


Figure 3.1-2. Secondary sample locations, Capulin Volcano NM, 2009 vs. 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Capulin Volcano NM Exotic Monitoring Blocks

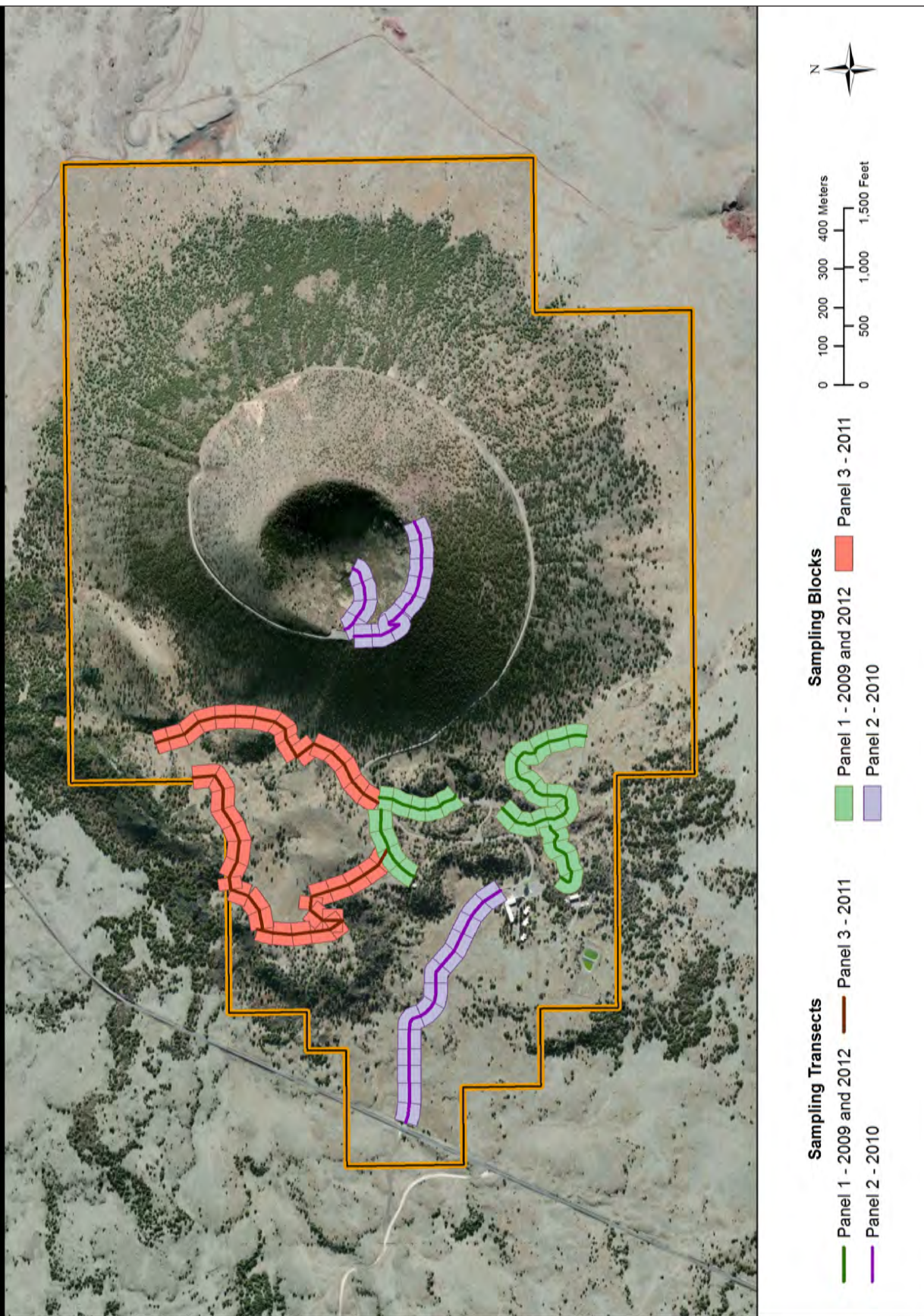


Figure 3.1-3. Overall sampling scheme for panels (annual samples) at Capulin Volcano NM for a full three-year rotation.

Table 3.2-1. Number and percentage of primary and secondary sample units where each species was detected in Panel 1 rotation, Capulin Volcano NM, 2009 vs. 2012.

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=52)		Primary vector blocks (N=52)		Secondary transects (N=2)		Secondary transects (N=11)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Bromus inermis</i>	smooth brome	–	–	1	1.9	–	–	1	9.1
<i>Bromus japonicus</i>	Japanese brome	–	–	44	84.6	–	–	7	63.6
<i>Bromus sp.</i>	brome species	47	90.4	–	–	2	100.00	–	–
<i>Bromus tectorum</i>	cheatgrass	–	–	1	1.9	–	–	1	9.1
<i>Chenopodium album</i>	common lambsquarters	20	38.5	15	28.8	1	50.00	–	–
<i>Convolvulus arvensis</i>	field bindweed	1	1.9	1	1.9	–	–	–	–
<i>Cynoglossum officinale</i>	houndstongue	3	5.8	–	–	–	–	–	–
<i>Descurainia sophia</i>	herb sophia	19	36.5	–	–	2	100.00	–	–
<i>Euphorbia davidii</i>	toothed spurge	1	1.9	–	–	–	–	–	–
<i>Kochia scoparia</i>	kochia	4	7.7	–	–	–	–	2	18.2
<i>Lactuca serriola</i>	prickly lettuce	1	1.9	–	–	1	50.00	–	–
<i>Marrubium vulgare</i>	horehound	19	36.5	19	36.5	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	9	17.3	–	–	–	–	–	–
<i>Polygonum convolvulus</i>	climbing buckwheat	2	3.8	–	–	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	3	5.8	31	59.6	–	–	8	72.7
<i>Setaria viridis</i>	green bristlegrass	1	1.9	–	–	–	–	–	–
<i>Sonchus asper</i>	spiny sowthistle	1	1.9	–	–	–	–	–	–
<i>Taraxacum officinale</i>	common dandelion	2	3.8	–	–	–	–	–	–
<i>Tragopogon dubius</i>	western salsify	16	30.8	26	50.0	–	–	5	45.5
<i>Verbascum thapsus</i>	common mullein	52	100.0	32	61.5	1	50.00	2	18.2

Table 3.2-2. Number of Vector Blocks and Density of exotic species recorded for CAVO in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012) in duplicated transects

Exotic Species	Density code	Distance Class 1		Distance Class 2	
		2009	2012	2009	2012
<i>Achillea millefolium</i> yarrow	1	–	3	–	1
	2	–	2	–	2
	3	–	–	–	–
	4	–	–	–	–
<i>Bromus japonicus</i> Japanese brome	1	–	5	–	7
	2	–	30	–	34
	3	–	–	–	–
	4	–	–	–	–
<i>Bromus species</i> brome species	1	4	–	1	–
	2	28	–	35	–
	3	1	–	9	–
	4	–	–	–	–
<i>Bromus tectorum</i> cheatgrass	1	–	1	–	–
	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Chenopodium album</i> common lambsquarters	1	15	7	9	8
	2	1	2	4	5
	3	–	–	–	–
	4	–	–	–	–
<i>Convolvulus arvensis</i> field bindweed	1	–	–	–	–
	2	–	–	–	1
	3	–	–	–	–
	4	–	–	–	–
<i>Cynoglossum officinale</i> houndstongue	1	1	–	–	–
	2	2	–	2	–
	3	–	–	–	–
	4	–	–	–	–
<i>Descurainia sophia</i> flixweed	1	4	–	7	–
	2	5	–	7	–
	3	–	–	1	–
	4	–	–	–	–
<i>Euphorbia davidii</i> David's spurge	1	–	–	1	–
	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Kochia scoparia</i> kochia	1	1	–	1	–
	2	2	–	1	–
	3	1	–	2	–
	4	–	–	–	–
<i>Lactuca serriola</i> prickly lettuce	1	–	–	1	–
	2	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.2-2. Number of Vector Blocks and Density of exotic species recorded for CAVO in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012) in duplicated transects (continued)

Exotic Species	Density code	Distance Class 1		Distance Class 2	
		2009	2012	2009	2012
<i>Lactuca serriola</i> (cont.)	3	–	–	–	–
	4	–	–	–	–
<i>Marrubium vulgare</i> horehound	1	2	6	4	5
	2	2	4	14	10
	3	–	–	–	–
	4	–	–	–	–
<i>Melilotus officinalis</i> yellow sweetclover	1	3	–	1	–
	2	3	–	4	–
	3	–	–	–	–
	4	–	–	–	–
<i>Polygonum convolvulus</i> climbing buckwheat	1	1	–	1	–
	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	2	10	–	6
	2	–	15	2	23
	3	–	–	–	–
	4	–	–	–	–
<i>Setaria viridis</i> green bristlegrass	1	1	–	–	–
	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Sonchus asper</i> spiny sowthistle	1	1	–	–	–
	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Taraxacum officinale</i> dandelion	1	1	–	–	–
	2	1	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Tragopogon dubius</i> western salsify	1	9	23	4	6
	2	4	–	3	1
	3	–	–	–	–
	4	–	–	–	–
<i>Tragopogon pratensis</i> meadow salsify	1	–	1	–	1
	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Verbascum thapsus</i> mullien	1	10	10	6	18
	2	6	2	39	11
	3	–	–	5	–
	4	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.3 Chickasaw NRA

Overall sampling at Chickasaw occurs on paved and unpaved roads and trails over its full three-year rotation (Figure 3.3-4). In 2012, exotic plant monitoring occurred at Chickasaw in early June along paved roads: Buckhorn Road from the park boundary to the campground area, and Cedar Blue from Buckhorn Road to the park boundary. Ninety-six primary vector blocks were monitored, for a total of 2.4 linear kilometers sampled on both sides (Figure 3.3-1). In addition, 13 permanent secondary transects within the landscape were sampled for a total of 65 2 x 1 meter plots. Thirty-one (31) species of exotics were detected with primary and secondary monitoring. Exotics were detected in every vector block.

K.R. bluestem (*Bothriochloa ischaemum*) was the most dominant exotic found in 2012, appearing in 91% of the primary vector blocks and four secondary transect. This perennial sod-forming grass is drought-tolerant, a prodigious seeder, and responds favorably to mowing and burning. The basal growth becomes very thick and full of thatch, displacing native species and decreasing both plant and animal biodiversity. Left unmanaged, this grass has the potential to become a monoculture and adds to fire threat by providing abundant fine fuel.

Johnsongrass (*Sorghum halepense*) was found in 88% of the primary vector blocks and 38.5% 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.

SOPN has now completed one full rotation of panels scheduled for CHIC (Table C-1 in Appendix C). Keep in mind that the panels are not annual spatial replications so there is a confounding of space and time. The true test of a temporal effect comes from the repeat of a panel which will come in the future. Re-visits will begin in 2013. Table 3.3-2 contains all exotic species detected during the past three years of primary monitoring, with a cumulative percentage of

detections at CHIC. A suite of exotic grasses rank as the greatest threats at CHIC over the first panel rotation: Johnsongrass (59%), K.R. bluestem (44%) and Japanese brome (*Bromus japonicas*) (59%). All of these grasses are highly competitive and spread easily, displacing native grasses and forbs. Twenty of the thirty-two exotic species were detected in less than 10% of the vector blocks.

CHIC 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 throughout CHIC provide an invasion pathway for exotics from surrounding urban and agricultural areas and a moist environment for their establishment. Recreational activities such as horseback riding and hunting provide additional opportunity for introduction and spread of exotics into the landscape. Historic homesteading and recent agricultural use of parklands provide long-term disturbance regimes that will be challenging to bring back to health. Recent control efforts of eastern red cedar (*Juniperus virginiana*) will require monitoring to prevent additional establishment of exotics in disturbed areas.



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King Ranch bluestem (*Bothriochloa ischaemum*) was the most commonly found exotic species in 2012 at Chickasaw NRA.

Chickasaw NRA Exotics Sampling Panel 1 - 6/7 - 6/8/2012

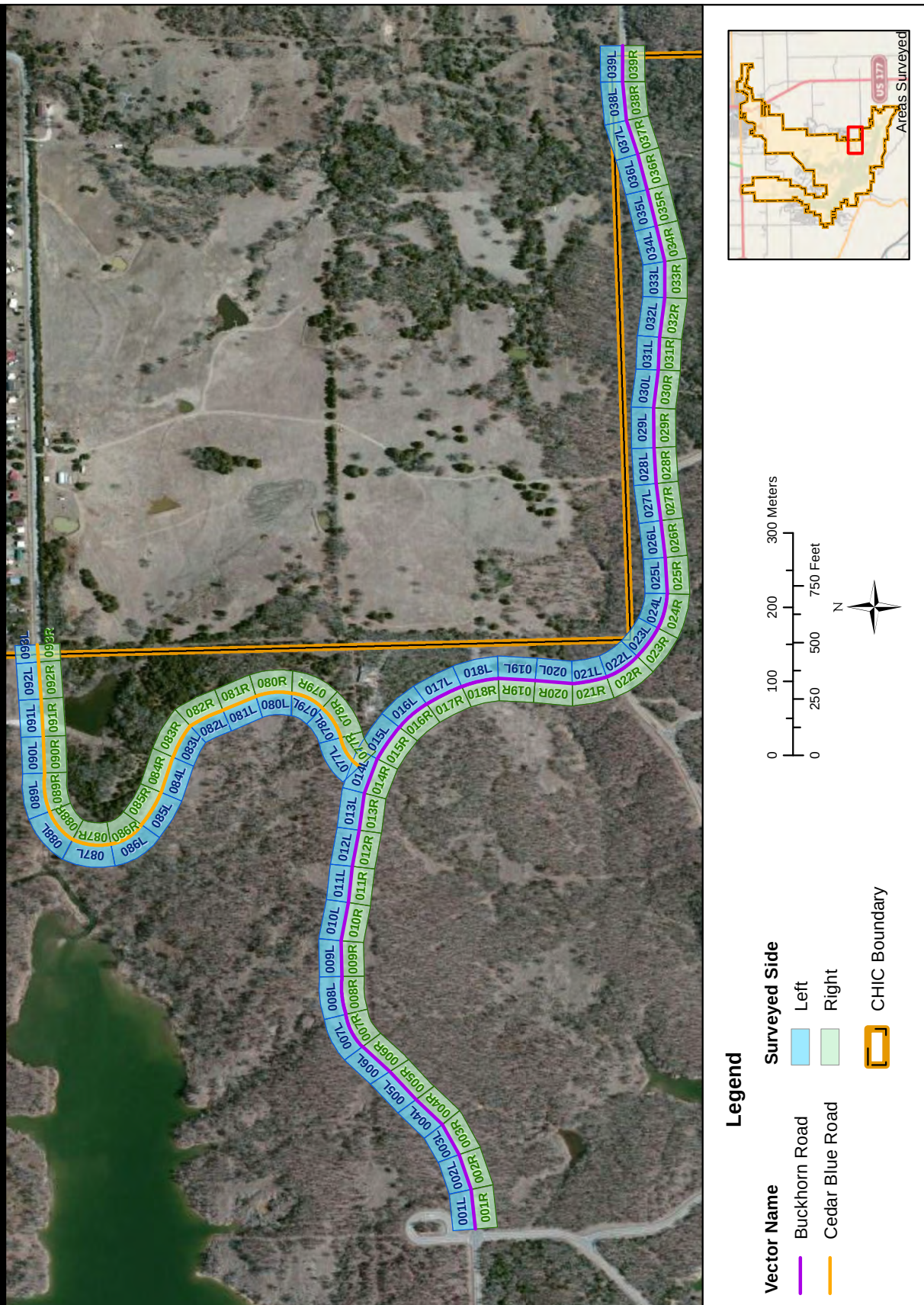


Figure 3.3-1. Individual vector blocks sampled, Panel 3, Chickasaw NRA, 2012.

Chickasaw NRA - Secondary Exotics 2012 West Hunting Area

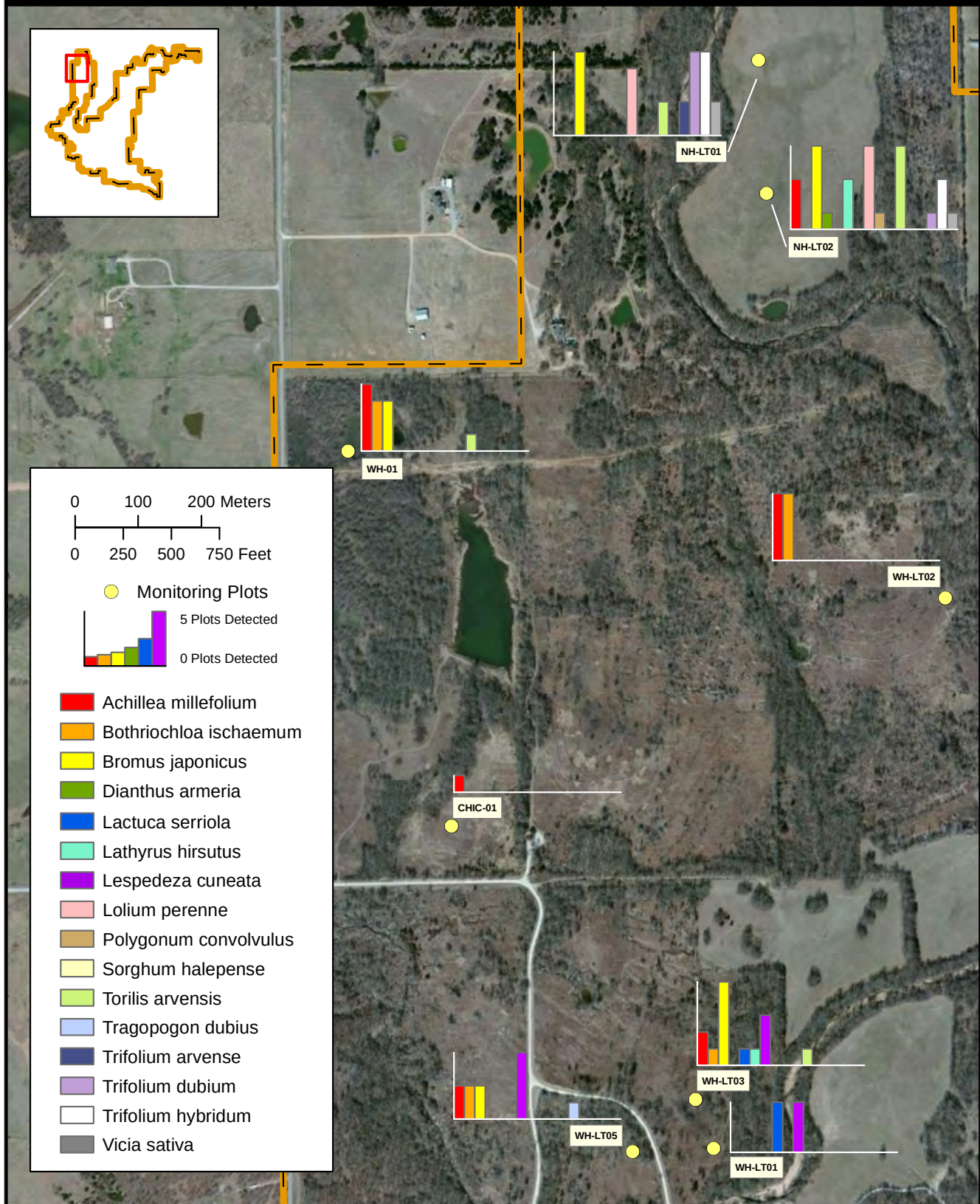


Figure 3.3-2. Secondary sample locations for Chickasaw NRA, West Hunting Area, 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Chickasaw NRA - Secondary Exotics 2012 Five Lakes Area

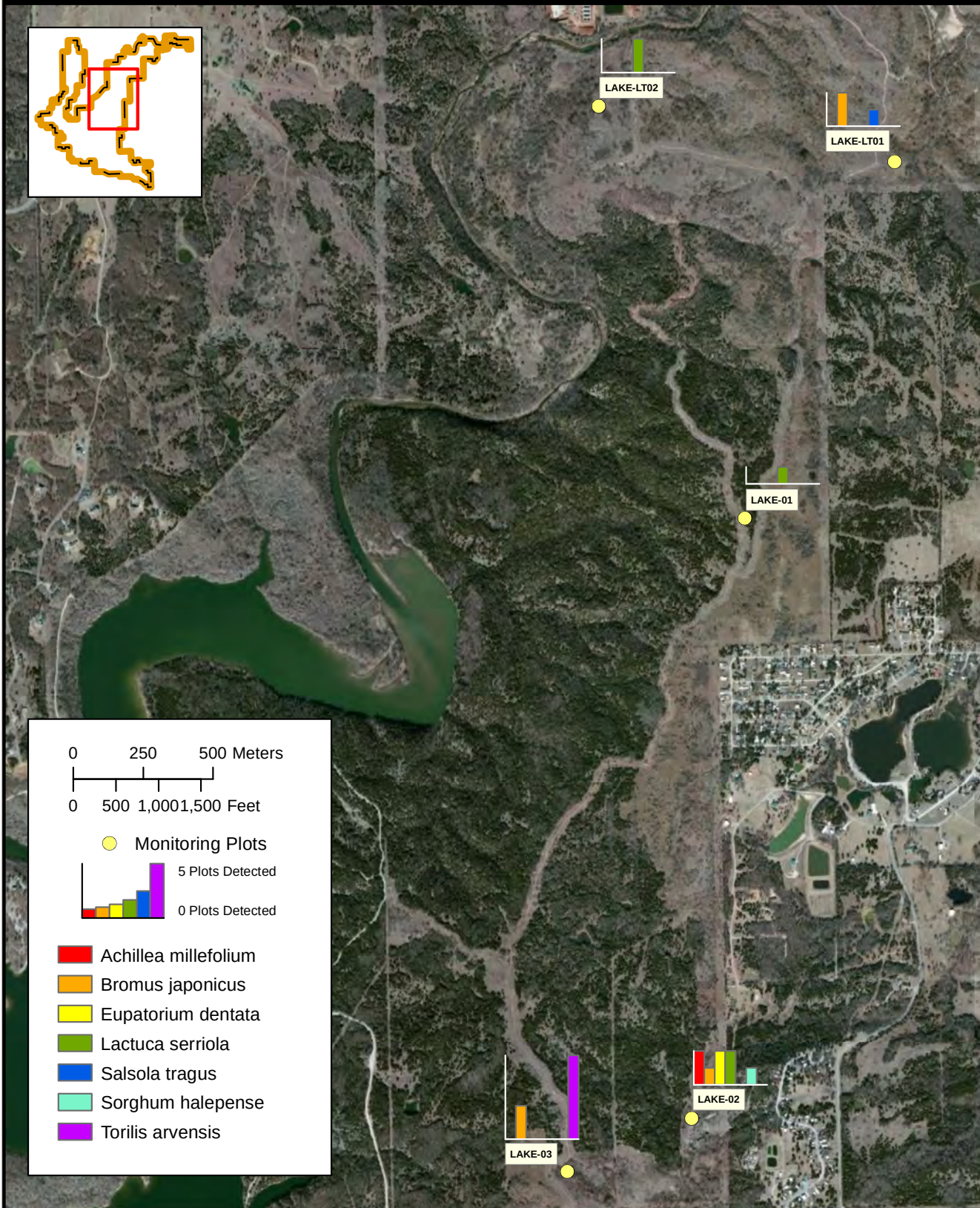


Figure 3.3-3. Secondary sample locations, Chickasaw NRA, Five Lakes Area, 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Chickasaw NRA Exotic Monitoring Blocks

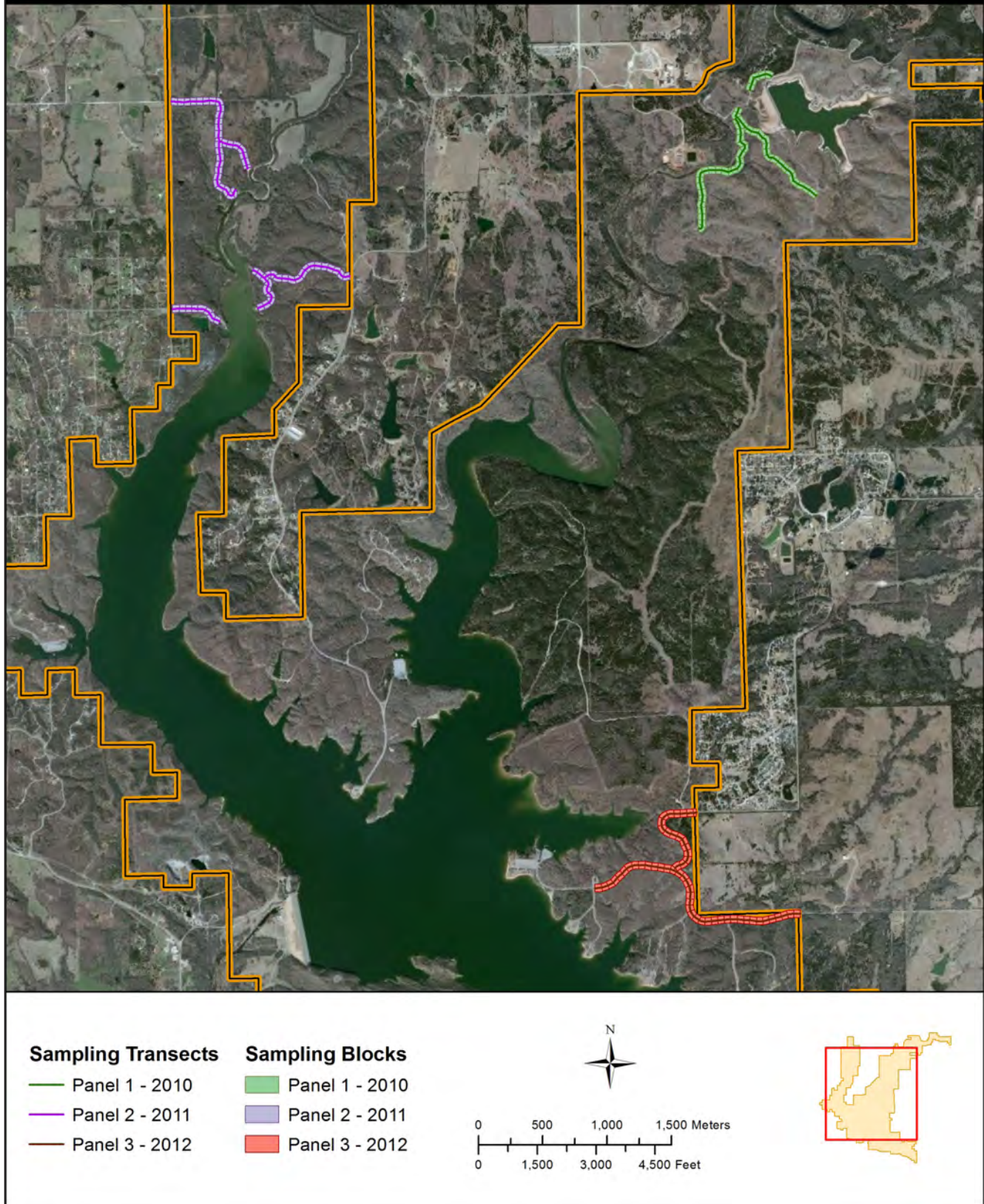


Figure 3.3-4. Overall sampling scheme for panels (annual samples) at Chickasaw NRA for a full three-year rotation.

Table 3.3-1. Number and percentage of primary and secondary sample units where each species was detected, Chickasaw NRA, 2012

Scientific name	Common name	Primary vector blocks (N=96)		Secondary transects (n=11)	
		Total	% blocks	Total ¹	% transects
<i>Achillea millefolium</i>	common yarrow	4	4.2	6	46.2
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	87	90.6	4	30.8
<i>Bromus inermis</i>	smooth brome	1	1.0	–	–
<i>Bromus japonicus</i>	Japanese brome	19	19.8	8	61.5
<i>Bromus tectorum</i>	cheatgrass	53	55.2	–	–
<i>Cynodon dactylon</i>	Bermudagrass	58	60.4	–	–
<i>Datura stramonium</i>	jimsonweed	2	2.1	–	–
<i>Dianthus armeria</i>	Deptford pink	–	–	1	7.7
<i>Euphorbia dentata</i>	toothed spurge	1	1.0	2	15.4
<i>Kummerowia stipulacea</i>	Korean lespedeza	38	39.6	–	–
<i>Lactuca serriola</i>	prickly lettuce	28	29.2	5	38.5
<i>Lathyrus hirsuta</i>	singletary pea	–	–	2	15.4
<i>Lespedeza cuneata</i>	sericea lespedeza	43	44.8	3	23.1
<i>Lonicera japonica</i>	Japanese honeysuckle	2	2.1	–	–
<i>Lolium perenne</i>	perennial ryegrass	–	–	2	15.4
<i>Medicago lupulina</i>	black medick clover	4	4.2	–	–
<i>Medicago minima</i>	burr medick clover	69	71.9	–	–
<i>Melilotus alba</i>	white sweetclover	2	2.1	–	–
<i>Onopordum acanthium</i>	scotch thistle	13	13.5	–	–
<i>Paspalum dilatatum</i>	dallisgrass	13	13.5	–	–
<i>Polygonum convolvulus</i>	climbing buckwheat	–	–	1	7.7
<i>Salsola tragus</i>	prickly Russian thistle	–	–	1	7.7
<i>Sonchus asper</i>	spiny sowthistle	4	4.2	–	–
<i>Sorghum halepense</i>	Johnsongrass	85	88.5	5	38.5
<i>Taraxacum officinale</i>	common dandelion	1	1.0	–	–
<i>Torilis arvensis</i>	spreading hedge parsley	10	10.4	2	15.4
<i>Tragopogon dubius</i>	western salsify	–	–	1	7.7
<i>Trifolium arvensis</i>	hares-foot clover	–	–	1	7.7
<i>Trifolium dubium</i>	small hop clover	–	–	2	15.4
<i>Trifolium hybrida</i>	Alsike clover	–	–	2	15.4
<i>Vicia sativa</i>	garden vetch	–	–	2	15.4

Table 3.3-2 Parkwide detection of exotics during primary monitoring at Chickasaw NRA for first 3-year panel rotation.

Scientific Name	Common Name	N= 100	N= 128	N= 96	N= 324	%
		2010	2011	2012	TOTAL	
<i>Achillea millefolium</i>	common yarrow	–	–	4	4	1.23
<i>Albizia julibrissin</i>	mimosa tree	40	48	–	88	27.16
<i>Amaranthus retroflexus</i>	redroot pigweed	4	–	–	4	1.23
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	55	87	142	43.83
<i>Bromus catharticus</i>	rescuegrass	–	2	–	2	0.62
<i>Bromus inermis</i>	smooth brome	–	–	1	1	0.31
<i>Bromus japonicus</i>	Japanese brome	97	74	19	190	58.64
<i>Bromus tectorum</i>	cheatgrass	3	20	53	76	23.46
<i>Conium maculatum</i>	poison hemlock	–	2	–	2	0.62
<i>Coronilla varia</i>	purple crownvetch	–	1	–	1	0.31
<i>Cynodon dactylon</i>	Bermudagrass	8	27	58	93	28.70
<i>Datura stramonium</i>	jimsonweed	–	–	2	2	0.62
<i>Eragrostis cilianensis</i>	stinkgrass	57	–	–	57	17.59
<i>Euphorbia dentata</i>	toothed spurge	4	4	1	9	2.78
<i>Kochia scoparia</i>	kochia	–	5	–	5	1.54
<i>Kummerowia stipulacea</i>	Korean lespedeza	–	–	38	38	11.73
<i>Lactuca serriola</i>	prickly lettuce	–	1	28	29	8.95
<i>Lathyrus hirsutus</i>	singletary pea	7	5	–	12	3.70
<i>Lespedeza cuneata</i>	sericea lespedeza	33	42	43	118	36.42
<i>Lolium arundinaceum</i>	tall fescue	1	–	–	1	0.31
<i>Lolium perenne</i>	perennial ryegrass	42	18	–	60	18.52
<i>Lolium pratense</i>	meadow fescue	2	–	–	2	0.62
<i>Lonicera japonica</i>	Japanese honeysuckle	–	29	2	31	9.57
<i>Medicago lupulina</i>	black medick clover	20	60	4	84	25.93
<i>Medicago minima</i>	burr medick clover	21	30	69	120	37.04
<i>Medicago sativa</i>	alfalfa	–	6	–	6	1.85
<i>Melia azedarach</i>	Chinaberry	23	–	–	23	7.10
<i>Melilotus alba</i>	white sweetclover	–	81	2	83	25.62
<i>Melilotus officinalis</i>	yellow sweetclover	50	16	–	66	20.37
<i>Onopordum acanthium</i>	scotch thistle	–	–	13	13	4.01
<i>Paspalum dilatatum</i>	dallisgrass	–	–	13	13	4.01
<i>Sonchus asper</i>	spiny sowthistle	–	–	4	4	1.23
<i>Sorghum halepense</i>	Johnsongrass	33	73	85	191	58.95
<i>Taraxacum officinale</i>	common dandelion	2	4	1	7	2.16
<i>Torilis arvensis</i>	spreading hedge parsley	73	28	10	111	34.26
<i>Tragopogon dubius</i>	yellow salsify	11	22	–	33	10.19

3.4 Fort Larned NHS

Overall sampling at Fort Larned occurs on paved and unpaved roads, trails and boundaries of the main unit over its full three-year rotation (Figure 3.4-3). In 2012, exotic-plant monitoring occurred at Fort Larned in mid-June. A total of 92 vector blocks were monitored resulting in 2.05 linear kilometers surveyed on one side of the Ruts boundary, and both sides of the west maintenance road and eastern trail (Figure 3.4-1 2012 vector block map). The Ruts site boundary is a new vector added to the existing main fort Panel 1 vectors. In addition, eleven permanent secondary transects within the landscape were sampled for a total of 55 2 x 1 meter plots. Thirty-seven (37) species of exotics were detected with primary and secondary monitoring. Exotics were detected in every vector block.

Kochia (*Kochia scoparia*) was the most frequently detected exotic found in 85% of the primary vector blocks, but only 27% of 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 successional 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.

Smooth brome (*Bromus inermis*) was detected in approximately 75% of the primary vector blocks and secondary transects monitored in 2012. Areas where smooth brome formed a matrix in 2009 appeared to be slightly less dense in 2012 and detection in primary blocks is down 6%, but whether this is due to environmental factors or is an effect of prescribed burning is difficult to determine. It is a deep rooting, rhizomatous, highly persistent perennial grass that colonizes old fields, becoming particularly troublesome to land managers. This grass forms thick mats

of roots underground and large quantities of litter, effectively excluding any preferred natives through efficient competition. A related species, Japanese brome (*Bromus japonicus*) was found in similar quantities in primary vector blocks but was not present in secondary transects. It was detected in scattered patches within the main fort but was more evenly distributed at the Ruts site. 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.

Field bindweed (*Convolvulus arvensis*) was present in 55% of the primary vector blocks and 73% of the secondary transects. 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.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in early June, two weeks earlier than the 2012 monitoring. This change in monitoring time should not have affected detection of any exotic species. The vectors monitored in 2012 were the same as those done in 2009, with the addition of the boundary vector at the Ruts site.

Table 3.4-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.4-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New vector blocks monitored in 2012 are notated

separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table D-1 in Appendix D contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

The exotic plant infestation at FOLS is very problematic due primarily to previous land use; all land except for immediately surrounding the fort has been repeatedly plowed and used as agricultural fields. The park itself is surrounded by agricultural fields in continuing production, providing a permanent vector for cross-contamination

of exotic species. The riparian area of the Pawnee River has suffered from agricultural drawdown in recent years resulting in an altered hydrological regime that affords the establishment of exotics in the alluvial soils of the streambed.



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Smooth brome (*Bromus inermis*) was the most commonly found exotic species in 2012 at Fort Larned NHS.

Fort Larned NHS Exotics Sampling Panel 1 - 6/12 - 6/13/2012



Legend

ECO_Exotics_Transect_In

Vector Name

- East Trail
- Lower Trail
- Rut Site

Surveyed Side

- Left
- Right

FOLS_bound_actual

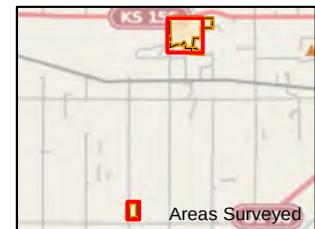
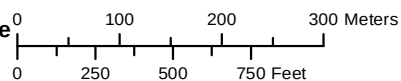


Figure 3.4-1. Individual vector blocks sampled, Panel 1, Fort Larned NHS, 2012.

Fort Larned NM - Secondary Exotics 2009 vs. 2012

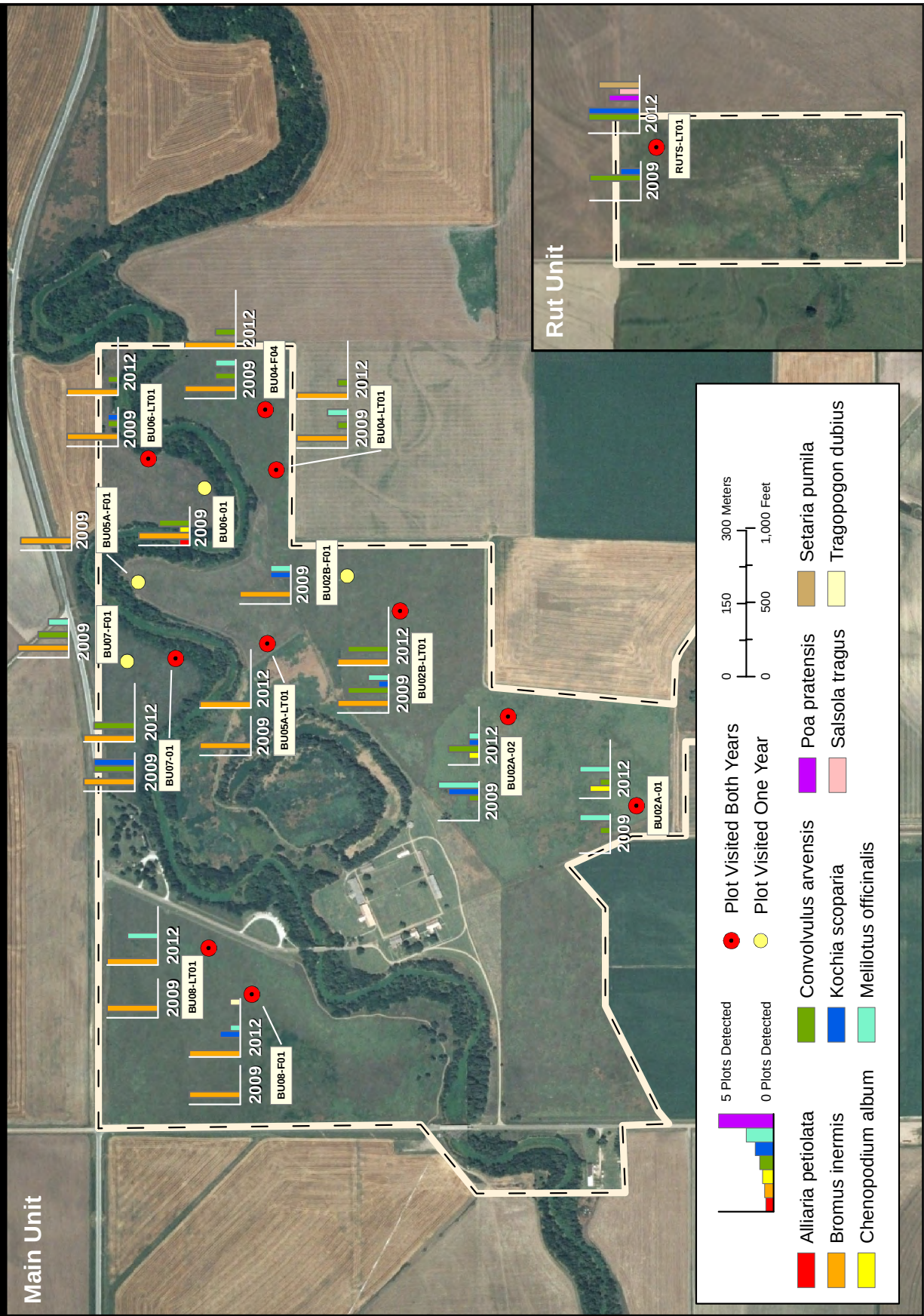


Figure 3.4-2. Secondary sample locations, Fort Larned NHS, 2009 vs. 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Fort Larned NHS Exotic Monitoring Blocks

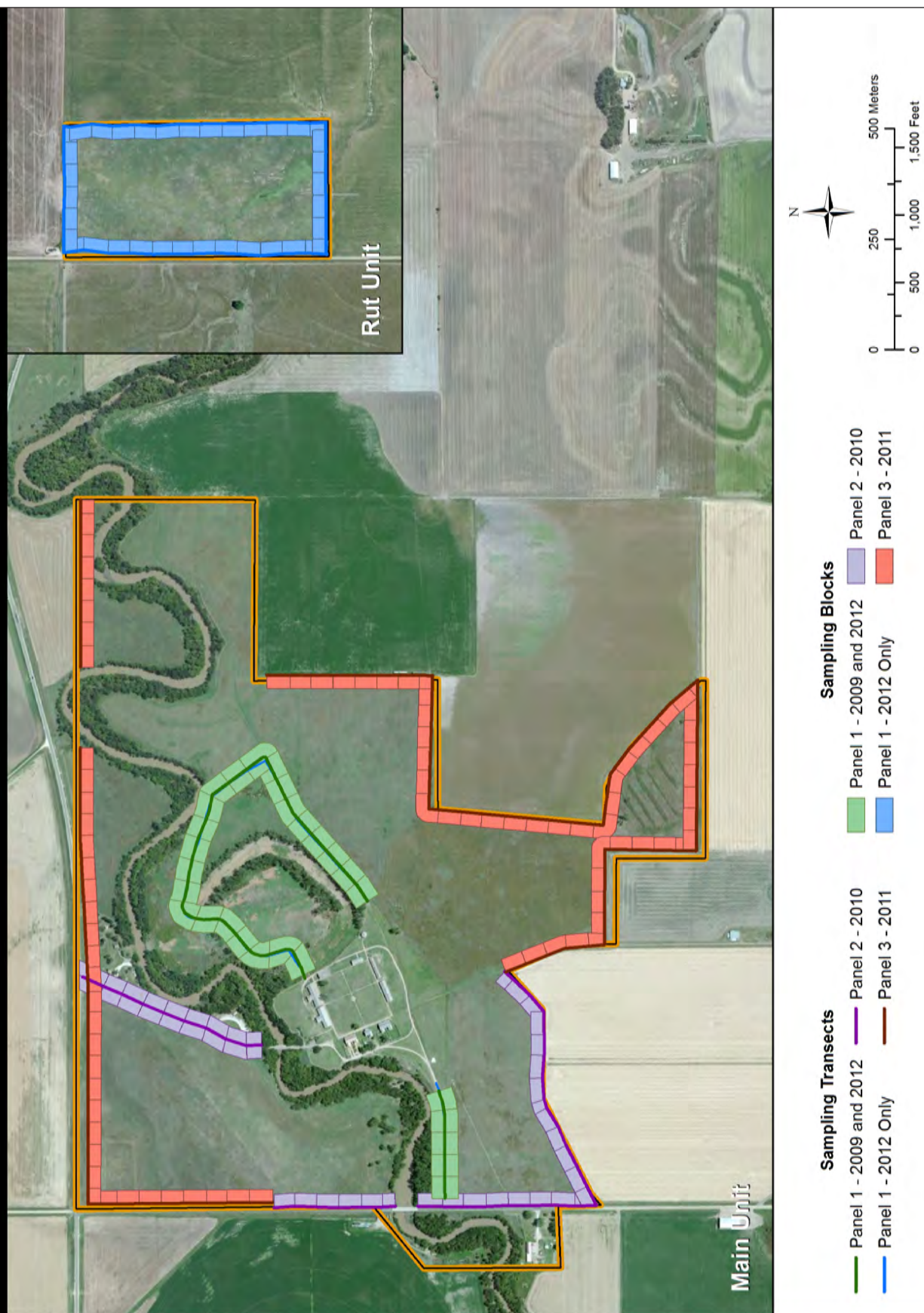


Figure 3.4-3. Overall sampling scheme for panels (annual samples) at Fort Larned NHS for a full three-year rotation.

Table 3.4-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, FOLS, 2009 vs. 2012

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=56)		Primary vector blocks (N=92)		Secondary transects (N=15)		Secondary transects (N=11)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Alliaria petiolata</i>	garlic mustard	6	10.7	–	–	1	6.7	–	–
<i>Amaranthus blitoides</i>	mat amaranth	9	16.1	–	–	–	–	–	–
<i>Amaranthus retroflexus</i>	redroot amaranth	31	55.4	–	–	–	–	–	–
<i>Bothriochloa bladhii</i>	Australian beardgrass	–	–	1	1.1	–	–	–	–
<i>Bromus inermis</i>	smooth brome	55	98.2	70	76.1	12	80.0	8	72.7
<i>Bromus japonicus</i>	Japanese brome	–	–	70	76.1	–	–	–	–
<i>Bromus tectorum</i>	cheatgrass	44	78.6	6	6.5	–	–	–	–
<i>Calystegia sepium</i>	hedge bindweed	3	5.4	–	–	–	–	–	–
<i>Cannabis sativa</i>	marijuana	2	3.6	3	3.3	–	–	–	–
<i>Capsella bursa-pastoris</i>	shepherd's purse	24	42.9	–	–	–	–	–	–
<i>Chenopodium album</i>	common lambsquarters	15	26.8	–	–	1	6.7	2	18.2
<i>Cirsium vulgare</i>	bull thistle	1	1.8	–	–	–	–	–	–
<i>Conium maculatum</i>	poison hemlock	33	58.9	26	28.3	–	–	–	–
<i>Convolvulus arvensis</i>	field bindweed	23	41.1	51	55.4	10	66.7	8	72.7
<i>Cynodon dactylon</i>	Bermudagrass	1	1.8	28	30.4	–	–	–	–
<i>Descurainia sophia</i>	herb sophia	1	1.8	–	–	–	–	–	–
<i>Digitaria sanguinalis</i>	hairy crabgrass	21	37.5	–	–	–	–	–	–
<i>Elaeagnus angustifolia</i>	Russian olive	1	1.8	–	–	–	–	–	–
<i>Eragrostis cilianensis</i>	stinkgrass	1	1.8	–	–	–	–	–	–
<i>Kochia scoparia</i>	kochia	43	76.8	78	84.8	5	33.3	3	27.3
<i>Lactuca serriola</i>	prickly lettuce	–	–	39	42.4	–	–	–	–
<i>Lamium amplexicaule</i>	henbit	42	75.0	–	–	–	–	–	–
<i>Lolium perenne</i>	perennial ryegrass	–	–	1	1.1	–	–	–	–
<i>Medicago lupulina</i>	black medick clover	8	14.3	–	–	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	6	10.7	–	–	8	53.3	4	36.4
<i>Poa pratensis</i>	Kentucky bluegrass	–	–	–	–	–	–	1	9.1
<i>Polygonum arenastrum</i>	prostrate knotweed	11	19.6	48	52.2	–	–	–	–
<i>Rumex crispus</i>	curly dock	4	7.1	1	1.1	–	–	–	–
<i>Rumex patientia</i>	patience dock	–	–	27	29.3	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	–	–	10	10.9	–	–	1	9.1
<i>Setaria viridis</i>	green bristlegrass	42	75.0	–	–	–	–	1	9.1
<i>Sonchus asper</i>	spiny sowthistle	31	55.4	–	–	–	–	–	–
<i>Taraxacum officinale</i>	common dandelion	55	98.2	10	10.9	–	–	–	–
<i>Tragopogon dubius</i>	yellow salsify	12	21.4	19	20.7	–	–	1	9.1
<i>Tribulus terrestris</i>	puncturevine	2	3.6	5	5.4	–	–	–	–
<i>Triticum aestivum</i>	common wheat	–	–	1	1.1	–	–	–	–
<i>Verbascum thapsus</i>	common mullein	–	–	2	2.2	–	–	–	–

Table 3.4-2. Number of Vector Blocks and Density of exotic species recorded for FOLS in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Achillea millefolium</i> yarrow	1	–	–	–	–	–	–
	2	–	–	1	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Alliaria petiolata</i> garlic mustard	1	–	–	–	–	–	–
	2	–	–	–	6	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Amaranthus blitoides</i> prostrate pigweed	1	3	–	–	1	–	–
	2	5	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Amaranthus retroflexus</i> red-root pigweed	1	–	–	–	6	–	–
	2	4	–	–	12	–	–
	3	–	–	–	7	–	–
	4	–	–	–	2	–	–
<i>Bothriochloa bladhii</i> Australian beardgrass	1	–	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	1	–
	4	–	–	–	–	–	–
<i>Bromus inermis</i> smooth brome	1	–	–	–	–	–	–
	2	12	–	11	9	17	14
	3	12	1	2	10	21	–
	4	2	–	–	36	16	–
<i>Bromus japonicus</i> Japanese brome	1	–	2	–	–	–	–
	2	–	1	16	–	35	15
	3	–	–	6	–	8	6
	4	–	–	–	–	–	–
<i>Bromus tectorum</i> cheatgrass	1	–	–	–	1	–	–
	2	9	–	4	15	–	5
	3	4	–	–	20	–	–
	4	–	–	–	5	–	–
<i>Calystegia sepium</i> hedge bindweed	1	–	–	–	3	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Cannabis sativa</i> marijuana	1	–	–	–	1	1	–
	2	–	–	–	1	2	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Capsella bursa-pastoris</i> shepard's purse	1	–	–	–	1	–	–
	2	14	–	–	6	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.4-2. Number of Vector Blocks and Density of exotic species recorded for FOLS in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Capsella bursa-pastoris</i> (cont.)	3	5	–	–	2	–	–
	4	–	–	–	–	–	–
<i>Chenopodium album</i> common lambsquarters	1	2	–	–	3	–	–
	2	5	–	–	6	–	–
	3	1	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Cirsium vulgare</i> bull thistle	1	1	–	–	1	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Conium maculatum</i> poison hemlock	1	1	–	–	1	1	–
	2	11	–	–	11	15	–
	3	–	–	–	5	–	–
	4	1	–	–	5	–	–
<i>Convolvulus arvensis</i> field bindweed	1	2	–	–	1	–	1
	2	6	13	24	7	11	22
	3	9	–	11	14	–	10
	4	–	–	–	–	–	–
<i>Cynodon dactylon</i> Bermudagrass	1	1	1	–	–	–	–
	2	–	26	1	–	3	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Descurainia sophia</i> flixweed	1	–	–	–	1	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Digitaria sanguinalis</i> hairy crabgrass	1	1	–	–	1	–	–
	2	9	–	–	–	–	–
	3	10	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Eragrostis cilianensis</i> stinkgrass	1	–	–	–	1	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i> kochia	1	1	4	–	–	–	–
	2	14	46	16	16	37	35
	3	22	–	9	17	–	8
	4	2	–	–	6	–	–
<i>Lactuca serriola</i> prickly lettuce	1	–	12	4	–	7	3
	2	–	1	14	–	6	13
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.4-2. Number of Vector Blocks and Density of exotic species recorded for FOLS in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Lamium amplexicaule</i> henbit	1	1	–	–	–	–	–
	2	25	–	–	12	–	–
	3	10	–	–	4	–	–
	4	–	–	–	–	–	–
<i>Lolium perenne</i> perennial ryegrass	1	–	–	–	–	–	–
	2	–	–	1	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Medicago lupulina</i> black medick clover	1	2	–	–	–	–	–
	2	6	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Polygonum arenastrum</i> prostrate knotweed	1	2	3	–	1	–	–
	2	7	45	–	–	1	–
	3	2	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Rumex crispus</i> curly dock	1	–	–	–	4	–	–
	2	–	–	1	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Rumex patientia</i> patience dock	1	–	4	5	–	2	2
	2	–	–	3	–	9	5
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	–	1	3	–	–	1
	2	–	–	4	–	1	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Setaria viridis</i> green bristlegrass	1	–	–	–	–	–	–
	2	15	–	–	5	–	–
	3	16	–	–	1	–	–
	4	11	–	–	–	–	–
<i>Sonchus asper</i> spiny sowthistle	1	2	–	–	8	–	–
	2	12	–	–	13	–	–
	3	4	–	–	4	–	–
	4	–	–	–	–	–	–
<i>Taraxacum officinale</i> dandelion	1	1	2	2	–	–	–
	2	18	6	–	4	–	–
	3	35	–	–	–	–	–
	4	1	–	–	–	–	–
<i>Tragopogon dubius</i> western salsify	1	1	–	7	3	1	7
	2	–	–	7	8	–	5

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.4-2. Number of Vector Blocks and Density of exotic species recorded for FOLS in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Tragopogon dubius</i> (cont.)	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Triticum aestivum</i> wheat	1	–	–	–	–	–	–
	2	–	–	1	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tribulus terrestris</i> puncturevine	1	–	–	–	–	–	–
	2	2	6	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Verbascum thapsus</i> mullien	1	–	–	1	–	–	–
	2	–	–	1	–	–	2
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.5 Fort Union NM

Overall sampling at Fort Union includes both paved and unpaved roads in both units over its full three-year rotation (Figure 3.5-3). In 2012, exotic-plant monitoring occurred at Fort Union July 9-11th. The vectors sampled were unpaved maintenance road around the fort ruin, the ruin spur and a newly monitored section of boundary from the front gate and housing area. One hundred fourteen (114) vector blocks were monitored, for a total of 2.85 linear kilometers sampled on both sides of the roads and one side of the boundary (Figure 3.5-1). In addition, six permanent transects within the landscape were sampled for a total of 30 2 x 1 meter plots. Thirteen (13) species of exotics were detected with primary and secondary monitoring. Exotics were found in all vector blocks.

Prickly Russian thistle (*Salsola tragus*) was detected in 99% of the primary vector blocks monitored in 2012, and two-thirds 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.

Kochia (*Kochia scoparia*) was detected in 63% of the primary vector blocks and one-third of the 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 successional 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.

Field bindweed (*Convolvulus arevensis*) was also prevalent, being found in 23% 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.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in late August. This change in monitoring time may have accounted for 2012 detection of common dandelion (*Taraxacum officinale*) and western salsify (*Tragopogon dubius*). The vectors monitored in 2012 were the same as those done in 2009, with the addition of the boundary vector through the housing area.

Table 3.5-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.5-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New vector blocks monitored in 2012 are notated separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and

the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table E-1 in Appendix E contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

FOUN 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. Both the fort ruins and the housing area are pools of exotic species propagules with the potential of being spread into the landscape by wind and machinery. Dirt brought into the park for the production of mud plaster on the ruins has a great potential to introduce additional exotic plants. The exclusion of fire and grazing on the prairie has the potential to weaken the resilience of the native plant community, thus allowing exotics to spread.

Prickly Russian thistle (*Salsola tragus*) was the most commonly found exotic species in 2012 at Fort Union NM.



STIEVE DEWEY, UTAH STATE UNIVERSITY, BUGWOOD.ORG

Fort Union NM Exotics Sampling Panel 1 - 7/9 - 7/11/2012

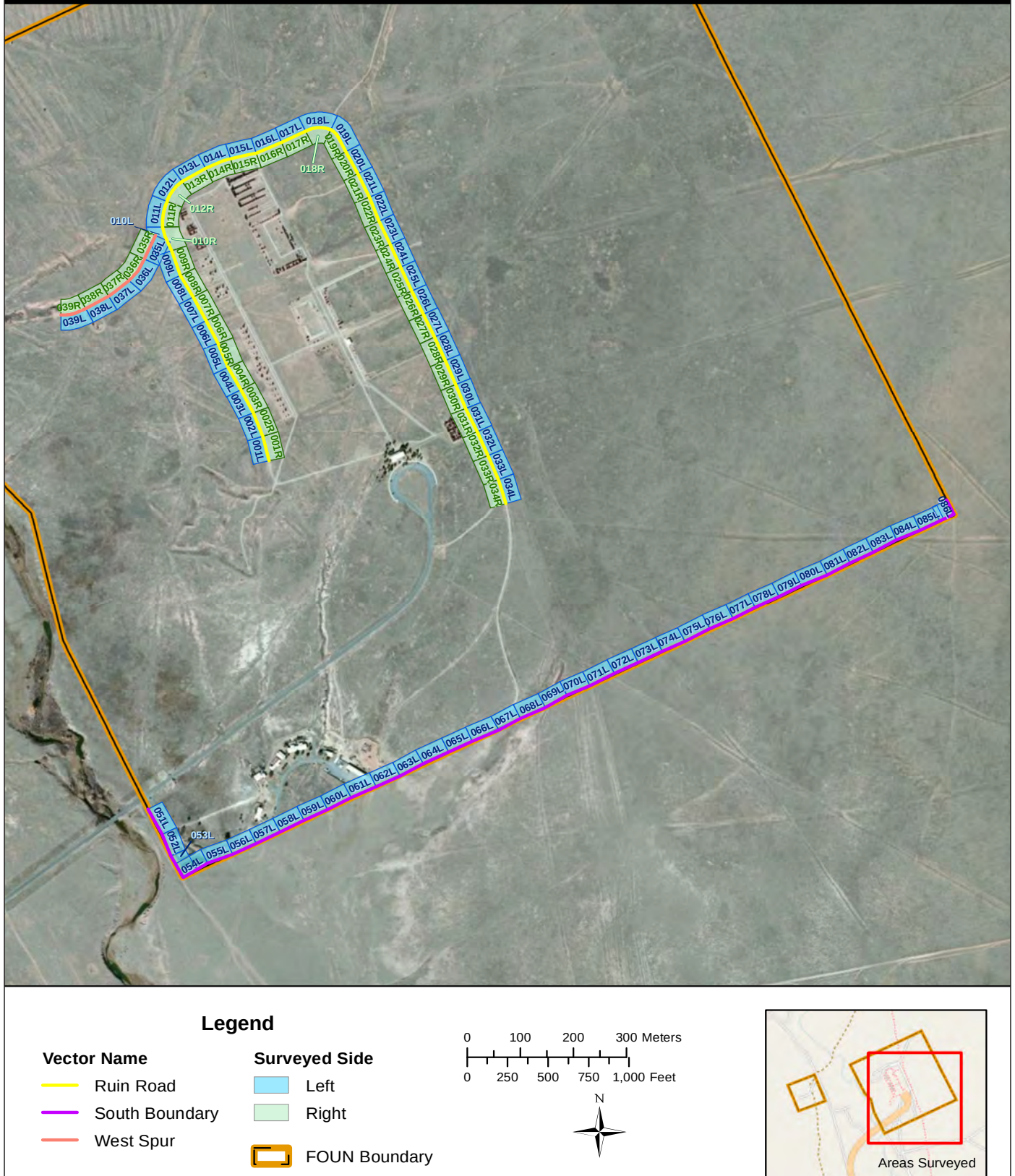


Figure 3.5-1. Individual vector blocks sampled, Panel 1, Fort Union NM, 2012.

Fort Union NM - Secondary Exotics 2012

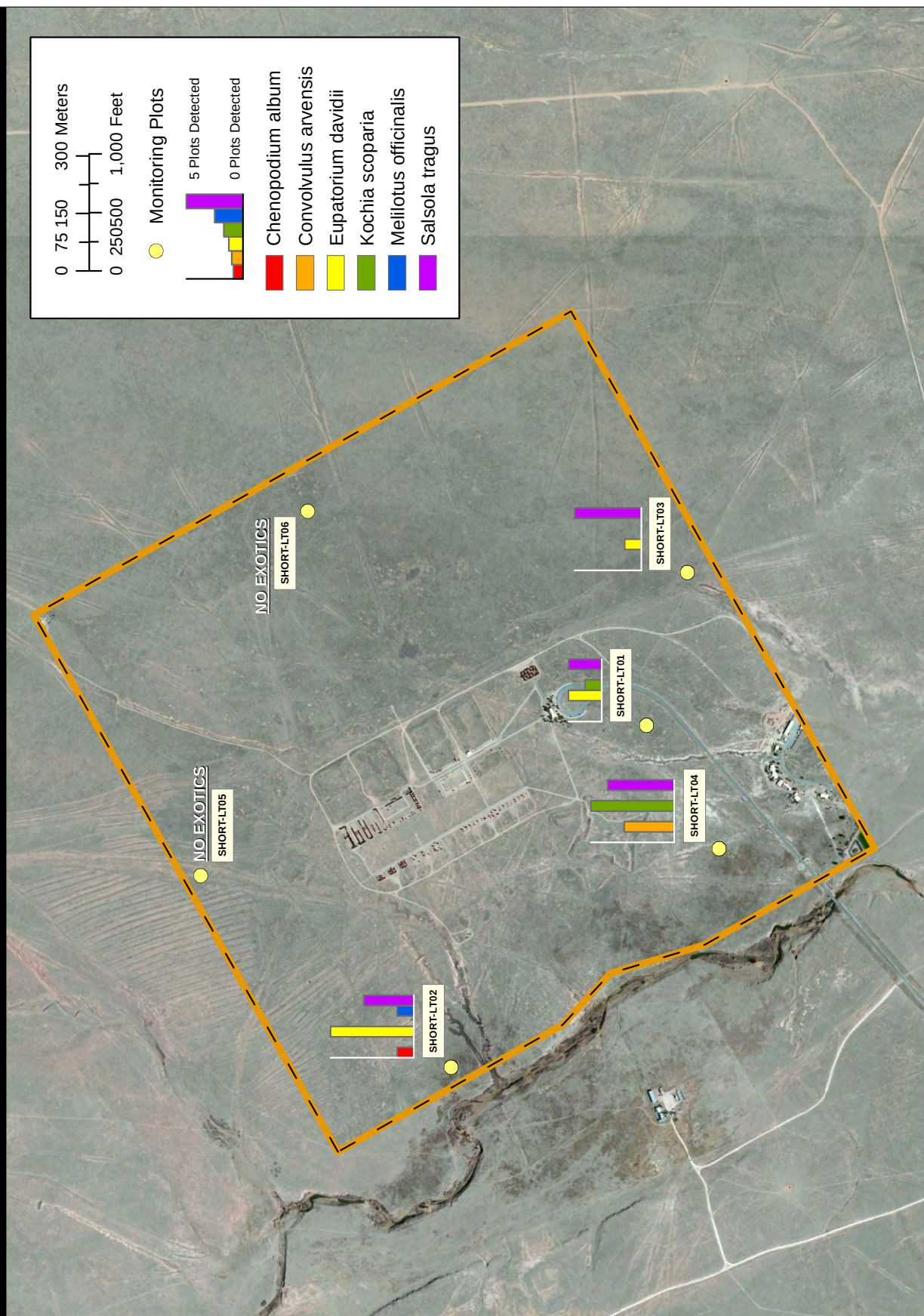


Figure 3.5-2. Secondary sample locations, Fort Union NM, 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Fort Union NM Exotic Monitoring Blocks

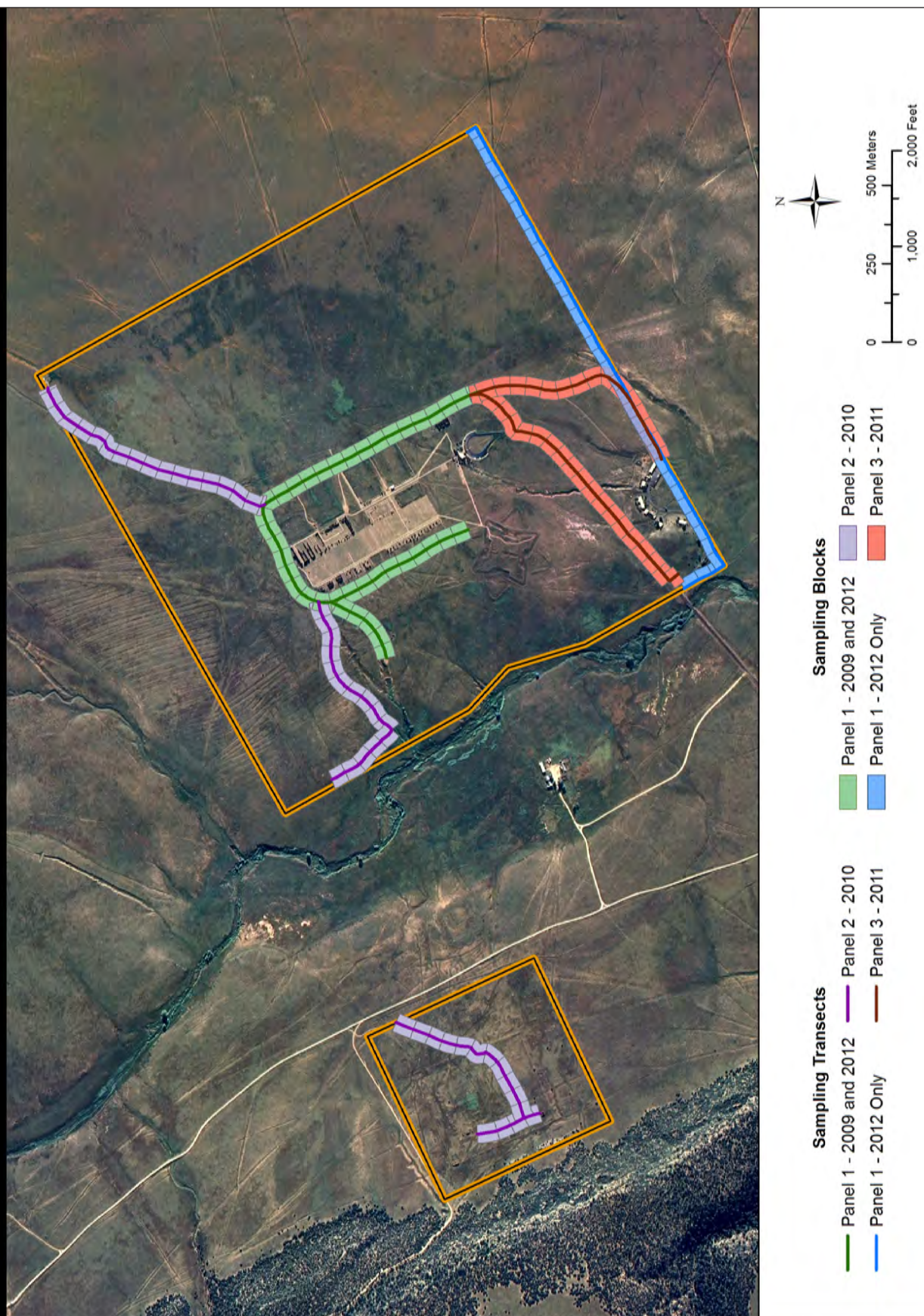


Figure 3.5-3. Overall sampling scheme for panels (annual samples) at Fort Union NM for a full three-year rotation.

Table 3.5-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, Fort Union NM, 2009 vs. 2012

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=78)		Primary vector blocks (N=114)		Secondary transects (N=0)		Secondary transects (N=6)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Brassica sp.</i>	mustard species	1	1.3	–	–	–	–	–	–
<i>Bromus inermis</i>	smooth brome	–	–	1	0.9	–	–	–	–
<i>Chenopodium album</i>	common lambsquarters	24	30.8	65	57.0	–	–	1	16.7
<i>Convolvulus arvensis</i>	field bindweed	3	3.8	26	22.8	–	–	1	16.7
<i>Euphorbia davidii</i>	toothed spurge	16	20.5	–	–	–	–	3	50.0
<i>Kochia scoparia</i>	kochia	74	94.9	72	63.2	–	–	2	33.3
<i>Marrubium vulgare</i>	horehound	10	12.8	2	1.8	–	–	–	–
<i>Melilotus alba</i>	white sweetclover	41	52.6	7	6.1	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	–	–	1	16.7
<i>Rumex crispus</i>	curly dock	–	–	4	3.5	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	20	25.6	113	99.1	–	–	4	66.7
<i>Taraxacum officinale</i>	common dandelion	–	–	1	0.9	–	–	–	–
<i>Tragopogon dubius</i>	western salsify	1	1.3	2	1.8	–	–	–	–

Table 3.5-2. Number of Vector Blocks and Density of exotic species recorded for FOUN in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Brassicaceae species</i>	1	1	–	–	–	–	–
mustard species	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus inermis</i>	1	–	–	–	–	–	–
smooth brome	2	–	–	1	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Chenopodium album</i>	1	3	16	–	1	17	1
common lambsquarters	2	9	17	3	8	35	5
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Convolvulus arvensis</i>	1	1	3	4	–	3	–
field bindweed	2	2	6	9	2	5	13
	3	–	–	2	–	–	2
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.5-2. Number of Vector Blocks and Density of exotic species recorded for FOUN in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Euphorbia davidii</i>	1	4	–	–	1	–	–
David's spurge	2	10	–	–	4	–	–
	3	–	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i>	1	9	17	1	6	5	–
kochia	2	28	30	7	33	38	5
	3	14	4	–	10	5	–
	4	–	–	–	3	–	–
<i>Marrubium vulgare</i>	1	1	–	–	–	1	–
horehound	2	–	–	–	–	2	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus alba</i>	1	10	3	1	15	2	1
white sweetclover	2	5	–	–	15	–	–
	3	–	–	–	2	–	–
	4	–	–	–	–	–	–
<i>Rumex crispus</i>	1	–	–	1	–	–	–
curly dock	2	–	–	–	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i>	1	1	6	1	4	5	7
prickly Russian thistle	2	11	71	34	8	66	28
	3	–	–	–	–	2	–
	4	–	–	–	–	–	–
<i>Taraxacum officinale</i>	1	–	1	–	–	–	–
dandelion	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tragopogon dubius</i>	1	–	–	–	–	2	–
western salsify	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.6 Lake Meredith NRA/Alibates Flint Quarries NM

Overall sampling at Lake Meredith/Alibates Flint Quarries (LAMR/ALFL) occurs on paved roads over its full three-year rotation (Figure 3.6-4). In 2012, exotic-plant monitoring occurred at ALFL in June. The paved road from the Visitor Center east through the monument was sampled. Eighty-two (82) vector blocks were monitored, for a total of just over 2 linear kilometers sampled on both sides (Figure 3.6-1). In addition, 29 permanent transects within the landscape were sampled for a total of 145 2 x 1 meter plots. Fourteen (14) species of exotics were detected with primary and secondary monitoring. There were no exotics found in fourteen vector blocks sampled.

Prickly Russian thistle (*Salsola tragus*) was the most frequently encountered exotic, detected in 72% of the primary vector blocks and 87.5% 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.

Common lambsquarters (*Chenopodium album*) was quite prevalent this year, found in 74% of the primary vector blocks. This drought-tolerant annual is found throughout the west, seeding prolifically and primarily occupying disturbed ground, although once established it has the capacity to persist in the landscape. Botanists debate its nativity, some treating it as an exotic from Eurasia while others think there is a native strain. A word of caution must be offered: positive identification of this species can be difficult. Common lambsquarters has variable traits that mimic other native and exotic lambsquarters. SOPN continues to verify this species whenever encountered, but we do believe we have identified it correctly.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in early August. This change in monitoring time may have accounted for 2012 detection of hairy crabgrass (*Digitaria sanguinalis*) and western salsify (*Tragopogon dubius*). The vector monitored in 2012 was the same as that done in 2009, but the transect was extended in 2012 almost to the road junction on the eastern boundary.

Table 3.6-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.6-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New vector blocks monitored in 2012 are notated separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table F-1 in Appendix F contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

ALFL is comprised primarily of dolomitic cap-rock uplands above the Canadian River drainage. The permitting of oil and gas leases inside the park contribute greatly to the disturbance and fragmenting of the landscape, providing numerous opportunities for exotic contamination. Historic grazing has impacted the plant communities that are now in early-to mid succession.

Alibates Flint Quarries NM Exotics Sampling Panel 1 - 6/20 - 6/21/2012

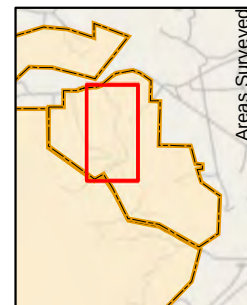
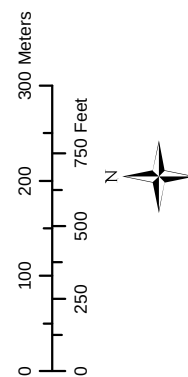
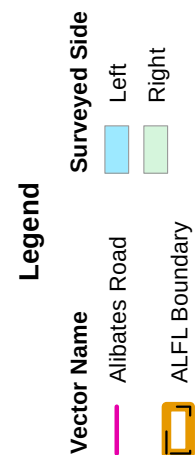
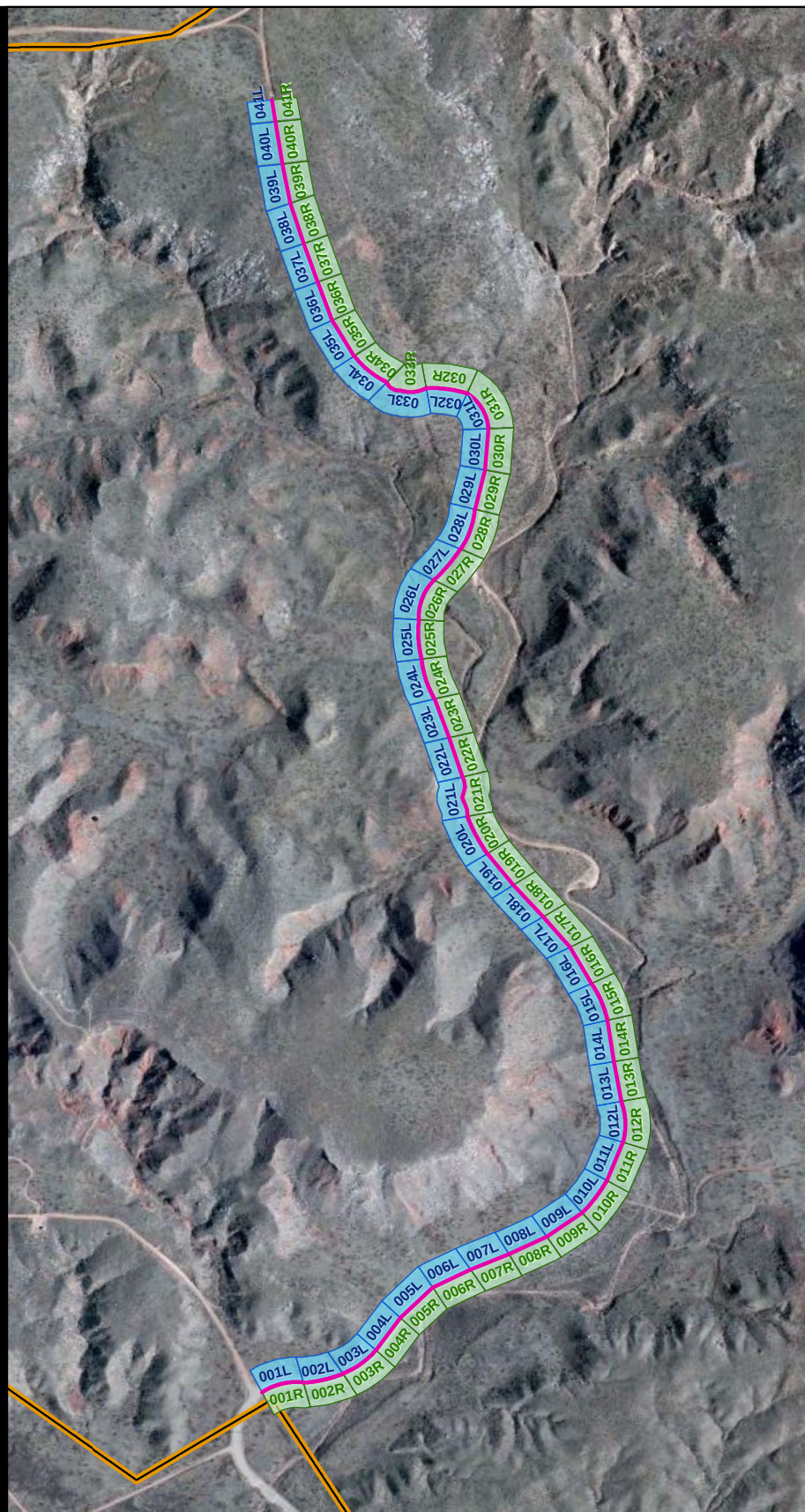


Figure 3.6-1. Individual vector blocks sampled, Panel 1, Alibates Flint Quarries NM, 2012.

Lake Meredith NRA - Secondary Exotics 2009 vs. 2012 Upper Region

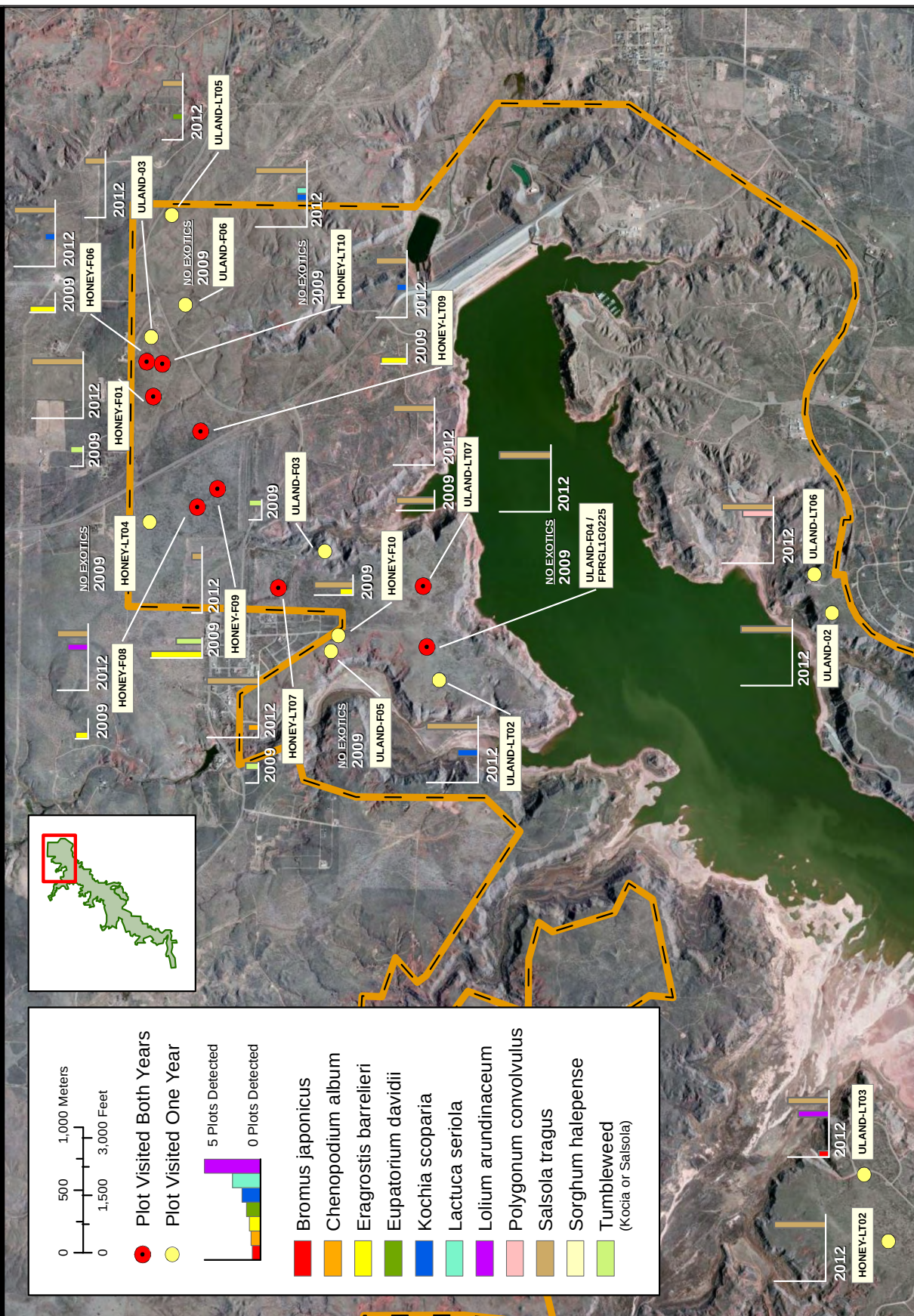


Figure 3.6-2. Secondary sample locations, Lake Meredith NRA and Alibates Flint Quarries NM, Upper Region, 2009 vs 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Lake Meredith NRA - Secondary Exotics 2009 vs. 2012 Lower Region

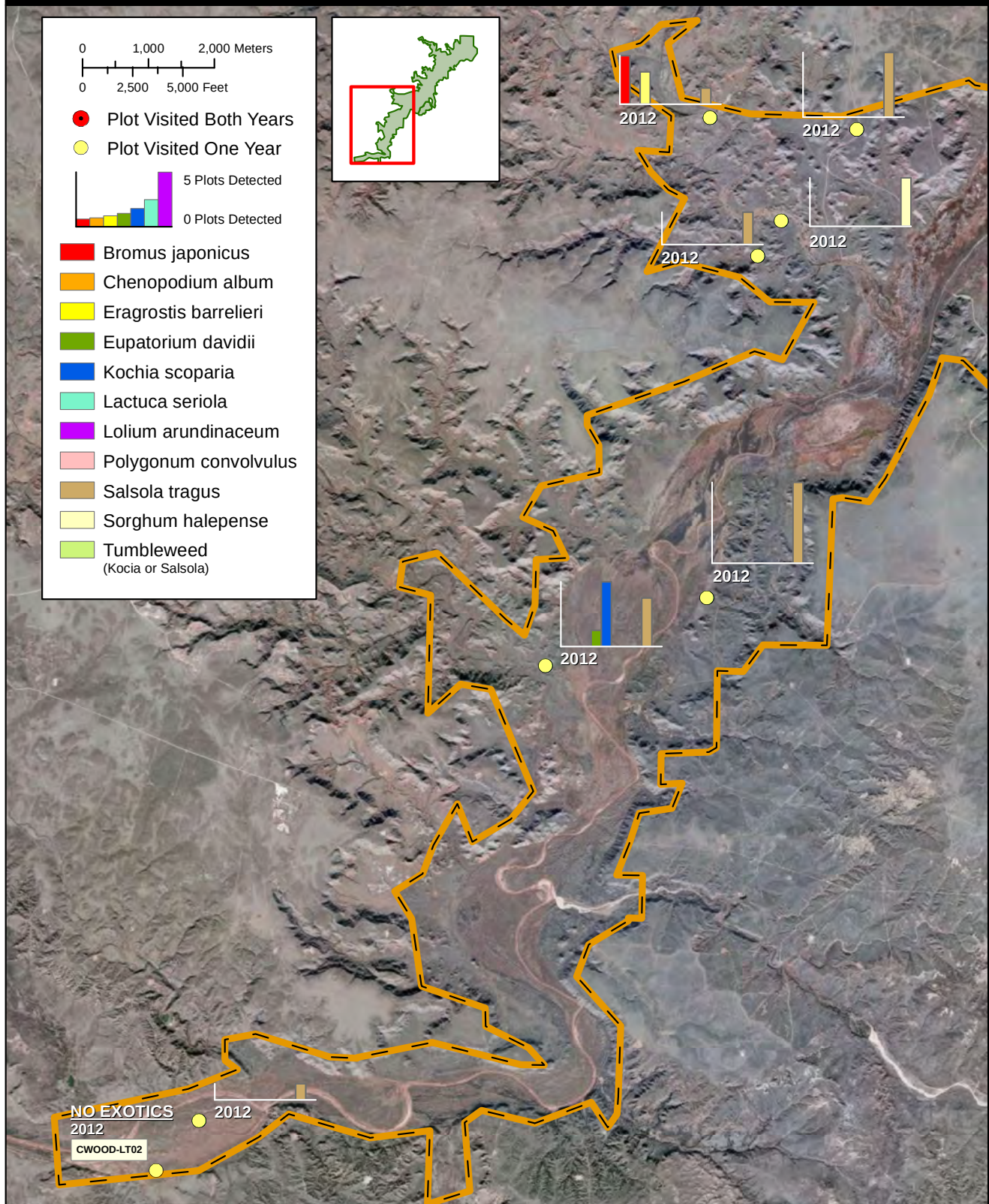


Figure 3.6-3. Secondary sample locations, Lake Meredith NRA and Alibates Flint Quarries NM - Lower Region, 2009 vs 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Lake Meredith NRA Exotic Monitoring Blocks

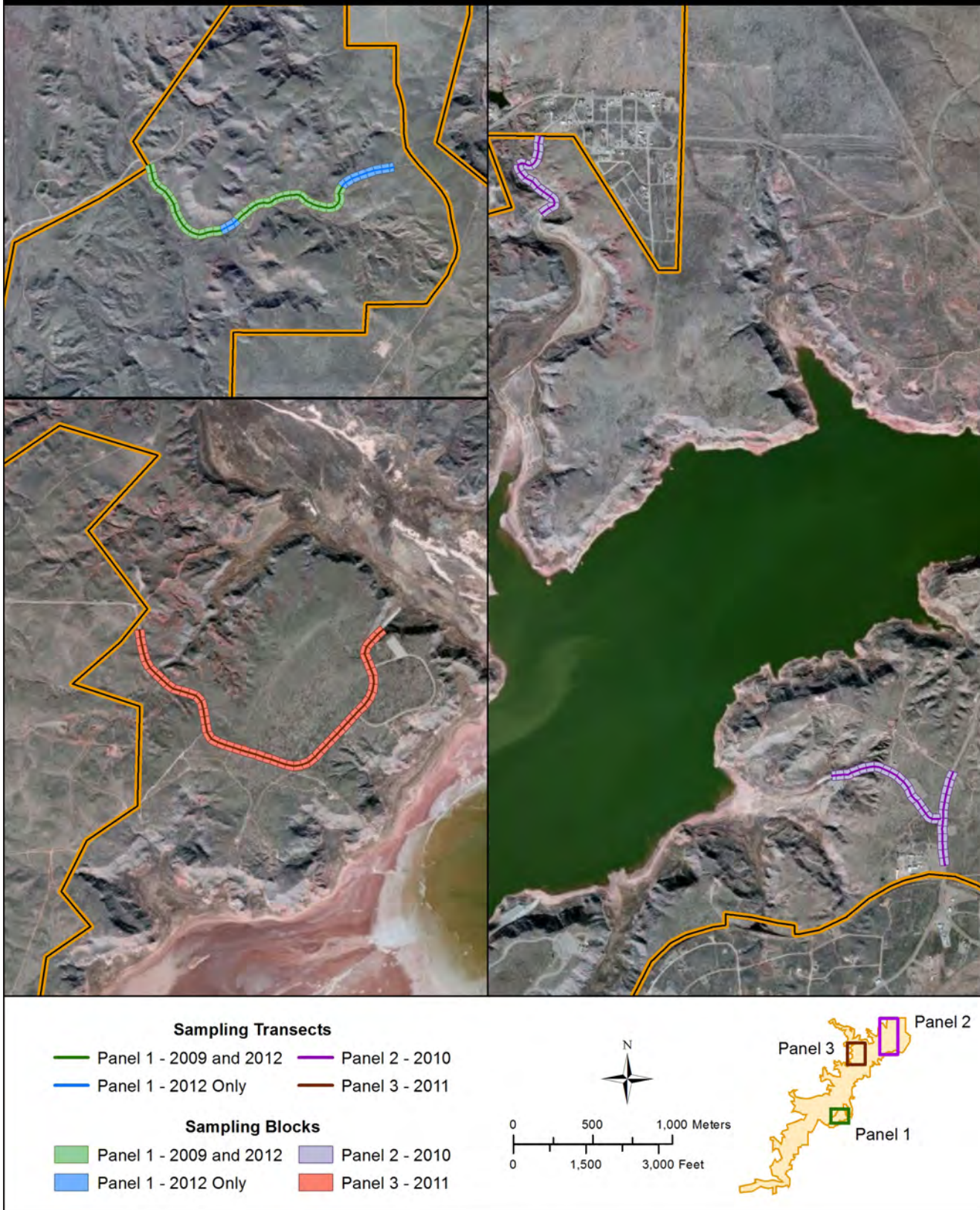


Figure 3.6-4. Overall sampling scheme for panels (annual samples) at Lake Meredith NRA and Alibates Flint Quarries NM for a full three-year rotation.

Table 3.6-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, ALFL, 2009 vs. 2012

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=62)		Primary vector blocks (N=82)		Secondary transects (N=14)		Secondary transects (N=24)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	8	9.8	–	–	–	–
<i>Bromus japonicus</i>	Japanese brome	–	–	4	4.9	–	–	1	4.2
<i>Chenopodium album</i>	lambsquarters	–	–	61	74.4	5	35.7	1	4.2
<i>Chenopodium glaucum</i>	oakleaf goosefoot	3	4.8	–	–	–	–	–	–
<i>Digitaria sanguinalis</i>	hairy crabgrass	4	6.5	–	–	–	–	–	–
<i>Eragrostis barrelii</i>	barnyard grass	–	–	–	–	–	–	1	4.2
<i>Eragrostis cilianensis</i>	stinkgrass	–	–	1	1.2	–	–	–	–
<i>Eupatorium davidii</i>	David's spurge	–	–	–	–	–	–	2	8.3
<i>Festuca arundinaceae</i>	tall fescue	–	–	–	–	–	–	2	8.3
<i>Kochia scoparia</i>	Mexican-fireweed	34	54.8	3	3.7	–	–	5	20.8
<i>Lactuca serriola</i>	prickly lettuce	–	–	2	2.4	–	–	1	4.2
No Exotics	No Exotics	3	4.8	14	17.1	–	–	–	–
<i>Polygonum convolvulus</i>	climbing buckwheat	–	–	–	–	–	–	1	4.2
<i>Salsola tragus</i>	prickly Russian thistle	15	24.2	59	72.0	6	42.9	21	87.5
<i>Setaria viridis</i>	green bristlegrass	24	38.7	–	–	–	–	–	–
<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	–	1	4.2
<i>Taraxacum officinale</i>	common dandelion	1	1.6	–	–	–	–	–	–
<i>Tragopogon dubius</i>	yellow salsify	5	8.1	4	4.9	–	–	–	–

Table 3.6-2. Number of Vector Blocks and Density of exotic species recorded for ALFL in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Bothriochloa ischaemum</i>	1	–	–	–	–	–	–
King Ranch bluestem	2	–	8	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus japonicus</i>	1	–	1	–	–	–	–
Japanese brome	2	–	–	–	–	3	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Chenopodium album</i>	1	–	12	2	–	4	1
common lambsquarters	2	–	21	–	–	51	3
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.6-2. Number of Vector Blocks and Density of exotic species recorded for ALFL in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Chenopodium glaucum</i> oakleaf goosefoot	1	2	–	–	–	–	–
	2	–	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Digitaria sanguinalis</i> hairy crabgrass	1	1	–	–	–	–	–
	2	3	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Eragrostis cilianensis</i> stinkgrass	1	–	–	–	–	–	–
	2	–	1	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i> kochia	1	1	–	–	–	–	–
	2	15	3	–	16	3	–
	3	18	–	–	13	–	–
	4	–	–	–	–	–	–
<i>Lactuca serriola</i> prickly lettuce	1	–	1	–	–	1	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	6	14	1	4	10	3
	2	6	38	–	–	40	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Setaria viridis</i> green bristlegrass	1	9	–	–	1	–	–
	2	5	–	–	18	–	–
	3	–	–	–	2	–	–
	4	–	–	–	–	–	–
<i>Taraxacum officinale</i> dandelion	1	1	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tragopogon dubius</i> western salsify	1	1	1	–	2	3	–
	2	–	–	–	2	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.7 Lyndon B. Johnson NHP

Overall sampling at Lyndon B. Johnson occurs only on the unpaved Settlement Trail over its full three-year rotation (Figure 3.7-2). In 2012, exotic-plant monitoring occurred at Lyndon B. Johnson in late May. Thirty-two (32) vector blocks were monitored, for a total of 0.8 linear kilometers sampled on both sides (Figure 3.7-1). In addition, two permanent transects within the landscape were sampled for a total of 10 2 x 1 meter plots. Twenty-one (21) species of exotics were detected with primary and secondary monitoring. Exotics were detected in every vector block.

K.R. bluestem (*Bothriochloa ischaemum*) was the most dominant exotic found in 2012, appearing in 87% of the primary vector blocks and one secondary transect. This perennial sod-forming grass is drought-tolerant, a prodigious seeder, and responds favorably to mowing and burning. The basal growth becomes very thick and full of thatch, displacing native species and decreasing both plant and animal biodiversity. Left unmanaged, this grass has the potential to become a monoculture and adds to fire threat by providing abundant fine fuel.

Johnsongrass (*Sorghum halepense*) was the second most prevalent exotic found, detected in 81% of the vector blocks monitored. 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.

The restoration area of the Johnson Settlement at LYJO is the only unmowed semi-natural area of the park available for monitoring. Therefore, we depart from the standard three-year panel rotation and instead monitor this area every year. This is the third year of monitoring in this area, so an average of detections was compiled for the all years of monitoring. Annual monitoring occurs in late May of each year, therefore time of monitoring has no effect upon which exotic species are detected.

Table 3.7-1 contains all exotic species detected during primary monitoring in 2010 and 2012. A new Table 3.1-2 is presented this year to compare the frequency of various densities of exotic species in 2010 vs. 2012. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape. Table 3.1-3 contains all exotic species detected in each block during primary monitoring in 2010, 2011 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

Long-term establishment of a suite of exotic species will make it very difficult to successfully control the invasions. The restoration area has been plowed and terraced in the past and has also served as a pecan orchard. Several efforts through the years to re-establish a midgrass prairie have met with limited success. It has been shown in many studies that the lack of prescribed fire can leave a grassland diminished and allow exotics to proliferate. KR bluestem is reported to diminish due to hot summer fire (Simmons et al., 2007).



CHARLES T. BRYSON, USDA AGRICULTURAL RESEARCH SERVICE, BUGWOOD.ORG

Johnsongrass (*Sorghum halepense*) was one of the most commonly found exotic species in 2012 at Lyndon B. Johnson NHP.

Lyndon B. Johnson NHP Exotics Sampling Panel 1 - 5/23/2012

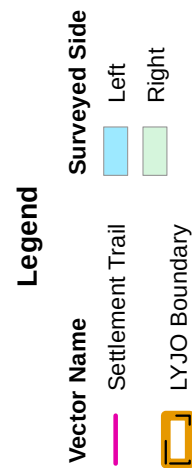
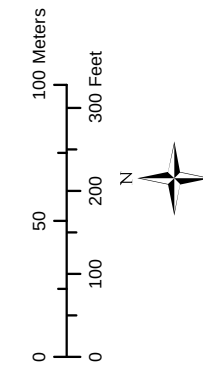
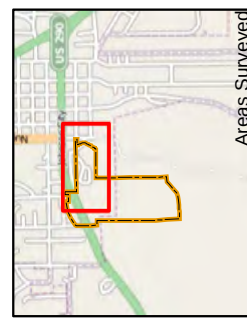


Figure 3.7-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, Lyndon B. Johnson NHP, 2010 vs. 2012

Lyndon B. Johnson NHP - Secondary Exotics 2009 vs. 2012

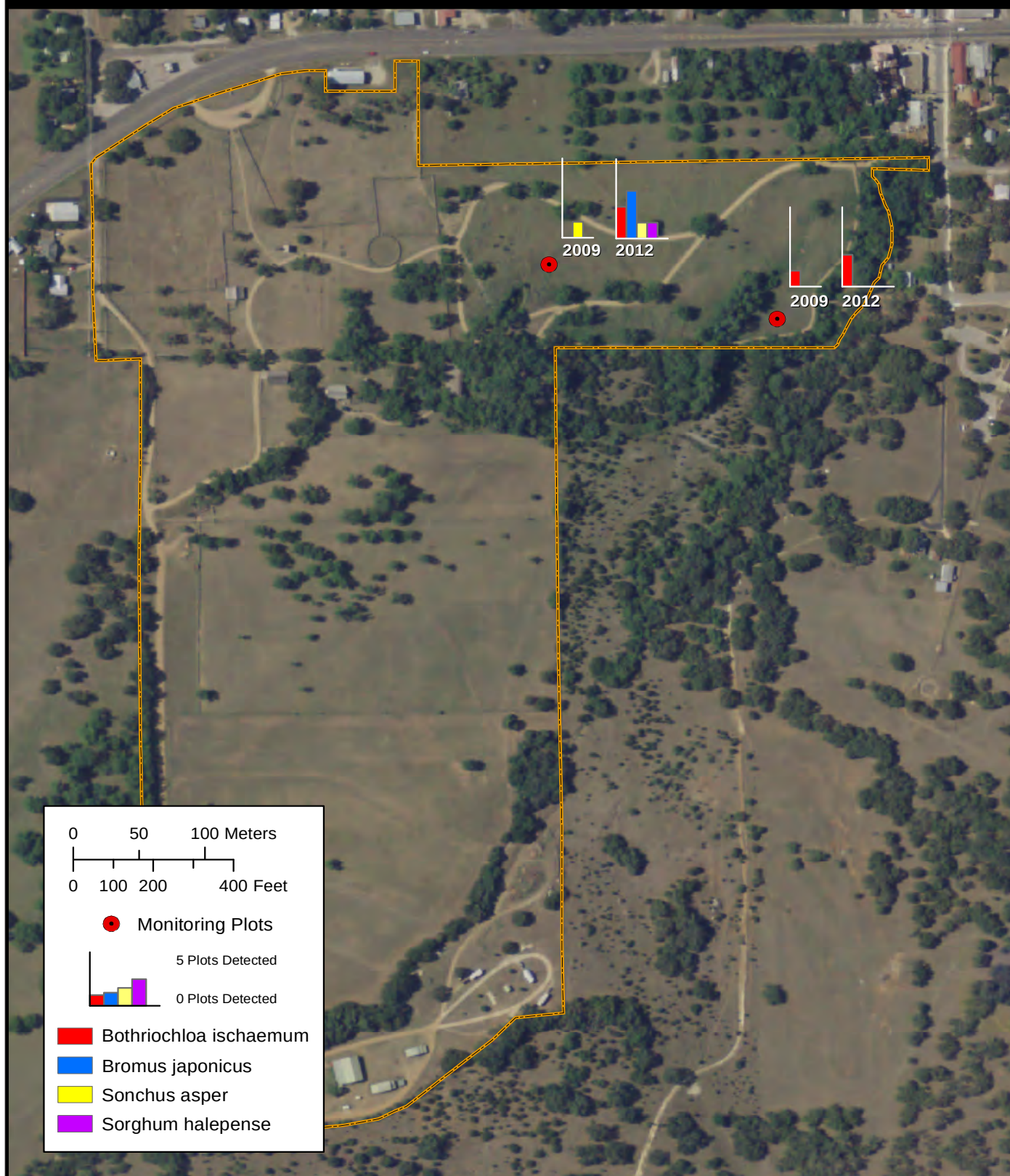


Figure 3.7-2. Secondary sample locations, Lyndon B. Johnson NHP, 2009 vs. 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Table 3.7-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, Lyndon B. Johnson NHP, 2010 vs. 2012

Scientific name	Common name	2010		2012		2010		2012	
		Primary vector blocks (N=32)		Primary vector blocks (N=32)		Secondary transects (N=2)		Secondary transects (N=2)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	18	56.3	28	87.5	1	50	2	100
<i>Bromus catharticus</i>	rescuegrass	–	–	2	6.3	–	–	–	–
<i>Bromus japonicus</i>	Japanese brome	12	37.5	–	–	–	–	1	50
<i>Bromus tectorum</i>	cheatgrass	–	–	20	62.5	–	–	–	–
<i>Centaurea melitensis</i>	Maltese star-thistle	4	12.5	–	–	–	–	–	–
<i>Cynodon dactylon</i>	Bermudagrass	10	31.3	20	62.5	–	–	–	–
<i>Cyperus esculentus</i>	yellow nutsedge	–	–	1	3.1	–	–	–	–
<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	6.3	–	–	–	–	–	–
<i>Galium divaricatum</i>	Lamarks bedstraw	–	–	4	12.5	–	–	–	–
<i>Lolium perenne</i>	perennial ryegrass	–	–	1	3.1	–	–	–	–
<i>Lonicera japonica</i>	Japanese honeysuckle	–	–	5	15.6	–	–	–	–
<i>Marrubium vulgare</i>	horehound	1	3.1	–	–	–	–	–	–
<i>Medicago lupulina</i>	black medick clover	–	–	23	71.9	–	–	–	–
<i>Medicago minima</i>	burr medick clover	–	–	5	15.6	–	–	–	–
<i>Paspalum dilitatum</i>	dallisgrass	–	–	–	–	–	–	1	50
<i>Poa pratensis</i>	Kentucky bluegrass	–	–	2	6.3	–	–	–	–
<i>Sonchus asper</i>	sowthistle	–	–	–	–	–	–	1	50
<i>Sorghum halepense</i>	Johnsongrass	15	46.9	26	81.3	1	50	1	50
<i>Taraxacum officinale</i>	common dandelion	–	–	11	34.4	–	–	–	–
<i>Torilis arvensis</i>	spreading hedge parsley	–	–	18	56.3	–	–	–	–
<i>Verbascum thapsus</i>	common mullein	1	3.1	–	–	–	–	–	–

Table 3.7-2. Number of Vector Blocks and Density of exotic species recorded for LYJO in Distance Classes 1 and 2 for Panel 1 (2010 vs. 2012)

Exotic Species	Density code	Distance Class 1		Distance Class 2	
		2010	2012	2010	2012
<i>Bothriochloa ischaemum</i>	1	–	–	1	2
King Ranch bluestem	2	1	28	1	18
	3	15	–	16	–
	4	2	–	–	–
<i>Bromus catharticus</i>	1	–	–	–	1
rescue grass	2	–	2	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Bromus japonicus</i>	1	3	–	2	–
Japanese brome	2	1	–	6	–
	3	–	–	2	–
	4	–	–	–	–
<i>Bromus tectorum</i>	1	–	2	–	2
cheatgrass	2	–	2	–	16
	3	–	–	–	–
	4	–	–	–	–
<i>Centaurea melitensis</i>	1	–	–	–	–
Malta starthistle	2	–	–	4	–
	3	–	–	–	–
	4	–	–	–	–
<i>Cynodon dactylon</i>	1	–	–	–	–
Bermudagrass	2	2	20	1	2
	3	8	–	1	–
	4	–	–	–	–
<i>Cyperus esculentus</i>	1	–	–	–	1
yellow nutsedge	2	–	–	–	–
	3	–	–	–	–
	4	–	–	–	–
<i>Eragrostis barrelieri</i>	1	1	–	–	–
Mediterranean lovegrass	2	–	–	1	–
	3	–	–	–	–
	4	–	–	–	–
<i>Galium divaricatum</i>	1	–	1	–	1
Lamarks bedstraw	2	–	–	–	3
	3	–	–	–	–
	4	–	–	–	–
<i>Lolium perenne</i>	1	–	1	–	–
Perennial ryegrass	2	–	–	–	1
	3	–	–	–	–
	4	–	–	–	–
<i>Lonicera japonicus</i>	1	–	–	–	2
Japanese honeysuckle	2	–	–	–	3

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.7-2. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, Lyndon B. Johnson NHP, 2010 vs. 2012 (continued)

Exotic Species	Density code	Distance Class 1		Distance Class 2	
		2010	2012	2010	2012
<i>Lonicera japonicus</i> (cont.)	3	–	–	–	–
	4	–	–	–	–
<i>Marrubium vulgare</i> horehound	1	–	–	–	–
	2	–	–	1	–
	3	–	–	–	–
	4	–	–	–	–
<i>Medicago lupulina</i> black medick clover	1	–	–	–	–
	2	–	23	–	5
	3	–	–	–	–
	4	–	–	–	–
<i>Medicago minima</i> burr medick clover	1	–	1	–	–
	2	–	4	–	1
	3	–	–	–	–
	4	–	–	–	–
<i>Poa pratensis</i> Kentucky bluegrass	1	–	–	–	–
	2	–	2	–	2
	3	–	–	–	–
	4	–	–	–	–
<i>Sorghum halepense</i> Johnsongrass	1	1	2	–	5
	2	2	1	10	20
	3	.	.	3	.
	4	.	.	.	.
<i>Taraxacum officinale</i> dandelion	1	.	1	.	3
	2	.	9	.	.
	3	.	.	.	.
	4	.	.	.	.
<i>Torilis arvensis</i> spreading hedge parsley	1	.	1	.	4
	2	.	1	.	13
	3	.	.	.	.
	4	.	.	.	.

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.8 Pecos NHP

Overall sampling at Pecos occurs on paved and unpaved roads and trails over its full three-year rotation (Figure 3.8-3). In 2012, exotic-plant monitoring occurred at Pecos in mid-July. The vector sampled was the unpaved road from the Trading Post to Forked Lightning Ranch house, and the access road through Pasture 3. One hundred two (102) vector blocks were monitored, for a total of 2.6 linear kilometer sampled on both sides (Figure 3.8-1). In addition, eight (8) permanent transects within the landscape were sampled for a total of 40 2 x 1 meter plots. Twenty-five species of exotics were detected with primary and secondary monitoring. No exotics were detected in 26 vector blocks.

Prickly Russian thistle (*Salsola tragus*) was detected in 58% of the primary vector blocks in 2012 and four secondary transect. 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.

Western salsify (*Tragopogon dubius*) was very evident this year, occurring in 27% of the primary vector blocks and five secondary transects. This annual produces flowers and seedheads very reminiscent of dandelion, except noticeably larger. These winged seeds are efficient dispersers and this species appears to be increasing at PECO.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in late August. This change in monitoring time should not affect species detection. The vector monitored in 2012 was the same as that done in 2009, with the addition of the Pasture 3 access road.

Table 3.8-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for

each year may be different, the percentage of vector blocks should be comparable. A new Table 3.8-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New vector blocks monitored in 2012 are notated separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table M-1 in Appendix M contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

The long-term habitation of the PECO area has permanently shaped the plant communities. Wind is a major factor in erosion and aids the dispersal of seeds throughout the landscape, including those of exotic species. The presence of both the Pecos River and Glorieta Creek provide continuous introduction of exotic propagules from upstream infestations. The current drought affecting the area may provide additional openings in the landscape for the establishment of additional exotics in areas of sparse vegetation.



DAVE POWELL, USDA FOREST SERVICE, BUGWOOD.ORG

Western salsify (*Tragopogon dubius*) was one of the most commonly found exotic species in 2012 at Pecos NHP.

Pecos NHP Exotics Sampling Panel 1 - 7/17 - 7/18/2012

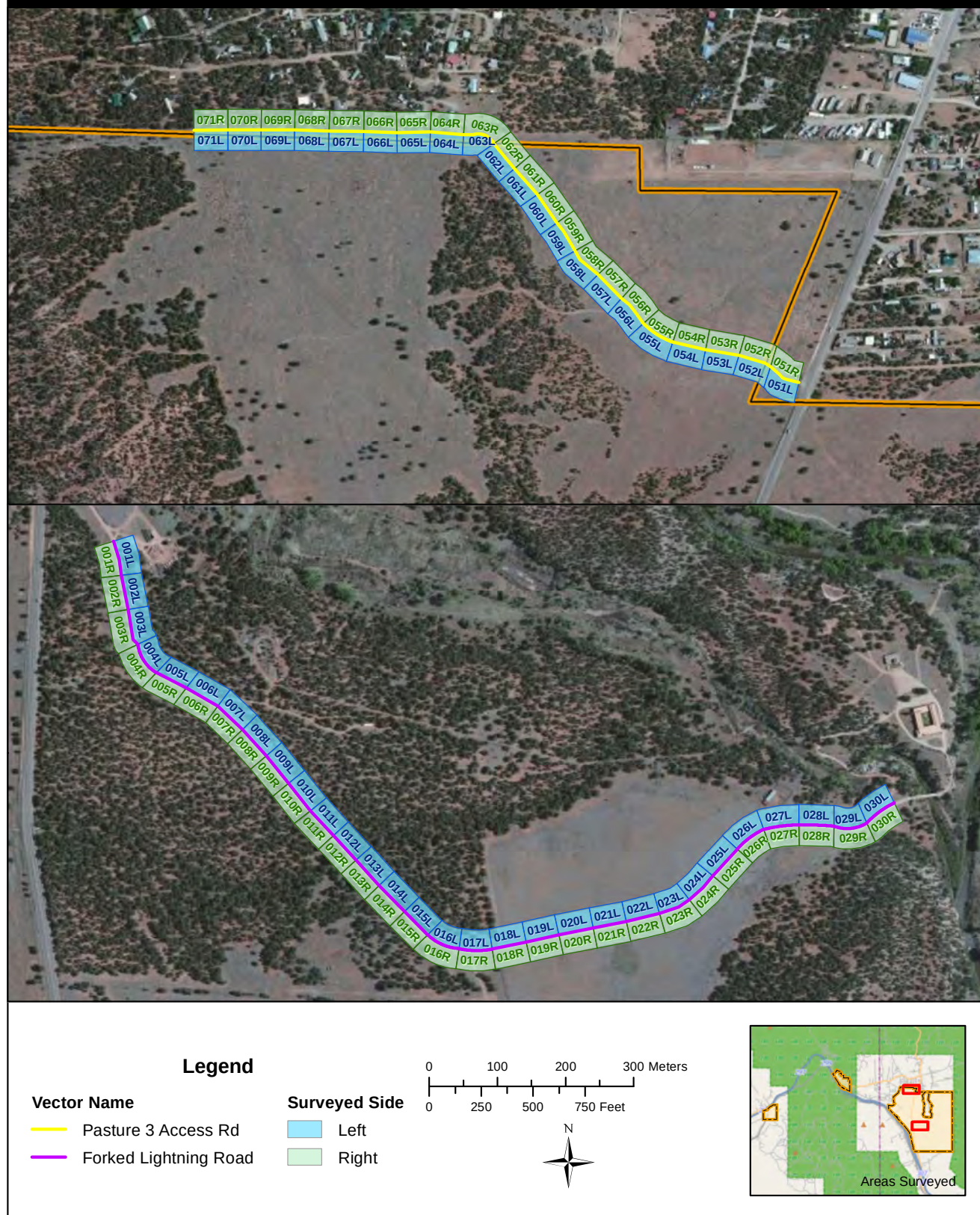


Figure 3.8-1. Individual vector blocks sampled, Panel 1, Pecos NHP, 2012.

Pecos NHP - Secondary Exotics 2012

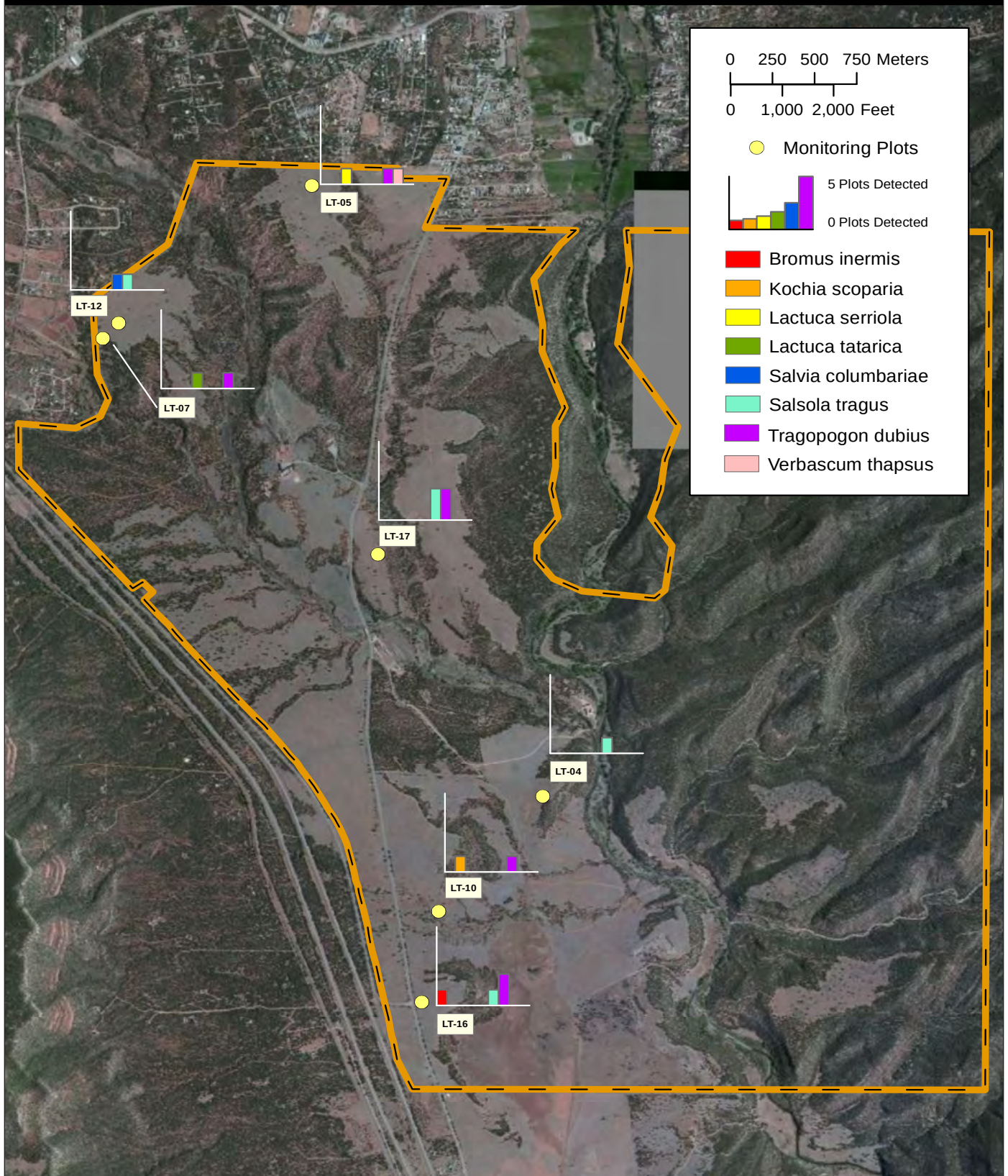


Figure 3.8-2. Secondary sample locations, Pecos NHP, 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Pecos NHP Exotic Monitoring Blocks

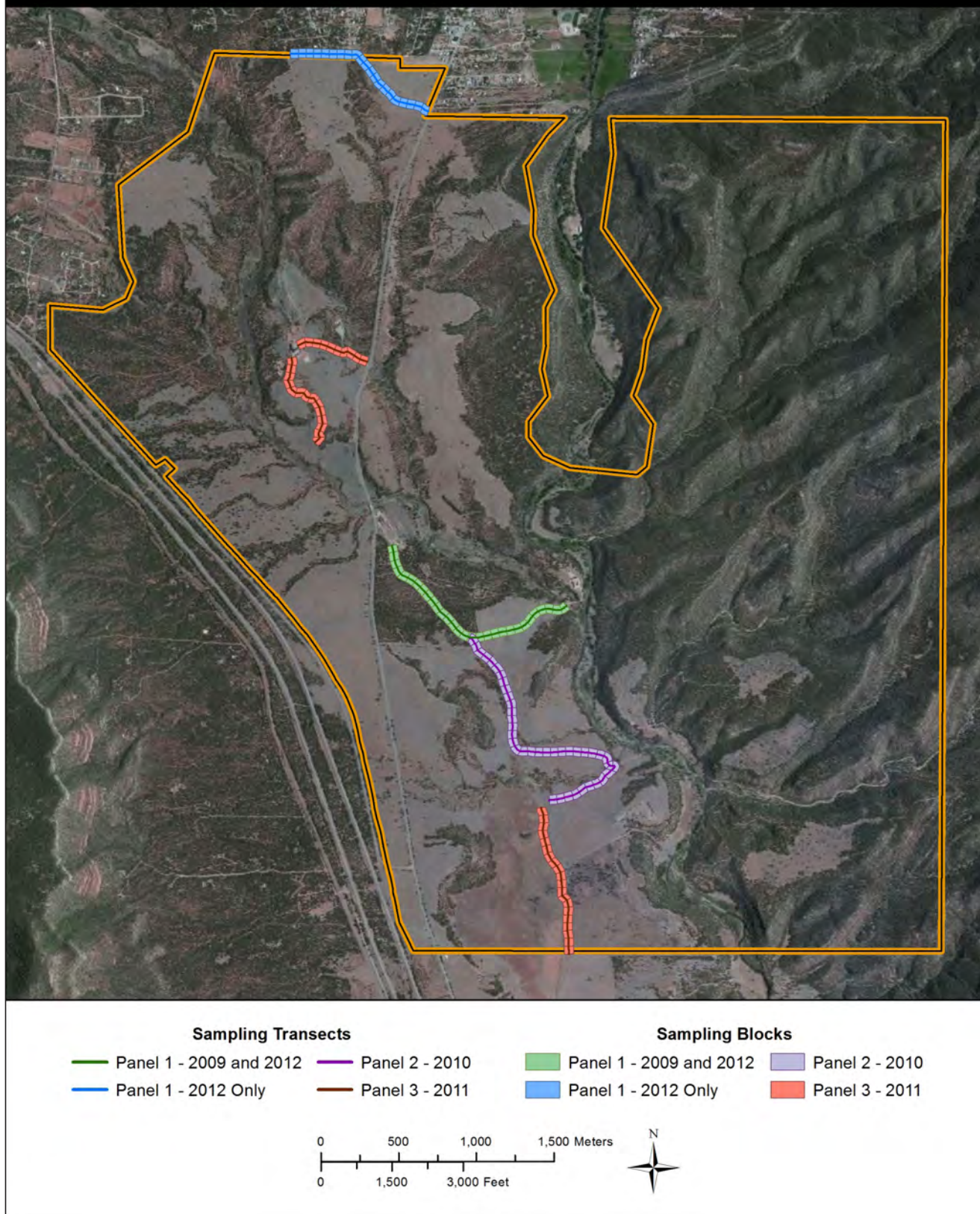


Figure 3.8-3. Overall planned sampling scheme for panels (annual samples) at Pecos NHP for a full three-year rotation.

Table 3.8-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, PECO, 2009 vs. 2012

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=60)		Primary vector blocks (N=102)		Secondary transects (N=0)		Secondary transects (N=8)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Agropyron desertorum</i>	desert wheatgrass	4	6.7	–	–	–	–	–	–
<i>Brassica sp.</i>	mustard species	5	8.3	–	–	–	–	–	–
<i>Bromus arvensis</i>	field brome	–	–	23	22.5	–	–	–	–
<i>Bromus inermis</i>	smooth brome	4	6.7	9	8.8	–	–	1	12.50
<i>Bromus japonicus</i>	Japanese brome	–	–	1	1.0	–	–	–	–
<i>Bromus sp.</i>	brome species	11	18.3	–	–	–	–	–	–
<i>Bromus tectorum</i>	cheatgrass	–	–	8	7.8	–	–	–	–
<i>Chenopodium album</i>	common lambsquarters	14	23.3	15	14.7	–	–	–	–
<i>Cirsium vulgare</i>	bull thistle	2	3.3	–	–	–	–	–	–
<i>Convolvulus arvensis</i>	field bindweed	11	18.3	6	5.9	–	–	–	–
<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	15	25.0	–	–	–	–	–	–
<i>Erodium cicutarium</i>	redstem stork's bill	1	1.7	5	4.9	–	–	–	–
<i>Euphorbia davidii</i>	toothed spurge	15	25.0	–	–	–	–	–	–
<i>Kochia scoparia</i>	kochia	39	65.0	17	16.7	–	–	1	12.50
<i>Lactuca serriola</i>	prickly lettuce	6	10.0	20	19.6	–	–	1	12.50
<i>Lactuca tatarica</i>	blue lettuce	–	–	3	2.9	–	–	1	12.50
<i>Melilotus alba</i>	white sweetclover	4	6.7	5	4.9	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	17	28.3	11	10.8	–	–	–	–
<i>No Exotics</i>	No Exotics	6	10.0	26	25.5	–	–	–	–
<i>Onopordum acanthium</i>	scotch thistle	–	–	5	4.9	–	–	–	–
<i>Polygonum aviculare</i>	prostrate knotweed	–	–	1	1.0	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	14	23.3	59	57.8	–	–	4	50.00
<i>Tragopogon dubius</i>	western salsify	17	28.3	28	27.5	–	–	5	62.50
<i>Tribulus terrestris</i>	puncturevine	8	13.3	–	–	–	–	–	–
<i>Verbascum thapsus</i>	common mullein	19	31.7	10	9.8	–	–	1	12.50

Table 3.8-2. Number of Vector Blocks and Density of exotic species recorded for PECO in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Agropyron desertorum</i> desert wheatgrass	1	1	–	–	–	–	–
	2	3	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Brassicaceae species</i> mustard species	1	1	–	–	–	–	–
	2	3	–	–	4	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus arvensis</i> field brome	1	–	4	1	–	–	–
	2	–	16	1	–	6	2
	3	–	1	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus inermis</i> smooth brome	1	2	4	–	–	1	–
	2	2	3	–	1	3	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus japonicus</i> Japanese brome	1	–	–	–	–	–	–
	2	–	1	–	–	1	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus species</i> brome species	1	1	–	–	–	–	–
	2	8	–	–	3	–	–
	3	1	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus tectorum</i> cheatgrass	1	–	4	–	–	–	–
	2	–	4	–	–	1	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Chenopodium album</i> common lambsquarters	1	4	10	1	3	2	1
	2	5	–	–	5	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Cirsium vulgare</i> bull thistle	1	1	–	–	1	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Convolvulus arvensis</i> field bindweed	1	2	1	–	–	2	–
	2	7	3	–	6	–	–
	3	2	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Eragrostis barrelieri</i> Mediterranean lovegrass	1	6	–	–	–	–	–
	2	7	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.8-2. Number of Vector Blocks and Density of exotic species recorded for PECO in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Eragrostis barrelieri</i> (cont.)	3	2	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Erodium cicutarium</i> red storks-bill	1	–	2	2	–	–	–
	2	1	–	1	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Euphorbia davidii</i> David's spurge	1	7	–	–	1	–	–
	2	6	–	–	–	–	–
	3	1	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i> kochia	1	5	2	3	3	1	1
	2	13	8	2	20	8	2
	3	18	–	–	2	–	–
	4	–	–	–	–	–	–
<i>Lactuca serriola</i> prickly lettuce	1	5	6	4	1	4	3
	2	–	1	1	–	1	3
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Lactuca tatarica</i> blue lettuce	1	–	3	–	–	1	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus alba</i> white sweetclover	1	2	–	3	1	2	–
	2	1	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus officinalis</i> yellow sweetclover	1	6	1	8	–	1	3
	2	11	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Onopordum acanthium</i> Scotch thistle	1	–	1	–	–	–	2
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Polygonum aviculare</i> yard knotweed	1	–	1	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	7	13	7	–	6	3
	2	7	24	11	2	14	16
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.8-2. Number of Vector Blocks and Density of exotic species recorded for PECO in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Tragopogon dubius</i>	1	12	9	10	5	6	7
western salsify	2	1	3	3	–	1	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tribulus terrestris</i>	1	6	–	–	–	–	–
puncturevine	2	2	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Verbascum thapsus</i>	1	5	–	–	4	4	–
mullien	2	2	–	–	9	–	5
	3	–	–	–	–	–	1
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.9 Sand Creek Massacre NHS

Overall sampling at Sand Creek Massacre occurs on unpaved roads over its full three-year rotation (Figure 3.9-3). In 2012, exotic-plant monitoring occurred at Sand Creek Massacre in late June. The vectors sampled were the unpaved entrance road, monument road and maintenance road leading into the interior, as well as the eastern boundary from the County Road north. A total of 86 vector blocks were monitored, for a total of 2.15 linear kilometers sampled on both sides of the roads and one side of the boundary (Figure 3.9-1). In addition, 12 permanent transects within the landscape were sampled for a total of 60 2 x 1 meter plots. Nineteen (19) species of exotics were detected with primary and secondary monitoring. No exotics were observed in seven vector blocks.

Prickly Russian thistle (*Salsola tragus*) was the most commonly detected species in 87% of the primary vector blocks and 75% 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.

A similar species, kochia (*Kochia scoparia*) was found in 36% of the primary vector blocks and 83% of the 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 successional 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.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in late July. This change in monitoring time may have affected detection of stinkgrass (*Eragrostis cilianensis*), Kentucky bluegrass (*Poa pratensis*) and green bristlrgrass (*Setaria viridis*). The vector monitored in 2012 was the same as that done in 2009, with the addition of the south-eastern boundary.

Table 3.9-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.9-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New vector blocks monitored in 2012 are notated separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters in from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table N-1 in Appendix N contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

Past land use at SAND has impacted the current plant communities and possibly introduced many of the exotics found today. Wind efficiently spreads the seed of many of the worst exotics at SAND. Fire suppression and lack of grazing may result in diminished resilience of the shortgrass prairie to exclude exotic establishment. The presence of CRP land in and around the park, as well as the constant disturbance of prairie dog towns, provide propagule pools for re-infestation of treated areas.



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Prickly Russian thistle (*Salsola tragus*) was the most commonly found exotic species in 2012 at Sand Creek Massacre NHS.

Sand Creek Massacre NHS Exotics Sampling Panel 1 - 6/25 - 6/27/2012

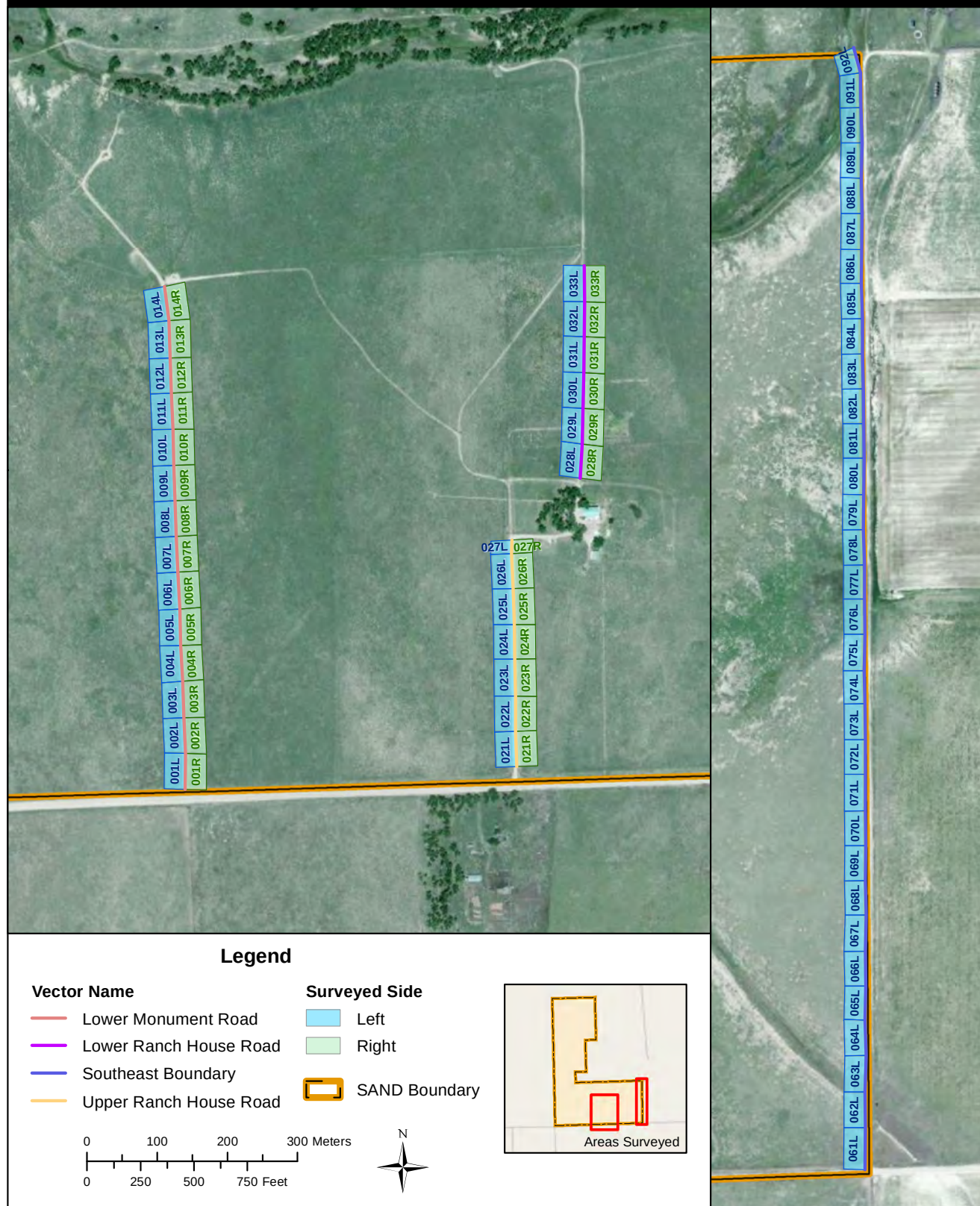


Figure 3.9-1. Individual vector blocks sampled, Panel 1, Sand Creek Massacre NHS, 2012.

Sand Creek Massacre NHS - Secondary Exotics 2009 vs. 2012

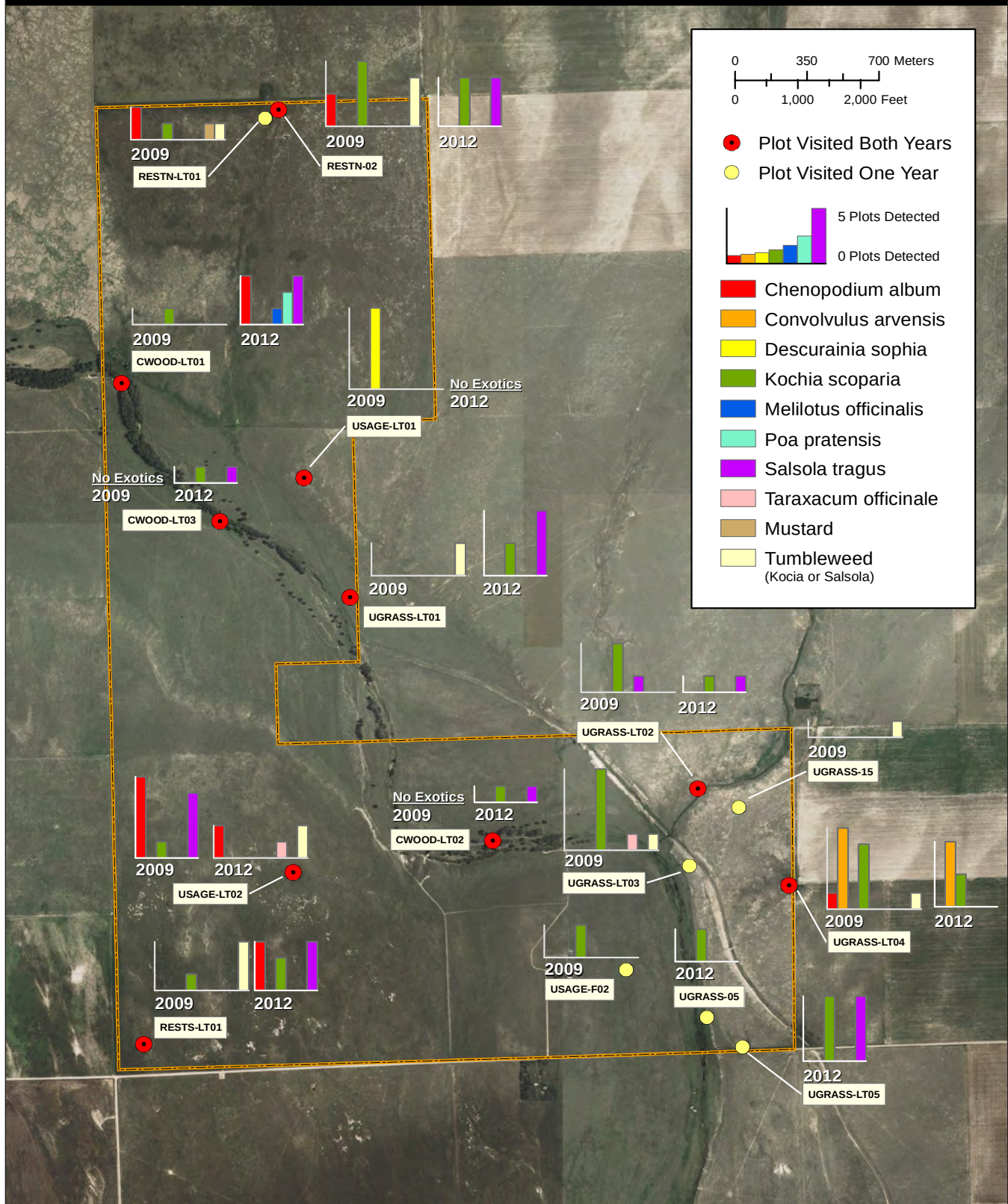
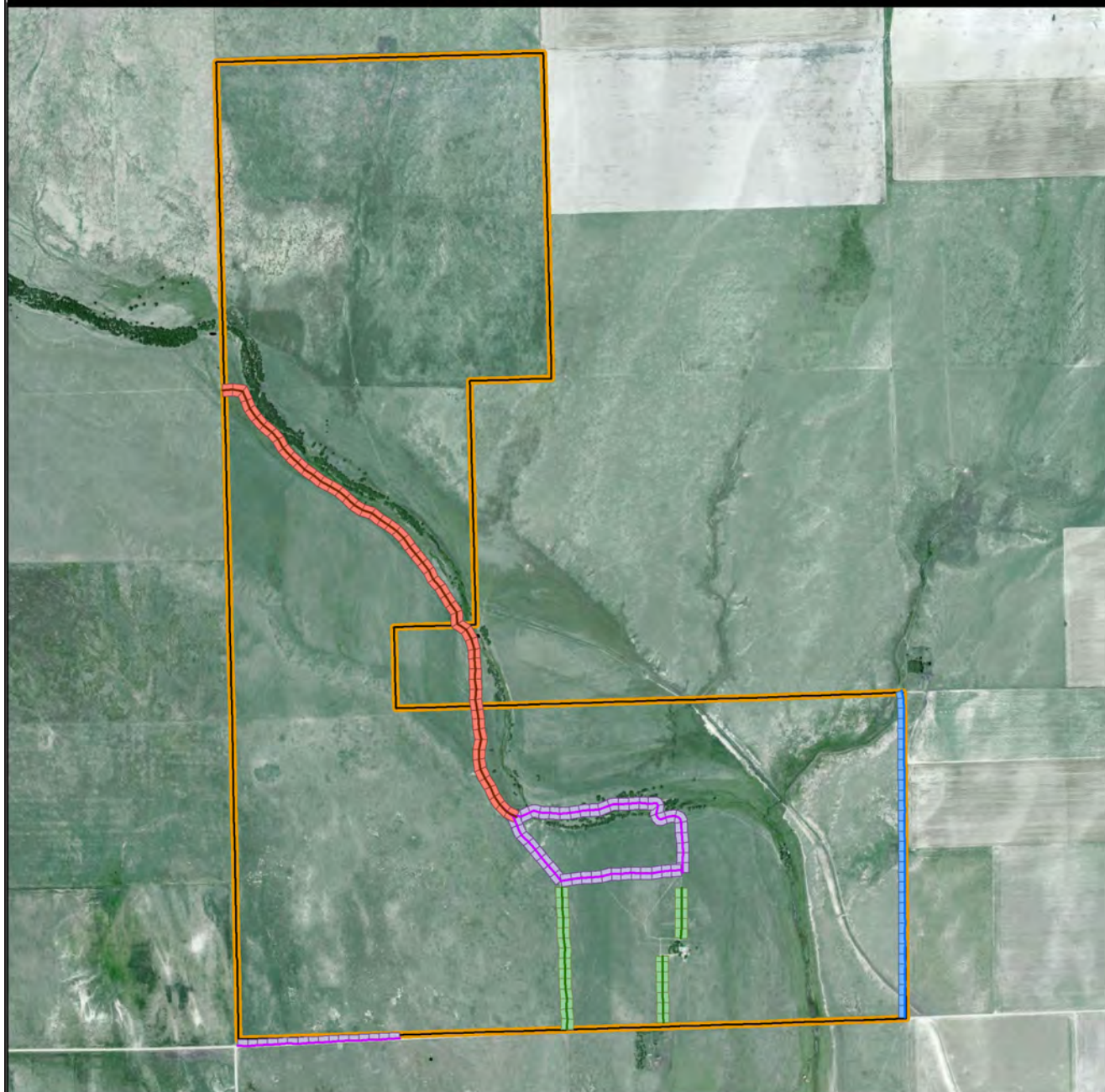


Figure 3.9-2. Secondary sample locations, Sand Creek Massacre NHS, 2009 vs. 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Sand Creek Massacre NHS Exotic Monitoring Blocks



Sampling Transects		Sampling Blocks	
— Panel 1 - 2009 and 2012	— Panel 2 - 2010	— Panel 1 - 2009 and 2012	— Panel 2 - 2010
— Panel 1 - 2012 Only	— Panel 3 - 2011	— Panel 1 - 2012 Only	— Panel 3 - 2011

0 500 1,000 Meters
0 1,500 3,000 Feet



Figure 3.9-3. Overall planned sampling scheme for panels (annual samples) at Sand Creek Massacre NHS for a full three-year rotation.

Table 3.9-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, Sand Creek Massacre NHS, 2009 vs. 2012

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=62)		Primary vector blocks (N=82)		Secondary transects (N=14)		Secondary transects (N=12)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Amaranthus blitoides</i>	postrate pigweed	–	–	1	1.2	–	–	–	–
<i>Brassicaceae sp.</i>	mustard species	–	–	–	–	1	7.7	–	–
<i>Bromus arvensis</i>	field brome	2	3.8	–	–	–	–	–	–
<i>Bromus tectorum</i>	cheatgrass	1	1.9	1	1.2	–	–	–	–
<i>Buglossoides arvensis</i>	corn gromwell	8	15.4	–	–	–	–	–	–
<i>Chenopodium album</i>	common lambsquarters	34	65.4	11	12.8	6	46.2	3	25.0
<i>Cirsium arvense</i>	Canada thistle	–	–	–	–	1	7.7	–	–
<i>Convolvulus arvensis</i>	field bindweed	–	–	3	3.5	2	15.4	1	8.3
<i>Descurainia sophia</i>	flixweed	–	–	–	–	1	7.7	–	–
<i>Eragrostis cilianensis</i>	stinkgrass	–	–	2	2.3	–	–	–	–
<i>Kochia scoparia</i>	kochia	6	11.5	31	36.0	11	84.6	10	83.3
<i>Melilotus alba</i>	white sweetclover	–	–	1	1.2	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	–	–	6	7.0	1	7.7	1	8.3
<i>No exotics</i>	no exotics found	–	–	7	8.1	–	–	–	–
<i>Poa pratensis</i>	Kentucky bluegrass	1	1.9	–	–	–	–	1	8.3
<i>Salsola tragus</i>	prickly Russian thistle	50	96.2	75	87.2	13	100.0	9	75.0
<i>Setaria viridis</i>	green bristlegrass	8	15.4	–	–	–	–	–	–
<i>Taraxacum officinalis</i>	common dandelion	–	–	–	–	2	15.4	–	–
<i>Tragopogon dubius</i>	western salsify	10	19.2	–	–	–	–	–	–

Table 3.9-2. Number of Vector Blocks and Density of exotic species recorded for SAND in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Amaranthus blitoides</i> prostrate pigweed	1	–	1	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus arvensis</i> field brome	1	2	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus tectorum</i> cheatgrass	1	–	1	–	1	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Buglossoides arvensis</i> corn gromwell	1	4	–	–	5	–	–
	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.9-2. Number of Vector Blocks and Density of exotic species recorded for SAND in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Chenopodium album</i> common lambsquarters	1	–	2	–	19	6	–
	2	5	1	–	14	4	–
	3	1	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Convolvulus arvensis</i> field bindweed	1	–	–	–	–	–	–
	2	–	–	3	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Eragrostis ciliensis</i> stinkgrass	1	–	1	–	–	–	–
	2	–	1	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i> kochia	1	1	4	3	1	2	9
	2	2	1	12	2	4	10
	3	–	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Melilotus alba</i> white sweetclover	1	–	–	–	–	1	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus officinalis</i> yellow sweetclover	1	–	–	3	–	–	5
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Poa pratensis</i> Kentucky bluegrass	1	1	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	8	10	1	10	3	3
	2	35	32	28	24	44	20
	3	6	–	–	8	–	–
	4	–	–	–	–	–	–
<i>Setaria viridis</i> green bristlegrass	1	2	–	–	–	–	–
	2	6	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tragopogon dubius</i> western salsify	1	1	–	–	7	–	–
	2	–	–	–	2	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

3.10 Washita Battlefield NHS

Overall sampling at Washita Battlefield includes both unpaved roads and trails over its full three-year rotation (Figure 3.10-3). In 2012, exotic plant monitoring occurred at Washita Battlefield in early June. The vectors sampled were the unpaved north and south Loop trails.. Eighty-two (82) vector blocks were monitored, for a total of just over 2 linear kilometers sampled on both sides (Figure 3.10-1). In addition, eleven (11) permanent transects within the landscape were sampled for a total of 55 2 x 1 meter plots. Twenty-nine (29) species of exotics were detected with primary and secondary monitoring. Exotics were detected in all vector blocks.

The grasslands at WABA exploded with exotics (primarily cheatgrass and Japanese brome) in 2012 in response to extreme and continuing drought over the past two years. This response was not limited to the parkland but occurred throughout the region. Various treatments are being implemented to control future impacts from these exotics.

Cheatgrass (*Bromus tectorum*) was the most frequently detected exotic in 2012, appearing in 100% of the primary vector blocks and one secondary transect. A closely related species, Japanese brome (*Bromus japonicas*), was not listed in any primary blocks but was detected in 91% of the secondary transects. Both species were dead at the time of monitoring, which may explain the difference in detection. These two species occupy the same niche and behave in the same way, so species identification is not critical. These cool-season annuals produce dense stands and abundant seed and have the capacity to alter native plant communities through displacement of natives and changes in fire regime.

Siberian elm (*Ulmus pumila*) was found in 34% of the primary vector blocks and 64% of the secondary transects. This is a fast-growing tree tolerant of a wide range of conditions and soil types. It efficiently competes for resources, produces abundant seed and has the capacity to greatly alter the native plant and animal communities. Siberian elm has

been long planted in surrounding areas as a shelter-belt tree.

Johnsongrass (*Sorghum halepense*) was observed in 41% of the 2012 primary vector blocks and 36% 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.

This is the first year of repeat monitoring, allowing us to compare current data with that from 2009. Monitoring in 2009 was conducted in late June. This change in monitoring time should not have affected detection of exotics. The vector monitored in 2012 was the same as that done in 2009, with the addition of the vector blocks to close the loop.

Table 3.10-1 contains all exotic species detected during primary monitoring in 2009 and 2012. While the total number of vector blocks for each year may be different, the percentage of vector blocks should be comparable. A new Table 3.10-2 is presented this year to compare the frequency of various densities of exotic species in 2009 vs. 2012. In this table we compare the 2009 vector blocks directly to the same vector blocks in 2012. New vector blocks monitored in 2012 are notated separately. We look at the two most accurate Distance Classes (1 and 2). Distance Class 1 is the area between the side of the vector and the transect and has a variable width. The transect placement is either along the inside line of an obvious mow strip or at 2 meters from the edge of the vector. Distance Class 2 is the area from the transect to 10 meters into the landscape.

Table J-1 in Appendix J contains all exotic species detected in each block during primary monitoring in 2009 and 2012 and the respective densities in each distance classes. This allows for direct comparison of data to determine species response to both environmental and anthropogenic factors.

Cheatgrass (*Bromus tectorum*) was the most commonly found exotic species in 2012 at Washita Battlefield NHS.



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The majority of the land at WABA is reclaimed agricultural field that still contains terracing and the scars of a one-time homestead. The hydrological regime is further altered by an abandoned railroad grade that effectively divides the uplands from the bottomlands across the park. These long-term disturbances provide ample microhabitats for the establishment and proliferation of exotic species. The surrounding agricultural lands and shelterbelts provide propagule sources for continuous re-infestation of park lands. The presence of the Washita River enables additional propagules to enter the park from up-stream populations of exotics and the altered flow, due to agricultural draw-downs and impoundments provide ideal conditions for exotic establishment.

Washita Battlefield NHS Exotics Sampling

Panel 1 - 6/2 - 6/3/2012

Legend

Vector Name	Surveyed Side
North Loop Trail	Left
South Loop Trail	Right
WABA Boundary	

0 100 200 Meters
0 250 500 Feet

Areas Surveyed

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Washita Battlefield NHS - Secondary Exotics 2009 vs. 2012

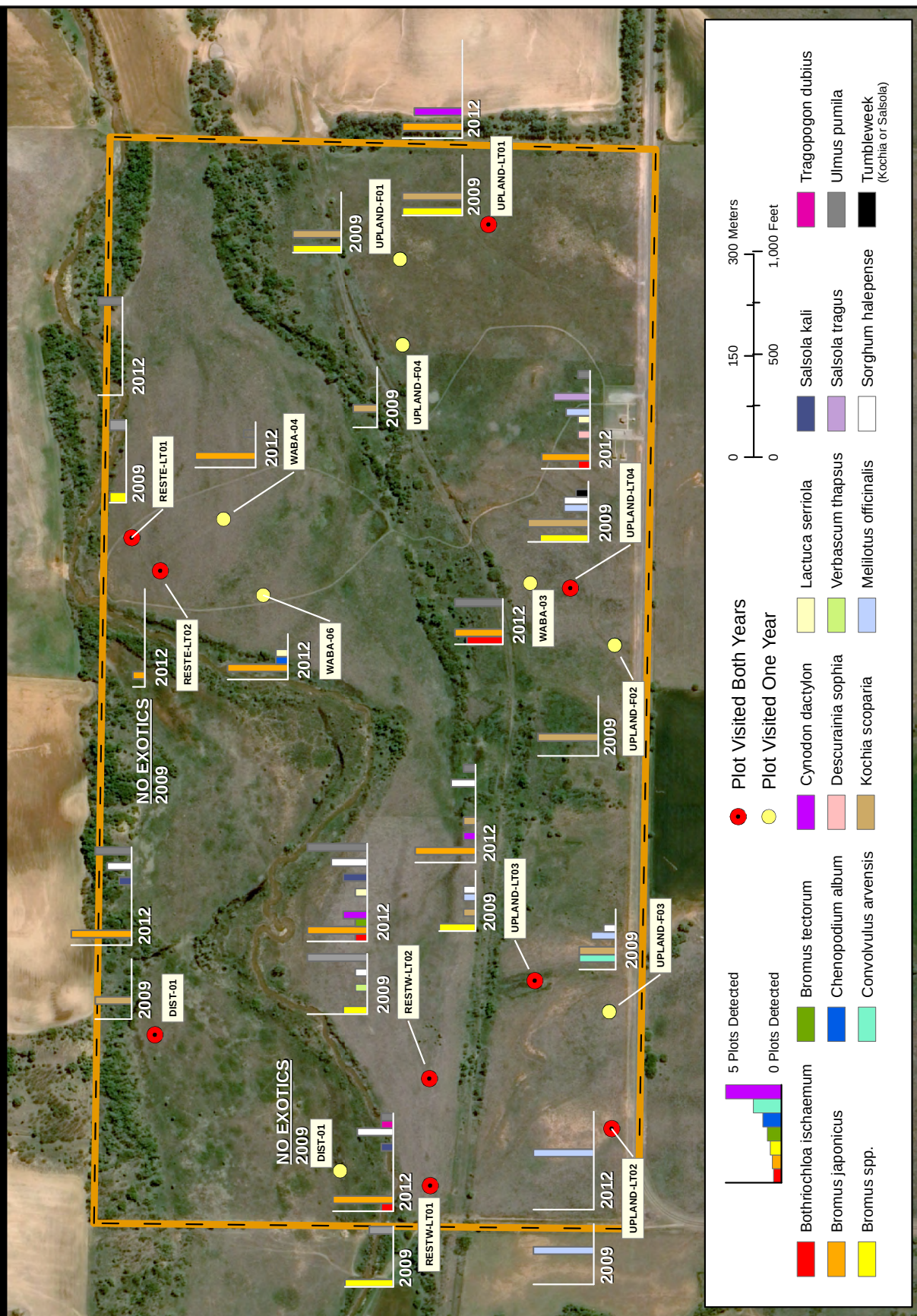


Figure 3.10-2. Secondary sample locations, Washita Battlefield NHS, 2009 vs. 2012. Map also shows the invasive species detected, and the number of individual plots (out of five) for each transect where they were detected.

Washita NHS Battlefield Exotic Monitoring Blocks

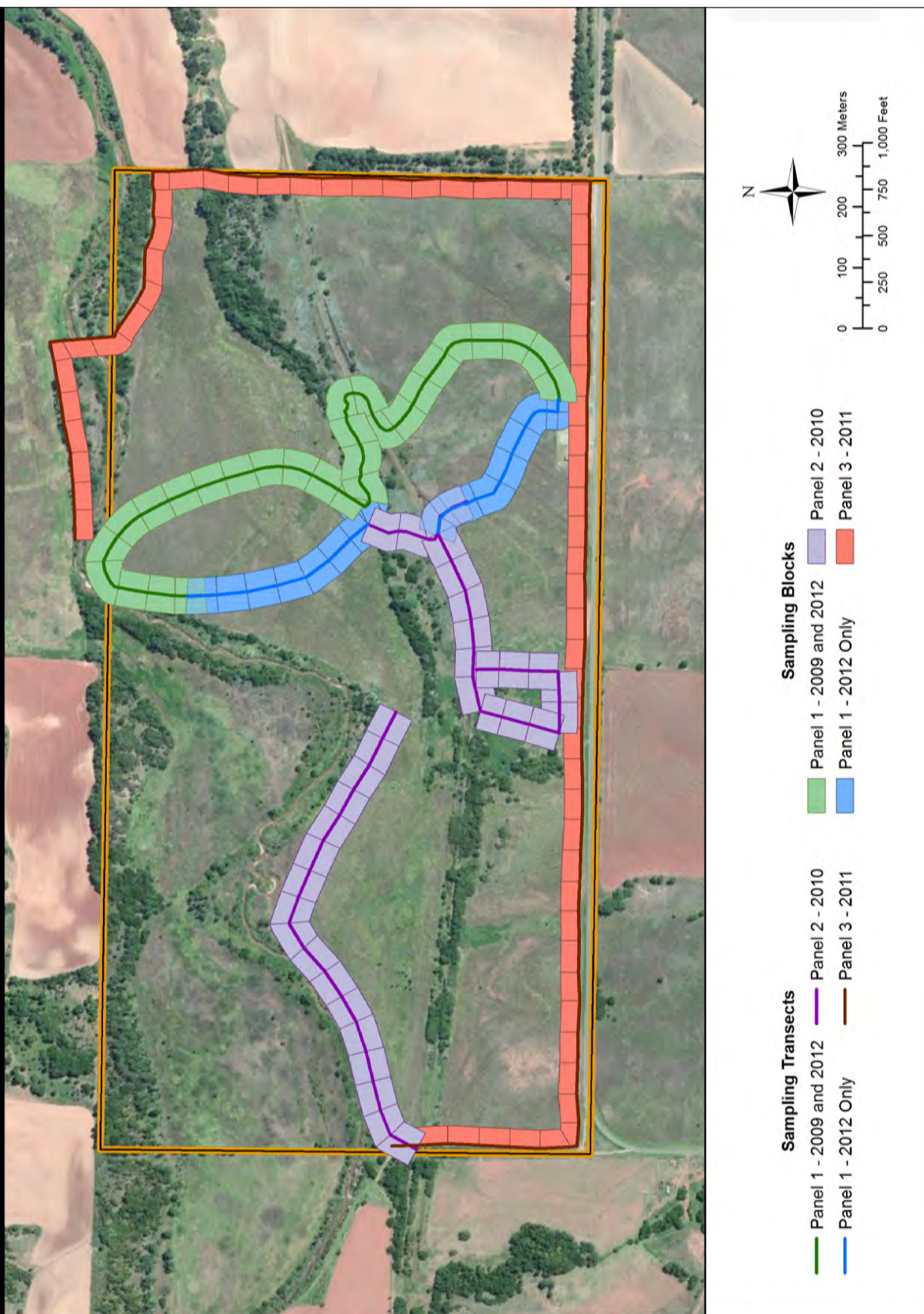


Figure 3.10-3. Overall planned sampling scheme for panels (annual samples) at Washita Battlefield NHS for a full three-year rotation.

Table 3.10-1. Number and percentage of primary and secondary sample units where each species was detected during Panel 1 rotation, Washita Battlefield NHS, 2009 vs. 2012

Scientific name	Common name	2009		2012		2009		2012	
		Primary vector blocks (N=56)		Primary vector blocks (N=82)		Secondary transects (N=13)		Secondary transects (N=11)	
		Total	% blocks	Total	% blocks	Total	% of transects	Total	% of transects
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	6	10.7	17	20.7	–	–	4	36.4
<i>Bromus catharticus</i>	rescuegrass	46	82.1	12	14.6	–	–	–	–
<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	6	46.2	10	90.9
<i>Bromus tectorum</i>	cheatgrass	–	–	84	102.4	–	–	1	9.1
<i>Chenopodium album</i>	common lambsquarters	–	–	2	2.4	–	–	1	9.1
<i>Cirsium arvense</i>	canada thistle	1	1.8	–	–	–	–	–	–
<i>Convolvulus arvensis</i>	field bindweed	1	1.8	–	–	1	7.7	–	–
<i>Cynodon dactylon</i>	Bermudagrass	–	–	29	35.4	–	–	3	27.3
<i>Descurainia sophia</i>	flixweed	–	–	–	–	–	–	1	9.1
<i>Erodium cicutarium</i>	redstem stork's bill	–	–	5	6.1	–	–	–	–
<i>Euphorbia dentata</i>	toothed spurge	1	1.8	–	–	–	–	–	–
<i>Kochia scoparia</i>	kochia	7	12.5	16	19.5	8	61.5	1	9.1
<i>Lactuca serriola</i>	prickly lettuce	–	–	22	26.8	–	–	3	27.3
<i>Lamium amplexicaule</i>	henbit	–	–	1	1.2	–	–	–	–
<i>Medicago lupulina</i>	black medick clover	–	–	1	1.2	–	–	–	–
<i>Medicago minima</i>	burr medick clover	–	–	11	13.4	–	–	–	–
<i>Melilotus alba</i>	white sweetclover	9	16.1	1	1.2	1	7.7	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	1	1.8	6	7.3	4	30.8	2	18.2
<i>No Exotics</i>	No Exotics	8	14.3	–	–	–	–	–	–
<i>Panicum coloratum</i>	Klein grass	3	5.4	–	–	–	–	–	–
<i>Rumex patientia</i>	patience dock	3	5.4	6	7.3	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	5	8.9	2	2.4	1	7.7	4	36.4
<i>Sonchus asper</i>	spiny sowthistle	23	41.1	–	–	–	–	–	–
<i>Sorghum halepense</i>	Johnsongrass	28	50.0	34	41.5	4	30.8	4	36.4
<i>Tamarix ramosissima</i>	saltcedar	1	1.8	–	–	–	–	–	–
<i>Taraxacum officinale</i>	common dandelion	–	–	2	2.4	–	–	–	–
<i>Tragopogon dubius</i>	western salsify	24	42.9	33	40.2	–	–	2	18.2
<i>Tribulus terrestris</i>	puncturevine	–	–	3	3.7	–	–	–	–
<i>Ulmus pumila</i>	Siberian elm	10	17.9	28	34.1	3	23.1	7	63.6

Table 3.10-2. Number of Vector Blocks and Density of exotic species recorded for WABA in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009.

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Bothriochloa ischaemum</i> King Ranch bluestem	1	2	1	2	1	–	–
	2	3	11	3	2	1	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Bromus catharticus</i> rescuegrass	1	2	2	–	–	–	–
	2	9	4	6	14	–	1
	3	19	–	–	31	–	–
	4	–	–	–	–	–	–
<i>Bromus tectorum</i> cheatgrass	1	–	1	1	–	–	–
	2	–	42	21	–	42	23
	3	–	–	–	–	14	5
	4	–	–	–	–	–	–
<i>Chenopodium album</i> common lambsquarters	1	–	2	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Cirsium arvense</i> Canada thistle	1	1	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Convolvulus arvensis</i> field bindweed	1	1	–	–	1	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Cynodon dactylon</i> Bermudagrass	1	–	–	–	–	–	–
	2	–	19	8	–	1	–
	3	–	2	–	–	–	–
	4	–	–	–	–	–	–
<i>Erodium cicutarium</i> red-stem storksbill	1	–	2	–	–	–	–
	2	–	–	3	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Euphorbia dentata</i> toothed spurge	1	1	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Kochia scoparia</i> kochia	1	–	1	–	–	2	–
	2	4	11	3	5	3	1
	3	2	–	–	1	–	–
	4	–	–	–	–	–	–
<i>Lactuca serriola</i> prickly lettuce	1	–	4	4	–	5	1
	2	–	1	5	–	2	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.10-2. Number of Vector Blocks and Density of exotic species recorded for WABA in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Lactuca serriola</i> (cont.)	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Lamium amplexicaule</i> henbit	1	–	–	–	–	–	–
	2	–	1	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Medicago lupulina</i> black medick clover	1	–	–	–	–	–	–
	2	–	–	1	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Medicago minima</i> burr medick clover	1	–	–	1	–	–	–
	2	–	4	6	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus alba</i> white sweetclover	1	7	1	–	–	1	–
	2	2	–	–	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Melilotus officinalis</i> yellow sweetclover	1	–	1	2	1	–	1
	2	–	–	3	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Panicum coloratum</i> Kleingrass	1	1	–	–	–	–	–
	2	–	–	–	2	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Rumex patiens</i> patient dock	1	–	1	–	1	–	1
	2	–	–	–	2	1	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Salsola tragus</i> prickly Russian thistle	1	1	–	2	4	–	–
	2	1	–	–	1	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Sonchus asper</i> spiny sowthistle	1	9	–	–	9	–	–
	2	8	–	–	9	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Sorghum halepense</i> Johnsongrass	1	–	1	3	5	5	2
	2	3	–	1	12	7	10
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table 3.10-2. Number of Vector Blocks and Density of exotic species recorded for WABA in Distance Classes 1 and 2 for Panel 1 (2009 vs. 2012). New 2012 are vector blocks added in 2012 that were not sampled in 2009. (continued)

Exotic Species	Density code	Distance Class 1			Distance Class 2		
		2009	Same 2012	New 2012	2009	Same 2012	New 2012
<i>Taraxacum officinale</i> dandelion	1	–	–	1	–	–	–
	2	–	–	1	–	–	1
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tragopogon dubius</i> western salsify	1	9	9	2	14	9	8
	2	4	–	–	6	7	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Tribulus terrestris</i> puncturevine	1	–	–	1	–	–	–
	2	–	1	1	–	–	–
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–
<i>Ulmus pumila</i> Siberian elm	1	–	–	–	7	7	4
	2	–	–	–	3	8	6
	3	–	–	–	–	–	–
	4	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Chapter 4: Discussion

Our monitoring objectives indicate that all SOPN parks will be stratified into high- and low-probability areas for sampling, roughly corresponding to roads, trails, streams, and boundaries (high-probability) and interior areas (low-probability). Exotic species present in the low invasion probability areas have been sampled in conjunction with grassland monitoring. This report encompasses both high- and low-probability invasion areas, although not all low-probability areas were sampled this season.

Specific exotic species differ among the parks as environmental conditions change along the north-south and east-west gradients. While Johnsongrass (*Sorghum halepense*) is a major problem at Chickasaw (easternmost park), it becomes non-existent in the far western reach of the network. Each state produces a noxious weed list, but any particular species may not be considered noxious in all states where it is found. Therefore, a noxious designation is just one of many components to be considered when determining the level of threat posed by a species. Of greater importance is the displacement of native species through the rate of spread and extent of an exotic. Both prickly Russian thistle (*Salsola tragus*) and mullein (*Verbascum thapsus*) are listed as noxious weeds only in Colorado, but they are major invasive components at Capulin Volcano, Fort Union, and Lake Meredith, requiring management consideration.

Each park within the SOPN has its problematic exotic plants, with field bindweed (*Convolvulus arvensis*), Johnsongrass, K.R. bluestem (*Bothriochloa ischaemum*), green bristleglass (*Setaria viridis*), and prickly Russian thistle found in several parks. Both the greatest variety of exotics and the most established populations occur most frequently within and adjacent to the mowstrips along paved vectors.

This is the first year of the second panel rotation; we can now compare current data to data collected in 2009. There are many factors that can influence the response of species composition and density in the data:

1. Exotic species could be naturally increasing/decreasing because environmental factors support/don't support the population. Severe drought has occurred and persisted since these transects were first monitored. Visual observation throughout the network parks over the past two years showed that some exotics, primarily field bindweed and prickly Russian thistle, were green, growing and flowering while native plants were drought dormant.
2. Exotic species could be naturally increasing/decreasing because of anthropogenic factors that support/don't support the population (mowing, disturbance, treatment, etc.). Exotic treatment, performed by the Exotic Plant Management Team (EPMT) and by parks has also occurred at some locations that (hopefully) impacted species presence and density.
3. The presence of annual plants can be cyclic in nature. They may show in small numbers for a couple of years, then have a really big year, followed by almost complete disappearance. Then they start the cycle over again. A longer period of monitoring may bring out these cycles in particular species.
4. Exotic species may have been present but not detected because of observer error or not being at a phenotypic stage that made detection possible.

The SOPN will continue to monitor the introduction, distribution, and spread of exotics in network parks, and develop a system to rapidly communicate results to parks and the appropriate Exotic Plant Management Teams. In return, it will be important for the SOPN to receive information about management activities relative to specific exotic species, which will help inform future monitoring results.

Chapter 5: Literature Cited

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Appendix A: Bent's Old Fort NHS 2012 Field Report and Sampling Results

Transect: Entrance Road

Species Found: BROTEC, CIRARV, CONARV, KOCSCO, LACSER, POPALB, SALTRA, TAROFF, TRADUB, TRITER, TYPANG

Description: The most common species on the entrance road were bindweed (*Convolvulus arvensis*), cheatgrass (*Bromus tectorum*), and kochia (*Kochia scoparia*). A population of white poplar (*Populus alba*) was found near the mature trees near the fence line. The gravel parking lot appeared to be relatively free of exotic species. The Canada thistle (*Cirsium arvense*) was found in two small sections near the waterway.

Transect: Main Maintenance/Oxbow Road

Species Found: ARUDON, BROINE, BROTEC, CIRARV, CONARV, CYNDAC, KOCSCO, LACSER, MELALB, MELOFF, RUMOBT, SALTRA, TAROFF, TRADUB, TYPANG

Description: The most common species on this road, in order of abundance, were bindweed (*Convolvulus arvensis*), kochia (*Kochia scoparia*), Russian thistle (*Salsola tragus*), and cheatgrass (*Bromus tectorum*). The bindweed (*Convolvulus arvensis*) was found mainly near the road while the other three species were found as far as 42 meters from the road. The prickly lettuce (*Lactuca serriola*) appeared to be spreading from the road closer to the riparian area. Giant reed (*Arundo donax*), a species not on the park list, was found in the riparian area behind the fort.

Transect: Path to Fort

Species Found: BROTEC, CIRARV, CONARV, ERACIL, KOCSCO, LACSER, SALTRA, TRITER, TYPANG

Description: The two most abundant species on this path were kochia (*Kochia scoparia*) and Russian thistle (*Salsola tragus*). Stinkgrass (*Eragrostis cilianensis*) was growing close to the trail and was not seen in years past. A small population of Canada thistle (*Cirsium arvense*) was growing near the riparian area close to the intersection with the parking lot.

Transect: West Boundary

Species Found: ARUDON, ASPOFF, BROINE, BROTEC, CHEALB, CIRARV, CONARV, KOCSCO, LACSER, LACTAT, MELALB, RUMCRI, RUMOBT, SALTRA, TAROFF, THIPON, TRADUB, TYPANG

Description: As expected, the most common exotic species found along the west boundary were bindweed (*Convolvulus arvensis*), kochia (*Kochia scoparia*), and Russian thistle (*Salsola tragus*). Most of the prickly lettuce (*Lactuca serriola*) and yellow salsify (*Tragopogon dubius*) was found closer to the railroad tracks after the intersection with the Arkansas River. The private property in this area was abundant with *Thinopyrum ponticum* which is slowly crossing into the park. Although not included in the transect, we noted a few tamarisks sprouting up along the road near the Arkansas River.

Bent's Old Fort NHS Exotics Sampling Panel 1 - 6/29 - 7/2/2012

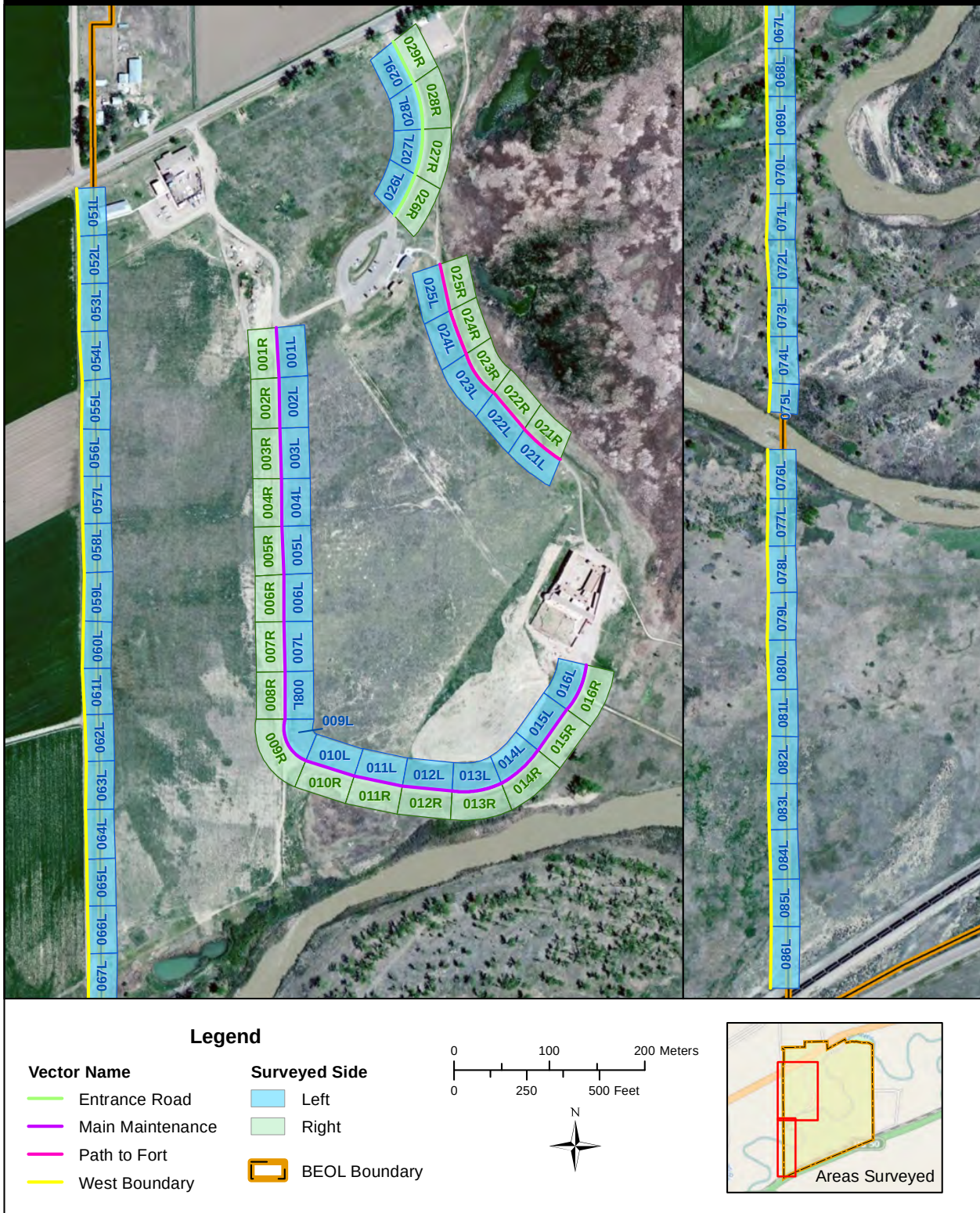


Figure A.1. Individual vector blocks sampled, Panel 1, Bent's Old Fort NHS, 2012.

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Bromus tectorum</i>	cheatgrass	2	–	2	2	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	1	1	–	–	2	1	2	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	2	–	–	–
001R	<i>Bromus tectorum</i>	cheatgrass	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	3	2	–	–
	<i>Kochia scoparia</i>	kochia	3	3	2	–	3	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	–	–	–	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
002L	<i>Bromus arvensis</i>	field brome	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	1	1	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	1	1	–	–	–	1	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
002R	<i>Bromus arvensis</i>	field brome	2	–	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
003L	<i>Bromus arvensis</i>	field brome	1	1	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	–	–	–	–
003R	<i>Bromus arvensis</i>	field brome	2	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	3	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
004L	<i>Bromus arvensis</i>	field brome	1	1	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	0	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	–
004R	<i>Convolvulus arvensis</i>	field bindweed	1	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	3	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
005L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
005R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
005R cont.	<i>Cirsium arvense</i>	Canada thistle	–	–	–	–	2	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	3	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
006L	<i>Bromus arvensis</i>	field brome	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	2	2	1	1
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	1	–
006R	<i>Bromus arvensis</i>	field brome	2	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	–	–	–	1	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	2	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	3	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
007L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	2	–
007R	<i>Bromus arvensis</i>	field brome	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	1	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	3	2	2	1
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	2	1
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
008L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	2	2	1
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	1
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
008R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	0	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
009L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	0	2	2	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	1
009R	<i>Bromus arvensis</i>	field brome	2	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	3	2	2	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
009R (cont.)	<i>Convolvulus arvensis</i>	field bindweed	–	1	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	3	–	3	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
010L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
010R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Cirsium arvense</i>	Canada thistle	–	1	1	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	2	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	4	–	–	–	2	–
011L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	2	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	2
011R	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	–	3	–	–	–	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	–	–	1	–
	<i>Rumex crispus</i>	curly dock	–	2	–	–	–	–	–	–
	<i>Rumex obtusifolius</i>	bluntleaf dock	–	–	–	–	–	–	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	4	–	–	–	–	–
012L	<i>Convolvulus arvensis</i>	field bindweed	2	1	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	1	3	–	2	1	3	3
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	2	2
012R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	X	X	2	2	X	X
	<i>Kochia scoparia</i>	kochia	2	–	X	X	–	1	X	X
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	2	–
	<i>Melilotus alba</i>	white sweetclover	–	1	X	X	–	–	2	X
	<i>Rumex obtusifolius</i>	bluntleaf dock	–	–	–	–	–	–	–	1
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	X	X	2	2	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	X	X	–	1	1	X
013L	<i>Convolvulus arvensis</i>	field bindweed	3	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	–	3	3
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
013R	<i>Bromus arvensis</i>	field brome	2	–	X	X	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	X	X	2	2	–	X
	<i>Kochia scoparia</i>	kochia	3	2	X	X	2	2	–	X
	<i>Lactuca serriola</i>	prickly lettuce	–	1	X	X	1	1	–	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	X
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	X
014L	<i>Convolvulus arvensis</i>	field bindweed	2	3	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	4	4	–	–	–	3	3
	<i>Lactuca serriola</i>	prickly lettuce	2	2	–	–	–	–	–	–
014R	<i>Arundo donax</i>	giant reed	–	–	–	–	–	–	–	3
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Cirsium arvense</i>	Canada thistle	–	–	–	–	2	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	X	2	2	–	–
	<i>Kochia scoparia</i>	kochia	3	2	2	X	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
015L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	4	4	4	–	–	3	3
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
015R	<i>Arundo donax</i>	giant reed	–	–	–	–	–	–	–	2
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	2	X	2	–	–	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
016L	<i>Bromus arvensis</i>	field brome	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	1	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	3	4	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	–	1	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	1	–	–	–
016R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Cirsium arvense</i>	Canada thistle	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	3	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
021L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	–	–	–
	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
021L (cont.)	<i>Kochia scoparia</i>	kochia	2	1	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
021R	<i>Bromus arvensis</i>	field brome	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	2	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	2	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	3	4	–	1	3	4
022L	<i>Bromus arvensis</i>	field brome	–	3	2	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	2	2	–
	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	1	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
022R	<i>Bromus arvensis</i>	field brome	–	3	–	–	–	–	–	–
	<i>Cirsium arvense</i>	Canada thistle	–	2	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	3	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	2	–	–	–	1	2	–
	<i>Lactuca serriola</i>	prickly lettuce	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	2	–	–	2	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	3	4	–	–	3	4
023L	<i>Bromus arvensis</i>	field brome	–	3	3	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	–	–	–
	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
023R	<i>Bromus arvensis</i>	field brome	–	2	–	–	–	–	–	–
	<i>Cirsium arvense</i>	Canada thistle	–	2	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	3	–	–	2	2	–	–
	<i>Euphorbia dentata</i>	toothed spurge	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	2	–	–	1	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	2	–	–	–	–	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	3	4	–	–	3	4
024L	<i>Bromus arvensis</i>	field brome	–	3	3	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	1

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
024L (cont.)	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
024R	<i>Bromus arvensis</i>	field brome	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Cirsium arvense</i>	Canada thistle	–	3	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	3	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	3	–	–	1	1	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	3	4	–	–	3	4
025L	<i>Bromus arvensis</i>	field brome	–	3	3	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
025R	<i>Cirsium arvense</i>	Canada thistle	–	2	–	–	–	–	2	–
	<i>Convolvulus arvensis</i>	field bindweed	2	3	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	3	4	4	–	–	3	4
026L	<i>Bromus arvensis</i>	field brome	–	3	3	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	1	2	2	–	2	2	–	–
	<i>Euphorbia dentata</i>	toothed spurge	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	2	3	3	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
026R	<i>Bromus arvensis</i>	field brome	2	3	X	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Cirsium arvense</i>	Canada thistle	–	1	X	–	–	–	X	2
	<i>Convolvulus arvensis</i>	field bindweed	2	3	X	–	2	2	2	–
	<i>Euphorbia dentata</i>	toothed spurge	–	1	X	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	X	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	1	–	X	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	X	–	–	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	X	3	–	–	X	3
027L	<i>Bromus arvensis</i>	field brome	–	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
027L (cont.)	<i>Convolvulus arvensis</i>	field bindweed	–	3	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	1	2	3	–	1	2	1	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
027R	<i>Bromus arvensis</i>	field brome	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Cirsium arvense</i>	Canada thistle	2	2	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	–	2	2	2	–
	<i>Euphorbia dentata</i>	toothed spurge	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	–	–	2	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	1	–	–	–	–	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	4	4	–	–	–	3
028L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	2	–	–	2	2	1	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–
	<i>Populus alba</i>	white poplar	–	–	–	–	–	–	–	2
028R	<i>Amaranthus retroflexus</i>	redroot pigweed	2	–	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	1	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	4	4	–	–	–	3
029L	<i>Amaranthus retroflexus</i>	redroot pigweed	1	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	2	2	–	2	2	1	–
	<i>Kochia scoparia</i>	kochia	2	3	3	–	2	2	2	2
	<i>Populus alba</i>	white poplar	–	–	–	–	–	–	–	2
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
029R	No Exotics	No Exotics	–	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	1	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	–	–	–	–	–	3
051L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	2	2
052L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
053L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	3	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
054L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
055L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
056L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
057L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	1	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	–	–
058L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
059L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
060L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
061L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
062L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	1	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
063L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
064L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	2	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
065L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
066L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	1
067L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Cirsium arvense</i>	Canada thistle	–	–	–	–	–	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	2	–
	<i>Rumex obtusifolius</i>	bluntleaf dock	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	–	–	–	2	2	–
068L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	1	2	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	1	–	–	–
	<i>Typha angustifolia</i>	narrowleaf cattail	–	–	–	–	2	2	2	2
069L	<i>Asparagus officinalis</i>	garden asparagus	–	–	–	–	–	1	–	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	2	X
	<i>Lactuca tatarica</i>	blue lettuce	–	–	–	–	2	2	–	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	2	X
070L	<i>Asparagus officinalis</i>	garden asparagus	–	–	–	–	1	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	1	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Lactuca tatarica</i>	blue lettuce	–	–	–	–	2	1	–	–
071L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
072L	<i>Arundo donax</i>	giant reed	–	–	–	–	1	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	–	2	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	1	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
073L	<i>Arundo donax</i>	giant reed	–	–	–	–	2	–	–	–
	<i>Asparagus officinalis</i>	garden asparagus	–	–	–	–	1	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	3	3	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
073L (cont.)	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
074L	<i>Asparagus officinalis</i>	garden asparagus	–	–	–	–	–	1	1	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
075L	<i>Asparagus officinalis</i>	garden asparagus	–	–	–	–	1	–	–	X
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	3	2	2	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	X
	<i>Lactuca tatarica</i>	blue lettuce	–	–	–	–	1	–	–	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	X
076L	<i>Cirsium arvense</i>	Canada thistle	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
077L	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	1	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
078L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	–	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
079L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
080L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Thinopyrum ponticum</i>	rush wheatgrass	–	–	–	–	1	1	1	–
081L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	1	–	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Thinopyrum ponticum</i>	rush wheatgrass	–	–	–	–	1	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
082L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	1	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table A-1. Comparison of species and density for each vector block monitored at BEOL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
082L (cont.)	<i>Rumex crispus</i>	curly dock	–	–	–	–	–	–	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Thinopyrum ponticum</i>	rush wheatgrass	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
083L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
084L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	1	–
	<i>Thinopyrum ponticum</i>	rush wheatgrass	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
085L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	–	1	–	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
	<i>Thinopyrum ponticum</i>	rush wheatgrass	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
086L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix B: Capulin Volcano NM 2012 Field Report and Sampling Results

Transect: Boca Trail

Species Found: ACHMIL, BROJAP, BROTEC, CHEALB, MARVUL, SALTRA, TRADUB, TRAPRA, VERTHA

Description: On this short trail, the species found in most abundance was senesced Japanese brome (*Bromus japonicas*). Although yellow salsify (*Tragopogon dubius*) was found throughout the trail it was not found in dense numbers. Most of the horehound (*Marrubium vulgare*) was found on the portion of the trail near the road. The yarrow (*Achillea millefolium*) was also found near the road and it is important to note there are both native and invasive phases of this species and because of hybridization, they are almost impossible to distinguish from one another (<http://www.fs.fed.us/database/feis/plants/forb/achmil/all.html>).

Transect: Water Tank Road

Species Found: BROJAP, MARVUL, SALTRA, TRADUB, VERTHA

Description: The two most common species were Russian thistle (*Salsola tragus*) and Japanese brome (*Bromus japonicas*). Both were found near the road with the Russian thistle increasing in density near the intersection with the main road. The majority of the mullein (*Verbascum thapsus*) was found a good distance from the road on the top of the hill.

Transect: Lava Flow Trail - North

Species Found: ACHMIL, BROINE, BROJAP, CHEALB, CONARV, MARVUL, SALTRA, TRADUB, VERTHA

Description: The most common species found on this trail were Japanese brome (*Bromus japonicas*), mullein (*Verbascum thapsus*), lambsquarters (*Chenopodium album*), and Russian thistle (*Salsola tragus*). The exotic species were densest at the drainage near the trail's intersection with the road. Mullein was found both high and low throughout the trail.

Transect: Lava Flow Trail - West

Species Found: ACHMIL, BROJAP, CHEALB, MARVUL, SALTRA, TRADUB, VERTHA

Description: Apart from yarrow (*Achillea millefolium*) and yellow salsify (*Tragopogon dubius*) most species were found throughout the trail. The horehound (*Marrubium vulgare*) was densest on the south side of the trail growing in patches of shade under the juniper.

Capulin Volcano NM Exotics Sampling Panel 1 - 7/6/2012

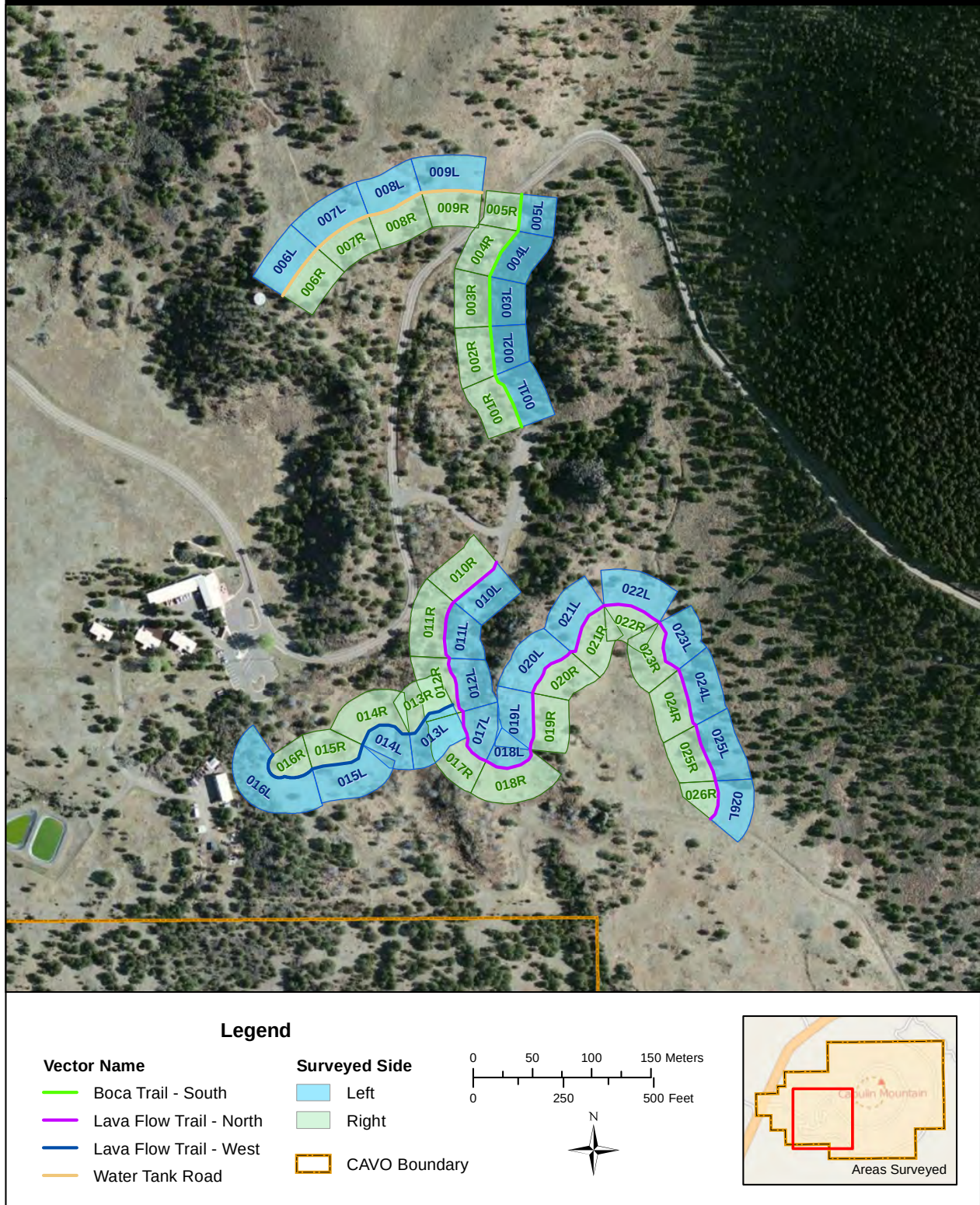


Figure B.1. Individual vector blocks sampled, Panel 1, Capulin Volcano NM, 2012.

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	X	X	X
	<i>Verbascum thapsus</i>	common mullein	1	–	–	–	–	–	–	–
001R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	1	–	–
	<i>Bromus sp.</i>	brome species	2	3	0	0	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	0	0	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
	<i>Verbascum thapsus</i>	common mullein	0	1	2	0	–	–	–	–
002L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	X
	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	1	–	–	–	–	–
	<i>Cynoglossum officinale</i>	houndstongue	1	–	–	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	1	–	–	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	2	3	3	–	1	1	X
002R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	X
	<i>Bromus sp.</i>	brome species	–	2	3	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	X
	<i>Verbascum thapsus</i>	common mullein	1	1	–	–	–	–	–	–
003L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	–
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	–	–	1	–	–
003R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	–	–	X
	<i>Bromus sp.</i>	brome species	–	2	X	X	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	X	X	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	1	–	X	X	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	2	–	X	X	1	–	–	X
	<i>Verbascum thapsus</i>	common mullein	1	1	X	X	–	–	–	–
004L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	–
	<i>Bromus sp.</i>	brome species	2	2	3	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	–	–	–	–	–	–
004R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	1	X	X
	<i>Bromus sp.</i>	brome species	0	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
004R (cont.)	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	1	–	X	X
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	X	X
	<i>Verbascum thapsus</i>	common mullein	–	2	2	2	–	1	X	X
005L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	3	3	2	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	0	–	–	1	–	–	–
	<i>Cynoglossum officinale</i>	houndstongue	2	2	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	1	2	2	1
	<i>Polygonum convolvulus</i>	climbing buckwheat	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
	<i>Verbascum thapsus</i>	common mullein	2	2	3	–	–	–	–	–
005R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	X	X
	<i>Bromus sp.</i>	brome species	2	2	–	X	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	–	X	–	–	–	–
	<i>Cynoglossum officinale</i>	houndstongue	2	2	2	X	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	1	–	–	X	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	2	2	–	X	1	–	X	X
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	X	–	–	–	–
	<i>Polygonum convolvulus</i>	climbing buckwheat	1	–	–	X	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	–	–	X	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	X	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	2	–	–	X	1	1	X	X
	<i>Verbascum thapsus</i>	common mullein	2	2	2	2	1	1	X	X
006L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	1	–	–	–	1	1	–
006R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus sp.</i>	brome species	–	2	–	X	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	2	–	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	1	–
	<i>Tragopogon dubius</i>	western salsify	1	2	–	X	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	X	–	–	–	–
007L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	2	3	2	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
007L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	1	–	–	–	–
007R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Bromus sp.</i>	brome species	2	2	–	X	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	–	X	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	2	2	–	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	X	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	X	–	–	–	–
008L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Bromus sp.</i>	brome species	–	3	3	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	2	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
	<i>Verbascum thapsus</i>	common mullein	2	2	–	2	–	–	–	2
008R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	2	–	–
	<i>Chenopodium album</i>	lambsquarters	2	1	–	X	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	2	–	–	X	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	–	X	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	X	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	X	–	–	–	–
009L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	2	3	3	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	2	2	2	3	–	–	–	2
009R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	2	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Verbascum thapsus</i>	common mullein	–	3	3	3	–	–	–	–
010L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	1	–	X
	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	X
	<i>Verbascum thapsus</i>	common mullein	–	1	–	–	–	–	–	–
010R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	2	–	X
	<i>Bromus sp.</i>	brome species	2	3	3	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
010R (cont.)	<i>Chenopodium album</i>	lambsquarters	1	2	–	–	2	–	–	X
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	2	–	X
	<i>Verbascum thapsus</i>	common mullein	–	3	3	–	1	1	–	X
011L	<i>Bromus sp.</i>	brome species	–	3	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	–	–	2	–	–
011R	<i>Bromus sp.</i>	brome species	–	3	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	2	–	–	1	1	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	1	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	–	–	1	2	2
012L	<i>Bromus sp.</i>	brome species	–	2	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	–	–	1	–	–
012R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	X	X
	<i>Bromus sp.</i>	brome species	2	3	3	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	–	2	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	–	1	2	X	X
013L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	1	2	2	–	1	–	–	X
	<i>Verbascum thapsus</i>	common mullein	1	2	3	3	1	2	–	X
013R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	–
	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	1	1	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	2	3	3	–	1	2	–
014L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	1	–	–
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	2	–	2	2	2	–
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	2	2	3	2	2	1	–
014R	<i>Kochia scoparia</i>	kochia	1	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	3	–	2	2	1	1
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	2	2	3	3	1	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
015L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	–
	<i>Bromus sp.</i>	brome species	1	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	1	–	–	–	–	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	–	–	–	1	–
015R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	1	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	3	–	1	1	1
016L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	–	X	X
	<i>Bromus sp.</i>	brome species	1	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	X	X
	<i>Verbascum thapsus</i>	common mullein	–	2	–	–	–	–	–	–
016R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	2	–	–	2	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
	<i>Verbascum thapsus</i>	common mullein	–	3	3	–	–	1	–	–
017L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	1	X	X
	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	1	–	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	1	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	1	2	X	X
	<i>Verbascum thapsus</i>	common mullein	–	2	2	–	–	–	–	–
017R	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	2	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	3	3	–	–	2	1	–
018L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	X
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	1	–	–	–	2	–	X
	<i>Marrubium vulgare</i>	horehound	–	2	2	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	X
	<i>Verbascum thapsus</i>	common mullein	2	2	3	–	1	2	–	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
018R	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	2	–	–	1	1	1	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	1	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	–	1	2	1	1
019L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	X
	<i>Bromus sp.</i>	brome species	2	2	3	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	1	–	–	–	1	2	X
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	–	2	2	X
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	X
	<i>Verbascum thapsus</i>	common mullein	–	3	–	–	–	–	–	–
019R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	2
	<i>Chenopodium album</i>	lambsquarters	1	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	2
	<i>Verbascum thapsus</i>	common mullein	–	2	3	3	–	1	–	–
020L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Bromus sp.</i>	brome species	2	2	3	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	2	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	3	–	–	–	–
020R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	1	–	–
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	1	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	0	2	3	3	1	2	–	2
021L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	1	2	0
	<i>Bromus sp.</i>	brome species	2	2	3	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	1	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	1	–	–	–	–	–	–
021R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	3	–	1	2	1
022L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	–	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	1	2	2	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Descurainia sophia</i>	herb sophia	–	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	–	1	1	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
022L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	2	–
	<i>Verbascum thapsus</i>	common mullein	1	2	3	–	–	1	1	1
022R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	0	2	3	2	–	2	2	1
023L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Bromus sp.</i>	brome species	2	2	3	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Descurainia sophia</i>	herb sophia	–	2	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	1	1	–	2	1	–	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	3	1	1	–	–
023R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Bromus sp.</i>	brome species	1	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Descurainia sophia</i>	herb sophia	–	1	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Verbascum thapsus</i>	common mullein	–	–	2	2	–	1	–	1
024L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	2	3	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Marrubium vulgare</i>	horehound	–	1	–	–	1	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	3	3	2	1	–	2
024R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	–	–	1	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
	<i>Verbascum thapsus</i>	common mullein	1	2	2	2	1	2	–	–
025L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	–	–	–
	<i>Bromus sp.</i>	brome species	2	2	2	–	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	1	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	2	2	3	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table B-1. Comparison of species and density for each vector block monitored at CAVO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
025R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	0	2	2	2
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	2	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	2	–	–	1	2	2	2
	<i>Tragopogon dubius</i>	western salsify	2	2	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	2	–	2	–	1
026L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	2	2	2	3	–	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	1	2	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	2	–	–	–	–
026R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	–	1	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	2	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	2	2	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix C: Chickasaw NRA 2012 Field Report and Sampling Results

Transect: Buckhorn Road

Species Found: ACHMIL, BOTISC, BROJAP, BROTEC, CYNDAC, DATSTR, KUMSTI, LACSER, LESCUN, LONJAP, MEDLUP, MEDMIN, ONOACA, PASDIL, SONASP, SORHAL, TORARV

Description: Buckhorn Road was rather heavily infested. The most common species found was King Ranch bluestem (*Bothriochloa ischaemum*), and it was spread along the roadsides very evenly. It was found in nearly every vector block along the road. Cheatgrass (*Bromus tectorum*) was also very problematic in large patches along the road. It was mainly seen along “hilly” portions of the roadside. The Johnsongrass (*Sorghum halepense*) is greatly reduced from previous years, but can still be found along “hilly” sections and in low areas. Dallisgrass (*Paspalum dilatatum*) was an oddity found along the road. It’s numbers were much higher near the dump station.

Transect: Cedar Blue Road

Species Found: ACHMIL, BOTISC, BROINE, BROJAP, CYNDAC, EROCIC, EUPDEN, KUMSTI, LACSER, LESCUN, MEDLUP, MEDMIN, MELALB, ONOACA, PASDIL, SORHAL, TAROFF, TORARV

Description: Same as Buckhorn for species distribution. The pond near the end of the road was heavily infested.

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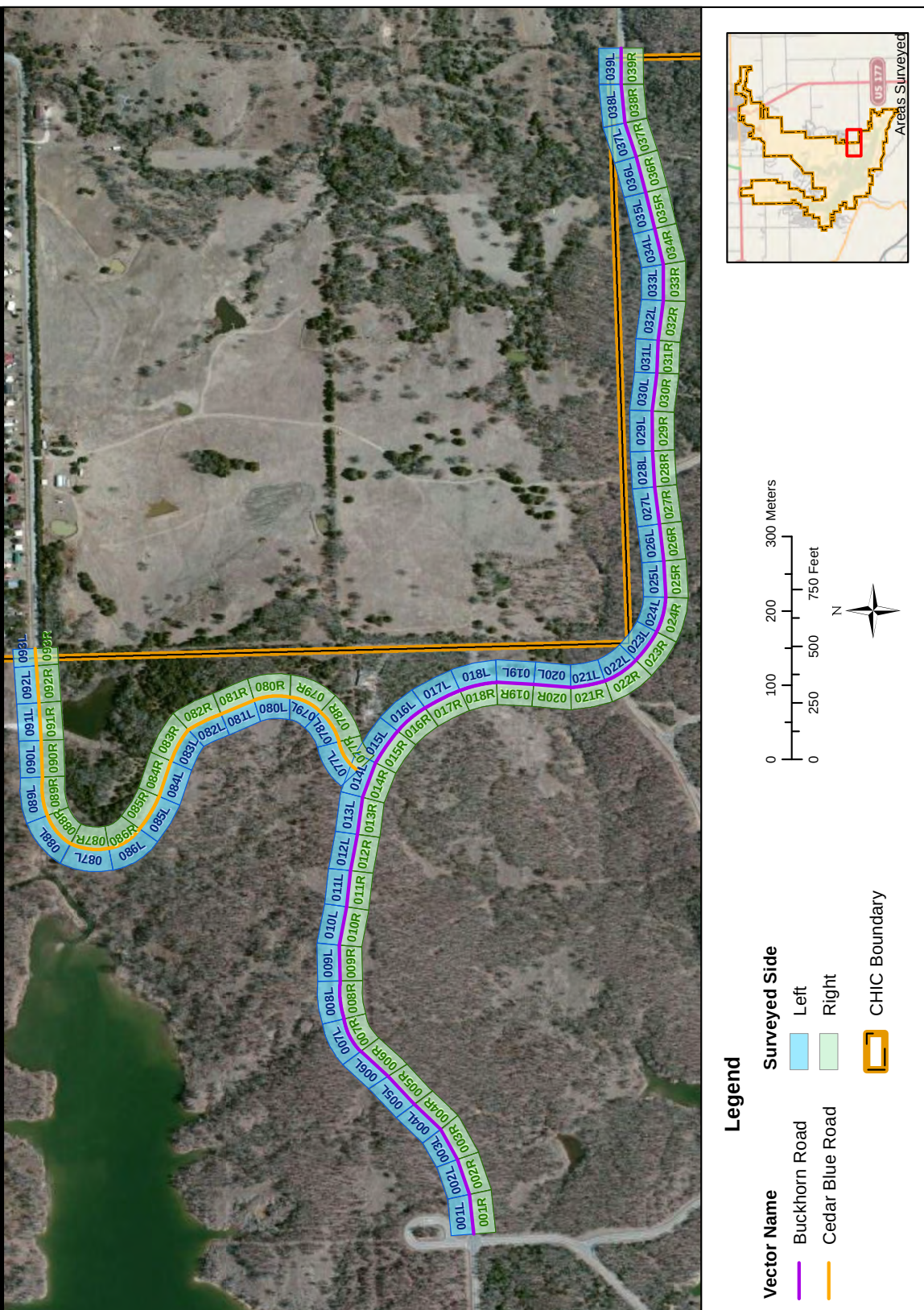


Figure C1. Individual vector blocks sampled, Panel 3, Chickasaw NRA, 2012.

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012.

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Achillea millefolium</i>	common yarrow	R	033	0	1	0	0
		R	034	0	1	0	0
		R	085	0	1	X	X
		R	090	0	1	X	X
<i>Bothriochloa ischaemum</i>	King Ranch bluestem	L	001	2	0	0	0
		R	001	2	0	0	0
		R	002	2	0	0	0
		L	002	2	0	0	X
		L	003	2	0	0	0
		R	003	2	0	0	0
		L	004	2	0	0	0
		R	004	2	0	0	0
		R	005	2	0	X	X
		L	005	2	0	0	0
		R	006	2	0	X	X
		L	006	2	0	0	0
		L	007	2	0	0	0
		R	007	2	0	X	X
		R	008	2	0	X	X
		L	008	2	0	0	0
		R	009	2	2	X	X
		L	009	2	0	0	0
		L	010	2	2	0	0
		R	010	2	2	X	X
		R	011	2	0	X	X
		L	011	2	2	0	0
		L	012	2	0	0	0
		R	012	2	0	X	X
		R	013	2	0	X	X
		L	013	2	2	2	0
		R	014	2	0	0	0
		L	014	2	2	2	0
		L	015	2	2	0	0
		R	015	2	0	0	0
		R	016	2	0	X	X
		L	016	2	0	0	0
		L	017	2	2	0	0
		R	017	2	0	X	X
		L	018	2	0	0	0
		R	018	2	0	X	X
		R	019	2	0	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Bothriochloa ischaemum</i> (continued)	King Ranch bluestem	L	019	2	0	0	0
		R	020	2	0	0	0
		L	020	2	0	0	0
		L	021	2	0	0	0
		R	021	2	0	0	0
		L	022	2	0	0	0
		L	024	2	2	X	X
		R	024	2	0	X	X
		R	025	2	0	X	X
		L	025	2	2	X	X
		R	026	1	0	X	X
		L	026	2	2	X	X
		R	027	2	0	X	X
		L	027	2	2	X	X
		L	028	2	2	X	X
		R	028	2	0	X	X
		L	029	2	2	X	X
		R	029	2	2	0	0
		L	030	2	2	X	X
		R	030	2	0	0	0
		R	031	2	2	0	0
		R	032	2	0	0	0
		L	033	2	0	X	X
		R	033	2	2	0	0
		R	034	2	2	0	0
		L	034	2	2	0	0
		L	035	2	2	0	0
		L	036	2	0	X	X
		R	037	2	0	X	X
		L	037	2	2	X	X
		R	038	2	0	X	X
		L	039	2	2	X	X
		R	039	1	0	X	X
		L	079	2	2	0	0
		R	079	2	0	0	0
		L	083	2	0	0	0
		R	083	2	0	X	X
		L	084	2	2	0	0
		R	084	2	2	X	X
		L	085	2	0	0	0
		R	085	2	2	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Bothriochloa ischaemum</i> (continued)	King Ranch bluestem	L	086	2	0	0	0
		R	086	2	0	X	X
		R	090	2	0	X	X
		L	090	2	0	0	0
		L	091	2	0	0	0
		R	091	2	2	0	0
		L	092	2	2	0	0
		R	092	2	0	X	X
		L	093	2	2	0	0
<i>Bromus inermis</i>	smooth brome	L	093	1	0	0	0
<i>Bromus japonicus</i>	Japanese brome	R	019	0	2	X	X
		R	020	0	2	0	0
		L	024	1	2	X	X
		R	032	0	2	0	0
		R	079	0	2	0	0
		R	079	0	2	0	0
		L	079	0	2	2	2
		R	083	0	2	X	X
		L	083	0	2	0	0
		L	084	2	2	0	0
		L	085	2	2	0	0
		R	086	0	2	X	X
		L	086	0	2	0	0
		L	090	0	2	0	0
		R	090	0	2	X	X
		R	091	1	0	X	X
		R	092	0	2	X	X
		L	093	1	2	0	0
		R	093	0	2	X	X
<i>Bromus tectorum</i>	cheatgrass	L	001	0	2	2	0
		R	001	0	2	0	0
		R	002	0	2	0	0
		R	003	0	2	0	0
		R	004	0	2	0	0
		R	005	0	2	X	X
		L	005	2	2	0	0
		L	006	2	2	0	0
		R	006	0	2	X	X
		R	007	0	2	X	X
		L	008	0	2	2	0
		L	009	0	2	2	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Bromus tectorum</i> (continued)	cheatgrass	R	009	0	1	X	X
		R	010	0	2	X	X
		L	010	0	2	0	0
		R	011	0	2	X	X
		L	011	0	2	2	0
		R	012	0	2	X	X
		L	013	1	1	0	0
		R	013	0	2	X	X
		L	014	2	2	0	0
		R	014	0	2	0	0
		R	015	0	2	2	2
		L	015	1	2	0	0
		R	016	0	2	X	X
		L	016	0	2	0	0
		R	017	0	2	X	X
		L	017	0	2	0	0
		R	018	0	2	X	X
		L	018	0	2	0	0
		R	020	0	2	0	0
		L	020	0	2	2	0
		R	021	0	2	0	0
		R	022	0	2	0	0
		R	025	0	2	X	X
		R	027	0	2	X	X
		R	028	0	2	X	X
		L	029	0	2	X	X
		R	029	0	2	0	0
		R	030	0	2	0	0
		L	031	1	2	X	X
		L	032	0	2	X	X
		R	033	0	2	1	0
		L	033	1	1	X	X
		R	034	0	2	0	0
		R	035	0	2	X	X
		L	036	0	2	X	X
		R	036	0	2	X	X
		R	037	0	2	X	X
		L	037	0	2	X	X
		L	038	1	2	X	X
		R	038	2	1	X	X
		R	039	2	0	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Cynodon dactylon</i>	Bermudagrass	L	001	2	0	0	0
		R	001	2	0	0	0
		R	002	2	0	0	0
		L	002	2	0	0	X
		R	003	2	0	0	0
		R	004	2	0	0	0
		L	004	2	0	0	0
		R	006	2	0	X	X
		R	007	2	0	X	X
		L	007	2	0	0	0
		L	008	2	0	0	0
		R	008	2	0	X	X
		R	009	2	0	X	X
		L	009	2	0	0	0
		L	011	2	0	0	0
		R	012	2	0	X	X
		L	012	2	0	0	0
		R	013	2	0	X	X
		L	013	2	2	0	0
		R	014	2	0	0	0
		L	014	2	2	2	0
		L	015	2	0	0	0
		R	016	2	0	X	X
		L	016	2	0	0	0
		L	017	2	0	0	0
		R	017	2	0	X	X
		L	018	2	2	0	0
		R	018	2	0	X	X
		L	019	2	2	0	0
		R	019	2	0	X	X
		L	020	2	0	0	0
		R	020	2	0	0	0
		L	021	2	0	0	0
		R	021	2	0	0	0
		L	022	2	0	0	0
		R	022	2	0	0	0
		R	023	2	0	0	0
		R	024	2	0	X	X
		R	025	2	0	X	X
		R	027	2	2	X	X
		R	028	2	0	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Cynodon dactylon</i> (continued)	Bermudagrass	R	029	2	0	0	0
		R	030	2	0	0	0
		L	030	2	0	X	X
		L	034	2	2	0	0
		L	035	2	2	0	0
		L	036	2	2	X	X
		L	037	2	2	X	X
		L	038	2	2	X	X
		L	079	2	0	0	0
		R	079	2	0	0	0
		L	083	2	0	0	0
		R	083	2	0	X	X
		L	084	2	0	0	0
		R	085	2	0	X	X
		L	085	2	0	0	0
		R	086	2	0	X	X
		L	093	2	0	0	0
<i>Datura stramonium</i>	jimsonweed	R	010	0	1	X	X
		R	011	0	2	X	X
<i>Euphorbia dentata</i>	toothed spurge	R	093	1	0	X	X
<i>Kummerowia stipulacea</i>	Korean lespedeza	R	001	2	0	0	0
		R	002	2	0	0	0
		R	003	2	0	0	0
		R	004	2	0	0	0
		L	004	2	0	0	0
		R	005	2	0	X	X
		R	006	2	0	X	X
		R	009	2	0	X	X
		R	010	2	0	X	X
		R	011	2	0	X	X
		R	012	2	0	X	X
		R	015	2	0	0	0
		R	016	2	0	X	X
		R	017	2	0	X	X
		R	018	2	0	X	X
		L	018	1	0	0	0
		R	019	2	0	X	X
		R	020	2	0	0	0
		R	022	2	0	0	0
		R	026	2	0	X	X
		R	027	2	0	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Kummerowia stipulacea</i> (continued)	Korean lespedeza	R	028	2	0	X	X
		R	029	2	0	0	0
		R	030	2	0	0	0
		R	031	2	2	0	0
		R	032	2	0	0	0
		R	033	2	0	0	0
		R	036	2	0	X	X
		R	037	2	0	X	X
		R	038	2	0	X	X
		R	083	2	0	X	X
		L	083	2	0	0	0
		L	084	2	0	0	0
		R	085	2	0	X	X
		L	085	2	0	0	0
		R	086	2	0	X	X
		L	091	2	0	0	0
		L	092	2	0	0	0
<i>Lactuca serriola</i>	prickly lettuce	R	001	1	0	0	0
		R	002	0	1	0	0
		R	004	1	1	0	0
		R	008	0	2	X	X
		R	016	0	1	X	X
		R	019	1	1	X	X
		L	020	0	0	1	0
		R	021	0	1	0	0
		L	023	0	1	X	X
		R	023	0	2	0	0
		R	026	0	1	X	X
		R	029	0	2	0	0
		R	033	1	0	0	0
		R	035	0	1	X	X
		R	036	0	2	X	X
		L	037	0	2	X	X
		R	037	0	1	X	X
		R	038	0	1	X	X
		R	079	0	1	0	0
		R	083	1	0	X	X
		L	084	1	0	0	0
		L	085	1	0	0	0
		L	086	0	1	0	0
		L	090	0	2	2	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Lactuca serriola</i> (continued)	prickly lettuce	L	091	0	1	1	0
		R	091	0	2	X	X
		L	092	1	2	2	0
		R	092	0	1	X	X
<i>Lespedeza cuneata</i>	sericea lespedeza	R	001	0	2	0	0
		L	001	2	2	0	0
		R	002	0	2	0	0
		L	002	1	2	0	X
		R	003	2	0	0	0
		L	003	0	2	0	0
		R	004	2	2	0	0
		L	004	0	2	0	0
		L	005	0	2	0	0
		R	005	0	2	X	X
		R	006	0	2	X	X
		L	006	0	2	0	0
		R	007	2	2	X	X
		L	007	0	2	2	0
		R	008	0	2	X	X
		L	008	0	2	0	0
		R	009	0	2	X	X
		L	009	0	2	0	0
		R	010	0	2	X	X
		R	011	0	2	X	X
		R	012	0	2	X	X
		R	014	0	1	0	0
		L	015	0	2	0	0
		R	016	0	1	X	X
		R	018	0	1	X	X
		R	019	0	2	X	X
		L	021	0	2	0	0
		R	021	0	1	0	0
		R	024	0	1	X	X
		L	029	0	1	X	X
		R	029	0	2	0	0
		R	030	0	2	0	0
		L	030	0	1	X	X
		R	031	0	2	0	0
		R	032	0	2	1	0
		R	033	0	2	0	0
		R	035	0	2	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Lespedeza cuneata</i> (continued)	sericea lespedeza	R	037	0	2	X	X
		R	039	0	2	X	X
		R	079	0	2	0	0
		L	085	0	1	0	0
		L	086	0	1	0	0
		R	086	1	0	X	X
<i>Lonicera japonica</i>	Japanese honeysuckle	R	003	0	1	0	0
		L	005	0	1	0	0
<i>Medicago lupulina</i>	black medick clover	R	004	1	0	0	0
		R	005	2	0	X	X
		R	006	2	0	X	X
		R	079	2	0	0	0
<i>Medicago minima</i>	burr medick clover	R	001	2	0	0	0
		R	002	2	0	0	0
		R	003	2	0	0	0
		L	004	2	0	0	0
		R	004	2	0	0	0
		L	006	2	0	0	0
		R	006	2	0	X	X
		L	007	2	0	0	0
		R	007	2	0	X	X
		R	008	2	0	X	X
		L	008	2	0	0	0
		L	009	2	0	0	0
		R	009	2	0	X	X
		L	010	2	0	0	0
		L	011	2	0	0	0
		L	012	2	0	0	0
		R	013	2	0	X	X
		L	014	2	0	0	0
		R	014	2	0	0	0
		R	015	2	0	0	0
		L	016	2	0	0	0
		R	017	2	0	X	X
		L	018	2	0	0	0
		R	018	2	0	X	X
		L	019	2	0	0	0
		L	020	2	0	0	0
		R	020	2	0	0	0
		L	021	2	0	0	0
		R	021	2	0	0	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Medicago minima</i> (continued)	burr medick clover	R	022	2	0	0	0
		L	022	2	2	0	0
		L	023	2	2	X	X
		L	024	2	0	X	X
		R	024	2	0	X	X
		R	025	2	0	X	X
		L	025	2	0	X	X
		L	026	2	0	X	X
		R	026	2	0	X	X
		L	027	2	2	X	X
		R	029	2	0	0	0
		L	029	2	0	X	X
		L	030	2	0	X	X
		L	031	2	0	X	X
		R	031	2	0	0	0
		L	032	2	0	X	X
		R	032	2	0	0	0
		R	033	2	0	0	0
		L	033	2	0	X	X
		L	034	2	0	0	0
		R	035	2	0	X	X
		R	036	2	0	X	X
		R	038	2	0	X	X
		L	039	2	2	X	X
		R	039	2	2	X	X
		L	079	2	0	0	0
		L	083	2	0	0	0
		R	083	2	0	X	X
		R	084	2	0	X	X
		L	084	2	0	0	0
		R	085	2	0	X	X
		L	085	2	0	0	0
		R	086	2	0	X	X
		L	086	2	0	0	0
		R	090	2	0	X	X
		L	090	2	0	0	0
		R	091	2	0	X	X
		R	092	3	0	X	X
		L	093	2	0	0	0
		R	093	2	0	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Melilotus alba</i>	white sweetclover	L	090	0	2	2	0
		R	090	0	1	X	X
<i>Onopordum acanthium</i>	scotch thistle	L	001	0	1	0	0
		R	002	0	1	0	0
		L	002	0	1	0	X
		R	004	0	1	0	0
		L	007	0	1	0	0
		L	008	1	2	1	0
		R	015	0	0	2	0
		R	020	0	0	1	0
		L	021	0	1	0	0
		R	023	0	1	0	0
		R	029	0	1	0	0
		L	090	0	1	1	0
		L	093	0	0	1	0
<i>Paspalum dilatatum</i>	dallisgrass	L	001	2	0	0	0
		L	002	2	0	0	X
		R	007	1	0	X	X
		R	008	1	0	X	X
		R	009	2	0	X	X
		R	029	2	0	0	0
		R	030	2	0	0	0
		L	034	2	2	0	0
		L	083	2	2	0	0
		R	084	1	0	X	X
		R	085	0	1	X	X
		L	085	2	0	0	0
		R	091	0	1	X	X
<i>Sonchus asper</i>	spiny sowthistle	R	033	0	1	0	0
		R	034	0	1	0	0
		R	036	0	1	X	X
		R	039	0	1	X	X
<i>Sorghum halepense</i>	Johnsongrass	L	001	1	2	2	0
		R	001	0	2	0	0
		R	002	2	0	0	0
		L	002	0	2	2	X
		R	003	0	2	0	0
		L	003	0	2	0	0
		L	004	0	2	2	0
		L	005	0	2	2	0
		L	006	1	2	0	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Sorghum halepense</i> (continued)	Johnsongrass	R	006	1	2	X	X
		L	007	0	2	0	0
		R	007	1	2	X	X
		R	008	0	2	X	X
		L	008	0	2	2	0
		R	009	1	2	X	X
		L	009	0	2	2	0
		L	010	0	0	2	0
		R	010	0	2	X	X
		L	011	0	2	2	0
		R	011	0	2	X	X
		R	012	0	2	X	X
		L	012	1	2	0	0
		R	013	1	2	X	X
		L	013	1	2	2	0
		R	014	0	2	0	0
		L	014	0	2	2	0
		R	015	0	2	2	2
		L	015	1	2	0	0
		L	016	0	2	0	0
		R	016	0	2	X	X
		L	017	1	2	0	0
		R	017	0	2	X	X
		R	018	0	2	X	X
		L	018	1	2	0	0
		L	019	1	2	0	0
		R	019	0	2	X	X
		R	020	1	2	0	0
		L	020	2	2	2	0
		R	021	0	2	0	0
		L	021	0	2	2	0
		L	022	0	2	0	0
		R	022	0	2	0	0
		L	023	0	2	X	X
		R	023	0	2	0	0
		R	024	0	2	X	X
		L	024	0	1	X	X
		L	025	0	2	X	X
		R	025	0	2	X	X
		L	026	0	1	X	X
		R	026	0	2	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table C-1. Sample locations (vector blocks) of exotic plant species observations with density class observed at each distance class, Chickasaw NRA, 2012. (continued)

Scientific Name	Common Name	Vector Side	Vector Block	D1	D2	D3	D4
<i>Sorghum halepense</i> (continued)	Johnsongrass	L	027	1	2	X	X
		R	027	0	2	X	X
		R	028	0	2	X	X
		L	028	0	2	X	X
		L	029	1	2	X	X
		R	029	1	2	0	0
		L	030	0	2	X	X
		R	030	0	2	0	0
		R	031	0	2	0	0
		L	031	1	2	X	X
		L	033	0	2	X	X
		R	034	0	2	0	0
		L	034	0	2	2	0
		L	035	1	2	0	0
		R	035	0	2	X	X
		R	036	0	2	X	X
		L	036	0	2	X	X
		L	038	1	2	X	X
		R	039	0	2	X	X
		L	039	0	1	X	X
		R	079	0	2	0	0
		L	079	0	2	2	0
		R	083	0	2	X	X
		L	084	0	2	0	0
		L	085	0	2	0	0
		R	085	0	2	X	X
		L	086	0	2	0	0
		R	086	0	2	X	X
		R	090	0	2	X	X
		L	090	0	2	1	0
		R	091	0	2	X	X
		L	092	2	2	2	0
		R	092	0	1	X	X
		L	093	2	2	0	0
		R	093	0	2	X	X
<i>Taraxacum officinale</i>	common dandelion	L	083	1	0	0	0
<i>Torilis arvensis</i>	spreading hedge parsley	R	033	0	2	0	0
		R	034	0	2	0	0
		R	036	2	0	X	X
		R	037	0	2	X	X
		R	090	0	1	X	X
		L	090	1	2	0	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix D: Fort Larned NHS 2012 Field Report and Sampling Results

Transect: East Trail

Species Found: BOTISC, BROINE, BROJAP, CANSAT, CONMAC, CONARV, CYNDAC, KOCSO, LACSER, POLARE, RUMPAT, SALTRA, TAROFF, TRITER, TRIAES

Description: Smooth brome (*Bromus inermis*) continues to be problematic throughout the park. The trail itself had kochia (*Kochia scoparia*), prostrate knotweed (*Polygonum arenastrum*), Bermudagrass (*Cynodon dactylon*), and puncturevine (*Tribulus terrestris*) growing on the walking path itself. Kochia was the most problematic species here. Most species were found within 5m of the trail itself, with poison hemlock (*Conium maculatum*) and marijuana (*Cannabis sativa*) being found within the old oxbow.

Transect: Lower Trail

Species Found: BROINE, BROJAP, CANSAT, CONMAC, CYNDAC, KOCSO, LACSER, POLARE, RUMPAT, SALTRA, TRADUB

Description: Most species found here were either in the dike on one side of the road or along the river on the other. The Bermudagrass (*Cynodon dactylon*) and prostrate knotweed (*Polygonum arenastrum*) were found along the mow lines.

Transect: Rut Site

Species Found: ACHMIL, BROINE, BROJAP, BROTEC, CONARV, CYNDAC, KOCSO, LACSER, LOLPER, RUMCRI, RUMPAT, SALTRA, TAROFF, TRADUB, VERTHA

Description: The Rut Site is heavily infested. The western fence line had the most diversity of species. This is where the most Smooth brome (*Bromus inermis*) can be found moving into the dog town. The crew surveyed the fence line along its entirety. Field bindweed (*Convolvulus arvensis*) was the most problematic species. It was found in nearly every vector block. Another species of great concern would be the common mullein (*Verbascum thapsus*) found along the eastern fence line. Common mullein (*Verbascum thapsus*) is not listed on the park species list and there were about 50 or so rosettes seen along the fence line. Kochia (*Kochia scoparia*) and prickly Russian thistle (*Salsola tragus*) are also moving in rather heavily on all sides of the dog town.

Fort Larned NHS Exotics Sampling Panel 1 - 6/12 - 6/13/2012

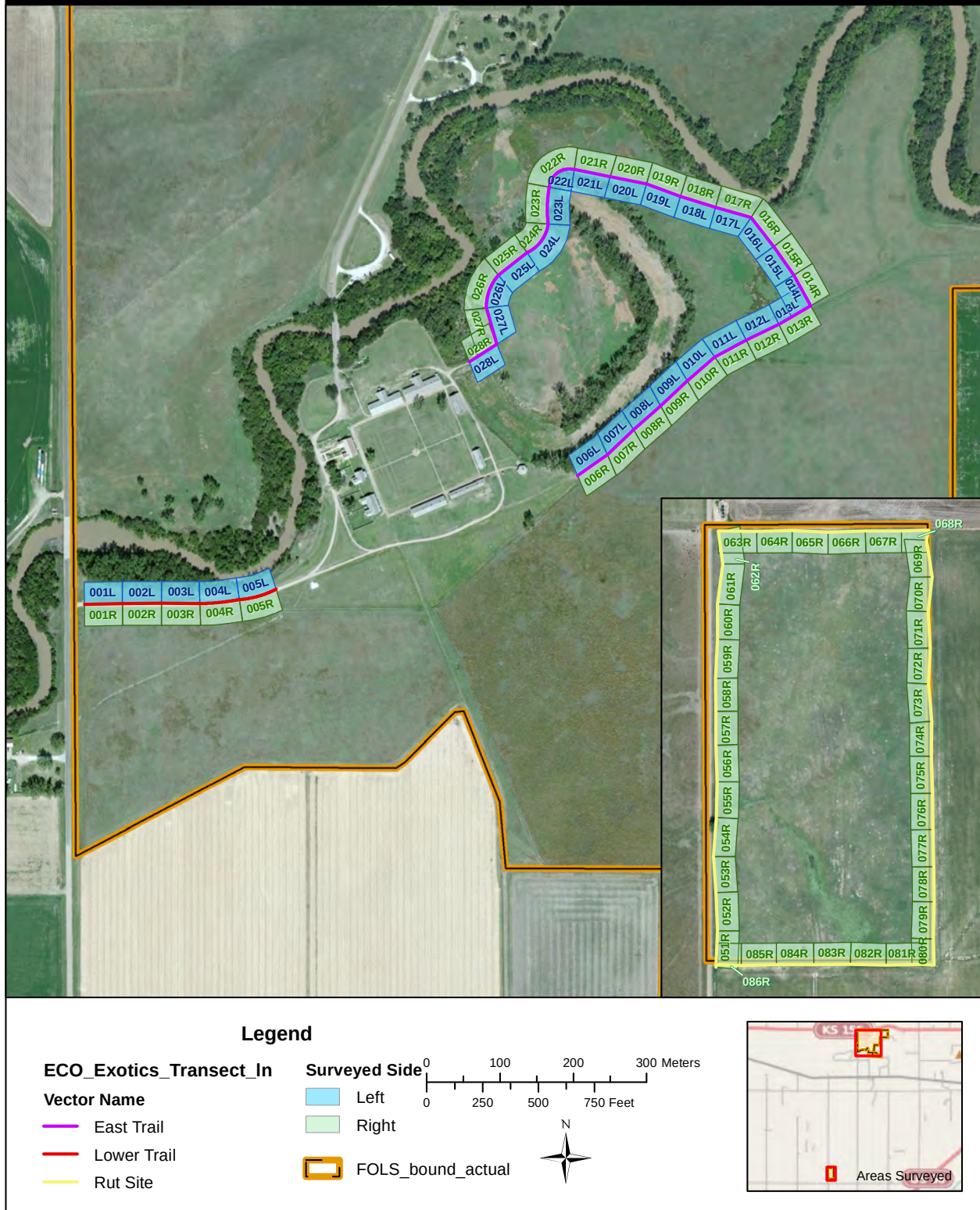


Figure D.1. Individual vector blocks sampled, Panel 1, Fort Larned NHS, 2012.

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Bromus inermis</i>	smooth brome	–	4	4	4	–	4	4	X
	<i>Bromus tectorum</i>	cheatgrass	–	2	–	–	–	–	–	–
	<i>Calystegia sepium</i>	hedge bindweed	–	1	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	–	–	X
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	2	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	X
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	–	–	–	–
001R	<i>Alliaria petiolata</i>	garlic mustard	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	3	4	4	–	4	4	4
	<i>Bromus tectorum</i>	cheatgrass	–	3	2	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	1	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	1	–	–	–	2	–	–	–
	<i>Lamium amplexicaule</i>	henbit	1	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex crispus</i>	curly dock	–	1	–	–	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	2	2	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
002L	<i>Bromus inermis</i>	smooth brome	–	4	4	3	–	4	4	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	X
	<i>Bromus tectorum</i>	cheatgrass	–	2	–	.	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	X
	<i>Medicago lupulina</i>	black medick clover	2	–	–	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	X
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	0	1	–	.	–	–	–	–
002R	<i>Alliaria petiolata</i>	garlic mustard	–	2	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	1	1	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	4	4	4	–	4	4	4
	<i>Bromus tectorum</i>	cheatgrass	–	3	2	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
002R (cont.)	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex crispus</i>	curly dock	–	1	–	–	–	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	–	1
	<i>Setaria viridis</i>	green bristlegrass	3	2	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	–	–	–	–
003L	<i>Bromus inermis</i>	smooth brome	–	4	4	X	–	3	3	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	X
	<i>Bromus tectorum</i>	cheatgrass	–	2	–	.	–	–	–	–
	<i>Cirsium vulgare</i>	bull thistle	1	1	–	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	3	X	–	2	2	X
	<i>Convolvulus arvensis</i>	field bindweed	2	3	2	.	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	2	–	X
	<i>Medicago lupulina</i>	black medick clover	2	–	–	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	X
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	.	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	.	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	1	X	–	1	1	X
003R	<i>Alliaria petiolata</i>	garlic mustard	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	4	4	4	0	4	4	4
	<i>Bromus tectorum</i>	cheatgrass	3	3	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	2	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Descurainia sophia</i>	herb sophia	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	–	–	–	–
004L	<i>Bromus inermis</i>	smooth brome	–	3	3	X	–	2	2	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	3	X
	<i>Bromus tectorum</i>	cheatgrass	–	3	3	.	–	–	–	–
	<i>Calystegia sepium</i>	hedge bindweed	–	1	–	.	–	–	–	–
	<i>Cannabis sativa</i>	marijuana	–	–	–	–	–	1	1	X
	<i>Conium maculatum</i>	poison hemlock	–	2	2	X	–	2	2	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
004L (cont.)	<i>Convolvulus arvensis</i>	field bindweed	–	2	2	.	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–		2	–	–	X
	<i>Kochia scoparia</i>	kochia	–	2	3	X	1	2	2	X
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–		1	–	–	X
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	.	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	2	.	–	–	–	–
004R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	2	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex crispus</i>	curly dock	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	1	1	–	–	–	–
005L	<i>Bromus inermis</i>	smooth brome	–	4	.	X	–	3	3	X
	<i>Bromus tectorum</i>	cheatgrass	–	3	.	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	2	.	.	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	2	–	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	–	X
	<i>Lamium amplexicaule</i>	henbit	2	–	.	.	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	.	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	X
	<i>Setaria viridis</i>	green bristlegrass	4	–	.	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	.	.	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	.	.	–	–	–	–
005R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	2	2	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	1	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
006L	<i>Bromus inermis</i>	smooth brome	–	4	4	.	–	4	3	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–		–	–	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	–	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	1	.	–	–	–	2
	<i>Convolvulus arvensis</i>	field bindweed	2	2	2	.	–	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	.	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–		2	2	2	2
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–		2	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	.	2	–	–	–
006R	<i>Bromus inermis</i>	smooth brome	–	4	4	4	–	3	3	3
	<i>Bromus tectorum</i>	cheatgrass	–	1	2	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	1	3	–	–	2	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Lamium amplexicaule</i>	henbit	2	2	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	2	3	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	2	–	–	1	–	–	–
007L	<i>Bromus inermis</i>	smooth brome	–	4	.	.	–	4	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	–	2	2
	<i>Conium maculatum</i>	poison hemlock	–	–	.	2	–	–	–	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	.	.	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	2
	<i>Medicago lupulina</i>	black medick clover	1	–	.	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	.	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	.	.	2	–	–	–
007R	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	4	4	4
	<i>Convolvulus arvensis</i>	field bindweed	2	3	1	–	2	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	3	–	–	2	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	3	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	2	–	–	–
008L	<i>Bromus inermis</i>	smooth brome	–	4	.	4	–	4	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	–	.	3	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
008L (cont.)	<i>Conium maculatum</i>	poison hemlock	–	–	.	3	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	0
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	.	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	2
	<i>Medicago lupulina</i>	black medick clover	2	–	.	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	.	–	2	–	–	–
008R	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	4	4	4
	<i>Cynodon dactylon</i>	Bermudagrass	2	–	–	–	–	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	–	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	2	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
009L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	1	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	4	–	4	–	4	3	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	–	2	2
	<i>Conium maculatum</i>	poison hemlock	–	–	3	3	–	–	–	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	–	2
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
009R	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	3	4	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	–	–
	<i>Lamium amplexicaule</i>	henbit	3	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	1	–	–	–
010L	<i>Bromus inermis</i>	smooth brome	–	4	4	3	–	4	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	0	3	–	–	1	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	–	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
010L (cont.)	<i>Lamium amplexicaule</i>	henbit	3	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
010R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	3	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	3	4	4	–	3	4	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	2	2	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
011L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	–	–	1	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	2	2	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	2	2	2	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	1	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	3	–	2	2	–	–
	<i>Lamium amplexicaule</i>	henbit	3	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
011R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	3	2	–	–	–	–	–
	<i>Bothriochloa bladhii</i>	Australian beardgrass	–	–	–	–	–	3	4	4
	<i>Bromus inermis</i>	smooth brome	–	3	4	4	–	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	1	–
	<i>Bromus tectorum</i>	cheatgrass	2	4	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	0	2	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	1	–	2	2	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	4	–	–	2	2	–	–
	<i>Lamium amplexicaule</i>	henbit	3	3	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
011R (cont.)	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
012L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	–	2	2	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	–	4	–	2	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	4	4	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	2	–
	<i>Lamium amplexicaule</i>	henbit	2	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
012R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	1	–	3	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	2	4	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	0	1	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	–	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	4	–	3	2	2	2	2
	<i>Lamium amplexicaule</i>	henbit	–	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	3	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
013L	<i>Bromus inermis</i>	smooth brome	2	3	4	4	–	2	2	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	3	2
	<i>Bromus tectorum</i>	cheatgrass	–	2	3	2	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	2	2	–	–	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	2	2	2	2
	<i>Lamium amplexicaule</i>	henbit	3	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	0	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
013R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	3	4	4	–	3	4	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	2	4	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	3	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
013R (cont.)	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	–	2	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	4	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	–	–
	<i>Lamium amplexicaule</i>	henbit	3	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	4	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
014L	<i>Bromus inermis</i>	smooth brome	2	4	4	4	–	3	4	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	2	2
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
014R	<i>Bromus inermis</i>	smooth brome	4	4	4	4	–	3	4	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	–	2	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	2	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	4	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
015L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	1	–	1	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	4	4	4	–	4	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	3	2
	<i>Bromus tectorum</i>	cheatgrass	–	–	2	2	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	2	2	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Lamium amplexicaule</i>	henbit	3	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	0	1	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
015R	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	4	4	4
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	–	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	1	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
016L	<i>Amaranthus blitoides</i>	mat amaranth	1	–	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	1	1	1	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	4	4	4	–	4	3	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	3	2
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	–	2	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	4	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	2	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
016R	<i>Amaranthus blitoides</i>	mat amaranth	2	–	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	2	2	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	1	2	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	3	3	–	–	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	3	–	2	2	–	2
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Triticum aestivum</i>	common wheat	2	–	–	–	–	–	–	–
017L	<i>Amaranthus blitoides</i>	mat amaranth	2	2	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	1	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	4	4	4	–	4	4	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	2
	<i>Bromus tectorum</i>	cheatgrass	–	2	2	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	2	2	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
017L (cont.)	<i>Digitaria sanguinalis</i>	hairy crabgrass	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Lamium amplexicaule</i>	henbit	–	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	1	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	2	–	–	–	2	–	–	–
017R	<i>Amaranthus blitoides</i>	mat amaranth	2	–	.	.	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	4	X	X	–	2	X	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	X	X
	<i>Bromus tectorum</i>	cheatgrass	3	3	.	.	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	.	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	4	4	.	–	2	X	X
	<i>Convolvulus arvensis</i>	field bindweed	2	2	.	.	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	X	X	2	2	X	X
	<i>Lamium amplexicaule</i>	henbit	2	3	.	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	–	X	X	2	–	X	X
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	X	X
	<i>Taraxacum officinale</i>	common dandelion	3	–	.	.	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	.	.	–	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	2	–	X	X	2	–	X	X
018L	<i>Amaranthus blitoides</i>	mat amaranth	2	–	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	1	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	4	4	–	3	4	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	3	2	–	–	–	–	–
	<i>Calystegia sepium</i>	hedge bindweed	–	1	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	2	–	–	–	–	–	2
	<i>Kochia scoparia</i>	kochia	–	2	–	–	2	–	–	2
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	3	–	–	–	1	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	0	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
018R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	.	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	4	3	.	–	3	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
018R (cont.)	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	X	X
	<i>Bromus tectorum</i>	cheatgrass	3	4	3	3	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	3	2	–	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	4	4	4	–	2	X	X
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	.	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	.	2	–	X	X
	<i>Lamium amplexicaule</i>	henbit	3	–	–	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	–	–	–	2	–	X	X
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	.	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	3	3	–	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	.	–	–	–	–
019L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	2	2	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	3	–	–	–	2
	<i>Convolvulus arvensis</i>	field bindweed	–	3	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	2	2
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	1	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	1	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
019R	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	3	3	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	2	2	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	4	4	–	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	.	2	2	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	.	2	–	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	3	–	–	.	2	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	3	2	–	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	.	–	–	–	–
020L	<i>Amaranthus blitoides</i>	mat amaranth	2	–	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	–	1	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	3	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	0	3	2	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	0	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	0	–	2	4	–	–	–	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
020L (cont.)	<i>Convolvulus arvensis</i>	field bindweed	0	3	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	2	2
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	1	–	–	–	2	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
020R	<i>Bromus inermis</i>	smooth brome	–	4	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	2	3	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	3	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	4	–	–	–	2
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	1	2	–	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
021L	<i>Amaranthus blitoides</i>	mat amaranth	1	–	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	–	–	–	2	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	2	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	–	3	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	3	3	4	–	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	3	2	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Lamium amplexicaule</i>	henbit	–	3	–	–	–	–	–	–
	<i>Rumex crispus</i>	curly dock	–	1	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
021R	<i>Amaranthus blitoides</i>	mat amaranth	1	–	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	4	4	–	2	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	4	3	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	3	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	4	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	4	–	–	2	–	–	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	2	–	–
	<i>Lamium amplexicaule</i>	henbit	2	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
021R (cont.)	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
022L	<i>Bromus inermis</i>	smooth brome	–	2	2	2	–	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	3	2	2	–	–	–	–
	<i>Cannabis sativa</i>	marijuana	–	–	–	–	–	2	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	2	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	0	2	3	4	–	2	2	2
	<i>Kochia scoparia</i>	kochia	2	2	3	2	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
	<i>Lamium amplexicaule</i>	henbit	–	2	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
022R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	3	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	4	4	4	–	2	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	3	–	–	–	–	–
	<i>Cannabis sativa</i>	marijuana	–	1	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	3	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	4	–	4	–	2	–	2
	<i>Kochia scoparia</i>	kochia	3	4	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	2	–	–
	<i>Lamium amplexicaule</i>	henbit	2	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	1	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	2	–	–	–	–	–	–
023L	<i>Bromus inermis</i>	smooth brome	–	3	–	–	–	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	2	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	–	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	3	3	4	–	2	2	2
	<i>Kochia scoparia</i>	kochia	1	2	2	2	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Lamium amplexicaule</i>	henbit	–	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
023R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	–	4	.	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	3	.	.	–	2	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–		–	3	2	2
	<i>Cannabis sativa</i>	marijuana	–	2	–	.	–	2	2	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	.	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	.	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	4	4	.	.	–	2	2	2
	<i>Kochia scoparia</i>	kochia	3	3	.	.	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	2	–	–
	<i>Lamium amplexicaule</i>	henbit	2	3	–	.	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	–	–	.	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	.	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	1	–	.	.	–	–	–	–
024L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	1	1	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	3	3	2	–	2	2	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	–	–	2	2	2
	<i>Elaeagnus angustifolia</i>	Russian olive	–	–	–	1	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	3	3	2	2	2	2
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	1	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
024R	<i>Amaranthus retroflexus</i>	redroot amaranth	2	2	–	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	4	4	–	–	2	X	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	X	X
	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	4	2	4	–	2	X	X
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	–	–	2	X	X
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	X	X
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	X	X
	<i>Lamium amplexicaule</i>	henbit	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
025L	<i>Amaranthus retroflexus</i>	redroot amaranth	–	3	3	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	4	4	4	–	3	3	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	3	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
025L (cont.)	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	1	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
025R	<i>Amaranthus retroflexus</i>	redroot amaranth	2	3	2	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	4	4	4	–	3	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	2	3	4	–	–	2	2
	<i>Convolvulus arvensis</i>	field bindweed	3	3	3	–	2	2	2	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	3	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
026L	<i>Amaranthus retroflexus</i>	redroot amaranth	2	3	2	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	4	4	4	4	–	3	4	4
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	–	2	–
	<i>Bromus tectorum</i>	cheatgrass	2	3	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	2	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
	<i>Lamium amplexicaule</i>	henbit	3	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	2	1	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	3	3	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
026R	<i>Amaranthus retroflexus</i>	redroot amaranth	–	4	4	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	4	3	3	–	2	2	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	3	2	X
	<i>Bromus tectorum</i>	cheatgrass	–	3	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	2	3	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	3	3	4	–	–	2	X
	<i>Convolvulus arvensis</i>	field bindweed	3	3	–	–	2	2	–	X
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	2	2	2	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
026R (cont.)	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	–	X
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	–	–	X
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	–	X
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	4	–	–	–	–	–	–	–
027L	<i>Amaranthus retroflexus</i>	redroot amaranth	2	4	2	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	4	4	4	–	2	2	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	3	3	–	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	3	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	2	–	–	–	1	–	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	2	–	–
	<i>Lamium amplexicaule</i>	henbit	–	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	–	–	2	0	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	3	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	3	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
027R	<i>Alliaria petiolata</i>	garlic mustard	–	2	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	3	3	2	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	3	4	3	–	–	2	2	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	X
	<i>Bromus tectorum</i>	cheatgrass	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	3	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	3	4	3	–	2	2	X
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	X
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	4	3	–	–	2	2	–	X
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	X
	<i>Lamium amplexicaule</i>	henbit	3	2	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	–	–	–	2	–	–	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	X
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	3	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
028L	<i>Alliaria petiolata</i>	garlic mustard	–	2	–	–	–	–	–	–
	<i>Amaranthus blitoides</i>	mat amaranth	–	1	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
028L (cont.)	<i>Amaranthus retroflexus</i>	redroot amaranth	–	2	2	2	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	2	2	2	3	–	–	3
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	2	2	2
	<i>Bromus tectorum</i>	cheatgrass	–	2	2	2	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	–	2	2	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	2	2	2	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	1	–	2	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	2	–	–
	<i>Eragrostis ciliaris</i>	stinkgrass	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	3	2	2	2	2	2
	<i>Polygonum arenastrum</i>	prostrate knotweed	2	–	–	–	2	2	2	–
	<i>Sonchus asper</i>	spiny sowthistle	–	–	–	2	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	2	–	–	–	–	–	–	–
028R	<i>Alliaria petiolata</i>	garlic mustard	–	2	–	–	–	–	–	–
	<i>Amaranthus retroflexus</i>	redroot amaranth	–	3	2	–	–	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	2	–	–	–	2	2	X
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	X
	<i>Bromus tectorum</i>	cheatgrass	2	–	2	–	–	–	–	–
	<i>Capsella bursa-pastoris</i>	shepherd's purse	2	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	2	3	3	4	–	2	2	X
	<i>Convolvulus arvensis</i>	field bindweed	–	2	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	X
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	4	4	–	–	2	2	2	X
	<i>Lamium amplexicaule</i>	henbit	2	–	–	–	–	–	–	–
	<i>Polygonum arenastrum</i>	prostrate knotweed	1	–	–	–	2	–	–	X
	<i>Rumex patientia</i>	patience dock	–	2	–	X	–	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	3	–	–	–	–	–	–	–
051R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	3	3
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	2	–	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
052R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	–	–	–
053R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	2	3	3
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	1	–	–
054R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	1	2	–	–
055R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
056R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	–	–	–
057R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	–	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
058R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	3	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	1	1	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	2	1	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
059R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	3	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	3	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
060R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	3	3	3	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	1	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	2	–	–
061R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	3	3	3	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	1	2	3
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
062R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	3	3	3	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	2	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	1	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	2	2	–
063R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	1	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	–	1	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
064R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	3	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
065R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
066R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
066R (cont.)	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	–	–
067R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	3	3	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	1	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
068R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	2	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	2	–	–
069R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	3	3	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	2	–
070R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	3	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	2	–	–
071R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
072R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
073R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
074R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
075R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	3	3
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	2	2
076R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	0	v
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table D-1. Comparison of species and density for each vector block monitored at FOLS in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
077R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	3	3
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	2	2
078R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	2	2	2	–
079R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	3	3
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	3	3	3
080R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	3	3	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
081R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	0	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	3	3
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	3	2
082R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
083R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	3	3
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	3	3
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	–	1	1
084R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	–	–
085R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	3	3
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	3	3	3
086R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	–	2	2
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	3	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix E: Fort Union NM 2012 Field Report and Sampling Results

Transect: Ruin Trail

Species Found: CHEALB, CONARV, KOCSCO, MARVUL, MELALB, SALTRA, TAROFF, TRADUB

Description: During this trip, the crew ran transects on the two-track around the ruins. The most commonly found species were Russian thistle (*Salsola Tragus*), kochia (*Kochia scoparia*), and lambsquarters (*Chenopodium album*). All three species were found in greater abundance on patches of bare soil near the ruins, especially on the NE side. These species also appear to grow densely in arroyos and in smaller depressions in the landscape. Bindweed (*Convolvulus arvensis*) was found in smaller numbers, mostly on the NW part of the road.

Transect: West Spur

Species Found: CHEALB, CONARV, KOCSCO, MARVUL, MELALB, SALTRA, TRADUB

Description: Like the Ruin Trail, the most common species were Russian thistle (*Salsola Tragus*), kochia (*Kochia scoparia*), and lambsquarters (*Chenopodium album*). Although not entirely visible from our vantage point on the road, the arroyo just to the north was dense with exotic species. The exotic species also increased in diversity near the end of the road.

Transect: South Boundary

Species Found: BROINE, CHEALB, CONARV, KOCSCO, MELALB, RUMCRI, SALTRA

Description: The two most common species along the south boundary were Russian thistle (*Salsola tragus*) and bindweed (*Convolvulus arvensis*). Although the crew focused on plants within the park boundary, it is worth noting that these two species were found crossing the fence line into private property. The area near the sewage treatment ponds was mainly Kochia (*Kochia scoparia*) and bindweed (*Convolvulus arvensis*). The maintenance area presented the most diversity with populations of smooth brome (*Bromus inermis*), lambsquarters (*Chenopodium album*), and dock (*Rumex crispus*). Smooth brome was not seen elsewhere in the park, but a few plants were seen crossing into private property. Once past the large arroyo, the only species found was Russian thistle (*Salsola tragus*).

Fort Union NM Exotics Sampling Panel 1 - 7/9 - 7/11/2012

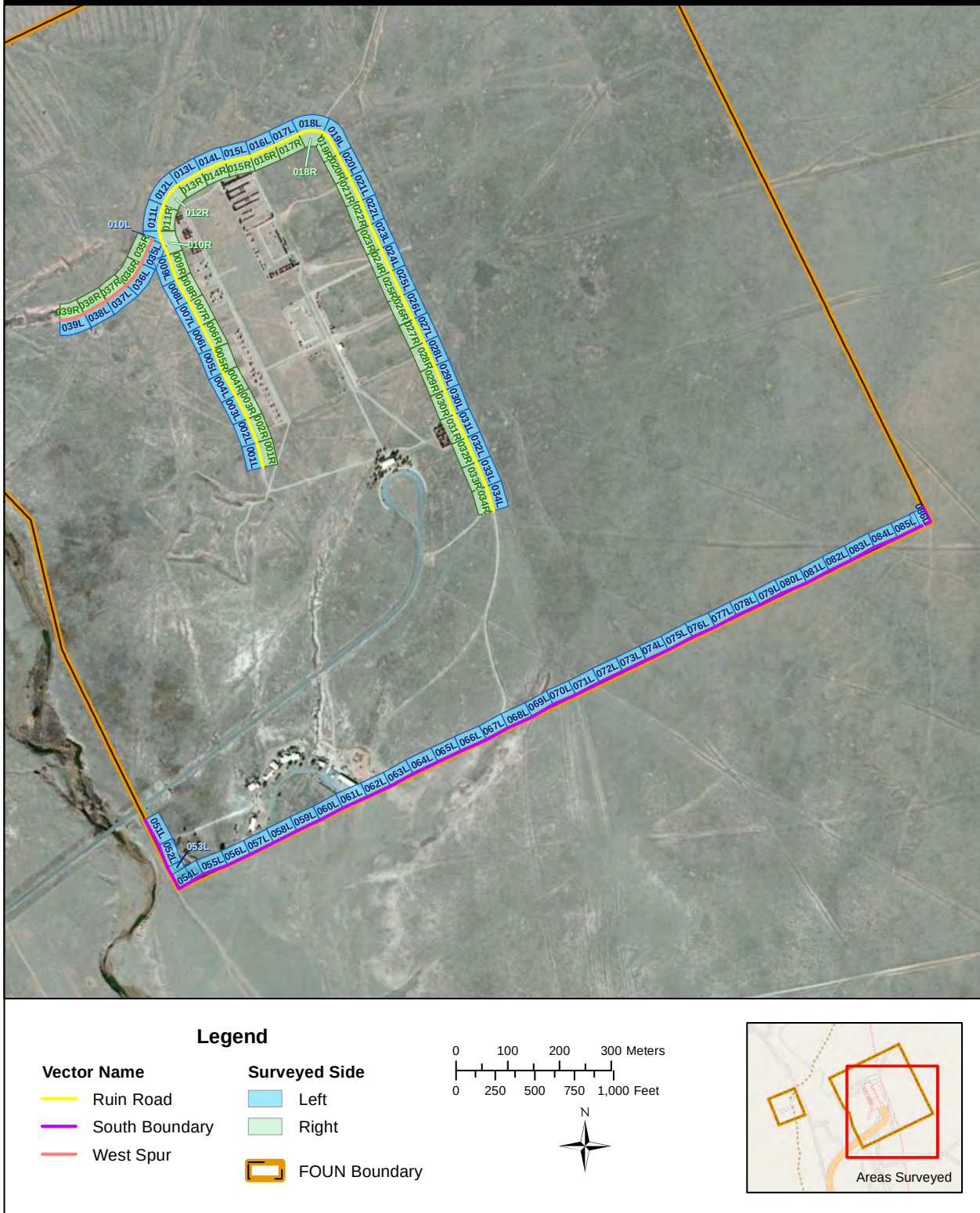


Figure E.1. Individual vector blocks sampled, Panel 1, Fort Union NM, 2012.

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	–	–
	<i>Kochia scoparia</i>	kochia	–	3	3	2	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	2	2	–	2	2	2	2
001R	<i>Kochia scoparia</i>	kochia	–	–	2	–	–	1	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	2	–	2	2	2	2
002L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	–
	<i>Kochia scoparia</i>	kochia	0	1	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
002R	<i>Chenopodium album</i>	lambsquarters	–	–	2	2	–	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	2	3	–	2	2	–
	<i>Melilotus alba</i>	white sweetclover	–	–	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	2	–	2	2	2	2
003L	<i>Kochia scoparia</i>	kochia	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	1
003R	<i>Chenopodium album</i>	lambsquarters	–	–	2	–	–	2	2	1
	<i>Kochia scoparia</i>	kochia	–	–	3	2	–	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
004L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	–	–
	<i>Kochia scoparia</i>	kochia	–	2	–	–	1	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	2	2
004R	<i>Chenopodium album</i>	lambsquarters	–	–	2	–	–	2	2	1
	<i>Kochia scoparia</i>	kochia	–	2	2	–	1	2	2	–
	<i>Marrubium vulgare</i>	horehound	–	–	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
005L	<i>Kochia scoparia</i>	kochia	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	2
005R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	1
	<i>Kochia scoparia</i>	kochia	1	2	3	2	–	2	2	–
	<i>Marrubium vulgare</i>	horehound	–	–	2	1	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	2	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	1	–	–	–	–	–
006L	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	–	–	–
	<i>Melilotus alba</i>	white sweetclover	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
006R	<i>Kochia scoparia</i>	kochia	–	2	2	2	1	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	1	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
007L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	–	–
	<i>Kochia scoparia</i>	kochia	–	2	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
007R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	–	–
	<i>Kochia scoparia</i>	kochia	–	–	3	2	1	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	2	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
008L	<i>Melilotus alba</i>	white sweetclover	1	2	1	1	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
008R	<i>Chenopodium album</i>	lambsquarters	–	–	1	–	–	1	–	–
	<i>Kochia scoparia</i>	kochia	1	–	2	–	–	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	1	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
009L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	1	2	–	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	2	3	2	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	2
009R	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	2	1	1	1
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	2	2	2	1	2	–	–
	<i>Melilotus alba</i>	white sweetclover	–	3	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
010L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	2	2	2	2
	<i>Melilotus alba</i>	white sweetclover	2	1	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
010R	<i>Chenopodium album</i>	lambsquarters	2	2	2	–	–	2	1	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Euphorbia davidii</i>	toothed spurge	–	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	3	2	2	2	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	1	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	2	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	2	2	2	2
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	1	–	–	–
011L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	–
	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	2	3	3	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	1
011R	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	1	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
011R (cont.)	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	3	2	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	–
012L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	–
	<i>Kochia scoparia</i>	kochia	1	–	2	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	1	–	1	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	2
012R	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	–	1	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	2	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	2	–
013L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	2	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	2	2
013R	<i>Melilotus alba</i>	white sweetclover	2	3	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
014L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	2
014R	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	1	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
015L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Convolvulus arvensis</i>	field bindweed	1	–	–	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
015R	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	1	1	0
	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	2	–	–	–	–	–	–
	<i>Marrubium vulgare</i>	horehound	1	–	–	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	2	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
016L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	1	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	1	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	1	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
016R	<i>Chenopodium album</i>	lambsquarters	2	2	X	X	–	2	X	1

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
016R (cont.)	<i>Kochia scoparia</i>	kochia	3	3	X	X	2	2	X	–
	<i>Melilotus alba</i>	white sweetclover	–	2	X	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	X	X	2	2	X	2
017L	<i>Euphorbia davidii</i>	toothed spurge	2	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	1	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
017R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	2	2	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	2
018L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	1	–
	<i>Euphorbia davidii</i>	toothed spurge	2	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	2	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
018R	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	2	2	2
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	2	–	3	3	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	0
019L	<i>Chenopodium album</i>	lambsquarters	1	2	2	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	1	2	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
019R	<i>Chenopodium album</i>	lambsquarters	2	–	1	–	2	2	2	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	4	–	3	3	3	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	2
020L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	1	2	–
	<i>Kochia scoparia</i>	kochia	3	–	–	2	2	–	2	2
	<i>Melilotus alba</i>	white sweetclover	–	–	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
020R	<i>Chenopodium album</i>	lambsquarters	0	2	2	–	2	2	2	2
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	4	2	3	2	3	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
021L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	1	2	–
	<i>Kochia scoparia</i>	kochia	1	2	–	–	2	–	2	–
	<i>Melilotus alba</i>	white sweetclover	0	1	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	2	2
021R	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	2	2	2
	<i>Kochia scoparia</i>	kochia	3	4	2	–	2	3	2	2
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
022L	<i>Kochia scoparia</i>	kochia	2	1	–	–	3	–	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	2	2
022R	<i>Chenopodium album</i>	lambsquarters	–	2	2	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	3	3	2	2	3	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	2
023L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	1	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	1
023R	<i>Chenopodium album</i>	lambsquarters	–	2	2	2	2	2	2	2
	<i>Kochia scoparia</i>	kochia	3	3	2	2	2	2	2	2
	<i>Melilotus alba</i>	white sweetclover	1	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
024L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
024R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	2	2
	<i>Kochia scoparia</i>	kochia	–	–	2	2	–	–	2	2
	<i>Melilotus alba</i>	white sweetclover	1	–	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	2	2
025L	<i>Kochia scoparia</i>	kochia	1	–	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
025R	<i>Chenopodium album</i>	lambsquarters	–	–	2	X	1	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	3	X	1	–	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	2	2
026L	<i>Kochia scoparia</i>	kochia	2	2	2	–	–	3	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	3	2	2
026R	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	1	2	–	–
	<i>Kochia scoparia</i>	kochia	2	2	3	2	1	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
027L	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	2	2	2
	<i>Melilotus alba</i>	white sweetclover	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	3	2	2
027R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	3	–	1	1	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	2	2
028L	<i>Kochia scoparia</i>	kochia	2	2	1	–	2	2	2	2
	<i>Melilotus alba</i>	white sweetclover	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
028R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	1	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	2	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
028R (cont.)	<i>Melilotus alba</i>	white sweetclover	2	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	2
029L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
029R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	2	2	2	1	2	–	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
030L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
030R	<i>Chenopodium album</i>	lambsquarters	–	–	1	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	2	–	2	2	–	–	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
031L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	1	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	1	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
031R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Kochia scoparia</i>	kochia	–	1	–	X	1	–	2	2
	<i>Marrubium vulgare</i>	horehound	–	–	3	X	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	2	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
032L	<i>Kochia scoparia</i>	kochia	2	2	–	–	1	1	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
032R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	2	2
	<i>Kochia scoparia</i>	kochia	2	–	–	2	–	2	–	–
	<i>Marrubium vulgare</i>	horehound	–	–	2	2	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	2
033L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	2	1	–	–	1	1	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	1	1	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	1	–
033R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	2	–
	<i>Kochia scoparia</i>	kochia	2	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	2	2	2	2
034L	<i>Kochia scoparia</i>	kochia	–	–	2	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
034L (cont.)	<i>Melilotus alba</i>	white sweetclover	–	–	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
034R	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	2	2	–	–
035L	<i>Brassica sp.</i>	mustard	1	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	–	1	–	–	2	2	1	2
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
035R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Kochia scoparia</i>	kochia	1	2	3	2	–	2	3	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	1
036L	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	1	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	–
036R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	3	3	2	1	2	2	2
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
037L	<i>Chenopodium album</i>	lambsquarters	2	2	2	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	2	2	2	2
	<i>Melilotus alba</i>	white sweetclover	–	–	2	2	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	2	–	2	2	2	2
037R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	2
	<i>Euphorbia davidii</i>	toothed spurge	2	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	2	–	2	2	3	2
	<i>Melilotus alba</i>	white sweetclover	1	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
038L	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	2	2	2	1
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	3	2	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	2
038R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	2
	<i>Euphorbia davidii</i>	toothed spurge	2	3	2	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	3	2	2	2	2	–
	<i>Melilotus alba</i>	white sweetclover	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
039L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	1	–	–
	<i>Kochia scoparia</i>	kochia	2	–	2	2	2	2	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
039R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	–	–	2
	<i>Kochia scoparia</i>	kochia	–	2	X	X	2	2	2	–
	<i>Marrubium vulgare</i>	horehound	–	–	–	–	–	2	–	–
	<i>Melilotus alba</i>	white sweetclover	–	2	X	X	–	–	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
051L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	1	1
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
052L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
053L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	3	3	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
054L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
055L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
056L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	2	2	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	–	–	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
057L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
058L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	–
059L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	2	3	1
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
060L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	–	–	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
061L	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	2	2
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	2	2	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	–	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table E-1 Comparison of species and density for each vector block monitored at FOUN in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
061L	<i>Rumex crispus</i>	curly dock	–	–	–	–	1	2	2	1
(cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	1
062L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	–	2	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	–	–	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
063L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	1	–	–	–
	<i>Rumex crispus</i>	curly dock	–	–	–	–	–	–	–	1
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
064L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
065L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
066L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
067L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
068L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
069L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	–
070L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	2
071L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
072L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
073L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	1	–
074L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
075L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
076L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
077L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
078L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
079L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
080L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
081L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
082L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
083L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
084L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
085L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
086L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix F: Lake Meredith NRA / Alibates Flint Quarries NM 2012 Field Report and Sampling Results

Transect: Alibates Road

Species Found: BOTISC, BROJAP, CHEALB, ERACIL, KOCSCO, LACSER, SALTRA, TRADUB

Description: Only two species were found with any abundance along this road, common lambsquarters (*Chenopodium album*) and prickly Russian thistle (*Salsola tragus*). Nearly all the other species seen were found along the paved section of this road which only lasted approximately 250m. Most vector blocks had no plants found within them, or small numbers of the two main species seen.

Alibates Flint Quarries NM Exotics Sampling Panel 1 - 6/20 - 6/21/2012

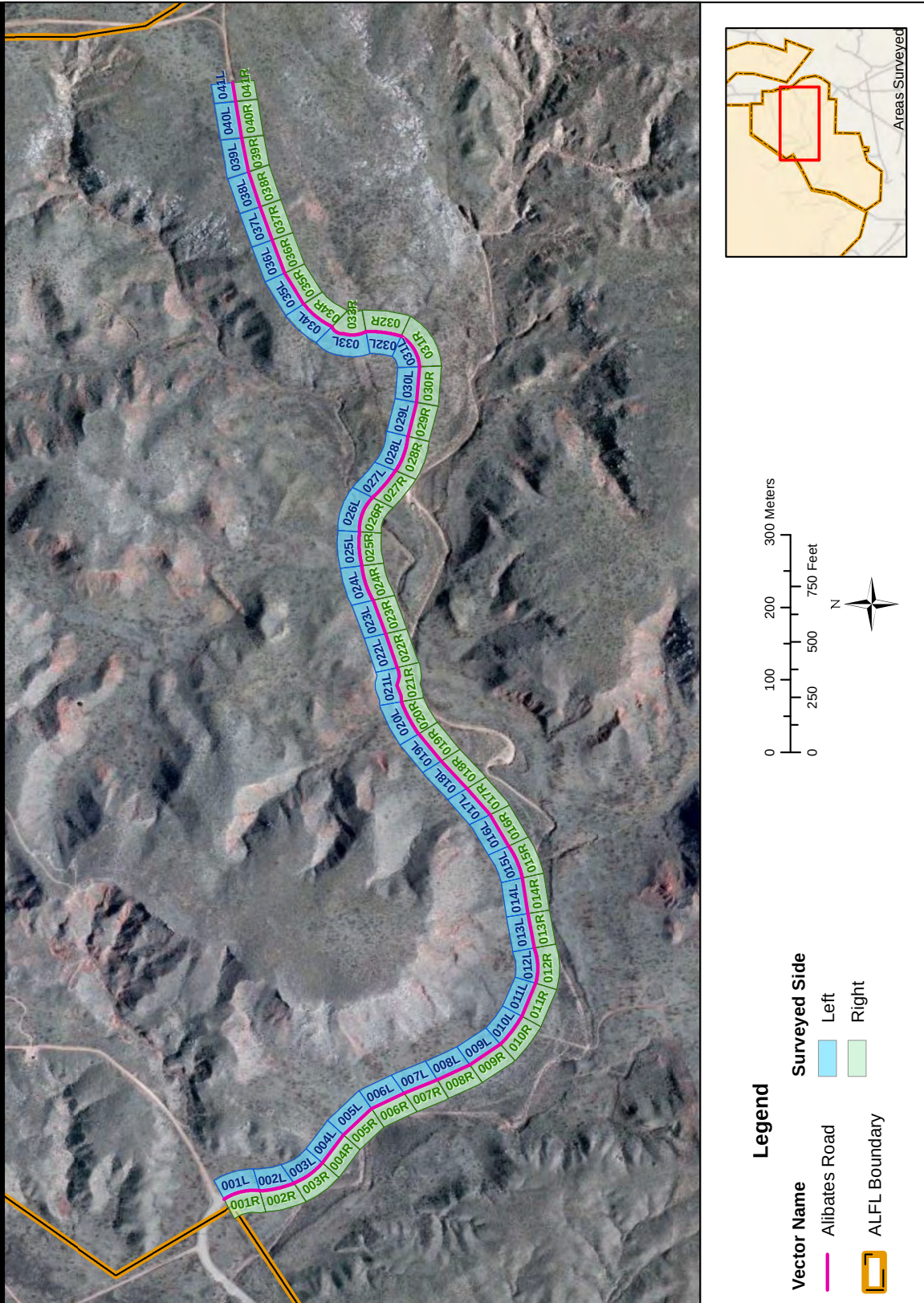


Figure F1. Individual vector blocks sampled, Panel 1, Alibates Flint Quarries NM, 2012.

Table F-1 Comparison of species and density for each vector block monitored at ALFL in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	2	2
	<i>Setaria viridis</i>	green bristlegrass	1	2	2	–	–	–	–	–
001R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	2	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	2	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
002L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	–
	<i>Digitaria sanguinalis</i>	hairy crabgrass	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	1	–	–	2	2	2	2
	<i>Setaria viridis</i>	green bristlegrass	1	2	2	–	–	–	–	–
002R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	2	–	–	–	–	–
003L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	–	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	1	2	2	–	–	–	–	–
003R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	2	2
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
004L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	–	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	–	3	3	2	–	–	–	–
004R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	–	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	–	–	–	–	–	–
005L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table F-1 Comparison of species and density for each vector block monitored at ALFL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
005L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Setaria viridis</i>	green bristlegrass	–	3	2	2	–	–	–	–
005R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	–	–	–	–	–	–
006L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	2	2	1	–	–	–	–
006R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	–	2	–	–	–	–	–	–
007L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	2
	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	2	1	1	–	–	–	–
007R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
008L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	3	2
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	2	2	3	–	–	–	–
008R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	3	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	X
	<i>Setaria viridis</i>	green bristlegrass	2	2	–	–	–	–	–	–
009L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	2	–	2	–	–	–	–
009R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	X
	<i>Setaria viridis</i>	green bristlegrass	–	2	2	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	X
010L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
010R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	2	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	–	1	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table F-1 Comparison of species and density for each vector block monitored at ALFL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
011L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	X	X	X	2	2	–	–
011R	No Exotics	no exotics found	0	0	0	0	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
012L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	X	X
	<i>Salsola tragus</i>	prickly Russian thistle	1	X	X	X	2	2	X	X
012R	No Exotics	no exotics found	0	0	0	0	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
013L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	X	X
	<i>Salsola tragus</i>	prickly Russian thistle	1	X	X	X	2	2	X	X
	<i>Setaria viridis</i>	green bristlegrass	2	X	X	X	–	–	–	–
013R	No Exotics	no exotics found	0	0	0	0	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
014L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	X	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	X	X
	<i>Setaria viridis</i>	green bristlegrass	2	2	2	X	–	–	–	–
014R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	2
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	–	–	–	–	–	–	–
015L	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
015R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
016L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	X	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	X	X
016R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
017L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	X	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	X	X
017R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	–	X
018L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	X	X
	<i>Kochia scoparia</i>	kochia	3	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	1	–	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	2	–	–	–	–	–
018R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	–	–	–	–
019L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table F-1 Comparison of species and density for each vector block monitored at ALFL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
019L (cont.)	<i>Kochia scoparia</i>	kochia	2	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	X	X
019R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	–	X	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
020L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	X	X
	<i>Kochia scoparia</i>	kochia	3	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	2	–	–	–	–	–
020R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	–	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	–	–
	<i>Kochia scoparia</i>	kochia	3	X	X	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
021L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	2	2	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
021R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
022L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	3	3	2	–	–	–	–	–
022R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	2
	<i>Kochia scoparia</i>	kochia	3	3	–	–	–	–	–	–
023L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	X	X
	<i>Kochia scoparia</i>	kochia	3	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	X	X
	<i>Tragopogon dubius</i>	western salsify	–	2	2	–	–	–	–	–
023R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	–	X
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	X
	<i>Setaria viridis</i>	green bristlegrass	1	2	2	–	–	–	–	–
024L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	X	X
	<i>Kochia scoparia</i>	kochia	3	3	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	X	X
024R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	–	2	–	–	–	–	–
025L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	–
	<i>Kochia scoparia</i>	kochia	3	3	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table F-1 Comparison of species and density for each vector block monitored at ALFL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
025R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	2
	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
026L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	3	3	3	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	2	–	–	–	–	–
026R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
027L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	2	2	2	–
	<i>Kochia scoparia</i>	kochia	2	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
027R	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	–	–	–
	No Exotics	no exotics found	–	–	–	–	0	0	0	0
028L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	X	X
	<i>Kochia scoparia</i>	kochia	3	3	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	X	X
028R	<i>Chenopodium glaucum</i>	oakleaf goosefoot	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	X	X
029L	<i>Chenopodium glaucum</i>	oakleaf goosefoot	–	2	–	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	3	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	X	X
029R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	–	–
	<i>Chenopodium glaucum</i>	oakleaf goosefoot	1	–	X	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	X	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
030L	<i>Kochia scoparia</i>	kochia	3	3	0	0	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	X	X
030R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	X	X
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	X	X
031L	<i>Kochia scoparia</i>	kochia	2	3	3	–	–	–	–	–
	No Exotics	no exotics found	–	–	–	–	0	0	0	0
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
031R	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–
	No Exotics	no exotics found	–	–	–	–	0	0	0	0
032L	<i>Kochia scoparia</i>	kochia	3	3	X	X	–	–	–	–
	No Exotics	no exotics found	–	–	–	–	0	0	0	0
	<i>Taraxacum officinale</i>	common dandelion	1	–	X	X	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table F-1 Comparison of species and density for each vector block monitored at ALFL in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
032R	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
033L	<i>Kochia scoparia</i>	kochia	2	3	X	X	–	–	–	–
	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	X	X	–	–	–	–
033R	<i>Kochia scoparia</i>	kochia	2	2	X	X	–	–	–	–
	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
034L	<i>Kochia scoparia</i>	kochia	2	3	0	0	–	–	–	–
	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
034R	<i>Kochia scoparia</i>	kochia	3	2	0	0	–	–	–	–
	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
035L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
035R	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
036L	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
036R	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	–	–
037L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
037R	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
038L	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
038R	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	X
039L	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0
039R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	–	X
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	–	X
040L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	2	2	–
040R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	X
041L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	–
041R	<i>No Exotics</i>	no exotics found	–	–	–	–	0	0	0	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix G: Lyndon B. Johnson NHP 2012 Field Report and Sampling Results

Transect: Restoration Trail

Species Found: BOTISC, BROCAT, BROTEC, CYNDAC, CYPESC, GALDIV, LOLPER, LONJAP, MEDLUP, MEDMIN, POAPRA, SORHAL, TAROFF, TORARV

Description: During this trip, the crew ran transects on the Settlement Trail. The most commonly found species along the trail were King Ranch bluestem (*Bothriochloa ischaemum*), both Medicago species, and both Brome species. Most species were found near the restroom area, and near the ponds within the interior of the trail. The species discovered this year were not as dense as in previous years. King Ranch bluestem (*Bothriochloa ischaemum*) and rescuegrass (*Bromus catharticus*) were the two species which seemed to have increased in numbers the most. Rescuegrass (*Bromus catharticus*) was found sporadically along the trail, and more heavily in the picnic/restroom area. The presence of Johnsongrass (*Sorghum halepense*) has decreased. It was mainly found near the ponds and in the picnic/restroom area.

On a good note, there are an abundance of natives found on both the interior and exterior of the loop. While we were at the park, the wildflowers were in full bloom!

Lyndon B. Johnson NHP Exotics Sampling Panel 1 - 5/23/2012

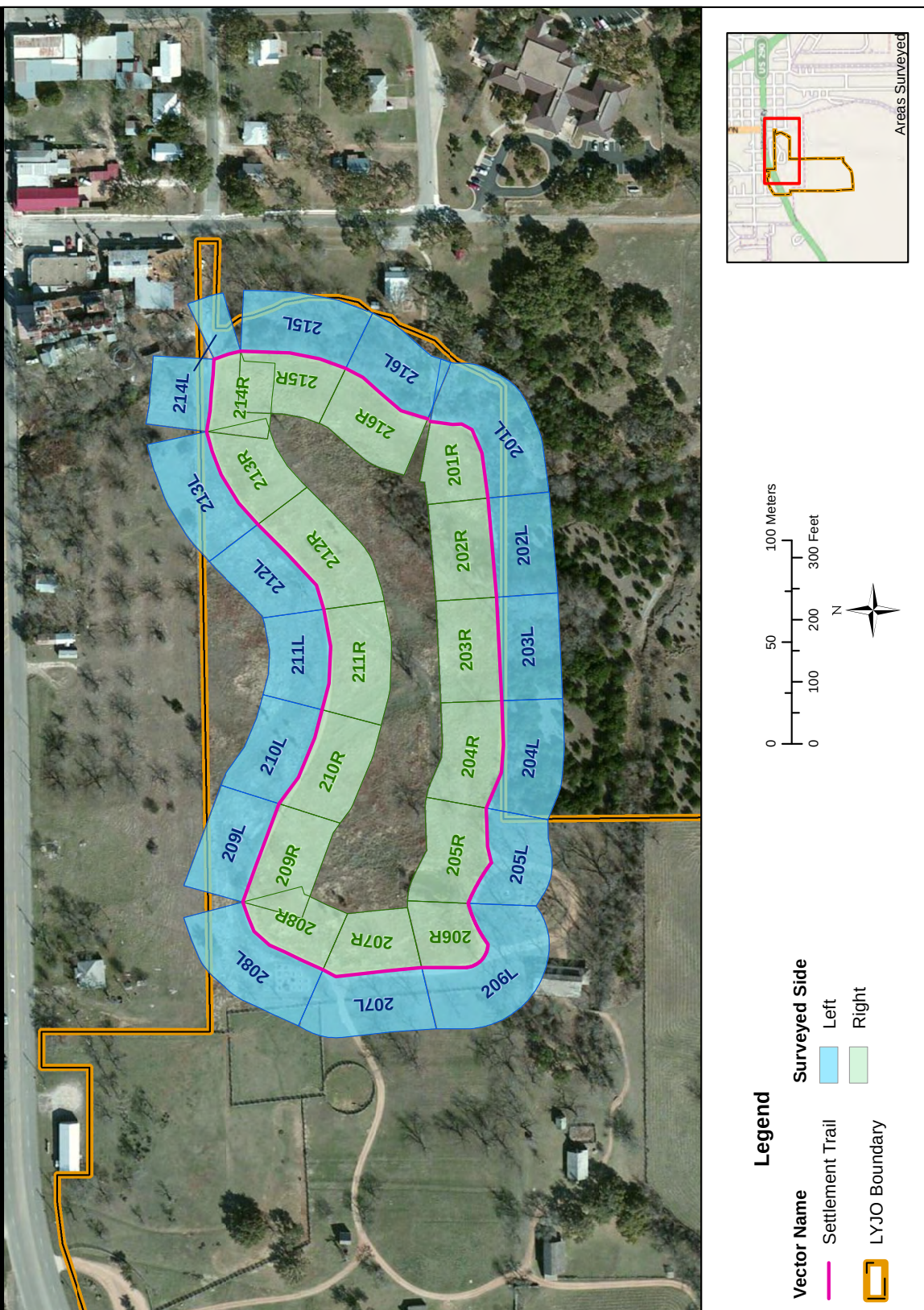


Figure G1. Individual vector blocks sampled, Panel 1, Lyndon B. Johnson NHP, 2012.

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
201L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	X	X	X	–	–	–	–	2	2	X	X
	<i>Bromus japonicus</i>	Japanese brome	1	X	X	X	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	–	–	–	–	–	–	–	–	1	X	X
	<i>Medicago lupulina</i>	black medick clover	2	X	X	X	–	–	–	–	2	–	X	X
	<i>Taraxacum officinale</i>	common dandelion	1	X	X	X	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	X	X	X	–	–	–	–	–	2	X	X
	<i>Vicia sativa</i>	garden vetch	1	X	X	X	–	–	–	–	–	–	–	–
201R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	1	1	–	–	–	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	–	–	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	–	–	–	–	–	–	–	–	1	–	–
	<i>Medicago lupulina</i>	black medick clover	3	2	–	–	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	1	2	–	–	–	–	–	–	–	2
	<i>Torilis arvensis</i>	spreading hedge parsley	–	–	–	–	–	–	–	–	–	2	–	–
202L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	–	X	X	2	–	X	X	–	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	1	–	X	X	–	–	–	–	1	–	X	X
	<i>Galium divaricatum</i>	Lamarks bedstraw	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	–	–	–	–	–	–	–	–	2	X	X
	<i>Medicago lupulina</i>	black medick clover	3	–	X	X	2	–	X	X	2	2	X	X
	<i>Paspalum urvillei</i>	vaseygrass	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Poa pratensis</i>	Kentucky bluegrass	–	–	–	–	–	–	–	–	2	2	X	X
	<i>Taraxacum officinale</i>	common dandelion	1	–	X	X	–	–	–	–	1	–	X	X
	<i>Torilis arvensis</i>	spreading hedge parsley	–	–	–	–	–	–	–	–	2	–	X	X
	<i>Vicia sativa</i>	garden vetch	1	–	X	X	–	–	–	–	–	–	–	–
202R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	2	1	–	2	2	–	X	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	2	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Cyperus esculentus</i>	chufa flatsedge	–	–	–	–	–	–	–	–	–	1	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	1	1	–	–	–	–	–	1	2	–	–
	<i>Lolium arundinaceum</i>	tall fescue	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	–	–	–	–	–	–	–	–	2	–	–
	<i>Medicago lupulina</i>	black medick clover	3	2	–	–	2	–	–	X	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	1	2	–	2	2	X	–	2	2	2
	<i>Torilis arvensis</i>	spreading hedge parsley	1	1	–	–	–	–	–	–	–	2	–	–
203L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	1	X	X	2	–	X	X	2	2	X	X
	<i>Bromus tectorum</i>	cheatgrass	1	1	X	X	–	–	–	–	–	2	X	X
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
203L (cont.)	<i>Lolium perenne</i>	perennial ryegrass	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	2	1	X	X	–	–	–	–	–	2	X	X
	<i>Medicago lupulina</i>	black medick clover	2	2	X	X	2	–	X	X	2	–	X	X
	<i>Paspalum urvillei</i>	vaseygrass	1	1	X	X	–	–	–	–	–	–	–	–
	<i>Poa pratensis</i>	Kentucky bluegrass	–	–	–	–	–	–	–	–	2	2	X	X
	<i>Taraxacum officinale</i>	common dandelion	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	–	X	X	–	–	–	–	–	2	X	X
	<i>Vicia sativa</i>	garden vetch	1	–	X	X	–	–	–	–	–	–	–	–
203R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	1	–	–	2	2	–	X	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	3	–	–	1	–	–	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	2	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	1	1	–	–	–	–	–	–	–	–	–
	<i>Lolium arundinaceum</i>	tall fescue	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	1	1	–	–	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	–	–	–	–	1	–	X	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	2	–	–	X	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	1	–	–	2	2	X	–	2	2	2
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	–	–	–	–	2	1	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	2	–	–	–	–	–	–	–	2	–	–
204L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	1	X	X	2	–	X	X	2	2	X	X
	<i>Bromus japonicus</i>	Japanese brome	1	1	X	X	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	2	1	X	X	–	–	–	–	1	2	X	X
	<i>Conium maculatum</i>	poison hemlock	–	–	–	–	1	–	X	X	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	X	X
	<i>Lonicera japonica</i>	Japanese honeysuckle	1	1	X	X	–	–	–	–	–	1	X	X
	<i>Medicago lupulina</i>	black medick clover	2	–	X	X	2	–	X	X	2	–	X	X
	<i>Sorghum halepense</i>	Johnsongrass	1	–	X	X	–	–	–	–	1	2	X	X
	<i>Taraxacum officinale</i>	common dandelion	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	–	X	X	–	–	–	–	–	2	X	X
204R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	3	1	–	–	–	2	2	–	2	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	2	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	–	1	–	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	1	–	–	–	–	–	–	–	2	–	–
	<i>Lolium arundinaceum</i>	tall fescue	–	2	–	2	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	2	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	3	2	1	–	2	2	–	–	2	2	2
	<i>Torilis arvensis</i>	spreading hedge parsley	–	2	–	–	–	–	–	–	–	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
205L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	X	X	2	2	2	–
	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	2	–	–	2	–	X	X	–	–	–	–
	<i>Centaurea melitensis</i>	Maltese star-thistle	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	–	1	–	X	X	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	2	–	–	–	–	–	2	2	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	3	–	2	–	X	X	–	2	1	–
	<i>Taraxacum officinale</i>	common dandelion	1	–	1	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	1	–	–	–	–	–	–	–	2	–	–
205R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	–	–	–	2	–	–	–	2	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	2	–	–	1	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	2	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	–	1	1	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	1	–	–	–	2	2	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	1	1	–	–	–	–	–	–	2	–	–
	<i>Lolium arundinaceum</i>	tall fescue	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	3	1	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	–	–	–	–	2	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	2	3	2	–	–	2	2	–	–	2	2	2
	<i>Taraxacum officinale</i>	common dandelion	1	–	–	–	–	–	–	–	2	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	0	1	–	–	–	–	–	–	–	2	–	–
206L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	2	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	–	–	–	–	2	1	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	1	–	–	2	2	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	2	2	–
	<i>Lolium arundinaceum</i>	tall fescue	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	1	2	1	–	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	2	2	–	2	2	–	–	2	2	–	–
	<i>Sorghum halepense</i>	Johnsongrass	1	1	–	–	–	–	–	–	–	2	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	1	1	–	–	–	–	–	–	–	–	–
	<i>Vicia sativa</i>	garden vetch	1	1	–	–	–	–	–	–	–	–	–	–
206R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	X	1	–	–	2	–	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	X	3	–	–	2	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	2	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–	–	–	–	–
	<i>Lolium arundinaceum</i>	tall fescue	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	2	–	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
206R (cont.)	<i>Sorghum halepense</i>	Johnsongrass	X	2	2	–	–	3	2	–	–	2	2	2
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	1	–	–	–	–	–	–	–	2	–	–
207L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	2	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	2	–	–	–	–	–	–	–	–	–	–	–
	<i>Centaurea melitensis</i>	Maltese star-thistle	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	2	–	–	2	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Paspalum urvillei</i>	vaseygrass	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	1	–	2	2	2	–	–	2	–	–
	<i>Taraxacum officinale</i>	common dandelion	1	–	1	–	–	–	–	–	–	–	–	–
207R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	–	–	–	2	1	–	–	2	2	2	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	1	1	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–	2	–	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	2	2	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	2	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	–	1	2	3	–	–	2	2	–
	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	–	1	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	2	–	–	–	–	–	–	–	1	–	–
208L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	2	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Centaurea melitensis</i>	Maltese star-thistle	1	3	3	2	–	–	–	–	–	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	–	2	2	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	1	1	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	2	–	2	2	2	–	–	2	2	–
	<i>Taraxacum officinale</i>	common dandelion	1	1	–	–	–	–	–	–	2	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Vicia sativa</i>	garden vetch	1	–	–	–	–	–	–	–	–	–	–	–
208R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	2	–	–	2	2	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	–	–
	<i>Conium maculatum</i>	poison hemlock	–	–	–	–	1	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	1	1	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	1	1	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	2	2	2	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	2	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	1	–	–	2	–	–	–	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
208R (cont.)	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	2	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	1	1	–	–	–	–	–	–	2	–	–
209L	<i>Bromus japonicus</i>	Japanese brome	2	–	–	–	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	1	–	–	–	–	–	–	–	–	2	–	–
	<i>Centaurea melitensis</i>	Maltese star-thistle	2	3	–	–	–	–	–	–	–	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	1	3	3	3	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	–	1	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Paspalum urvillei</i>	vaseygrass	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	1	2	2	2	2	2	–	–	–	2	1	–
	<i>Taraxacum officinale</i>	common dandelion	1	–	–	–	–	–	–	–	2	–	–	–
209R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	1	2	–	–	2	2	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	–	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	2	–	2	2	–	–	–	1	2	–	–
	<i>Medicago lupulina</i>	black medick clover	2	1	–	–	–	–	–	–	2	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	1	1	–	–	–	–	–	–	1	–	–
210L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–	2	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Lolium arundinaceum</i>	tall fescue	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	2	–	–	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	1	1	2	2	2	–	–	–	2	1	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	1	1	–	–	–	–	–	2	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	2	2	–	–	–	–	–	–	–	–	–
210R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	2	–	–	–	–	–	–	–	–	–	–	–
	<i>Galium divaricatum</i>	Lamarks bedstraw	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	1	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	–	–	–	2	2	3	–	1	–	–
	<i>Taraxacum officinale</i>	common dandelion	1	2	1	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	1	1	–	–	–	–	–	–	–	–	–
211L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	–	–	–	–
	<i>Centaurea melitensis</i>	Maltese star-thistle	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	1	2	3	2	2	2	2	–	–	2	–	–
	<i>Taraxacum officinale</i>	common dandelion	1	1	–	–	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
211R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	2	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	1	2	3	–	1	1	2
	<i>Taraxacum officinale</i>	common dandelion	–	2	–	–	–	–	–	–	–	–	–	–
212L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–	2	2	2	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	1	–	–
	<i>Lolium arundinaceum</i>	tall fescue	2	3	3	2	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	2	3	3	2	2	2	2	–	–	2	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	–	–	–	–	2	1	–	–
212R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	–	–	–	–	–	–	–	–
	<i>Medicago minima</i>	burr medick clover	2	–	–	–	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	–	2	–	1	2	2	–	2	2	2
	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	1	–	–	–	–	–	–	–	–	–	–
213L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	2	2	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	2	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	–	2	3	2	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	2	2	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	–	–	–	–	1	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	2	2	–	–	–	–	–	1	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	1	1	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	2	3	3	–	–	–	–	–	–	–	–	–
213R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Galium divaricatum</i>	Lamarck's bedstraw	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	–	–	–	–	2	–	–	–
	<i>Medicago minima</i>	burr medick clover	2	2	–	–	–	–	–	–	2	2	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	–	–	–	–	–	–	–	2	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	2	–	–	–	–	–	–	–	–	–	–
214L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	1	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	2	2	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	2	2	–	–	–	–	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
214L (cont.)	<i>Lolium arundinaceum</i>	tall fescue	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Lonicera japonica</i>	Japanese honeysuckle	–	1	1	–	–	–	–	–	–	–	–	–
	<i>Medicago minima</i>	burr medick clover	1	–	–	–	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	3	3	2	2	–	–	1	2	2	–
	<i>Torilis arvensis</i>	spreading hedge parsley	1	2	–	–	–	–	–	–	–	2	–	–
214R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–	2	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	1	–	–	–	2	–	–	–	2	–	–	–
	<i>Medicago minima</i>	burr medick clover	2	2	–	–	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	2	2	–	1	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	–	–	–	–	–	–	–	–	1	–	–
215L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	X	X	2	–	X	X
	<i>Bromus japonicus</i>	Japanese brome	1	–	X	X	–	–	–	–	–	–	–	–
	<i>Lolium perenne</i>	perennial ryegrass	2	1	1	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	X	X	–	–	–	–	2	–	X	X
	<i>Medicago minima</i>	burr medick clover	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	2	3	X	X	2	2	X	X	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	2	2	2	–	–	–	–	–	1	1	X	X
215R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	1	2	–	–	–	–	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	2	–	–	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	2	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Dichanthium annulatum</i>	Kleberg bluestem	1	2	–	–	–	–	–	–	–	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	2	–	–	–	2	2	–	–
	<i>Medicago minima</i>	burr medick clover	2	–	–	–	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	2	–	–	2	2	2
	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	1	–	–	–	–	–	–	–	–	–	–
216L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	X	X	X	2	–	X	X	2	–	X	X
	<i>Medicago lupulina</i>	black medick clover	3	X	X	X	2	–	X	X	2	–	X	X
	<i>Medicago minima</i>	burr medick clover	3	X	X	X	–	–	–	–	–	–	–	–
	<i>Paspalum urvillei</i>	vaseygrass	1	X	X	X	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	1	X	X	X	2	–	X	X	–	–	–	–
	<i>Torilis arvensis</i>	spreading hedge parsley	–	–	–	–	–	–	–	–	–	2	X	X
216R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	–	–	–	2	2	–	–	2	1	–	–
	<i>Bromus japonicus</i>	Japanese brome	–	1	–	–	–	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	–	–	–	–	1	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	–	–	–	–	2	–	–	–
	<i>Medicago lupulina</i>	black medick clover	2	–	–	–	2	–	–	–	2	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table G-1. Comparison of species and density for each vector block monitored at LYJO in 2010, 2011 and 2012.(continued).

Vector Block	Scientific Name	Common Name	2010				2011				2012			
			D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
216R (cont.)	<i>Medicago minima</i>	burr medick clover	2	2	–	–	–	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	–	2	–	–	2	3	–	2	–	2
	<i>Taraxacum officinale</i>	common dandelion	–	1	–	–	–	–	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix H: Pecos NHP 2012 Field Report and Sampling Results

At PECO, the bromes were showing up in mass. Four species were found along the transects. The crew also noticed more concentrated areas of King Ranch bluestem (*Bothriochloa ischaemum*) along the river and around the maintenance areas. Nearly all species were found directly along the road or within the first few meters of D2.

Transect: Forked Lightning Road

Species Found: BROARV, BROINE, BROJAP, BROTEC, CHEALB, CONARV, EROCIC, KOCSCO, LACSER, LACTAT, MELALB, MELOFF, ONOACA, POLAVI, SALTRA, TRADUB, VERTHA

Description: On Forked Lightning Road, many species were seen, but most in very small numbers. It seems as though this is an area of high introduction for new species. It will be very interesting to see if these new species found continue to expand in the area during the next survey. Only field brome (*Bromus arvensis*) and prickly Russian thistle (*Salsola tragus*) were found the whole length of the road. All other species were very sporadic.

Transect: Pasture 3 Access Road

Species Found: BROARV, BROINE, CHEALB, CONARV, EROCIC, KOCSCO, LACSER, MELALB, MELOFF, ONOACA, SALTRA, TRADUB, VERTHA

Description: On Pasture 3 Access Road, most species were found right at the beginning or down along the north fence line. Prickly Russian thistle (*Salsola tragus*), western salsify (*Tragopogon dubius*), and prickly lettuce (*Lactuca serriola*) were the top three species of concern. Along the north fence, common mullein (*Verbascum thapsus*) was VERY heavy. There were areas with nearly 10-15 plants per meter. It is definitely an area to watch.

Pecos NHP Exotics Sampling Panel 1 - 7/17 - 7/18/2012

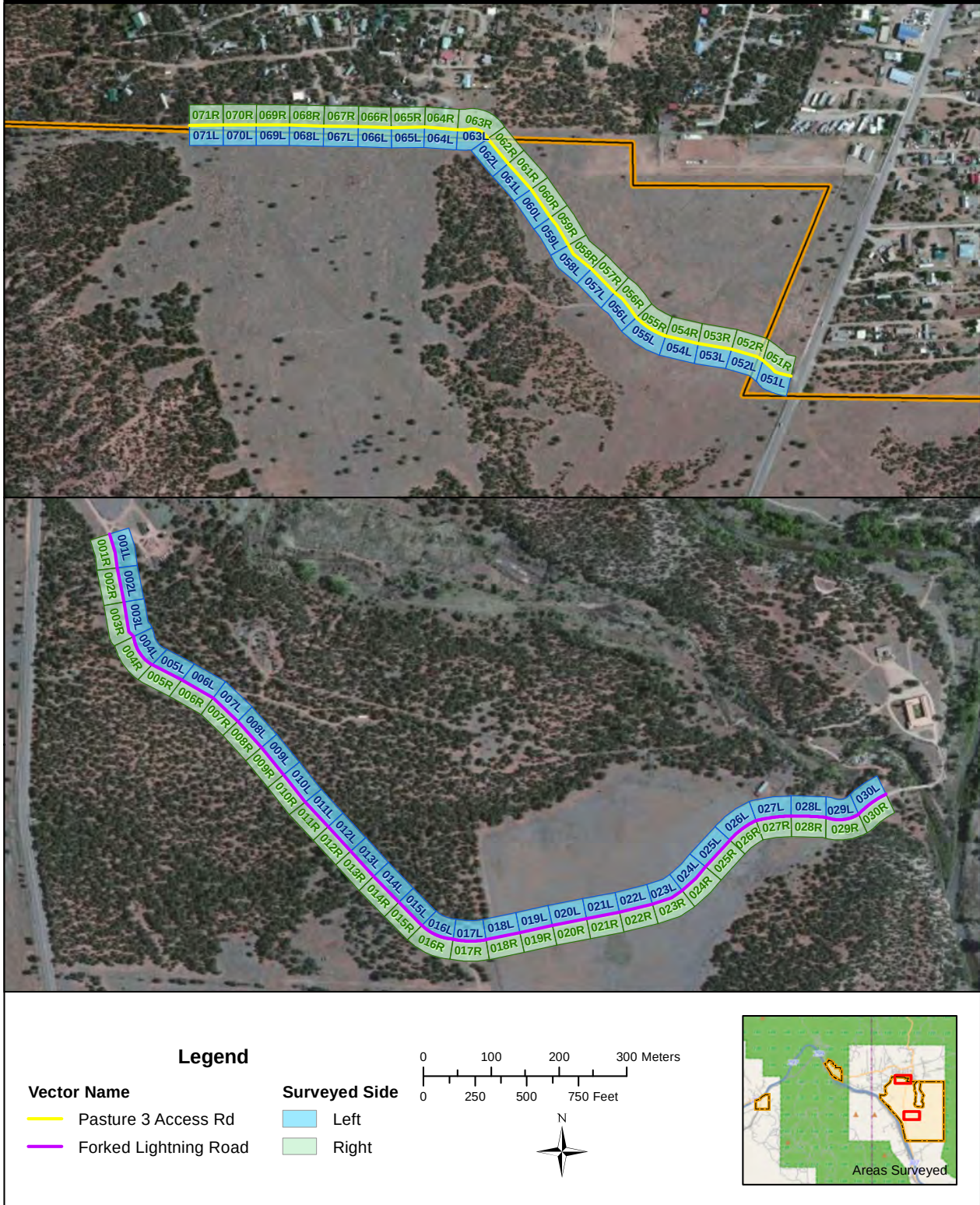


Figure H.1. Individual vector blocks sampled, Panel 1, Pecos NHP, 2012.

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Melilotus alba</i>	white sweetclover	2	2	X	X	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	2	X	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	X	X	–	–	–	–
001R	No Exotics	No Exotics	0	0	0	0	0	0	0	0
002L	<i>Melilotus alba</i>	white sweetclover	1	–	–	X	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
002R	No Exotics	No Exotics	0	0	0	0	0	0	0	0
003L	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	1	1	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
	<i>Tragopogon dubius</i>	western salsify	2	–	–	X	–	–	–	–
003R	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
	<i>Verbascum thapsus</i>	common mullein	1	–	–	–	–	–	–	–
004L	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	1	1	X	X
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	1	–	–	–	–	–	–
004R	<i>Melilotus alba</i>	white sweetclover	1	–	–	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
005L	<i>Chenopodium album</i>	lambsquarters	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	–	–	X
005R	<i>Bromus japonicus</i>	Japanese brome	–	–	–	–	2	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
	<i>Verbascum thapsus</i>	common mullein	–	1	–	–	–	–	–	–
006L	No Exotics	No Exotics	0	0	0	X	0	0	0	0
006R	<i>Kochia scoparia</i>	kochia	1	–	–	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
007L	<i>Chenopodium album</i>	lambsquarters	1	–	–	X	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	X	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
007L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	X
	<i>Tragopogon dubius</i>	western salsify	1	–	–	X	–	–	–	–
007R	No Exotics	No Exotics	–	–	–	–	0	0	0	0
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
008L	<i>Convolvulus arvensis</i>	field bindweed	3	2	–	X	1	–	X	X
	<i>Tragopogon dubius</i>	western salsify	1	–	–	X	–	–	–	–
008R	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	1	–	–	–
009L	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	0	1	–	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
009R	<i>Convolvulus arvensis</i>	field bindweed	2	2	0	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	1	0	0	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
010L	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	X	X
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	1	–	X	–	–	–	–
010R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	2	2	X	–	–	–	–
011L	No Exotics	No Exotics	0	0	0	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	X	X
011R	No Exotics	No Exotics	0	0	0	0	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
012L	<i>Bromus inermis</i>	smooth brome	1	–	–	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	X	X
	<i>Chenopodium album</i>	lambsquarters	2	2	–	X	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	1	–	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	X	X
	<i>Verbascum thapsus</i>	common mullein	–	–	1	X	–	–	–	–
012R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
013L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	X	X
	<i>Chenopodium album</i>	lambsquarters	1	–	–	X	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	1	–	–	X	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	X	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	1	–	X	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
013L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	2	2	2	X	–	1	X	X
013R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	2	2	2	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	–	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	2	2	–	–	–	1	1	–
014L	<i>Chenopodium album</i>	lambsquarters	2	1	0	X	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	1	0	0	X	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	0	0	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	0	0	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
014R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	1	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	–	–	–	–	–	–
015L	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	X	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
015R	No Exotics	No Exotics	0	0	0	0	0	0	0	0
016L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	X	X
	<i>Chenopodium album</i>	lambsquarters	2	–	–	X	1	–	X	X
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	1	–	–	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	X	X
	<i>Tribulus terrestris</i>	puncturevine	1	–	–	X	–	–	–	–
016R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
017L	<i>Kochia scoparia</i>	kochia	2	–	–	X	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	X	X
017R	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	1	1	–	–	2	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Polygonum aviculare</i>	prostrate knotweed	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
019L	<i>Bromus arvensis</i>	field brome	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
019L (cont.)	No Exotics	No Exotics	–	–	–	–	0	0	0	0
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	–	–	–	–	–	–	–
018R	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	2	–	–
	<i>Bromus sp.</i>	brome species	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Chenopodium album</i>	lambsquarters	2	–	–	–	–	–	–	–
	<i>Cirsium vulgare</i>	bull thistle	–	1	–	–	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Onopordum acanthium</i>	scotch thistle	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
019L	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	1	–	–	–	–	–	–
019R	<i>Brassica sp.</i>	mustard species	1	–	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	2	–	–
	<i>Bromus sp.</i>	brome species	3	–	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	2	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
020L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	2	–	–	–	–	–	–	–
020R	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus sp.</i>	brome species	2	–	–	–	–	–	–	–
	<i>Cirsium vulgare</i>	bull thistle	1	–	–	–	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
021L	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	1	–	–	–
	<i>Lactuca tatarica</i>	blue lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	1	–	–
	<i>Tribulus terrestris</i>	puncturevine	2	–	–	–	–	–	–	–
021R	<i>Brassica sp.</i>	mustard species	2	2	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
021R (cont.)	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	–	–	2
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Erodium cicutarium</i>	redstem stork's bill	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	1	–	–	–	1	–	–	–
	<i>Lactuca tatarica</i>	blue lettuce	–	–	–	–	1	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	2	2	1	–
	<i>Verbascum thapsus</i>	common mullein	1	–	–	–	–	–	–	–
022L	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	3	–	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
	<i>Tribulus terrestris</i>	puncturevine	1	–	–	–	–	–	–	–
022R	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus sp.</i>	brome species	2	–	–	–	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Lactuca tatarica</i>	blue lettuce	–	–	–	–	1	1	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	1	–	–	–	–	–	–	–
023L	<i>Agropyron desertorum</i>	desert wheatgrass	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	–	–	–	–
	No Exotics	No Exotics	–	–	–	–	0	0	0	0
023R	<i>Agropyron desertorum</i>	desert wheatgrass	2	–	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	–	–	–	1	2	–	–
	<i>Bromus sp.</i>	brome species	2	–	–	–	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	2	1	–	–
024L	<i>Bromus arvensis</i>	field brome	–	–	–	–	1	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
024L (cont.)	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	1	–	–	–	–	–	–	–
024R	<i>Agropyron desertorum</i>	desert wheatgrass	2	–	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus inermis</i>	smooth brome	–	–	–	–	1	–	–	–
	<i>Bromus sp.</i>	brome species	2	–	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	1	1	–	–
	<i>Verbascum thapsus</i>	common mullein	–	1	–	–	–	–	–	–
025L	<i>Convolvulus arvensis</i>	field bindweed	1	–	–	–	–	–	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
	<i>Tribulus terrestris</i>	puncturevine	1	–	–	–	–	–	–	–
025R	<i>Agropyron desertorum</i>	desert wheatgrass	2	2	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	3	2	–	–
	<i>Bromus sp.</i>	brome species	2	–	–	–	–	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	1	–	–	–	2	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	2	2	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	–	1	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	–	2	–	–	–	–
026L	<i>Bromus arvensis</i>	field brome	–	–	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	1	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Onopordum acanthium</i>	scotch thistle	–	–	–	–	–	–	–	1
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	1	–	–
024L	<i>Brassica sp.</i>	mustard species	2	2	2	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus inermis</i>	smooth brome	1	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
024L (cont.)	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	0	2	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	2	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	–	2	–	1	–	–
027L	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus inermis</i>	smooth brome	2	–	–	–	1	1	–	–
	<i>Convolvulus arvensis</i>	field bindweed	2	2	–	–	2	1	–	–
	<i>Eragrostis barrelieri</i>	Mediterranean lovegrass	1	–	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	2	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	2	1	1	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	1	–
	<i>Melilotus officinalis</i>	yellow sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	–	–	–	–	–
027R	<i>Brassica sp.</i>	mustard species	–	2	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	–	3	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	–	1	–	–
	<i>Onopordum acanthium</i>	scotch thistle	–	–	–	–	–	–	–	1
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	–	–	–	1	–	–
028L	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus sp.</i>	brome species	2	2	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Euphorbia davidii</i>	toothed spurge	1	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	3	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	1	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	–	–	–	–	–
028R	<i>Bromus arvensis</i>	field brome	–	–	–	–	1	–	–	–
	<i>Kochia scoparia</i>	kochia	–	2	2	2	–	–	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	1	1	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
028R (cont.)	<i>Tribulus terrestris</i>	puncturevine	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	1	–	–	–	–	–	–	–
029L	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	1	–	–	–	–	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	2	2	1	–	–	–	–
029R	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	–	–	–
	<i>Bromus sp.</i>	brome species	2	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	2	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	1	–	–	–
	<i>Verbascum thapsus</i>	common mullein	–	–	–	2	–	–	–	–
030L	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	1	–	–	–
	<i>Convolvulus arvensis</i>	field bindweed	3	–	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
030R	<i>Brassica sp.</i>	mustard species	2	2	–	–	–	–	–	–
	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	2	–	–
	<i>Bromus inermis</i>	smooth brome	2	2	–	–	2	2	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	1	–	–	–	–	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	1	1	–	–
051L	<i>Bromus arvensis</i>	field brome	–	–	–	–	1	2	–	–
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	–	–
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	1	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Onopordum acanthium</i>	scotch thistle	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
051R	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	2	–	–
052L	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
052R	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
053L	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
053L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
053R	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	1	–	–
054L	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	2	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
054R	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	1	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	–	–	–
055L	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	1	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
055R	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
056L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
056R	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
057L	No Exotics	No Exotics	–	–	–	–	0	0	0	0
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
058L	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
058R	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	2	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	2	1	–	–
059L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
059R	No Exotics	No Exotics	–	–	–	–	0	0	0	0
060L	No Exotics	No Exotics	–	–	–	–	0	0	0	0
060R	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	1	–	–
061L	No Exotics	No Exotics	–	–	–	–	0	0	0	0
061R	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	–	2	–	–
062L	No Exotics	No Exotics	–	–	–	–	0	0	0	0
062R	No Exotics	No Exotics	–	–	–	–	0	0	0	0
063L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table H-1. Comparison of species and density for each vector block monitored at PECO in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
063R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	–	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	2	–
064L	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	1	1	–
064R	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	–	–	2	2
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	–	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
065L	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
065R	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
066L	<i>Bromus arvensis</i>	field brome	–	–	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	1	–
	<i>Onopordum acanthium</i>	scotch thistle	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	–	2	2	–
066R	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
067L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	2	–
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	–	3	3	2
067R	<i>Bromus inermis</i>	smooth brome	–	–	–	–	–	2	2	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	2	–	–
068L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	2	2
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	–	2	3	2
068R	No Exotics	No Exotics	–	–	–	–	0	0	0	0
069L	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	–	2	2	2
069R	No Exotics	No Exotics	–	–	–	–	0	0	0	0
070L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	2	2
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	–	2	2	2
070R	No Exotics	No Exotics	–	–	–	–	0	0	0	0
071L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	–	2	2
	<i>Verbascum thapsus</i>	common mullein	–	–	–	–	–	2	2	2
071R	No Exotics	No Exotics	–	–	–	–	0	0	0	0

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix I: Sand Creek Massacre NHS 2012 Field Report and Sampling Results

Transect: Lower Monument Road

Species Found: CHEALB, KOCSCO, SALTRA

Transect: Upper Ranch House Road

Species Found: AMABLI, BROTEC, ERACIL, KOCSCO, SALTRA

Transect: Lower Ranch House Road

Species Found: CHEALB, KOCSCO, SALTRA

Transect: Southeast Boundary

Species Found: KOCSCO, SALTRA

Overall Description: The most common species found along all transect were prickly Russian thistle (*Salsola tragus*), common lambsquarters (*Chenopodium album*), and kochia (*Kochia scoparia*). Nearly all species found were in the D1 distance class, with the interior areas of the park being very clean. Along the Monument Road, prickly Russian thistle (*Salsola tragus*) was the only species to begin moving into the interior areas. It seemed to be doing so very quickly. Along the Southeast boundary, all species were found either along the fence line or atop the old dog mounds. The rest of the old dog town was made up of native grasses such as red three-awn, sideoats grama (*Bouteloua curtipendula*), and buffalograss (*Buchloe dactyloides*). Old Ranch House Road was doing very well. Species were only detected near the maintenance area, and began dwindling in number the further down the road the transect went.

Sand Creek Massacre NHS Exotics Sampling Panel 1 - 6/25 - 6/27/2012

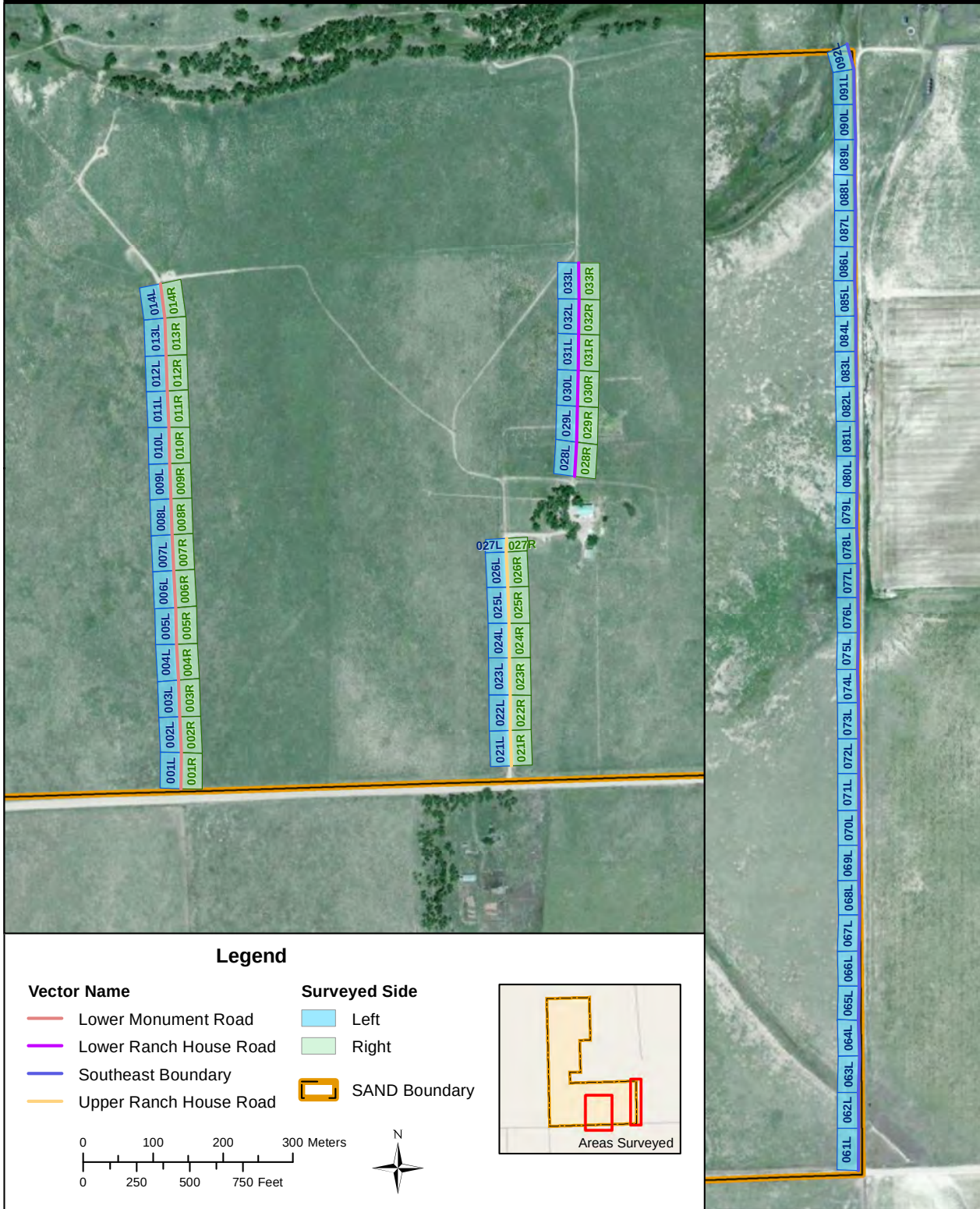


Figure I.1. Individual vector blocks sampled, Panel 1, Sand Creek Massacre NHS, 2012.

Table I-1. Comparison of species and density for each vector block monitored at SAND in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Chenopodium album</i>	lambsquarters	2	2	1	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	1	–	2	2	–	–
001R	<i>Chenopodium album</i>	lambsquarters	–	2	2	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	3	3	–	–	2	2	–	–
002L	<i>Chenopodium album</i>	lambsquarters	–	1	1	1	–	–	–	–
	<i>Kochia scoparia</i>	kochia	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
002R	<i>Buglossoides arvensis</i>	corn gromwell	–	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
003L	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	2	2	–	–
003R	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
004L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
004R	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	2	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
005L	<i>Chenopodium album</i>	lambsquarters	–	1	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
005R	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	1	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	1	2	2	–
006L	<i>Kochia scoparia</i>	kochia	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	3	2	–	–	1	1	–	–
006R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	1	2	–	–
007L	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	2	2	–	–
007R	<i>Salsola tragus</i>	prickly Russian thistle	1	1	–	–	–	2	2	–
008L	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	2	2	–	–
008R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	1	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	1	2	2	–
009L	<i>Chenopodium album</i>	lambsquarters	–	1	1	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
009R	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
010L	<i>Chenopodium album</i>	lambsquarters	–	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	1	–	–	–	–	–	–
010R	<i>Buglossoides arvensis</i>	corn gromwell	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table I-1. Comparison of species and density for each vector block monitored at SAND in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
011L	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
011R	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
012L	<i>Buglossoides arvensis</i>	corn gromwell	–	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
012R	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	X	2	2	–	–
013L	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
013R	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	1	1	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	X	2	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	–	–	–
014L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
014R	<i>Chenopodium album</i>	lambsquarters	–	1	–	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	2	–	X	2	2	–	–
021L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	–	–	–
	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
021R	<i>Bromus tectorum</i>	cheatgrass	–	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Eragrostis cilianensis</i>	stinkgrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	3	3	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
022L	<i>Chenopodium album</i>	lambsquarters	–	2	2	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	1	2	–	–
022R	<i>Amaranthus blitoides</i>	mat amaranth	–	–	–	–	1	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	–	–	–	–
023L	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	–	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	–	–	–	–	–	–	–
023R	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	3	3	–	–	2	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table I-1. Comparison of species and density for each vector block monitored at SAND in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
024L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	–	2	–	–
024R	<i>Buglossoides arvensis</i>	corn gromwell	–	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	3	–	–	1	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	1	–	–	–	–	–
025L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	–	1	–	–
025R	<i>Buglossoides arvensis</i>	corn gromwell	1	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	–	2	–	–
026L	<i>Buglossoides arvensis</i>	corn gromwell	1	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	1	2	–	–
026R	<i>Buglossoides arvensis</i>	corn gromwell	1	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	3	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	–	–	–	–
027L	<i>Buglossoides arvensis</i>	corn gromwell	–	1	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	1	–	–	1	1	–	–
027R	<i>Salsola tragus</i>	prickly Russian thistle	2	2	X	X	2	2	–	–
028L	<i>Chenopodium album</i>	lambsquarters	3	2	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	1	3	–	–	1	2	–	–
028R	<i>Chenopodium album</i>	lambsquarters	2	3	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	3	–	–	2	2	–	–
029L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	3	2	–	–	2	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	1	–	–	–	–	–	–	–
029R	<i>Chenopodium album</i>	lambsquarters	2	2	2	–	1	1	–	–
	<i>Kochia scoparia</i>	kochia	–	3	3	–	–	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	3	–	–	2	2	2	–
	<i>Setaria viridis</i>	green bristlegrass	2	2	–	–	–	–	–	–
030L	<i>Chenopodium album</i>	lambsquarters	2	2	–	–	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	3	2	–	–	2	2	–	–
030R	<i>Kochia scoparia</i>	kochia	–	2	–	–	1	2	–	–
	<i>Poa pratensis</i>	Kentucky bluegrass	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	1	2	–	–
	<i>Setaria viridis</i>	green bristlegrass	2	–	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table I-1. Comparison of species and density for each vector block monitored at SAND in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
031L	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	No exotics	No exotics found	–	–	–	–	0	0	0	0
031R	<i>Bromus arvensis</i>	field brome	1	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	2	–	–	–	–	–	–
	No exotics	No exotics found	–	–	–	–	0	0	0	0
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	–	–	–	–
032L	No exotics	No exotics found	–	–	–	–	0	0	0	0
	<i>Salsola tragus</i>	prickly Russian thistle	1	–	–	–	–	–	–	–
032R	<i>Bromus arvensis</i>	field brome	1	–	–	–	–	–	–	–
	<i>Chenopodium album</i>	lambsquarters	–	1	–	–	–	–	–	–
	No exotics	No exotics found	–	–	–	–	0	0	0	0
	<i>Salsola tragus</i>	prickly Russian thistle	2	–	–	–	–	–	–	–
033L	No exotics	No exotics found	–	–	–	–	0	0	0	0
033R	No exotics	No exotics found	–	–	–	–	0	0	0	0
061L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
062L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	2	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
063L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
064L	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
065L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
066L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
067L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
068L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
069L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
070L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
071L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
072L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–
073L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	1	–
074L	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
075L	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
076L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table I-1. Comparison of species and density for each vector block monitored at SAND in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
076L (cont.)	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
077L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	1	1	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	1	–	–
078L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
079L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
080L	<i>Convolvulus arvensis</i>	field bindweed	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	1	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
081L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
082L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
083L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
084L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
085L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
086L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	1	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	–	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
087L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	2	–	–
088L	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
089L	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	1	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
090L	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	–	–	–
091L	No exotics	No exotics found	–	–	–	–	0	0	0	0
092L	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	2	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Appendix J: Washita Battlefield NHS 2012 Field Report and Sampling Results

Transect: North Loop

Species Found: BOTISC, BROTEC, CYNDAC, EROCIC, KOCSCO, LACSER, LAMAMP, MEDMIN, MELALB, RUMPAT, SORHAL, TAROFF, TRADUB, TRITER, ULMPUM

Description: As in the rest of geographical area, the bromes have exploded. Cheatgrass (*bromus tectorum*) was found in nearly every vector block. It was usually found in high density in rather large patches. It was found not only along the trail, but also much farther out in the furthest distance classes. The kochia (*Kochia scoparia*) is not nearly as bad as in recent years, but it has replaced PASSMI in areas where the wheat grass was very strong. A perfect example of this is the southern interior of the loop. This area was nearly 100% western wheatgrass (*Pascopyrum smithii*) last year, but this year is sunflower and kochia (*Kochia scoparia*). Another species of concern is King Ranch bluestem (*Bothriochloa ischaemum*). It was found rather commonly in the center of the trail. In some areas along the trail, it was found beyond the trail, but never more than 5 meters from the trail. The density of Johnsongrass (*Sorghum halepense*) within the park has greatly diminished from previous survey years. It was mainly only found along the tree line of the old rail bed. It was also seen up by the river, but in much smaller numbers. Prickly lettuce (*Lactuca serriola*) is also on the rise all over the park. It was seen in 20 vector blocks along the North Loop. Siberian elm (*Ulmus pumila*) was also seen rather commonly. Its number seem to equal those from previous years. Its numbers are highest closer to the rail bed, and further west.

Transect: South Loop

Species Found: BOTISC, BROCAT, BROTEC, CHEALB, CYNDAC, EROCIC, KOCSCO, LACSER, MEDLUP, MEDMIN, MELOFF, RUMPAT, SALTRA, SORHAL

Description: Along this trail, like the rest of the park, cheatgrass (*Bromus tectorum*) is everywhere. It was seen in nearly every vector block, usually in large densities. Besides cheatgrass (*Bromus tectorum*), the other most commonly found species were rescuegrass (*Bromus catharticus*) and Bermudagrass (*Cynodon dactylon*). These species were mainly found on the trail itself. They were most likely brought in on visitor's shoes, or on mowers. Most species were found closer to the trailhead. There is a large patch of Johnsongrass (*Sorghum halepense*) right at the trailhead. In the parking area there is quite a bit of redstem stork's bill (*Erodium cicutarium*), and it can be found making its way north along the trail, as well. The big surprise was the lack of prickly Russian thistle (*Salsola tragus*) along the trail system in general.

Washita Battlefield NHS Exotics Sampling Panel 1 - 6/2 - 6/3/2012

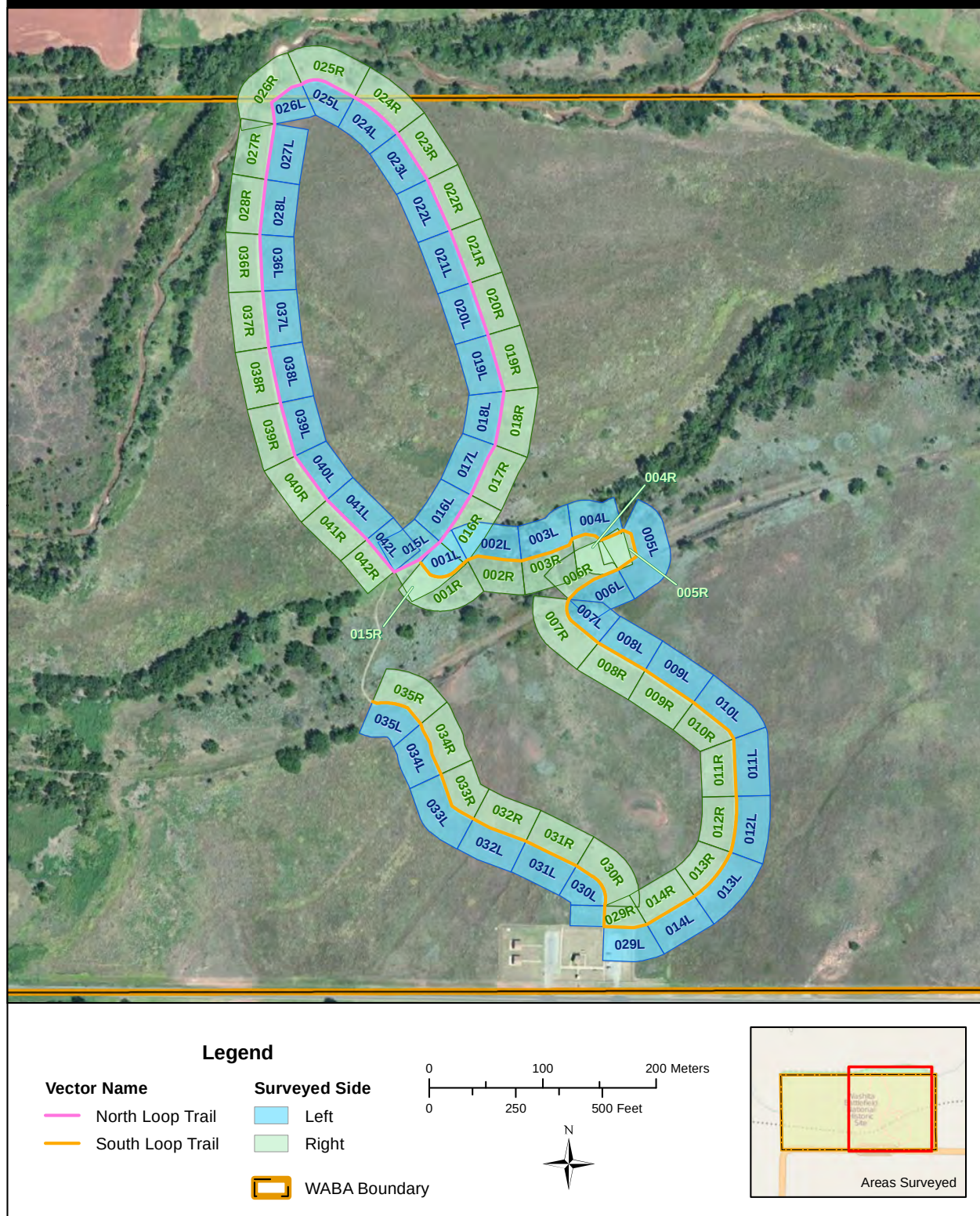


Figure J.1. Individual vector blocks sampled, Panel 1, Washita Battlefield NHS, 2012.

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012.

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
001L	<i>Bromus catharticus</i>	rescuegrass	1	2	2	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	3	3	3
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	1	–	–	–
	<i>Rumex patientia</i>	patience dock	–	2	3	X	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	X	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	2	X	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	X	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	2	–
001R	<i>Bromus catharticus</i>	rescuegrass	2	3	2	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	2	–	–
	<i>Euphorbia dentata</i>	toothed spurge	1	–	–	X	–	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	2	2	–	X	1	–	–	–
002L	<i>Bromus catharticus</i>	rescuegrass	2	3	3	3	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	3	3	3
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	2	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	2	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	2	–
002R	<i>Bromus catharticus</i>	rescuegrass	2	3	3	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	X	X
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	X	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	–	–	–
003L	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	3	3	3
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	2	2	2	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	2	–	–	–	–	–
003R	<i>Bromus catharticus</i>	rescuegrass	3	3	2	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	X	X
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	X	X
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	X	X
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	X	X
	<i>Tragopogon dubius</i>	western salsify	1	1	–	X	1	–	X	X

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
004L	<i>Bromus catharticus</i>	rescuegrass	3	X	X	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	–	–	2
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	–	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	2	–	–
004R	<i>Bromus catharticus</i>	rescuegrass	–	3	–	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	X	X
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	1	X	X
005L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	2	X	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Melilotus alba</i>	white sweetclover	2	X	X	X	–	–	–	–
005R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	X	X
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	X	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	1	X	X
006L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	2	3	3	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	3	3
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	1	–	X	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	–	X	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	2	–	–
006R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	X
	<i>Bromus catharticus</i>	rescuegrass	–	3	–	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	2	2	X
	<i>Sorghum halepense</i>	Johnsongrass	–	2	–	X	–	1	–	X
	<i>Tragopogon dubius</i>	western salsify	–	1	–	X	–	1	–	X
007L	<i>Bromus catharticus</i>	rescuegrass	2	3	2	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
	<i>Salsola tragus</i>	prickly Russian thistle	1	1	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	2	–	–	2	–	–
007R	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	4	3
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	1	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	1	–
008L	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	1	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	3	3

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
008L (cont.)	<i>Salsola tragus</i>	prickly Russian thistle	2	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	2	–	–	1	–	–	–
008R	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	4	3
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	1	1	–	–
009L	<i>Bromus catharticus</i>	rescuegrass	2	3	3	3	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	2
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	1	–	–
009R	<i>Bromus catharticus</i>	rescuegrass	2	2	2	2	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
	<i>Chenopodium album</i>	lambsquarters	–	–	–	–	1	–	–	–
010L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
010R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	–	1	–
011L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	2
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
011R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	1	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	3
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
012L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
012R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
013L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	2
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
013R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	No Exotics	No Exotics	0	0	0	0	–	–	–	–
014L	<i>Bromus catharticus</i>	rescuegrass	–	3	3	3	1	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
014L (cont.)	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	–	–	–	–	–	–
014R	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
	<i>Salsola tragus</i>	prickly Russian thistle	–	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	2	2	–	–	–	–	–	–
015L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	3	3	2	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	3	2	–	2	2	2	–
	<i>Lamium amplexicaule</i>	henbit	–	–	–	–	2	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	2	–	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	2	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
015R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	3	3	3	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	3	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	2	–	2	1	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Rumex patientia</i>	patience dock	–	1	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	–	–
016L	<i>Bromus catharticus</i>	rescuegrass	–	3	2	2	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	3	2	–	–	2	2	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Panicum coloratum</i>	Klein grass	–	2	2	–	–	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	0	1	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	2	–	2	2	2
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	–	–
016R	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	2	2	2	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
016R (cont.)	<i>Sonchus asper</i>	spiny sowthistle	1	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	2	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
017L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	–	–	–	–	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	3	3	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	2	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Panicum coloratum</i>	Klein grass	1	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	2	–	2	2	2
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
017R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	2	2	–	–	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	3	–	–	–
	<i>Kochia scoparia</i>	kochia	–	2	2	–	–	–	–	–
	<i>Melilotus alba</i>	white sweetclover	–	–	–	–	1	1	–	–
	<i>Panicum coloratum</i>	Klein grass	–	2	2	2	–	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	–	2	–
	<i>Sonchus asper</i>	spiny sowthistle	1	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	2	2	2	2	–	–	–	2
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	1	–
018L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	–	–	–	–	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	2	2	2	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	2	–	–	–	–	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	–	–	2
	<i>Tragopogon dubius</i>	western salsify	2	1	–	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	–	–	1	–	–
018R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	2	2	–	–	–	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	3	3	3	3	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	1	1	–	–	–	–	–	–
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
018R (cont.)	<i>Sonchus asper</i>	spiny sowthistle	1	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	2	–	–	–	2
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	1	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	2	–
019L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	1	–	–	–	–	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	3	2	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	–	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	0	0	2	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	2	2	–	–	1	2	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	–	–
019R	<i>Bromus catharticus</i>	rescuegrass	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	2	2	–	2	–	1	–	2
	<i>Tragopogon dubius</i>	western salsify	1	1	1	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	–	2	–
020L	<i>Bromus catharticus</i>	rescuegrass	3	2	2	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	2	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	2	2	1	–	1	2	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	–	–	–	–	–
020R	<i>Bromus catharticus</i>	rescuegrass	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	1	–	–	1	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	–	–	–	2	2
021L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	1	–	–	–	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
021L (cont.)	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	–	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	2	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
021R	<i>Bromus catharticus</i>	rescuegrass	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	1	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	2	2	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	–	–	–	–	–
022L	<i>Bromus catharticus</i>	rescuegrass	2	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cirsium arvense</i>	canada thistle	1	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	2	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	1	–	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	–	–	–	–	–
022R	<i>Bromus catharticus</i>	rescuegrass	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Sorghum halepense</i>	Johnsongrass	–	–	2	2	–	–	–	–
023L	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	–	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	2	–	–	–	1	–	–
023R	<i>Bromus catharticus</i>	rescuegrass	3	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	1	–	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	–	–	1	–	–
024L	<i>Bromus catharticus</i>	rescuegrass	–	3	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	1	–	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
024R	<i>Bromus catharticus</i>	rescuegrass	3	3	–	–	–	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
024R (cont.)	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Melilotus alba</i>	white sweetclover	1	–	–	–	–	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	–	–	–
025L	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Sorghum halepense</i>	Johnsongrass	–	1	–	–	–	–	2	–
025R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	–	–	2	–
	<i>Tamarix ramosissima</i>	saltcedar	–	–	–	1	–	–	–	–
026L	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Melilotus alba</i>	white sweetclover	2	–	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	2	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
026R	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	3	3	–	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	–	–
027L	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	–	–
	<i>Sonchus asper</i>	spiny sowthistle	–	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	2	–	–	–	–	–	–
027R	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Sonchus asper</i>	spiny sowthistle	–	1	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	–	2	–	–	–	–
028L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	2	–	–	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	2	–	–	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	2	2	2	–	2	2	–
	<i>Tragopogon dubius</i>	western salsify	1	–	–	–	–	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	2	–	–	–	2	–	–
028R	<i>Bromus catharticus</i>	rescuegrass	1	2	–	X	–	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Sonchus asper</i>	spiny sowthistle	1	1	–	X	–	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
028R (cont.)	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	1	–	X	–	–	–	–
029L	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	2	2	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	2	2	–	–
	<i>Medicago lupulina</i>	black medick clover	–	–	–	–	2	–	–	–
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	2	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	2	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	2	2	–	–
029R	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	2	–	–	–
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	1	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
030L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	1	3	3	2
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	2	–	–	–
030R	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
	<i>Erodium cicutarium</i>	redstem stork's bill	–	–	–	–	2	–	–	–
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	1	–	–
031L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	3	2	2
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Tribulus terrestris</i>	puncturevine	–	–	–	–	1	–	–	–
031R	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	3	3	3
032L	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
032R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–
033L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	1	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	–	1	1
033R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
032L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	2	–	–	–
	<i>Salsola tragus</i>	prickly Russian thistle	–	–	–	–	1	–	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
034R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	–	–
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	2	1	–	–
035L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	1	–	–	–
	<i>Bromus catharticus</i>	rescuegrass	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Melilotus officinalis</i>	yellow sweetclover	–	–	–	–	2	–	–	–
035R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	1	–	–
036L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	–	1	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
036R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	–
037L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	1	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	2	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	–	–
037R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	1	–
038L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Medicago minima</i>	burr medick clover	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	1	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
038R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	–	2
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	1	–
039L	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Taraxacum officinale</i>	common dandelion	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	1	–
039R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	1	–	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	1	–	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	1	1	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

Table J-1. Comparison of species and density for each vector block monitored at WABA in 2009 and 2012. (continued)

Vector Block	Scientific Name	Common Name	2009				2012			
			D1	D2	D3	D4	D1	D2	D3	D4
040L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	1	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	2	0
040R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	–	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	2	1
041L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	2	–
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	2	–
041R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Rumex patientia</i>	patience dock	–	–	–	–	–	1	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	1	2	2	2
	<i>Ulmus pumila</i>	Siberian elm	–	–	–	–	–	2	2	1
042L	<i>Bothriochloa ischaemum</i>	King Ranch bluestem	–	–	–	–	2	–	–	–
	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	–	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	–	2	2	–
	<i>Lactuca serriola</i>	prickly lettuce	–	–	–	–	–	1	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	–	2	–	2
042R	<i>Bromus tectorum</i>	cheatgrass	–	–	–	–	2	2	2	2
	<i>Cynodon dactylon</i>	Bermudagrass	–	–	–	–	2	–	–	–
	<i>Kochia scoparia</i>	kochia	–	–	–	–	2	–	–	–
	<i>Sorghum halepense</i>	Johnsongrass	–	–	–	–	1	2	2	2
	<i>Tragopogon dubius</i>	western salsify	–	–	–	–	–	1	–	–

Density code: 1 = 1-5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix

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