



Sand Creek Massacre National Historic Site

Southern Plains Network and Southern Plains Fire Group 2014 Vegetation Monitoring Data Summary



ON THE COVER

Grasslands at Sand Creek Massacre 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 I&M Network (SOPN) and the Southern Plains Fire Group (SPFG) during 2014 at Sand Creek Massacre National Historic Site (SAND). Data summaries are used to impart current monitoring data until enough years of data have been collected to facilitate trend analysis. More detailed synthesis reports will be produced in 2015-2017.

Grassland Monitoring Results

Grassland monitoring occurred during mid-July of 2014 (Table 1). Data from six (6) permanent transects (Figure 2) were collected following 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. Additional data is collected during visits that support the SPFG program.

Table 1. Plant community and sampling dates for each transect at Sand Creek Massacre NHS in 2014.

Group	Transect	Plant community	Date
Cottonwood	CWOOD-LT01	<i>Populus deltoides</i> / <i>Pascopyrum smithii</i> - <i>Panicum virgatum</i> Woodland	07/21
	CWOOD-LT02	<i>Populus deltoides</i> / <i>Pascopyrum smithii</i> - <i>Panicum virgatum</i> Woodland	07/22
Sage	RETS-LT01	<i>Artemisia filifolia</i> / <i>Andropogon hallii</i> Shrubland	07/22
	USAGE-LT02	<i>Artemisia filifolia</i> / <i>Andropogon hallii</i> Shrubland	07/22
Upland	UGRASS-LT01	<i>Sporobolus airoides</i> - <i>Distichlis spicata</i> Herbaceous	07/21
	UGRASS-LT04	<i>Boutaloua gracilis</i> - <i>Buchloe dactyloides</i> Herbaceous	07/22
	UGRASS-LT05	<i>Boutaloua gracilis</i> - <i>Buchloe dactyloides</i> Herbaceous	07/21

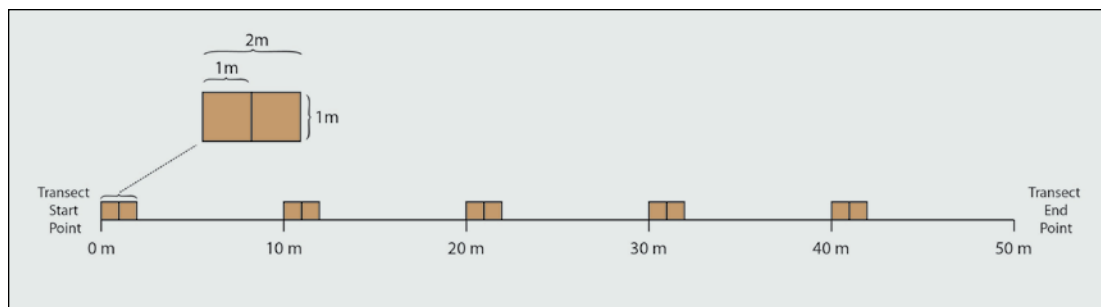


Figure 1. Layout of plots within each permanent transect.

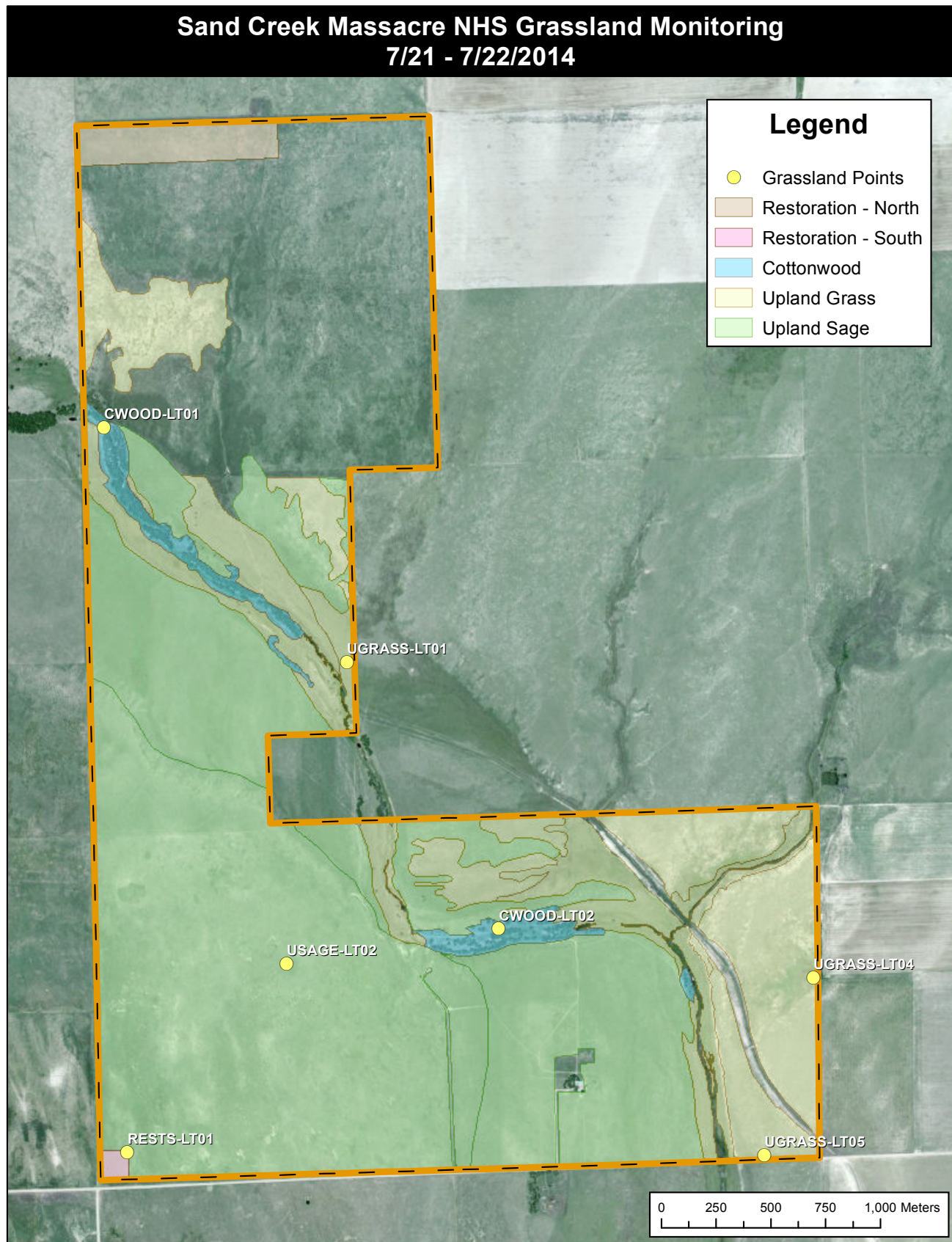


Figure 2. Location of each permanent plot at SAND monitored in 2014

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 SAND in 2014 can be found in Table 2.

Table 3 contains numerical results of 2014 grassland monitoring at SAND. 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 SAND in 2014.

Cover	Cottonwood Community		Sage Community	
	CWOOD-LT01	CWOOD-LT02	RESTS-LT01	USAGE-LT02
SOIOPEN	1.4	13.2	12.2	17.4
SOILUNDER	10.8	1	2.2	5
LITTER	68.2	79.4	83.2	75
WOOD	19.4	6.4	2.4	2.6
ROCKSM	0.2	0	0	0
ROCKLG	0	0	0	0
LICHEN	0	0	0	0
MOSS	0	0	0	0
CRUST	0	0	0	0

Cover	Upland Community		
	UGRASS-LT01	UGRASS-LT04	UGRASS-LT05
SOIOPEN	10.4	8.4	20.2
SOILUNDER	6.4	1.8	4.2
LITTER	81.2	89.8	75
WOOD	1	0	0.2
ROCKSM	0	0	0.4
ROCKLG	0	0	0
LICHEN	0	0	0
MOSS	0	0	0
CRUST	1	0	0

Table 3. Species cover sum and frequency for each permanent transect monitored at SAND in 2014. Exotic species are highlighted in pink.

Species Code	Cottonwood Community				Sage Community			
	CWOOD-LT01		CWOOD-LT02		RESTS-LT01		USAGE-LT02	
	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency
Forb								
AMBPSI			0.5	1			0.5	1
ASCSub	4.5	3						
ASTCRA								
BRIEUP			0.5	1				
CALINV							0.5	1
CALSER								
CIRUND			1	1			1.5	2
CONARV								
CONCAN								
EVONUT					1	1		
GAUCOC			1	2			0.5	1
HYMTEN			0.5	1				
KOCSCO	3	4					1	2
LYGJUN								
MACPIN					1	1		
PHYCUN								
PHYLON								
POROLE							0.5	1
PSOTEN								
SALTRA	3	4	1	2	24	5	31	5
SOLROS								
SPHCOC			0.5	1	1	2		
SYMERI			0.5	1				
Grass								
ARIPUR					1	1	5.5	2
BOUCUR					1	1		
BOUGRA					7	3	7.5	4
BUCDAC			4	2				
DISSPI	5.5	2						
ELYSAN	1	1	0.5	1				
HORPUS	0.5	1						
PASSMI	78	4	38.5	5				
POAPRA	1	1						
SPOAIR	0.5	1	3	1				
SPOCRY			4	2	6	4	9	5
Shrub								
ARTFIL					24	5	28	2
YUCGLA					0.5	1		
Subshrub								
ESCVIV								
OPUPOL	1	1					0.5	1
Tree								
POPDEL	105	3	75	3				

Table 3. Species cover sum and frequency for each permanent transect monitored at SAND in 2014. Exotic species are highlighted in pink (continued).

Species Code	Upland Community					
	RESTN-02		UGRASS-05		UGRASS-LT01	
	Cover Sum	Frequency	Cover Sum	Frequency	Cover Sum	Frequency
Forb						
AMBPSI						
ASCSub						
ASTCRA			1	2		
BRIEUP			3	3		
CALINV			1.5	2		
CALSER			0.5	1		
CIRUND			1	1		
CONARV			4	5		
CONCAN	1	2				
EVONUT						
GAUCOC			2	2		
HYMTEN						
KOCSCO	5.5	5	1	2	13	3
LYGJUN	1	2	1	2		
MACPIN						
PHYCUN					6	2
PHYLON			0.5	1		
POROLE						
PSOTEN			1	2		
SALTRA	11	5	0.5	1	9.5	4
SOLROS			0.5	1		
SPHCOC	0.5	1	6.5	5	0.5	1
SYMERI						
Grass						
ARIPUR			2.5	3	6	2
BOUCUR						
BOUGRA	53	5			46.5	4
BUCDAC	0.5	1			0.5	1
DISSPI	2	3				
ELycAN						
HORPUS						
PASSMI			22	5	10	2
POAPRA						
SPOAIR	0.5	1	3	1		
SPOCRY	2	2				
Shrub						
ARTFIL	1.5	2				
YUCGLA	1	1				
Subshrub						
ESCVIV	0.5	1				
OPUPOL						
Tree						
POPDEL						

Table 4. All plant species detected during grassland monitoring in 2011 and exotic monitoring in 2011 and 2014 at SAND. Exotic species are highlighted in pink.

Species Code	LifeForm	Scientific Name	Common Name	Primary Duration
AMBPSI	Forb	<i>Ambrosia psilostachya</i>	western ragweed	Perennial
ARIPUR	Grass	<i>Aristida purpurea</i>	purple threeawn	Perennial
ARTFIL	Shrub	<i>Artemisia filifolia</i>	sand sagebrush	Perennial
ASCSUB	Forb	<i>Asclepias subverticillata</i>	horsetail milkweed	Perennial
ASTCRA	Forb	<i>Astragalus crassicaupus</i>	ground-plum	Perennial
BOUCUR	Grass	<i>Bouteloua curtipendula</i>	sideoats grama	Perennial
BOUGRA	Grass	<i>Bouteloua gracilis</i>	blue grama	Perennial
BRIEUP	Forb	<i>Brickellia eupatorioides</i>	false boneset brickellbush	Perennial
BUCDAC	Grass	<i>Buchloe dactyloides</i>	buffalograss	Perennial
CALINV	Forb	<i>Callirhoe involucrata</i>	winecup	Perennial
CALSER	Forb	<i>Calylophus serrulatus</i>	halfshrub sundrop	Perennial
CHEALB	Forb	<i>Chenopodium album</i>	common lambsquarters	Annual
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
DISSPI	Grass	<i>Distichlis spicata</i>	inland saltgrass	Perennial
ELYSAN	Grass	<i>Elymus canadensis</i>	canada wildrye	Perennial
ESCVIV	Subshrub	<i>Escobaria vivipara</i>	spinystar	Perennial
EVONUT	Forb	<i>Evolvulus nuttallianus</i>	shaggy dwarf morning glory	Perennial
GAUCOC	Forb	<i>Gaura coccinea</i>	scarlet guara	Perennial
HORPUS	Grass	<i>Hordeum pusillum</i>	little barley	Perennial
HYMTEN	Forb	<i>Hymenopappus tenuifolius</i>	chalkhill woollywhite	Biennial
KOCSCO	Forb	<i>Kochia scoparia</i>	kochia	Annual
LYGJUN	Forb	<i>Lygodesmia juncea</i>	rush skeletonplant	Perennial
MACPIN	Forb	<i>Machaeranthera pinnatifida</i>	lacy tansyaster	Perennial
MELOFF	Forb	<i>Melilotus officinalis</i>	yellow sweetclover	Annual
OPUPOL	Subshrub	<i>Opuntia polyacantha</i>	plains pricklypear cactus	Perennial
PASSMI	Grass	<i>Pascopyrum smithii</i>	western wheatgrass	Perennial
PHYCUN	Forb	<i>Phyla cuneifolia</i>	wedgeleaf frogfruit	Perennial
PHYLON	Forb	<i>Physalis longifolia</i>	longleaf groundcherry	Perennial
POAPRA	Grass	<i>Poa pratensis</i>	kentucky bluegrass	Perennial
POPDEL	Tree	<i>Populus deltoides</i>	plains cottonwood	Perennial
POROLE	Forb	<i>Portulaca oleracea</i>	common purslane	Annual
PSOTEN	Forb	<i>Psoralidium tenuiflorum</i>	slimflower scurfpea	Perennial
RUMCRI	Forb	<i>Rumex crispus</i>	curley dock	Perennial
SALTRA	Forb	<i>Salsola tragus</i>	prickly russian thistle	Annual
SOLROS	Forb	<i>Solanum rostratum</i>	buffalobur	Annual
SPHCOC	Forb	<i>Sphaeralcea coccinea</i>	scarlet globemallow	Perennial
SPOAIR	Grass	<i>Sporobolus airoides</i>	alkali sacaton	Perennial
SPOCRY	Grass	<i>Sporobolus cryptandrus</i>	sand dropseed	Perennial
SYMERI	Forb	<i>Symphyotrichum ericoides</i>	white heath aster	Perennial
TRADUB	Forb	<i>Tragopogon dubius</i>	western salsify	Annual
YUCGLA	Shrub	<i>Yucca glauca</i>	soft soapweed yucca	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 discrete 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 July 9-10, 2014 and included the interior two-track road of the park (Figure 4). These vectors have been previously monitored late-June, 2011. It should be noted that 2011 was the beginning of years of severe to exceptional drought, including early 2014. Data summarized in this report compares the results of 2014 monitoring to that detected in 2011.

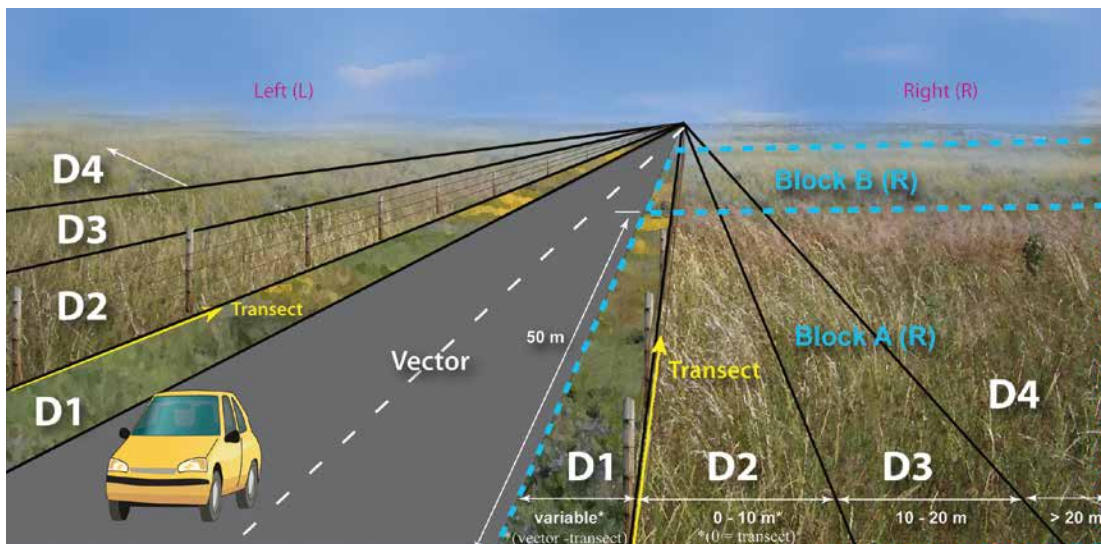


Figure 3. Layout of Vector Blocks and Distance Classes along a vector.

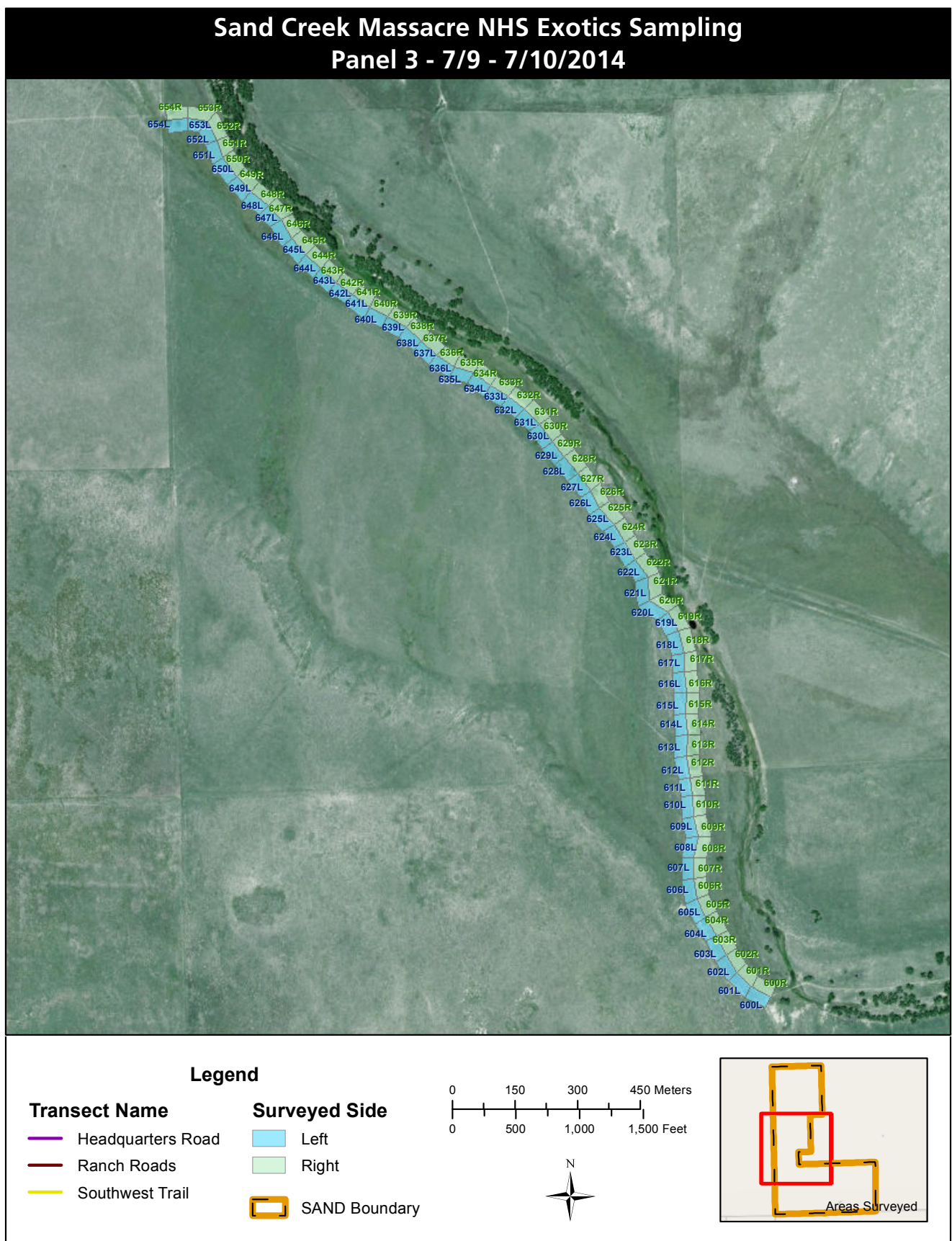


Figure 4. Panel 3 numbered vector blocks monitored at SAND in both 2011 and 2014.

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=110) and transects (N=7)(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 SAND.

Scientific Name	Common Name	2011		2014		2011		2014	
		Primary Blocks (N=110)		Primary Blocks (N=110)		Secondary Transects (N=12)		Secondary Transects (N=7)	
		Total	% Blocks	Total	% Blocks	Total	% Blocks	Total	% Blocks
<i>Chenopodium album</i>	common lambsquarters	66	60.00%	17	15.45%	1	8.33%	-	-
<i>Cirsium vulgare</i>	bull thistle	3	2.73%	-	-	-	-	-	-
<i>Convolvulus arvensis</i>	field bindweed	1	0.91%	1	0.91%	1	8.33%	1	14.29%
<i>Kochia scoparia</i>	kochia	31	28.18%	98	89.09%	6	50.00%	5	71.43%
<i>Melilotus officinalis</i>	yellow sweetclover	1	0.91%	-	-	1	8.33%	-	-
No Plant	no plant	25	22.73%	-	-	3	25.00%	-	-
<i>Poa pratensis</i>	kentucky bluegrass	-	-	-	-	-	-	1	14.29%
<i>Rumex crispus</i>	curley dock	1	0.91%	3	2.73%	-	-	-	-
<i>Salsola tragus</i>	prickly Russian thistle	41	37.27%	110	100.00%	3	25.00%	7	100.00%
<i>Tragopogon dubius</i>	western salsify	2	1.82%	-	-	-	-	-	-

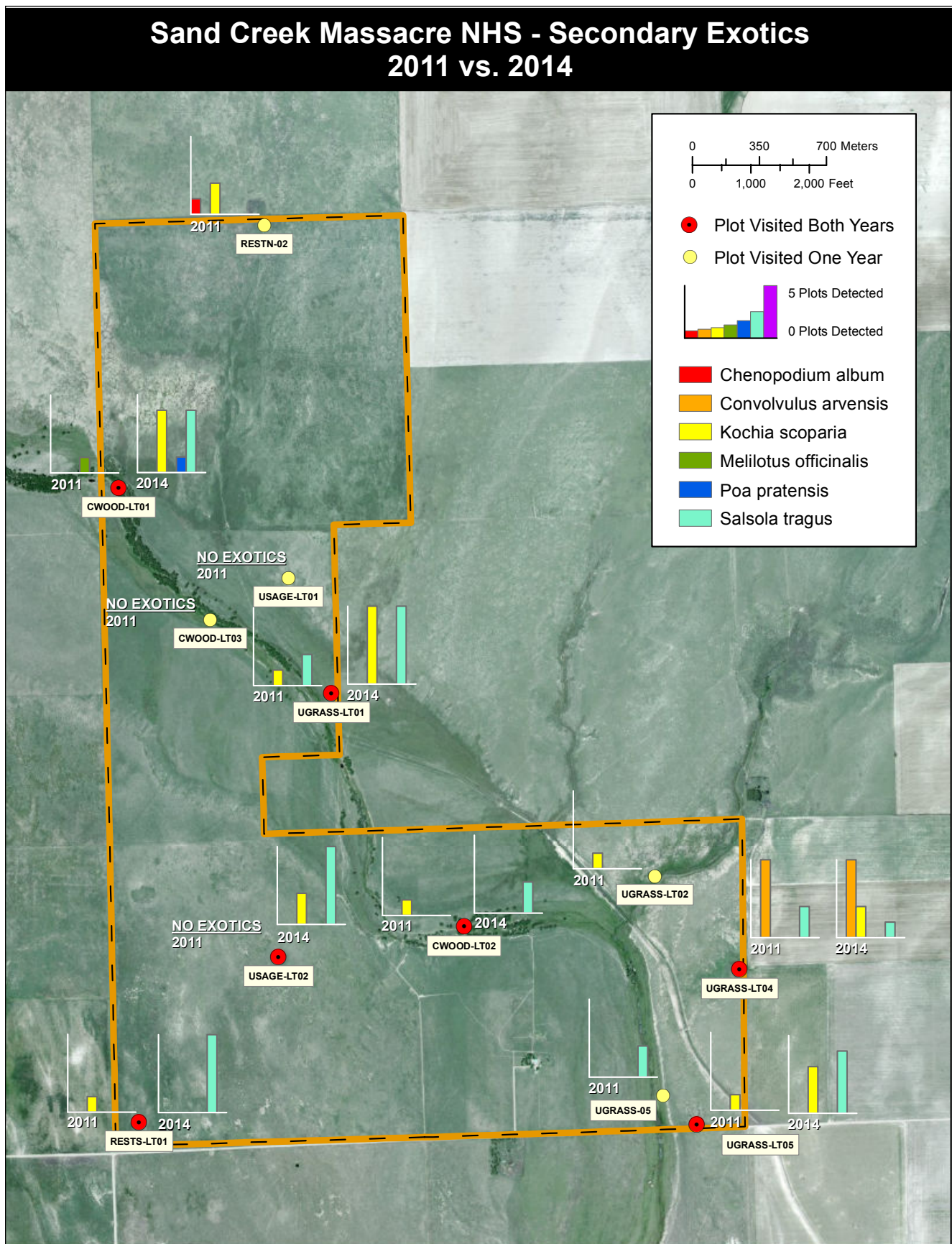


Figure 5. Comparison of exotics detected in 2011 and 2014 grassland monitoring permanent transects at SAND.

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 2011 and 2014 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 2011 and 2014 in two Distance Classes.

Species Code	Scientific Name	Common Name	Density Code	Distance Class 1		Distance Class 2	
				2011	2014	2011	2014
CHEALB	<i>Chenopodium album</i>	common lambsquarters	1	36	9	15	4
			2	27	5	28	6
CIRVUL	<i>Cirsium vulgare</i>	bull thistle	1	3			
CONARV	<i>Convolvulus arvensis</i>	field bindweed	1	1	1		
KOCSCO	<i>Kochia scoparia</i>	kochia	1	14	9	5	8
			2	14	88	2	57
MELOFF	<i>Melilotus officinalis</i>	yellow sweetclover	1	1			
RUMCRI	<i>Rumex crispus</i>	curley dock	1	1	2		1
SALTRA	<i>Salsola tragus</i>	prickly Russian thistle	1	27		8	1
			2	14	110	1	105
			3				1
TRADUB	<i>Tragopogon dubius</i>	western salsify	1	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.

Table 7. Comparison of 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class.

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
600L	<i>Kochia scoparia</i>	kochia					2	0	0	0
600L	No Plant	no plant	0	0	0	X				
600L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
600R	<i>Chenopodium album</i>	common lambsquarters					1	1	0	0
600R	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	2	2	0
600R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	2	0
601L	<i>Kochia scoparia</i>	kochia					2	2	0	X
601L	No Plant	no plant	0	0	0	X				
601L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	X
601R	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	2	0	0
601R	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	0	2	2	2	2
602L	<i>Chenopodium album</i>	common lambsquarters	1	0	0	X	1	1	0	X
602L	<i>Kochia scoparia</i>	kochia					2	2	0	X
602L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	X	2	3	2	X
602R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0	1	0	0	0
602R	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	0	0
602R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	2	2
603L	<i>Chenopodium album</i>	common lambsquarters	1	0	0	X	1	0	0	X
603L	<i>Kochia scoparia</i>	kochia	2	2	0	X	2	2	0	X
603L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	X	2	2	2	X
603R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
603R	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	0	0
603R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
604L	<i>Chenopodium album</i>	common lambsquarters	2	0	0	X	1	1	0	X
604L	<i>Kochia scoparia</i>	kochia	2	0	0	X	2	2	0	X
604L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	X	2	2	2	X
604R	<i>Chenopodium album</i>	common lambsquarters	2	1	0	0				
604R	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	1	0	0
604R	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	2	2
605L	<i>Kochia scoparia</i>	kochia	2	0	0	X	1	1	0	X
605L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	X
605R	<i>Chenopodium album</i>	common lambsquarters	0	1	0	0				
605R	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	1	0	0
605R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
606L	<i>Kochia scoparia</i>	kochia					1	0	0	0
606L	No Plant	no plant	0	0	0	0				
606L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
606R	<i>Chenopodium album</i>	common lambsquarters	1	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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
606R	<i>Kochia scoparia</i>	kochia					2	0	0	0
606R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
606R	<i>Tragopogon dubius</i>	western salsify	0	1	0	0				
607L	<i>Kochia scoparia</i>	kochia					2	0	0	0
607L	<i>No Plant</i>	no plant	0	0	0	0				
607L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
607R	<i>Kochia scoparia</i>	kochia					2	0	0	0
607R	<i>No Plant</i>	no plant	0	0	0	0				
607R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
608L	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	0	0	0
608L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
608R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
608R	<i>Kochia scoparia</i>	kochia					2	0	0	0
608R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
609L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
609R	<i>Kochia scoparia</i>	kochia					2	0	0	0
609R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
610L	<i>Kochia scoparia</i>	kochia					1	0	0	0
610L	<i>No Plant</i>	no plant	0	0	0	0				
610L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
610R	<i>Kochia scoparia</i>	kochia					0	0	2	2
610R	<i>No Plant</i>	no plant	0	0	0	0				
610R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
611L	<i>Kochia scoparia</i>	kochia					2	0	0	0
611L	<i>No Plant</i>	no plant	0	0	0	0				
611L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
611R	<i>Kochia scoparia</i>	kochia					1	2	2	2
611R	<i>No Plant</i>	no plant	0	0	0	0				
611R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
612L	<i>Kochia scoparia</i>	kochia					2	0	0	0
612L	<i>No Plant</i>	no plant	0	0	0	0				
612L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
612R	<i>Kochia scoparia</i>	kochia					2	2	0	0
612R	<i>No Plant</i>	no plant	0	0	0	0				
612R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
613L	<i>Kochia scoparia</i>	kochia					1	1	1	0
613L	<i>No Plant</i>	no plant	0	0	0	0				
613L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
613R	<i>Kochia scoparia</i>	kochia					2	0	0	0
613R	<i>No Plant</i>	no plant	0	0	0	0				
613R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
614L	<i>Kochia scoparia</i>	kochia					2	2	0	0
614L	<i>No Plant</i>	no plant	0	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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
614L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
614R	<i>Kochia scoparia</i>	kochia					2	2	0	0
614R	No Plant	no plant	0	0	0	0				
614R	<i>Rumex crispus</i>	curley dock					0	1	0	0
614R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
615L	<i>Kochia scoparia</i>	kochia					2	2	0	0
615L	<i>Rumex crispus</i>	curley dock					1	0	0	0
615L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	2	0
615R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
615R	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	1	0	0
615R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
616L	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	0	0
616L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	2	0
616R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
616R	<i>Kochia scoparia</i>	kochia					2	0	0	0
616R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
617L	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	0	0
617L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	0	0
617R	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	0	0	0
617R	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	0	0
618L	<i>Kochia scoparia</i>	kochia					2	2	0	0
618L	No Plant	no plant	0	0	0	0				
618L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
618R	<i>Kochia scoparia</i>	kochia					2	0	0	0
618R	No Plant	no plant	0	0	0	0				
618R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
619L	<i>Kochia scoparia</i>	kochia					2	2	0	0
619L	<i>Rumex crispus</i>	curley dock	1	0	0	0				
619L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
619R	<i>Kochia scoparia</i>	kochia	0	1	0	0	2	2	0	0
619R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
620L	<i>Kochia scoparia</i>	kochia					2	1	0	0
620L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
620R	<i>Kochia scoparia</i>	kochia					2	2	0	0
620R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
621L	<i>Kochia scoparia</i>	kochia					2	2	2	0
621L	No Plant	no plant	0	0	0	0				
621L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
621R	<i>Chenopodium album</i>	common lambsquarters	0	1	0	0				
621R	<i>Kochia scoparia</i>	kochia					2	2	0	0
621R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
622L	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
622L	<i>Kochia scoparia</i>	kochia					2	2	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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
622L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
622R	<i>Kochia scoparia</i>	kochia					2	2	0	0
622R	No Plant	no plant	0	0	0	0				
622R	<i>Salsola tragus</i>	prickly Russian thistle					2	1	0	0
623L	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
623L	<i>Kochia scoparia</i>	kochia					2	1	0	0
623L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
623R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
623R	<i>Kochia scoparia</i>	kochia					2	1	0	0
623R	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	0	2	2	0	0
624L	<i>Kochia scoparia</i>	kochia					2	0	0	0
624L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	X	2	2	0	0
624R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
624R	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	0	0	0
624R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
625L	<i>Chenopodium album</i>	common lambsquarters	1	0	X	X				
625L	<i>Kochia scoparia</i>	kochia	1	0	X	X	2	0	0	0
625L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	X	X	2	2	0	0
625R	<i>Chenopodium album</i>	common lambsquarters	2	0	0	0				
625R	<i>Kochia scoparia</i>	kochia	2	1	0	0	2	0	0	0
625R	<i>Salsola tragus</i>	prickly Russian thistle	2	1	0	0	2	2	0	0
626L	<i>Kochia scoparia</i>	kochia					2	0	0	0
626L	No Plant	no plant	0	0	X	X				
626L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
626R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
626R	<i>Salsola tragus</i>	prickly Russian thistle					2	0	0	0
627L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	X	2	2	0	0
627R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
627R	<i>Kochia scoparia</i>	kochia					2	2	0	0
627R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
628L	<i>Cirsium vulgare</i>	bull thistle	1	0	0	X				
628L	<i>Kochia scoparia</i>	kochia					1	2	0	0
628L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
628R	<i>Chenopodium album</i>	common lambsquarters	0	2	0	0				
628R	<i>Cirsium vulgare</i>	bull thistle	1	0	0	0				
628R	<i>Kochia scoparia</i>	kochia					2	2	0	0
628R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
628R	<i>Tragopogon dubius</i>	western salsify	1	0	0	0				
629L	<i>Kochia scoparia</i>	kochia					2	0	0	0
629L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	X	2	2	2	0
629R	<i>Chenopodium album</i>	common lambsquarters	1	2	2	0				
629R	<i>Kochia scoparia</i>	kochia	0	1	0	0	2	0	0	0
629R	<i>Melilotus officinalis</i>	yellow sweetclover	1	0	0	0				

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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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
629R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
630L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	X				
630L	<i>Kochia scoparia</i>	kochia	1	0	0	X	2	0	0	0
630L	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	X	2	2	2	0
630R	<i>Chenopodium album</i>	common lambsquarters	1	2	2	0				
630R	<i>Kochia scoparia</i>	kochia					2	0	0	0
630R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
631L	<i>Chenopodium album</i>	common lambsquarters	1	2	0	X				
631L	<i>Cirsium vulgare</i>	bull thistle	1	0	0	X				
631L	<i>Kochia scoparia</i>	kochia					2	2	0	0
631L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	X	2	2	2	0
631R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
631R	<i>Convolvulus arvensis</i>	field bindweed	1	0	0	0	1	0	0	0
631R	<i>Kochia scoparia</i>	kochia					2	2	0	0
631R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
632L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	X				
632L	<i>Kochia scoparia</i>	kochia	1	0	0	X				
632L	<i>Salsola tragus</i>	prickly Russian thistle	2	1	0	X	2	2	2	0
632R	<i>Chenopodium album</i>	common lambsquarters	1	2	0	0				
632R	<i>Kochia scoparia</i>	kochia	1	0	0	0				
632R	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	0	2	2	2	0
633L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0				
633L	<i>Kochia scoparia</i>	kochia					2	2	0	0
633L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	3	0
633R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
633R	<i>Kochia scoparia</i>	kochia	0	1	0	0				
633R	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	2	0
634L	<i>Chenopodium album</i>	common lambsquarters	2	0	0	0				
634L	<i>Kochia scoparia</i>	kochia					2	0	0	0
634L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	2	0
634R	<i>Chenopodium album</i>	common lambsquarters	2	2	2	0				
634R	<i>Kochia scoparia</i>	kochia					2	2	0	0
634R	<i>Salsola tragus</i>	prickly Russian thistle	1	2	0	0	2	2	2	0
635L	<i>Chenopodium album</i>	common lambsquarters	2	0	0	0				
635L	<i>Kochia scoparia</i>	kochia					1	0	0	0
635L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
635R	<i>Chenopodium album</i>	common lambsquarters	2	2	2	0				
635R	<i>Kochia scoparia</i>	kochia					2	2	2	0
635R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
636L	<i>Chenopodium album</i>	common lambsquarters	1	1	0	X				
636L	<i>Kochia scoparia</i>	kochia					1	0	0	0
636L	<i>Salsola tragus</i>	prickly Russian thistle					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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
636R	<i>Kochia scoparia</i>	kochia					2	0	0	0
636R	No Plant	no plant	0	0	0	0				
636R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
637L	<i>Chenopodium album</i>	common lambsquarters	1	1	0	X				
637L	<i>Kochia scoparia</i>	kochia					2	0	0	X
637L	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	X	2	2	0	X
637R	<i>Chenopodium album</i>	common lambsquarters	2	0	0	X				
637R	<i>Kochia scoparia</i>	kochia					2	2	0	0
637R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
638L	<i>Chenopodium album</i>	common lambsquarters	1	2	0	X				
638L	<i>Kochia scoparia</i>	kochia					2	2	0	X
638L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	X
638R	<i>Kochia scoparia</i>	kochia	1	1	0	0				
638R	<i>Salsola tragus</i>	prickly Russian thistle	1	1	0	0	2	2	2	0
639L	<i>Chenopodium album</i>	common lambsquarters	1	0	0	X				
639L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
639R	No Plant	no plant	0	0	0	0				
639R	<i>Salsola tragus</i>	prickly Russian thistle					2	0	0	0
640L	No Plant	no plant	0	0	0	X				
640L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
640R	No Plant	no plant	0	0	0	0				
640R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
641L	<i>Chenopodium album</i>	common lambsquarters	2	0	0	X				
641L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
641R	<i>Chenopodium album</i>	common lambsquarters	2	1	0	0				
641R	<i>Kochia scoparia</i>	kochia					2	2	2	2
641R	<i>Rumex crispus</i>	curley dock					1	0	0	0
641R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
642L	<i>Chenopodium album</i>	common lambsquarters	2	0	0	0	1	0	0	0
642L	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	2	2	0
642L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
642R	<i>Chenopodium album</i>	common lambsquarters	2	2	2	0				
642R	<i>Kochia scoparia</i>	kochia					2	2	2	2
642R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
643L	<i>Kochia scoparia</i>	kochia					2	0	0	0
643L	No Plant	no plant	0	0	0	0				
643L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
643R	<i>Chenopodium album</i>	common lambsquarters	1	2	2	0				
643R	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	2	2	2
643R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
644L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0				
644L	<i>Kochia scoparia</i>	kochia					2	0	0	0
644L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
644R	<i>Chenopodium album</i>	common lambsquarters	2	2	2	0				
644R	<i>Kochia scoparia</i>	kochia					2	2	2	0
644R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
645L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0				
645L	<i>Kochia scoparia</i>	kochia					2	2	0	0
645L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
645R	<i>Chenopodium album</i>	common lambsquarters	2	2	2	0				
645R	<i>Kochia scoparia</i>	kochia					2	2	2	0
645R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
646L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0	2	0	0	0
646L	<i>Kochia scoparia</i>	kochia					2	2	2	0
646L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
646R	<i>Chenopodium album</i>	common lambsquarters	1	2	0	0	1	0	0	0
646R	<i>Kochia scoparia</i>	kochia					2	2	0	0
646R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
647L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0	1	0	0	0
647L	<i>Kochia scoparia</i>	kochia					2	2	2	0
647L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
647R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
647R	<i>Kochia scoparia</i>	kochia					2	2	0	0
647R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
648L	<i>Chenopodium album</i>	common lambsquarters	2	2	2	0	2	2	2	0
648L	<i>Kochia scoparia</i>	kochia					2	2	2	0
648L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
648R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
648R	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	2	0	0
648R	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	0	0
649L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0	2	2	0	0
649L	<i>Kochia scoparia</i>	kochia					2	2	2	0
649L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
649R	<i>Chenopodium album</i>	common lambsquarters	1	2	0	0				
649R	<i>Kochia scoparia</i>	kochia					2	2	0	0
649R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
650L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0	2	2	2	0
650L	<i>Kochia scoparia</i>	kochia					2	2	2	0
650L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	0
650R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0	0	1	0	0
650R	<i>Kochia scoparia</i>	kochia					2	2	0	0
650R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
651L	<i>Chenopodium album</i>	common lambsquarters	2	2	0	0	2	2	2	0
651L	<i>Kochia scoparia</i>	kochia					2	2	2	0
651L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	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 2011 vs. 2014 detections for each individual Vector Block, detailing the given Density Code for each Distance Class (continued).

Block	Scientific Name	Common Name	2011				2014			
			D1	D2	D3	D4	D1	D2	D3	D4
651R	<i>Chenopodium album</i>	common lambsquarters	1	2	0	0	0	2	0	0
651R	<i>Kochia scoparia</i>	kochia					2	2	0	0
651R	<i>Salsola tragus</i>	prickly Russian thistle					2	2	0	0
652L	<i>Chenopodium album</i>	common lambsquarters	1	2	0	0	0	2	2	0
652L	<i>Kochia scoparia</i>	kochia					2	2	2	2
652L	<i>Salsola tragus</i>	prickly Russian thistle					2	2	2	2
652R	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
652R	<i>Kochia scoparia</i>	kochia					1	0	0	0
652R	<i>Salsola tragus</i>	prickly Russian thistle					2	0	0	0
653L	<i>Chenopodium album</i>	common lambsquarters	2	1	0	0	1	0	0	0
653L	<i>Kochia scoparia</i>	kochia	1	0	0	0	2	2	2	0
653L	<i>Salsola tragus</i>	prickly Russian thistle	1	0	0	0	2	2	2	0
653R	<i>Chenopodium album</i>	common lambsquarters	2	0	0	0				
653R	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	2	0
653R	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	2	0
654L	<i>Chenopodium album</i>	common lambsquarters	1	1	0	0				
654L	<i>Kochia scoparia</i>	kochia	2	0	0	0	2	2	0	0
654L	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	2	2	0	0
654R	<i>Chenopodium album</i>	common lambsquarters	1	0	0	0				
654R	<i>Kochia scoparia</i>	kochia	2	2	3	0	2	2	0	0
654R	<i>Salsola tragus</i>	prickly Russian thistle	2	0	0	0	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

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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