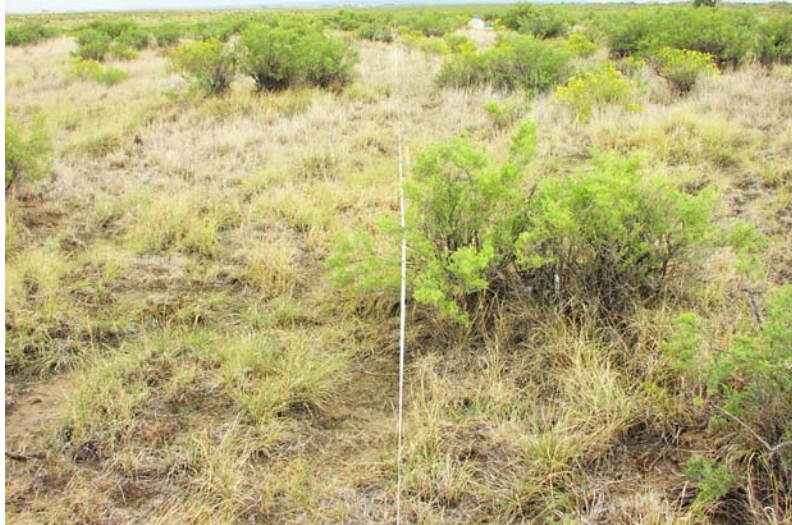


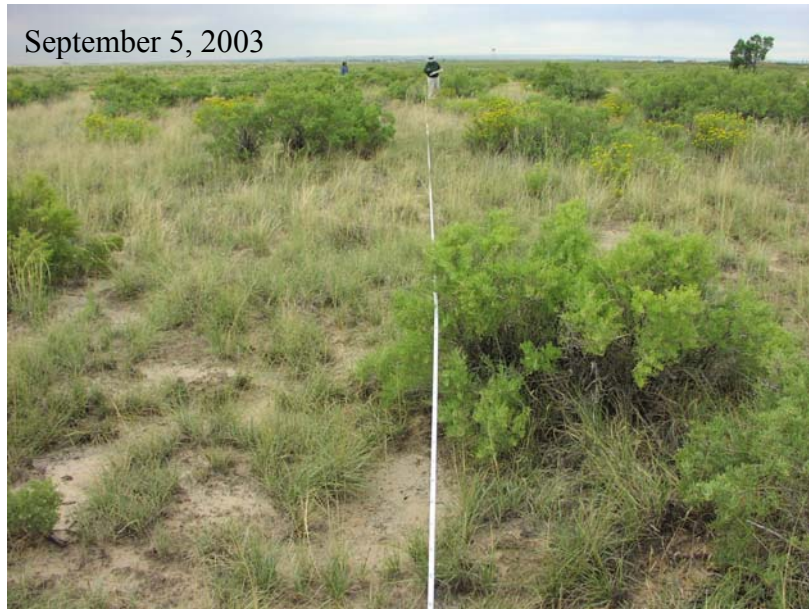
# VEGETATION MONITORING AT PUEBLO CHEMICAL DEPOT, 1998-2003:

## 2003 UPDATE

September 10, 2002



September 5, 2003



# VEGETATION MONITORING AT PUEBLO CHEMICAL DEPOT, 1998-2003:

## 2003 UPDATE

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March 2005



## **Executive Summary**

In 1998 the U. S. Army Pueblo Chemical Depot (PCD) contracted the Colorado Natural Heritage Program to set up a long-term vegetation monitoring program on the Depot in Pueblo County, Colorado. The monitoring program was established to detect vegetation changes in shortgrass prairie, sandsage shrubland, and greasewood shrubland as a result of the removal of all cattle grazing in June of 1998. Each vegetation type included areas with four different historic cattle grazing regimes: 1) grazed year-round until 1998, 2) grazed, but not year-round until 1998, 3) grazed lightly (several times/year) since 1942, and 3) ungrazed since 1942. For the purpose of this study I consider the first two regimes “grazed” and the latter two regimes “ungrazed.” All further reference to the “grazed” regime refers to its historical use and not to management practices during the course of the monitoring. During the six years of monitoring discussed in this report, neither grazed nor ungrazed study plots received any livestock grazing.

The following report includes a brief summary and updated graphs and tables incorporating the 2003 field season data. In this report I review attributes that had a significant difference between grazed and ungrazed plots; recovery of vegetation after the 2002 drought (the worst drought recorded since record keeping began in 1955); the composition difference in prairie dog towns; status of weeds; and miscellaneous field observations. For details of study area, sampling, management objectives, and methods please refer to Rondeau (2003).

### *Climate*

The following data are from the Western Regional Climate Data Center, posted at [www.wrcc.dri.edu](http://www.wrcc.dri.edu). At the Pueblo Memorial Airport (six miles west of PCD), 2003 annual precipitation was nearly 11 inches (27.9 cm), which was 10% below average, yet a marked increase over the 4 inches (10.2 cm) of 2002. Thus 2003 was the fourth consecutive year of below average precipitation (Fig. 1). Seventeen consecutive months of below average, or average, monthly precipitation were recorded from September 2001 to January 2003 (Fig. 2). February 2003 to June 2003 had above average, or average monthly precipitation, while part of the peak growing season months (July and August) were below average (Fig. 2).

### *Review of different metrics: frequency, cover, and density (modified from Elzinga et al. 1998)*

Three distinct attributes were measured during this study: frequency, cover, and density. Although the details of these methods were outlined in Rondeau (2003), I review the reasons and choice of these different metrics below in order to facilitate interpretation of this report.

**Frequency** is defined as the percentage of possible plots within a sampled area occupied by the target species. Occupation is defined by occurrence; the abundance of the species within the plot does not matter, only whether it is present. Because the target species will

more likely occur in very large plots compared to small ones, frequency is a measure dependent on plot size and shape. Frequency values from different studies are not comparable unless the plot size and shape used were identical. Plot size determines the frequency value. The larger the plot, the greater the likelihood that an individual will occur within the plot, resulting in a larger overall frequency value. If plots are large enough, all of them will contain the target species (100% frequency). This leaves no sensitivity to an increase in frequency. If too small, there will be little sensitivity to a decrease in frequency. Frequency values, at least the first year, should be between 30% and 70%. From sample plot data collected in 1998, it was determined that a nested frequency frame with square frames measuring 0.31 m x 0.31 m, and 1 m x 1 m were the best fit for the targeted species. For those targeted species that were common, primarily blue grama, alkali sacaton grass, galleta grass, and three-awn grass, I report frequency for the smaller plot, i.e., 0.31 m x 0.31 m, where as for the less common species, such as sand dropseed and annual weeds, I report frequency for the 1 x 1 m plot. A key advantage of frequency methods is that the only decision required by the observer is whether or not the species occurs within the plot.

**Cover** is the downward projection of vegetation on the ground as viewed from above. Cover measurements are one of the most common measures of community composition because it equalizes the contribution of species that are very small, but abundant, and species that are very large, but few. I used canopy cover or aerial cover rather than basal cover. Of the three measures --- frequency, cover, and density --- cover is the most directly related to biomass. A disadvantage of cover measures (especially canopy cover)

is that they can change dramatically over the course of a growing season, while both frequency and density measures are fairly stable after germination is complete. Annual variability tends to be highest with measures of canopy cover. That is, canopy cover of live vegetation may be sensitive to annual precipitation or grazing events, whereas frequency and density (especially of perennial plants) are less likely to reflect annual events. To facilitate comparison between years, I collected a given plot's data at the same time of year each year (within one to two weeks of the previous year).

**Density** is the number of counting units per unit area. A critical question in the measure of density, is to define the counting unit. A counting unit has to be consistently recognized by all observers for density to be used as a monitoring method. Density is most effective when the change expected is recruitment or loss of individuals. Because density is reported as a per area measure one can compare between sites even if the quadrat shape used for sampling differs. This is in contrast to frequency, which is dependent on plot size and shape. Density may be an especially insensitive monitoring measure when individuals are long-lived and respond to stress with reduced biomass or cover, rather than mortality. Observer bias is generally low if the counting units are few and easily recognized, but errors are common when quadrats contain cryptic individuals or numerous plants. Of all three metrics used, I considered density the least robust. This was primarily due to the difficulty of distinguishing one individual from another, especially if they were close together. In the case of sandsage, we also added the complication of high numbers of individuals per area. Observer bias was highest in this measurement, thus extreme care was taken to calibrate all observers each year. Although

I consider density the measurement with the least precision, I believe that the lower density we detected in sandsage accurately represents the impact of the drought.

*The graphs that are represented in this report:* For certain target species, I present the results of two different metrics, for example cover and frequency or cover and density. When I report two different metrics, I placed these graphs next to one another in order to facilitate comparison of measurements. In other instances, only one metric is displayed, either because I measured only one metric, or because only one metric was sensitive enough to detect differences or changes.

#### *Grazed vs. ungrazed*

Most of the differences between grazed and ungrazed areas were still evident six years after the removal of all cattle grazing. An exception to this was the amount of bare ground in the greasewood shrubland vegetation type. Up until 2001 there was significantly more bare ground in areas that were recently grazed, but in 2002 and 2003, the amount of bare ground was not significantly different (Fig. 3). In stark contrast to this was the consistency in the amount of bare ground in shortgrass prairie. Recently grazed plots continued to have significantly more bare ground than ungrazed plots, even after six years of rest from cattle grazing (Fig. 4). In addition, sand dropseed and needle-and-thread grass maintained a noticeable difference between recently grazed versus ungrazed areas. Sand dropseed, an “increaser” especially in sandsage shrublands, still had significantly higher frequency in recently grazed plots than ungrazed, although the removal of cattle coupled with the drought appears to have closed the gap (Fig. 5).

Needle-and-thread grass maintained its wide gap between grazed and ungrazed areas (Fig. 6). Thus, in general, the vegetation composition response to the removal of cattle is relatively slow and it may take many more years, if not decades, to reflect this management change.

#### *Recovery of vegetation after the 2002 drought*

Although the 2003 annual precipitation was still below average it was so much greater than 2002 that the cover of all species increased, while the density and frequency of certain species continued to decline (lag effect). Although all species increased in canopy cover, certain species had large gains, while others had moderate gains (Figs. 3-17). In general, the largest gains were in species that didn't lose individuals (density or frequency remained constant) over the course of the drought, while the smallest gains were in species that lost individuals (density or frequency declined). Greasewood, rabbitbrush, prickly pear, alkali sacaton grass and galleta grass were the five species that maintained constant density or frequency over the course of the drought (Figs. 3, 6-9, 14). Consequently, canopy cover of those species had the greatest increase in 2003 and reached cover that was similar to 2001 (Figs. 3, 6-9, 14). On the other hand, sandsage, blue grama, sand dropseed, three-awn, and needle-and-thread grass continued to show the effects of the 2002 drought with a continued decline in density or frequency in 2003 (Figs. 3, 5, 6, 8, 9, 13, 14). Consequently, although the canopy cover of these species increased, they were still far below their canopy cover of 2001.



Grasses that expressed a lag effect from the drought continued to decline in frequency in 2003, in spite of the increased annual precipitation. In 2003, blue grama, the signature species of the shortgrass prairie, continued to lose individuals with a 12-20% loss in frequency over that of 2002 (Table 1, Figs. 18, 19). The one exception to this was on prairie dog towns, where the frequency of blue grama in prairie dog towns remained at the same rate as 2002, while frequency decreased, on average 30%, off of prairie dog towns (Fig 15).

Sand dropseed, three-awn, and needle-and-thread grass frequency also significantly declined in 2003 (Table 1). Sand dropseed, one of the only species common in all vegetation types, declined between 25-37% (Table 1). Three-awn grass that was so dominant in the previous years, especially in the shortgrass prairie and sandsage shrubland, dropped 42% and 31% respectively (Table 1). Needle-and-thread grass, found only in the sandsage shrubland, declined in frequency by 28% (Table 1). While the above species had a lag effect, alkali sacaton grass, galleta grass, and prickly pear never responded to the drought as they maintained a relatively stable and statistically unchanging frequency throughout (Table 1).

The three dominant shrubs of Pueblo Chemical Depot also responded differently to annual precipitation events. Greasewood canopy cover had been more or less stable over the preceding five years (Fig. 7), but in 2003 there was a marked increase (Figs. 7 and 20). Most plots had over a 50% increase in cover, with an average increase of 57% (range was 13-100%). While greasewood and rabbitbrush remained stable or increased

throughout the drought, sandsage was negatively impacted by the drought. Although sandsage canopy cover significantly increased from an average of 3% canopy cover in 2002 to 8% canopy cover in 2003 (Fig. 21), this was still 50% lower than 2001, when there was an average of 17% canopy cover (Figs. 11 and 21). While sandsage cover increased in 2003, sandsage density displayed a lag effect as it continued to decline an additional 8% over 2002 density (Fig. 11).

Apparently, the species that had the highest tolerance of drought conditions and the fastest recovery were those species that have either numerous tap roots (i.e., greasewood, rabbitbrush, alkali sacaton grass, and galleta grass), that may reach into the ground water, or are succulent (i.e., prickly pear). The species with the lowest tolerance for serious drought conditions are primarily short rooted and rely heavily on recent precipitation events (i.e., blue grama, sand dropseed, three-awn, needle-and thread grass, and sandsage).

#### *Prairie dog towns*

Prairie dog towns continued to have a different vegetation composition than non-prairie dog towns despite greatly reduced occupancy since 1998. Primarily, a higher frequency of three-awn grass occurred on prairie dog towns (Fig. 15), even though drought resulted in decline of three-awn grasses. Prior to 2002, sand dropseed (an “increaser”) had a higher frequency on prairie dog towns, but as of 2003, the frequency was nearly identical both on and off the towns (Fig. 16). The large difference in prickly pear on and off towns

was maintained, with nearly zero percent prickly pear on towns compared to nearly 50% frequency off of towns (Fig. 16).

### *Weeds*

Although Russian thistle (*Salsola* spp.) and kochia (*Bassia sieversiana*), both annual weeds, were present in all vegetation types, they seldom reached more than 5% frequency in greasewood and 10% in shortgrass. The exception to this was on prairie dog towns where kochia averaged nearly 20% (Fig. 17) and sandsage shrublands, where Russian thistle averaged nearly 25% on grazed plots (Fig. 12).

### *Miscellaneous observational notes*

- 1) The field crew deemed 2003, “the year of *Portulaca* and *Chenopodium*.” The alkaline shortgrass prairie plots as well as the greasewood shrubland plots had a high cover of *Portulaca* (*P. oleracea* and *P. halioides* were both present, *P. halioides* was more abundant (Fig. 22)), while the sandsage shrubland had an abundance of *Chenopodium*.
  
- 2) PCD must have had spotty rain events as some plots appeared relatively verdant while others displayed extremely dry conditions. For example plot ss27, in 2003, was verdant compared to 2002, with sand dropseed exhibiting substantial growth in foliage as well as a high rate of flowering (Fig. 21). In contrast, sg70 appeared to be under full drought conditions in 2002 and 2003 as it was very dry and brown (Fig. 23).

3) There was an abundance of seeds and duff laying on the ground in 2003, with some deposition pockets reaching greater than 5 mm of thickness. This was the first year that I had ever noted this type of deposition. Small mammals and scaled quail populations had crashed by June 2003 (small mammal report, in review), prior to seed production.

4) Several newly recorded species for PCD were found in the plots, including *Atriplex rosea*, *Verbesina enceloides*, *Avena sativa*, *Chondrosium barbatum*, *Chenopodium incanum*, and *Sporobolus pulvinatus*, all annuals. The *Atriplex* and *Avena* are non-natives.

5) Although ants have always been present, they were extremely abundant in 2003, especially in the shortgrass. (Very noticeable to one who wears sandals).

6) In spite of the drought, the individual grasses that did recover had an excellent blooming year.

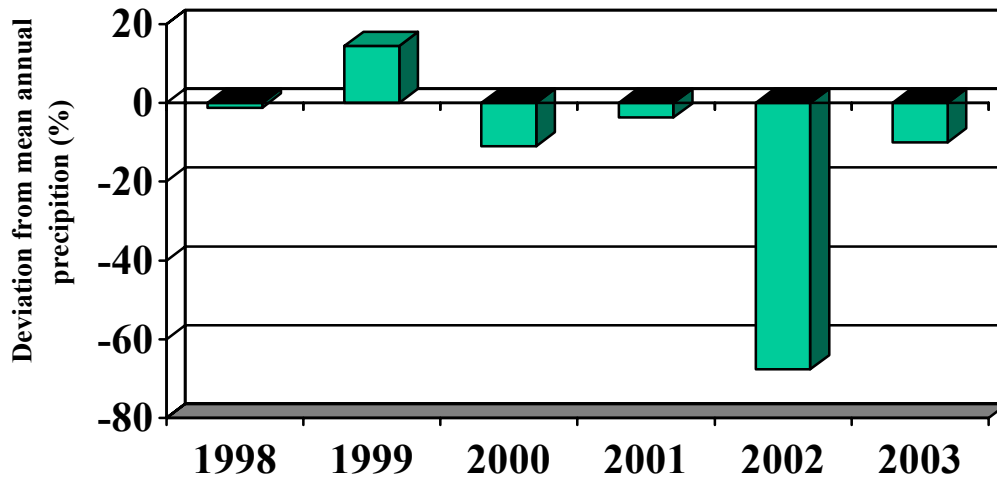
#### *Acknowledgments*

As in previous years, this study would not have been possible without the assistance and funding from the Department of Defense. Max Canestorp (USFWS) continued to provide help throughout the study. Our field crews had comfortable field quarters thanks to Max's assistance. The field crew of 2003 consisted of April Wasson and Georgia Doyle, both experienced PCD veterans of previous years. Thanks to Rebecca Gorney, the field data and graphs were promptly entered and generated. This status report was

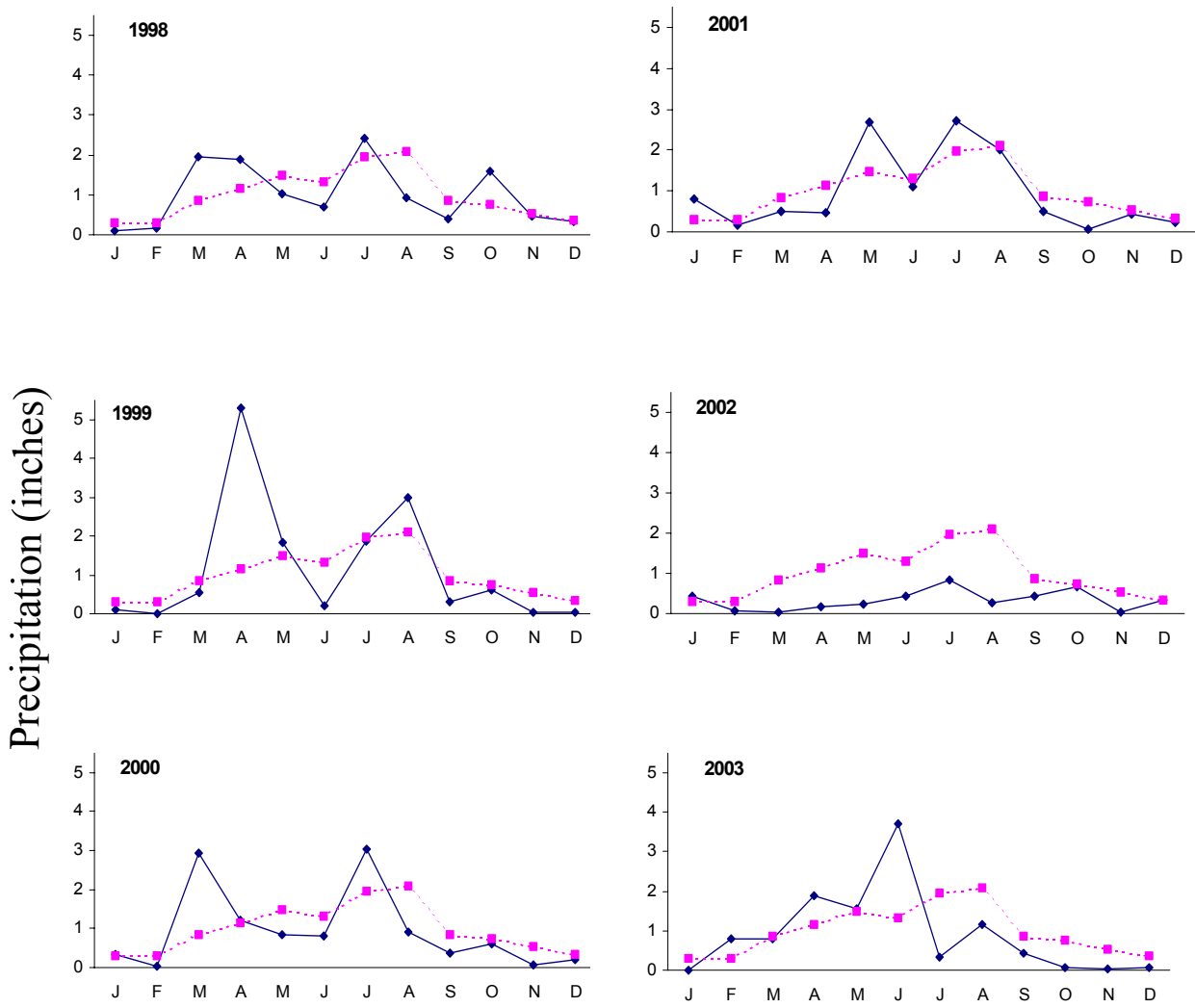
enhanced by reviews and edits from Max Canestorp, Gordon Rodda, Georgia Doyle, and Joe Stevens.

*Literature Cited*

- Elzinga, C. L., D. W. Salzer, and J. W. Willoughby. 1998. Measuring and monitoring plant populations. BLM Technical Reference 1730—1. U.S.D.I. Bureau of Land Management, Denver, CO. 492 pp.
- Rondeau, R. J. 2003. Vegetation monitoring at Pueblo Chemical Depot: 1998-2002. Fort Collins, CO: Colorado Natural Heritage Program.

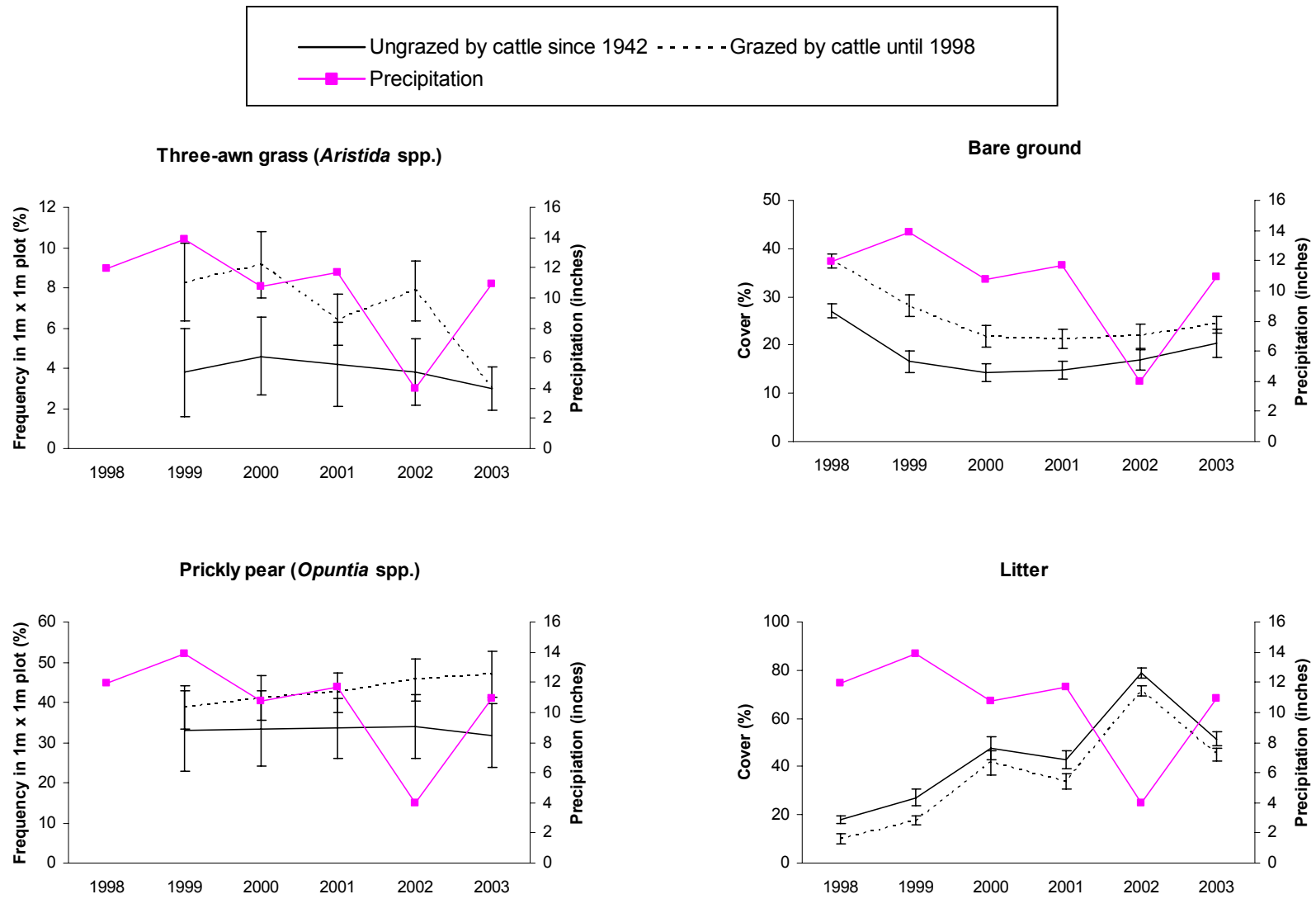


**Figure 1.** Deviation from mean annual precipitation at Pueblo Memorial Airport (1998-2003). Mean is from 1957-2000.

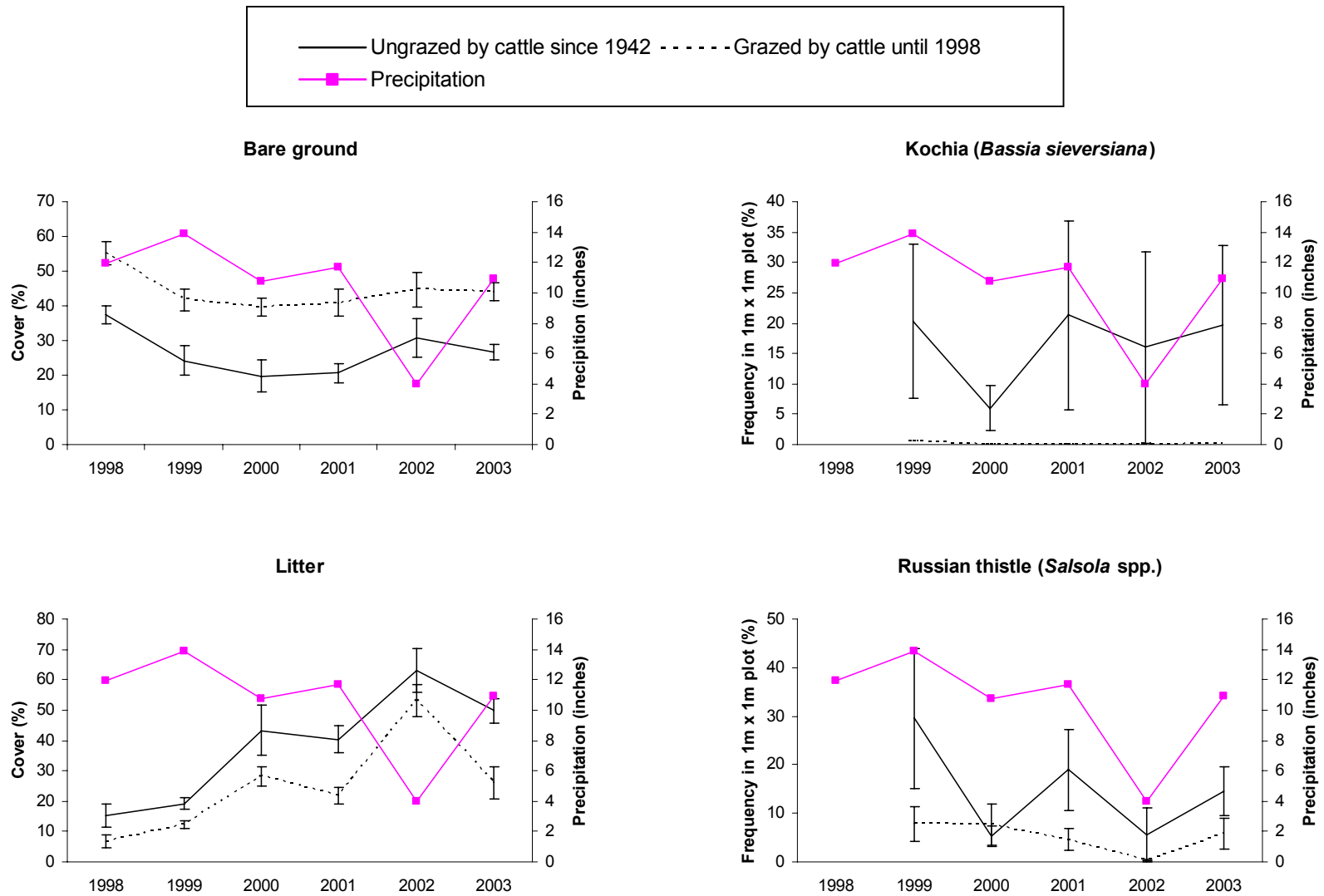


**Figure 2.** Monthly precipitation amounts at the Pueblo Airport in 1998-2003. The 43-year (1957-2000) mean is plotted as a broken line.

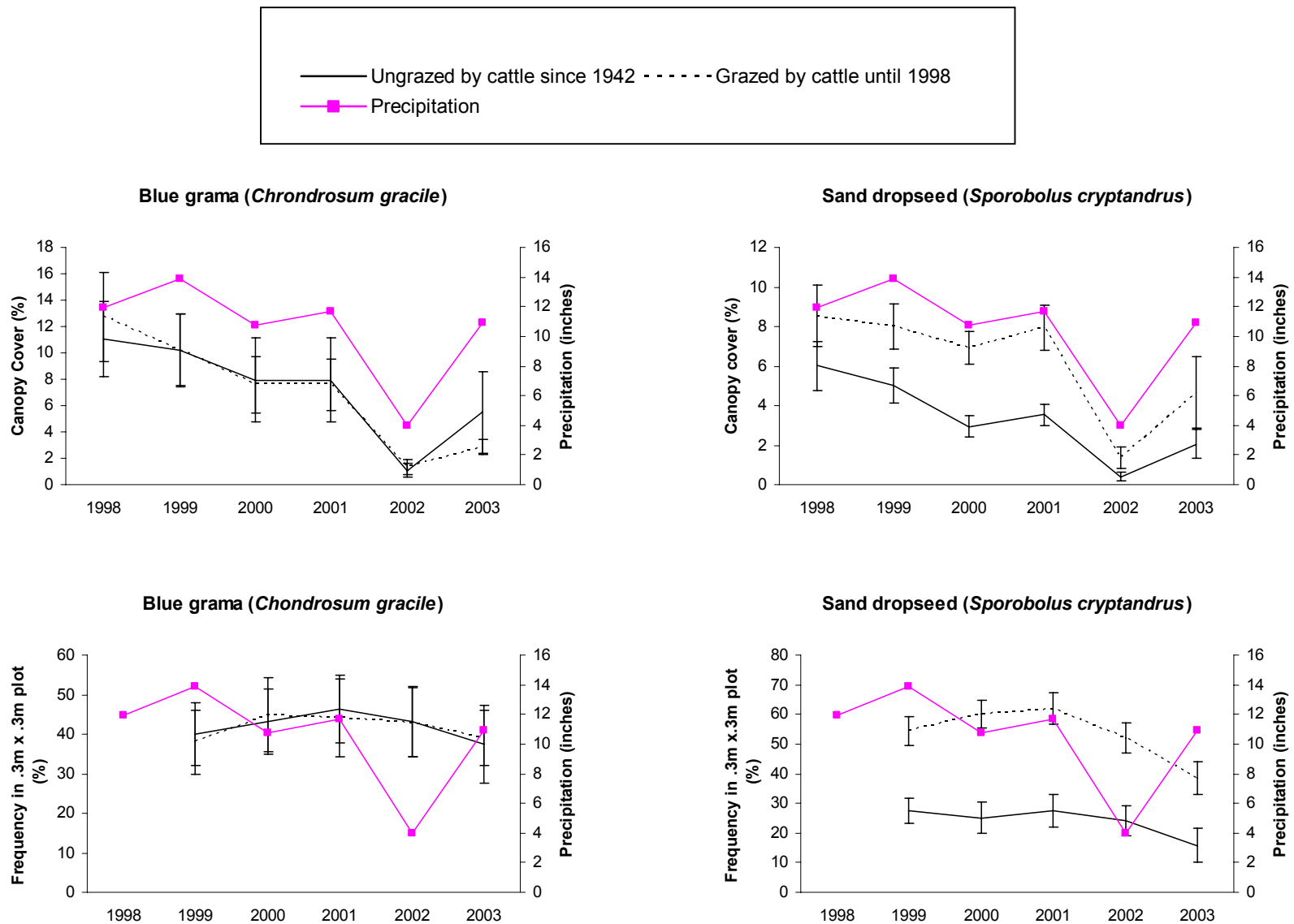




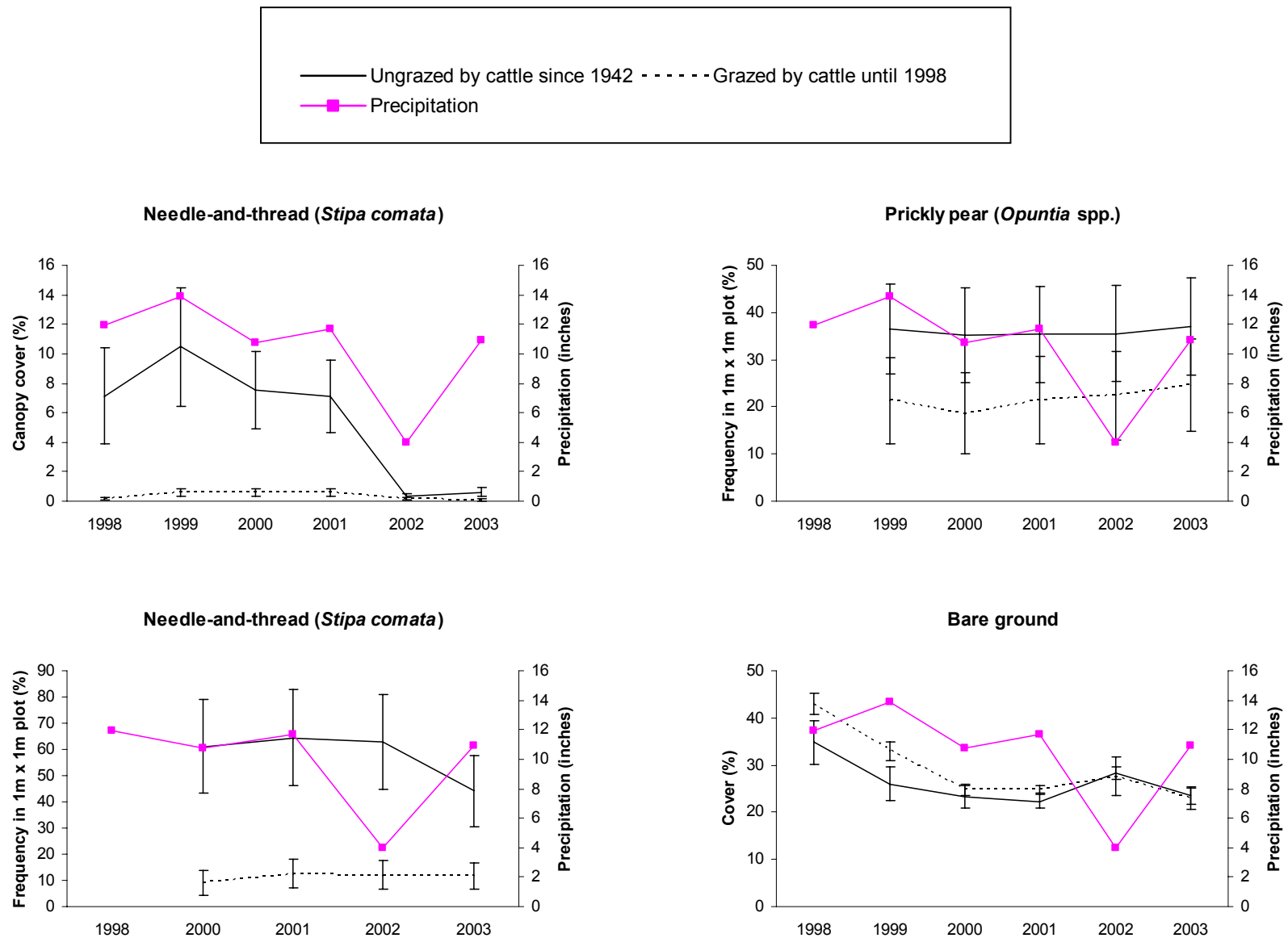
**Figure 3.** Mean frequency for three-awn and prickly pear (+/- 1 SE) and cover for bare ground and litter (+/- 1 SE) within the **greasewood shrubland**, and annual precipitation 1998-2003. Sample size for 1998 was 5 plots grazed, 3 plots ungrazed. Sample size for 1999-2003 was 7 plots grazed, 5 plots ungrazed.



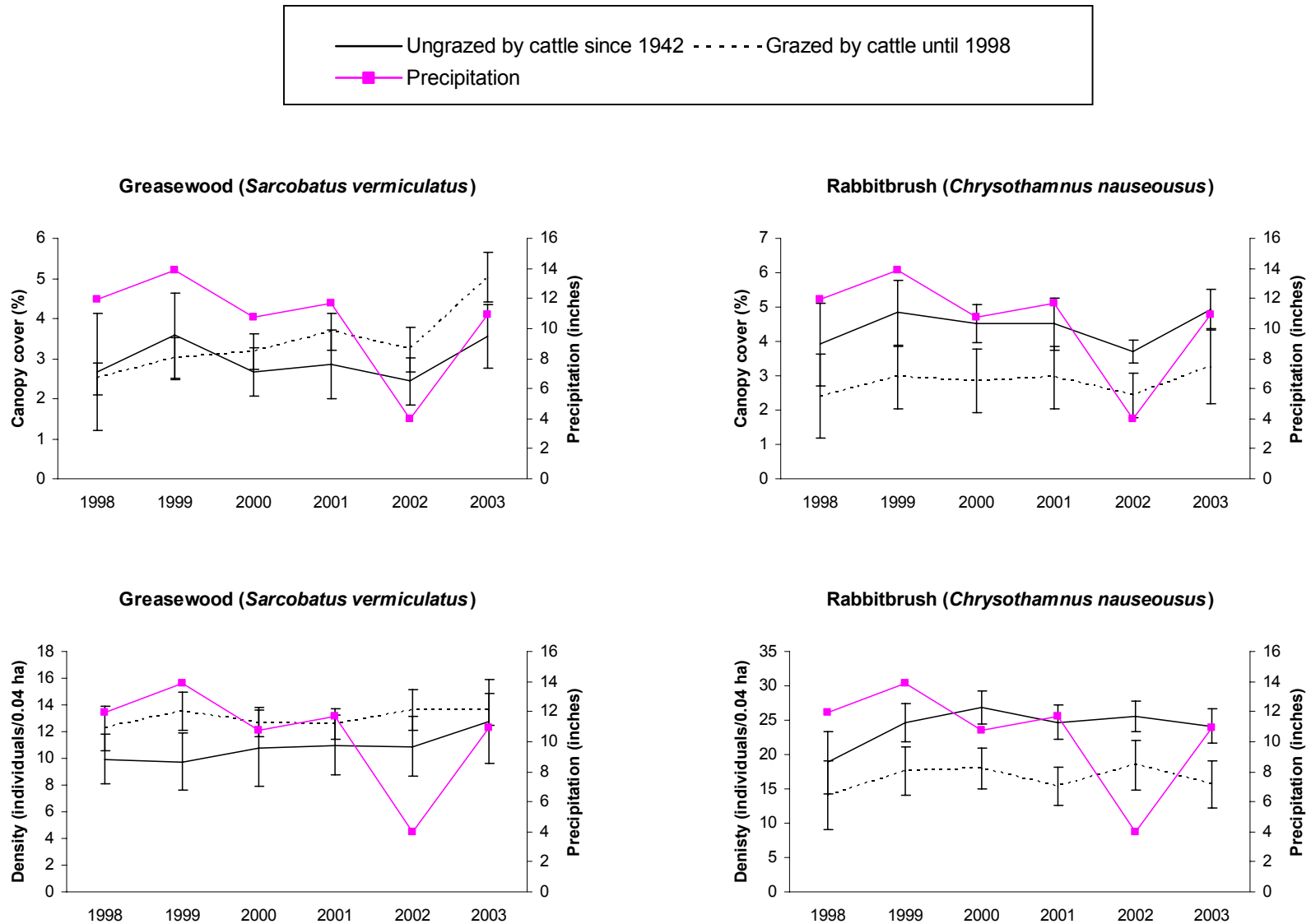
**Figure 4.** Mean cover of bare ground and litter ( $\pm 1$  SE) and frequency of annual weeds ( $\pm 1$  SE) within the **shortgrass prairie**, and annual precipitation (1998-2003). Sample size for 1998 was 5 plots grazed, 2 plots ungrazed. Sample size for 1999-2000 was 7 plots grazed, 4 plots ungrazed. Sample size for 2001-2003 was 7 plots grazed, 6 plots ungrazed.



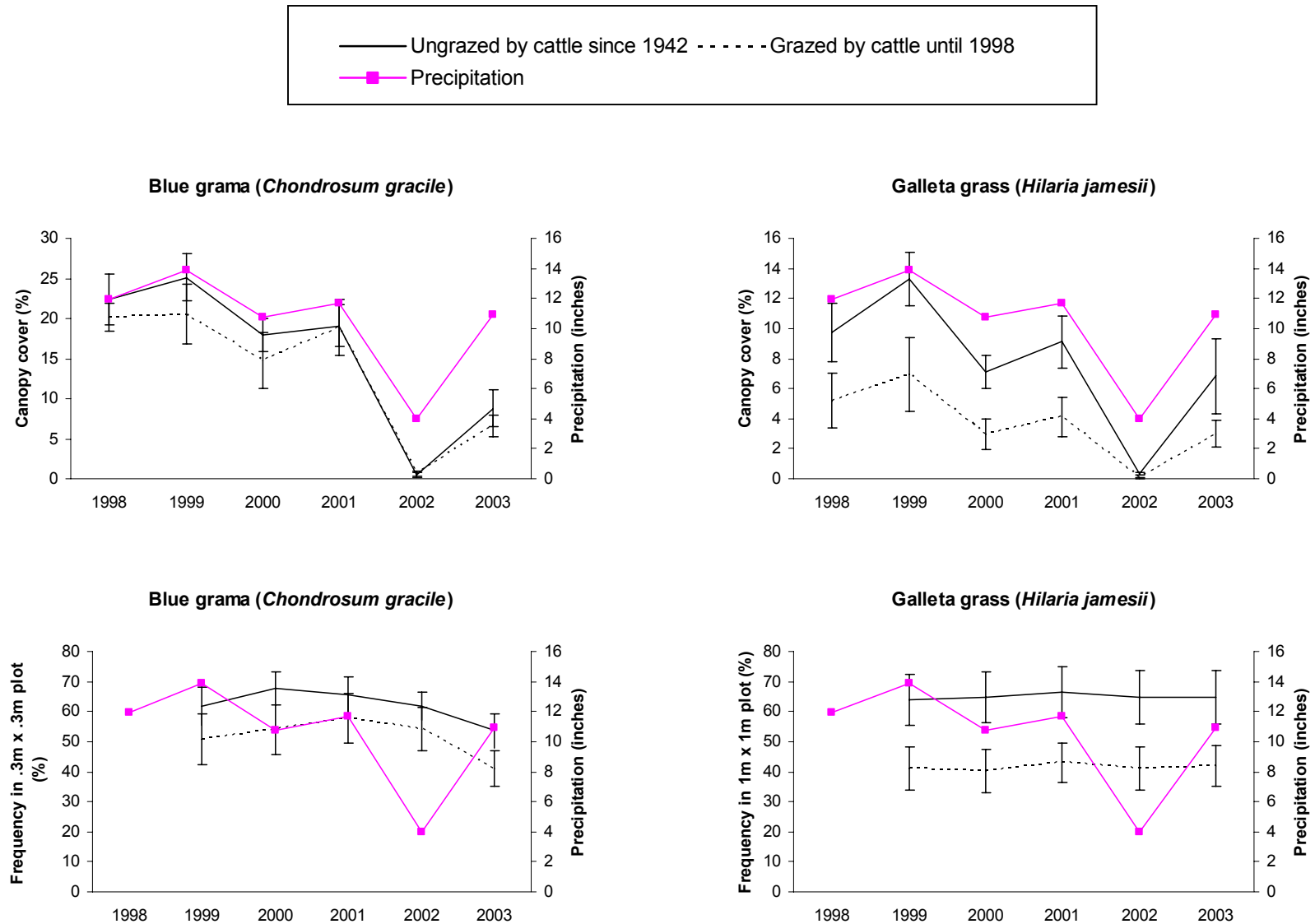
**Figure 5.** Mean canopy cover and frequency (+/- 1 SE) for blue grama and sand dropseed within the **sandsage shrubland**, and annual precipitation. Sample size for 1998 was 5 plots grazed, 5 plots ungrazed. Sample size for 1999-2003 was 5 plots grazed, 6 plots ungrazed.



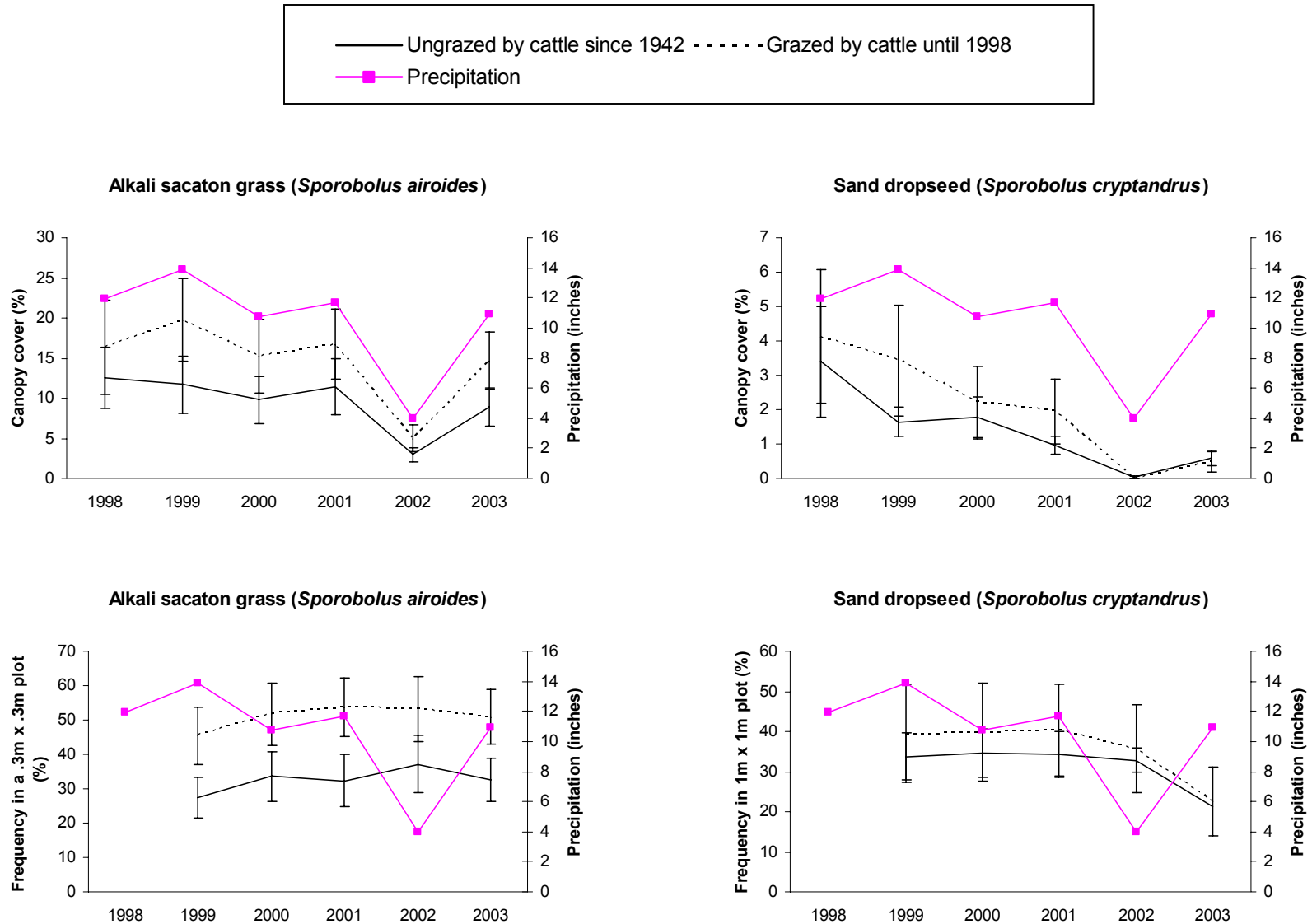
**Figure 6.** Mean canopy cover and frequency (+/- 1 SE) for species and bare ground within the **sandsage shrubland**, and annual precipitation. Sample size for 1998 was 5 plots grazed, 5 plots ungrazed. Sample size for 1999-2003 was 5 plots grazed, 6 plots ungrazed.



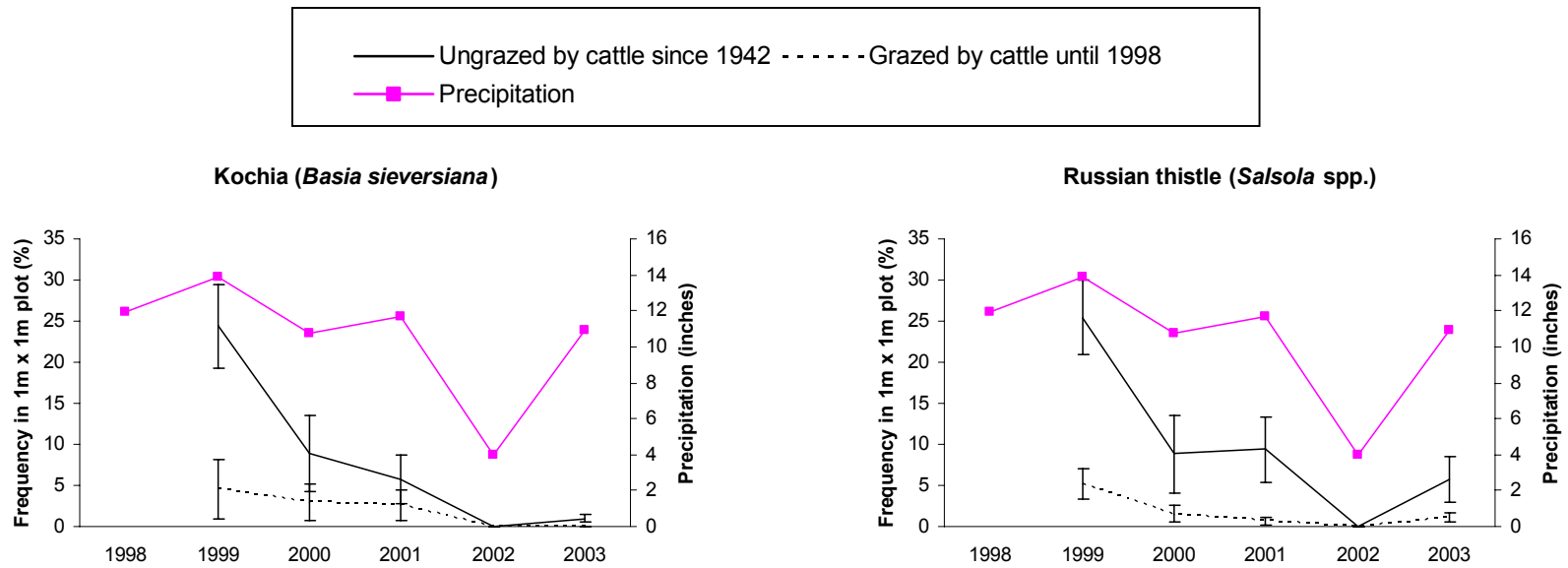
**Figure 7.** Mean canopy cover and density ( $\pm$  1 SE) for greasewood and rabbitbrush within the **greasewood shrubland**, and annual precipitation 1998-2003. Sample size for 1998 was 5 plots grazed, 3 plots ungrazed. Sample size for 1999-2003 was 7 plots grazed, 5 plots ungrazed.



**Figure 8.** Mean canopy cover and frequency (+/- 1 SE) for blue grama and galleta grass within the **greasewood shrubland**, and annual precipitation 1998-2003. Sample size for 1998 was 5 plots grazed, 3 plots ungrazed. Sample size for 1999-2003 was 7 plots grazed, 5 plots ungrazed.

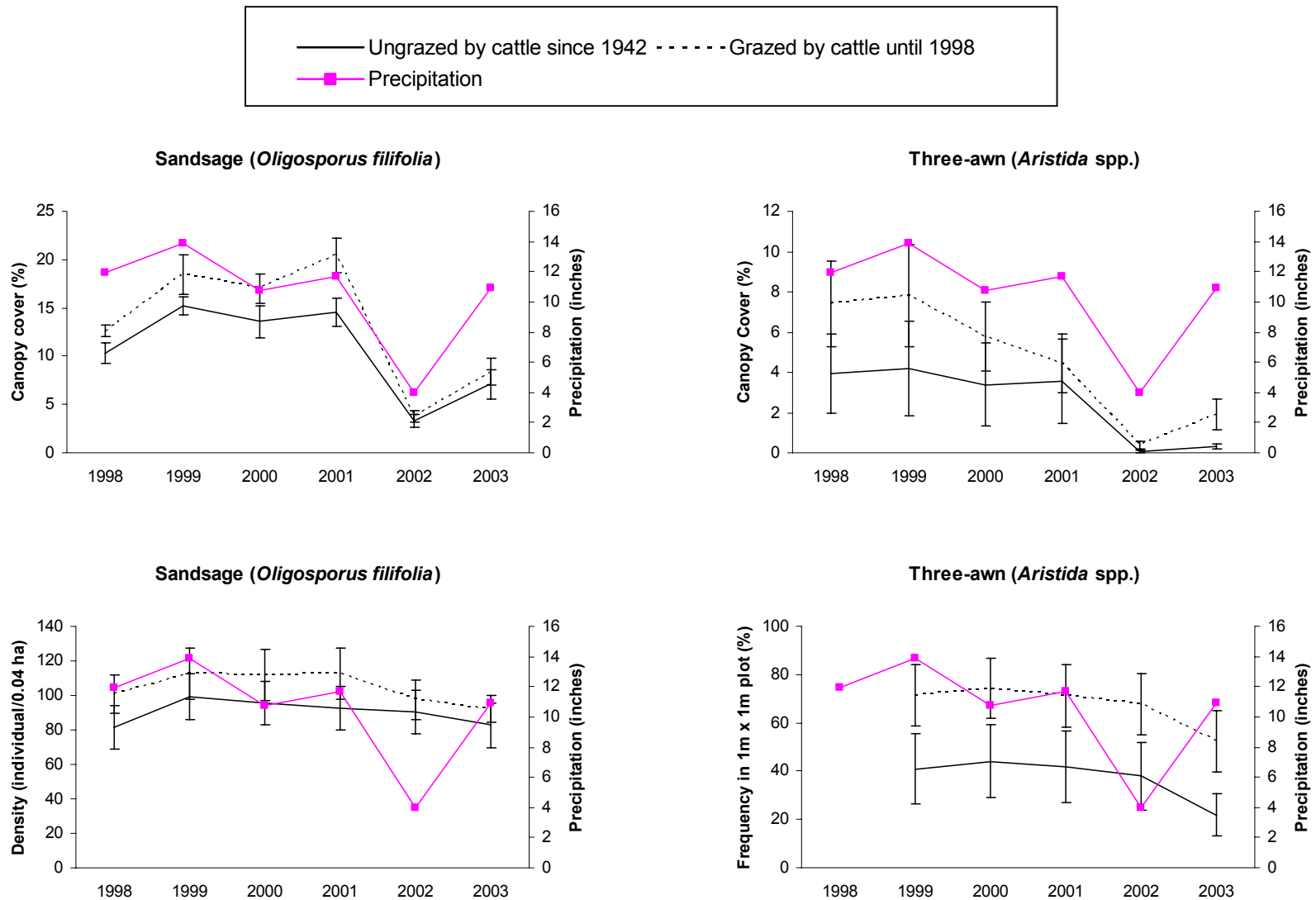


**Figure 9.** Mean canopy cover and frequency ( $\pm 1$  SE) for alkali sacaton grass and sand dropseed within the **greasewood shrubland**, and annual precipitation 1998-2003. Sample size for 1998 was 5 plots grazed, 3 plots ungrazed. Sample size for 1999-2003 was 7 plots grazed, 5 plots ungrazed.

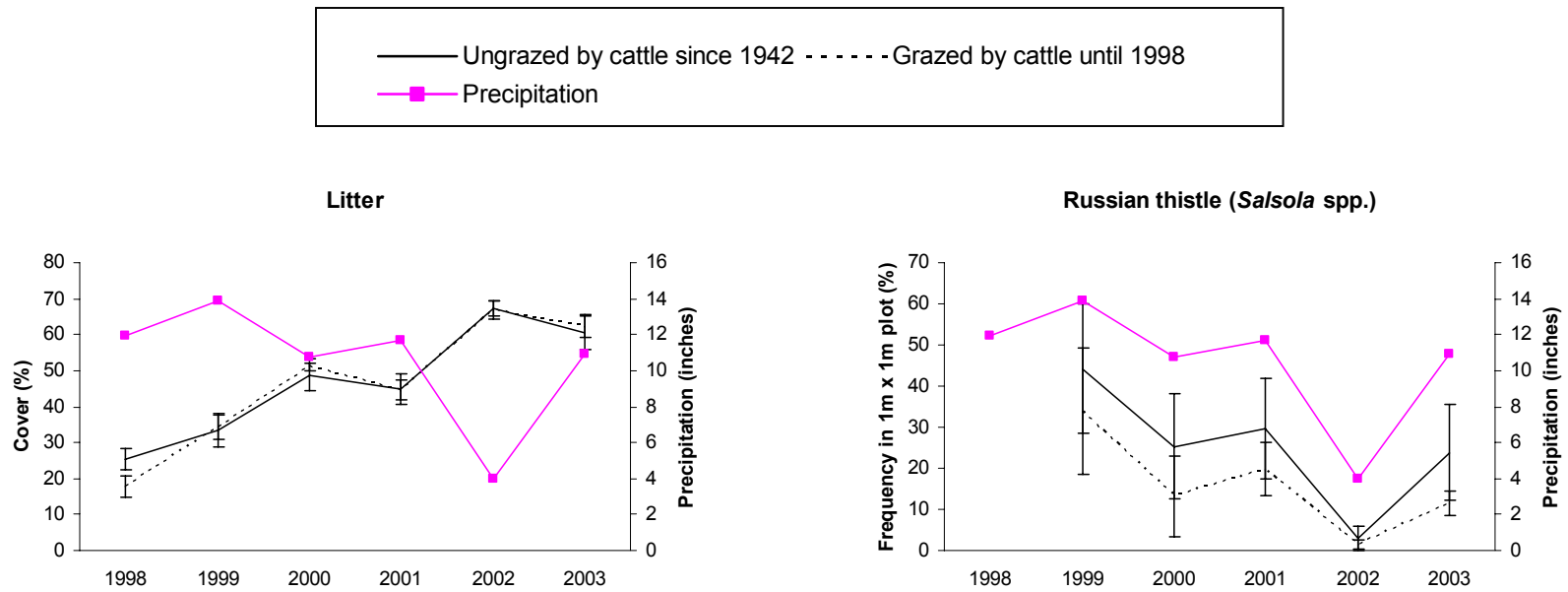


**Figure 10.** Mean frequency (+/- 1 SE) for kochia and Russian thistle in the **greasewood shrubland**, and annual precipitation 1998-2003. Sample size for 1998 was 5 plots grazed, 3 plots ungrazed. Sample size for 1999-2003 was 7 plots grazed, 5 plots ungrazed.

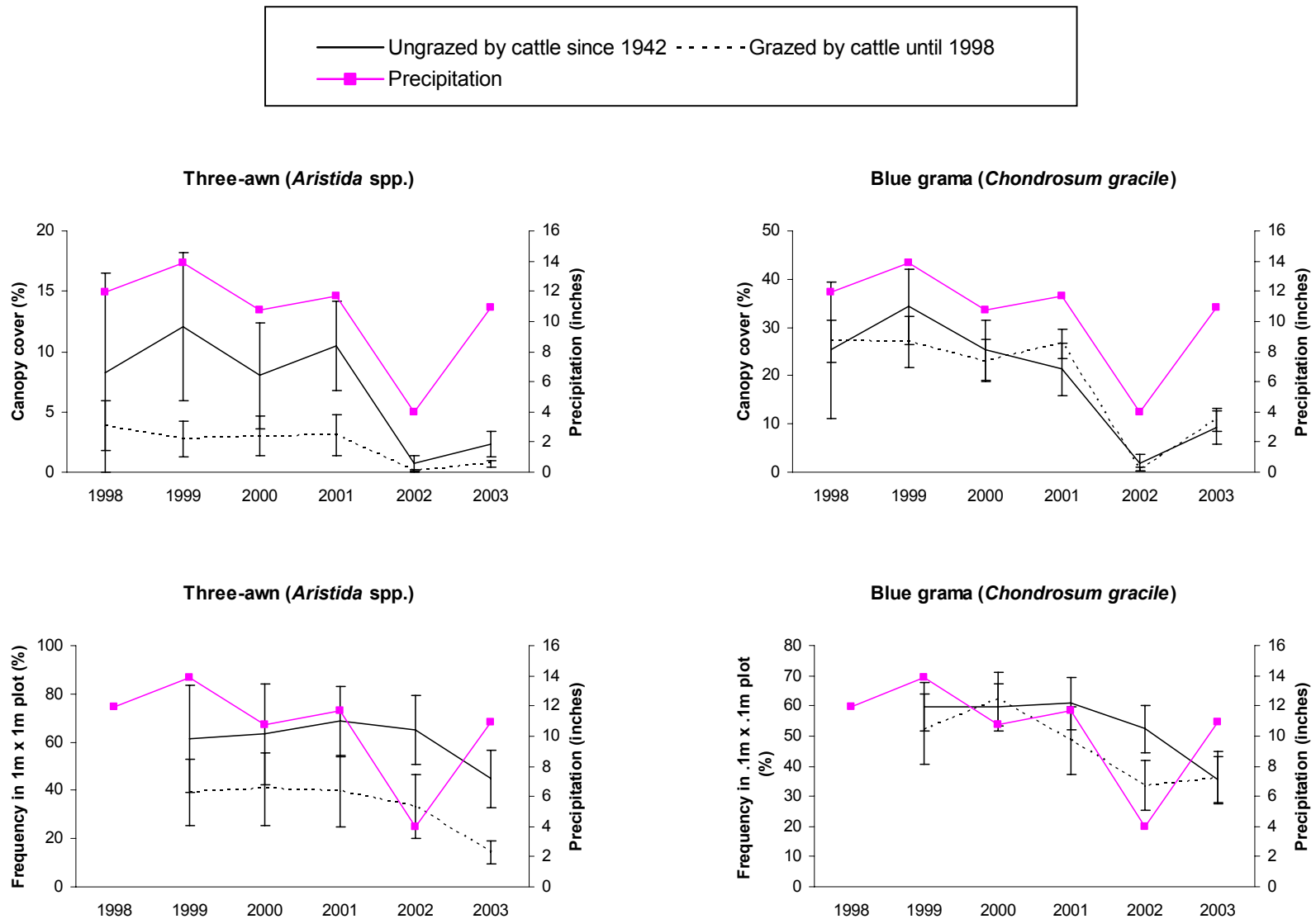




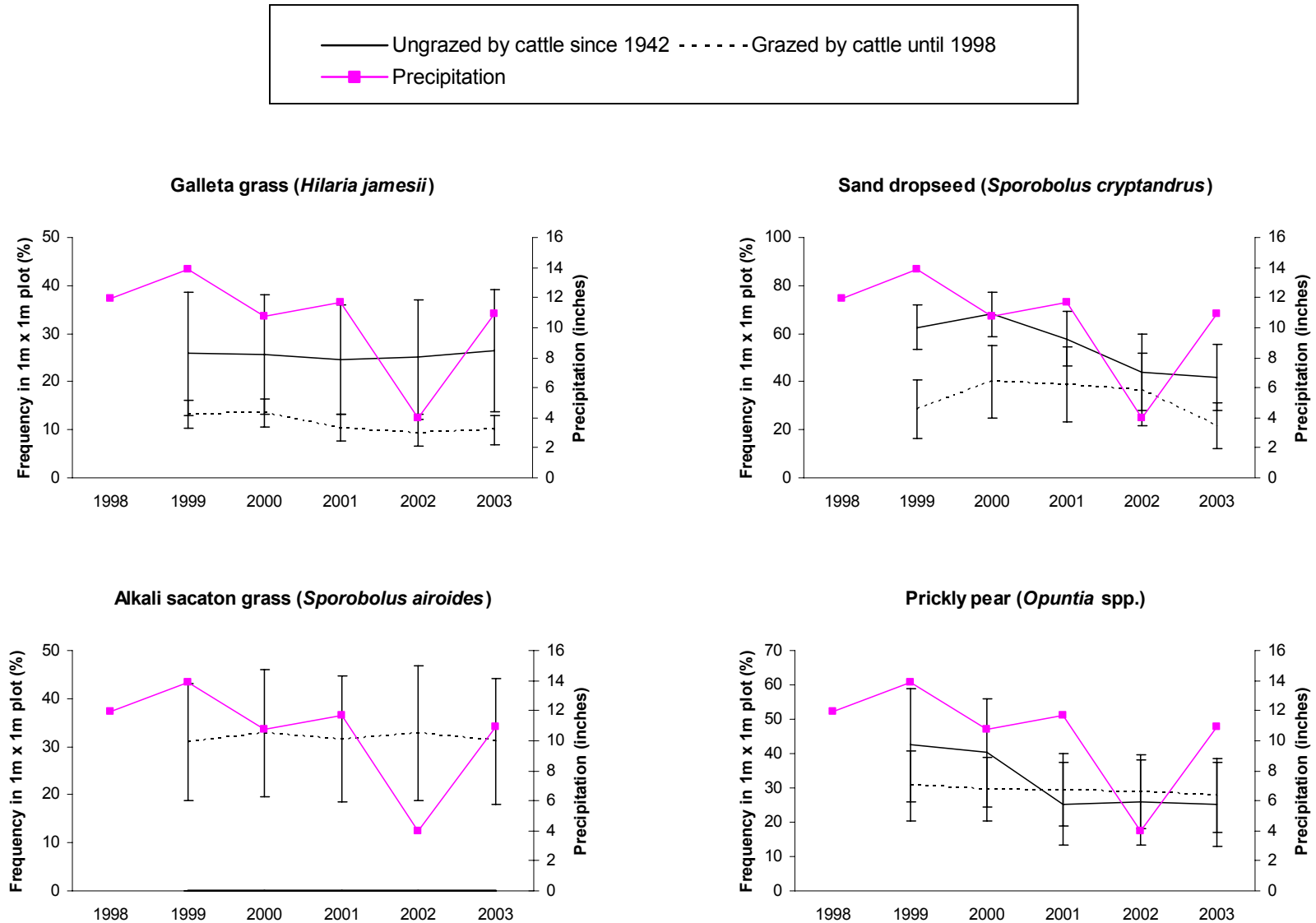
**Figure 11.** Mean canopy cover and density of sandsage and cover and frequency of three-awn (+/- 1 SE) within the **sandsage shrubland**, and annual precipitation. Sample size for 1998 was 5 plots grazed, 5 plots ungrazed. Sample size for 1999-2003 was 5 plots grazed, 6 plots ungrazed.



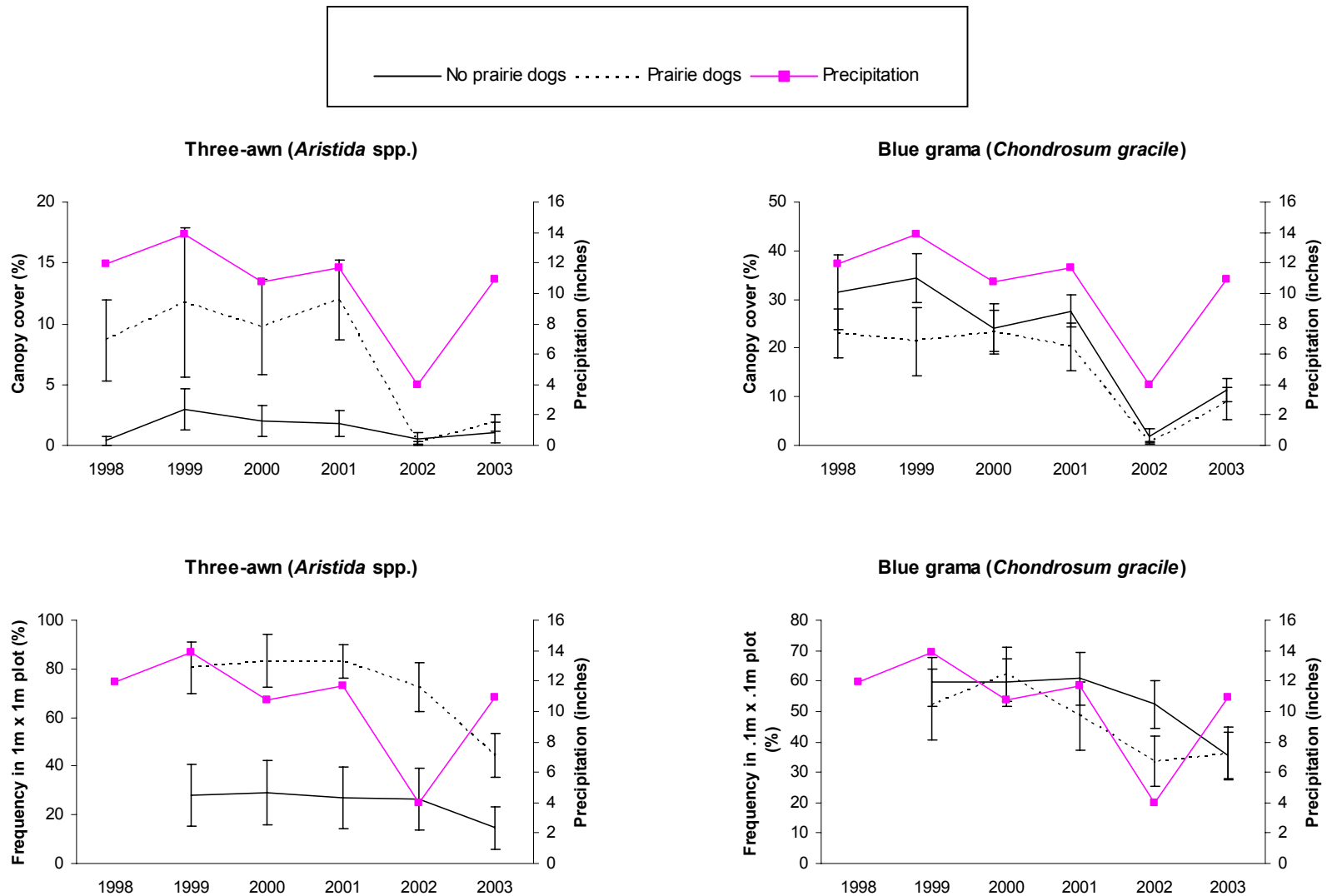
**Figure 12.** Mean cover for litter and frequency for Russian thistle ( $\pm$  1 SE) within the **sageshrubland**, and annual precipitation. Sample size for 1998 was 5 plots grazed, 5 plots ungrazed. Sample size for 1999-2003 was 5 plots grazed, 6 plots ungrazed.



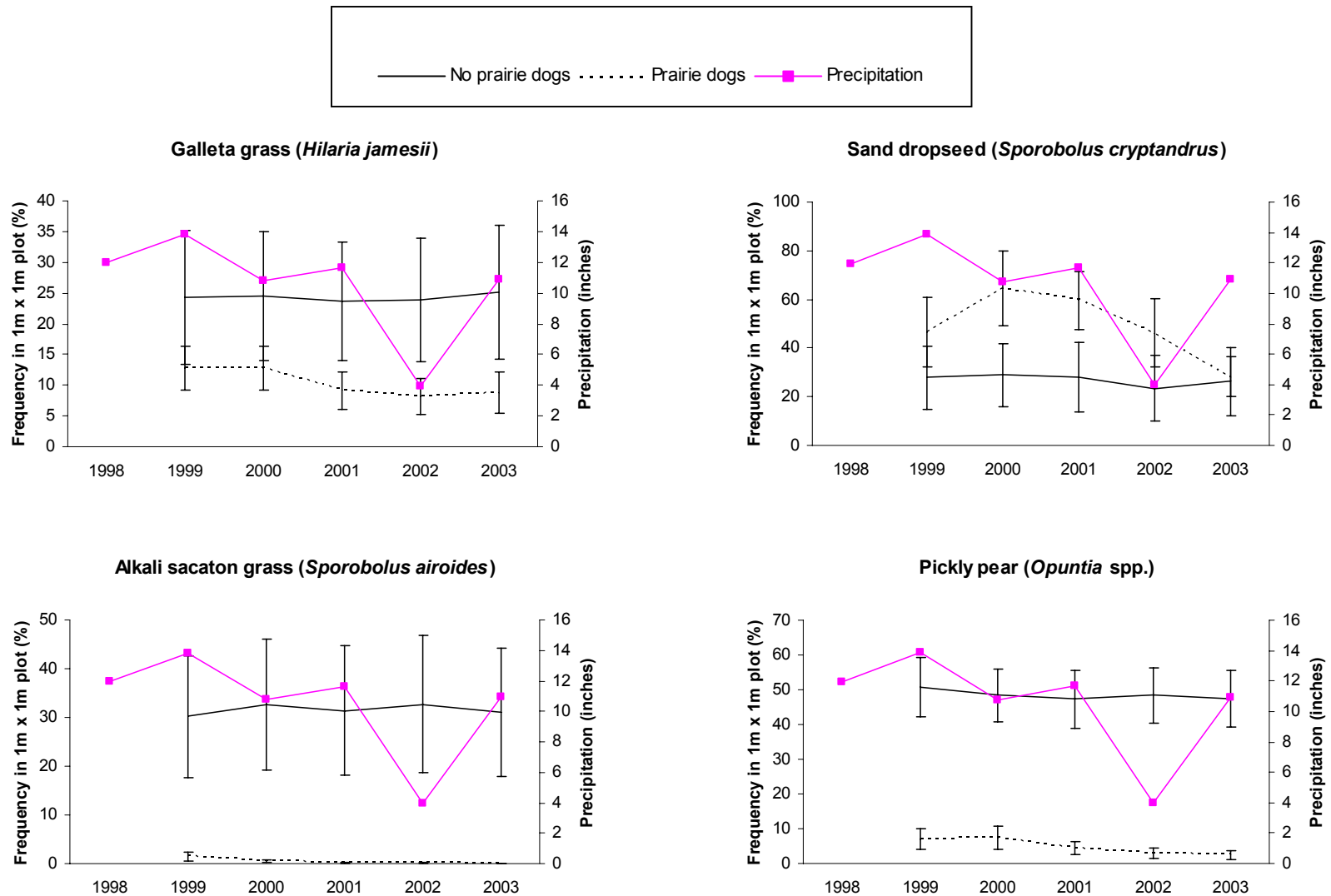
**Figure 13.** Mean canopy cover and frequency ( $\pm 1$  SE) for three-awn and blue grama within the **shortgrass prairie**, and annual precipitation (1998-2003). Sample size for 1998 was 5 plots grazed, 2 plots ungrazed. Sample size for 1999-2000 was 7 plots grazed, 4 plots ungrazed. Sample size for 2001-2003 was 7 plots grazed, 6 plots ungrazed.



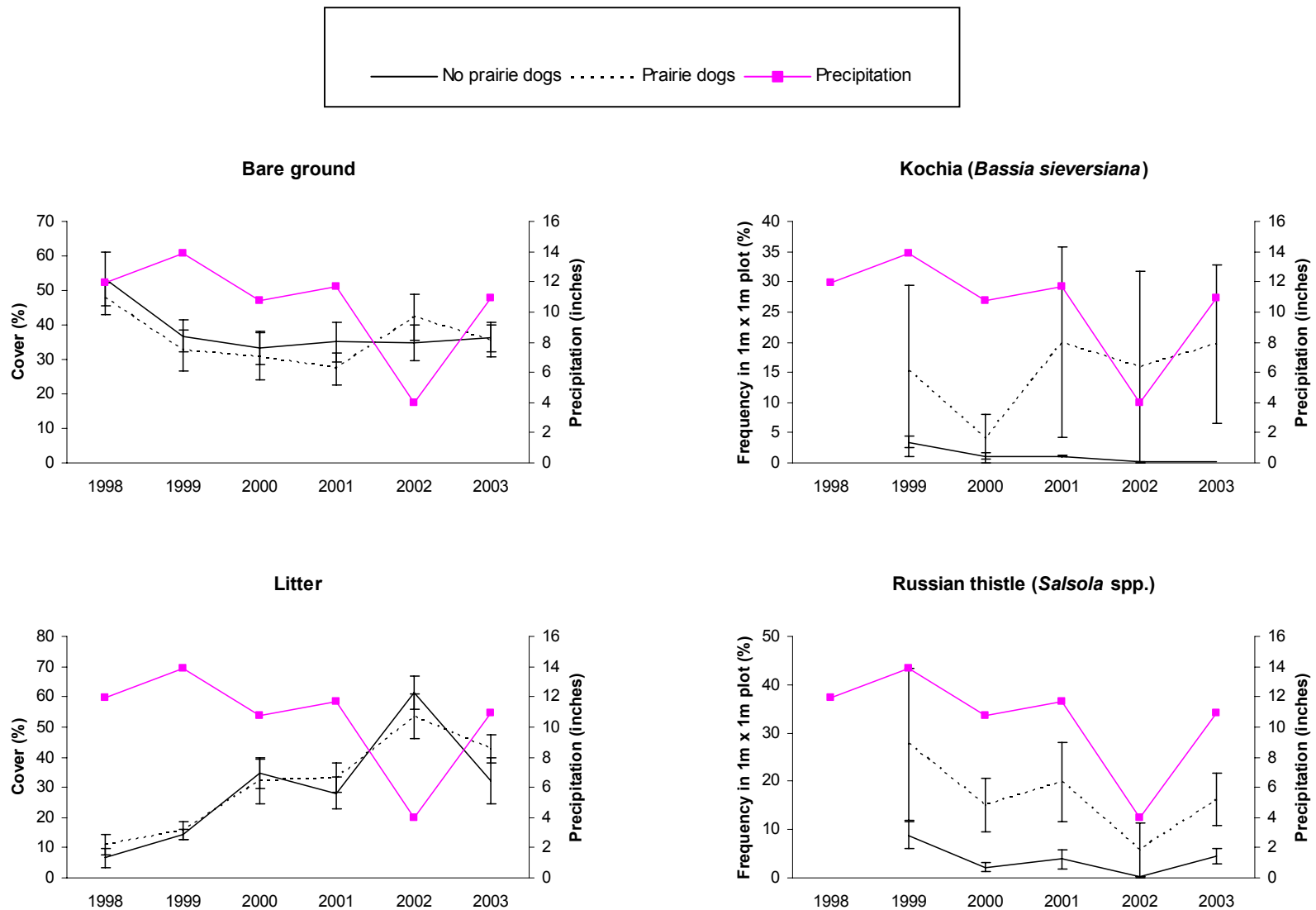
**Figure 14.** Mean frequency ( $\pm 1$  SE) for species within the **shortgrass prairie**, and annual precipitation (1998-2003). Sample size for 1998 was 5 plots grazed, 2 plots ungrazed. Sample size for 1999-2000 was 7 plots grazed, 4 plots ungrazed. Sample size for 2001-2003 was 7 plots grazed, 6 plots ungrazed. Note: Frequency was 0 for ungrazed alkali sacaton grass.



**Figure 15.** Mean canopy cover and frequency ( $\pm 1$  SE) for three-awn and blue grama within the **shortgrass prairie** with and without **prairie dogs**. Sample size for 1998 was 4 plots with prairie dogs, 3 plots without prairie dogs. Sample size for 1999-2000 was 4 plots with prairie dogs, 7 plots without prairie dogs. Sample size for 2001-2003 was 6 plots with prairie dogs, 7 plots without prairie dogs.



**Figure 16.** Mean frequency ( $\pm 1$  SE) for species within the **shortgrass prairie** with and without **prairie dogs**, and annual precipitation. Sample size for 1998 was 4 plots with prairie dogs, 3 plots without prairie dogs. Sample size for 1999-2000 was 4 plots with prairie dogs, 7 plots without prairie dogs. Sample size for 2001-2003 was 6 plots with prairie dogs, 7 plots without prairie dogs.



**Figure 17.** Mean canopy cover for bare ground and frequency for annual weeds ( $\pm 1$  SE) within the **shortgrass prairie** with and without **prairie dogs**, and annual precipitation. Sample size for 1998 was 4 plots with prairie dogs, 3 plots without prairie dogs. Sample size for 1999-2000 was 4 plots with prairie dogs, 7 plots without prairie dogs. Sample size for 2001-2003 was 6 plots with prairie dogs, 7 plots without prairie dogs.



**Figure 18.** Frequency and cover of blue grama decreased in response to the drought, while alkali sacaton grass was stable and in many cases expanded into the areas that had blue grama. The two photos are from the same microplot (gw09-south 19 m). Top photo had approximately 20% alkali sacaton grass and 30% blue grama while bottom photo had 40% alkali sacaton grass and 5% blue grama. The dead grass stumps in 2003 are all blue grama.





**Figure 19.** Blue grama suffered more from the drought than alkali sacaton grass. The top row of photos were from sg 64-south 16 m and were dominated by blue grama; the bottom row of photos were from gw 09-north 12 m and were dominated by alkali sacaton grass. Although some prickly pear individuals died back, overall they remained stable.

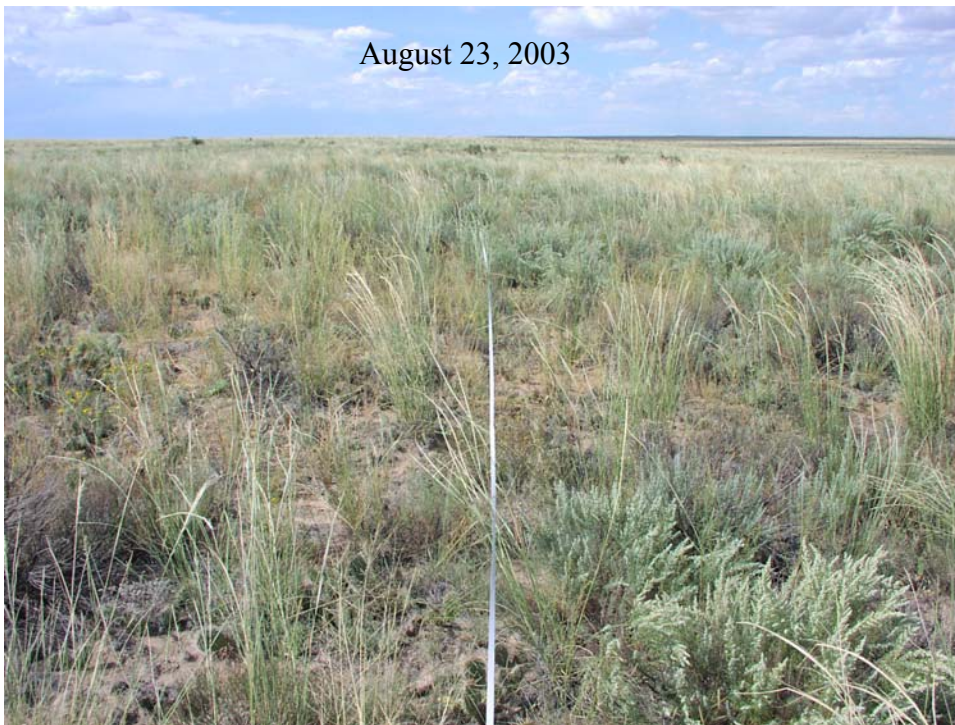
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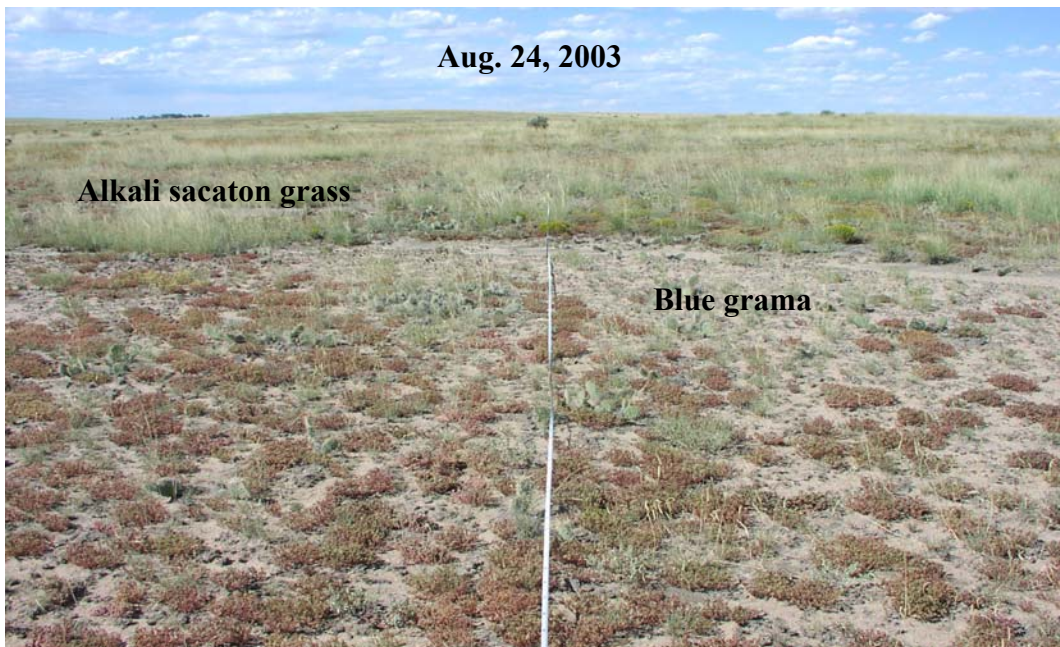
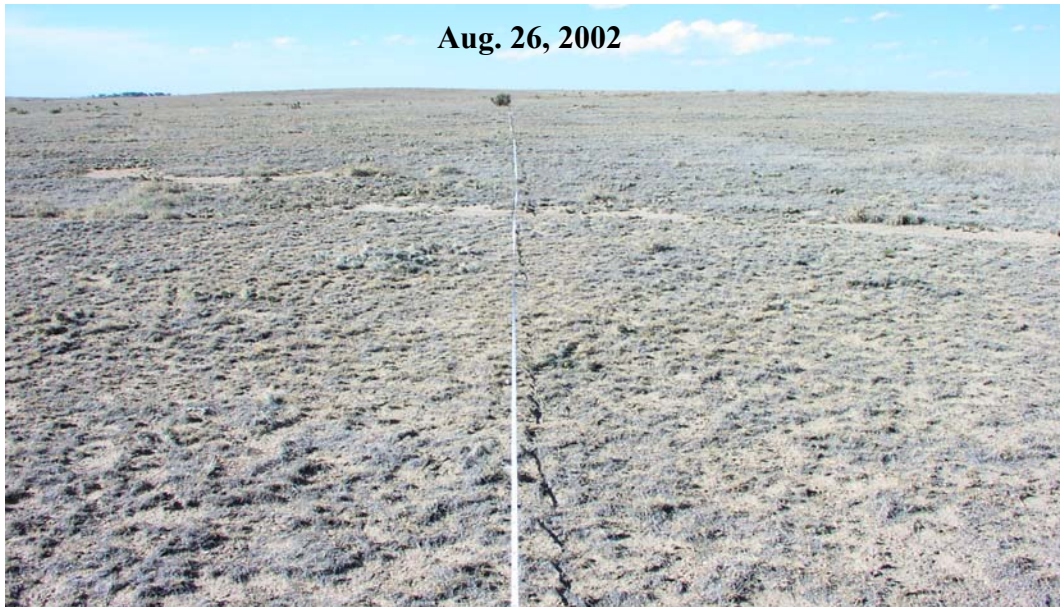
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**Figure 20.** Greasewood cover increased more in 2003 than any previous year, with an average increase of 57%. Plot gw05.

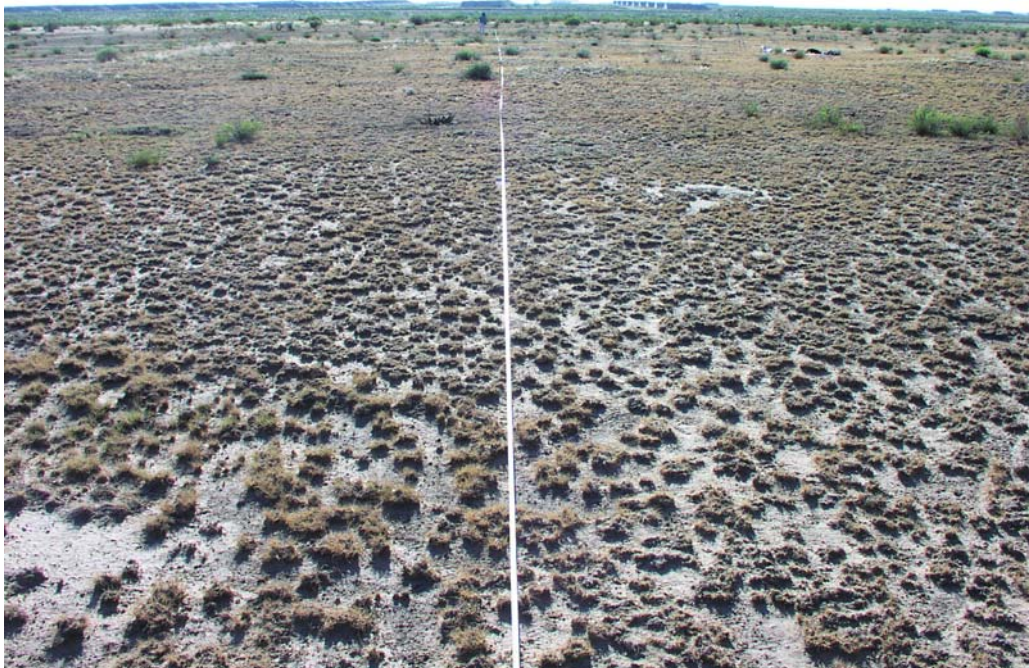


**Figure 21.** The average live canopy cover of sandsage was 3% in 2002, during the peak drought, and increased to 8% in 2003. Plot ss27.

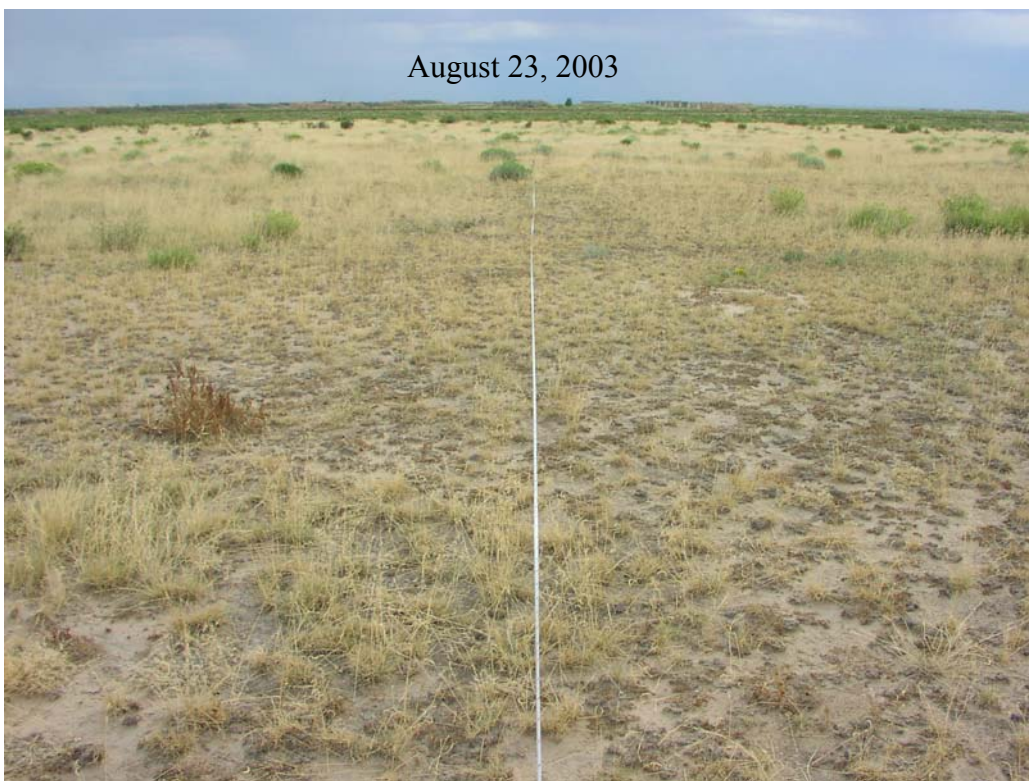


**Figure 22.** In 2003, the vegetation appeared to recover from the intense drought of 2002, although the recovery was greater for alkali sacaton grass than blue grama. 2003 was an exceptional year for native annuals, especially *Portulaca* (red forb in 2003 photo). Plot sg67.

August 24, 2002



August 23, 2003



**Figure 23.** While some plots appeared relatively verdant in 2003 (see Fig. 21), others displayed extremely dry conditions such as sg70.

**Table 1.** Mean frequency ( $\pm 1$  SE) of dominant species in shortgrass, sandsage, and greasewood communities in 2002 and 2003 and the relative change between years. Wilcoxon Signed Rank Test was used to test for significance between years (P-value in parentheses). Significant differences bolded. Note 2003 was a wetter year than 2002.

Species	Shortgrass (n = 13)			Sandsage (n = 11)			Greasewood (n = 12)		
	2002	2003	Change (%)	2002	2003	Change (%)	2002	2003	Change (%)
<i>Blue grama</i>	44 $\pm$ 6	36 $\pm$ 5	-19 (P = 0.07)	<b>43 <math>\pm</math> 6</b>	<b>38 <math>\pm</math> 6</b>	<b>- 12</b> (P = <b>0.03</b> )	<b>57 <math>\pm</math> 5</b>	<b>46 <math>\pm</math> 4</b>	<b>- 20</b> (P = <b>0.003</b> )
<i>Sand dropseed</i>	36 $\pm$ 10	27 $\pm$ 7	-25 (P = 0.2)	<b>37 <math>\pm</math> 6</b>	<b>26 <math>\pm</math> 5</b>	<b>-30</b> (P = <b>0.01</b> )	<b>35 <math>\pm</math> 7</b>	<b>22 <math>\pm</math> 5</b>	<b>-37</b> (P = <b>0.002</b> )
<i>Three-awn</i>	<b>48 <math>\pm</math> 10</b>	<b>28 <math>\pm</math> 7</b>	<b>- 42</b> (P = <b>0.002</b> )	<b>52 <math>\pm</math> 10</b>	<b>36 <math>\pm</math> 9</b>	<b>- 31</b> (P = <b>0.003</b> )	<b>6 <math>\pm</math> 1</b>	<b>3 <math>\pm</math> 1</b>	<b>-50</b> (P = <b>0.006</b> )
<i>Needle-and-thread</i>	0	0		<b>40 <math>\pm</math> 13</b>	<b>29 <math>\pm</math> 9</b>	<b>- 28</b> (P = <b>0.03</b> )	0	0	
<i>Galleta grass</i>	17 $\pm$ 6	18 $\pm$ 6	+ 1 (P = 0.12)	0	0		51 $\pm$ 6	51 $\pm$ 6	0 (P = 0.8)
<i>Alkali sacaton grass</i>	18 $\pm$ 9	17 $\pm$ 8	- 1 (P = 0.3)	0	0		47 $\pm$ 7	43 $\pm$ 6	- 9 (P = 0.13)
<i>Prickly pear</i>	27 $\pm$ 8	27 $\pm$ 8	0 (P = 0.8)	<b>30 <math>\pm</math> 7</b>	<b>31 <math>\pm</math> 7</b>	<b>+ 1</b> (P = <b>0.02</b> )	41 $\pm$ 5	41 $\pm$ 5	0 (P = 0.9)
<i>Sandsage (density)</i>	0	0		<b>94 <math>\pm</math> 8</b>	<b>87 <math>\pm</math> 8</b>	<b>-8</b> (P = <b>0.05</b> )	na	na	

## **Data Tables for Cover, Density, and Frequency: 1998-2003**

Table C-1. Mean canopy cover for greasewood shrubland

Table C-2. Mean density in greasewood shrubland

Table C-3. Frequency in greasewood shrubland

Table C-4. Mean canopy cover for sandsage shrubland

Table C-5. Mean density for sandsage shrubland

Table C-6. Frequency for sandsage shrubland

Table C-7. Mean canopy cover for shortgrass prairie

Table C-8. Frequency for shortgrass prairie

Table C-1. Mean canopy cover (%) and standard deviation in greasewood shrubland for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for shrubs and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Rabbit-brush 98</i>	<i>Rabbit-brush 99</i>	<i>Rabbit-brush 00</i>	<i>Rabbit-brush 01</i>	<i>Rabbit-brush 02</i>	<i>Rabbit-brush 03</i>	<i>Greasewood 98</i>	<i>Greasewood 99</i>	<i>Greasewood 00</i>	<i>Greasewood 01</i>	<i>Greasewood 02</i>	<i>Greasewood 03</i>
gw04ug	0	mean		0	1	1	1	1		3	4	4	3	5
gw04ug	0	std dev		0	0	0	0	0		1	1	1	1	2
gw06ug	0	mean	6	8	6	7	5	7	1	2	2	1	2	3
gw06ug	0	std dev	1	2	2	2	1	2	0	0	0	0	1	1
gw10ug	0	mean		4	3	3	3	3		7	4	5	4	5
gw10ug	0	std dev		1	1	1	0	0		1	1	2	1	1
gw11ug	0	mean	3	4	5	5	4	5	1	1	1	1	1	2
gw11ug	0	std dev	1	1	1	2	1	2	1	1	1	1	1	1
gw14ug	0	mean	2	3	4	4	4	5	6	6	4	5	3	5
gw14ug	0	std dev	1	1	2	2	2	2	1	1	1	0	0	1
gw16ug	0	mean		6	5	5	3	5		2	2	2	2	2
gw16ug	0	std dev		1	1	1	0	1		1	1	1	1	1
gw01g	1	mean	0	0	0	0	0	0	1	2	3	3	2	4
gw01g	1	std dev	0	0	0	0	0	0	1	1	1	1	1	1
gw02g	1	mean	1	1	1	1	0	1	3	4	4	4	3	5
gw02g	1	std dev	1	1	1	1	0	0	0	1	1	1	1	1
gw05g	1	mean	3	2	2	2	3	4	3	5	4	6	6	7
gw05g	1	std dev	1	1	1	1	1	2	1	1	1	1	1	2
gw09g	1	mean		3	3	4	3	3		4	4	4	4	7
gw09g	1	std dev		1	1	1	1	1		1	1	1	1	1
gw13g	1	mean	1	2	1	2	2	2	3	4	4	4	3	6
gw13g	1	std dev	1	1	0	1	1	1	2	2	2	2	2	3
gw19g	1	mean	7	7	7	7	5	8	2	1	1	2	2	3
gw19g	1	std dev	2	1	2	1	1	2	1	0	0	1	1	1
gw20g	1	mean		6	5	5	4	5		2	3	3	3	3
gw20g	1	std dev		2	1	1	1	1		0	1	1	1	1



Table C-1. Mean canopy cover (%) and standard deviation in greasewood shrubland for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for shrubs and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Three-awn 98</i>	<i>Three-awn 99</i>	<i>Three-awn 00</i>	<i>Three-awn 01</i>	<i>Three-awn 02</i>	<i>Three-awn 03</i>	<i>Blue grama 98</i>	<i>Blue grama 99</i>	<i>Blue grama 00</i>	<i>Blue grama 01</i>	<i>Blue grama 02</i>	<i>Blue grama 03</i>	<i>Galleta grass 98</i>
gw04ug	0	mean		0	0	0	0	0		37	19	31	0	20	
gw04ug	0	std dev		0	0	0	0	0		3	1	2	0	3	
gw06ug	0	mean	0	1	0	0	0	0	28	31	25	17	0	5	6
gw06ug	0	std dev	0	1	1	0	0	0	1	1	1	2	0	1	3
gw10ug	0	mean		0	0	0	0	0		26	19	20	1	7	
gw10ug	0	std dev		0	0	0	0	0		2	3	4	1	2	
gw11ug	0	mean	0	0	0	0	0	0	18	14	14	12	0	5	12
gw11ug	0	std dev	0	0	0	0	0	0	2	3	1	1	0	1	3
gw14ug	0	mean	0	0	0	0	0	0	21	24	18	18	1	11	11
gw14ug	0	std dev	0	0	0	0	0	0	3	3	2	2	1	1	8
gw16ug	0	mean		1	0	1	0	0		30	14	28	0	17	
gw16ug	0	std dev		1	0	1	0	0		2	1	1	0	4	
gw01g	1	mean	0	1	0	1	0	0	35	35	29	34	2	10	2
gw01g	1	std dev	0	1	1	2	0	0	3	2	3	3	2	3	4
gw02g	1	mean	0	0	0	0	0	0	27	33	24	27	2	11	3
gw02g	1	std dev	0	0	0	0	0	0	1	1	1	2	2	3	3
gw05g	1	mean	1	1	1	1	0	0	5	8	3	4	0	1	12
gw05g	1	std dev	2	3	1	1	0	0	3	6	3	4	0	1	1
gw09g	1	mean		0	0	0	0	0		16	12	16	0	4	
gw09g	1	std dev		0	0	0	0	0		6	4	4	0	2	
gw13g	1	mean	0	0	0	0	0	0	19	18	17	18	0	5	1
gw13g	1	std dev	0	0	0	0	0	0	2	3	2	2	0	4	1
gw19g	1	mean	1	3	1	1	0	0	15	16	10	17	0	9	8
gw19g	1	std dev	1	5	2	1	0	0	4	5	4	5	0	4	4
gw20g	1	mean		4	2	3	0	1		18	8	16	0	6	
gw20g	1	std dev		6	4	7	0	3		0	2	5	0	3	

Table C-1. Mean canopy cover (%) and standard deviation in greasewood shrubland for 1998-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for shrubs and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Galleta grass 99</i>	<i>Galleta grass 00</i>	<i>Galleta grass 01</i>	<i>Galleta grass 02</i>	<i>Galleta grass 03</i>	<i>Alkali sacaton 98</i>	<i>Alkali sacaton 99</i>	<i>Alkali sacaton 00</i>	<i>Alkali sacaton 01</i>	<i>Alkali sacaton 02</i>	<i>Alkali sacaton 03</i>
gw04ug	0	mean	0	0	0	0	0		13	5	7	0	4
gw04ug	0	std dev	0	0	0	0	0		6	4	4	0	3
gw06ug	0	mean	11	3	3	0	2	5	6	6	7	4	9
gw06ug	0	std dev	4	2	2	0	1	3	3	2	2	3	1
gw10ug	0	mean	8	7	10	0	5		18	14	19	5	13
gw10ug	0	std dev	2	2	2	0	2		6	5	4	3	2
gw11ug	0	mean	17	10	10	0	6	16	16	13	14	3	10
gw11ug	0	std dev	5	2	3	0	3	3	4	3	3	1	3
gw14ug	0	mean	13	7	9	0	4	17	18	16	18	3	12
gw14ug	0	std dev	8	3	5	0	2	8	9	9	9	3	7
gw16ug	0	mean	18	8	14	1	17		0	0	0	0	0
gw16ug	0	std dev	3	1	3	1	3	0	0	0	1	0	0
gw01g	1	mean	2	1	1	0	1	10	10	9	7	3	7
gw01g	1	std dev	2	1	1	0	1	5	4	4	3	1	4
gw02g	1	mean	3	2	1	0	1	7	5	3	3	1	5
gw02g	1	std dev	2	1	2	0	1	4	3	1	1	1	3
gw05g	1	mean	20	5	4	0	6	6	10	9	8	6	10
gw05g	1	std dev	3	1	1	0	2	6	7	7	5	4	5
gw09g	1	mean	8	4	4	0	3		32	26	30	10	30
gw09g	1	std dev	4	3	3	0	2		3	4	3	3	3
gw13g	1	mean	1	1	1	0	1	37	43	36	33	11	25
gw13g	1	std dev	1	1	1	0	1	1	1	2	2	1	1
gw19g	1	mean	9	8	10	0	4	22	22	17	19	1	10
gw19g	1	std dev	4	1	3	0	3	3	3	2	3	1	4
gw20g	1	mean	7	1	7	0	6		16	7	17	2	15
gw20g	1	std dev	3	0	4	0	3		2	1	2	1	2

Table C-1. Mean canopy cover (%) and standard deviation in greasewood shrubland for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for shrubs and 32 microplots/plot for all others.

Plot number	Grazed	Mean Std dev	Sand					Kochia					
			98	99	00	01	02	03	98	99	00	01	02
gw04ug	0	mean		0	0	0	0	0		0	0	0	0
gw04ug	0	std dev		0	0	0	0	0	0	0	0	0	0
gw06ug	0	mean	4	3	3	2	0	0	0	0	0	0	0
gw06ug	0	std dev	3	2	1	1	0	1	0	1	0	0	0
gw10ug	0	mean		2	0	0	0	0		0	0	0	0
gw10ug	0	std dev		3	1	1	0	0	0	0	0	0	0
gw11ug	0	mean	6	2	3	2	0	1	1	0	0	0	0
gw11ug	0	std dev	4	2	1	1	0	1	2	0	0	0	0
gw14ug	0	mean	0	0	2	1	0	1	1	0	0	0	0
gw14ug	0	std dev	1	1	2	1	0	1	1	1	0	0	0
gw16ug	0	mean		1	1	0	0	1		1	0	0	0
gw16ug	0	std dev		2	1	1	0	2	0	1	0	1	0
gw01g	1	mean	0	0	0	0	0	0	0	0	0	0	0
gw01g	1	std dev	1	0	0	0	0	0	0	0	0	0	0
gw02g	1	mean	2	3	2	1	0	0	0	0	0	0	0
gw02g	1	std dev	2	2	1	1	0	0	0	0	0	0	0
gw05g	1	mean	9	12	6	6	0	2	3	1	0	0	0
gw05g	1	std dev	3	5	2	3	0	1	2	1	0	0	0
gw09g	1	mean		1	0	0	0	0		0	0	0	0
gw09g	1	std dev		2	0	0	0	0	0	0	0	0	0
gw13g	1	mean	1	0	1	1	0	0	0	0	0	0	0
gw13g	1	std dev	2	1	3	2	0	0	0	0	0	0	0
gw19g	1	mean	9	6	7	5	0	1	0	0	0	0	0
gw19g	1	std dev	6	3	4	2	0	0	0	0	0	0	0
gw20g	1	mean		2	1	1	0	1		0	0	0	0
gw20g	1	std dev		1	1	1	0	1	0	0	0	0	0

Table C-1. Mean canopy cover (%) and standard deviation in greasewood shrubland for 1998-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for shrubs and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Russian thistle</i>						
			<i>Kochia 03</i>	<i>98</i>	<i>99</i>	<i>00</i>	<i>01</i>	<i>02</i>	<i>03</i>
gw04ug	0	mean	0		0	0	0	0	0
gw04ug	0	std dev	0	0	0	0	0	0	0
gw06ug	0	mean	0	0	0	0	0	0	0
gw06ug	0	std dev	0	0	0	0	0	0	0
gw10ug	0	mean	0		0	0	0	0	0
gw10ug	0	std dev	0	0	0	0	0	0	0
gw11ug	0	mean	0	0	0	0	0	0	0
gw11ug	0	std dev	0	1	0	0	0	0	0
gw14ug	0	mean	0	2	1	2	0	0	0
gw14ug	0	std dev	0	3	1	2	1	0	0
gw16ug	0	mean	2		2	2	3	0	0
gw16ug	0	std dev	5		1	2	4	0	0
gw01g	1	mean	0	0	0	0	0	0	0
gw01g	1	std dev	0	0	0	0	0	0	0
gw02g	1	mean	0	0	0	0	0	0	
gw02g	1	std dev	0	0	0	0	0	0	0
gw05g	1	mean	0	0	0	0	0	0	1
gw05g	1	std dev	0	0	0	0	0	0	4
gw09g	1	mean	0		0	0	0	0	0
gw09g	1	std dev	0	0	0	0	0	0	0
gw13g	1	mean	0	0	0	0	0	0	0
gw13g	1	std dev	0	0	0	0	0	0	0
gw19g	1	mean	0	0	0	0	0	0	0
gw19g	1	std dev	0	0	0	0	0	0	0
gw20g	1	mean	0		0	0	0	0	0
gw20g	1	std dev	0	0	0	0	0	0	0

Table C-1. Mean canopy cover (%) and standard deviation in greasewood shrubland for 1998-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for shrubs and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Bare ground 98</i>	<i>Bare ground 99</i>	<i>Bare ground 00</i>	<i>Bare ground 01</i>	<i>Bare ground 02</i>	<i>Bare ground 03</i>	<i>Litter 98</i>	<i>Litter 99</i>	<i>Litter 00</i>	<i>Litter 01</i>	<i>Litter 02</i>	<i>Litter 03</i>
gw04ug	0	mean		40	24	25	24	29		12	52	37	76	43
gw04ug	0	std dev		4	2	1	4	1		2	3	3	4	3
gw06ug	0	mean	28	18	15	16	18	24	21	21	46	55	76	57
gw06ug	0	std dev	1	2	4	3	4	2	2	3	3	4	2	2
gw10ug	0	mean		11	10	10	11	15		34	50	40	82	59
gw10ug	0	std dev		2	2	3	3	1		3	2	2	3	2
gw11ug	0	mean	24	19	17	17	20	25	17	30	43	46	76	50
gw11ug	0	std dev	4	4	5	5	4	2	4	1	2	1	3	1
gw14ug	0	mean	29	23	19	20	22	26	15	17	35	32	74	43
gw14ug	0	std dev	7	6	8	8	8	7	5	6	2	4	6	2
gw16ug	0	mean		12	11	11	13	11		33	64	42	86	50
gw16ug	0	std dev		4	4	5	7	5		5	2	5	7	3
gw01g	1	mean	39	36	31	27	29	31	6	15	30	30	66	40
gw01g	1	std dev	1	4	4	4	6	3	2	2	1	3	5	2
gw02g	1	mean	39	35	29	28	33	28	10	16	40	38	63	34
gw02g	1	std dev	3	4	3	6	3	4	4	6	5	5	3	7
gw05g	1	mean	41	25	18	19	18	26	17	19	57	50	74	50
gw05g	1	std dev	3	4	7	5	6	5	1	4	4	2	5	1
gw09g	1	mean		19	15	13	13	19		24	42	34	75	43
gw09g	1	std dev		2	2	2	2	1		4	4	5	2	2
gw13g	1	mean	37	26	21	23	20	25	6	11	24	25	68	43
gw13g	1	std dev	4	4	4	3	4	2	3	2	2	2	4	1
gw19g	1	mean	32	26	19	19	19	20	13	17	39	28	79	54
gw19g	1	std dev	3	3	3	4	5	3	6	7	3	4	4	1
gw20g	1	mean		30	20	20	19	19		22	60	33	77	49
gw20g	1	std dev		2	4	4	5	4		2	3	1	5	2

Table C-2. Mean density (individuals per 0.04 hectare) and standard deviation per belt transect in greasewood shrubland for 1998-2003. Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Rabbit-brush 98</i>	<i>Rabbit-brush 99</i>	<i>Rabbit-brush 00</i>	<i>Rabbit-brush 01</i>	<i>Rabbit-brush 02</i>	<i>Rabbit-brush 03</i>	<i>Grease-wood 98</i>	<i>Grease-wood 99</i>	<i>Grease-wood 00</i>	<i>Grease-wood 01</i>	<i>Grease-wood 02</i>	<i>Grease-wood 03</i>
gw04ug	0	mean density		4	4	3	3	3		10	11	13	12	12
gw04ug	0	std dev		2	2	1	1	1		4	4	6	4	6
gw06ug	0	mean density	28	32	32	30	30	29	11	14	12	13	14	16
gw06ug	0	std dev	7	3	3	4	4	3	3	4	4	3	3	4
gw10ug	0	mean density		16	21	19	21	17		12	17	16	16	19
gw10ug	0	std dev		5	6	5	6	5		3	6	7	7	9
gw11ug	0	mean density	13	22	21	24	24	21	6	7	6	9	9	8
gw11ug	0	std dev	5	7	7	8	10	6	3	4	3	5	5	4
gw14ug	0	mean density	16	23	29	20	22	25	12	13	16	14	13	18
gw14ug	0	std dev	5	9	9	6	6	6	3	4	4	5	4	6
gw16ug	0	mean density		30	32	31	32	30		3	2	3	3	3
gw16ug	0	std dev		8	9	9	11	11		3	4	5	4	5
gw01g	1	mean density	3	4	5	3	3	1	6	6	7	7	7	7
gw01g	1	std dev	3	2	3	2	2	2	2	2	1	2	2	2
gw02g	1	mean density	6	9	11	9	8	5	12	15	14	12	13	14
gw02g	1	std dev	6	6	8	7	5	5	3	5	5	3	2	3
gw05g	1	mean density	17	20	20	17	20	19	15	14	14	13	13	14
gw05g	1	std dev	7	5	5	6	8	8	4	3	4	2	2	3
gw09g	1	mean density		21	22	19	23	21		14	14	12	13	13
gw09g	1	std dev		6	7	8	8	7		6	6	7	7	7
gw13g	1	mean density	13	15	18	17	20	16	16	19	17	17	21	18
gw13g	1	std dev	8	9	15	15	18	11	9	9	7	12	11	8
gw19g	1	mean density	31	31	28	24	30	27	13	13	13	14	14	15
gw19g	1	std dev	4	10	8	7	13	7	5	6	6	6	5	7
gw20g	1	mean density		25	25	21	26	21		13	11	13	14	16
gw20g	1	std dev		13	13	11	14	12		5	3	4	5	5

Table C-3. Frequency (%) and standard deviation in greasewood shrubland for 1999-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

<i>Plot number</i>	<i>Grazed</i>	<i>Frequency plot size</i>	<i>Prickly pear 99</i>	<i>Prickly pear 00</i>	<i>Prickly pear 01</i>	<i>Prickly pear 02</i>	<i>Prickly pear 03</i>	<i>Three-awn 99</i>	<i>Three-awn 00</i>	<i>Three-awn 01</i>	<i>Three-awn 02</i>	<i>Three-awn 03</i>	<i>Blue grama 99</i>	<i>Blue grama 00</i>
gw04ug	0	.3 m x .3 m	16	12	11	11	16	0	0	0	0	0	69	69
gw04ug	0	1 m x 1 m	54	50	49	48	51	0	0	0	0	0	81	81
gw06ug	0	.3 m x .3 m	23	18	17	15	17	0	0	1	0	0	79	80
gw06ug	0	1 m x 1 m	73	71	63	66	63	2	2	2	0	1	98	98
gw10ug	0	.3 m x .3 m	7	8	10	11	10	0	0	0	0	0	65	67
gw10ug	0	1 m x 1 m	24	25	28	27	25	0	0	0	0	0	92	95
gw11ug	0	.3 m x .3 m	9	7	6	7	5	1	0	0	0	0	55	68
gw11ug	0	1 m x 1 m	22	22	21	23	24	3	2	2	2	1	90	95
gw14ug	0	.3 m x .3 m	8	9	10	10	10	3	6	5	4	2	41	48
gw14ug	0	1 m x 1 m	24	24	29	27	26	8	12	11	11	9	85	84
gw16ug	0	.3 m x .3 m	3	3	3	6	5	2	4	2	2	1	69	76
gw16ug	0	1 m x 1 m	22	25	27	27	21	6	7	6	6	4	97	96
gw01g	1	.3 m x .3 m	10	12	16	15	0	1	4	3	3	0	78	81
gw01g	1	1 m x 1 m	42	49	50	53	0	4	13	7	5	1	94	95
gw02g	1	.3 m x .3 m	12	13	15	16	20	6	5	8	7	0	87	88
gw02g	1	1 m x 1 m	49	56	52	58	61	12	12	10	11	1	97	98
gw05g	1	.3 m x .3 m	4	4	6	5	3	2	5	2	1	1	25	28
gw05g	1	1 m x 1 m	14	15	18	20	17	14	13	11	13	7	60	58
gw09g	1	.3 m x .3 m	12	10	15	18	22	2	1	1	1	1	44	52
gw09g	1	1 m x 1 m	54	49	51	54	57	3	2	2	2	1	74	78
gw13g	1	.3 m x .3 m	12	10	16	15	14	1	1	1	1	0	37	41
gw13g	1	1 m x 1 m	48	51	51	56	58	4	5	3	5	3	69	70
gw19g	1	.3 m x .3 m	6	7	7	9	12	9	5	2	3	2	39	41
gw19g	1	1 m x 1 m	25	29	32	33	38	15	11	7	10	7	67	66
gw20g	1	.3 m x .3 m	12	12	14	17	17	2	2	1	1	1	46	47
gw20g	1	1 m x 1 m	40	38	43	45	45	6	8	5	9	1	77	78

Table C-3. Frequency (%) and standard deviation in greasewood shrubland for 1999-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

<i>Plot number</i>	<i>Grazed</i>	<i>Frequency plot size</i>	<i>Blue grama 01</i>	<i>Blue grama 02</i>	<i>Blue grama 03</i>	<i>Galleta grass 99</i>	<i>Galleta grass 00</i>	<i>Galleta grass 01</i>	<i>Galleta grass 02</i>	<i>Galleta grass 03</i>	<i>Alkali sacaton 99</i>	<i>Alkali sacaton 00</i>
gw04ug	0	.3 m x .3 m	69	67	61	0	0	0	0	0	37	34
gw04ug	0	1 m x 1 m	79	79	74	1	1	0	1	1	43	43
gw06ug	0	.3 m x .3 m	73	69	54	19	27	29	25	26	26	33
gw06ug	0	1 m x 1 m	98	97	87	41	41	43	39	39	61	70
gw10ug	0	.3 m x .3 m	68	66	54	28	37	40	39	42	33	45
gw10ug	0	1 m x 1 m	95	92	88	63	65	68	65	66	74	80
gw11ug	0	.3 m x .3 m	67	63	56	42	41	45	44	41	40	48
gw11ug	0	1 m x 1 m	96	94	80	60	63	63	65	67	79	75
gw14ug	0	.3 m x .3 m	43	43	34	33	40	42	39	41	32	35
gw14ug	0	1 m x 1 m	81	79	73	61	61	63	61	57	69	64
gw16ug	0	.3 m x .3 m	77	68	70	80	79	84	79	83	6	7
gw16ug	0	1 m x 1 m	93	92	95	94	94	95	94	94	15	16
gw01g	1	.3 m x .3 m	84	72	50	16	19	22	21	23	36	41
gw01g	1	1 m x 1 m	96	94	74	29	27	28	27	29	61	70
gw02g	1	.3 m x .3 m	90	87	69	23	25	25	25	33	22	25
gw02g	1	1 m x 1 m	98	98	89	41	44	49	45	50	50	50
gw05g	1	.3 m x .3 m	30	33	22	56	61	52	56	55	18	19
gw05g	1	1 m x 1 m	59	60	53	72	71	68	70	67	31	32
gw09g	1	.3 m x .3 m	55	52	40	21	19	22	21	23	71	74
gw09g	1	1 m x 1 m	79	81	66	37	36	40	39	36	93	95
gw13g	1	.3 m x .3 m	43	41	30	4	5	5	5	7	76	82
gw13g	1	1 m x 1 m	70	68	54	10	9	14	10	13	96	95
gw19g	1	.3 m x .3 m	54	51	45	29	30	33	30	33	45	57
gw19g	1	1 m x 1 m	77	72	63	50	48	55	53	53	64	75
gw20g	1	.3 m x .3 m	49	42	31	23	22	24	21	25	50	64
gw20g	1	1 m x 1 m	80	79	64	49	47	47	44	45	70	86



Table C-3. Frequency (%) and standard deviation in greasewood shrubland for 1999-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

<i>Plot number</i>	<i>Grazed</i>	<i>Frequency plot size</i>	<i>Alkali sacaton 01</i>	<i>Alkali sacaton 02</i>	<i>Alkali sacaton 03</i>	<i>Sand dropseed 99</i>	<i>Sand dropseed 00</i>	<i>Sand dropseed 01</i>	<i>Sand dropseed 02</i>	<i>Sand dropseed 03</i>	<i>Kochia 99</i>
gw04ug	0	.3 m x .3 m	33	34	30	0	0	0	0	0	8
gw04ug	0	1 m x 1 m	43	43	42	0	0	0	0	0	18
gw06ug	0	.3 m x .3 m	36	38	38	18	14	14	10	10	2
gw06ug	0	1 m x 1 m	75	76	70	45	43	44	40	24	6
gw10ug	0	.3 m x .3 m	33	52	36	7	9	13	9	8	3
gw10ug	0	1 m x 1 m	73	85	81	30	28	29	28	22	21
gw11ug	0	.3 m x .3 m	50	49	46	10	15	14	11	10	4
gw11ug	0	1 m x 1 m	76	81	77	35	41	36	37	27	31
gw14ug	0	.3 m x .3 m	39	42	35	14	18	17	18	7	6
gw14ug	0	1 m x 1 m	67	68	69	45	46	49	46	24	29
gw16ug	0	.3 m x .3 m	4	5	8	3	3	3	3	2	13
gw16ug	0	1 m x 1 m	12	15	15	14	15	14	13	10	35
gw01g	1	.3 m x .3 m	45	45	44	2	3	3	1	0	0
gw01g	1	1 m x 1 m	69	69	72	15	14	16	16	1	0
gw02g	1	.3 m x .3 m	30	23	29	17	18	18	7	5	0
gw02g	1	1 m x 1 m	52	49	52	47	41	42	27	20	0
gw05g	1	.3 m x .3 m	22	20	24	51	64	58	53	36	6
gw05g	1	1 m x 1 m	35	34	36	91	87	85	84	64	26
gw09g	1	.3 m x .3 m	76	80	71	5	5	7	5	0	2
gw09g	1	1 m x 1 m	96	92	94	11	13	18	13	7	4
gw13g	1	.3 m x .3 m	80	80	81	0	0	0	0	0	0
gw13g	1	1 m x 1 m	98	98	98	0	0	2	3	1	2
gw19g	1	.3 m x .3 m	57	58	51	36	38	35	22	9	0
gw19g	1	1 m x 1 m	80	76	70	58	69	69	60	33	0
gw20g	1	.3 m x .3 m	66	67	56	21	24	21	18	10	0
gw20g	1	1 m x 1 m	87	89	85	54	54	51	47	32	0

Table C-3. Frequency (%) and standard deviation in greasewood shrubland for 1999-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

Plot number	Grazed	Frequency plot size	Kochia					Russian thistle				
			00	01	02	03	99	00	01	02	03	
gw04ug	0	.3 m x .3 m	2	2	0	0	0	0	0	0	0	
gw04ug	0	1 m x 1 m	2	11	0	4	1	0	0	0	4	
gw06ug	0	.3 m x .3 m	2	1	0	0	3	1	1	0	0	
gw06ug	0	1 m x 1 m	6	1	0	0	15	3	8	0	1	
gw10ug	0	.3 m x .3 m	1	2	0	0	3	0	0	0	2	
gw10ug	0	1 m x 1 m	2	5	0	2	17	0	0	0	3	
gw11ug	0	.3 m x .3 m	0	0	0	0	7	0	0	0	0	
gw11ug	0	1 m x 1 m	0	1	0	1	23	1	3	0	0	
gw14ug	0	.3 m x .3 m	2	0	0	0	7	3	1	0	1	
gw14ug	0	1 m x 1 m	10	5	0	0	37	17	14	0	12	
gw16ug	0	.3 m x .3 m	10	5	0	0	11	7	8	0	2	
gw16ug	0	1 m x 1 m	26	17	0	2	35	23	22	0	13	
gw01g	1	.3 m x .3 m	0	0	0	0	0	0	0	0	0	
gw01g	1	1 m x 1 m	0	0	0	0	0	0	0	0	1	
gw02g	1	.3 m x .3 m	0	0	0	0	0	0	0	0	0	
gw02g	1	1 m x 1 m	0	0	0	0	6	1	0	0	0	
gw05g	1	.3 m x .3 m	2	3	0	0	1	0	1	0	0	
gw05g	1	1 m x 1 m	16	12	0	0	10	0	3	0	2	
gw09g	1	.3 m x .3 m	0	0	0	0	5	1	0	0	0	
gw09g	1	1 m x 1 m	4	6	0	0	13	3	0	0	0	
gw13g	1	.3 m x .3 m	0	0	0	0	0	0	0	0	0	
gw13g	1	1 m x 1 m	0	0	0	0	0	0	0	0	0	
gw19g	1	.3 m x .3 m	0	0	0	0	0	1	1	0	2	
gw19g	1	1 m x 1 m	0	0	0	0	4	7	2	0	4	
gw20g	1	.3 m x .3 m	0	0	0	0	1	0	0	0	0	
gw20g	1	1 m x 1 m	1	0	0	0	3	0	0	0	1	

Table C-4. Mean canopy cover (%) and standard deviation in sandsage shrubland for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for sandsage and 32 microplots/plot for all others.

Plot number	Grazed	Mean Std dev	Sandsage					Three-awn				
			98	99	00	01	02	98	99	00	01	02
ss08ug	0	mean		17	14	15	1		1	0	0	0
ss08ug	0	std dev		2	2	2	0		1	0	0	0
ss30ug	0	mean	8	12	9	13	5	12	15	13	14	0
ss30ug	0	std dev	2	3	2	2	1	4	8	6	7	0
ss31ug	0	mean	8	14	9	10	2	2	1	1	1	0
ss31ug	0	std dev	2	3	2	3	1	3	1	1	2	0
ss32ug	0	mean	12	16	17	19	3	4	5	5	4	0
ss32ug	0	std dev	1	1	2	2	1	3	3	2	2	0
ss39ug	0	mean	13	18	19	18	5	1	1	1	1	0
ss39ug	0	std dev	3	3	3	4	1	1	2	2	2	1
ss40ug	0	mean	11	14	12	13	3	2	1	1	1	0
ss40ug	0	std dev	2	1	0	1	1	3	3	1	2	0
ss21g	1	mean	13	25	21	23	4	4	5	3	3	0
ss21g	1	std dev	1	2	2	3	1	3	4	4	5	0
ss27g	1	mean	12	22	20	25	2	12	14	11	6	0
ss27g	1	std dev	1	3	3	4	1	4	7	5	4	0
ss36g	1	mean	13	14	16	20	3	6	4	3	4	0
ss36g	1	std dev	2	3	3	4	0	4	3	3	3	1
ss37g	1	mean	14	17	17	18	5	2	3	3	1	0
ss37g	1	std dev	1	1	1	1	1	4	5	5	1	0
ss38g	1	mean	11	14	12	16	5	13	14	9	9	1
ss38g	1	std dev	4	5	4	4	1	7	7	4	5	2

Table C-4. Mean canopy cover (%) and standard deviation in sandsage shrubland for 1998-2003.  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for sandsage and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Blue grama 98</i>	<i>Blue grama 99</i>	<i>Blue grama 00</i>	<i>Blue grama 01</i>	<i>Blue grama 02</i>	<i>Sand dropseed 98</i>	<i>Sand dropseed 99</i>	<i>Sand dropseed 00</i>	<i>Sand dropseed 01</i>	<i>Sand dropseed 02</i>
ss08ug	0	mean		8	3	3	0		3	1	2	0
ss08ug	0	std dev		5	1	2	0		2	0	1	0
ss30ug	0	mean	20	23	23	23	3	5	4	3	3	0
ss30ug	0	std dev	4	4	3	3	2	5	3	2	2	0
ss31ug	0	mean	11	9	5	5	0	6	4	2	5	1
ss31ug	0	std dev	3	1	3	2	0	2	3	2	2	1
ss32ug	0	mean	13	12	10	9	2	6	8	5	6	0
ss32ug	0	std dev	5	5	5	4	1	4	3	2	3	0
ss39ug	0	mean	6	5	4	4	1	3	5	3	3	1
ss39ug	0	std dev	4	4	3	3	1	2	4	4	5	2
ss40ug	0	mean	5	5	3	3	0	10	8	3	3	0
ss40ug	0	std dev	6	3	3	3	0	7	6	2	3	0
ss21g	1	mean	10	7	4	5	1	15	12	8	12	1
ss21g	1	std dev	5	3	2	4	1	8	8	7	8	0
ss27g	1	mean	2	2	1	1	1	7	8	7	9	3
ss27g	1	std dev	2	1	1	1	0	4	2	1	2	2
ss36g	1	mean	16	13	11	12	1	6	5	4	5	0
ss36g	1	std dev	4	3	4	5	1	2	1	1	2	0
ss37g	1	mean	14	13	10	9	1	6	6	9	7	1
ss37g	1	std dev	6	4	4	5	1	1	1	3	3	1
ss38g	1	mean	22	17	11	10	4	8	9	7	7	1
ss38g	1	std dev	17	11	8	8	4	5	3	3	3	1

Table C-4. Mean canopy cover (%) and standard deviation in sandsage shrubland for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for sandsage and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Needle- and-thread 98</i>	<i>Needle- and-thread 99</i>	<i>Needle- and-thread 00</i>	<i>Needle- and-thread 01</i>	<i>Needle- and-thread 02</i>	<i>Russian thistle 98</i>	<i>Russian thistle 99</i>	<i>Russian thistle 00</i>	<i>Russian thistle 01</i>	<i>Russian thistle 02</i>
ss08ug	0	mean		27	16	13	0		4	0	1	0
ss08ug	0	std dev		16	11	6	1		2	0	0	0
ss30ug	0	mean	0	0	0	0	0	0	0	0	0	0
ss30ug	0	std dev	0	0	0	0	0	0	0	0	0	0
ss31ug	0	mean	13	12	12	14	0	4	1	0	1	0
ss31ug	0	std dev	6	8	9	10	1	5	0	0	1	0
ss32ug	0	mean	0	1	0	1	0	0	0	0	0	0
ss32ug	0	std dev	0	1	0	1	0	0	0	0	0	0
ss39ug	0	mean	7	9	8	6	1	14	4	4	4	1
ss39ug	0	std dev	4	6	4	3	1	12	4	6	4	1
ss40ug	0	mean	16	14	10	9	0	3	1	0	1	0
ss40ug	0	std dev	10	8	6	5	0	4	1	0	1	0
ss21g	1	mean	0	1	1	1	0	0	0	0	1	0
ss21g	1	std dev	1	1	2	2	1	0	0	0	1	0
ss27g	1	mean	0	1	1	1	0	0	0	0	0	0
ss27g	1	std dev	1	2	1	1	0	0	0	0	0	0
ss36g	1	mean	0	0	0	0	0	2	0	0	0	0
ss36g	1	std dev	0	0	0	0	0	3	0	0	0	0
ss37g	1	mean	0	1	1	1	0	2	2	0	0	0
ss37g	1	std dev	0	1	1	2	1	1	2	0	0	0
ss38g	1	mean	0	0	0	0	0	1	1	1	1	0
ss38g	1	std dev	0	0	0	0	0	1	1	1	1	0

Table C-4. Mean canopy cover (%) and standard deviation in sandsage shrubland for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects for sandsage and 32 microplots/plot for all others.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Bare ground 98</i>	<i>Bare ground 99</i>	<i>Bare ground 00</i>	<i>Bare ground 01</i>	<i>Bare ground 02</i>	<i>Litter 98</i>	<i>Litter 99</i>	<i>Litter 00</i>	<i>Litter 01</i>	<i>Litter 02</i>
ss08ug	0	mean		22	19	18	23		27	59	59	77
ss08ug	0	std dev		7	8	6	10		11	9	5	10
ss30ug	0	mean	47	41	30	28	33	15	15	30	30	63
ss30ug	0	std dev	7	4	2	3	4	5	5	4	5	7
ss31ug	0	mean	25	26	29	25	29	28	32	45	36	68
ss31ug	0	std dev	8	12	12	10	11	5	10	7	7	11
ss32ug	0	mean	44	29	27	23	29	24	39	47	48	65
ss32ug	0	std dev	8	5	5	8	8	4	11	8	9	7
ss39ug	0	mean	33	23	17	20	29	31	45	56	53	64
ss39ug	0	std dev	13	10	10	10	14	11	5	7	10	12
ss40ug	0	mean	26	15	18	20	28	30	45	56	43	68
ss40ug	0	std dev	9	8	12	13	11	5	7	11	9	11
ss21g	1	mean	38	29	24	24	32	28	40	55	39	63
ss21g	1	std dev	8	13	17	15	16	4	10	14	10	17
ss27g	1	mean	48	27	24	22	16	16	40	50	54	77
ss27g	1	std dev	3	10	6	3	3	3	11	10	4	4
ss36g	1	mean	39	30	24	26	34	20	39	53	40	64
ss36g	1	std dev	4	3	5	8	11	10	11	12	14	11
ss37g	1	mean	49	38	24	27	31	15	28	49	47	65
ss37g	1	std dev	10	17	10	12	12	11	16	14	14	13
ss38g	1	mean	41	30	22	24	29	10	24	49	43	64
ss38g	1	std dev	12	12	5	11	11	12	7	4	3	9

Table C-5. Mean density (individuals per 0.04 hectare) and standard deviation per belt transect in sandsage shrubland for 1998-2003. Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 4 50-m transects.

<i>Plot number</i>	<i>Grazed</i>	<i>Mean Std dev</i>	<i>Sandsage 98</i>	<i>Sandsage 99</i>	<i>Sandsage 00</i>	<i>Sandsage 01</i>	<i>Sandsage 02</i>	<i>Sandsage 03</i>
ss08ug	0	mean density		91	85	86	85	80
ss08ug	0	std dev		30	28	25	30	24
ss30ug	0	mean density	82	135	123	114	113	103
ss30ug	0	std dev	20	86	69	66	65	70
ss31ug	0	mean density	83	99	92	88	83	63
ss31ug	0	std dev	34	44	35	33	33	16
ss32ug	0	mean density	127	138	138	138	135	132
ss32ug	0	std dev	36	18	25	16	11	11
ss39ug	0	mean density	62	81	84	83	82	80
ss39ug	0	std dev	14	16	23	25	21	22
ss40ug	0	mean density	54	54	51	47	46	40
ss40ug	0	std dev	15	10	9	7	9	5
ss21g	1	mean density	122	151	157	148	136	116
ss21g	1	std dev	19	26	24	24	24	30
ss27g	1	mean density	134	146	132	146	105	92
ss27g	1	std dev	13	9	13	23	32	27
ss36g	1	mean density	93	98	111	108	99	102
ss36g	1	std dev	15	18	17	21	21	24
ss37g	1	mean density	76	91	84	83	71	77
ss37g	1	std dev	12	9	11	17	9	13
ss38g	1	mean density	80	79	76	79	77	75
ss38g	1	std dev	41	47	44	44	42	40

Table C-6. Frequency (%) and standard deviation in sandsage shrubland for 1999-2003 (2000-2003 for needle-and-thread).  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

<i>Plot number</i>	<i>Grazed</i>	<i>Frequency plot size</i>	<i>Prickly pear 99</i>	<i>Prickly pear 00</i>	<i>Prickly pear 01</i>	<i>Prickly pear 02</i>	<i>Prickly pear 03</i>	<i>Three-awn 99</i>	<i>Three-awn 00</i>	<i>Three-awn 01</i>	<i>Three-awn 02</i>	<i>Three-awn 03</i>	<i>Blue grama 99</i>	<i>Blue grama 00</i>	<i>Blue grama 01</i>
ss08ug	0	.3 m x .3 m	2	2	1	1	1	8	6	2	3	3	30	31	30
ss08ug	0	1 m x 1 m	4	4	3	3	2	24	20	13	11	8	76	76	72
ss30ug	0	.3 m x .3 m	9	11	14	12	17	38	52	60	50	22	69	75	79
ss30ug	0	1 m x 1 m	29	31	32	30	34	86	88	88	86	58	94	98	99
ss31ug	0	.3 m x .3 m	3	6	3	5	6	9	18	14	10	5	46	42	39
ss31ug	0	1 m x 1 m	24	20	19	20	23	35	49	41	32	17	78	72	74
ss32ug	0	.3 m x .3 m	33	30	38	35	33	29	29	30	20	6	53	60	65
ss32ug	0	1 m x 1 m	69	71	73	72	72	84	87	84	76	37	94	91	91
ss39ug	0	.3 m x .3 m	14	8	9	10	11	3	3	0	2	1	22	29	36
ss39ug	0	1 m x 1 m	36	29	30	31	31	12	11	14	13	7	63	67	69
ss40ug	0	.3 m x .3 m	27	23	26	25	24	1	2	3	4	0	20	22	29
ss40ug	0	1 m x 1 m	57	56	55	57	60	5	10	10	10	4	46	52	54
ss21g	1	.3 m x .3 m	9	5	11	13	14	15	20	19	16	7	35	41	45
ss21g	1	1 m x 1 m	28	22	35	34	41	60	64	66	61	31	81	80	82
ss27g	1	.3 m x .3 m	17	17	18	26	26	50	61	65	43	29	9	12	8
ss27g	1	1 m x 1 m	54	51	51	54	55	97	96	93	89	80	27	31	24
ss36g	1	.3 m x .3 m	0	1	1	1	3	24	27	32	26	18	51	62	62
ss36g	1	1 m x 1 m	3	5	4	4	6	83	88	82	77	68	90	93	93
ss37g	1	.3 m x .3 m	1	2	2	2	2	9	5	6	6	2	54	64	61
ss37g	1	1 m x 1 m	10	5	6	9	9	27	30	23	22	14	93	90	95
ss38g	1	.3 m x .3 m	4	3	3	2	5	42	50	45	47	30	41	45	45
ss38g	1	1 m x 1 m	12	10	11	11	12	90	93	92	90	70	78	75	75



Table C-6. Frequency (%) and standard deviation in sandsage shrubland for 1999-2003 (2000-2003 for needle-and-thread).  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

<i>Plot number</i>	<i>Grazed</i>	<i>Frequency plot size</i>	<i>Blue grama 02</i>	<i>Blue grama 03</i>	<i>Sand dropseed 99</i>	<i>Sand dropseed 00</i>	<i>Sand dropseed 01</i>	<i>Sand dropseed 02</i>	<i>Sand dropseed 03</i>	<i>Needle-and-thread 00</i>	<i>Needle-and-thread 01</i>	<i>Needle-and-thread 02</i>
ss08ug	0	.3 m x .3 m	26	12	21	17	16	15	7	48	49	46
ss08ug	0	1 m x 1 m	65	58	65	64	58	53	29	85	90	89
ss30ug	0	.3 m x .3 m	76	76	42	44	45	45	39	0	0	0
ss30ug	0	1 m x 1 m	99	99	85	86	87	86	85	1	1	1
ss31ug	0	.3 m x .3 m	39	40	24	13	16	15	10	54	61	52
ss31ug	0	1 m x 1 m	73	78	65	58	62	67	55	98	99	97
ss32ug	0	.3 m x .3 m	63	54	35	32	39	28	27	2	4	2
ss32ug	0	1 m x 1 m	90	86	90	88	89	82	81	11	13	12
ss39ug	0	.3 m x .3 m	35	24	13	13	16	13	6	42	55	49
ss39ug	0	1 m x 1 m	67	62	51	64	69	58	40	93	98	97
ss40ug	0	.3 m x .3 m	20	19	31	32	33	28	6	35	50	40
ss40ug	0	1 m x 1 m	49	46	77	83	83	78	49	79	85	81
ss21g	1	.3 m x .3 m	44	39	57	61	62	58	38	3	6	5
ss21g	1	1 m x 1 m	81	80	98	98	97	96	93	18	23	18
ss27g	1	.3 m x .3 m	10	12	39	50	57	41	49	2	3	3
ss27g	1	1 m x 1 m	23	30	90	92	98	97	98	5	16	13
ss36g	1	.3 m x .3 m	59	50	49	52	47	38	30	0	0	0
ss36g	1	1 m x 1 m	90	92	97	96	96	89	83	0	0	0
ss37g	1	.3 m x .3 m	58	50	65	61	65	59	23	4	4	9
ss37g	1	1 m x 1 m	94	96	99	97	99	99	84	23	24	29
ss38g	1	.3 m x .3 m	44	44	62	77	79	64	52	0	0	0
ss38g	1	1 m x 1 m	76	69	98	99	100	100	100	0	0	0

Table C-6. Frequency (%) and standard deviation in sandsage shrubland for 1999-2003 (2000-2003 for needle-and-thread).  
 Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Sample size is 100/plot.

Plot number	Grazed	Frequency plot size	Needle-and-thread					
			03	Russian thistle 99	Russian thistle 00	Russian thistle 01	Russian thistle 02	Russian thistle 03
ss08ug	0	.3 m x .3 m	9	71	25	18	0	22
ss08ug	0	1 m x 1 m	47	90	56	55	0	72
ss30ug	0	.3 m x .3 m	0	1	1	1	0	0
ss30ug	0	1 m x 1 m	1	4	1	4	0	0
ss31ug	0	.3 m x .3 m	17	7	0	1	0	1
ss31ug	0	1 m x 1 m	64	26	3	11	0	26
ss32ug	0	.3 m x .3 m	2	0	1	0	0	0
ss32ug	0	1 m x 1 m	8	2	1	0	0	0
ss39ug	0	.3 m x .3 m	34	45	35	27	2	7
ss39ug	0	1 m x 1 m	86	81	72	74	18	40
ss40ug	0	.3 m x .3 m	16	29	6	10	0	0
ss40ug	0	1 m x 1 m	59	62	19	33	0	5
ss21g	1	.3 m x .3 m	4	0	0	5	0	3
ss21g	1	1 m x 1 m	19	3	1	17	0	14
ss27g	1	.3 m x .3 m	6	0	0	0	0	0
ss27g	1	1 m x 1 m	16	0	0	1	0	0
ss36g	1	.3 m x .3 m	0	7	0	1	0	2
ss36g	1	1 m x 1 m	0	32	1	18	1	13
ss37g	1	.3 m x .3 m	5	38	6	8	0	7
ss37g	1	1 m x 1 m	24	82	13	21	0	17
ss38g	1	.3 m x .3 m	0	18	12	12	1	3
ss38g	1	1 m x 1 m	0	52	51	42	6	13

Table C-7. Mean canopy cover (%) and standard deviation in shortgrass prairie for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 32 microplots/plot.

Plot number	Prairie Grazed	Prairie Dogs	Mean Std dev	Three-awn	Three-awn	Three-awn	Three-awn	Three-awn	Three-awn	Blue grama	Blue grama	Blue grama	Blue grama	Blue grama	Blue grama	Galleta grass
				98	99	00	01	02	03	98	99	00	01	02	03	98
sg61ug	0	1	mean	17	29	20	25	0	4	11	14	12	18	0	5	0
sg61ug	0	1	std dev	1	3	1	3	0	4	1	1	1	1	0	2	0
sg63ug	0	0	mean	1	1	0	0	0	0	3	4	1	2	0	1	28
sg63ug	0	0	std dev	1	2	0	0	0	1	2	4	1	3	0	1	3
sg68ug	0	0	mean	0	0	0	0	0	0	39	42	42	39	1	21	6
sg68ug	0	0	std dev	0	0	0	0	0	0	2	2	2	3	1	3	5
sg69ug	0	0	mean		9	3	3	0	0		50	23	28	0	8	
sg69ug	0	0	std dev		5	2	2	0	0		4	2	1	0	3	
sg74ug	0	0	mean		9	9	8	4	6		31	24	27	10	18	
sg74ug	0	0	std dev		3	4	2	1	4		1	1	1	2	2	
sg80ug	0	1	mean				14	0	0				0	0	0	
sg80ug	0	1	std dev				20	0	0				0	0	0	
sg81ug	0	1	mean				13	1	4				16	0	4	
sg81ug	0	1	std dev				4	1	2				12	0	5	
sg64g	1	0	mean		0	0	0	0	0		32	18	26	1	9	
sg64g	1	0	std dev		0	0	0	0	0		1	1	1	0	0	
sg65g	1	0	mean		0	0	0	0	0		18	5	15	0	2	
sg65g	1	0	std dev		0	0	0	0	0		5	1	4	0	4	
sg67g	1	0	mean	0	0	0	0	0	0	39	48	40	38	0	11	0
sg67g	1	0	std dev	0	0	0	0	0	0	1	4	3	3	0	3	1
sg70g	1	1	mean	8	10	8	6	0	1	21	24	26	29	2	6	2
sg70g	1	1	std dev	3	3	3	3	0	1	3	1	2	2	1	3	4
sg77g	1	1	mean	0	1	1	2	0	2	36	40	34	34	0	18	1
sg77g	1	1	std dev	1	2	1	2	0	2	2	3	3	2	0	1	2
sg78g	1	1	mean	10	6	11	12	0	1	24	8	22	25	1	19	0
sg78g	1	1	std dev	3	3	2	2	0	1	1	2	1	1	0	2	0
sg79g	1	0	mean	1	2	2	2	0	2	16	18	18	20	1	11	1
sg79g	1	0	std dev	1	2	3	2	1	2	3	2	2	2	1	3	1

Table C-7. Mean canopy cover (%) and standard deviation in shortgrass prairie for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 32 microplots/plot.

Plot number	Prairie Dogs		Mean Std dev	Galleta grass	Galleta grass	Galleta grass	Galleta grass	Galleta grass	Alkali sacaton	Alkali sacaton	Alkali sacaton	Alkali sacaton	Alkali sacaton	Alkali sacaton
	Grazed	Dogs		99	00	01	02	03	98	99	00	01	02	03
sg61ug	0	1	mean	0	0	0	0	0	0	0	0	0	0	0
sg61ug	0	1	std dev	0	0	0	0	0	0	0	0	0	0	0
sg63ug	0	0	mean	37	9	27	0	7	0	0	0	0	0	0
sg63ug	0	0	std dev	5	1	3	0	2	0	0	0	0	0	0
sg68ug	0	0	mean	7	5	5	0	1	0	0	0	0	0	0
sg68ug	0	0	std dev	5	4	4	0	1	0	0	0	0	0	0
sg69ug	0	0	mean	0	0	0	0	0	0	0	0	0	0	0
sg69ug	0	0	std dev	0	0	0	0	0	0	0	0	0	0	0
sg74ug	0	0	mean	0	0	0	0	0	0	0	0	0	0	0
sg74ug	0	0	std dev	0	0	0	0	0	0	0	0	0	0	0
sg80ug	0	1	mean			0	0	0				0	0	0
sg80ug	0	1	std dev			0	0	0				0	0	0
sg81ug	0	1	mean			2	0	0				0	0	0
sg81ug	0	1	std dev			4	0	1				0	0	0
sg64g	1	0	mean	13	4	6	1	12		2	1	1	0	9
sg64g	1	0	std dev	2	1	1	0	1		2	1	1	0	5
sg65g	1	0	mean	0	0	0	0	1		21	7	14	3	13
sg65g	1	0	std dev	1	1	1	1	2		2	0	2	1	2
sg67g	1	0	mean	1	1	1	0	1	0	1	0	1	0	1
sg67g	1	0	std dev	2	2	2	0	3	1	2	0	2	0	2
sg70g	1	1	mean	6	4	5	1	2	0	0	2	1	0	1
sg70g	1	1	std dev	6	4	4	2	4	0	0	4	4	0	3
sg77g	1	1	mean	2	1	0	0	0	0	0	0	0	0	0
sg77g	1	1	std dev	4	1	1	0	1	1	1	0	0	0	0
sg78g	1	1	mean	0	0	0	0	1	1	0	0	0	0	0
sg78g	1	1	std dev	0	1	1	0	1	2	0	0	0	0	0
sg79g	1	0	mean	1	2	1	0	0	5	7	6	7	1	8
sg79g	1	0	std dev	2	3	1	0	1	0	4	2	3	1	3

Table C-7. Mean canopy cover (%) and standard deviation in shortgrass prairie for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 32 microplots/plot.

Plot number	Prairie Grazed	Prairie Dogs	Mean Std dev	Sand	Sand	Sand	Sand	Sand	Sand	Kochia	Kochia	Kochia	Kochia
				dropseed 98	dropseed 99	dropseed 00	dropseed 01	dropseed 02	dropseed 03	98	99	00	01
sg61ug	0	1	mean	2	3	2	2	0	0	2	1	0	0
sg61ug	0	1	std dev	1	1	2	1	0	0	2	1	0	1
sg63ug	0	0	mean	3	3	1	1	0	0	0	0	0	0
sg63ug	0	0	std dev	2	3	1	2	0	1	0	0	0	0
sg68ug	0	0	mean	0	0	0	0	0	0	1	3	0	2
sg68ug	0	0	std dev	0	0	0	0	0	0	2	7	0	6
sg69ug	0	0	mean		4	1	0	0	3		0	0	0
sg69ug	0	0	std dev		2	1	0	0	2		0	0	0
sg74ug	0	0	mean		5	3	3	1	1		0	0	0
sg74ug	0	0	std dev		2	2	2	0	1		1	0	0
sg80ug	0	1	mean				2	0	0				10
sg80ug	0	1	std dev				4	0	0				6
sg81ug	0	1	mean				1	0	0				0
sg81ug	0	1	std dev				1	0	0				0
sg64g	1	0	mean		0	0	0	0	0		0	0	0
sg64g	1	0	std dev		0	0	0	0	0		0	0	0
sg65g	1	0	mean		0	0	0	0	0		0	0	0
sg65g	1	0	std dev		0	0	0	0	0		0	0	0
sg67g	1	0	mean	0	0	0	0	0	1	0	0	0	0
sg67g	1	0	std dev	0	1	1	1	0	1	0	0	0	0
sg70g	1	1	mean	2	3	3	3	1	1	0	0	0	0
sg70g	1	1	std dev	1	4	1	1	1	1	0	0	0	0
sg77g	1	1	mean	0	0	0	0	0	0	0	0	0	0
sg77g	1	1	std dev	0	0	1	1	0	0	0	0	0	0
sg78g	1	1	mean	1	0	1	1	0	2	0	0	0	0
sg78g	1	1	std dev	0	0	0	1	0	3	0	0	0	0
sg79g	1	0	mean	7	7	5	4	0	4	0	0	0	0
sg79g	1	0	std dev	2	3	4	3	0	3	0	0	0	0

Table C-7. Mean canopy cover (%) and standard deviation in shortgrass prairie for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 32 microplots/plot.

Plot number	Prairie Grazed	Prairie Dogs	Mean Std dev	Kochia		Russian thistle						Bare ground		
				02	03	98	99	00	01	02	03	98	99	00
sg61ug	0	1	mean	0	0	0	3	0	0	0	2	35	18	11
sg61ug	0	1	std dev	0	0	1	2	0	0	0	4	2	1	1
sg63ug	0	0	mean	0	0	0	0	0	0	0	0	38	30	24
sg63ug	0	0	std dev	0	0	0	0	0	0	0	0	5	5	7
sg68ug	0	0	mean	0	0	0	0	0	0	0	0	40	34	29
sg68ug	0	0	std dev	0	0	0	0	0	0	0	0	1	1	1
sg69ug	0	0	mean	0	0	0	0	0	0	0	0	16	13	
sg69ug	0	0	std dev	0	0	0	0	0	0	1	0	2	2	
sg74ug	0	0	mean	0	0	0	0	0	0	0	0	29	27	
sg74ug	0	0	std dev	0	0	0	1	0	0	0	0	1	1	
sg80ug	0	1	mean	0	6	0	0	0	0	0	0			
sg80ug	0	1	std dev	0	4	0	0	0	1	0	0			
sg81ug	0	1	mean	0	1	0	0	1	2	0	0			
sg81ug	0	1	std dev	0	2	0	0	1	2	0	0			
sg64g	1	0	mean	0	0	0	0	0	0	0	0	39	35	
sg64g	1	0	std dev	0	0	0	0	0	0	1	0	2	2	
sg65g	1	0	mean	0	0	0	0	0	0	0	0	49	50	
sg65g	1	0	std dev	0	0	0	0	0	0	0	0	2	2	
sg67g	1	0	mean	0	0	0	0	0	0	0	0	53	38	33
sg67g	1	0	std dev	0	0	0	0	0	0	0	0	2	3	4
sg70g	1	1	mean	0	0	0	4	1	0	0	0	57	40	35
sg70g	1	1	std dev	0	0	0	7	2	0	0	0	3	3	3
sg77g	1	1	mean	0	0	0	0	0	0	0	0	51	45	37
sg77g	1	1	std dev	0	0	0	0	0	0	0	1	1	4	4
sg78g	1	1	mean	0	0	0	0	0	0	0	0	49	28	41
sg78g	1	1	std dev	0	0	0	0	0	0	0	0	3	1	1
sg79g	1	0	mean	0	0	0	0	0	1	0	0	67	53	47
sg79g	1	0	std dev	0	0	0	0	1	2	0	0	1	3	2

Table C-7. Mean canopy cover (%) and standard deviation in shortgrass prairie for 1998-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 32 microplots/plot.

Plot number	Prairie Grazed	Prairie Dogs	Mean Std dev	Bare	Bare	Bare	Litter	Litter	Litter	Litter	Litter	Litter
				ground 01	ground 02	ground 03	98	99	00	01	02	03
sg61ug	0	1	mean	12	21	25	19	22	54	39	79	57
sg61ug	0	1	std dev	3	5	2	1	2	1	1	5	6
sg63ug	0	0	mean	27	31	37	23	24	65	42	68	54
sg63ug	0	0	std dev	3	2	5	2	1	5	2	2	4
sg68ug	0	0	mean	25	24	30	12	14	23	28	74	46
sg68ug	0	0	std dev	2	1	4	2	1	4	1	1	2
sg69ug	0	0	mean	15	17	19		19	59	53	82	63
sg69ug	0	0	std dev	1	3	2		2	4	2	3	2
sg74ug	0	0	mean	30	31	31		22	36	30	54	41
sg74ug	0	0	std dev	2	1	1		2	2	1	2	2
sg80ug	0	1	mean	19	39	23				51	45	37
sg80ug	0	1	std dev	6	13	9				8	11	8
sg81ug	0	1	mean	23	53	33				41	43	53
sg81ug	0	1	std dev	7	7	8				4	8	6
sg64g	1	0	mean	35	34	40		12	42	32	64	27
sg64g	1	0	std dev	2	3	2		1	3	1	3	2
sg65g	1	0	mean	62	59	49		9	38	8	38	22
sg65g	1	0	std dev	4	3	1		4	3	1	3	3
sg67g	1	0	mean	34	40	38	7	11	26	26	59	0
sg67g	1	0	std dev	3	3	3	1	1	1	1	3	0
sg70g	1	1	mean	31	63	45	2	10	23	24	32	44
sg70g	1	1	std dev	2	3	2	2	3	3	2	3	3
sg77g	1	1	mean	40	50	52	12	11	27	23	50	26
sg77g	1	1	std dev	3	3	2	1	1	2	1	3	1
sg78g	1	1	mean	39	27	35	11	20	24	21	71	40
sg78g	1	1	std dev	2	3	2	0	2	2	2	2	2
sg79g	1	0	mean	46	39	49	1	13	19	19	58	25
sg79g	1	0	std dev	2	1	2	1	3	3	2	1	1

Table C-8. Frequency (%) and standard deviation in shortgrass prairie for 1999-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 100/plot.

<i>Plot number</i>	<i>Grazed</i>	<i>Prairie Dogs</i>	<i>Frequency plot size</i>	<i>Prickly pear 99</i>	<i>Prickly pear 00</i>	<i>Prickly pear 01</i>	<i>Prickly pear 02</i>	<i>Prickly pear 03</i>	<i>Three-awn 99</i>	<i>Three-awn 00</i>	<i>Three-awn 01</i>	<i>Three-awn 02</i>	<i>Three-awn 03</i>	<i>Blue grama 99</i>	<i>Blue grama 00</i>
sg61ug	0	1	.3 m x .3 m	0	0	0	0	0	68	75	78	71	24	58	68
sg61ug	0	1	1 m x 1 m	1	0	1	0	0	99	97	98	98	63	92	94
sg63ug	0	0	.3 m x .3 m	24	24	22	21	21	10	7	4	4	0	16	13
sg63ug	0	0	1 m x 1 m	65	66	60	61	57	29	30	28	27	1	35	34
sg68ug	0	0	.3 m x .3 m	11	13	12	14	13	4	6	4	4	2	93	94
sg68ug	0	0	1 m x 1 m	59	57	51	56	53	9	11	9	11	7	99	99
sg69ug	0	0	.3 m x .3 m	22	23	23	20	20	19	20	20	19	2	88	90
sg69ug	0	0	1 m x 1 m	77	72	67	67	67	40	47	42	41	11	96	95
sg74ug	0	0	.3 m x .3 m	4	4	6	7	7	53	60	53	55	29	78	80
sg74ug	0	0	1 m x 1 m	33	32	32	31	32	97	98	96	96	65	97	96
sg80ug	0	1	.3 m x .3 m	0	0	0	0	0	0	0	45	25	9	0	0
sg80ug	0	1	1 m x 1 m	0	0	1	1	0	0	0	81	56	46	0	0
sg81ug	0	1	.3 m x .3 m	0	0	0	0	0	0	0	52	49	41	0	0
sg81ug	0	1	1 m x 1 m	0	0	0	0	0	0	0	86	88	77	0	0
sg64g	1	0	.3 m x .3 m	9	7	6	5	7	2	2	1	1	0	69	66
sg64g	1	0	1 m x 1 m	39	39	35	35	34	10	5	3	3	0	92	92
sg65g	1	0	.3 m x .3 m	6	7	7	7	12	0	0	0	0	0	43	44
sg65g	1	0	1 m x 1 m	48	43	46	45	41	1	0	0	0	0	67	66
sg67g	1	0	.3 m x .3 m	25	21	23	26	25	4	3	3	4	3	96	96
sg67g	1	0	1 m x 1 m	80	75	83	82	83	7	9	12	11	5	100	100
sg70g	1	1	.3 m x .3 m	1	1	2	0	0	51	48	45	24	14	64	74
sg70g	1	1	1 m x 1 m	6	5	5	4	4	84	85	81	46	24	88	89
sg77g	1	1	.3 m x .3 m	6	3	3	1	0	10	10	10	8	3	96	97
sg77g	1	1	1 m x 1 m	15	16	11	4	3	50	52	53	48	26	100	100
sg78g	1	1	.3 m x .3 m	1	2	4	3	3	75	84	84	84	15	84	92
sg78g	1	1	1 m x 1 m	6	8	9	9	8	89	99	99	99	31	100	100
sg79g	1	0	.3 m x .3 m	3	2	1	2	2	6	4	3	6	3	56	55
sg79g	1	0	1 m x 1 m	20	21	17	23	22	33	34	28	25	14	84	84



Table C-8. Frequency (%) and standard deviation in shortgrass prairie for 1999-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 100/plot.

Plot number	Grazed	Prairie Dogs	Frequency plot size	Blue grama	Blue grama	Blue grama	Galleta grass	Galleta grass	Galleta grass	Galleta grass	Galleta grass	Alkali sacaton	Alkali sacaton	Alkali sacaton
				01	02	03	99	00	01	02	03	99	00	01
sg61ug	0	1	.3 m x .3 m	69	57	63	0	0	0	0	0	0	0	0
sg61ug	0	1	1 m x 1 m	93	87	95	2	2	2	0	1	0	0	0
sg63ug	0	0	.3 m x .3 m	11	11	9	95	98	96	99	90	3	3	3
sg63ug	0	0	1 m x 1 m	33	30	32	100	100	97	100	98	7	6	6
sg68ug	0	0	.3 m x .3 m	93	91	89	23	26	26	27	27	0	0	0
sg68ug	0	0	1 m x 1 m	98	97	99	46	51	46	50	52	0	0	0
sg69ug	0	0	.3 m x .3 m	90	89	58	0	0	0	0	0	0	0	0
sg69ug	0	0	1 m x 1 m	96	97	95	0	0	0	0	0	0	0	0
sg74ug	0	0	.3 m x .3 m	81	79	89	0	0	0	0	0	0	0	0
sg74ug	0	0	1 m x 1 m	95	94	100	0	0	0	0	0	0	0	0
sg80ug	0	1	.3 m x .3 m	3	2	5	0	0	0	0	0	0	0	0
sg80ug	0	1	1 m x 1 m	9	3	24	0	0	0	0	0	0	0	0
sg81ug	0	1	.3 m x .3 m	60	52	49	0	0	4	2	3	0	0	0
sg81ug	0	1	1 m x 1 m	75	74	72	0	0	6	5	4	0	0	0
sg64g	1	0	.3 m x .3 m	66	60	53	43	44	45	52	61	29	36	33
sg64g	1	0	1 m x 1 m	91	89	85	80	74	70	71	77	50	61	55
sg65g	1	0	.3 m x .3 m	48	49	23	6	8	9	9	11	58	64	71
sg65g	1	0	1 m x 1 m	69	70	39	12	12	15	14	15	87	90	91
sg67g	1	0	.3 m x .3 m	96	94	57	5	6	6	7	4	15	16	13
sg67g	1	0	1 m x 1 m	100	100	82	17	17	17	16	15	27	30	27
sg70g	1	1	.3 m x .3 m	74	69	73	8	12	12	10	12	0	0	0
sg70g	1	1	1 m x 1 m	94	91	93	15	16	16	13	16	0	1	1
sg77g	1	1	.3 m x .3 m	98	61	89	8	10	9	8	6	0	0	0
sg77g	1	1	1 m x 1 m	100	76	100	17	16	15	15	13	3	1	0
sg78g	1	1	.3 m x .3 m	91	93	84	7	7	9	9	13	3	0	0
sg78g	1	1	1 m x 1 m	100	100	100	17	17	16	16	19	3	0	0
sg79g	1	0	.3 m x .3 m	57	59	47	6	7	7	7	6	28	28	25
sg79g	1	0	1 m x 1 m	82	81	72	15	17	18	16	17	47	47	47

Table C-8. Frequency (%) and standard deviation in shortgrass prairie for 1999-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 100/plot.

Plot number	Prairie Grazed	Prairie Dogs	Frequency plot size	Alkali	Alkali	Sand	Sand	Sand	Sand	Sand	Kochia	Kochia	Kochia
				sacaton 02	sacaton 03	dropseed 99	dropseed 00	dropseed 01	dropseed 02	dropseed 03	99	00	01
sg61ug	0	1	.3 m x .3 m	0	0	11	23	17	11	7	20	5	9
sg61ug	0	1	1 m x 1 m	0	0	57	70	66	60	23	58	16	23
sg63ug	0	0	.3 m x .3 m	3	3	11	12	11	7	0	1	0	0
sg63ug	0	0	1 m x 1 m	5	5	25	27	24	15	1	2	0	0
sg68ug	0	0	.3 m x .3 m	0	0	3	1	3	1	2	4	0	2
sg68ug	0	0	1 m x 1 m	0	0	12	12	12	8	9	5	0	3
sg69ug	0	0	.3 m x .3 m	0	0	18	21	17	9	41	5	2	0
sg69ug	0	0	1 m x 1 m	0	0	48	49	41	25	77	12	7	3
sg74ug	0	0	.3 m x .3 m	0	0	44	45	55	45	24	1	0	1
sg74ug	0	0	1 m x 1 m	0	0	83	85	93	89	63	6	1	2
sg80ug	0	1	.3 m x .3 m	0	0	0	0	14	0	0	0	0	84
sg80ug	0	1	1 m x 1 m	0	0	0	0	31	1	4	0	0	97
sg81ug	0	1	.3 m x .3 m	0	0	0	0	36	3	2	0	0	0
sg81ug	0	1	1 m x 1 m	0	0	0	0	71	24	27	0	0	0
sg64g	1	0	.3 m x .3 m	37	35	1	1	0	0	0	0	0	0
sg64g	1	0	1 m x 1 m	62	65	7	9	6	5	2	0	0	0
sg65g	1	0	.3 m x .3 m	72	51	0	1	0	0	1	0	0	0
sg65g	1	0	1 m x 1 m	95	86	3	2	1	1	2	0	0	0
sg67g	1	0	.3 m x .3 m	13	13	4	6	5	4	1	0	0	0
sg67g	1	0	1 m x 1 m	24	24	14	17	15	13	5	1	0	0
sg70g	1	1	.3 m x .3 m	0	0	21	48	50	28	24	0	0	0
sg70g	1	1	1 m x 1 m	1	0	63	88	88	80	54	1	0	0
sg77g	1	1	.3 m x .3 m	0	0	1	1	1	0	0	0	0	0
sg77g	1	1	1 m x 1 m	0	0	1	4	2	0	0	1	0	0
sg78g	1	1	.3 m x .3 m	0	0	16	45	45	41	18	0	0	0
sg78g	1	1	1 m x 1 m	0	0	30	75	76	75	38	1	0	0
sg79g	1	0	.3 m x .3 m	22	18	56	60	56	39	19	0	0	0
sg79g	1	0	1 m x 1 m	48	43	82	85	83	83	52	0	0	0

Table C-8. Frequency (%) and standard deviation in shortgrass prairie for 1999-2003.

Grazed: 0 = Ungrazed since 1942, 1 = Grazed until 1998. Prairie dogs: 0 = prairie dogs absent, 1 = prairie dogs present. Sample size is 100/plot.

Plot number	Prairie Dogs		Frequency plot size	Russian thistle						
	Grazed	Dogs		Kochia 02	Kochia 03	99	00	01	02	03
sg61ug	0	1	.3 m x .3 m	0	0	25	4	2	0	2
sg61ug	0	1	1 m x 1 m	0	0	72	11	10	0	10
sg63ug	0	0	.3 m x .3 m	0	0	1	0	0	0	0
sg63ug	0	0	1 m x 1 m	0	0	2	0	2	0	0
sg68ug	0	0	.3 m x .3 m	0	0	3	0	0	0	0
sg68ug	0	0	1 m x 1 m	1	0	9	1	2	0	3
sg69ug	0	0	.3 m x .3 m	0	0	6	1	1	0	3
sg69ug	0	0	1 m x 1 m	0	0	22	4	4	0	13
sg74ug	0	0	.3 m x .3 m	0	0	2	1	1	0	2
sg74ug	0	0	1 m x 1 m	0	0	15	5	14	0	6
sg80ug	0	1	.3 m x .3 m	64	34	0	0	12	1	3
sg80ug	0	1	1 m x 1 m	95	76	0	0	28	1	18
sg81ug	0	1	.3 m x .3 m	0	7	0	0	13	9	4
sg81ug	0	1	1 m x 1 m	0	42	0	0	56	33	37
sg64g	1	0	.3 m x .3 m	0	0	0	0	0	0	1
sg64g	1	0	1 m x 1 m	0	0	2	0	0	0	2
sg65g	1	0	.3 m x .3 m	0	0	1	0	0	0	0
sg65g	1	0	1 m x 1 m	0	1	7	0	0	0	1
sg67g	1	0	.3 m x .3 m	0	0	0	0	0	0	0
sg67g	1	0	1 m x 1 m	0	0	4	0	0	0	2
sg70g	1	1	.3 m x .3 m	0	0	6	12	5	0	1
sg70g	1	1	1 m x 1 m	0	0	28	19	12	0	4
sg77g	1	1	.3 m x .3 m	0	0	1	0	0	0	3
sg77g	1	1	1 m x 1 m	0	0	2	2	0	0	25
sg78g	1	1	.3 m x .3 m	0	0	1	9	5	0	2
sg78g	1	1	1 m x 1 m	0	0	9	28	13	1	3
sg79g	1	0	.3 m x .3 m	0	0	0	1	2	0	0
sg79g	1	0	1 m x 1 m	0	0	3	5	7	1	4