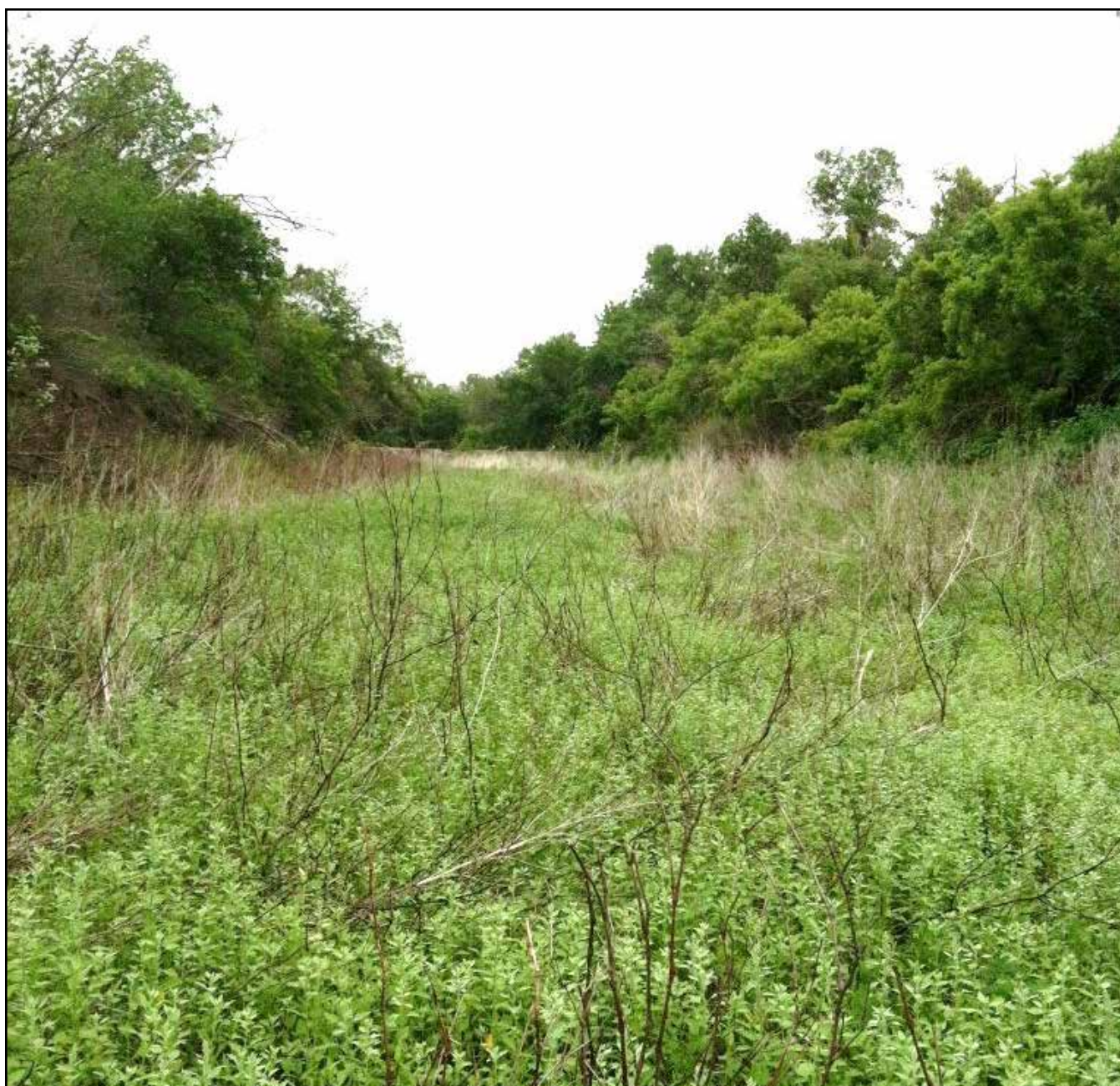




Fort Larned National Historic Site

Southern Plains Network and Southern Plains Fire Group 2013 Vegetation Monitoring Data Summary



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ON THE COVER

Pawnee River channel at Fort Larned NHS. NPS Photo.

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Introduction

This report contains a data summary of results from all vegetation monitoring conducted by the Southern Plains Network (SOPN) and the Southern Plains Fire Group (SPFG) during 2013 at Fort Larned National Historic Site (FOLS). Data summaries are used to impart current monitoring data until enough years of data have been collected to facilitate trend analysis. A more detailed synthesis report is scheduled to be produced in 2015.

Grassland Monitoring Results

Grassland monitoring occurred during mid June of 2013 (Table 1). Data from the eleven (11) permanent transects (Figure 2) were collected; one transect was located in a construction zone and was not accessible. Data collection followed the established monitoring protocol *Grassland Monitoring Protocol and Standard Operating Procedures for the Southern Plains I&M Network and Fire Group* (Folts-Zettner et al.)(Figure 1). The protocol calls for a series of permanent 50-meter transects containing five 2x1-meter plots. Species composition, relative cover and ground strata are collected during annual visits.

Table 1. Plant community and sampling dates for each transect at Fort Larned NHS in 2013.

Group	Transect	Plant community	Date
Prairie Dog	RUTS-LT01	Upland Prairie Dog	06/21
Restoration	BU02A-01	Upland Restoration	06/22
	BU02A-02	Upland Restoration	06/22
	BU02B-LT01	Upland Restoration	06/22
	BU04-F01	Upland Restoration	06/21
	BU04-LT01	Upland Restoration	06/21
	BU05-LT01	Upland Restoration	06/21
	BU06-LT01	Upland Restoration	06/22
	BU07-01	Upland Restoration	06/22
	BU08-F01	Upland Restoration	06/21
	BU08-LT01	Upland Restoration	06/21



Figure 1. Layout of plots within each permanent transect.



Figure 2. Location of each permanent plot at FOLS monitored in 2013

The type and amount of ground strata (bare soil, litter, rock) influences many aspects of grassland health. The benefits of these influences vary along an east-west gradient. Litter accumulation, for example is considered more beneficial in the western parts of the Southern Great Plains because it protects the soil from erosion by wind and rain, and keeps soil root-zones cooler. These same benefits accrue in the eastern area, but because higher rainfall results in higher vegetative production, the greater accumulation of litter can negatively impact a grassland by limiting seedling recruitment. Ground strata estimates for each transect monitored at FOLS in 2013 can be found in Table 2.

Table 3 contains numerical results of 2013 grassland monitoring at FOLS. Each transect contains five plots. Frequency reflects the number of plots in each transect where a particular species was detected. Exotic plant species are highlighted in pink. Scientific and common names for each plant code, as well as that species attributes can be found in Table 4.

Table 2. Ground strata type and percentage for each transect monitored at FOLS in 2013.

Cover	BU02A-01	BU02A-02	BU02B-LT01	BU04-F01	BU04-LT01	BU05-LT01
SOIOPEN	0.4	0.4	7.4	2.6	10.75	29.8
SOILUNDER	0.8	0.6	3.6	12.6	3.25	3.2
LITTER	98.8	99	88.8	84.8	86	67
WOOD	0	0	0	0	0	0
ROCKSM	0	0	0	0	0	0
ROCKLG	0	0	0	0	0	0
LICHEN	0	0	0	0	0	0
MOSS	0	0	0.2	0	0	0
CRUST	0	0	0	0	0	0

Cover	BU06-LT01	BU07-01	BU08-F01	BU08-LT01	RUTS-LT01
SOIOPEN	7.8	6.6	31	10.8	4.8
SOILUNDER	3.2	4.8	7	3.6	3
LITTER	89	88.6	62	85.6	93.2
WOOD	0	0	0	0	0
ROCKSM	0	0	0	0	0
ROCKLG	0	0	0	0	0
LICHEN	0	0	0	0	0
MOSS	0	0	0	0	0
CRUST	0	0	0	0	0

Table 3. Species cover sum and frequency for each permanent transect monitored at FOLS in 2013. Exotic species are highlighted in pink.

Species Code	BU02A-01		BU02A-02		BU02B-LT01		BU04-F01		BU04-LT01		BU05-LT01	
	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency
Forb												
AMAALB												
AMAPAL												
AMARET												
AMBPSI	25	1										
ASCPUM												
ASTMOL							0.5	1				
CALINV							0.5	1	0.5	1		
CHAMAC			0.5	1								
CHASTI												
CHEALB	8	2	1	1								
CIRUND	1	1	6	3								
CONARV	1	1	20	3	11.5	4	1	2	0.5	1		
CONCAN			1	2								
CONRAM												
DESPIN	1	2	0.5	1								
EUPMAR												
HELPET	89	5	75	5								
KOCSCO	0.5	1	0.5	1								
LACSER	1	2	0.5	1								
LEPDEN									0.5	1		
MELOFF	17.5	4	1	1								
OXASTR												
PHYLON			1.5	2					0.5	1		
RATTAG			3	1								
SALTRA												
SOLCAN	1	1										
SOLNEM												
SOLROS												
SPHCOC							1	2	3	1		
SYMERI	15	1										
TEUCAN												
Grass												
ANDGER	15.5	5	10.5	5								
ARIPUR									3.5	2		
BOTLAG	1.5	2										
BOUCUR	1.5	2	0.5	1							1.5	3
BOUGRA					0.5	1					0.5	1
BROINE					255	5	360	5	358	5	315	5
BUCDAC												
DACGLO											1	1
DIGSAN												
PANVIR	18	5	97	5								
SCHSCO	16	4	1.5	2							1	2
SORNUT	3	3	1.5	2								
SPOCRY												
SYMORB			1	1								

Table 3. Species cover sum and frequency for each permanent transect monitored at FOLS in 2013. Exotic species are highlighted in pink (continued).

Species Code	BU06-LT01		BU07-01		BU08-F01		BU08-LT01		RUTS-LT01	
	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency
Forb										
AMAALB					2.5	4				
AMAPAL					0.5	1				
AMARET									0.5	1
AMBPSI										
ASCPUM									1	1
ASTMOL										
CALINV									1	2
CHAMAC					1.5	3			0.5	1
CHASTI									0.5	1
CHEALB										
CIRUND									0.5	1
CONARV	1	1	6.5	4					155	5
CONCAN										
CONRAM									0.5	1
DESPIN										
EUPMAR									2	4
HELPET										
KOCSCO					1	2			150.5	5
LACSER										
LEPDEN					2	4	0.5	1	0.5	1
MELOFF					0.5	1	2	3		
OXASTR									17.5	5
PHYLON	2	3			3.5	2				
RATTAG										
SALTRA									17.5	5
SOLCAN	4	1								
SOLNEM									0.5	1
SOLROS									1	2
SPHCOC										
SYMERI										
TEUCAN	1	1								
Grass										
ANDGER							67	5		
ARIPUR									0.5	1
BOTLAG										
BOUCUR	13.5	4	2	3					0.5	1
BOUGRA							0.5	1		
BROINE	210	5	225	4	225	5	155	5		
BUCDAC	0.5	1								
DACGLO										
DIGSAN									54	5
PANVIR										
SCHSCO	3.5	2	4	2	0.5	1	6	2		
SORNUT							13	3		
SPOCRY	0.5	1								
SYMORB										

Table 4. All plant species detected during grassland monitoring in 2010 and exotic monitoring in 2010 and 2013 at FOLS. Exotic species are highlighted in pink.

Species Code	LifeForm	Scientific Name	Common Name	Primary Duration
AMAAALB	Forb	<i>Amaranthus albus</i>	tumble pigweed	Annual
AMAPAL	Forb	<i>Amaranthus palmeri</i>	carelessweed pigweed	Annual
AMARET	Forb	<i>Amaranthus retroflexus</i>	redroot pigweed	Annual
AMBPSI	Forb	<i>Ambrosia psilostachya</i>	western ragweed	Perennial
ANDGER	Grass	<i>Andropogon gerardii</i>	big bluestem	Perennial
ARIPUR	Grass	<i>Aristida purpurea</i>	purple threeawn	Perennial
ASCPUM	Forb	<i>Asclepias pumila</i>	plains milkweed	Perennial
ASTMOL	Forb	<i>Astragalus mollissimus</i>	wooly milkvetch	Perennial
BOTLAG	Grass	<i>Bothriochloa laguroides</i>	silver bluestem	Perennial
BOUCUR	Grass	<i>Bouteloua curtipendula</i>	sideoats grama	Perennial
BOUGRA	Grass	<i>Bouteloua gracilis</i>	blue grama	Perennial
BROINE	Grass	<i>Bromus inermis</i>	smooth brome	Perennial
BROJAP	Grass	<i>Bromus japonicus</i>	Japanese brome	Annual
BROTEC	Grass	<i>Bromus tectorum</i>	cheatgrass	Annual
BUCDAC	Grass	<i>Buchloe dactyloides</i>	buffalograss	Perennial
CALINV	Forb	<i>Callirhoe involucrata</i>	winecup	Perennial
CHAMAC	Forb	<i>Chamaesyce maculata</i>	spotted sandmat	Annual
CHASTI	Forb	<i>Chamaesyce stictospora</i>	slim-seed sandmat	Annual
CHEALB	Forb	<i>Chenopodium album</i>	common lambsquarters	Annual
CIRARV	Forb	<i>Cirsium arvense</i>	Canada thistle	Perennial
CIRUND	Forb	<i>Cirsium undulatum</i>	wavyleaf thistle	Biennial
CIRVUL	Forb	<i>Cirsium vulgare</i>	bull thistle	Biennial
CONARV	Forb	<i>Convolvulus arvensis</i>	field bindweed	Perennial
CONCAN	Forb	<i>Conyza canadensis</i>	canada horseweed	Annual
CONMAC	Forb	<i>Conium maculatum</i>	poison hemlock	Biennial
CONRAM	Forb	<i>Conyza ramosissima</i>	dwarf horseweed	Annual
CYNDAC	Grass	<i>Cynodon dactylon</i>	Bermudagrass	Perennial
DACGLO	Grass	<i>Dactylis glomerata</i>	orchardgrass	Perennial
DESPIN	Forb	<i>Descurainia pinnata</i>	western tansymustard	Annual
DESSOP	Forb	<i>Descurainia sophia</i>	flixweed	Annual
DIGSAN	Grass	<i>Digitaria sanguinalis</i>	hairy crabgrass	Annual
EUPDEN	Forb	<i>Euphorbia dentata</i>	toothed spurge	Annual
EUPMAR	Forb	<i>Euphorbia marginata</i>	snow-on-the-mountain	Annual
HELPET	Forb	<i>Helianthus petiolaris</i>	prairie sunflower	Annual
HORVUL	Grass	<i>Hordeum vulgare</i>	cereal barley	Annual
KOCSCO	Forb	<i>Kochia scoparia</i>	kochia	Annual
LACSER	Forb	<i>Lactuca serriola</i>	prickly lettuce	Annual
LAMAMP	Forb	<i>Lamium amplexicaule</i>	henbit	Annual
LEPDEN	Forb	<i>Lepidium densiflorum</i>	common pepperweed	Annual
LOLPER	Grass	<i>Lolium perenne</i>	perennial ryegrass	Perennial
MEDLUP	Forb	<i>Medicago lupulina</i>	black medic clover	Annual/Perennial

Table 4. All plant species detected during grassland monitoring in 2010 and exotic monitoring in 2010 and 2013 at FOLS. Exotic species are highlighted in pink. (continued).

Species Code	LifeForm	Scientific Name	Common Name	Primary Duration
MELOFF	Forb	<i>Melilotus officinalis</i>	yellow sweetclover	Annual
OXASTR	Forb	<i>Oxalis stricta</i>	sheep sorrel	Perennial
PANVIR	Grass	<i>Panicum virgatum</i>	switchgrass	Perennial
PHYLON	Forb	<i>Physalis longifolia</i>	longleaf groundcherry	Perennial
POAPRA	Grass	<i>Poa pratensis</i>	Kentucky bluegrass	Perennial
POLARE	Forb	<i>Polygonum arenastrum</i>	prostrate knotweed	Annual/Perennial
RATTAG	Forb	<i>Ratibida tagetes</i>	green mexican hat	Perennial
RUMCRI	Forb	<i>Rumex crispus</i>	curley dock	Perennial
RUMPAT	Forb	<i>Rumex patientia</i>	patience dock	Perennial
SALTRA	Forb	<i>Salsola tragus</i>	prickly russian thistle	Annual
SCHSCO	Grass	<i>Schizachyrium scoparium</i>	little bluestem	Perennial
SOLCAN	Forb	<i>Solidago canadensis</i>	canada goldenrod	Perennial
SOLNEM	Forb	<i>Solidago nemoralis</i>	gray goldenrod	Perennial
SOLROS	Forb	<i>Solanum rostratum</i>	buffalobur	Annual
SONASP	Forb	<i>Sonchus asper</i>	spiny sowthistle	Annual
SORHAL	Grass	<i>Sorghum halepense</i>	Johnsongrass	Perennial
SORNUT	Grass	<i>Sorghastrum nutans</i>	indiangrass	Perennial
SPHCOC	Forb	<i>Sphaeralcea coccinea</i>	scarlet globemallow	Perennial
SPOCRY	Grass	<i>Sporobolus cryptandrus</i>	sand dropseed	Perennial
SYMERI	Forb	<i>Symphyotrichum ericoides</i>	white heath aster	Perennial
SYMORB	Shrub	<i>Symphoricarpos orbiculatus</i>	buckbrush	Perennial
TAROFF	Forb	<i>Taraxacum officinale</i>	dandelion	Perennial
TEUCAN	Forb	<i>Teucrium canadense</i>	american germander	Perennial
TRADUB	Forb	<i>Tragopogon dubius</i>	western salsify	Annual
TRIREF	Forb	<i>Trifolium repens</i>	ladino clover	Perennial
TRITER	Forb	<i>Tribulus terrestris</i>	puncturevine	Annual
ULMPUM	Tree	<i>Ulmus pumila</i>	Siberian elm	Perennial

Exotic Monitoring Results

Exotic plant monitoring followed the protocol *Multi-Network Exotic Plant Monitoring Protocol and Standard Operating Procedures* (Folts-Zettner et al. 2013). Methodology requires a series of discreet 50-meter blocks along designated vectors chosen for high-probability of introduction. Exotic species detected within each block are assigned densities, and their proximity to the vector itself is divided into various Distance Classes (Figure 3).

Monitoring occurred June 6-8, 2013 and included the Entrance Road and the western park boundary (Figure 4). These vectors have been previously monitored June 103, 2010. Seven (7) vector blocks along the western boundary were not monitored in 2013 due to an active construction zone. It should be noted that 2010 was a year of above average precipitation, followed by consecutive years of moderate to severe drought, including 2013. Data summarized in this report compares the results of 2013 monitoring to that detected in 2010.

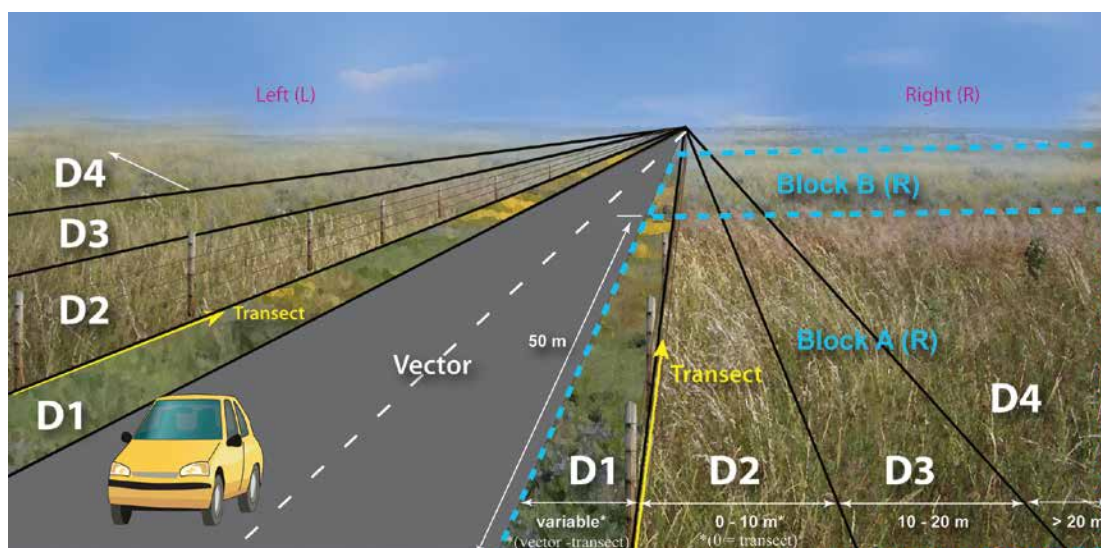


Figure 3. Layout of Vector Blocks and Distance Classes along a vector.

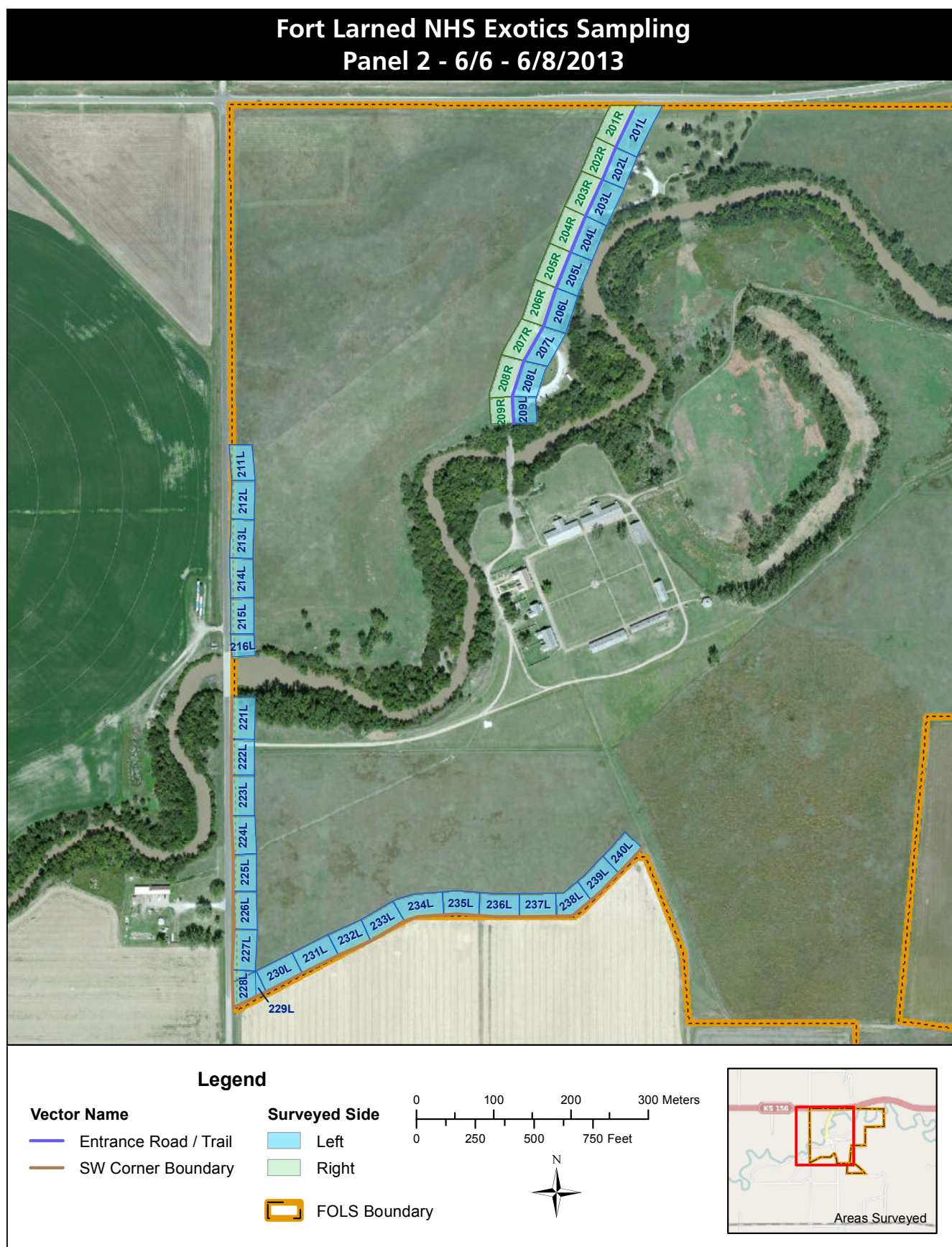


Figure 4. Panel 2 numbered vector blocks monitored at FOLS in both 2010 and 2013.

Table 5 presents all exotic species detected during both exotic and grassland (secondary transects) monitoring in both years as well as the number and percentage of vector blocks (N=45) and transects (N=12)(Figure 5) in which these species were found.

Table 5. Number and percentage comparison of unit detections of exotic species found in repeated monitoring of vector blocks and permanent transects at FOLS.

Scientific Name	Common Name	2010		2013		2010		2013	
		Primary Blocks (N=45)		Primary Blocks (N=38)		Secondary Transects (N=12)		Secondary Transects (N=11)	
		Total	% Blocks	Total	% Blocks	Total	% Blocks	Total	% Blocks
<i>Amaranthus retroflexus</i>	redroot pigweed	11	24.4%	2	5.3%	–	–	1	9%
<i>Bromus inermis</i>	smooth brome	44	97.8%	38	100.0%	9	75%	8	73%
<i>Bromus japonicus</i>	Japanese brome	1	2.2%	–	–	1	8%	–	–
<i>Bromus tectorum</i>	cheatgrass	10	22.2%	21	55.3%	–	–	–	–
<i>Chenopodium album</i>	common lambsquarters	11	24.4%	1	2.6%	2	17%	2	18%
<i>Cirsium arvense</i>	canada thistle	6	13.3%	–	–	–	–	–	–
<i>Cirsium vulgare</i>	bull thistle	5	11.1%	–	–	–	–	–	–
<i>Convolvulus arvensis</i>	field bindweed	17	37.8%	20	52.6%	9	75%	8	73%
<i>Conium maculatum</i>	poison hemlock	2	4.4%	1	2.6%	–	–	–	–
<i>Cynodon dactylon</i>	Bermudagrass	11	24.4%	5	13.2%	–	–	–	–
<i>Dactylis glomerata</i>	orchardgrass	–	–	–	–	–	–	1	9%
<i>Descurainia sophia</i>	flixweed	2	4.4%	–	–	–	–	–	–
<i>Digitaria sanguinalis</i>	hairy crabgrass	10	22.2%	–	–	–	–	1	9%
<i>Euphorbia dentata</i>	toothed spurge	16	35.6%	–	–	1	8%	–	–
<i>Hordeum vulgare</i>	cereal barley	–	–	2	5.3%	–	–	–	–
<i>Kochia scoparia</i>	kochia	19	42.2%	10	26.3%	2	17%	4	36%
<i>Lactuca serriola</i>	prickly lettuce	–	–	6	15.8%	–	–	2	18%
<i>Lamium amplexicaule</i>	henbit	7	15.6%	–	–	–	–	–	–
<i>Lolium perenne</i>	perennial ryegrass	1	2.2%	–	–	–	–	–	–
<i>Medicago lupulina</i>	black medic clover	16	35.6%	8	21.1%	–	–	–	–
<i>Melilotus officinalis</i>	yellow sweetclover	28	62.2%	10	26.3%	7	58%	4	36%
<i>Poa pratensis</i>	Kentucky bluegrass	–	–	1	2.6%	1	8%	–	–
<i>Polygonum arenastrum</i>	prostrate knotweed	–	–	9	23.7%	–	–	–	–
<i>Rumex crispus</i>	curley dock	1	2.2%	–	–	1	8%	–	–
<i>Rumex patientia</i>	patience dock	6	13.3%	–	–	–	–	–	–
<i>Salsola tragus</i>	prickly Russian thistle	2	4.4%	–	–	–	–	1	9%
<i>Sonchus asper</i>	spiny sowthistle	–	–	–	–	1	8%	–	–
<i>Sorghum halepense</i>	Johnsongrass	4	8.9%	–	–	–	–	–	–
<i>Taraxacum officinale</i>	dandelion	16	35.6%	9	23.7%	–	–	–	–
<i>Tragopogon dubius</i>	western salsify	14	31.1%	8	21.1%	1	8%	–	–
<i>Trifolium repens</i>	ladino clover	2	4.4%	–	–	–	–	–	–
<i>Tribulus terrestris</i>	puncturevine	1	2.2%	8	21.1%	–	–	–	–
<i>Ulmus pumila</i>	Siberian elm	–	–	3	7.9%	–	–	–	–

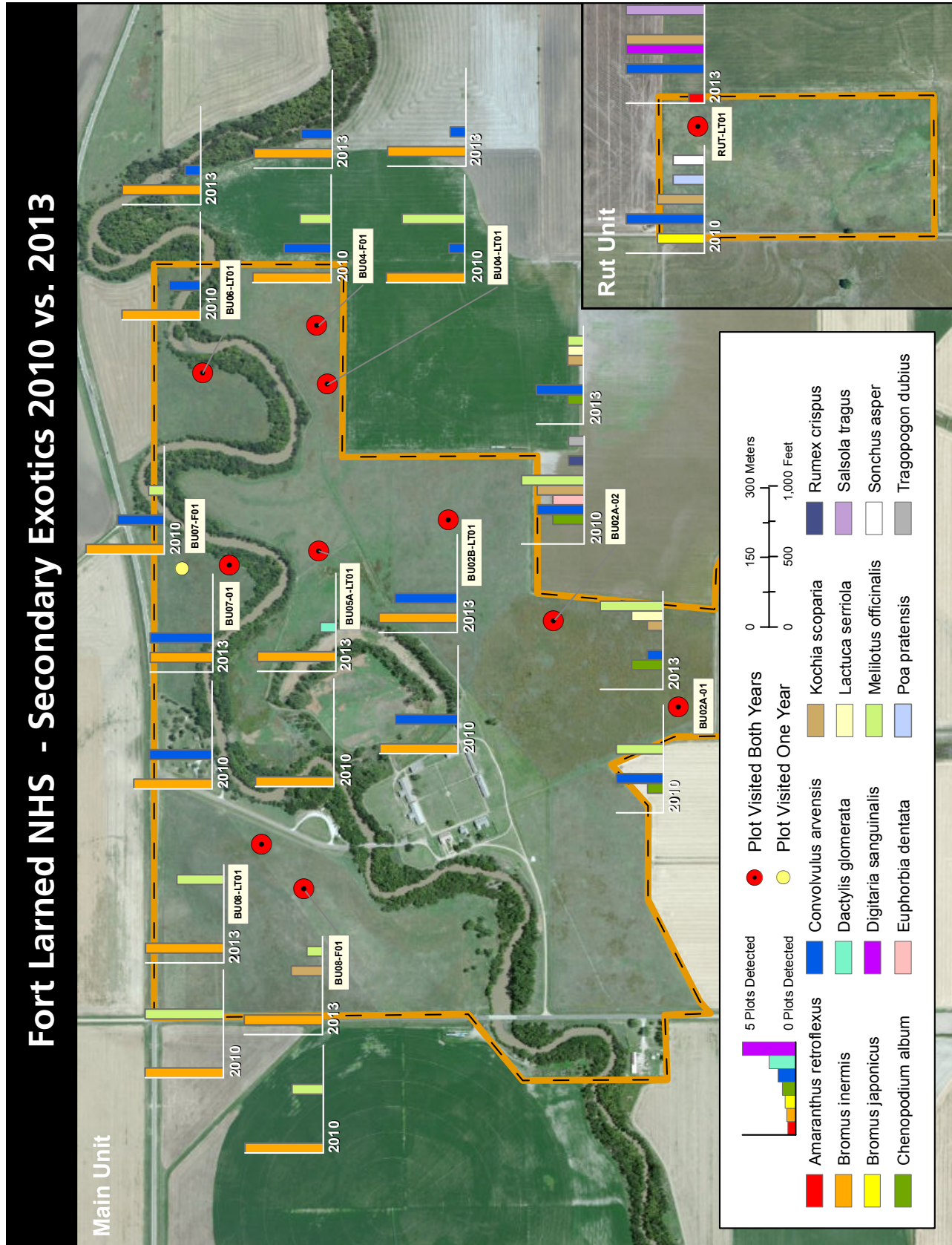


Figure 5. Comparison of exotics detected in 2010 and 2013 grassland monitoring permanent transects at FOLS.

The density of a detection of any given exotic species informs us of the invasion stage of that area. A Density Code of 1 will point to either a new introduction in an area or a lack of suitable resources for that species to establish and spread. Conversely, a Density Code of 4 denotes a matrix of the exotic species that has successfully colonized the site and pushed out all native species. Table 6 is a comparison of the number of blocks containing that density in 2010 and 2013 in two Distance Classes. Distance Class 1 is from immediately along the vector to 2 meters into the landscape or the depth of the mowed verge (whichever is greater). Distance Class 2 is a constant 10 meters into the landscape beginning at the interior edge of Distance Class 1. This minimum depth of 12 meters will give the resource manager an idea of the ability of a given exotic species to invade into the interior of a landscape.

Table 6. A comparison of the number of blocks containing a given density in 2010 and 2013 in two Distance Classes.

Species Code	Scientific Name	Common Name	Density Code	Distance Class 1		Distance Class 2	
				2010	2013	2010	2013
AMARET	<i>Amaranthus retroflexus</i>	redroot pigweed	1	4	2	3	1
			2	3	–	6	–
BROINE	<i>Bromus inermis</i>	smooth brome	1	2	4	2	–
			2	2	26	3	17
			3	24	5	23	15
			4	3	–	13	6
BROJAP	<i>Bromus japonicus</i>	Japanese brome	2	1	–	1	–
BROTEC	<i>Bromus tectorum</i>	cheatgrass	1	1	4	1	3
			2	4	16	4	11
CHEALB	<i>Chenopodium album</i>	common lambsquarters	1	4	1	1	–
			2	6	–	2	–
CIRARV	<i>Cirsium arvense</i>	canada thistle	1	4	–	–	–
			2	1	–	2	–
CIRVUL	<i>Cirsium vulgare</i>	bull thistle	1	1	–	–	–
			2	–	–	3	–
CONARV	<i>Convolvulus arvensis</i>	field bindweed	1	4	1	7	3
			2	7	14	3	13
			3	1	–	4	–
CONMAC	<i>Conium maculatum</i>	poison hemlock	1	1	–	–	1
CYNDAC	<i>Cynodon dactylon</i>	Bermudagrass	1	3	–	–	–
			2	8	4	2	–
			3	–	1	–	–
DESSOP	<i>Descurainia sophia</i>	flixweed	1	1	–	1	–
DIGSAN	<i>Digitaria sanguinalis</i>	hairy crabgrass	1	1	–	–	–
			2	9	–	2	–
EUPDEN	<i>Euphorbia dentata</i>	toothed spurge	1	6	–	10	–
			2	4	–	3	–
HORVUL	<i>Hordeum vulgare</i>	cereal barley	1	–	2	–	1
KOCSCO	<i>Kochia scoparia</i>	kochia	1	–	4	6	3
			2	13	3	7	2
LACSER	<i>Lactuca serriola</i>	prickly lettuce	1	–	3	–	4
LAMAMP	<i>Lamium amplexicaule</i>	henbit	1	1	–	–	–
			2	6	–	–	–

Density Code Key: 1 = one to five individual plants; 2 = scattered patches; 3 = evenly distributed patches; 4 = matrix; X = non-detect.

Table 6. A comparison of the number of blocks containing a given density in 2010 and 2013 in two Distance Classes. (continued).

Species Code	Scientific Name	Common Name	Density Code	Distance Class 1		Distance Class 2	
				2010	2013	2010	2013
LOLPER	<i>Lolium perenne</i>	perennial ryegrass	1	–	–	1	–
MEDLUP	<i>Medicago lupulina</i>	black medic clover	1	–	–	–	1
			2	10	2	5	6
			3	–	–	2	–
MELOFF	<i>Melilotus officinalis</i>	yellow sweetclover	1	5	–	3	9
			2	3	1	16	1
POAPRA	<i>Poa pratensis</i>	Kentucky bluegrass	2	–	1	–	–
POLARE	<i>Polygonum arenastrum</i>	prostrate knotweed	1	–	–	–	1
			2	–	9	–	3
RUMCRI	<i>Rumex crispus</i>	curley dock	1	1	–	–	–
RUMPAT	<i>Rumex patientia</i>	patience dock	1	2	–	3	–
			1	–	–	1	–
SALTRA	<i>Salsola tragus</i>	prickly Russian thistle	1	2	–	1	–
SORHAL	<i>Sorghum halepense</i>	Johnsongrass	1	1	–	1	–
			2	3	–	2	–
TAROFF	<i>Taraxacum officinale</i>	dandelion	1	6	3	3	2
			2	3	–	5	5
			3	–	–	1	–
TRADUB	<i>Tragopogon dubius</i>	western salsify	1	3	2	4	4
			2	3	–	5	–
TRIREF	<i>Trifolium repens</i>	ladino clover	2	–	–	1	–
TRITER	<i>Tribulus terrestris</i>	puncturevine	1	1	–	–	–
			2	–	8	–	–
ULMPUM	<i>Ulmus pumila</i>	Siberian elm	1	–	–	–	1

Density Code Key: 1 = one to five individual plants; 2 = scattered patches; 3 = evenly distributed patches; 4 = matrix; X = non-detect.

Table 7 is included for the benefit of those resource managers with an active exotic management program. This table lists the specific species found in each vector block and the Density Code of that species in each Distance Class. The comparison of current detections to that those from 2010 underscores the current drought effect – the more herbaceous species have disappeared, while the drought tolerant exotics (ie: bindweed, kochia, prickly Russian thistle) appear and often have increased.

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class.

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
201L	<i>Bromus inermis</i>	smooth brome					1	2	2	3
	<i>Bromus japonicus</i>	Japanese brome	2	1	0	0				
	<i>Bromus tectorum</i>	cheatgrass	0	1	0	0	1	1	1	0
	<i>Convolvulus arvensis</i>	field bindweed	0	1	2	2	0	2	2	0
	<i>Hordeum vulgare</i>	cereal barley					1	1	1	0
	<i>Kochia scoparia</i>	kochia					1	2	0	0
	<i>Medicago lupulina</i>	black medic clover	2	0	2	1				
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	0	0	0
	<i>Taraxacum officinale</i>	common dandelion	0	2	2	2	0	1	2	2
201R	<i>Bromus inermis</i>	smooth brome	2	4	4	4	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass	1	0	0	0	1	1	0	0
	<i>Cirsium arvense</i>	canada thistle	2	0	0	0				
	<i>Hordeum vulgare</i>	cereal barley					1	0	0	0
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	1	0	0	0				
	<i>Rumex patientia</i>	patience dock	0	2	2	0				
	<i>Taraxacum officinale</i>	common dandelion	2	1	0	0				
202L	<i>Bromus inermis</i>	smooth brome	0	1	1	0	0	2	2	3
	<i>Convolvulus arvensis</i>	field bindweed	0	1	0	0				
	<i>Cynodon dactylon</i>	Bermudagrass	1	0	0	0				
	<i>Kochia scoparia</i>	kochia					1	1	0	0
	<i>Lactuca serriola</i>	prickly lettuce					0	1	0	0
	<i>Medicago lupulina</i>	black medic clover	0	2	2	2				
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	0	0	0
	<i>Taraxacum officinale</i>	common dandelion	0	2	3	3	0	2	2	0
202R	<i>Bromus inermis</i>	smooth brome	2	4	4	4	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass					1	0	0	0
	<i>Kochia scoparia</i>	kochia	0	1	1	0	2	0	0	0
	<i>Lactuca serriola</i>	prickly lettuce					1	0	0	0
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	3				
	<i>Taraxacum officinale</i>	common dandelion	2	0	0	0				
203L	<i>Bromus inermis</i>	smooth brome	0	0	2	2	0	2	2	3
	<i>Convolvulus arvensis</i>	field bindweed	0	1	0	0				
	<i>Kochia scoparia</i>	kochia					0	0	2	0

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
203L (cont.)	<i>Medicago lupulina</i>	black medic clover	0	2	2	2	0	2	0	0
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	1	0	0
	<i>Taraxacum officinale</i>	common dandelion	0	3	3	3	0	2	2	2
203R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	3	4	4
	<i>Convolvulus arvensis</i>	field bindweed					0	1	0	0
	<i>Lactuca serriola</i>	prickly lettuce					1	1	0	0
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0	2	2	0	0
	<i>Melilotus officinalis</i>	yellow sweetclover	0	0	2	3				
	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	0				
	<i>Taraxacum officinale</i>	common dandelion					1	0	0	0
	<i>Tragopogon dubius</i>	western salsify	0	1	0	0				
204L	<i>Bromus inermis</i>	smooth brome	0	2	4	X	2	2	3	X
	<i>Medicago lupulina</i>	black medic clover	0	2	2	X	0	2	0	X
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	0	0	X
	<i>Taraxacum officinale</i>	common dandelion	0	2	2	X	1	2	2	X
204R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	2	2	2
	<i>Bromus tectorum</i>	cheatgrass					2	0	0	0
	<i>Convolvulus arvensis</i>	field bindweed	1	1	0	0	0	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	2	0	0	0				
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	0	3	3	0	1	0	0
	<i>Rumex patientia</i>	patience dock	0	1	0	0				
	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0				
	<i>Taraxacum officinale</i>	common dandelion					1	0	0	0
205L	<i>Bromus inermis</i>	smooth brome	0	2	4	X	1	2	3	X
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	X				
	<i>Medicago lupulina</i>	black medic clover	0	3	0	X	0	2	0	X
	<i>Taraxacum officinale</i>	common dandelion	0	2	0	X				
205R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	2	3	3
	<i>Convolvulus arvensis</i>	field bindweed	0	3	2	0	0	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	2	0	0	0				
	<i>Lactuca serriola</i>	prickly lettuce					1	0	0	0
	<i>Melilotus officinalis</i>	yellow sweetclover	0	0	3	3				
206L	<i>Bromus inermis</i>	smooth brome	0	1	4	4	2	2	4	X
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	0				
	<i>Medicago lupulina</i>	black medic clover	0	3	0	0	0	2	0	X
	<i>Melilotus officinalis</i>	yellow sweetclover					0	1	0	X
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	0	0	X
	<i>Taraxacum officinale</i>	common dandelion	0	2	0	0	0	2	0	X
206R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	2	3	3
	<i>Convolvulus arvensis</i>	field bindweed	2	2	0	0	2	1	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	2	0	0	0				

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
206R (cont.)	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	0				
	<i>Kochia scoparia</i>	kochia	0	1	0	0				
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0	2	0	0	0
	<i>Melilotus officinalis</i>	yellow sweetclover	0	0	3	3				
	<i>Taraxacum officinale</i>	common dandelion	1	0	0	0				
207L	<i>Bromus inermis</i>	smooth brome	0	0	2	3	2	2	2	2
	<i>Kochia scoparia</i>	kochia	0	1	1	0	0	1	1	0
	<i>Medicago lupulina</i>	black medic clover	0	2	0	0	0	1	0	0
	<i>Taraxacum officinale</i>	common dandelion	0	0	1	0	0	2	2	0
	<i>Trifolium repens</i>	ladino clover	0	0	2	0				
207R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	2	3	3
	<i>Convolvulus arvensis</i>	field bindweed	2	0	0	0	2	0	0	0
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	0				
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	1	2	2				
208L	<i>Bromus inermis</i>	smooth brome	1	0	0	3	0	2	2	2
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	0				
	<i>Medicago lupulina</i>	black medic clover					0	2	0	0
	<i>Melilotus officinalis</i>	yellow sweetclover					0	1	0	0
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	2	0	0
	<i>Taraxacum officinale</i>	common dandelion					0	1	0	0
	<i>Trifolium repens</i>	ladino clover	0	2	2	0				
208R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	2	3	3
	<i>Convolvulus arvensis</i>	field bindweed	2	2	3	0	2	0	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	2	0	0	0				
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	0				
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	0	2	0	0	1	0	0
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	0	0	0
209L	<i>Bromus inermis</i>	smooth brome	1	2	2	3	1	2	2	X
	<i>Conium maculatum</i>	poison hemlock					0	1	1	X
	<i>Kochia scoparia</i>	kochia					0	1	0	X
	<i>Lactuca serriola</i>	prickly lettuce					0	1	0	X
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	2	2	X
209R	<i>Bromus inermis</i>	smooth brome	0	4	4	4	2	2	2	2
	<i>Convolvulus arvensis</i>	field bindweed	2	3	2	0	2	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	2	0	0	0				
	<i>Kochia scoparia</i>	kochia					2	0	0	0
	<i>Poa pratensis</i>	Kentucky bluegrass					2	0	0	0
	<i>Taraxacum officinale</i>	common dandelion	1	1	0	0				
211L	<i>Bromus inermis</i>	smooth brome	3	3	3	3				
	<i>Convolvulus arvensis</i>	field bindweed	1	2	2	2				

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non–detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
211L (cont.)	<i>Euphorbia dentata</i>	toothed spurge	1	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	2				
	<i>Rumex patientia</i>	patience dock	1	1	1	0				
	<i>Sorghum halepense</i>	Johnsongrass	2	2	2	2				
212L	<i>Bromus inermis</i>	smooth brome	3	3	3	3				
	<i>Bromus tectorum</i>	cheatgrass	2	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed	2	3	3	0				
	<i>Euphorbia dentata</i>	toothed spurge	1	1	0	0				
	<i>Kochia scoparia</i>	kochia	0	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	3				
	<i>Sorghum halepense</i>	Johnsongrass	2	2	2	0				
213L	<i>Bromus inermis</i>	smooth brome	3	3	3	3				
	<i>Convolvulus arvensis</i>	field bindweed	1	1	0	0				
	<i>Descurainia sophia</i>	flixweed	0	1	0	0				
	<i>Euphorbia dentata</i>	toothed spurge	0	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	2				
	<i>Sorghum halepense</i>	Johnsongrass	1	1	0	0				
214L	<i>Bromus inermis</i>	smooth brome	3	3	3	3				
	<i>Cirsium vulgare</i>	bull thistle	0	2	2	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	3	3				
	<i>Sorghum halepense</i>	Johnsongrass	2	0	0	0				
215L	<i>Bromus inermis</i>	smooth brome	4	3	3	3				
	<i>Cirsium vulgare</i>	bull thistle	0	2	2	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	2				
	<i>Rumex patientia</i>	patience dock	0	0	1	0				
216L	<i>Amaranthus retroflexus</i>	redroot amaranth	1	0	0	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3				
	<i>Bromus tectorum</i>	cheatgrass	2	0	0	0				
	<i>Cirsium vulgare</i>	bull thistle	0	0	2	0				
	<i>Conium maculatum</i>	poison hemlock	1	0	0	0				
	<i>Taraxacum officinale</i>	common dandelion	1	0	0	0				
221L	<i>Bromus inermis</i>	smooth brome	3	3	3	4	2	2	3	3
	<i>Bromus tectorum</i>	cheatgrass					1	0	0	0
	<i>Digitaria sanguinalis</i>	hairy crabgrass	1	0	0	0				
	<i>Tragopogon dubius</i>	western salsify	0	0	1	0				
222L	<i>Bromus inermis</i>	smooth brome	3	4	4	4	1	3	4	4
	<i>Bromus tectorum</i>	cheatgrass					0	2	0	2
	<i>Cynodon dactylon</i>	Bermudagrass	2	0	0	0				
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	0	0	0				
	<i>Euphorbia dentata</i>	toothed spurge	0	1	0	0				
	<i>Polygonum arenastrum</i>	prostrate knotweed					2	2	0	0

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
222L (cont.)	<i>Rumex patientia</i>	patience dock	0	1	0	0				
	<i>Ulmus pumila</i>	Siberian elm					0	1	0	0
223L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Convolvulus arvensis</i>	field bindweed	2	1	0	0	2	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	1	0	0	0	2	0	0	0
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	0	0	1	0	0
	<i>Taraxacum officinale</i>	common dandelion	1	0	0	0				
	<i>Tragopogon dubius</i>	western salsify					0	0	1	0
	<i>Ulmus pumila</i>	Siberian elm					0	0	1	0
224L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Cirsium arvense</i>	canada thistle	0	0	1	0				
	<i>Cirsium vulgare</i>	bull thistle	0	2	0	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	2	0	0
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	2	0	0				
	<i>Kochia scoparia</i>	kochia	0	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	3	2	0	2	2	0
	<i>Tragopogon dubius</i>	western salsify					0	1	0	0
225L	<i>Amaranthus retroflexus</i>	redroot amaranth	0	1	0	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass					2	0	0	0
	<i>Euphorbia dentata</i>	toothed spurge	0	1	0	0				
	<i>Lactuca serriola</i>	prickly lettuce					0	1	0	0
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	3	0				
	<i>Tragopogon dubius</i>	western salsify					0	1	0	0
226L	<i>Amaranthus retroflexus</i>	redroot amaranth	0	2	0	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Cynodon dactylon</i>	Bermudagrass	2	2	0	0	2	0	0	0
	<i>Digitaria sanguinalis</i>	hairy crabgrass	2	2	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	2				
227L	<i>Amaranthus retroflexus</i>	redroot amaranth	0	2	0	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	3
	<i>Bromus tectorum</i>	cheatgrass					2	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	1	0	0	0	3	0	0	0
	<i>Euphorbia dentata</i>	toothed spurge	0	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	0	0				
	<i>Taraxacum officinale</i>	common dandelion	2	0	0	0				
228L	<i>Amaranthus retroflexus</i>	redroot amaranth	0	2	3	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass	0	0	2	0	2	2	2	2
	<i>Chenopodium album</i>	lambquarters	0	2	0	0				

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
(cont.)	<i>Convolvulus arvensis</i>	field bindweed					1	2	0	0
	<i>Cynodon dactylon</i>	Bermudagrass	2	2	0	0	2	0	0	0
	<i>Euphorbia dentata</i>	toothed spurge	0	1	0	0				
	<i>Kochia scoparia</i>	kochia	0	0	1	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	2	2	2				
	<i>Tragopogon dubius</i>	western salsify	0	0	1	0				
229L	<i>Amaranthus retroflexus</i>	redroot amaranth	2	2	2	0				
	<i>Bromus inermis</i>	smooth brome	4	4	4	4	2	2	2	2
	<i>Bromus tectorum</i>	cheatgrass					2	2	3	3
	<i>Chenopodium album</i>	lambsquarters	2	2	2	0				
	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	0	0
	<i>Taraxacum officinale</i>	common dandelion	1	0	0	0				
	<i>Tragopogon dubius</i>	western salsify	0	1	0	0	1	0	0	0
230L	<i>Amaranthus retroflexus</i>	redroot amaranth	2	2	0	0				
	<i>Bromus inermis</i>	smooth brome	4	4	4	4	3	4	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	2	0	0
	<i>Chenopodium album</i>	lambsquarters	1	0	0	0				
	<i>Cirsium vulgare</i>	bull thistle	1	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed	3	3	3	0	2	2	0	0
	<i>Euphorbia dentata</i>	toothed spurge	1	0	0	0				
	<i>Kochia scoparia</i>	kochia	2	2	2	0				
	<i>Lamium amplexicaule</i>	henbit	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	2	2	0	0				
	<i>Tragopogon dubius</i>	western salsify	0	0	1	0				
	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
231L	<i>Amaranthus retroflexus</i>	redroot amaranth	1	0	0	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	2	0	0
	<i>Convolvulus arvensis</i>	field bindweed					0	2	2	0
	<i>Kochia scoparia</i>	kochia	2	0	0	0				
	<i>Lamium amplexicaule</i>	henbit	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover					0	1	0	0
	<i>Tragopogon dubius</i>	western salsify	2	2	0	0				
	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
232L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	3	4	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	2	0	0
	<i>Chenopodium album</i>	lambsquarters	2	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	1	1	0
	<i>Euphorbia dentata</i>	toothed spurge	0	1	0	0				
	<i>Kochia scoparia</i>	kochia	2	2	0	0	1	0	0	0
	<i>Lamium amplexicaule</i>	henbit	2	0	0	0				

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
232L (cont.)	<i>Melilotus officinalis</i>	yellow sweetclover					0	1	0	0
	<i>Tragopogon dubius</i>	western salsify	0	0	0	0	0	1	1	0
	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
233L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	3	4	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	0	0	0
	<i>Chenopodium album</i>	lambsquarters	2	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed	0	1	0	0				
	<i>Kochia scoparia</i>	kochia	2	0	0	0				
	<i>Lamium amplexicaule</i>	henbit	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	1	0	0				
	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
234L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	4	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	2	0	0
	<i>Chenopodium album</i>	lambsquarters	1	1	0	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	2	0	0
	<i>Euphorbia dentata</i>	toothed spurge	2	2	2	0				
	<i>Kochia scoparia</i>	kochia	2	2	0	0				
	<i>Lamium amplexicaule</i>	henbit	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover					0	1	1	0
	<i>Tragopogon dubius</i>	western salsify	0	2	0	0	0	1	1	0
235L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass	2	2	0	0	2	2	0	0
	<i>Cirsium arvense</i>	canada thistle	1	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	2	2	0
	<i>Euphorbia dentata</i>	toothed spurge	2	0	0	0				
	<i>Kochia scoparia</i>	kochia	2	2	0	0				
	<i>Lamium amplexicaule</i>	henbit	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	1	2	0	0				
	<i>Tragopogon dubius</i>	western salsify	2	2	0	0				
	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
236L	<i>Amaranthus retroflexus</i>	redroot amaranth	2	1	0	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	3	4	4	4
	<i>Bromus tectorum</i>	cheatgrass	0	2	0	0	2	0	0	0
	<i>Chenopodium album</i>	lambsquarters	2	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed	2	0	0	0	2	2	0	0
	<i>Descurainia sophia</i>	flixweed	1	0	0	0				
	<i>Euphorbia dentata</i>	toothed spurge	1	1	0	0				
	<i>Kochia scoparia</i>	kochia	2	0	0	0				
	<i>Lamium amplexicaule</i>	henbit	1	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	1	2	0	0				
	<i>Tragopogon dubius</i>	western salsify	1	1	0	0	0	0	1	0
	<i>Tribulus terrestris</i>	puncturevine	1	0	0	0	2	0	0	0

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
237L	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass					2	0	0	0
	<i>Cirsium arvense</i>	canada thistle	1	2	0	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	0	2	2
	<i>Kochia scoparia</i>	kochia	2	2	2	0				
	<i>Medicago lupulina</i>	black medic clover	2	2	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	0	1	2	0				
	<i>Tragopogon dubius</i>	western salsify	0	2	2	0	1	0	0	0
238L	<i>Amaranthus retroflexus</i>	redroot amaranth	1	1	0	0	1	1	0	0
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	3	4	4	4
	<i>Bromus tectorum</i>	cheatgrass	0	2	0	0	2	1	0	0
	<i>Chenopodium album</i>	lambsquarters	2	0	0	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	2	0	0
	<i>Euphorbia dentata</i>	toothed spurge	2	1	0	0				
	<i>Kochia scoparia</i>	kochia	2	0	0	0	1	0	0	0
	<i>Lolium perenne</i>	perennial ryegrass	0	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	1	0	2	0				
	<i>Rumex patientia</i>	patience dock	1	0	0	0				
	<i>Taraxacum officinale</i>	common dandelion	1	1	0	0				
	<i>Tragopogon dubius</i>	western salsify	1	0	0	1				
239L	<i>Amaranthus retroflexus</i>	redroot amaranth	1	2	2	0				
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass	2	0	0	0	2	0	0	0
	<i>Chenopodium album</i>	lambsquarters	1	0	0	0				
	<i>Cirsium arvense</i>	canada thistle	1	2	0	0				
	<i>Conium maculatum</i>	poison hemlock	0	0	1	0				
	<i>Convolvulus arvensis</i>	field bindweed					2	0	0	0
	<i>Euphorbia dentata</i>	toothed spurge	1	2	0	0				
	<i>Kochia scoparia</i>	kochia	2	2	0	0				
	<i>Medicago lupulina</i>	black medic clover	2	0	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	2	2	0	0				
	<i>Tragopogon dubius</i>	western salsify	2	2	2	0				
	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
240L	<i>Amaranthus retroflexus</i>	redroot amaranth					1	0	0	0
	<i>Bromus inermis</i>	smooth brome	3	3	3	3	2	3	4	4
	<i>Bromus tectorum</i>	cheatgrass	0	2	0	0	2	2	0	0
	<i>Chenopodium album</i>	lambsquarters	2	0	0	0	1	0	0	0
	<i>Convolvulus arvensis</i>	field bindweed	1	0	0	0				
	<i>Euphorbia dentata</i>	toothed spurge	1	0	0	0				
	<i>Kochia scoparia</i>	kochia	2	1	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	2	0	1	0	2	1	0	0
	<i>Tragopogon dubius</i>	western salsify	1	1	0	0				

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Table 7. Comparison of 2010 vs. 2013 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2010				2013			
			D1	D2	D3	D4	D1	D2	D3	D4
240L (cont.)	<i>Tribulus terrestris</i>	puncturevine					2	0	0	0
	<i>Ulmus pumila</i>	Siberian elm					0	0	1	0
241L	<i>Bromus inermis</i>	smooth brome	3	4	4	3				
	<i>Chenopodium album</i>	lambsquarters	1	0	0	0				
	<i>Cirsium arvense</i>	canada thistle	1	0	0	0				
	<i>Euphorbia dentata</i>	toothed spurge	2	2	0	0				
	<i>Kochia scoparia</i>	kochia	2	2	0	0				
	<i>Melilotus officinalis</i>	yellow sweetclover	1	0	0	0				
	<i>Rumex crispus</i>	curly dock	1	0	0	0				

Distance Class Key: D1 = edge of vector to 2 meters into the landscape (or inner edge of mow line); D2 = interior edge of D1 to 10 meters; D3 & D4 = each additional 10 meters into the landscape.

Density Code Key: 0 = no plants; 1 = 1–5 plants; 2 = scattered patches; 3 = even distributed patches; 4 = matrix; X = non-detect

Literature Cited

Folts–Zettner, T., R. Gatewood, R. Bennetts and K. Cherwin No date. Grassland monitoring protocol and standard operating procedures for the Southern Plains I&M Network and Fire Group. Natural Resource Technical Report. National Park Service, Fort Collins, Colorado. In review.

Folts–Zettner, T., R. Bennetts, K. Gallo, S. Studd, M. Powell, K. Beaupre, and H. Sosinski. 2013. Multi–Network Exotic Plant Monitoring Protocol and Standard Operating Procedures : A collaboration among the Southern Plains, Chihuahuan Desert and Sonoran Desert Networks Natural Resource Technical Report NPS/SOPN/NRTR—2013/XXX. National Park Service, Fort Collins, Colorado.

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