

Study



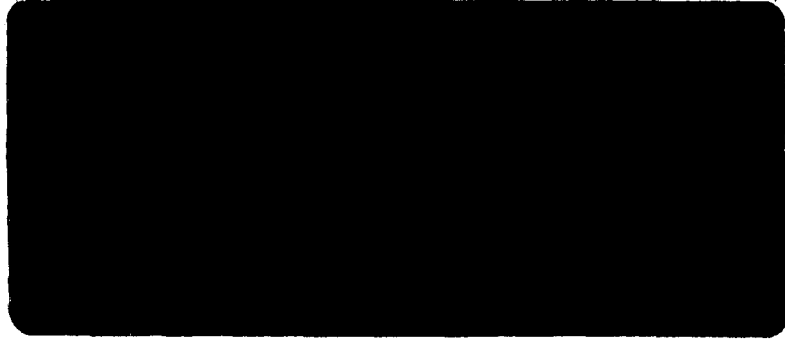
ESCO Associates

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Report of Findings

Diffuse Knapweed Control Studies -
Tordon Spray Application
Boulder City and County Open Space
1996 Data

Prepared for:

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INTRODUCTION

Studies reported here were undertaken in April 1996 with the intent of documenting effects of a planned application of Tordon herbicide to approximately 800 acres of land infested by diffuse knapweed (*Acosta diffusa*). Objectives were 1) assessment of the extent of knapweed before and after spraying and 2) assessment of the impact of the herbicide on other broadleaf plant species, especially the native species.

This document is a data report of 1996 results. No interpretation or discussion of results is included.

METHODS

Sample Location

Samples were located subjectively with consideration of incorporating the variability of each site. Sites S-1 and S-2 were within the sprayed area on the upland west of Coalton Road (see Map 1). Site S-3 was on a mid-slope area and site S-4 was placed in a swale area on deeper soils. Control sample C-1 was placed on an upland exposed site similar to spray sites S-1 and S-2. Control sample C-2 was more comparable to the less exposed sites of spray samples S-3 and S-4. Sample locations are shown on Map 1. At each sample location, the end points of the sample transect were marked with a rebar stake driven flush with the ground (for subsequent use with a metal detector) and a Carsonite flat fiberglass post.

Cover

The point intercept method of cover assessment was chosen because it provides superior objectivity and repeatability; the inherent tendency to collect the most information on the more abundant species has been countered through use of a total vascular species inventory along the sample transect (see below). In addition, frequency plot data have been collected in one late summer and one spring sampling to provide further details of the abundance of less common species.

Point intercept cover sampling was developed early in the history of plant ecology (Levy and Madden 1933), and translated into varying forms by

subsequent researchers (Goodall 1952, Winkworth and Goodall 1962).

Cover data were tabulated as interceptions of a point with plant species, soil, standing dead plant material (produced in a previous year), litter (fallen dead plant material), or rock. Plant material produced during the sample year and still standing was tallied by species. The point was optically projected using a Cover-Point Model 5 Optical Point Projector. The sample was taken at a randomly located and randomly oriented 50 m transect and consisted of a total of 100 projected points per transect. Permanent marking of the endpoints was accomplished as described above.

Frequency

Frequency data were collected in each of ten 1m x 5m plots located along each 50m transect, to the right side of the transect as viewed from the origin. In each plot, all species present were tallied. For each species, the number of plots in which the plant was observed was divided by the number of plots observed (10). Thus, for example, if Species A occurred in seven plots, its frequency for the transect is 7/10, or 70 percent. In addition, all species present within 1 meter to either side of the 50 meter sample transect were tallied and a value of species density expressed as number of species per 100 square meters calculated.

Density

In order to better assess the population dynamics of knapweed, the sample transects were revisited in October 1996 and the density of rosette-stage and bolted knapweed within each of the ten 1m x 1m frequency plots determined by direct count.

Sampling Dates

Sampling of the treatment areas was begun in April 1996, shortly before the Tordon was to be applied. Inasmuch as it was desirable to be able to compare the extent of fully developed plant cover before spraying to observations to be made later in 1996, the April 1996 sampling separately assessed the extent of living plant cover at the time plus the extent of standing dead material produced in 1995. Taken together, these two measures were to approximate the extent of vegetation cover that would be comparable to the August 1996 measurements that were planned after

spraying had occurred.

RESULTS

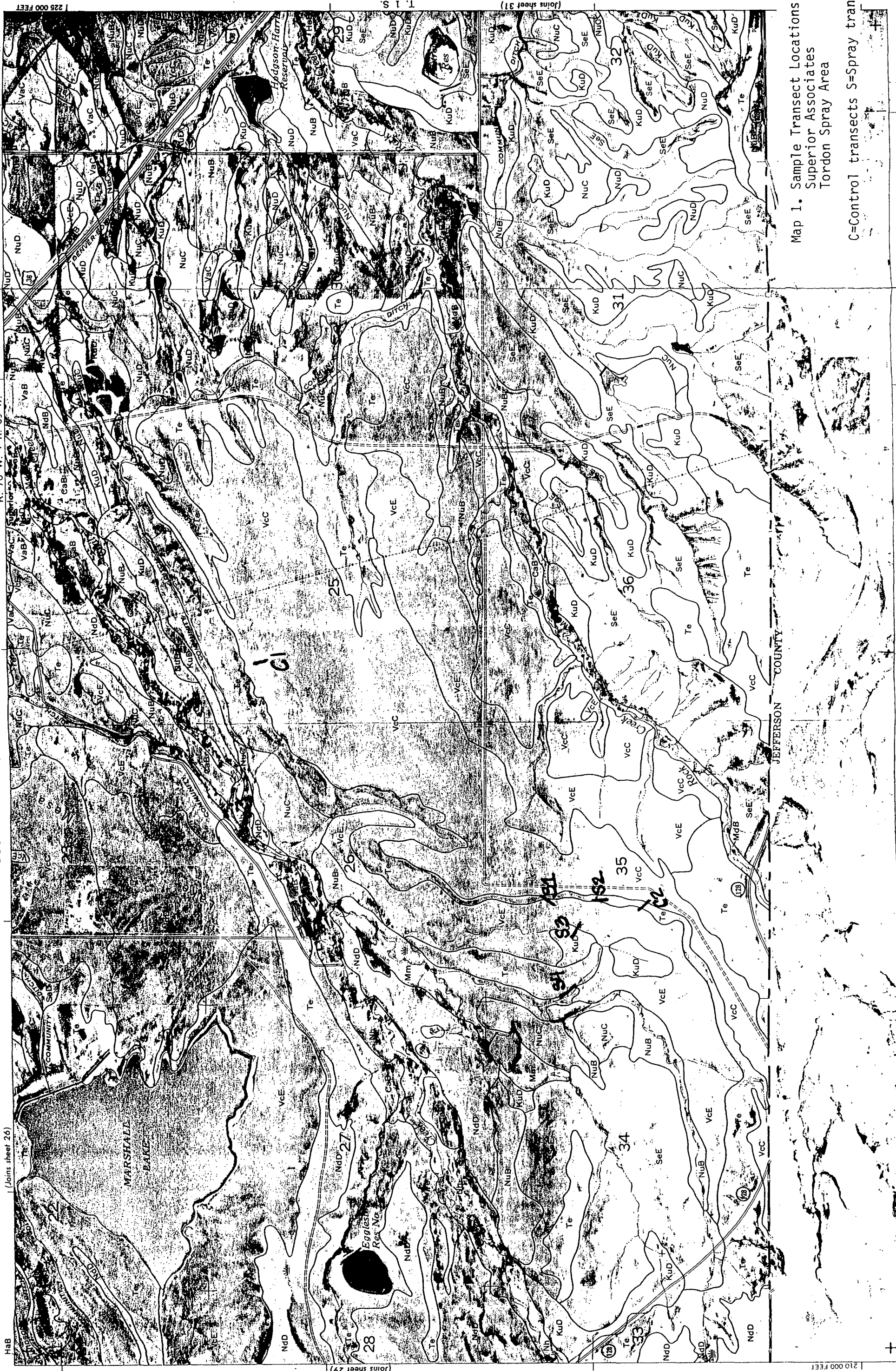
Tabulated results are present in Tables 1a through 17. Cover data from the April 1996 (pre-spray) observations of control transects are present in Tables 1a and 1b. Pre-spray cover data from sprayed area transects are present in Table 2. 1996 post spray (August) cover data from control transects are present in Tables 3a and 3b, while sprayed area cover data are located in Table 4. Frequency data from pre-spray (April) observations are found in Tables 5 and 6 for control area transects and Tables 7 through 10 for sprayed area transects. Frequency data from post-spray (August) observations are found in Tables 11 and 12 for control area transects and Tables 13 through 16 for sprayed area transects. October 1996 knapweed density data are present in Table 17 and illustrated in Figure 2. Knapweed cover and frequency results for 1996 are graphically illustrated in Figure 1. Relative cover by lifeform is depicted in Figure 3 and species density by lifeform is similarly depicted in Figure 4.

BOULDER AREA, COLORADO — SHEET NUMBER 30 R. 70 W. | R. 69 W.

225 000 FEET

210 000 FEET

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



Map 1. Sample Transect Locations
 Superior Associates
 Tordon Spray Area

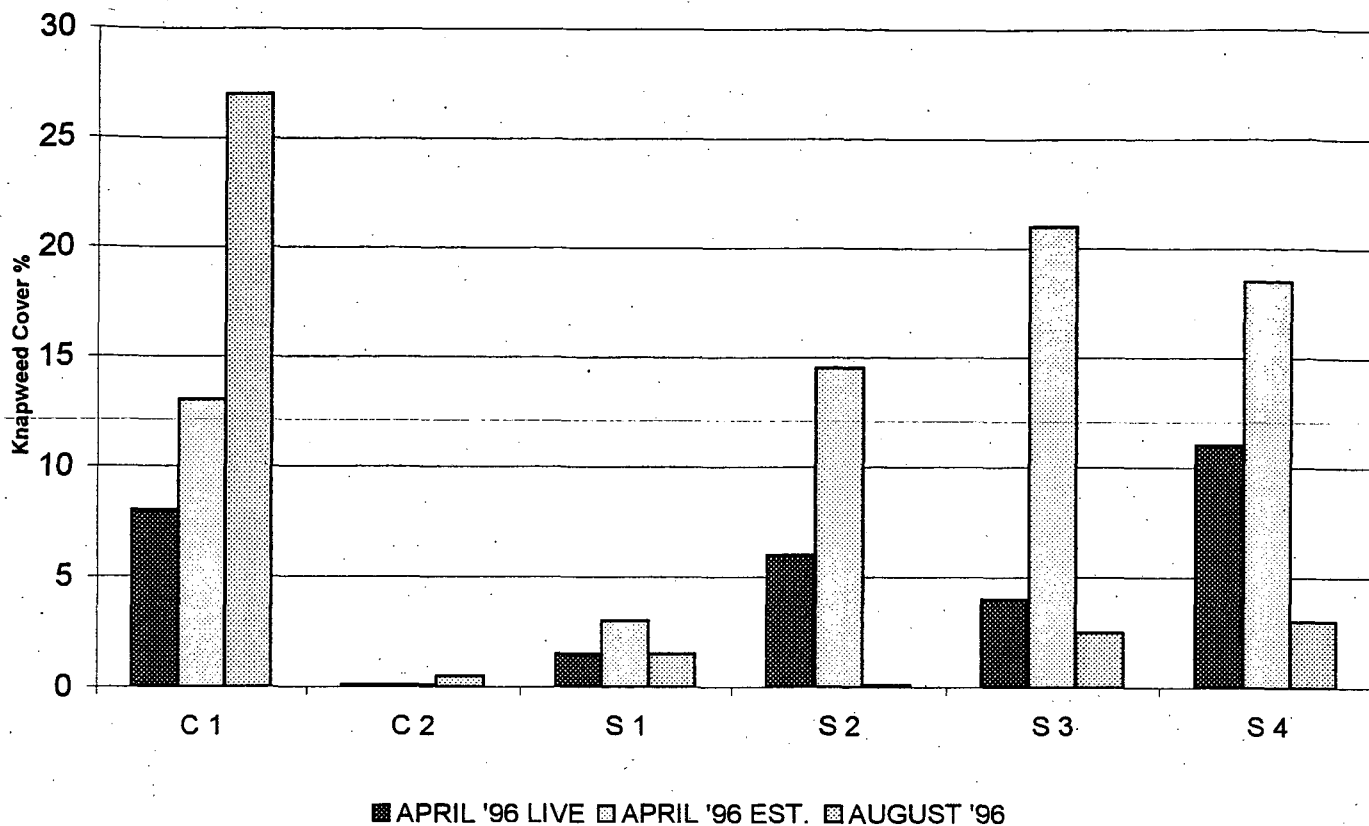
C=Control transects S=Spray transects

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the Colorado Agricultural Experiment Station. Land division corners are approximately positioned on this map. Photographs from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Colorado coordinate system, north zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the Colorado Agricultural Experiment Station.

Figure 1. Knapweed Cover and Frequency Results - Pre- and Post-Spray 1996
Acosta diffusa Tordon Study - Boulder City Open Space, CO.

Pre- and Post-Spray Cover - 1996.



Pre- and Post-Spray Frequency - 1996.

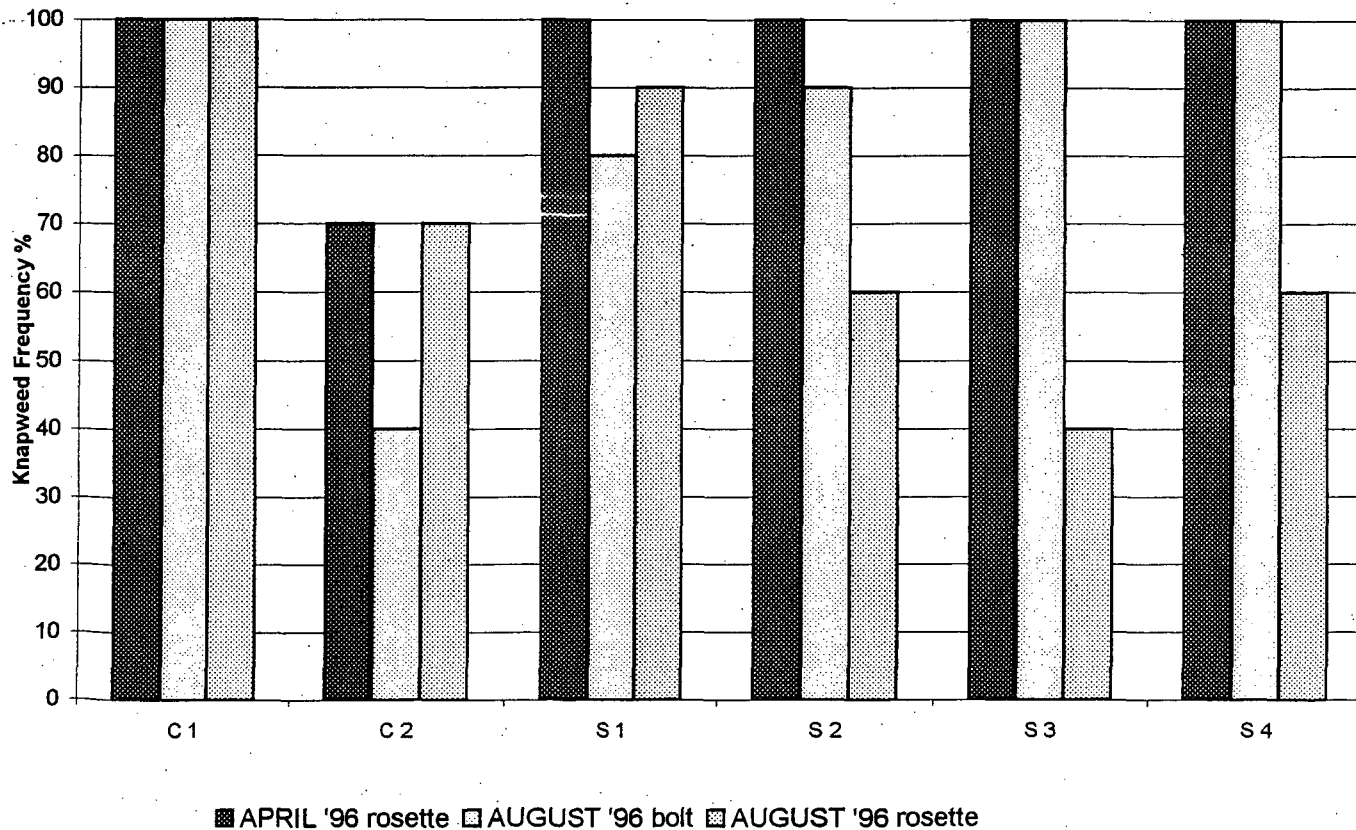


Figure 2. Knapweed Density - Post-Spray - Oct., '96.
Acosta diffusa Density Count - Boulder City Open Space, CO

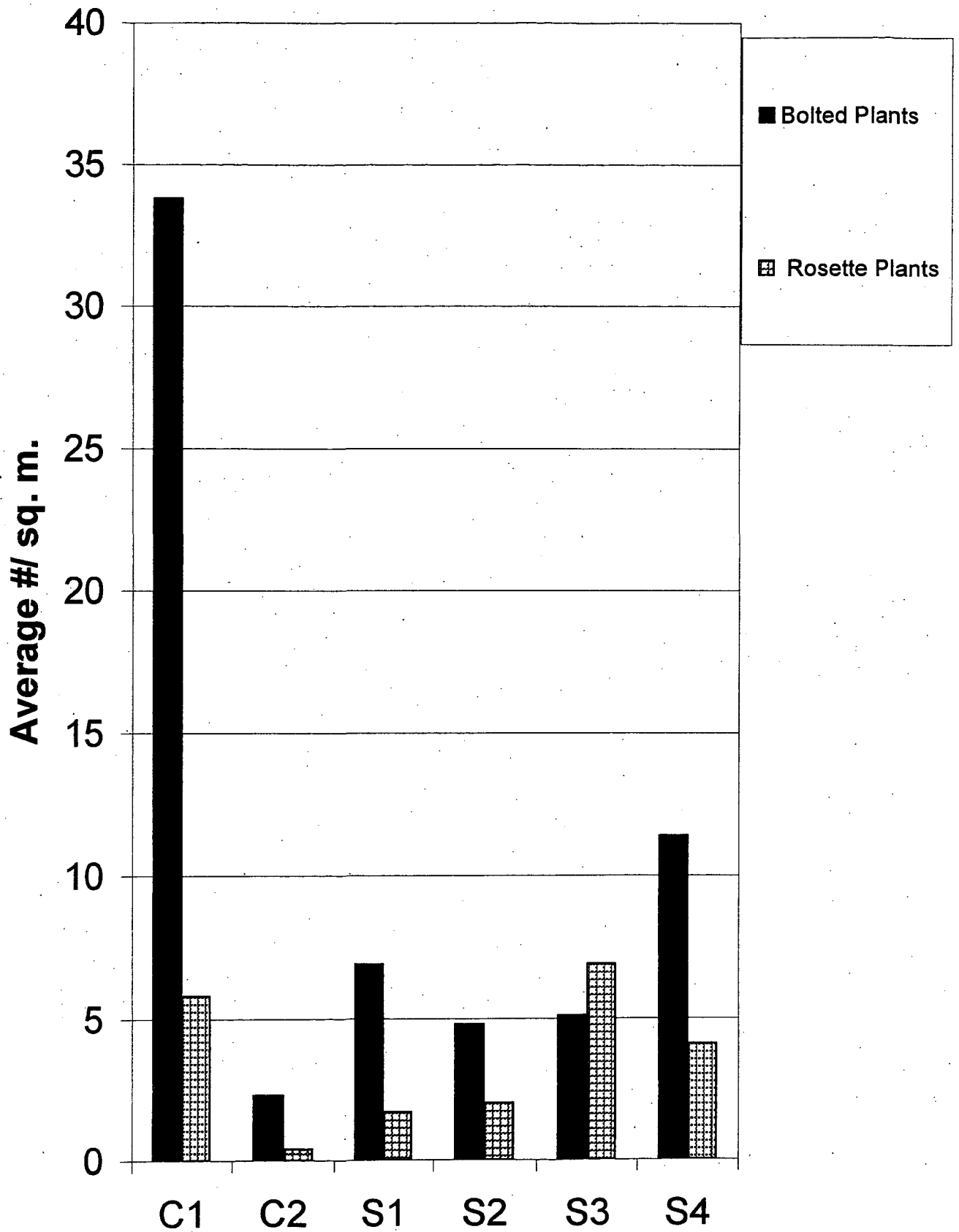


Figure 4. Species Density by Lifeform
 Tordon Pre-and Post-Spray Study, Boulder City Open Space
 April & August 1996

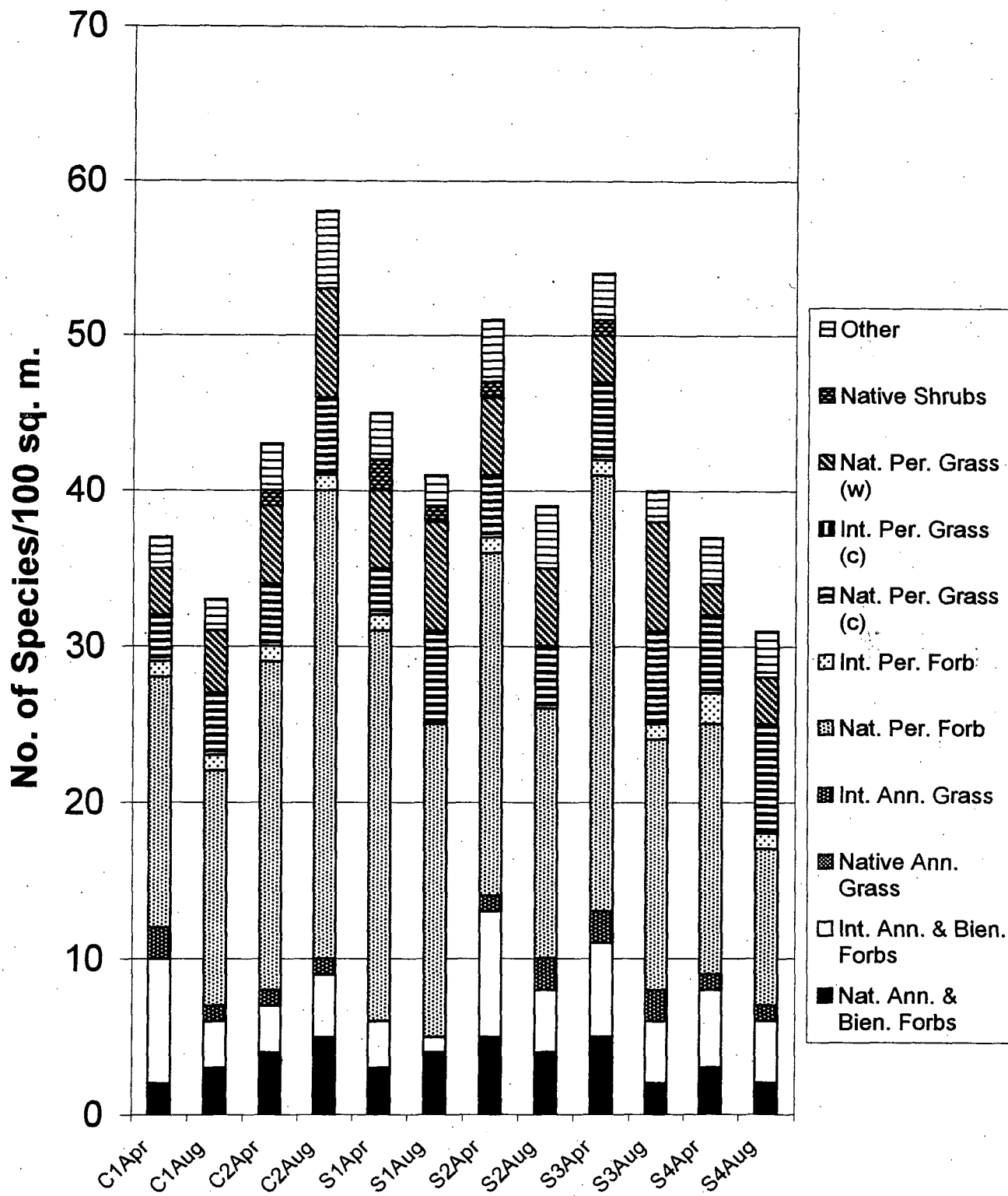


Table 1a. Cover Data – Control Area, Transect 1, Tordon Pre–Spray Study, Bldr City Open Space, CO – April 1996 Page 1 of 2

PLANT SPECIES	COVER (%)	RELATIVE VEGETATION COVER (%)	RELATIVE VEGETATION COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover* – SAMPLE NUMBER – C-1
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Grindelia squarrosa</i>	0.00	0.00	0.00	0.00	P
<i>Plantago patagonica</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE ANN. & BIEN. FORBS	0.0	0.0	0.0	0.0	P
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	8.00	12.31	10.50	15.22	8.0(2.5)
<i>Acosta diffusa (dead)</i>	5.00	7.69	5.00	7.25	[5.0]
<i>Acosta diffusa (TOTAL ESTIMATE)</i>	13.00	20.00	15.50	22.47	13.0(2.5)
<i>Alyssum minus</i>	7.50	11.54	8.50	12.32	7.5(1.0)
<i>Camelina microcarpa</i>	0.00	0.00	0.00	0.00	P
<i>Carduus nutans ssp. macrolepis</i>	0.00	0.00	0.00	0.00	P
<i>Erodium cicutarium</i>	1.00	1.54	1.00	1.45	1.0
<i>Podospermum laciniatum</i>	0.00	0.00	0.00	0.00	P
<i>Tragopogon dubius ssp. major</i>	1.50	2.31	1.50	2.17	1.5
<i>Verbascum blattaria</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. ANN. & BIEN. FORBS	23.0	35.4	26.5	38.4	23.0(3.5)
INTRODUCED ANNUAL GRASSES					
<i>Anisantha tectorum</i>	6.50	10.00	6.50	9.42	6.5
<i>Anisantha tectorum (dead)</i>	10.00	15.38	10.50	15.22	[10.0](0.5)
<i>Bromus japonicus</i>	0.00	0.00	0.00	0.00	P
<i>Bromus japonicus (dead)</i>	0.50	0.77	0.50	0.72	[0.5]
TOTAL INTRO. ANN. GRASSES	17.0	26.2	17.5	25.4	17.0(0.5)
NATIVE PERENNIAL FORBS					
<i>Allium textile</i>	0.00	0.00	0.00	0.00	P
<i>Ambrosia psilostachya var. coronopifolia</i>	0.00	0.00	0.00	0.00	P
<i>Artemisia frigida</i>	0.00	0.00	0.00	0.00	P
<i>Aster porteri</i>	0.50	0.77	0.50	0.72	0.5
<i>Astragalus adsurgens var. robustior</i>	0.50	0.77	0.50	0.72	0.5
<i>Astragalus drummondii</i>	0.00	0.00	0.00	0.00	P
<i>Drymocallis fissa</i>	0.00	0.00	0.00	0.00	P
<i>Gutierrezia sarothrae</i>	0.00	0.00	0.00	0.00	P
<i>Heterotheca villosa</i>	1.00	1.54	1.00	1.45	1.0
<i>Lesquerella montana</i>	0.50	0.77	0.50	0.72	0.5
<i>Leucocrinum montanum</i>	0.00	0.00	0.00	0.00	P
<i>Liatris punctata</i>	0.00	0.00	0.00	0.00	P
<i>Lomatium orientale</i>	1.50	2.31	1.50	2.17	1.5
<i>Sphaeralcea coccinea</i>	0.00	0.00	0.00	0.00	P
Unknown composite	0.00	0.00	0.00	0.00	P
<i>Virgulus falcatus</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE PERENNIAL FORBS	4.0	6.2	4.0	5.8	4.0
INTRODUCED PERENNIAL FORBS					
<i>Taraxacum officinale</i>	0.50	0.77	0.50	0.72	0.5
TOTAL INTRO. PERENNIAL FORBS	0.5	0.8	0.5	0.7	0.5
NATIVE PERENNIAL GRASSES (cool)					
<i>Pascopyrum smithii</i>	0.50	0.77	0.50	0.72	0.5
<i>Pascopyrum smithii (dead)</i>	6.50	10.00	6.50	9.42	[6.5]
<i>Poa compressa</i>	0.00	0.00	0.00	0.00	P
<i>Poa secunda</i>	0.50	0.77	0.50	0.72	0.5
TOTAL NATIVE PERENNIAL GRASSES (c)	7.5	11.5	7.5	10.9	7.5
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	0.50	0.77	0.50	0.72	0.5
<i>Andropogon gerardii (dead)</i>	1.00	1.54	1.00	1.45	[1.0]
<i>Aristida purpurea</i>	0.00	0.00	0.00	0.00	P
<i>Chondrosum gracile</i>	0.50	0.77	0.50	0.72	0.5
<i>Chondrosum gracile (dead)</i>	11.00	16.92	11.00	15.94	[11.0]
TOTAL NATIVE PERENNIAL GRASSES (w)	13.0	20.0	13.0	18.8	13.0

Table 1a. Cover Data – Control Area, Transect 1, Tordon Pre–Spray Study, Bldr City Open Space, CO – April 1996 Page 2 of 2

PLANT SPECIES	COVER (%)	RELATIVE VEGETATION COVER (%)	COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover* – SAMPLE NUMBER – C-1
SUCCULENT					
Opuntia macrorhiza	0.00	0.00	0.00	0.00	P
Pediocactus simpsonii	0.00	0.00	0.00	0.00	P
TOTAL SUCCULENT	0.0	0.0	0.0	0.0	P
Standing dead	1.00		1.00		1.0
Litter	25.50		25.50		25.5
Bare soil	8.50		8.50		8.5
TOTALS	100.0		104.0		100
TOTAL VEGETATION COVER	65.0	100.0	69.0	100.0	65.0(4.0)
GROUND COVER (Litter+Rock+Veg+St.Dead)	91.5		95.5		92(4)
SPECIES DENSITY (# of species/100 sq.m.)					37

*P=Present within 1 m. on either side of the cover transect, but not quantitatively encountered.

Table 1b. Cover Data – Control Area, Transect 2, Tordon Pre-Spray Study, Bldr City Open Space, CO – April 1996 Page 1 of 2

PLANT SPECIES	RELATIVE VEGETATION COVER		RELATIVE VEGETATION COVER-ALL		Percent Foliar Cover*
	COVER (%)	COVER (%)	COVER-ALL (%)	COVER-ALL (%)	- SAMPLE NUMBER - C-2
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Grindelia squarrosa</i>	0.00	0.00	0.00	0.00	P
<i>Oligosporus pacificus</i>	0.00	0.00	0.00	0.00	P
<i>Plantago patagonica</i>	0.00	0.00	0.00	0.00	P
<i>Pterogonum alatum</i>	0.00	0.00	0.00	0.00	P
<i>Pterogonum alatum (dead)</i>	0.50	1.10	0.50	1.04	[0.5]
TOTAL NATIVE ANN. & BIEN. FORBS	0.5	1.1	0.5	1.0	0.5
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	0.00	0.00	0.00	0.00	P
<i>Alyssum minus</i>	0.00	0.00	0.00	0.00	P
<i>Tragopogon dubius ssp. major</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. ANN. & BIEN. FORBS	0.0	0.0	0.0	0.0	P
INTRODUCED ANNUAL GRASSES					
<i>Anisantha tectorum (dead)</i>	0.50	1.10	1.00	2.08	0.5
<i>Bromus japonicus</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. ANN. GRASSES	0.5	1.1	1.0	2.1	0.5(0.5)
NATIVE PERENNIAL FORBS					
<i>Artemisia frigida</i>	0.00	0.00	0.00	0.00	P
<i>Artemisia ludoviciana</i>	0.50	1.10	0.50	1.04	0.5
<i>Aster porteri</i>	0.00	0.00	0.00	0.00	P
<i>Castilleja sessiliflora</i>	0.50	1.10	0.50	1.04	0.5
<i>Gutierrezia sarothrae</i>	0.00	0.00	0.00	0.00	P
<i>Helianthus rigidus ssp. subrhomboides</i>	0.00	0.00	0.00	0.00	P
<i>Heterotheca villosa</i>	4.00	8.79	4.00	8.33	4.0
<i>Heterotheca villosa (dead)</i>	2.00	4.40	2.00	4.17	[2.0]
<i>Ipomopsis aggregata</i>	0.00	0.00	0.00	0.00	P
<i>Lesquerella montana</i>	0.00	0.00	0.00	0.00	P
<i>Leucocrinum montanum</i>	0.00	0.00	0.00	0.00	P
<i>Lithospermum spp.</i>	0.00	0.00	0.00	0.00	P
<i>Lomatium orientale</i>	2.00	4.40	2.00	4.17	2.0
<i>Mertensia lanceolata</i>	0.00	0.00	0.00	0.00	P
<i>Nothocalais cuspidata</i>	0.00	0.00	0.00	0.00	P
<i>Oxytropis x sericea</i>	0.50	1.10	0.50	1.04	0.5
<i>Paronychia jamesii</i>	0.00	0.00	0.00	0.00	P
<i>Penstemon spp.</i>	0.00	0.00	0.00	0.00	P
<i>Tithymalus brachyceras</i>	0.00	0.00	0.00	0.00	P
<i>Townsendia hookeri</i>	0.00	0.00	0.00	0.00	P
<i>Viola nuttallii</i>	0.50	1.10	0.50	1.04	0.5
<i>Virgulus falcatus</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE PERENNIAL FORBS	10.0	22.0	10.0	20.8	10.0
INTRODUCED PERENNIAL FORBS					
<i>Taraxacum officinale</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. PERENNIAL FORBS	0.0	0.0	0.0	0.0	P
NATIVE PERENNIAL GRASSES (cool)					
<i>Carex pensylvanica ssp. heliophila</i>	3.00	6.59	3.00	6.25	3.0
<i>Carex pensylvanica ssp. heliophila (dead)</i>	1.00	2.20	1.00	2.08	[1.0]
<i>Koeleria macrantha</i>	0.00	0.00	0.00	0.00	P
<i>Pascopyrum smithii</i>	2.00	4.40	2.00	4.17	2.0
<i>Pascopyrum smithii (dead)</i>	8.00	17.58	8.00	16.67	[8.0]
<i>Poa agassizensis</i>	4.50	9.89	4.50	9.38	4.5
<i>Poa agassizensis (dead)</i>	0.50	1.10	0.50	1.04	[0.5]
TOTAL NATIVE PERENNIAL GRASSES (c)	19.0	41.8	19.0	39.6	19.0

Table 1b. Cover Data – Control Area, Transect 2, Tordon Pre–Spray Study, Bldr City Open Space, CO – April 1996 Page 2 of 2

PLANT SPECIES	COVER (%)	RELATIVE VEGETATION COVER (%)	COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover* – SAMPLE NUMBER – C-2
NATIVE PERENNIAL GRASSES (warm)					
<i>Aristida purpurea</i>	0.00	0.00	0.00	0.00	P
<i>Aristida purpurea</i> (dead)	2.50	5.49	3.00	6.25	[2.5](0.5)
<i>Bouteloua curtipendula</i>	0.00	0.00	0.00	0.00	P
<i>Buchloe dactyloides</i>	0.00	0.00	0.00	0.00	P
<i>Chondrosium gracile</i>	0.50	1.10	0.50	1.04	0.5
<i>Chondrosium gracile</i> (dead)	9.00	19.78	10.50	21.88	[9.0](1.5)
<i>Schizachyrium scoparium</i>	0.00	0.00	0.00	0.00	P
<i>Schizachyrium scoparium</i> (dead)	2.50	5.49	2.50	5.21	[2.5]
TOTAL NATIVE PERENNIAL GRASSES (w)	14.5	31.9	16.5	34.4	14.5(2.0)
NATIVE SHRUBS					
<i>Gutierrezia sarothrae</i> (dead)	1.00	2.20	1.00	2.08	[1.0]
TOTAL NATIVE SHRUBS	1.0	2.2	1.0	2.1	1.0
LICHEN					
<i>Xanthoparmelia chlorochloa</i>	0.00	0.00	0.00	0.00	P
TOTAL LICHEN	0.0	0.0	0.0	0.0	P
SUCCULENT					
<i>Opuntia macrohiza</i>	0.00	0.00	0.00	0.00	P
<i>Pediocactus simpsonii</i> var. minor	0.00	0.00	0.00	0.00	P
TOTAL SUCCULENT	0.0	0.0	0.0	0.0	P
Standing dead	1.00		1.00		1.0
Litter	32.50		32.50		32.5
Bare soil	14.50		14.50		14.5
Rock	6.50		6.50		6.5
TOTALS	100.0		102.5		100
TOTAL VEGETATION COVER	45.5	100.0	48.0	100.0	45.5(2.5)
GROUND COVER (Litter+Rock+Veg+St.Dead)	85.5		88.0		86(3)
SPECIES DENSITY (# of species/100 sq.m.)					42

*P=Present within 1 m. on either side of the cover transect, but not quantitatively encountered.

Table 2. Cover Data – Spray Area, Tordon Pre–Spray Study, Bldr City Open Space, CO – April 1996

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Cirsium undulatum</i>	0.00	50.00	0.00	0.00	0.00
<i>Draba reptans</i>	0.00	50.00	0.00	0.00	0.00
<i>Grindelia squarrosa</i>	0.00	75.00	0.00	0.13	0.18
<i>Hedeoma hispidum</i> (dead)	0.13	25.00	0.22	0.13	0.18
<i>Helianthus petiolaris</i>	0.00	25.00	0.00	0.00	0.00
<i>Oligosporus pacificus</i>	0.00	50.00	0.00	0.00	0.00
<i>Plantago patagonica</i>	0.00	100.00	0.00	0.00	0.00
<i>Pterogonum alatum</i>	0.13	75.00	0.22	0.13	0.18
TOTAL NATIVE ANN. & BIEN. FORBS	0.3	100.0	0.4	0.4	0.5
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	5.63	100.00	9.80	9.50	13.67
<i>Acosta diffusa</i> (dead)	8.63	100.00	15.03	8.63	12.41
<i>Acosta diffusa</i> (TOTAL ESTIMATE)	14.26	100.00	24.83	18.13	26.08
<i>Alyssum minus</i>	1.63	75.00	2.83	3.00	4.32
<i>Alyssum minus</i> (dead)	0.38	25.00	0.65	0.38	0.54
<i>Alyssum</i> spp.	0.00	25.00	0.00	0.00	0.00
<i>Camelina microcarpa</i>	0.00	50.00	0.00	0.00	0.00
<i>Carduus nutans</i> ssp. <i>macrolepis</i>	0.00	50.00	0.00	0.00	0.00
<i>Lactuca serriola</i>	0.00	50.00	0.00	0.00	0.00
<i>Lepidium densiflorum</i>	0.00	25.00	0.00	0.00	0.00
<i>Noccaea montana</i>	0.00	25.00	0.00	0.00	0.00
<i>Podospermum laciniatum</i>	0.00	50.00	0.00	0.00	0.00
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.25	100.00	0.44	0.25	0.36
<i>Verbascum blattaria</i>	0.00	25.00	0.00	0.00	0.00
TOTAL INTRO. ANN. & BIEN. FORBS	16.5	100.0	28.8	21.8	31.3
INTRODUCED ANNUAL GRASSES					
<i>Anisantha tectorum</i>	0.88	25.00	1.53	1.13	1.62
<i>Anisantha tectorum</i> (dead)	0.25	25.00	0.44	0.25	0.36
<i>Bromus japonicus</i>	1.00	75.00	1.74	1.00	1.44
<i>Bromus japonicus</i> (dead)	1.75	75.00	3.05	1.88	2.70
TOTAL INTRO. ANN. GRASSES	3.9	75.0	6.8	4.3	6.1
NATIVE PERENNIAL FORBS					
<i>Achillea lanulosa</i>	0.13	75.00	0.22	0.25	0.36
<i>Agoseris glauca</i>	0.25	50.00	0.44	0.25	0.36
<i>Allium textile</i>	0.13	75.00	0.22	0.13	0.18
<i>Antennaria rosea</i>	0.25	75.00	0.44	0.25	0.36
<i>Antennaria rosea</i> (dead)	0.13	25.00	0.22	0.13	0.18
<i>Arnica fulgens</i>	0.00	50.00	0.00	0.00	0.00
<i>Artemisia frigida</i>	0.00	75.00	0.00	0.00	0.00
<i>Artemisia frigida</i> (dead)	0.13	25.00	0.22	0.13	0.18
<i>Artemisia ludoviciana</i>	0.00	50.00	0.00	0.00	0.00
<i>Aster porteri</i>	0.00	75.00	0.00	0.00	0.00
<i>Astragalus tridactylus</i>	0.00	25.00	0.00	0.00	0.00
<i>Castilleja sessiliflora</i>	0.00	75.00	0.00	0.00	0.00
<i>Dalea purpurea</i>	0.00	25.00	0.00	0.00	0.00
<i>Drymocallis fissa</i>	0.00	50.00	0.00	0.00	0.00
<i>Erigeron compositus</i>	0.00	25.00	0.00	0.00	0.00
<i>Gaura coccinea</i>	0.00	100.00	0.00	0.00	0.00
<i>Gutierrezia sarothrae</i>	0.25	100.00	0.44	0.25	0.36
<i>Heterotheca villosa</i>	0.38	50.00	0.65	0.75	1.08
<i>Lesquerella montana</i>	0.75	50.00	1.31	1.38	1.98
<i>Lesquerella</i> spp.	0.75	25.00	1.31	0.75	1.08
<i>Leucocrinum montanum</i>	0.25	75.00	0.44	0.38	0.54
<i>Liatris punctata</i>	0.13	50.00	0.22	0.13	0.18
<i>Liatris punctata</i> (dead)	0.25	50.00	0.44	0.25	0.36
<i>Lithospermum</i> spp.	0.00	25.00	0.00	0.00	0.00
<i>Lomatium orientale</i>	0.38	100.00	0.65	0.38	0.54
<i>Mertensia lanceolata</i>	0.00	25.00	0.00	0.00	0.00
<i>Musineon divaricatum</i>	0.13	100.00	0.22	0.25	0.36
<i>Nothocalais cuspidata</i>	0.00	75.00	0.00	0.00	0.00
<i>Oxytropis x sericea</i>	0.25	50.00	0.44	0.25	0.36

Table 2. Cover Data – Spray Area, Tordon Pre–Spray Study, Bldr City Open Space, CO – April 1996

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER–ALL (%)	RELATIVE VEGETATION COVER–ALL (%)
NATIVE PERENNIAL FORBS (concluded)					
<i>Paronychia jamesii</i>	0.00	25.00	0.00	0.00	0.00
<i>Paronychia jamesii</i> (dead)	0.13	25.00	0.22	0.13	0.18
<i>Penstemon</i> spp.	0.00	25.00	0.00	0.00	0.00
<i>Pulsatilla patens</i> ssp. <i>hirsutissima</i>	0.00	50.00	0.00	0.00	0.00
<i>Ratibida columnifera</i>	0.00	50.00	0.00	0.00	0.00
<i>Rumex</i> spp.	0.00	25.00	0.00	0.00	0.00
<i>Senecio integerrimus</i>	0.00	75.00	0.00	0.00	0.00
<i>Solidago</i> spp.	0.13	25.00	0.22	0.13	0.18
<i>Sphaeralcea coccinea</i>	0.00	50.00	0.00	0.00	0.00
<i>Tithymalus brachyceras</i>	0.00	25.00	0.00	0.00	0.00
<i>Townsendia hookeri</i>	0.13	50.00	0.22	0.25	0.36
Unknown composite	0.00	25.00	0.00	0.00	0.00
<i>Vicia americana</i>	0.13	25.00	0.22	0.13	0.18
<i>Viola nuttallii</i>	0.00	75.00	0.00	0.00	0.00
<i>Virgulus falcatus</i>	0.25	100.00	0.44	0.25	0.36
TOTAL NATIVE PERENNIAL FORBS	5.3	100.0	9.2	6.8	9.7
INTRODUCED PERENNIAL FORBS					
<i>Cichorium intybus</i>	0.00	25.00	0.00	0.00	0.00
<i>Taraxacum officinale</i>	0.25	100.00	0.44	0.25	0.36
TOTAL INTRO. PERENNIAL FORBS	0.3	100.0	0.4	0.3	0.4
NATIVE PERENNIAL GRASSES (cool)					
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	1.88	100.00	3.27	2.25	3.24
<i>Carex pensylvanica</i> ssp. <i>heliophila</i> (dead)	1.13	50.00	1.96	1.25	1.80
<i>Koeleria macrantha</i>	0.63	25.00	1.09	0.75	1.08
<i>Pascopyrum smithii</i>	2.38	100.00	4.14	3.50	5.04
<i>Pascopyrum smithii</i> (dead)	10.88	100.00	18.95	12.13	17.45
<i>Poa agassizensis</i>	1.13	100.00	1.96	1.50	2.16
<i>Poa agassizensis</i> (dead)	0.50	25.00	0.87	0.50	0.72
<i>Poa compressa</i>	0.50	50.00	0.87	1.00	1.44
<i>Poa secunda</i>	0.00	50.00	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL GRASSES (c)	19.0	100.0	33.1	22.9	32.9
NATIVE PERENNIAL GRASSES (warm)					
<i>Aristida purpurea</i>	0.00	50.00	0.00	0.00	0.00
<i>Aristida purpurea</i> (dead)	0.63	25.00	1.09	0.63	0.90
<i>Bouteloua curtipendula</i>	0.00	75.00	0.00	0.00	0.00
<i>Bouteloua curtipendula</i> (dead)	0.88	50.00	1.53	1.00	1.44
<i>Buchloe dactyloides</i>	0.13	75.00	0.22	0.13	0.18
<i>Chondrosium gracile</i>	1.38	100.00	2.40	1.63	2.34
<i>Chondrosium gracile</i> (dead)	7.00	100.00	12.20	7.50	10.79
<i>Muhlenbergia montana</i>	0.13	25.00	0.22	0.13	0.18
<i>Schizachyrium scoparium</i>	0.00	50.00	0.00	0.00	0.00
<i>Schizachyrium scoparium</i> (dead)	0.88	25.00	1.53	0.88	1.26
TOTAL NATIVE PERENNIAL GRASSES (w)	11.0	100.0	19.2	11.9	17.1
NATIVE SHRUBS					
<i>Gutierrezia sarothrae</i> (dead)	0.75	50.00	1.31	0.88	1.26
<i>Rosa sayi</i>	0.00	25.00	0.00	0.00	0.00
<i>Yucca glauca</i>	0.13	25.00	0.22	0.13	0.18
TOTAL NATIVE SHRUBS	0.9	75.0	1.5	1.0	1.4
LICHEN					
<i>Xanthoparmelia chlorochloa</i>	0.00	50.00	0.00	0.00	0.00
TOTAL LICHEN	0.0	50.0	0.0	0.0	0.0
SUCCULENT					
<i>Coryphantha vivipara</i> var. <i>vivipara</i>	0.00	25.00	0.00	0.00	0.00
<i>Opuntia fragilis</i>	0.13	50.00	0.22	0.13	0.18
<i>Opuntia macrorhiza</i>	0.25	100.00	0.44	0.25	0.36
<i>Opuntia polyacantha</i>	0.00	50.00	0.00	0.00	0.00
<i>Pediocactus simpsonii</i>	0.00	50.00	0.00	0.00	0.00
TOTAL SUCCULENT	0.4	100.0	0.7	0.4	0.5

Table 2. Cover Data – Spray Area, Tordon Pre–Spray Study, Bldr City Open Space, CO – April 1996

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
Standing dead	1.88	50.00		1.88	
Litter	27.00	100.00		27.00	
Bare soil	11.13	100.00		11.13	
Rock	2.63	75.00		2.63	
TOTALS	100.0			112.1	
TOTAL VEGETATION COVER	57.4 (s=6.7)		100.0	69.5 (s=13.2)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	88.9			101.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 45.8 Std.Dev.= 5.4)					

Table 2. Cover Data — Spray Area, Tordon Pre-Spray Study, Bldr City Open Space, CO — April 1996

PLANT SPECIES	Percent Foliar Cover*			
	----- SAMPLE NUMBER -----			
	S-1	S-2	S-3	S-4
NATIVE ANNUAL & BIENNIAL FORBS				
<i>Cirsium undulatum</i>	P	P		
<i>Draba reptans</i>	P			
<i>Grindelia squarrosa</i>		P	(0.5)	P
<i>Hedeoma hispidum</i> (dead)			[0.5]	
<i>Helianthus petiolaris</i>			P	
<i>Oligosporus pacificus</i>		P		P
<i>Plantago patagonica</i>	P	P	P	P
<i>Pterogonum alatum</i>	0.5	P	P	
TOTAL NATIVE ANN. & BIEN. FORBS	0.5	P	0.5(0.5)	P
INTRODUCED ANNUAL & BIENNIAL FORBS				
<i>Acosta diffusa</i>	1.5(1.0)	6.0(4.5)	4.0(4.0)	11.0(6.0)
<i>Acosta diffusa</i> (dead)	[1.5]	[8.5]	[17.0]	[7.5]
<i>Acosta diffusa</i> (TOTAL ESTIMATE)	3.0(1.0)	14.5(4.5)	21.0(4.0)	18.5(6.0)
<i>Alyssum minus</i>	P		P	6.5(5.5)
<i>Alyssum minus</i> (dead)			[1.5]	
<i>Alyssum</i> spp.		P		
<i>Camelina microcarpa</i>		P	P	
<i>Carduus nutans</i> ssp. <i>macrolepis</i>		P	P	
<i>Lactuca serriola</i>		P		P
<i>Lepidium densiflorum</i>		P		
<i>Noccaea montana</i>		P		
<i>Podospermum laciniatum</i>			P	P
<i>Tragopogon dubius</i> ssp. <i>major</i>	P	0.5	0.5	P
<i>Verbascum blattaria</i>				P
TOTAL INTRO. ANN. & BIEN. FORBS	3.0(1.0)	15.0(4.5)	23.0(4.0)	25.0(11.5)
INTRODUCED ANNUAL GRASSES				
<i>Anisantha tectorum</i>			3.5(1.0)	
<i>Anisantha tectorum</i> (dead)			[1.0]	
<i>Bromus japonicus</i>		1.5	P	2.5
<i>Bromus japonicus</i> (dead)		[0.5]	[1.0]	[5.5](0.5)
TOTAL INTRO. ANN. GRASSES	---	2.0	5.5(1.0)	8.0(0.5)
NATIVE PERENNIAL FORBS				
<i>Achillea lanulosa</i>		0.5(0.5)	P	P
<i>Agoseris glauca</i>		0.5		0.5
<i>Allium textile</i>	P	0.5	P	
<i>Antennaria rosea</i>	P	P	1.0	
<i>Antennaria rosea</i> (dead)	[0.5]			
<i>Arnica fulgens</i>		P		P
<i>Artemisia frigida</i>	P	P		P
<i>Artemisia frigida</i> (dead)				[0.5]
<i>Artemisia ludoviciana</i>	P		P	
<i>Aster porteri</i>	P	P	P	
<i>Astragalus tridactylus</i>	P			
<i>Castilleja sessiliflora</i>	P	P	P	
<i>Dalea purpurea</i>		P		
<i>Drymocallis fissa</i>			P	
<i>Erigeron compositus</i>				P
<i>Gaura coccinea</i>	P	P	P	P
<i>Gutierrezia sarothrae</i>	P	0.5	0.5	P
<i>Heterotheca villosa</i>	1.5(1.5)		P	
<i>Lesquerella montana</i>	P		3.0(2.5)	
<i>Lesquerella</i> spp.		3.0		
<i>Leucocrinum montanum</i>	1.0(0.5)	P	P	
<i>Liatris punctata</i>	P	0.5		
<i>Liatris punctata</i> (dead)	[0.5]	[0.5]		
<i>Lithospermum</i> spp.				P
<i>Lomatium orientale</i>	P	1.5	P	P
<i>Mertensia lanceolata</i>	P			
<i>Musineon divaricatum</i>	P	P	0.5(0.5)	P
<i>Nothocalais cuspidata</i>	P	P	P	
<i>Oxytropis x sericea</i>	1.0		P	

Table 2. Cover Data -- Spray Area, Tordon Pre-Spray Study, Bldr City Open Space, CO -- April 1996

PLANT SPECIES	Percent Foliar Cover*			
	----- SAMPLE NUMBER -----			
	S-1	S-2	S-3	S-4
NATIVE PERENNIAL FORBS (concluded)				
<i>Paronychia jamesii</i>	P			
<i>Paronychia jamesii</i> (dead)			[0.5]	
<i>Penstemon</i> spp.			P	
<i>Pulsatilla patens</i> ssp. <i>hirsutissima</i>			P	P
<i>Ratibida columnifera</i>	P	P		
<i>Rumex</i> spp.				P
<i>Senecio integerrimus</i>	P	P	P	
<i>Solidago</i> spp.			0.5	
<i>Sphaeralcea coccinea</i>			P	P
<i>Tithymalus brachyceras</i>	P			
<i>Townsendia hookeri</i>	0.5(0.5)	P		
Unknown composite			P	
<i>Vicia americana</i>				0.5
<i>Viola nuttallii</i>	P	P	P	
<i>Virgulus falcatus</i>	P	P	P	1.0
TOTAL NATIVE PERENNIAL FORBS	5.0(2.5)	7.5(0.5)	6.0(3.0)	2.5
INTRODUCED PERENNIAL FORBS				
<i>Cichorium intybus</i>				P
<i>Taraxacum officinale</i>	P	0.5	0.5	P
TOTAL INTRO. PERENNIAL FORBS	P	0.5	0.5	P
NATIVE PERENNIAL GRASSES (cool)				
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	2.0	2.5(0.5)	P	3.0(1.0)
<i>Carex pensylvanica</i> ssp. <i>heliophila</i> (dead)	[3.5]	[1.0](0.5)		
<i>Koeleria macrantha</i>		2.5(0.5)		
<i>Pascopyrum smithii</i>	1.5(0.5)	2.0	(1.0)	6.0(3.0)
<i>Pascopyrum smithii</i> (dead)	[7.5]	[7.0]	[17.0](2.0)	[12.0](3.0)
<i>Poa agassizensis</i>	1.5(0.5)	0.5(1.0)	1.5	1.0
<i>Poa agassizensis</i> (dead)	[2.0]			
<i>Poa compressa</i>			(0.5)	2.0(1.5)
<i>Poa secunda</i>			P	P
TOTAL NATIVE PERENNIAL GRASSES (c)	18.0(1.0)	15.5(2.5)	18.5(3.5)	24.0(8.5)
NATIVE PERENNIAL GRASSES (warm)				
<i>Aristida purpurea</i>	P	P		
<i>Aristida purpurea</i> (dead)	[2.5]			
<i>Bouteloua curtipendula</i>	P	P	P	
<i>Bouteloua curtipendula</i> (dead)	[1.5]	[2.0](0.5)		
<i>Buchloe dactyloides</i>	P	0.5		P
<i>Chondrosium gracile</i>	1.5(0.5)	1.5	0.5(0.5)	2.0
<i>Chondrosium gracile</i> (dead)	[18.5](0.5)	[1.5]	[6.0](1.0)	[2.0](0.5)
<i>Muhlenbergia montana</i>		0.5		
<i>Schizachyrium scoparium</i>	P		P	
<i>Schizachyrium scoparium</i> (dead)	[3.5]			
TOTAL NATIVE PERENNIAL GRASSES (w)	27.5(1.0)	6.0(0.5)	6.5(1.5)	4.0(0.5)
NATIVE SHRUBS				
<i>Gutierrezia sarothrae</i> (dead)		[3.0]	(0.5)	
<i>Rosa sayi</i>	P			
<i>Yucca glauca</i>	0.5			
TOTAL NATIVE SHRUBS	0.5	3.0	(0.5)	---
LICHEN				
<i>Xanthoparmelia chlorochloa</i>	P		P	
TOTAL LICHEN	P	---	P	---
SUCCULENT				
<i>Coryphantha vivipara</i> var. <i>vivipara</i>				P
<i>Opuntia fragilis</i>		P		0.5
<i>Opuntia macrorhiza</i>	P	P	0.5	0.5
<i>Opuntia polyacantha</i>	P	P		
<i>Pediocactus simpsonii</i>		P	P	
TOTAL SUCCULENT	P	P	0.5	1.0

PLANT SPECIES	Percent Foliar Cover*			
	----- SAMPLE NUMBER -----			
	S-1	S-2	S-3	S-4
Standing dead		1.5		6.0
Litter	23.5	27.5	32.0	25.0
Bare soil	16.0	17.5	6.5	4.5
Rock	6.0	4.0	0.5	
TOTALS	100	100	100	100
TOTAL VEGETATION COVER	54.5(5.5)	49.5(8.0)	61.0(14.0)	64.5(21.0)
GROUND COVER (Litter+Rock+Veg+St.Dead)	84(6)	83(8)	94(14)	96(21)
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 45.8 Std.Dev.= 5.4)	46	50	49	38

*P=Present within 1 m. on either side of the cover transect, but not quantitatively encountered.

Table 3a. Cover Data – Control Area, Transect 1, Tordon Post–Spray Study, Bldr City OS, CO – August 1996

PLANT SPECIES	RELATIVE VEGETATION COVER		RELATIVE VEGETATION COVER-ALL		Percent Foliar Cover*
	COVER (%)	COVER (%)	COVER-ALL (%)	COVER-ALL (%)	– SAMPLE NUMBER – C-1
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Erigeron divergens</i>	2.00	4.44	2.00	4.21	2.0
<i>Grindelia squarrosa</i>	0.00	0.00	0.00	0.00	P
<i>Plantago patagonica</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE ANN. & BIEN. FORBS	2.0	4.4	2.0	4.2	2.0
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i> (flowering)	18.50	41.11	19.00	40.00	18.5(0.5)
<i>Acosta diffusa</i> (rosette)	8.50	18.89	9.00	18.95	8.5(0.5)
<i>Acosta diffusa</i> (TOTAL)	27.0	60.0	28.0	58.9	27.0(1.0)
<i>Carduus nutans</i> ssp. <i>macrolepis</i>	0.00	0.00	0.00	0.00	P
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. ANN. & BIEN. FORBS	27.0	60.0	28.0	58.9	27.0(1.0)
INTRODUCED ANNUAL GRASSES					
<i>Bromus japonicus</i>	0.50	1.11	0.50	1.05	0.5
TOTAL INTRO. ANN. GRASSES	0.5	1.1	0.5	1.1	0.5
NATIVE PERENNIAL FORBS					
<i>Achillea lanulosa</i>	0.00	0.00	0.00	0.00	P
<i>Artemisia frigida</i>	0.00	0.00	0.00	0.00	P
<i>Aster porteri</i>	0.50	1.11	1.00	2.11	0.5(0.5)
<i>Dalea purpurea</i>	0.00	0.00	0.00	0.00	P
<i>Drymocallis fissa</i>	0.00	0.00	0.00	0.00	P
<i>Gaura coccinea</i>	0.00	0.00	0.00	0.00	P
<i>Gutierrezia sarothrae</i>	0.00	0.00	0.00	0.00	P
<i>Heterotheca villosa</i>	1.00	2.22	1.00	2.11	1.0
<i>Liatris punctata</i>	0.00	0.00	0.00	0.00	P
<i>Oligosporus dracunculus</i> ssp. <i>glauca</i>	0.00	0.00	0.00	0.00	P
<i>Psoralidium tenuiflorum</i>	0.00	0.00	0.00	0.00	P
<i>Ratibida columnifera</i>	0.00	0.00	0.00	0.00	P
<i>Senecio</i> spp.	0.00	0.00	0.00	0.00	P
<i>Sphaeralcea coccinea</i>	0.00	0.00	0.00	0.00	P
<i>Virgulus falcatus</i>	0.50	1.11	0.50	1.05	0.5
TOTAL NATIVE PERENNIAL FORBS	2.0	4.4	2.5	5.3	2.0(0.5)
INTRODUCED PERENNIAL FORBS					
<i>Convolvulus arvensis</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. PERENNIAL FORBS	0.0	0.0	0.0	0.0	P
NATIVE PERENNIAL GRASSES (cool)					
<i>Pascopyrum smithii</i>	0.00	0.00	0.50	1.05	(0.5)
<i>Poa agassizensis</i>	0.00	0.00	0.00	0.00	P
<i>Poa compressa</i>	1.00	2.22	1.00	2.11	1.0
<i>Poa secunda</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE PERENNIAL GRASSES (c)	1.0	2.2	1.5	3.2	1.0(0.5)
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	1.50	3.33	1.50	3.16	1.5
<i>Aristida purpurea</i>	0.00	0.00	0.00	0.00	P
<i>Chondrosium gracile</i>	11.00	24.44	11.50	24.21	11.0(0.5)
<i>Sporobolus cryptandrus</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE PERENNIAL GRASSES (w)	12.5	27.8	13.0	27.4	12.5(0.5)
SUCCULENT					
<i>Opuntia macrorhiza</i>	0.00	0.00	0.00	0.00	P
<i>Pediocactus simpsonii</i>	0.00	0.00	0.00	0.00	P
TOTAL SUCCULENT	0.0	0.0	0.0	0.0	P
Standing dead	1.00		1.00		1.0
Litter	51.50		51.50		51.5
Bare soil	2.50		2.50		2.5
TOTALS	100.0		102.5		100
TOTAL VEGETATION COVER	45.0	100.0	47.5	100.0	45.0(2.5)
GROUND COVER (Litter+Rock+Veg+St.Dead)	97.5		100.0		98(3)
SPECIES DENSITY (# of species/100 sq.m.)					33

*P=Present within 1 m. on either side of the cover transect, but not quantitatively encountered.

Table 3b. Cover Data – Control Area, Transect 2, Tordon Post–Spray Study, Bldr City OS, CO – August 1996

PLANT SPECIES	COVER (%)	RELATIVE VEGETATION COVER (%)	RELATIVE VEGETATION COVER--ALL (%)	RELATIVE VEGETATION COVER--ALL (%)	Percent Foliar Cover* – SAMPLE NUMBER – C-2
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Cirsium undulatum</i>	0.50	1.12	0.50	1.06	0.5
<i>Erysimum asperum</i>	0.00	0.00	0.00	0.00	P
<i>Grindelia squarrosa</i>	0.00	0.00	0.00	0.00	P
<i>Plantago patagonica</i>	0.00	0.00	0.00	0.00	P
<i>Pterogonum alatum</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE ANN. & BIEN. FORBS	0.5	1.1	0.5	1.1	0.5
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i> (flowering)	0.50	1.12	0.50	1.06	0.5
<i>Acosta diffusa</i> (rosette)	0.00	0.00	0.00	0.00	P
<i>Acosta diffusa</i> (TOTAL)	0.50	1.12	0.50	1.06	0.5
<i>Alyssum minus</i>	0.00	0.00	0.00	0.00	P
<i>Podospermum laciniatum</i>	0.00	0.00	0.00	0.00	P
<i>Tragopogon dubius</i> ssp. major	0.50	1.12	0.50	1.06	0.5
TOTAL INTRO. ANN. & BIEN. FORBS	1.0	2.2	1.0	2.1	1.0
INTRODUCED ANNUAL GRASSES					
<i>Bromus japonicus</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. ANN. GRASSES	0.0	0.0	0.0	0.0	P
NATIVE PERENNIAL FORBS					
<i>Agoseris glauca</i>	0.00	0.00	0.00	0.00	P
<i>Artemisia frigida</i>	1.50	3.37	1.50	3.19	1.5
<i>Artemisia ludoviciana</i>	0.50	1.12	0.50	1.06	0.5
<i>Asclepias viridiflora</i>	0.00	0.00	0.00	0.00	P
<i>Aster porteri</i>	0.50	1.12	0.50	1.06	0.5
<i>Astragalus adsurgens</i> var. robustior	0.00	0.00	0.00	0.00	P
<i>Castilleja sessiliflora</i>	0.00	0.00	0.00	0.00	P
<i>Dalea purpurea</i>	0.00	0.00	0.00	0.00	P
<i>Eremogone fendleri</i>	0.50	1.12	0.50	1.06	0.5
<i>Erigeron flagellaris</i>	0.00	0.00	0.50	1.06	(0.5)
<i>Gaillardia aristata</i>	0.00	0.00	0.00	0.00	P
<i>Gaura coccinea</i>	0.00	0.00	0.00	0.00	P
<i>Gutierrezia sarothrae</i>	4.00	8.99	4.00	8.51	4.0
<i>Helianthus rigidus</i> ssp. subrhomboides	0.50	1.12	0.50	1.06	0.5
<i>Heterotheca fulcrata</i>	0.00	0.00	0.00	0.00	P
<i>Heterotheca villosa</i>	5.00	11.24	5.00	10.64	5.0
<i>Lesquerella montana</i>	0.00	0.00	0.00	0.00	P
<i>Liatris punctata</i>	0.50	1.12	0.50	1.06	0.5
<i>Nothocalais cuspidata</i>	0.00	0.00	0.00	0.00	P
<i>Oligosporus dracunculus</i> ssp. glaucus	0.00	0.00	0.00	0.00	P
<i>Oxybaphus linearis</i>	0.00	0.00	0.00	0.00	P
<i>Oxytropis x sericea</i>	0.00	0.00	0.00	0.00	P
<i>Paronychia jamesii</i>	0.50	1.12	0.50	1.06	0.5
<i>Penstemon strictus</i>	0.00	0.00	0.00	0.00	P
<i>Psoralidium tenuiflorum</i>	0.00	0.00	0.00	0.00	P
<i>Ratibida columnifera</i>	0.00	0.00	0.00	0.00	P
<i>Sphaeralcea coccinea</i>	0.00	0.00	0.00	0.00	P
<i>Tithymalus brachyceras</i>	0.00	0.00	0.00	0.00	P
<i>Townsendia hookeri</i>	0.00	0.00	0.00	0.00	P
<i>Virgulus falcatus</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE PERENNIAL FORBS	13.5	30.3	14.0	29.8	13.5(0.5)
INTRODUCED PERENNIAL FORBS					
<i>Hypericum perforatum</i>	0.00	0.00	0.00	0.00	P
TOTAL INTRO. PERENNIAL FORBS	0.0	0.0	0.0	0.0	P
NATIVE PERENNIAL GRASSES (cool)					
<i>Carex pensylvanica</i> ssp. heliophila	4.00	8.99	4.50	9.57	4.0(0.5)
<i>Hesperostipa comata</i>	1.00	2.25	1.00	2.13	1.0
<i>Koeleria macrantha</i>	2.00	4.49	2.00	4.26	2.0
<i>Pascopyrum smithii</i>	5.50	12.36	6.00	12.77	5.5(0.5)
<i>Poa compressa</i>	0.00	0.00	0.00	0.00	P
TOTAL NATIVE PERENNIAL GRASSES (c)	12.5	28.1	13.5	28.7	12.5(1.0)

Table 3b. Cover Data – Control Area, Transect 2, Tordon Post–Spray Study, Bldr City OS, CO – August 1996

PLANT SPECIES	COVER (%)	RELATIVE VEGETATION COVER (%)	COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover* – SAMPLE NUMBER – C-2
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	2.00	4.49	2.00	4.26	2.0
<i>Aristida purpurea</i>	4.50	10.11	4.50	9.57	4.5
<i>Bouteloua curtipendula</i>	2.00	4.49	2.00	4.26	2.0
<i>Buchloe dactyloides</i>	1.00	2.25	1.00	2.13	1.0
<i>Chondrosum gracile</i>	6.50	14.61	7.50	15.96	6.5(1.0)
<i>Muhlenbergia montana</i>	0.50	1.12	0.50	1.06	0.5
<i>Schizachyrium scoparium</i>	0.50	1.12	0.50	1.06	0.5
TOTAL NATIVE PERENNIAL GRASSES (w)	17.0	38.2	18.0	38.3	17.0(1.0)
LICHEN					
<i>Xanthoparmelia chlorochloa</i>	0.00	0.00	0.00	0.00	P
TOTAL LICHEN	0.0	0.0	0.0	0.0	P
SUCCULENT					
<i>Coryphantha vivipara var. vivipara</i>	0.00	0.00	0.00	0.00	P
<i>Opuntia fragilis</i>	0.00	0.00	0.00	0.00	P
<i>Opuntia macrorhiza</i>	0.00	0.00	0.00	0.00	P
<i>Pediocactus simpsonii</i>	0.00	0.00	0.00	0.00	P
TOTAL SUCCULENT	0.0	0.0	0.0	0.0	P
Standing dead	2.50		2.50		2.5
Litter	31.00		31.00		31.0
Bare soil	18.50		18.50		18.5
Rock	3.50		3.50		3.5
TOTALS	100.0		102.5		100
TOTAL VEGETATION COVER	44.5	100.0	47.0	100.0	44.5(2.5)
GROUND COVER (Litter+Rock+Veg+St.Dead)	81.5		84.0		82(3)
SPECIES DENSITY (# of species/100 sq.m.)					58

*P=Present within 1 m. on either side of the cover transect, but not quantitatively encountered.

Table 4. Cover Data – Spray Area, Tordon Post–Spray Study, Bldr City OS, CO – August 1996

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Erigeron divergens</i>	0.00	50.00	0.00	0.00	0.00
<i>Erysimum asperum</i>	0.00	25.00	0.00	0.00	0.00
<i>Grindelia squarrosa</i>	0.00	75.00	0.00	0.00	0.00
<i>Oligosporus pacificus</i>	0.00	25.00	0.00	0.00	0.00
<i>Plantago patagonica</i>	0.00	75.00	0.00	0.00	0.00
<i>Pterogonum alatum</i>	0.00	50.00	0.00	0.00	0.00
TOTAL NATIVE ANN. & BIEN. FORBS	0.0	100.0	0.0	0.0	0.0
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	1.50	100.00	4.23	1.50	3.88
<i>Acosta diffusa (rosette)</i>	0.25	100.00	0.70	0.25	0.65
<i>Acosta diffusa (TOTAL)</i>	1.75	100.00	4.93	1.75	4.53
<i>Alyssum minus</i>	0.50	50.00	1.41	0.63	1.62
<i>Camelina microcarpa</i>	0.00	25.00	0.00	0.00	0.00
<i>Noccaea montana</i>	0.00	25.00	0.00	0.00	0.00
<i>Podospermum laciniatum</i>	0.00	25.00	0.00	0.00	0.00
<i>Tragopogon dubius ssp. major</i>	0.13	50.00	0.35	0.13	0.32
<i>Verbascum blattaria</i>	0.00	50.00	0.00	0.00	0.00
TOTAL INTRO. ANN. & BIEN. FORBS	2.4	100.0	6.7	2.5	6.5
INTRODUCED ANNUAL GRASSES					
<i>Anisantha tectorum</i>	0.25	50.00	0.70	0.38	0.97
<i>Bromus japonicus</i>	1.50	75.00	4.23	1.63	4.21
TOTAL INTRO. ANN. GRASSES	1.8	75.0	4.9	2.0	5.2
NATIVE PERENNIAL FORBS					
<i>Achillea lanulosa</i>	0.00	75.00	0.00	0.00	0.00
<i>Ambrosia psilostachya var. coronopifolia</i>	0.00	25.00	0.00	0.00	0.00
<i>Antennaria rosea</i>	0.00	50.00	0.00	0.00	0.00
<i>Arnica fulgens</i>	0.00	25.00	0.00	0.00	0.00
<i>Artemisia frigida</i>	0.00	75.00	0.00	0.00	0.00
<i>Artemisia ludoviciana</i>	0.00	25.00	0.00	0.00	0.00
<i>Aster porteri</i>	0.00	50.00	0.00	0.00	0.00
<i>Castilleja sessiliflora</i>	0.00	25.00	0.00	0.00	0.00
<i>Dalea purpurea</i>	0.13	75.00	0.35	0.13	0.32
<i>Erigeron flagellaris</i>	0.13	75.00	0.35	0.13	0.32
<i>Gaillardia aristata</i>	0.00	25.00	0.00	0.00	0.00
<i>Gaura coccinea</i>	0.00	50.00	0.00	0.00	0.00
<i>Gutierrezia sarothrae</i>	1.25	100.00	3.52	1.50	3.88
<i>Heterotheca fulcrata</i>	0.00	25.00	0.00	0.00	0.00
<i>Heterotheca villosa</i>	0.63	100.00	1.76	0.63	1.62
<i>Hymenopappus filifolius</i>	0.00	25.00	0.00	0.00	0.00
<i>Lesquerella montana</i>	0.00	25.00	0.00	0.00	0.00
<i>Liatris punctata</i>	0.50	75.00	1.41	0.50	1.29
<i>Lomatium orientale</i>	0.00	25.00	0.00	0.00	0.00
<i>Nothocalais cuspidata</i>	0.00	25.00	0.00	0.00	0.00
<i>Oligosporus dracunculus ssp. glaucus</i>	0.00	75.00	0.00	0.00	0.00
<i>Oxybaphus linearis</i>	0.00	25.00	0.00	0.00	0.00
<i>Oxytropis x sericea</i>	0.00	25.00	0.00	0.00	0.00
<i>Paronychia jamesii</i>	0.13	50.00	0.35	0.13	0.32
<i>Potentilla spp.</i>	0.00	25.00	0.00	0.00	0.00
<i>Psoralidium tenuiflorum</i>	0.13	100.00	0.35	0.13	0.32
<i>Ratibida columnifera</i>	0.00	50.00	0.00	0.00	0.00
<i>Senecio integerrimus</i>	0.00	25.00	0.00	0.00	0.00
<i>Sphaeralcea coccinea</i>	0.00	25.00	0.00	0.00	0.00
<i>Tithymalus brachyceras</i>	0.00	50.00	0.00	0.00	0.00
<i>Townsendia hookeri</i>	0.00	50.00	0.00	0.00	0.00
<i>Virgulus falcatus</i>	0.13	75.00	0.35	0.25	0.65
TOTAL NATIVE PERENNIAL FORBS	3.0	100.0	8.5	3.4	8.7
INTRODUCED PERENNIAL FORBS					
<i>Convolvulus arvensis</i>	0.13	25.00	0.35	0.13	0.32
<i>Taraxacum officinale</i>	0.00	25.00	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL FORBS	0.1	50.0	0.4	0.1	0.3

Table 4. Cover Data – Spray Area, Tordon Post–Spray Study, Bldr City OS, CO – August 1996

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE PERENNIAL GRASSES (cool)					
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	3.00	100.00	8.45	3.25	8.41
<i>Juncus interior</i>	0.00	25.00	0.00	0.00	0.00
<i>Koeleria macrantha</i>	2.75	100.00	7.75	2.75	7.12
<i>Nassella viridula</i>	0.00	25.00	0.00	0.00	0.00
<i>Pascopyrum smithii</i>	6.25	100.00	17.61	7.13	18.45
<i>Poa agassizensis</i>	2.00	75.00	5.63	2.38	6.15
<i>Poa compressa</i>	1.25	75.00	3.52	1.38	3.56
<i>Poa secunda</i>	0.25	75.00	0.70	0.25	0.65
TOTAL NATIVE PERENNIAL GRASSES (c)	15.5	100.0	43.7	17.1	44.3
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	0.25	75.00	0.70	0.25	0.65
<i>Aristida purpurea</i>	0.50	75.00	1.41	0.50	1.29
<i>Bouteloua curtipendula</i>	2.38	75.00	6.69	2.50	6.47
<i>Buchloe dactyloides</i>	0.00	75.00	0.00	0.00	0.00
<i>Chondrosium gracile</i>	7.88	100.00	22.18	8.25	21.36
<i>Chondrosium hirsutum</i>	0.00	25.00	0.00	0.00	0.00
<i>Muhlenbergia montana</i>	0.13	75.00	0.35	0.13	0.32
<i>Schizachyrium scoparium</i>	0.88	50.00	2.46	0.88	2.27
TOTAL NATIVE PERENNIAL GRASSES (w)	12.0	100.0	33.8	12.5	32.4
NATIVE SHRUBS					
<i>Yucca glauca</i>	0.25	25.00	0.70	0.25	0.65
TOTAL NATIVE SHRUBS	0.3	25.0	0.7	0.3	0.6
LICHEN					
<i>Xanthoparmelia chlorochloa</i>	0.25	100.00	0.70	0.25	0.65
TOTAL LICHEN	0.3	100.0	0.7	0.3	0.6
SUCCULENT					
<i>Opuntia fragilis</i>	0.00	50.00	0.00	0.00	0.00
<i>Opuntia macrorhiza</i>	0.25	100.00	0.70	0.50	1.29
<i>Pediocactus simpsonii</i>	0.00	25.00	0.00	0.00	0.00
TOTAL SUCCULENT	0.3	100.0	0.7	0.5	1.3
Standing dead	7.13	100.00		7.38	
Litter	43.50	100.00		43.50	
Bare soil	11.38	100.00		11.38	
Rock	2.50	75.00		2.50	
TOTALS	100.0			103.4	
TOTAL VEGETATION COVER	35.5 (s=8.1)		100.0	38.6 (s=11.6)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	88.6			92.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 37.8 Std.Dev.= 4.6)					

Table 4. Cover Data - Spray Area, Tordon Post-Spray Study, Bldr City OS, CO - August 1996

PLANT SPECIES	Percent Foliar Cover*			
	----- SAMPLE NUMBER -----			
	1	2	3	4
NATIVE ANNUAL & BIENNIAL FORBS				
<i>Erigeron divergens</i>	P		P	
<i>Erysimum asperum</i>		P		
<i>Grindelia squarrosa</i>		P	P	P
<i>Oligosporus pacificus</i>	P			
<i>Plantago patagonica</i>	P	P		P
<i>Pterogonum alatum</i>	P	P		
TOTAL NATIVE ANN. & BIEN. FORBS	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS				
<i>Acosta diffusa</i>	0.5	P	2.5	3.0
<i>Acosta diffusa (rosette)</i>	1.0	P	P	P
<i>Acosta diffusa (TOTAL)</i>	1.5	P	2.5	3.0
<i>Alyssum minus</i>		0.5(0.5)		1.5
<i>Camelina microcarpa</i>		P		
<i>Noccaea montana</i>			P	
<i>Podospermum laciniatum</i>			P	
<i>Tragopogon dubius ssp. major</i>		P		0.5
<i>Verbascum blattaria</i>			P	P
TOTAL INTRO. ANN. & BIEN. FORBS	1.5	0.5(0.5)	2.5	5.0
INTRODUCED ANNUAL GRASSES				
<i>Anisantha tectorum</i>		(0.5)	1.0	
<i>Bromus japonicus</i>		P	3.0	3.0(0.5)
TOTAL INTRO. ANN. GRASSES	---	(0.5)	4.0	3.0(0.5)
NATIVE PERENNIAL FORBS				
<i>Achillea lanulosa</i>		P	P	P
<i>Ambrosia psilostachya var. coronopifolia</i>			P	
<i>Antennaria rosea</i>	P	P		
<i>Arnica fulgens</i>		P		
<i>Artemisia frigida</i>	P	P		P
<i>Artemisia ludoviciana</i>			P	
<i>Aster porteri</i>	P		P	
<i>Castilleja sessiliflora</i>		P		
<i>Dalea purpurea</i>	0.5	P	P	
<i>Erigeron flagellaris</i>	P	P	0.5	
<i>Gaillardia aristata</i>		P		
<i>Gaura coccinea</i>	P		P	
<i>Gutierrezia sarothrae</i>	P	5.0(1.0)	P	P
<i>Heterotheca fulcrata</i>	P			
<i>Heterotheca villosa</i>	2.0	P	P	0.5
<i>Hymenopappus filifolius</i>	P			
<i>Lesquerella montana</i>		P		
<i>Liatris punctata</i>	2.0	P	P	
<i>Lomatium orientale</i>		P		
<i>Nothocalais cuspidata</i>	P			
<i>Oligosporus dracunculus ssp. glaucus</i>		P	P	P
<i>Oxybaphus linearis</i>		P		
<i>Oxytropis x sericea</i>	P			
<i>Paronychia jamesii</i>	0.5		P	
<i>Potentilla spp.</i>				P
<i>Psoralidium tenuiflorum</i>	P	P	P	0.5
<i>Ratibida columnifera</i>	P		P	
<i>Senecio integerrimus</i>	P			
<i>Sphaeralcea coccinea</i>				P
<i>Tithymalus brachyceras</i>	P		P	
<i>Townsendia hookeri</i>	P			P
<i>Virgulus falcatus</i>	P		P	0.5(0.5)
TOTAL NATIVE PERENNIAL FORBS	5.0	5.0(1.0)	0.5	1.5(0.5)
INTRODUCED PERENNIAL FORBS				
<i>Convolvulus arvensis</i>			0.5	
<i>Taraxacum officinale</i>				P
TOTAL INTRO. PERENNIAL FORBS	---	---	0.5	P

Table 4. Cover Data - Spray Area, Tordon Post-Spray Study, Bldr City OS, CO - August 1996

PLANT SPECIES	Percent Foliar Cover*			
	----- SAMPLE NUMBER -----			
	1	2	3	4
NATIVE PERENNIAL GRASSES (cool)				
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	6.5	4.5(0.5)	1.0	(0.5)
<i>Juncus interior</i>				P
<i>Koeleria macrantha</i>	3.5	5.5	1.5	0.5
<i>Nassella viridula</i>	P			
<i>Pascopyrum smithii</i>	P	7.0	5.0	13.0(3.5)
<i>Poa agassizensis</i>	P		0.5	7.5(1.5)
<i>Poa compressa</i>	P		3.0	2.0(0.5)
<i>Poa secunda</i>		1.0	P	P
TOTAL NATIVE PERENNIAL GRASSES (c)	10.0	18.0(0.5)	11.0	23.0(6.0)
NATIVE PERENNIAL GRASSES (warm)				
<i>Andropogon gerardii</i>	0.5		P	0.5
<i>Aristida purpurea</i>	1.5	0.5	P	
<i>Bouteloua curtipendula</i>	3.0	3.5(0.5)	3.0	
<i>Buchloe dactyloides</i>	P	P	P	
<i>Chondrosium gracile</i>	6.0	5.0(0.5)	8.0(0.5)	12.5(0.5)
<i>Chondrosium hirsutum</i>	P			
<i>Muhlenbergia montana</i>		P	P	0.5
<i>Schizachyrium scoparium</i>	3.0		0.5	
TOTAL NATIVE PERENNIAL GRASSES (w)	14.0	9.0(1.0)	11.5(0.5)	13.5(0.5)
NATIVE SHRUBS				
<i>Yucca glauca</i>	1.0			
TOTAL NATIVE SHRUBS	1.0	---	---	---
LICHEN				
<i>Xanthoparmelia chlorochloa</i>	P	0.5	P	0.5
TOTAL LICHEN	P	0.5	P	0.5
SUCCULENT				
<i>Opuntia fragilis</i>		P		P
<i>Opuntia macrorhiza</i>	P	(0.5)	P	1.0(0.5)
<i>Pediocactus simpsonii</i>		P		
TOTAL SUCCULENT	P	(0.5)	P	1.0(0.5)
Standing dead	3.5	9.0(0.5)	4.5	11.5(0.5)
Litter	43.0	35.5	58.0	37.5
Bare soil	17.0	19.0	6.0	3.5
Rock	5.0	3.5	1.5	
TOTALS	100	100	100	100
TOTAL VEGETATION COVER	31.5	33.0(4.0)	30.0(0.5)	47.5(8.0)
GROUND COVER (Litter+Rock+Veg+St.Dead)	83	81(5)	94(1)	97(9)
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 37.8 Std.Dev.= 4.6)	41	39	40	31

*P=Present within 1 m. on either side of the cover transect, but not quantitatively encountered.

Table 5. Frequency Data - Control Area, Transect 1, Tordon Pre-Spray Study, Bldr City OS, CO - April 1996

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Grindelia squarrosa</i>	60.00					P	P	P	P	P	P
<i>Plantago patagonica</i>	20.00					P					P
<i>Silene antirrhina</i>	10.00									P	
TOTAL NATIVE ANN. & BIEN. FORBS	60.0	---	---	---	---	P	P	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Alyssum minus</i>	90.00	P	P	P	P	P	P	P	P		P
<i>Camelina microcarpa</i>	10.00					P					
<i>Carduus nutans ssp. macrolepis</i>	20.00					P			P		
<i>Erodium cicutarium</i>	70.00				P	P	P	P	P	P	P
<i>Podospermum laciniatum</i>	10.00										P
<i>Tragopogon dubius ssp. major</i>	80.00	P	P		P		P	P	P	P	P
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES											
<i>Anisantha tectorum</i>	70.00		P	P	P		P	P	P	P	
<i>Bromus japonicus</i>	50.00			P			P	P	P	P	
TOTAL INTRO. ANN. GRASSES	70.0	---	P	P	P	---	P	P	P	P	---
NATIVE PERENNIAL FORBS											
<i>Allium textile</i>	10.00					P					
<i>Ambrosia psilostachya var. coronopifolia</i>	20.00				P						P
<i>Artemisia frigida</i>	80.00	P		P	P		P	P	P	P	P
<i>Astragalus drummondii</i>	10.00										P
<i>Drymocallis fissa</i>	20.00				P				P		
<i>Gutierrezia sarothrae</i>	30.00	P		P							P
<i>Lesquerella montana</i>	10.00									P	
<i>Leucocrinum montanum</i>	30.00	P	P							P	
<i>Liatris punctata</i>	30.00		P		P						P
<i>Lomatium orientale</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Nothocalais cuspidata</i>	10.00										P
<i>Sphaeralcea coccinea</i>	10.00										P
Unknown composite	20.00						P	P			
<i>Viola nuttallii</i>	10.00					P					
<i>Virgulus falcatus</i>	80.00	P	P	P		P	P	P	P		P
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Taraxacum officinale</i>	80.00	P	P	P	P	P	P			P	P
TOTAL INTRO. PERENNIAL FORBS	80.0	P	P	P	P	P	P	---	---	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Pascopyrum smithii</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Poa compressa</i>	50.00			P	P	P		P	P		
<i>Poa secunda</i>	20.00		P							P	
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	20.00	P	P								
<i>Aristida purpurea</i>	10.00							P			
<i>Chondrosium gracile</i>	80.00	P	P	P			P	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	80.0	P	P	P	---	---	P	P	P	P	P
SUCCULENT											
<i>Opuntia macrorhiza</i>	50.00		P		P				P	P	P
<i>Pediocactus simpsonii</i>	50.00	P	P			P			P		P
TOTAL SUCCULENT	70.0	P	P	---	P	P	---	---	P	P	P
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 15.2 Std.Dev.= 2.5)		13	15	12	14	15	14	15	17	16	21

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 6. Frequency Data – Control Area, Transect 2, Tordon Pre-Spray Study, Bldr City OS, CO – April 1996

PLANT SPECIES	FREQUENCY (%)	PRESENCE* SAMPLE NUMBER									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Plantago patagonica</i>	30.00	P	P	P							
<i>Pterogonum alatum</i>	90.00	P	P	P	P	P	P	P	P	P	P
TOTAL NATIVE ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Acosta diffusa</i>	70.00	P	P	P	P		P			P	P
<i>Alyssum minus</i>	10.00								P		
<i>Tragopogon dubius ssp. major</i>	30.00	P	P	P							
TOTAL INTRO. ANN. & BIEN. FORBS	80.0	P	P	P	P	---	P	---	P	P	P
INTRODUCED ANNUAL GRASSES											
<i>Anisantha tectorum</i>	30.00	P	P								P
<i>Bromus japonicus</i>	10.00		P								
TOTAL INTRO. ANN. GRASSES	30.0	P	P	---	---	---	---	---	---	---	P
NATIVE PERENNIAL FORBS											
<i>Artemisia frigida</i>	80.00	P	P	P	P				P	P	P
<i>Artemisia ludoviciana</i>	20.00				P				P		
<i>Aster porteri</i>	10.00					P					
<i>Castilleja sessiliflora</i>	30.00			P		P		P			
<i>Gutierrezia sarothrae</i>	70.00	P	P		P	P	P		P	P	
<i>Helianthus rigidus ssp. subrhomboides</i>	10.00										P
<i>Heterotheca villosa</i>	70.00	P	P				P	P	P	P	P
<i>Ipomopsis aggregata</i>	20.00							P			P
<i>Lesquerella montana</i>	80.00	P	P	P	P		P	P	P	P	
<i>Leucocrinum montanum</i>	80.00	P	P	P	P		P	P	P	P	P
<i>Lithospermum spp.</i>	20.00					P	P				
<i>Lomatium orientale</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Mertensia lanceolata</i>	30.00			P		P			P		
<i>Nothocalais cuspidata</i>	50.00		P	P		P	P		P		
<i>Oxytropis x sericea</i>	70.00			P	P	P		P	P	P	P
<i>Paronychia jamesii</i>	40.00							P	P	P	P
<i>Penstemon spp.</i>	40.00		P		P			P		P	
<i>Tithymalus brachyceras</i>	10.00										P
<i>Townsendia hookeri</i>	30.00			P	P					P	
<i>Viola nuttallii</i>	20.00								P	P	
<i>Virgulus falcatus</i>	40.00			P	P		P	P			
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Taraxacum officinale</i>	20.00	P		P							
TOTAL INTRO. PERENNIAL FORBS	20.0	P	---	P	---	---	---	---	---	---	---
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex pensylvanica ssp. heliophila</i>	80.00		P	P	P	P		P	P	P	P
<i>Pascopyrum smithii</i>	80.00	P	P	P	P	P		P	P	P	
<i>Poa agassizensis</i>	70.00		P	P	P		P	P	P		P
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Aristida purpurea</i>	50.00				P			P	P	P	P
<i>Bouteloua curtipendula</i>	20.00		P	P							
<i>Chondrosium gracile</i>	80.00		P	P	P	P	P	P	P	P	
<i>Schizachyrium scoparium</i>	60.00				P		P	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	90.0	---	P	P	P	P	P	P	P	P	P
LICHEN											
<i>Xanthoparmelia chlorochloa</i>	10.00		P								
TOTAL LICHEN	10.0	---	P	---	---	---	---	---	---	---	---
SUCCULENT											
<i>Opuntia macrorhiza</i>	50.00		P	P		P	P			P	
<i>Pediocactus simpsonii var. minor</i>	20.00			P					P		
TOTAL SUCCULENT	60.0	---	P	P	---	P	P	---	P	P	---
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 17.3 Std.Dev.= 3.2)		13	20	22	18	13	15	17	20	20	15

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 7. Frequency Data - Spray Area, Transect 1, Tordon Pre-Spray Study, Bldr City OS, CO - April 1996

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Draba reptans</i>	10.00						P				
<i>Plantago patagonica</i>	10.00										P
<i>Pterogonum alatum</i>	90.00		P	P	P	P	P	P	P	P	P
TOTAL NATIVE ANN. & BIEN. FORBS	90.0	---	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Alyssum minus</i>	50.00				P		P	P	P		P
<i>Tragopogon dubius ssp. major</i>	40.00	P			P		P				P
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS											
<i>Allium textile</i>	30.00							P		P	P
<i>Antennaria rosea</i>	20.00	P		P							
<i>Artemisia frigida</i>	50.00		P		P	P			P	P	
<i>Artemisia ludoviciana</i>	10.00				P						
<i>Aster porteri</i>	30.00	P			P		P				
<i>Astragalus tridactylus</i>	20.00			P							P
<i>Castilleja sessiliflora</i>	60.00		P	P	P	P		P			P
<i>Gaura coccinea</i>	20.00									P	P
<i>Gutierrezia sarothrae</i>	50.00			P	P			P	P		P
<i>Heterotheca villosa</i>	80.00	P	P	P	P	P		P	P	P	P
<i>Lesquerella montana</i>	70.00	P	P	P				P	P	P	
<i>Leucocrinum montanum</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Liatris punctata</i>	90.00		P	P	P	P	P	P	P	P	P
<i>Lomatium orientale</i>	50.00		P		P		P			P	P
<i>Mertensia lanceolata</i>	20.00										P
<i>Musineon divaricatum</i>	30.00							P	P	P	
<i>Nothocalais cuspidata</i>	50.00		P	P	P	P	P				
<i>Oxytropis x sericea</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Paronychia jamesii</i>	70.00	P	P	P	P	P			P	P	
<i>Ratibida columnifera</i>	60.00	P	P	P	P	P		P			
<i>Senecio integerrimus</i>	30.00		P	P	P						
<i>Tithymalus brachyceras</i>	20.00	P	P								
<i>Townsendia hookeri</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Viola nuttallii</i>	80.00	P			P	P	P	P	P	P	P
<i>Virgulus falcatus</i>	40.00		P		P			P	P		
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Taraxacum officinale</i>	20.00								P		P
TOTAL INTRO. PERENNIAL FORBS	20.0	---	---	---	---	---	---	---	P	---	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex pensylvanica ssp. heliophila</i>	90.00	P	P	P	P	P	P	P	P	P	
<i>Pascopyrum smithii</i>	60.00					P	P	P	P	P	P
<i>Poa agassizensis</i>	100.00	P	P	P	P	P	P	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Aristida purpurea</i>	40.00	P	P	P					P		
<i>Bouteloua curtipendula</i>	50.00	P	P					P		P	P
<i>Buchloe dactyloides</i>	30.00		P	P		P					
<i>Chondrosium gracile</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Schizachyrium scoparium</i>	90.00	P	P	P	P	P	P	P	P	P	
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE SHRUBS											
<i>Yucca glauca</i>	30.00					P	P	P			
TOTAL NATIVE SHRUBS	30.0	---	---	---	---	P	P	P	---	---	---
LICHEN											
<i>Xanthoparmelia chlorochloa</i>	60.00	P	P	P	P	P	P				
TOTAL LICHEN	60.0	P	P	P	P	P	P	---	---	---	---
SUCCULENT											
<i>Opuntia macrorhiza</i>	40.00			P	P		P	P			
TOTAL SUCCULENT	40.0	---	---	P	P	---	P	P	---	---	---
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE = 22.9 Std.Dev. = 2.3)		20	25	24	27	21	23	25	21	21	22

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
SUCCULENT											
Opuntia macrorhiza	30.00	P			P		P				
Opuntia polyacantha	10.00								P		
Pediocactus simpsonii	30.00		P		P		P				
TOTAL SUCCULENT	50.0	P	P	---	P	---	P	---	P	---	---
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 22.4 Std.Dev.= 3.3)		23	22	16	27	23	25	20	24	25	19

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 9. Frequency Data – Spray Area, Transect 3, Tordon Pre-Spray Study, Bldr City OS, CO – April, 1996

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Grindelia squarrosa</i>	70.00	P				P	P	P	P	P	P
<i>Helianthus petiolaris</i>	10.00									P	
<i>Plantago patagonica</i>	30.00						P	P			P
<i>Pterogonum alatum</i>	30.00				P					P	P
TOTAL NATIVE ANN. & BIEN. FORBS	80.0	P	---	---	P	P	P	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Alyssum minus</i>	80.00	P	P	P	P		P	P	P	P	
<i>Camelina microcarpa</i>	30.00						P	P	P		
<i>Carduus nutans ssp. macrolepis</i>	20.00		P	P							
<i>Podospermum laciniatum</i>	20.00			P	P						
<i>Tragopogon dubius ssp. major</i>	70.00	P		P		P	P	P		P	P
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES											
<i>Anisantha tectorum</i>	80.00		P	P	P	P	P	P		P	P
<i>Bromus japonicus</i>	40.00						P		P	P	P
TOTAL INTRO. ANN. GRASSES	90.0	---	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS											
<i>Achillea lanulosa</i>	30.00		P						P	P	
<i>Artemisia ludoviciana</i>	20.00	P	P								
<i>Aster porteri</i>	10.00									P	
<i>Castilleja sessiliflora</i>	20.00	P							P		
<i>Drymocallis fissa</i>	10.00				P						
<i>Gaura coccinea</i>	10.00								P		
<i>Gutierrezia sarothrae</i>	60.00		P	P	P	P	P			P	
<i>Heterotheca villosa</i>	20.00	P						P			
<i>Lesquerella montana</i>	60.00					P	P	P	P	P	P
<i>Leucocrinum montanum</i>	20.00		P		P						
<i>Lomatium orientale</i>	90.00	P	P	P	P	P	P		P	P	P
<i>Musineon divaricatum</i>	60.00	P		P	P			P	P	P	P
<i>Nothocalais cuspidata</i>	80.00	P		P	P	P	P	P	P	P	P
<i>Oxytropis x sericea</i>	60.00		P			P	P		P	P	P
<i>Penstemon spp.</i>	10.00	P									
<i>Senecio integerrimus</i>	20.00	P		P							
<i>Sphaeralcea coccinea</i>	10.00										P
Unknown composite	10.00				P						
<i>Viola nuttallii</i>	10.00								P		
<i>Virgulus falcatus</i>	70.00		P	P	P	P	P	P	P		
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Taraxacum officinale</i>	80.00		P	P	P	P	P	P	P	P	
TOTAL INTRO. PERENNIAL FORBS	80.0	---	P	P	P	P	P	P	P	P	---
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex pensylvanica ssp. heliophila</i>	20.00	P	P								
<i>Pascopyrum smithii</i>	80.00	P	P		P	P	P	P		P	P
<i>Poa agassizensis</i>	60.00	P			P	P		P	P		P
TOTAL NATIVE PERENNIAL GRASSES (c)	90.0	P	P	---	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Bouteloua curtipendula</i>	10.00								P		
<i>Chondrosium gracile</i>	50.00		P			P	P	P			P
<i>Schizachyrium scoparium</i>	50.00	P	P	P	P				P		
TOTAL NATIVE PERENNIAL GRASSES (w)	90.0	P	P	P	P	P	P	P	P	---	P
LICHEN											
<i>Xanthoparmelia chlorochloa</i>	40.00	P				P	P	P			
TOTAL LICHEN	40.0	P	---	---	---	P	P	P	---	---	---
SUCCULENT											
<i>Opuntia macrorhiza</i>	10.00		P								
TOTAL SUCCULENT	10.0	---	P	---	---	---	---	---	---	---	---
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE = 16.6 Std.Dev. = 1.4)		17	17	14	16	15	18	17	19	17	16

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 10. Frequency Data - Spray Area, Transect 4, Tordon Pre-Spray Study, Bldr City OS, CO - April 1996

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Grindelia squarrosa</i>	20.00	P	P								
<i>Plantago patagonica</i>	10.00		P								
TOTAL NATIVE ANN. & BIEN. FORBS	20.0	P	P	---	---	---	---	---	---	---	---
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Alyssum minus</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Lactuca serriola</i>	40.00	P	P		P				P		
<i>Podospermum laciniatum</i>	10.00	P									
<i>Tragopogon dubius ssp. major</i>	20.00	P								P	
<i>Verbascum blattaria</i>	50.00	P	P		P	P	P				
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES											
<i>Bromus japonicus</i>	100.00	P	P	P	P	P	P	P	P	P	P
TOTAL INTRO. ANN. GRASSES	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS											
<i>Achillea lanulosa</i>	30.00				P	P					P
<i>Agoseris glauca</i>	80.00	P		P	P	P	P	P	P	P	P
<i>Arnica fulgens</i>	20.00				P						P
<i>Artemisia frigida</i>	10.00	P									
<i>Drymocallis fissa</i>	10.00				P						
<i>Erigeron compositus</i>	30.00	P	P	P							
<i>Gaura coccinea</i>	10.00			P							
<i>Gutierrezia sarothrae</i>	40.00	P	P	P							P
<i>Lithospermum spp.</i>	20.00		P								P
<i>Lomatium orientale</i>	80.00	P	P	P	P		P	P		P	P
<i>Pulsatilla patens ssp. hirsutissima</i>	20.00	P		P							
<i>Rumex spp.</i>	10.00			P							
<i>Sphaeralcea coccinea</i>	10.00			P							
<i>Vicia americana</i>	70.00			P			P	P	P	P	P
<i>Virgulus falcatus</i>	60.00	P	P		P				P	P	P
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Cichorium intybus</i>	50.00				P			P	P	P	P
<i>Taraxacum officinale</i>	60.00	P	P	P	P	P				P	
TOTAL INTRO. PERENNIAL FORBS	90.0	P	P	P	P	P	---	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex pensylvanica ssp. heliophila</i>	80.00	P	P	P	P	P		P		P	P
<i>Pascopyrum smithii</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Poa compressa</i>	20.00				P					P	
<i>Poa secunda</i>	50.00			P	P				P	P	P
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Buchloe dactyloides</i>	10.00			P							
<i>Chondrosium gracile</i>	90.00	P	P	P	P		P	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	90.0	P	P	P	P	---	P	P	P	P	P
SUCCULENT											
<i>Coryphantha vivipara var. vivipara</i>	10.00	P									
<i>Opuntia fragilis</i>	40.00			P				P		P	P
<i>Opuntia macrorhiza</i>	70.00	P	P			P	P	P	P	P	P
TOTAL SUCCULENT	90.0	P	P	P	---	P	P	P	P	P	P
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 15.3 Std.Dev.= 4.2)		22	17	19	18	10	10	12	12	19	14

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 11. Frequency Data – Control Area, Transect 1, Tordon Post–Spray Study, Bldr City OS, CO – August 1996 Page 1 of 1

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----										
		1	2	3	4	5	6	7	8	9	10	
NATIVE ANNUAL & BIENNIAL FORBS												
<i>Erigeron divergens</i>	80.00			P	P	P	P	P	P	P	P	P
<i>Grindelia squarrosa</i>	90.00	P	P	P		P	P	P	P	P	P	P
<i>Plantago patagonica</i>	20.00							P			P	
TOTAL NATIVE ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS												
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Acosta diffusa (rosette)</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Carduus nutans ssp. macrolepis</i>	10.00					P						
<i>Tragopogon dubius ssp. major</i>	20.00							P			P	
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES												
<i>Bromus japonicus</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
TOTAL INTRO. ANN. GRASSES	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS												
<i>Achillea lanulosa</i>	10.00				P							
<i>Artemisia frigida</i>	80.00	P	P	P	P		P		P	P	P	
<i>Aster porteri</i>	40.00	P		P		P					P	
<i>Dalea purpurea</i>	10.00			P								
<i>Drymocallis fissa</i>	20.00				P				P			
<i>Gaura coccinea</i>	20.00			P							P	
<i>Gutierrezia sarothrae</i>	60.00	P		P		P		P			P	P
<i>Heterotheca villosa</i>	40.00	P	P		P							P
<i>Liatris punctata</i>	60.00	P	P	P	P		P					P
<i>Oligosporus dracunculus ssp. glaucus</i>	30.00	P					P	P				
<i>Psoraleidium tenuiflorum</i>	70.00	P	P		P	P	P	P				P
<i>Ratibida columnifera</i>	30.00		P	P	P							
<i>Senecio spp.</i>	30.00							P	P	P		
<i>Sphaeralcea coccinea</i>	50.00					P	P	P	P			P
<i>Virgulus falcatus</i>	30.00	P			P						P	
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS												
<i>Convolvulus arvensis</i>	10.00											P
TOTAL INTRO. PERENNIAL FORBS	10.0											P
NATIVE PERENNIAL GRASSES (cool)												
<i>Pascopyrum smithii</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Poa agassizensis</i>	10.00			P								
<i>Poa compressa</i>	50.00			P	P			P	P	P		
<i>Poa secunda</i>	20.00				P	P						
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)												
<i>Andropogon gerardii</i>	20.00	P	P									
<i>Aristida purpurea</i>	20.00						P	P				
<i>Chondrosium gracile</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Sporobolus cryptandrus</i>	10.00										P	
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P	P
SUCCULENT												
<i>Opuntia macrorhiza</i>	60.00		P	P	P				P	P	P	
<i>Pediocactus simpsonii</i>	30.00								P	P	P	
TOTAL SUCCULENT	60.0	---	P	P	P	---	---	---	P	P	P	---
SPECIES DENSITY (# of species/5 sq.m.)												
(AVERAGE= 14.3 Std.Dev.= 2.3)												
		14	12	16	16	12	12	15	13	19	14	

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 12. Frequency Data -- Control Area, Transect 2, Tordon Post-Spray Study, Bldr City OS, CO -- August 1996 Page 2 of 2

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
NATIVE PERENNIAL GRASSES (warm)											
Andropogon gerardii	30.00						P			P	P
Aristida purpurea	90.00		P	P	P	P	P	P	P	P	P
Bouteloua curtipendula	80.00			P	P	P	P	P	P	P	P
Buchloe dactyloides	50.00			P	P	P	P	P			
Chondrosium gracile	100.00	P	P	P	P	P	P	P	P	P	P
Muhlenbergia montana	30.00	P	P	P							
Schizachyrium scoparium	30.00						P			P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P
LICHEN											
Xanthoparmelia chlorochloa	40.00	P	P	P		P					
TOTAL LICHEN	40.0	P	P	P	---	P	---	---	---	---	---
SUCCULENT											
Coryphantha vivipara var. vivipara	10.00										P
Opuntia fragilis	20.00	P		P							
Opuntia macrorhiza	40.00	P	P	P		P					
Pediocactus simpsonii	20.00	P							P		
TOTAL SUCCULENT	60.0	P	P	P	---	P	---	---	P	---	P
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 25.7 Std.Dev.= 4.3)		25	26	29	27	33	26	18	22	22	29

*P=Present within 1 m X 5 m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 13. Frequency Data – Spray Area, Transect 1, Tordon Post–Spray Study, Bldr City OS, CO – August 1996 Page 1 of 2

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----										
		1	2	3	4	5	6	7	8	9	10	
NATIVE ANNUAL & BIENNIAL FORBS												
<i>Erigeron divergens</i>	10.00											P
<i>Oligosporus pacificus</i>	10.00		P									
<i>Plantago patagonica</i>	10.00											P
<i>Pterogonum alatum</i>	70.00	P	P	P				P		P	P	P
TOTAL NATIVE ANN. & BIEN. FORBS	70.0	P	P	P	---	---	P	---	P	P	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS												
<i>Acosta diffusa</i>	80.00			P	P	P	P	P	P	P	P	P
<i>Acosta diffusa (rosette)</i>	90.00	P		P	P	P	P	P	P	P	P	P
TOTAL INTRO. ANN. & BIEN. FORBS	90.0	P	---	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES												
<i>Bromus japonicus</i>	10.00								P			
TOTAL INTRO. ANN. GRASSES	10.0	---	---	---	---	---	---	---	P	---	---	---
NATIVE PERENNIAL FORBS												
<i>Antennaria rosea</i>	10.00	P										
<i>Artemisia frigida</i>	50.00		P		P	P			P	P		
<i>Aster porteri</i>	30.00				P				P	P		
<i>Castilleja sessiliflora</i>	10.00											P
<i>Dalea purpurea</i>	60.00		P	P				P	P	P	P	
<i>Erigeron flagellaris</i>	20.00							P	P			
<i>Gaura coccinea</i>	20.00					P					P	
<i>Gutierrezia sarothrae</i>	30.00				P				P			P
<i>Heterotheca fulcrata</i>	10.00	P										
<i>Heterotheca villosa</i>	70.00	P	P	P	P	P			P		P	
<i>Hymenopappus filifolius</i>	40.00	P				P	P	P				
<i>Liatris punctata</i>	90.00	P	P	P	P	P	P		P	P	P	P
<i>Nothocalais cuspidata</i>	30.00				P			P				P
<i>Oxytropis x sericea</i>	10.00										P	
<i>Paronychia jamesii</i>	60.00			P		P	P		P	P	P	P
<i>Psoralidium tenuiflorum</i>	60.00	P	P		P			P	P			P
<i>Ratibida columnifera</i>	10.00										P	
<i>Senecio integerrimus</i>	20.00			P	P							
<i>Tithymalus brachyceras</i>	10.00	P										
<i>Townsendia hookeri</i>	60.00		P				P	P		P	P	P
<i>Virgulus falcatus</i>	20.00				P						P	
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)												
<i>Carex pensylvanica ssp. heliophila</i>	60.00				P	P	P	P	P	P	P	P
<i>Koeleria macrantha</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Nassella viridula</i>	30.00	P	P									P
<i>Pascopyrum smithii</i>	60.00					P	P	P	P	P	P	P
<i>Poa agassizensis</i>	10.00					P						
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)												
<i>Andropogon gerardii</i>	40.00	P		P	P			P				
<i>Aristida purpurea</i>	80.00	P	P	P	P	P	P	P	P	P		
<i>Bouteloua curtipendula</i>	80.00	P	P		P	P	P	P	P	P	P	P
<i>Buchloe dactyloides</i>	60.00		P			P	P	P	P	P	P	P
<i>Chondrosium gracile</i>	70.00			P	P	P	P	P	P	P	P	P
<i>Chondrosium hirsutum</i>	50.00	P	P	P	P	P						
<i>Schizachyrium scoparium</i>	90.00		P	P	P	P	P	P	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE SHRUBS												
<i>Yucca glauca</i>	40.00					P	P	P			P	
TOTAL NATIVE SHRUBS	40.0	---	---	---	---	P	P	P	---	P	---	---

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
LICHEN											
Xanthoparmelia chlorochloa	40.00			P	P				P		P
TOTAL LICHEN	40.0	---	---	P	P	---	---	P	---	---	P
SUCCULENT											
Opuntia macrorhiza	10.00							P			
TOTAL SUCCULENT	10.0	---	---	---	---	---	---	P	---	---	---
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 17.4 Std.Dev.= 2.4)		15	15	14	19	19	20	18	16	21	17

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 14. Frequency Data – Spray Area, Transect 2, Tordon Post–Spray Study, Bldr City OS, CO – August 1996 Page 1 of 1

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Erysimum asperum</i>	40.00			P	P	P		P			
<i>Grindelia squarrosa</i>	40.00			P	P				P		P
<i>Plantago patagonica</i>	40.00			P	P			P	P		
<i>Pterogonum alatum</i>	20.00								P		P
TOTAL NATIVE ANN. & BIEN. FORBS	70.0	---	---	P	P	P	P	P	P	---	P
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Acosta diffusa</i>	90.00	P	P	P	P	P	P	P	P	P	P
<i>Acosta diffusa (rosette)</i>	60.00	P	P		P	P	P			P	
<i>Alyssum minus</i>	40.00						P		P	P	P
<i>Camelina microcarpa</i>	10.00		P								
<i>Tragopogon dubius ssp. major</i>	70.00	P			P	P	P	P	P		P
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES											
<i>Bromus japonicus</i>	70.00	P	P	P	P	P	P	P			
TOTAL INTRO. ANN. GRASSES	70.0	P	P	P	P	P	P	P	---	---	---
NATIVE PERENNIAL FORBS											
<i>Achillea lanulosa</i>	10.00							P			
<i>Antennaria rosea</i>	10.00					P					
<i>Arnica fulgens</i>	30.00			P	P				P		
<i>Artemisia frigida</i>	60.00		P		P	P			P	P	P
<i>Castilleja sessiliflora</i>	30.00	P				P					P
<i>Dalea purpurea</i>	30.00	P		P	P						
<i>Erigeron flagellaris</i>	80.00	P	P	P		P	P	P	P	P	
<i>Gaillardia aristata</i>	10.00	P									
<i>Gutierrezia sarothrae</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Heterotheca villosa</i>	30.00	P	P		P						
<i>Lesquerella montana</i>	60.00		P		P		P		P	P	P
<i>Liatris punctata</i>	80.00	P	P	P	P		P	P		P	P
<i>Lomatium orientale</i>	10.00						P				
<i>Oligosporus dracunculus ssp. glaucus</i>	20.00			P	P						
<i>Oxybaphus linearis</i>	10.00								P		
<i>Psoraleidium tenuiflorum</i>	60.00		P	P		P	P			P	P
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex pensylvanica ssp. heliophila</i>	70.00	P	P	P	P				P		P
<i>Koeleria macrantha</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Pascopyrum smithii</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Poa secunda</i>	10.00								P		
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Aristida purpurea</i>	20.00						P				P
<i>Bouteloua curtipendula</i>	90.00	P	P	P	P	P		P	P	P	P
<i>Buchloe dactyloides</i>	30.00							P	P		P
<i>Chondrosium gracile</i>	100.00	P	P	P	P	P		P	P	P	P
<i>Muhlenbergia montana</i>	50.00	P	P	P				P	P		
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P
LICHEN											
<i>Xanthoparmelia chlorochloa</i>	60.00		P	P	P	P				P	P
TOTAL LICHEN	60.0	---	P	P	P	P	---	---	P	---	P
SUCCULENT											
<i>Opuntia fragilis</i>	10.00					P					
<i>Opuntia macrorhiza</i>	40.00	P				P	P				P
<i>Pediocactus simpsonii</i>	30.00	P			P		P				
TOTAL SUCCULENT	50.0	P	---	---	P	P	P	---	---	---	P
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 17.6 Std.Dev.= 1.8)		18	17	19	21	18	19	16	16	15	17

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 15. Frequency Data - Spray Area, Transect 3, Tordon Post-Spray Study, Bld City OS, CO - August 1996

PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----										
		1	2	3	4	5	6	7	8	9	10	
NATIVE ANNUAL & BIENNIAL FORBS												
<i>Erigeron divergens</i>	20.00										P	P
<i>Grindelia squarrosa</i>	10.00			P								
TOTAL NATIVE ANN. & BIEN. FORBS	30.0			P							P	P
INTRODUCED ANNUAL & BIENNIAL FORBS												
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Acosta diffusa (rosette)</i>	40.00	P	P	P	P							
<i>Podospermum laciniatum</i>	10.00			P								
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES												
<i>Bromus japonicus</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
TOTAL INTRO. ANN. GRASSES	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS												
<i>Achillea lanulosa</i>	10.00									P		
<i>Artemisia ludoviciana</i>	30.00	P	P	P								
<i>Aster porteri</i>	50.00	P	P	P	P	P						
<i>Dalea purpurea</i>	10.00	P										
<i>Erigeron flagellaris</i>	40.00	P	P		P				P			
<i>Gaura coccinea</i>	10.00	P										
<i>Gutierrezia sarothrae</i>	60.00		P	P				P		P	P	P
<i>Heterotheca villosa</i>	40.00	P					P		P	P		
<i>Liatris punctata</i>	10.00	P										
<i>Oligosporus dracunculus ssp. glaucus</i>	10.00		P									
<i>Psoralidium tenuiflorum</i>	40.00	P		P	P				P			
<i>Ratibida columnifera</i>	20.00			P	P							
<i>Tithymalus brachyceras</i>	10.00	P										
<i>Virgulus falcatus</i>	30.00		P		P	P						
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)												
<i>Carex pensylvanica ssp. heliophila</i>	30.00	P	P				P					
<i>Koeleria macrantha</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Pascopyrum smithii</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Poa agassizensis</i>	30.00	P	P								P	
<i>Poa compressa</i>	40.00	P	P	P					P			
<i>Poa secunda</i>	10.00			P								
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)												
<i>Andropogon gerardii</i>	20.00	P	P									
<i>Aristida purpurea</i>	20.00				P			P				
<i>Bouteloua curtipendula</i>	70.00	P	P	P	P	P			P	P		
<i>Buchloe dactyloides</i>	30.00								P	P		P
<i>Chondrosium gracile</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Muhlenbergia montana</i>	90.00	P	P	P		P	P	P	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P	P
LICHEN												
<i>Xanthoparmelia chlorochloa</i>	80.00	P	P	P	P	P	P	P	P			
TOTAL LICHEN	80.0	P	P	P	P	P	P	P	P	P		
SUCCULENT												
<i>Opuntia macrorhiza</i>	10.00		P									
TOTAL SUCCULENT	10.0		P									
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 13.4 Std.Dev.= 4.3)		21	19	17	13	12	9	13	12	9	9	

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

Table 16. Frequency Data – Spray Area, Transect 4, Tordon Post–Spray Study, Bldr City OS, CO – August 1996 Page 1 of 1

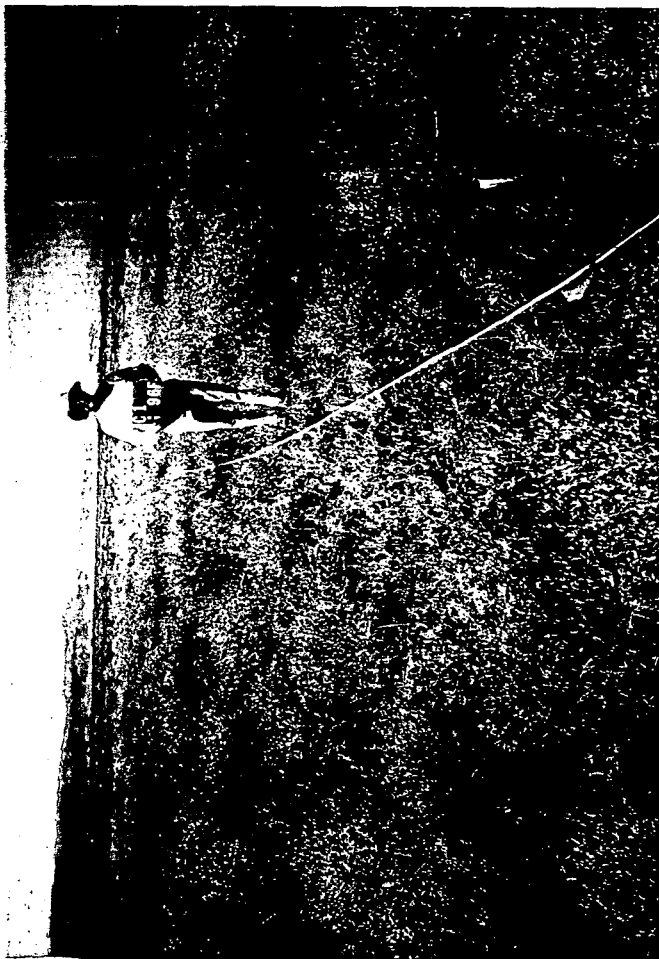
PLANT SPECIES	FREQUENCY (%)	PRESENCE* ----- SAMPLE NUMBER -----										
		1	2	3	4	5	6	7	8	9	10	
NATIVE ANNUAL & BIENNIAL FORBS												
<i>Grindelia squarrosa</i>	30.00	P	P									P
<i>Plantago patagonica</i>	20.00			P								P
TOTAL NATIVE ANN. & BIEN. FORBS	40.0	P	P	P	---	---	---	---	---	---	---	P
INTRODUCED ANNUAL & BIENNIAL FORBS												
<i>Acosta diffusa</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Acosta diffusa (rosette)</i>	60.00	P	P	P	P			P				P
<i>Alyssum minus</i>	90.00	P	P		P	P	P	P	P	P	P	P
<i>Tragopogon dubius ssp. major</i>	40.00			P		P		P	P			
<i>Verbascum blattaria</i>	20.00					P	P					
TOTAL INTRO. ANN. & BIEN. FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
INTRODUCED ANNUAL GRASSES												
<i>Bromus japonicus</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
TOTAL INTRO. ANN. GRASSES	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS												
<i>Achillea lanulosa</i>	30.00				---	P					P	
<i>Artemisia frigida</i>	10.00	P										
<i>Gutierrezia sarothrae</i>	60.00		P	P	P		P		P			P
<i>Heterotheca villosa</i>	20.00		P	P								
<i>Psoraleidum tenuiflorum</i>	80.00	P	P	P	P		P	P	P			P
<i>Sphaeralcea coccinea</i>	30.00	P		P							P	
<i>Townsendia hookeri</i>	10.00		P									
<i>Virgulus falcatus</i>	80.00	P	P	P	P	P			P	P	P	
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS												
<i>Taraxacum officinale</i>	10.00				P							
TOTAL INTRO. PERENNIAL FORBS	10.0	---	---	---	P	---	---	---	---	---	---	---
NATIVE PERENNIAL GRASSES (cool)												
<i>Carex pensylvanica ssp. heliophila</i>	80.00	P	P	P	P			P	P	P	P	
<i>Juncus interior</i>	10.00					P						
<i>Pascopyrum smithii</i>	100.00	P	P	P	P	P	P	P	P	P	P	
<i>Poa agassizensis</i>	30.00				P	P		P				
<i>Poa compressa</i>	40.00			P	P	P		P				
<i>Poa secunda</i>	50.00			P	P				P	P	P	
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)												
<i>Chondrosium gracile</i>	100.00	P	P	P	P	P	P	P	P	P	P	P
<i>Muhlenbergia montana</i>	10.00			P								
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P	P
LICHEN												
<i>Xanthoparmelia chlorochloa</i>	50.00			P	P				P	P	P	
TOTAL LICHEN	50.0	---	---	P	P	---	---	---	P	P	P	---
SUCCULENT												
<i>Opuntia fragilis</i>	50.00		P	P				P	P	P		
<i>Opuntia macrorhiza</i>	80.00	P	P			P	P	P	P	P	P	P
TOTAL SUCCULENT	90.0	P	P	P	---	P	P	P	P	P	P	P
SPECIES DENSITY (# of species/5 sq.m.) (AVERAGE= 13.3 Std.Dev.= 2.1)		12	14	17	15	13	9	12	14	13	14	

*P=Present within 1m X 5m plot on right side (when standing at origin and facing the endpoint) of the cover transect.

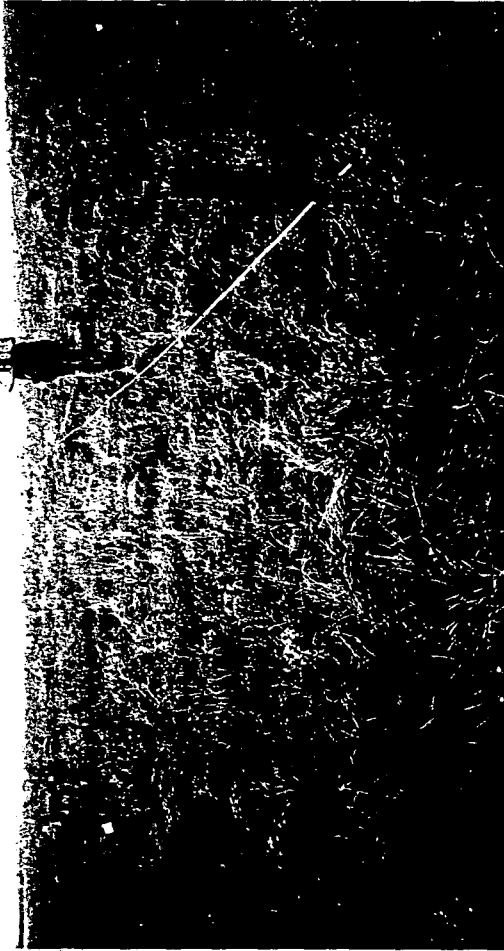
Table 17. Knapweed (*Acosta diffusa*) Density – October 1996

OCTOBER 14, 1996

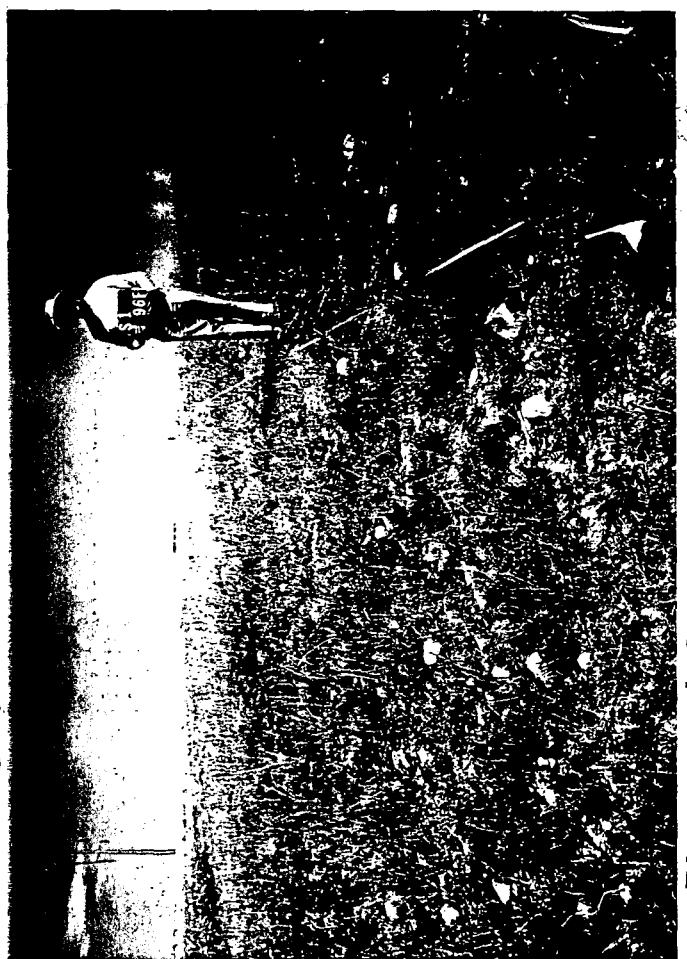
			----- Subplot -----									
			# individuals/sq. m.									
	Average	Maximum	1	2	3	4	5	6	7	8	9	10
C1 BOLT	33.8	88	30	53	88	85	22	24	15	13	5	3
C1 ROSETTE	5.8	11	6	6	11	10	7	5	3	5	4	1
C2 BOLT	2.3	14	14	7	1	1	0	0	0	0	0	0
C2 ROSETTE	0.4	2	2	2	0	0	0	0	0	0	0	0
S1 BOLT	6.9	41	0	0	0	5	2	0	0	6	41	15
S1 ROSETTE	1.7	5	1	0	0	0	2	0	1	3	5	5
S2 BOLT	4.8	24	6	3	4	5	24	0	3	1	2	0
S2 ROSETTE	2	9	1	2	0	9	3	2	0	1	1	1
S3 BOLT	5.1	33	5	3	33	6	0	0	2	0	0	2
S3 ROSETTE	6.9	27	6	7	7	27	7	0	11	2	0	2
S4 BOLT	11.4	76	5	76	15	0	2	0	6	0	2	8
S4 ROSETTE	4.1	10	2	2	7	3	6	7	2	2	10	0



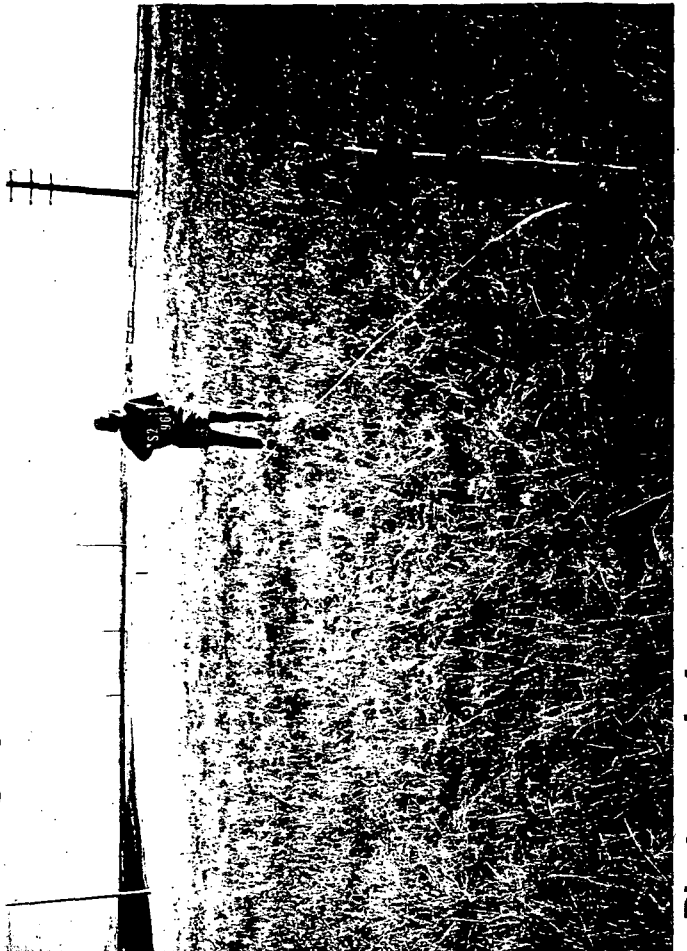
Photograph 1. Tordon Monitoring Fall '96, Control Sample 1.



Photograph 2. Tordon Monitoring Fall '96, Control Sample 2.



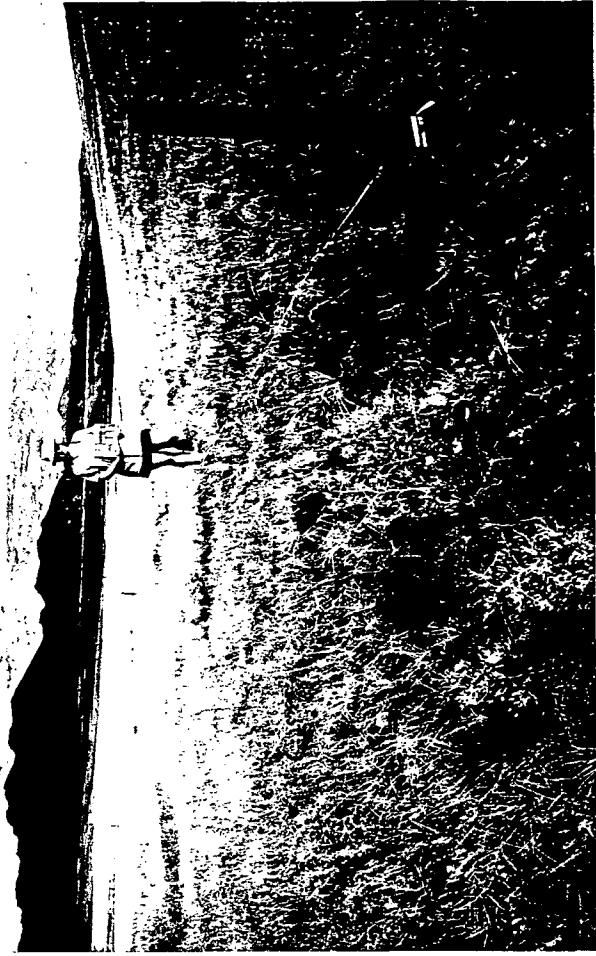
Photograph 3. Tordon Monitoring Fall '96, Spray Sample 1.



Photograph 4. Tordon Monitoring Fall '96, Spray Sample 2.



Photograph 5. Tordon Monitoring Fall '96, Spray Sample 3.



Photograph 6. Tordon Monitoring Fall '96, Spray Sample 4.