

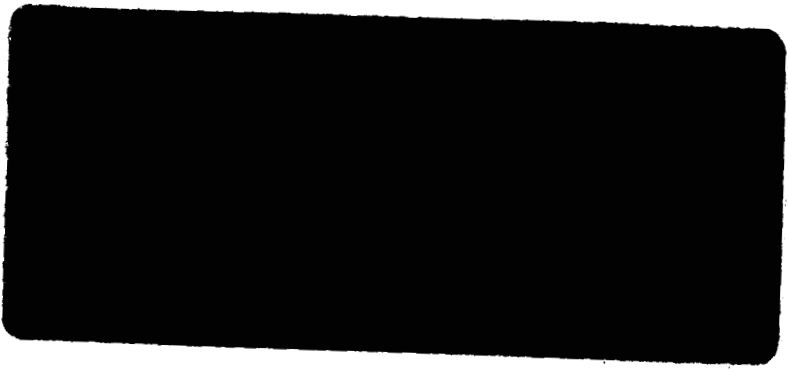
ESCO
TALLGRASS
2001

Tallgrass Natural Area Vegetation Monit
OSMP Studies 4438

Study



ESCO Associates



ESCO

**Tallgrass Natural Area
Vegetation Monitoring Data
2001**

City of Boulder Open Space
and Mountain Parks Dept.

Data Collected for:

City of Boulder
Open Space and Mountain Parks Dept.
66 So. Cherryvale Rd.
Boulder, CO 80303

Data Collected by:

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Table 1. Cover Data - Area 3, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Gaura parviflora</i>	0.00	33.33	0.00	0.00	0.00
<i>Grindelia squarrosa</i>	0.00	16.67	0.00	0.00	0.00
<i>Pterogonum alatum</i>	0.50	16.67	0.75	0.50	0.68
TOTAL NATIVE ANN. & BIEN. FORBS	0.5	66.7	0.7	0.5	0.7
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	0.00	16.67	0.00	0.00	0.00
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	0.00	16.67	0.00	0.00	0.00
<i>Dianthus armeria</i>	0.00	16.67	0.00	0.00	0.00
<i>Lactuca serriola</i>	0.00	33.33	0.00	0.00	0.00
<i>Medicago lupulina</i>	0.17	33.33	0.25	0.50	0.68
<i>Melilotus officinalis</i>	0.17	16.67	0.25	0.17	0.23
<i>Neolepia campestre</i>	0.00	16.67	0.00	0.00	0.00
<i>Plantago lanceolata</i>	1.00	100.00	1.49	2.00	2.73
<i>Sonchus asper</i>	0.33	16.67	0.50	0.33	0.45
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.17	33.33	0.25	0.17	0.23
TOTAL INTRO. ANN. & BIEN. FORBS	1.8	100.0	2.7	3.2	4.3
INTRODUCED ANNUAL GRASSES					
<i>Bromus japonicus</i>	0.17	16.67	0.25	0.17	0.23
<i>Panicum capillare</i>	0.50	66.67	0.75	0.50	0.68
TOTAL INTRO. ANN. GRASSES	0.7	83.3	1.0	0.7	0.9
NATIVE PERENNIAL FORBS					
<i>Achillea lanulosa</i>	0.17	33.33	0.25	0.33	0.45
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	0.83	66.67	1.24	0.83	1.14
<i>Artemisia ludoviciana</i>	0.00	16.67	0.00	0.00	0.00
<i>Asclepias speciosa</i>	1.33	100.00	1.99	1.33	1.82
<i>Asclepias stenophylla</i>	0.00	16.67	0.00	0.00	0.00
<i>Comandra umbellata</i> ssp. <i>pallida</i>	0.17	16.67	0.25	0.17	0.23
<i>Dalea purpurea</i>	0.00	33.33	0.00	0.00	0.00
<i>Epilobium ciliatum</i>	0.00	33.33	0.00	0.00	0.00
<i>Heterotheca villosa</i>	0.00	16.67	0.00	0.00	0.00
<i>Liatris punctata</i>	0.00	16.67	0.00	0.00	0.00
<i>Lythrum alatum</i>	0.50	50.00	0.75	0.50	0.68
<i>Mentha arvensis</i>	0.50	16.67	0.75	0.50	0.68
<i>Oenothera villosa</i>	0.00	33.33	0.00	0.00	0.00
<i>Oligoneuron rigidum</i>	0.33	33.33	0.50	0.33	0.45
<i>Oxalis dillenii</i>	0.00	33.33	0.00	0.00	0.00
<i>Psoralidium tenuiflorum</i>	0.50	66.67	0.75	0.50	0.68
<i>Ratibida columnifera</i>	0.00	16.67	0.00	0.00	0.00
<i>Solidago speciosa</i> var. <i>pallida</i>	0.00	16.67	0.00	0.00	0.00
<i>Symphyotrichum laeve</i>	0.17	16.67	0.25	0.17	0.23
<i>Symphyotrichum lanceolatum</i> ssp. <i>hesperius</i>	0.17	33.33	0.25	0.17	0.23
<i>Symphyotrichum porteri</i>	0.67	33.33	1.00	0.67	0.91
<i>Thermopsis divaricarpa</i>	0.00	33.33	0.00	0.00	0.00
<i>Verbena hastata</i>	0.33	33.33	0.50	0.33	0.45
<i>Virgulus ericoides</i> group	1.33	83.33	1.99	1.50	2.05
TOTAL NATIVE PERENNIAL FORBS	7.0	100.0	10.4	7.3	10.0

Table 1. Cover Data - Area 3, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
INTRODUCED PERENNIAL FORBS					
<i>Acetosella vulgaris</i>	0.33	16.67	0.50	0.33	0.45
<i>Breca arvensis</i>	1.00	83.33	1.49	1.17	1.59
<i>Cichorium intybus</i>	2.83	100.00	4.23	3.17	4.32
<i>Convolvulus arvensis</i>	0.33	66.67	0.50	0.67	0.91
<i>Daucus carota</i>	9.50	83.33	14.18	10.33	14.09
<i>Hypericum perforatum</i>	0.00	16.67	0.00	0.00	0.00
<i>Medicago sativa</i>	0.00	16.67	0.00	0.00	0.00
<i>Rumex crispus</i>	0.00	16.67	0.00	0.00	0.00
<i>Taraxacum officinale</i>	0.00	33.33	0.00	0.00	0.00
<i>Trifolium pratense</i>	0.00	16.67	0.00	0.00	0.00
<i>Trifolium repens</i>	0.00	16.67	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL FORBS	14.0	100.0	20.9	15.7	21.4
NATIVE PERENNIAL GRASSES (cool)					
<i>Carex brevior</i>	0.00	33.33	0.00	0.00	0.00
<i>Carex lanuginosa</i>	1.83	50.00	2.74	1.83	2.50
<i>Carex microptera</i>	0.50	16.67	0.75	0.67	0.91
<i>Carex nebrascensis</i>	0.83	16.67	1.24	0.83	1.14
<i>Carex pennsylvanica</i> ssp. <i>heliophila</i>	0.17	16.67	0.25	0.17	0.23
<i>Carex praegracilis</i>	8.50	66.67	12.69	9.33	12.73
<i>Critesion jubatum</i>	0.00	33.33	0.00	0.00	0.00
<i>Cyperus erythrorhizos</i>	0.00	33.33	0.00	0.00	0.00
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	0.17	16.67	0.25	0.17	0.23
<i>Eleocharis palustris</i>	0.50	50.00	0.75	0.50	0.68
<i>Elymus trachycaulus</i>	0.00	50.00	0.00	0.00	0.00
<i>Juncus arcticus</i> ssp. <i>ater</i>	1.83	83.33	2.74	2.00	2.73
<i>Juncus interior</i>	0.17	16.67	0.25	0.17	0.23
<i>Juncus longistylis</i>	1.00	50.00	1.49	1.17	1.59
<i>Juncus saximontanus</i>	0.33	50.00	0.50	0.50	0.68
<i>Pascopyrum smithii</i>	0.00	16.67	0.00	0.00	0.00
<i>Poa agassizensis</i>	1.33	83.33	1.99	1.33	1.82
<i>Poa compressa</i>	1.17	83.33	1.74	1.17	1.59
<i>Typha latifolia</i>	0.17	33.33	0.25	0.17	0.23
TOTAL NATIVE PERENNIAL GRASSES (c)	18.5	100.0	27.6	20.0	27.3
INTRODUCED PERENNIAL GRASSES (cool)					
<i>Agrostis gigantea</i>	3.00	83.33	4.48	3.00	4.09
<i>Agrostis stolonifera</i>	0.50	16.67	0.75	0.50	0.68
<i>Bromopsis inermis</i>	0.67	16.67	1.00	0.83	1.14
<i>Dactylis glomerata</i>	0.00	50.00	0.00	0.00	0.00
<i>Phleum pratense</i>	0.17	50.00	0.25	0.17	0.23
TOTAL INTRO. PERENNIAL GRASSES (c)	4.3	100.0	6.5	4.5	6.1
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	4.00	83.33	5.97	4.00	5.45
<i>Aristida purpurea</i>	0.33	16.67	0.50	0.33	0.45
<i>Bouteloua curtipendula</i>	0.17	16.67	0.25	0.17	0.23
<i>Buchloe dactyloides</i>	0.00	16.67	0.00	0.00	0.00
<i>Chondrosum gracile</i>	0.00	33.33	0.00	0.00	0.00
<i>Distichlis stricta</i>	0.33	16.67	0.50	0.33	0.45
<i>Muhlenbergia cuspidata</i>	0.00	16.67	0.00	0.00	0.00
<i>Muhlenbergia richardsonis</i>	0.17	16.67	0.25	0.17	0.23
<i>Panicum virgatum</i>	3.67	100.00	5.47	4.17	5.68
<i>Schizachyrium scoparium</i>	0.33	50.00	0.50	0.33	0.45
<i>Sorghastrum avenaceum</i>	7.00	100.00	10.45	7.17	9.77
<i>Spartina pectinata</i>	1.83	33.33	2.74	1.83	2.50
<i>Sporobolus asper</i>	0.67	66.67	1.00	0.67	0.91
<i>Sporobolus heterolepis</i>	0.00	33.33	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL GRASSES (w)	18.5	100.0	27.6	19.2	26.1

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE SHRUBS					
<i>Crataegus macracantha</i> var. <i>occidentalis</i>	0.00	16.67	0.00	0.00	0.00
<i>Rosa sayi</i>	0.83	100.00	1.24	1.17	1.59
<i>Rosa woodsii</i>	0.33	50.00	0.50	0.67	0.91
<i>Symphoricarpos occidentalis</i>	0.17	50.00	0.25	0.17	0.23
TOTAL NATIVE SHRUBS	1.3	100.0	2.0	2.0	2.7
FERNS					
<i>Hippochaete hyemalis</i> ssp. <i>affinis</i>	0.00	33.33	0.00	0.00	0.00
<i>Hippochaete laevigata</i>	0.17	50.00	0.25	0.17	0.23
TOTAL FERNS	0.2	83.3	0.2	0.2	0.2
SUCCULENT					
<i>Opuntia macrorhiza</i>	0.00	16.67	0.00	0.00	0.00
TOTAL SUCCULENT	0.0	16.7	0.0	0.0	0.0
AGAVOIDS					
<i>Yucca glauca</i>	0.17	16.67	0.25	0.17	0.23
TOTAL AGAVOIDS	0.2	16.7	0.2	0.2	0.2
Standing dead	7.00	100.00		7.00	
Litter	22.67	100.00		22.67	
Bare soil	2.83	83.33		2.83	
Rock	0.50	16.67		0.50	
TOTALS	100.0			106.3	
TOTAL VEGETATION COVER	67.0 (s=6.1)		100.0	73.3 (s=13.2)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	97.2			103.5	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 37.2 Std.Dev.= 7.5)					

PLANT SPECIES	Percent Foliar Cover*					
	---Sample Number---					
	1	2	3	4	5	6
NATIVE ANNUAL & BIENNIAL FORBS						
<i>Gaura parviflora</i>	P			P		
<i>Grindelia squarrosa</i>					P	
<i>Pterogonum alatum</i>		3				
TOTAL NATIVE ANN. & BIEN. FORBS	P	3	--	P	P	--
INTRODUCED ANNUAL & BIENNIAL FORBS						
<i>Acosta diffusa</i>		P				
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>					P	
<i>Dianthus armeria</i>		P				
<i>Lactuca serriola</i>	P		P			
<i>Medicago lupulina</i>			1(2)		P	
<i>Melilotus officinalis</i>			1			
<i>Neolepia campestre</i>		P				
<i>Plantago lanceolata</i>	P	P	2(4)	1(1)	1(1)	2
<i>Sonchus asper</i>				2		
<i>Tragopogon dubius</i> ssp. <i>major</i>	P	1				
TOTAL INTRO. ANN. & BIEN. FORBS	P	1	4(6)	3(1)	1(1)	2
INTRODUCED ANNUAL GRASSES						
<i>Bromus japonicus</i>		1				
<i>Panicum capillare</i>	P			1	2	P
TOTAL INTRO. ANN. GRASSES	--	1	--	1	2	P
NATIVE PERENNIAL FORBS						
<i>Achillea lanulosa</i>		1	(1)			
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>		1	4		P	P
<i>Artemisia ludoviciana</i>		P				
<i>Asclepias speciosa</i>	2	P	1	2	3	P
<i>Asclepias stenophylla</i>		P				
<i>Comandra umbellata</i> ssp. <i>pallida</i>		1				
<i>Dalea purpurea</i>		P				P
<i>Epilobium ciliatum</i>	P			P		
<i>Heterotheca villosa</i>		P				
<i>Liatris punctata</i>		P				
<i>Lythrum alatum</i>	2			P	1	
<i>Mentha arvensis</i>				3		
<i>Oenothera villosa</i>	P			P		
<i>Oligoneuron rigidum</i>		1	1			
<i>Oxalis dillenii</i>		P				P
<i>Psoraleidum tenuiflorum</i>		1	1		1	P
<i>Ratibida columnifera</i>						P
<i>Solidago speciosa</i> var. <i>pallida</i>		P				
<i>Symphyotrichum laeve</i>		1				
<i>Symphyotrichum lanceolatum</i> ssp. <i>hesperius</i>	1			P		
<i>Symphyotrichum porteri</i>		4				P
<i>Thermopsis divaricarpa</i>	P					P
<i>Verbena hastata</i>	P			2		
<i>Virgulus ericoides</i> group		P	6(1)	1	P	1
TOTAL NATIVE PERENNIAL FORBS	5	10	13(2)	8	5	1

PLANT SPECIES	Percent Foliar Cover*					
	—Sample Number—					
	1	2	3	4	5	6
INTRODUCED PERENNIAL FORBS						
<i>Acetosella vulgaris</i>		2				
<i>Breea arvensis</i>	3		1(1)	1	P	1
<i>Cichorium intybus</i>	P	1	1	P	6(1)	9(1)
<i>Convolvulus arvensis</i>		P	1(1)		1(1)	P
<i>Daucus carota</i>		1	14(3)	10	9(1)	23(1)
<i>Hypericum perforatum</i>		P				
<i>Medicago sativa</i>						P
<i>Rumex crispus</i>	P					
<i>Taraxacum officinale</i>	P				P	
<i>Trifolium pratense</i>						P
<i>Trifolium repens</i>		P				
TOTAL INTRO. PERENNIAL FORBS	3	4	17(5)	11	16(3)	33(2)
NATIVE PERENNIAL GRASSES (cool)						
<i>Carex brevior</i>				P	P	
<i>Carex lanuginosa</i>	3			8	P	
<i>Carex microptera</i>			3(1)			
<i>Carex nebrascensis</i>				5		
<i>Carex pennsylvanica</i> ssp. <i>heliophila</i>		1				
<i>Carex praegracilis</i>	31(1)		9(3)	9(1)	2	
<i>Critesion jubatum</i>	P			P		
<i>Cyperus erythrorhizos</i>	P			P		
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>		1				
<i>Eleocharis palustris</i>	2			1	P	
<i>Elymus trachycaulus</i>	P			P	P	
<i>Juncus arcticus</i> ssp. <i>ater</i>	4	P	4(1)	P	3	
<i>Juncus interior</i>	1					
<i>Juncus longistylis</i>	1			5(1)	P	
<i>Juncus saximontanus</i>	(1)			2	P	
<i>Pascopyrum smithii</i>				P		
<i>Poa agassizensis</i>	P	5	P	1		2
<i>Poa compressa</i>	P	6	P	P		1
<i>Typha latifolia</i>	P			1		
TOTAL NATIVE PERENNIAL GRASSES (c)	42(2)	13	16(5)	32(2)	5	3
INTRODUCED PERENNIAL GRASSES (cool)						
<i>Agrostis gigantea</i>		P	3	8	7	P
<i>Agrostis stolonifera</i>	3					
<i>Bromopsis inermis</i>			4(1)			
<i>Dactylis glomerata</i>		P	P			P
<i>Phleum pratense</i>		P	P			1
TOTAL INTRO. PERENNIAL GRASSES (c)	3	P	7(1)	8	7	1
NATIVE PERENNIAL GRASSES (warm)						
<i>Andropogon gerardii</i>	P	11	1		11	1
<i>Aristida purpurea</i>		2				
<i>Bouteloua curtipendula</i>						1
<i>Buchloe dactyloides</i>					P	
<i>Chondrosium gracile</i>		P				P
<i>Distichlis stricta</i>					2	
<i>Muhlenbergia cuspidata</i>	P					
<i>Muhlenbergia richardsonis</i>				1		
<i>Panicum virgatum</i>	1	2	5(3)	4	6	4
<i>Schizachyrium scoparium</i>		P	1	1		
<i>Sorghastrum avenaceum</i>	2	11	5	4	9(1)	11
<i>Spartina pectinata</i>	10			1		
<i>Sporobolus asper</i>	P		P		P	4
<i>Sporobolus heterolepis</i>		P	P			
TOTAL NATIVE PERENNIAL GRASSES (w)	13	26	12(3)	11	28(1)	21

PLANT SPECIES	Percent Foliar Cover*					
	—Sample Number—					
	1	2	3	4	5	6
NATIVE SHRUBS						
<i>Crataegus macracantha</i> var. <i>occidentalis</i>		P				
<i>Rosa sayi</i>	1	1	3(2)	P	P	P
<i>Rosa woodsii</i>	2(2)	P				P
<i>Symphoricarpos occidentalis</i>	1	P		P		
TOTAL NATIVE SHRUBS	4(2)	1	3(2)	P	P	P
FERNS						
<i>Hippochaete hyemalis</i> ssp. <i>affinis</i>					P	P
<i>Hippochaete laevigata</i>	P		1	P		
TOTAL FERNS	P	--	1	P	P	P
SUCCULENT						
<i>Opuntia macrorhiza</i>		P				
TOTAL SUCCULENT	--	P	--	--	--	--
AGAVOIDS						
<i>Yucca glauca</i>		1				
TOTAL AGAVOIDS	--	1	--	--	--	--
Standing dead	8	13	10	5	3	3
Litter	22	25	15	18	29	27
Bare soil		2	2	3	4	6
Rock						3
TOTALS	100	100	100	100	100	100
TOTAL VEGETATION COVER	70(4)	60	73(24)	74(3)	64(5)	61(2)
GROUND COVER (Litter+Rock+Veg+St. Dead)	100(4)	98	98(24)	97(3)	96(5)	94(2)
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 37.2 Std.Dev.= 7.5)	40	50	31	39	32	31

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

Table 2. Cover Data - Area 6, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION		RELATIVE VEGETATION		Percent Foliar Cover*	
			COVER (%)	COVER-ALL (%)	COVER-ALL (%)	---Sample Number---		
							1	2
INTRODUCED ANNUAL & BIENNIAL FORBS								
<i>Melilotus alba</i>	0.00	100.00	0.00	0.00	0.00		P	P
<i>Plantago lanceolata</i>	0.00	50.00	0.00	0.00	0.00		P	
TOTAL INTRO. ANN. & BIEN. FORBS	0.0	100.0	0.0	0.0	0.0		P	P
INTRODUCED ANNUAL GRASSES								
<i>Panicum capillare</i>	0.00	50.00	0.00	0.00	0.00		P	
TOTAL INTRO. ANN. GRASSES	0.0	50.0	0.0	0.0	0.0		P	---
NATIVE PERENNIAL FORBS								
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	0.00	50.00	0.00	0.00	0.00		P	
<i>Asclepias speciosa</i>	3.50	100.00	4.02	4.00	4.17		5(1)	2
<i>Glycyrrhiza lepidota</i>	0.00	50.00	0.00	0.00	0.00		P	
<i>Oenothera villosa</i>	0.00	50.00	0.00	0.00	0.00		P	
<i>Virgulus ericoides</i> group	0.00	50.00	0.00	0.00	0.00		P	
TOTAL NATIVE PERENNIAL FORBS	3.5	100.0	4.0	4.0	4.2		5(1)	2
INTRODUCED PERENNIAL FORBS								
<i>Breera arvensis</i>	2.50	100.00	2.87	3.00	3.13		4(1)	1
<i>Convolvulus arvensis</i>	0.00	50.00	0.00	0.00	0.00		P	
<i>Rumex crispus</i>	0.00	50.00	0.00	0.00	0.00			P
<i>Taraxacum officinale</i>	0.00	50.00	0.00	0.00	0.00			P
TOTAL INTRO. PERENNIAL FORBS	2.5	100.0	2.9	3.0	3.1		4(1)	1
NATIVE PERENNIAL GRASSES (cool)								
<i>Carex brevior</i>	0.50	50.00	0.57	0.50	0.52			1
<i>Carex praegracilis</i>	11.00	100.00	12.64	13.50	14.06		14(2)	8(3)
<i>Carex vulpinoidea</i>	0.50	50.00	0.57	0.50	0.52		1	
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	0.00	50.00	0.00	0.00	0.00		P	
<i>Eleocharis palustris</i>	0.00	50.00	0.00	0.00	0.00		P	
<i>Juncus arcticus</i> ssp. <i>ater</i>	15.50	100.00	17.82	15.50	16.15		31	P
<i>Juncus longistylis</i>	0.00	50.00	0.00	0.00	0.00			P
<i>Poa agassizensis</i>	5.50	100.00	6.32	5.50	5.73		8	3
TOTAL NATIVE PERENNIAL GRASSES (c)	33.0	100.0	37.9	35.5	37.0		54(2)	12(3)
INTRODUCED PERENNIAL GRASSES (cool)								
<i>Agrostis gigantea</i>	1.00	100.00	1.15	1.00	1.04		P	2
<i>Phleum pratense</i>	0.50	100.00	0.57	0.50	0.52		P	1
TOTAL INTRO. PERENNIAL GRASSES (c)	1.5	100.0	1.7	1.5	1.6		P	3
NATIVE PERENNIAL GRASSES (warm)								
<i>Andropogon gerardii</i>	18.00	100.00	20.69	20.50	21.35		(1)	36(4)
<i>Muhlenbergia asperifolia</i>	0.00	50.00	0.00	0.00	0.00			P
<i>Panicum virgatum</i>	16.50	100.00	18.97	17.50	18.23		1	32(2)
<i>Schizachyrium scoparium</i>	1.00	50.00	1.15	1.00	1.04		2	
<i>Sporobolus asper</i>	0.50	50.00	0.57	0.50	0.52		1	
TOTAL NATIVE PERENNIAL GRASSES (w)	36.0	100.0	41.4	39.5	41.1		4(1)	68(6)

Table 2. Cover Data - Area 6, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE	AVERAGE	RELATIVE	Percent Foliar Cover*	
			VEGETATION COVER (%)	COVER-ALL COVER-ALL (%)	VEGETATION COVER-ALL (%)	Sample Number— 1	2
NATIVE SHRUBS							
Rosa arkansana	9.00	100.00	10.34	10.50	10.94	17(3)	1
Symphoricarpos occidentalis	1.50	50.00	1.72	2.00	2.08	3(1)	
TOTAL NATIVE SHRUBS	10.5	100.0	12.1	12.5	13.0	20(4)	1
Standing dead	4.50	100.00		4.50		5	4
Litter	8.50	100.00		8.50		8	9
TOTALS	100.0			109.0		100	100
TOTAL VEGETATION COVER	87.0 (s=0.0)		100.0	96.0 (s=0.0)	100.0	87(9)	87(9)
GROUND COVER (Litter+Rock+Veg+St.Dead)	100.0			109.0		100(9)	100(9)
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 20.0 Std.Dev.= 5.7)						24	16

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

Table 3. Cover Data - Area 7, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Chenopodium berlandieri</i>	0.00	10.00	0.00	0.00	0.00
<i>Chenopodium leptophyllum</i>	0.00	10.00	0.00	0.00	0.00
<i>Cirsium undulatum</i>	0.00	50.00	0.00	0.00	0.00
<i>Erigeron divergens</i>	0.00	20.00	0.00	0.00	0.00
<i>Gaura parviflora</i>	0.00	10.00	0.00	0.00	0.00
<i>Grindelia squarrosa</i>	0.20	20.00	0.41	0.20	0.40
<i>Plantago patagonica</i>	0.00	10.00	0.00	0.00	0.00
<i>Pterogonum alatum</i>	0.20	10.00	0.41	0.20	0.40
<i>Silene antirrhina</i>	0.00	20.00	0.00	0.00	0.00
TOTAL NATIVE ANN. & BIEN. FORBS	0.4	70.0	0.8	0.4	0.8
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	0.10	10.00	0.21	0.10	0.20
<i>Alyssum desertorum</i>	0.00	10.00	0.00	0.00	0.00
<i>Alyssum parviflorum</i>	0.20	20.00	0.41	0.20	0.40
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	0.30	50.00	0.62	0.30	0.60
<i>Camelina microcarpa</i>	0.00	10.00	0.00	0.00	0.00
<i>Conyza canadensis</i>	0.00	10.00	0.00	0.00	0.00
<i>Cynoglossum officinale</i>	0.10	10.00	0.21	0.10	0.20
<i>Dianthus armeria</i>	0.10	30.00	0.21	0.10	0.20
<i>Erodium cicutarium</i>	0.30	40.00	0.62	0.40	0.80
<i>Fallopia convolvulus</i>	0.00	10.00	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	20.00	0.00	0.00	0.00
<i>Melilotus officinalis</i>	0.00	10.00	0.00	0.00	0.00
<i>Neolepia campestre</i>	0.00	20.00	0.00	0.00	0.00
<i>Plantago lanceolata</i>	0.60	60.00	1.24	0.70	1.41
<i>Sisymbrium altissimum</i>	0.00	20.00	0.00	0.00	0.00
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.10	70.00	0.21	0.10	0.20
TOTAL INTRO. ANN. & BIEN. FORBS	1.8	100.0	3.7	2.0	4.0
INTRODUCED ANNUAL GRASSES					
<i>Anisantha tectorum</i>	0.00	10.00	0.00	0.00	0.00
<i>Bromus japonicus</i>	0.20	60.00	0.41	0.30	0.60
<i>Panicum capillare</i>	0.00	20.00	0.00	0.00	0.00
TOTAL INTRO. ANN. GRASSES	0.2	60.0	0.4	0.3	0.6
NATIVE PERENNIAL FORBS					
<i>Achillea lanulosa</i>	0.00	30.00	0.00	0.00	0.00
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	0.70	70.00	1.45	0.70	1.41
<i>Artemisia ludoviciana</i>	0.00	60.00	0.00	0.00	0.00
<i>Astragalus shortianus</i>	0.00	10.00	0.00	0.00	0.00
<i>Astragalus</i> spp.	0.00	10.00	0.00	0.00	0.00
<i>Brickellia rosmarinifolia</i> ssp. <i>chlorolepis</i>	0.00	30.00	0.00	0.00	0.00
<i>Cerastium strictum</i>	0.00	20.00	0.00	0.00	0.00
<i>Comandra umbellata</i> ssp. <i>pallida</i>	0.00	30.00	0.00	0.00	0.00
<i>Dalea candida</i> var. <i>oligophylla</i>	0.00	20.00	0.00	0.00	0.00
<i>Dalea purpurea</i>	0.00	40.00	0.00	0.00	0.00
<i>Drymocallis fissa</i>	0.00	10.00	0.00	0.00	0.00
<i>Erigeron flagellaris</i>	0.00	10.00	0.00	0.00	0.00
<i>Eriogonum umbellatum</i>	0.20	10.00	0.41	0.20	0.40
<i>Evolvulus nuttallianus</i>	0.00	10.00	0.00	0.00	0.00
<i>Gaura coccinea</i>	0.00	10.00	0.00	0.00	0.00
<i>Geranium richardsonii</i>	0.00	10.00	0.00	0.00	0.00
<i>Heterotheca villosa</i>	0.00	60.00	0.00	0.00	0.00
<i>Iris missouriensis</i>	0.10	10.00	0.21	0.10	0.20
<i>Iva axillaris</i>	0.00	10.00	0.00	0.00	0.00
<i>Lesquerella montana</i>	0.00	10.00	0.00	0.00	0.00

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE PERENNIAL FORBS (continued)					
<i>Leucocrinum montanum</i>	0.20	20.00	0.41	0.20	0.40
<i>Liatris punctata</i>	0.00	80.00	0.00	0.00	0.00
<i>Lithospermum incisum</i>	0.00	10.00	0.00	0.00	0.00
<i>Lupinus argenteus</i>	0.00	10.00	0.00	0.00	0.00
<i>Lupinus</i> spp.	0.00	10.00	0.00	0.00	0.00
<i>Mentha arvensis</i>	0.00	10.00	0.00	0.00	0.00
<i>Oenothera villosa</i>	0.00	10.00	0.00	0.00	0.00
<i>Oligoneuron rigidum</i>	0.00	10.00	0.00	0.00	0.00
<i>Oligosporus dracunculus</i> ssp. <i>glaucus</i>	0.00	30.00	0.00	0.00	0.00
<i>Onosmodium molle</i> ssp. <i>occidentale</i>	0.00	30.00	0.00	0.00	0.00
<i>Oxalis dillenii</i>	0.00	30.00	0.00	0.00	0.00
<i>Oxybaphus hirsutus</i>	0.00	10.00	0.00	0.00	0.00
<i>Oxybaphus linearis</i>	0.10	60.00	0.21	0.10	0.20
<i>Oxybaphus nyctagineus</i>	0.00	10.00	0.00	0.00	0.00
<i>Paronychia jamesii</i>	0.00	10.00	0.00	0.00	0.00
<i>Penstemon secundiflorus</i>	0.00	10.00	0.00	0.00	0.00
<i>Phyla cuneifolia</i>	0.00	20.00	0.00	0.00	0.00
<i>Potentilla hippiana</i>	0.00	10.00	0.00	0.00	0.00
<i>Psoralea tenuiflorum</i>	0.80	80.00	1.66	0.80	1.61
<i>Ratibida columnifera</i>	0.00	50.00	0.00	0.00	0.00
<i>Senecio spartioides</i>	0.00	10.00	0.00	0.00	0.00
<i>Symphyotrichum porteri</i>	0.20	50.00	0.41	0.20	0.40
<i>Thelesperma megapotamicum</i>	0.00	10.00	0.00	0.00	0.00
<i>Thermopsis divaricarpa</i>	0.30	30.00	0.62	0.30	0.60
<i>Tithymalus brachyceras</i>	0.00	10.00	0.00	0.00	0.00
<i>Tragia ramosa</i>	0.10	10.00	0.21	0.10	0.20
<i>Verbena hastata</i>	0.40	10.00	0.83	0.60	1.20
<i>Virgulus ericoides</i>	0.00	30.00	0.00	0.00	0.00
<i>Virgulus ericoides</i> group	0.30	70.00	0.62	0.30	0.60
<i>Virgulus falcatus</i>	0.10	10.00	0.21	0.10	0.20
TOTAL NATIVE PERENNIAL FORBS	3.5	100.0	7.2	3.7	7.4
INTRODUCED PERENNIAL FORBS					
<i>Acetosella vulgaris</i>	0.30	50.00	0.62	0.30	0.60
<i>Breua arvensis</i>	0.10	40.00	0.21	0.40	0.80
<i>Cichorium intybus</i>	1.10	80.00	2.28	1.20	2.41
<i>Convolvulus arvensis</i>	0.80	60.00	1.66	0.80	1.61
<i>Daucus carota</i>	0.00	10.00	0.00	0.00	0.00
<i>Hypericum perforatum</i>	0.00	40.00	0.00	0.00	0.00
<i>Taraxacum officinale</i>	0.20	20.00	0.41	0.20	0.40
<i>Trifolium pratense</i>	0.10	20.00	0.21	0.10	0.20
<i>Verbena bracteata</i>	0.00	10.00	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL FORBS	2.6	100.0	5.4	3.0	6.0
NATIVE PERENNIAL GRASSES (cool)					
<i>Agrostis</i> spp.	0.00	20.00	0.00	0.00	0.00
<i>Carex douglasii</i>	0.20	10.00	0.41	0.20	0.40
<i>Carex nebrascensis</i>	0.00	10.00	0.00	0.00	0.00
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	0.60	70.00	1.24	0.60	1.20
<i>Carex praegracilis</i>	0.00	10.00	0.00	0.00	0.00
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	0.30	50.00	0.62	0.30	0.60
<i>Eleocharis palustris</i>	0.20	10.00	0.41	0.20	0.40
<i>Hesperostipa comata</i>	0.60	50.00	1.24	0.60	1.20
<i>Juncus arcticus</i> ssp. <i>ater</i>	1.00	80.00	2.07	1.10	2.21
<i>Juncus longistylis</i>	0.60	10.00	1.24	0.60	1.20
<i>Koeleria macrantha</i>	0.10	10.00	0.21	0.10	0.20
<i>Pascopyrum smithii</i>	0.30	20.00	0.62	0.30	0.60
<i>Poa agassizensis</i>	1.90	50.00	3.93	1.90	3.82
<i>Poa compressa</i>	0.40	50.00	0.83	0.40	0.80
<i>Poa secunda</i>	0.70	10.00	1.45	0.70	1.41
TOTAL NATIVE PERENNIAL GRASSES (c)	6.9	100.0	14.3	7.0	14.1

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
INTRODUCED PERENNIAL GRASSES (cool)					
Bromopsis inermis	0.00	10.00	0.00	0.00	0.00
Dactylis glomerata	0.20	20.00	0.41	0.20	0.40
TOTAL INTRO. PERENNIAL GRASSES (c)	0.2	30.0	0.4	0.2	0.4
NATIVE PERENNIAL GRASSES (warm)					
Andropogon gerardii	8.60	90.00	17.81	8.70	17.47
Aristida purpurea	0.00	30.00	0.00	0.00	0.00
Bouteloua curtipendula	0.70	70.00	1.45	0.70	1.41
Buchloe dactyloides	0.10	40.00	0.21	0.10	0.20
Chondrosium gracile	3.60	90.00	7.45	3.60	7.23
Chondrosium hirsutum	0.00	20.00	0.00	0.00	0.00
Muhlenbergia cuspidata	0.90	40.00	1.86	0.90	1.81
Muhlenbergia montana	0.40	40.00	0.83	0.40	0.80
Panicum virgatum	5.50	100.00	11.38	5.50	11.04
Schizachyrium scoparium	1.30	80.00	2.69	1.30	2.61
Sorghastrum avenaceum	0.30	70.00	0.62	0.30	0.60
Spartina pectinata	7.30	20.00	15.11	7.50	15.06
Sporobolus asper	0.70	30.00	1.45	0.70	1.41
Sporobolus cryptandrus	0.30	40.00	0.62	0.30	0.60
Sporobolus heterolepis	0.80	60.00	1.66	0.80	1.61
TOTAL NATIVE PERENNIAL GRASSES (w)	30.4	100.0	63.1	30.7	61.8
NATIVE SUBSHRUBS					
Artemisia frigida	0.50	70.00	1.04	0.50	1.00
Gutierrezia sarothrae	0.00	10.00	0.00	0.00	0.00
TOTAL NATIVE SUBSHRUBS	0.5	70.0	1.0	0.5	1.0
NATIVE SHRUBS					
Amorpha nana	0.00	20.00	0.00	0.00	0.00
Rosa sayi	0.40	40.00	0.83	0.50	1.00
Rosa woodsii	0.30	30.00	0.62	0.30	0.60
Symphoricarpos occidentalis	0.00	20.00	0.00	0.00	0.00
TOTAL NATIVE SHRUBS	0.8	60.0	1.5	0.9	1.6
INTRODUCED SHRUBS					
Rhamnus cathartica	0.00	10.00	0.00	0.00	0.00
TOTAL INTRODUCED SHRUBS	0.0	10.0	0.0	0.0	0.0
FERNS					
Hippochaete laevigata	0.00	10.00	0.00	0.00	0.00
TOTAL FERNS	0.0	10.0	0.0	0.0	0.0
SUCCULENT					
Echinocereus viridiflorus	0.50	50.00	1.04	0.50	1.00
Opuntia fragilis	0.00	30.00	0.00	0.10	0.20
Opuntia macrorhiza	0.50	80.00	1.04	0.50	1.00
TOTAL SUCCULENT	1.0	80.0	2.1	1.1	2.2
AGAVOIDS					
Yucca glauca	0.00	30.00	0.00	0.00	0.00
TOTAL AGAVOIDS	0.0	30.0	0.0	0.0	0.0

Table 3. Cover Data - Area 7, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
Standing dead	3.10	100.00		3.10	
Litter	23.70	100.00		23.70	
Bare soil	19.50	100.00		19.50	
Rock	5.40	80.00		5.40	
TOTALS	100.0			101.5	
TOTAL VEGETATION COVER	48.3 (s=14.4)		100.0	49.8 (s=16.0)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	80.5			82.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 39.6 Std.Dev.= 14.4)					

PLANT SPECIES	Percent Foliar Cover*									
	—Sample Number—									
	1	2	3	4	5	6	7	8	9	10
NATIVE PERENNIAL FORBS (continued)										
<i>Leucocrinum montanum</i>						1				1
<i>Liatris punctata</i>	P	P	P	P	P	P			P	P
<i>Lithospermum incisum</i>					P					
<i>Lupinus argenteus</i>									P	
<i>Lupinus spp.</i>						P				
<i>Mentha arvensis</i>								P		
<i>Oenothera villosa</i>		P								
<i>Oligoneuron rigidum</i>				P						
<i>Oligosporus dracunculus ssp. glaucus</i>		P	P							P
<i>Onosmodium molle ssp. occidentale</i>		P				P				P
<i>Oxalis dillenii</i>		P		P						P
<i>Oxybaphus hirsutus</i>						P				
<i>Oxybaphus linearis</i>		P	P	1		P			P	P
<i>Oxybaphus nyctagineus</i>									P	
<i>Paronychia jamesii</i>										P
<i>Penstemon secundiflorus</i>			P							
<i>Phyla cuneifolia</i>						P				P
<i>Potentilla hippiana</i>									P	
<i>Psoralea tenuiflora</i>	P	P	2	2	P	P			2	2
<i>Ratibida columnifera</i>		P	P		P	P			P	
<i>Senecio spartioides</i>										P
<i>Symphyotrichum porteri</i>	1		P	P					P	1
<i>Thelesperma megapotamicum</i>					P					
<i>Thermopsis divaricata</i>		P			3		P			
<i>Tithymalus brachyceras</i>			P							
<i>Tragia ramosa</i>										1
<i>Verbena hastata</i>								4(2)		
<i>Virgulus ericoides</i>	P	P	P							
<i>Virgulus ericoides group</i>			P	P	P	P	3		P	P
<i>Virgulus falcatus</i>	1									
TOTAL NATIVE PERENNIAL FORBS	2	P	4	3	3	4	4	4(2)	4	7
INTRODUCED PERENNIAL FORBS										
<i>Acetosella vulgaris</i>		P	P			P			P	3
<i>Brexa arvensis</i>		P			P	P		1(3)		
<i>Cichorium intybus</i>	4(1)	P		1	1	P	1		4	P
<i>Convolvulus arvensis</i>	1	P		P	4	P			3	
<i>Daucus carota</i>									P	
<i>Hypericum perforatum</i>		P		P		P				P
<i>Taraxacum officinale</i>									1	1
<i>Trifolium pratense</i>								P	1	
<i>Verbena bracteata</i>		P								
TOTAL INTRO. PERENNIAL FORBS	5(1)	P	P	1	5	P	1	1(3)	9	4
NATIVE PERENNIAL GRASSES (cool)										
<i>Agrostis spp.</i>	P						P			
<i>Carex douglasii</i>							2			
<i>Carex nebrascensis</i>								P		
<i>Carex pensylvanica ssp. heliophila</i>		2	P	P	P	2			2	P
<i>Carex praegracilis</i>								P		
<i>Dichanthelium oligosanthes var. scribnerianum</i>	P	P	1			2	P			
<i>Eleocharis palustris</i>								2		
<i>Hesperostipa comata</i>		3	1			1			P	1
<i>Juncus arcticus ssp. ater</i>	P	1		P	3	3	3(1)	P	P	
<i>Juncus longistylis</i>								6		
<i>Koeleria macrantha</i>						1				1
<i>Pascopyrum smithii</i>					2	1				
<i>Poa agassizensis</i>				P	5		3		7	4
<i>Poa compressa</i>	1			P			P		3	P
<i>Poa secunda</i>									7	
TOTAL NATIVE PERENNIAL GRASSES (c)	1	6	2	P	10	9	8(1)	8	19	6

PLANT SPECIES	Percent Foliar Cover*									
	—Sample Number—									
	1	2	3	4	5	6	7	8	9	10
INTRODUCED PERENNIAL GRASSES (cool)										
Bromopsis inermis					P					
Dactylis glomerata									2	P
TOTAL INTRO. PERENNIAL GRASSES (c)	—	—	—	—	P	—	—	—	2	P
NATIVE PERENNIAL GRASSES (warm)										
Andropogon gerardii	6	9	12	17	18	7	4		12(1)	1
Aristida purpurea		P		P						P
Bouteloua curtipendula		P	1	2	1	P			P	3
Buchloe dactyloides	1	P		P					P	
Chondrosum gracile	2	6	2	5	P	2	P		2	17
Chondrosum hirsutum	P			P						
Muhlenbergia cuspidata	P	3					6			P
Muhlenbergia montana		P	3			1				P
Panicum virgatum	4	9	3	1	8	15	13	1	P	1
Schizachyrium scoparium	2	1	P	5		P	P		5	P
Sorghastrum avenaceum	2	P		P		P	1		P	P
Spartina pectinata					8			65(2)		
Sporobolus asper	7			P			P			
Sporobolus cryptandrus		3	P						P	P
Sporobolus heterolepis	2	P	P	1	P		5			
TOTAL NATIVE PERENNIAL GRASSES (w)	26	31	21	31	35	25	29	66(2)	19(1)	21
NATIVE SUBSHRUBS										
Artemisia frigida		1	2	P	P	P			P	2
Gutierrezia sarothrae									P	
TOTAL NATIVE SUBSHRUBS	—	1	2	P	P	P	—	—	P	2
NATIVE SHRUBS										
Amorpha nana		P							P	
Rosa sayi		P			P		4(1)		P	
Rosa woodsii					3	P				P
Symphoricarpos occidentalis		P			P					
TOTAL NATIVE SHRUBS	—	P	—	—	3	P	4(1)	—	P	1
INTRODUCED SHRUBS										
Rhamnus cathartica										P
TOTAL INTRODUCED SHRUBS	—	—	—	—	—	—	—	—	—	P
FERNS										
Hippochaete laevigata						P				
TOTAL FERNS	—	—	—	—	—	P	—	—	—	—
SUCCULENT										
Echinocereus viridiflorus		P	5	P		P				P
Opuntia fragilis		(1)	P							P
Opuntia macrorhiza	P	1	2	1	P	1			P	P
TOTAL SUCCULENT	P	1(1)	7	1	P	1	—	—	P	P
AGAVOIDS										
Yucca glauca			P			P				P
TOTAL AGAVOIDS	—	—	P	—	—	P	—	—	—	P

PLANT SPECIES	Percent Foliar Cover*									
	---Sample Number---									
	1	2	3	4	5	6	7	8	9	10
Standing dead	3	4	5	5	2	1	3	1	3	4
Litter	27	32	20	21	28	30	23	7	14	35
Bare soil	26	20	23	30	9	24	26	12	20	5
Rock	10	3	14	8	2	4			2	11
TOTALS	100	100	100	100	100	100	100	100	100	100
TOTAL VEGETATION COVER	34(1)	41(3)	38	36	59	41	48(3)	80(7)	61(1)	45
GROUND COVER (Litter+Rock+Veg+St. Dead)	74(1)	80(3)	77	70	91	76	74(3)	88(7)	80(1)	95
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 39.6 Std.Dev.= 14.4)	26	54	44	39	37	47	21	17	52	59

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Gaura parviflora</i>	10.00										P
TOTAL NATIVE ANN. & BIEN. FORBS	10.0	—	—	—	—	—	—	—	—	—	P
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Lactuca serriola</i>	30.00					P	P				P
<i>Plantago lanceolata</i>	30.00	P	P								P
<i>Tragopogon dubius</i> ssp. <i>major</i>	10.00				P						
TOTAL INTRO. ANN. & BIEN. FORBS	60.0	P	P	—	P	P	P	—	—	—	P
INTRODUCED ANNUAL GRASSES											
<i>Panicum capillare</i>	40.00	P	P	P							P
TOTAL INTRO. ANN. GRASSES	40.0	P	P	P	—	—	—	—	—	—	P
NATIVE PERENNIAL FORBS											
<i>Asclepias speciosa</i>	50.00	P	P	P	P	P					
<i>Epilobium ciliatum</i>	20.00									P	P
<i>Lythrum alatum</i>	30.00								P	P	P
<i>Oenothera villosa</i>	20.00								P	P	
<i>Symphytotrichum lanceolatum</i> ssp. <i>hesperius</i>	10.00									P	
<i>Thermopsis divaricarpa</i>	10.00										P
<i>Verbena hastata</i>	20.00								P	P	
TOTAL NATIVE PERENNIAL FORBS	80.0	P	P	P	P	P	—	—	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Breera arvensis</i>	70.00		P	P		P	P		P	P	P
<i>Taraxacum officinale</i>	20.00				P		P				
TOTAL INTRO. PERENNIAL FORBS	80.0	—	P	P	P	P	P	—	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex lanuginosa</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Carex praegracilis</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Cyperus erythrorhizos</i>	10.00					P					
<i>Eleocharis palustris</i>	30.00					P	P	P			
<i>Elymus trachycaulus</i>	50.00			P	P		P	P	P		
<i>Juncus arcticus</i> ssp. <i>ater</i>	70.00				P	P	P	P	P	P	P
<i>Juncus interior</i>	80.00	P		P		P	P	P	P	P	P
<i>Juncus longistylis</i>	10.00										P
<i>Juncus saximontanus</i>	20.00								P	P	
<i>Poa agassizensis</i>	90.00		P	P	P	P	P	P	P	P	P
<i>Poa compressa</i>	10.00	P									
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis stolonifera</i>	40.00	P	P	P	P						
TOTAL INTRO. PERENNIAL GRASSES (c)	40.0	P	P	P	P	—	—	—	—	—	—
NATIVE PERENNIAL GRASSES (warm)											
<i>Muhlenbergia cuspidata</i>	10.00								P		
<i>Panicum virgatum</i>	10.00				P						
<i>Sorghastrum avenaceum</i>	40.00	P	P	P			P				
<i>Spartina pectinata</i>	50.00					P	P	P		P	P
<i>Sporobolus asper</i>	20.00	P			P						
TOTAL NATIVE PERENNIAL GRASSES (w)	90.0	P	P	P	P	P	P	P	—	P	P
NATIVE SHRUBS											
<i>Rosa sayi</i>	40.00		P					P	P	P	
<i>Rosa woodsii</i>	50.00	P	P	P					P	P	
<i>Symphoricarpos occidentalis</i>	10.00					P					
TOTAL NATIVE SHRUBS	70.0	P	P	P	—	P	—	P	P	P	—
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 12.1 Std.Dev.= 1.9)		11	11	12	10	12	12	10	13	16	14

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
NATIVE SHRUBS											
<i>Crataegus macracantha</i> var. <i>occidentalis</i>	20.00					P	P				
<i>Rosa sayi</i>	10.00								P		
<i>Rosa woodsii</i>	10.00								P		
TOTAL NATIVE SHRUBS	30.0	--	--	--	--	P	P	--	P	--	--
SUCCULENT											
<i>Opuntia macrorhiza</i>	50.00		P	P					P	P	P
TOTAL SUCCULENT	50.0	--	P	P	--	--	--	--	P	P	P
AGAVOIDS											
<i>Yucca glauca</i>	30.00		P	P				P			
TOTAL AGAVOIDS	30.0	--	P	P	--	--	--	P	--	--	--
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 18.0 Std.Dev.= 2.8)		14	21	19	18	13	21	18	17	18	21

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Medicago lupulina</i>	20.00						P		P		
<i>Melilotus officinalis</i>	10.00								P		
<i>Plantago lanceolata</i>	60.00	P	P	P			P			P	P
TOTAL INTRO. ANN. & BIEN. FORBS	70.0	P	P	P	--	--	P	--	P	P	P
NATIVE PERENNIAL FORBS											
<i>Achillea lanulosa</i>	10.00		P								
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	80.00	P		P	P	P	P	P		P	P
<i>Asclepias speciosa</i>	30.00	P	P						P		
<i>Oligoneuron rigidum</i>	60.00	P	P		P	P	P		P		
<i>Psoraleidum tenuiflorum</i>	40.00		P				P	P	P		
<i>Virgulus ericoides</i> group	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>Breea arvensis</i>	10.00		P								
<i>Cichorium intybus</i>	70.00	P	P	P		P	P			P	P
<i>Convolvulus arvensis</i>	40.00	P	P				P	P			
<i>Daucus carota</i>	100.00	P	P	P	P	P	P	P	P	P	P
TOTAL INTRO. PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex microptera</i>	50.00	P		P	P	P	P				
<i>Carex praegracilis</i>	90.00	P	P	P	P	P	P		P	P	P
<i>Juncus arcticus</i> ssp. <i>ater</i>	80.00	P	P	P	P	P	P	P	P		
<i>Poa agassizensis</i>	30.00	P	P					P			
<i>Poa compressa</i>	30.00					P	P		P		
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis gigantea</i>	50.00	P		P	P	P			P		
<i>Bromopsis inermis</i>	60.00				P		P	P	P	P	P
<i>Dactylis glomerata</i>	10.00	P									
<i>Phleum pratense</i>	10.00	P									
TOTAL INTRO. PERENNIAL GRASSES (c)	90.0	P	--	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	70.00		P	P	P		P		P	P	P
<i>Panicum virgatum</i>	80.00		P		P	P	P	P	P	P	P
<i>Schizachyrium scoparium</i>	20.00				P						P
<i>Sorghastrum avenaceum</i>	100.00	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
NATIVE SHRUBS											
<i>Rosa sayi</i>	20.00		P	P							
TOTAL NATIVE SHRUBS	20.0	--	P	P	--	--	--	--	--	--	--
FERNS											
<i>Hippochaete laevigata</i>	70.00	P	P	P	P	P			P	P	
TOTAL FERNS	70.0	P	P	P	P	P	--	--	P	P	--
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 13.8 Std.Dev.= 2.9)		17	18	13	14	13	17	10	15	10	11

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Gaura parviflora</i>	10.00				P						
TOTAL NATIVE ANN. & BIEN. FORBS	10.0	---	---	---	P	---	---	---	---	---	---
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Plantago lanceolata</i>	40.00	P					P	P	P		
<i>Sonchus asper</i>	20.00		P	P							
TOTAL INTRO. ANN. & BIEN. FORBS	60.0	P	P	P	---	---	P	P	P	---	---
INTRODUCED ANNUAL GRASSES											
<i>Panicum capillare</i>	10.00				P						
TOTAL INTRO. ANN. GRASSES	10.0	---	---	---	P	---	---	---	---	---	---
NATIVE PERENNIAL FORBS											
<i>Asclepias speciosa</i>	60.00	P	P			P	P	P	P		
<i>Epilobium ciliatum</i>	20.00				P		P				
<i>Mentha arvensis</i>	50.00			P		P	P		P	P	
<i>Oenothera villosa</i>	10.00									P	
<i>Verbena hastata</i>	20.00									0	P
<i>Virgulus ericoides</i> group	10.00									P	
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Breca arvensis</i>	50.00				P	P	P			P	P
<i>Cichorium intybus</i>	20.00	P	P								
<i>Daucus carota</i>	90.00	P	P	P	P	P	P	P	P	P	
TOTAL INTRO. PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex brevior</i>	20.00	P									P
<i>Carex lanuginosa</i>	90.00	P	P	P	P	P	P	P	P	P	
<i>Carex nebrascensis</i>	40.00				P				P	P	P
<i>Carex praegracilis</i>	70.00	P	P	P	P	P	P			P	
<i>Critesion jubatum</i>	10.00										P
<i>Cyperus erythrorhizos</i>	10.00								P		
<i>Eleocharis palustris</i>	20.00									P	P
<i>Elymus trachycaulus</i>	20.00	P	P								
<i>Juncus arcticus</i> ssp. <i>ater</i>	20.00								P		P
<i>Juncus longistylis</i>	70.00	P		P		P	P	P	P	P	
<i>Juncus saximontanus</i>	20.00			P		P					
<i>Pascopyrum smithii</i>	10.00	P									
<i>Poa compressa</i>	10.00										P
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis gigantea</i>	80.00		P	P	P	P	P	P	P	P	
TOTAL INTRO. PERENNIAL GRASSES (c)	80.0	---	P	P	P	P	P	P	P	P	---
NATIVE PERENNIAL GRASSES (warm)											
<i>Muhlenbergia richardsonis</i>	10.00					P					
<i>Panicum virgatum</i>	40.00	P	P	P				P			
<i>Sorghastrum avenaceum</i>	80.00	P	P	P		P	P	P	P	P	
<i>Sporobolus heterolepis</i>	10.00			P							
TOTAL NATIVE PERENNIAL GRASSES (w)	80.0	P	P	P	---	P	P	P	P	P	---

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
NATIVE SHRUBS											
Rosa sayi	20.00		P		P						
Symphoricarpos occidentalis	10.00							P			
TOTAL NATIVE SHRUBS	30.0	--	P	--	P	--	--	P	--	--	--
FERNS											
Hippochaete laevigata	20.00	P		P							
TOTAL FERNS	20.0	P	--	P	--	--	--	--	--	--	--
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 10.9 Std.Dev.= 2.4)		13	11	12	10	11	11	9	11	15	6

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Ambrosia artemisiifolia</i> var. <i>elatiar</i>	10.00										P
<i>Medicago lupulina</i>	10.00	P									
<i>Plantago lanceolata</i>	100.00	P	P	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>Panicum capillare</i>	40.00	P					P	P	P		
TOTAL INTRO. ANN. GRASSES	40.0	P	—	—	—	—	P	P	P	—	—
NATIVE PERENNIAL FORBS											
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	30.00	P			P				P		
<i>Asclepias speciosa</i>	80.00		P	P		P	P	P	P	P	P
<i>Lythrum alatum</i>	20.00							P	P		
<i>Psoraleum tenuiflorum</i>	20.00		P	P							
<i>Virgulus ericoides</i> group	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>Breua arvensis</i>	30.00				P	P			P		
<i>Cichorium intybus</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Convolvulus arvensis</i>	20.00	P	P								
<i>Daucus carota</i>	90.00	P	P	P	P	P	P	P	P	P	
TOTAL INTRO. PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex brevior</i>	20.00	P			P						
<i>Carex lanuginosa</i>	60.00	P			P	P			P	P	P
<i>Carex praegracilis</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Eleocharis palustris</i>	10.00							P			
<i>Elymus trachycaulus</i>	10.00									P	
<i>Juncus arcticus</i> ssp. <i>ater</i>	10.00	P									
<i>Juncus longistylis</i>	10.00								P		
<i>Juncus saximontanus</i>	10.00									P	
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis gigantea</i>	60.00						P	P	P	P	P
TOTAL INTRO. PERENNIAL GRASSES (c)	60.0	—	—	—	—	—	P	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	30.00	P	P	P							
<i>Buchloe dactyloides</i>	10.00	P									
<i>Distichlis stricta</i>	10.00			P							
<i>Panicum virgatum</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Sorghastrum avenaceum</i>	70.00			P	P	P	P		P	P	P
<i>Sporobolus asper</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
NATIVE SHRUBS											
<i>Rosa sayi</i>	10.00						P				
TOTAL NATIVE SHRUBS	10.0	—	—	—	—	—	P	—	—	—	—
FERNS											
<i>Hippochaete hyemalis</i> ssp. <i>affinis</i>	70.00	P			P		P	P	P	P	P
TOTAL FERNS	70.0	P	—	—	P	—	P	P	P	P	P
SPECIES DENSITY (# of species/100 sq.m.)		17	9	11	13	12	12	11	15	14	9
(AVERAGE= 12.3 Std.Dev.= 2.5)											

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Plantago lanceolata</i>	100.00	P	P	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>Panicum capillare</i>	20.00						P	P			
TOTAL INTRO. ANN. GRASSES	20.0	—	—	—	—	—	P	P	—	—	—
NATIVE PERENNIAL FORBS											
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	60.00	P	P		P	P				P	P
<i>Asclepias speciosa</i>	80.00	P	P		P	P	P	P	P	P	
<i>Dalea purpurea</i>	10.00	P									
<i>Oxalis dillenii</i>	10.00		P								
<i>Psoraleum tenuiflorum</i>	20.00	P	P								
<i>Ratibida columnifera</i>	10.00	P									
<i>Symphyotrichum porteri</i>	10.00	P									
<i>Thermopsis divaricarpa</i>	10.00	P									
<i>Virgulus ericoides</i> group	40.00		P		P	P				P	
TOTAL NATIVE PERENNIAL FORBS	90.0	P	P	—	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Breca arvensis</i>	30.00							P	P	P	
<i>Cichorium intybus</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Convolvulus arvensis</i>	10.00										P
<i>Daucus carota</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Medicago sativa</i>	10.00										P
<i>Trifolium pratense</i>	20.00	P		P							
TOTAL INTRO. PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis gigantea</i>	50.00			P	P	P	P	P			
<i>Dactylis glomerata</i>	10.00		P								
TOTAL INTRO. PERENNIAL GRASSES (c)	60.0	—	P	P	P	P	P	P	—	—	—
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	10.00								P		
<i>Chondrosium gracile</i>	10.00	P									
<i>Panicum virgatum</i>	60.00	P	P	P	P		P		P		
<i>Sorghastrum avenaceum</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Sporobolus asper</i>	80.00	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>Rosa woodsii</i>	10.00										P
TOTAL NATIVE SHRUBS	10.0	—	—	—	—	—	—	—	—	—	P
FERNS											
<i>Hippochaete hyemalis</i> ssp. <i>affinis</i>	60.00	P	P				P	P	P	P	
TOTAL FERNS	60.0	P	P	—	—	—	P	P	P	P	—
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 10.3 Std.Dev.= 2.4)		16	13	8	9	9	9	10	10	10	9

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Melilotus alba</i>	10.00										P
TOTAL INTRO. ANN. & BIEN. FORBS	10.0	--	--	--	--	--	--	--	--	P	--
INTRODUCED ANNUAL GRASSES											
<i>Panicum capillare</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>Asclepias speciosa</i>	90.00	P	P	P	P	P	P	P	P	P	P
<i>Glycyrrhiza lepidota</i>	20.00	P	P								
<i>Oenothera villosa</i>	10.00	P									
<i>Virgulus ericoides</i> group	10.00										P
TOTAL NATIVE PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Breca arvensis</i>	80.00	P		P	P	P	P	P	P		P
<i>Convolvulus arvensis</i>	10.00										P
TOTAL INTRO. PERENNIAL FORBS	80.0	P	--	P	P	P	P	P	P	--	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex praegracilis</i>	70.00	P			P	P		P	P	P	P
<i>Carex vulpinoidea</i>	30.00	P	P	P							
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	20.00							P			P
<i>Eleocharis palustris</i>	10.00		P								
<i>Juncus arcticus</i> ssp. <i>ater</i>	100.00	P	P	P	P	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
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis gigantea</i>	20.00				P	P					
<i>Phleum pratense</i>	20.00				P	P					
TOTAL INTRO. PERENNIAL GRASSES (c)	20.0	--	--	--	P	P	--	--	--	--	--
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	70.00	P	P	P	P	P				P	P
<i>Panicum virgatum</i>	30.00			P	P			P			
<i>Schizachyrium scoparium</i>	30.00			P	P					P	
<i>Sporobolus asper</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
NATIVE SHRUBS											
<i>Rosa arkansana</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Symphoricarpos occidentalis</i>	20.00									P	P
TOTAL NATIVE SHRUBS	100.0	P	P	P	P	P	P	P	P	P	P
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 9.8 Std.Dev.= 2.1)		11	10	10	13	10	5	8	10	11	10

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Melilotus alba</i>	10.00								P		
TOTAL INTRO. ANN. & BIEN. FORBS	10.0	--	--	--	--	--	--	--	P	--	--
NATIVE PERENNIAL FORBS											
<i>Asclepias speciosa</i>	60.00			P	P	P		P	P		P
TOTAL NATIVE PERENNIAL FORBS	60.0	--	--	P	P	P	--	P	P	--	P
INTRODUCED PERENNIAL FORBS											
<i>Breca arvensis</i>	20.00						P				P
<i>Rumex crispus</i>	10.00									P	
<i>Taraxacum officinale</i>	10.00										P
TOTAL INTRO. PERENNIAL FORBS	30.0	--	--	--	--	--	P	--	--	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex brevior</i>	10.00								P		
<i>Carex praegracilis</i>	90.00	P	P	P	P	P	P	P	P	P	
<i>Juncus arcticus ssp. ater</i>	50.00		P	P		P	P			P	
<i>Juncus longistylis</i>	30.00		P			P		P			
<i>Poa agassizensis</i>	30.00		P		P		P				
TOTAL NATIVE PERENNIAL GRASSES (c)	90.0	P	P	P	P	P	P	P	P	P	--
INTRODUCED PERENNIAL GRASSES (cool)											
<i>Agrostis gigantea</i>	50.00			P		P	P	P		P	
<i>Phleum pratense</i>	20.00			P							P
TOTAL INTRO. PERENNIAL GRASSES (c)	60.0	--	--	P	--	P	P	P	--	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Muhlenbergia asperifolia</i>	10.00										P
<i>Panicum virgatum</i>	100.00	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
NATIVE SHRUBS											
<i>Rosa arkansana</i>	70.00	P	P	P			P	P	P		P
TOTAL NATIVE SHRUBS	70.0	P	P	P	--	--	P	P	P	--	P
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 6.7 Std.Dev.= 1.4)		4	7	8	5	7	8	8	6	6	8

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	80.00		P	P	P	P	P	P		P	P
<i>Dianthus armeria</i>	10.00			P							
<i>Plantago lanceolata</i>	20.00									P	P
TOTAL INTRO. ANN. & BIEN. FORBS	80.0	—	P	P	P	P	P	P	—	P	P
NATIVE PERENNIAL FORBS											
<i>Artemisia ludoviciana</i>	30.00	P		P	P						
<i>Liatris punctata</i>	20.00	P	P								
<i>Psoraleum tenuiflorum</i>	30.00	P	P			P					
<i>Symphotrichum porteri</i>	60.00	P	P	P	P			P	P		
<i>Virgulus ericoides</i> group	40.00	P								P	P
TOTAL NATIVE PERENNIAL FORBS	90.0	P	P	P	P	P	P	P	—	P	P
INTRODUCED PERENNIAL FORBS											
<i>Cichorium intybus</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Convolvulus arvensis</i>	30.00						P	P			P
TOTAL INTRO. PERENNIAL FORBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Agrostis</i> spp.	20.00									P	P
<i>Juncus arcticus</i> ssp. <i>ater</i>	10.00										P
<i>Poa compressa</i>	50.00	P	P		P				P		P
TOTAL NATIVE PERENNIAL GRASSES (c)	60.0	P	P	—	P	—	—	—	P	P	P
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	90.00	P	P	P	P		P	P	P	P	P
<i>Buchloe dactyloides</i>	30.00				P		P	P			
<i>Chondrosum gracile</i>	80.00	P	P	P	P	P	P	P		P	
<i>Chondrosum hirsutum</i>	10.00				P						
<i>Muhlenbergia cuspidata</i>	40.00	P		P	P				P		
<i>Panicum virgatum</i>	80.00	P	P	P	P	P		P	P		P
<i>Schizachyrium scoparium</i>	40.00	P			P					P	P
<i>Sorghastrum avenaceum</i>	60.00				P	P	P	P		P	P
<i>Sporobolus asper</i>	50.00		P	P	P			P	P		
<i>Sporobolus heterolepis</i>	70.00		P	P	P	P	P	P			P
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	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/100 sq.m.) (AVERAGE= 10.9 Std.Dev.= 2.9)		12	12	12	16	8	9	12	6	9	13

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
NATIVE SUBSHRUBS											
Artemisia frigida	20.00			P		P					
TOTAL NATIVE SUBSHRUBS	20.0	--	--	P	--	P	--	--	--	--	--
NATIVE SHRUBS											
Rosa sayi	10.00							P			
Symphoricarpos occidentalis	10.00								P		
TOTAL NATIVE SHRUBS	20.0	--	--	--	--	--	--	P	P	--	--
SUCCULENT											
Echinocereus viridiflorus	20.00				P	P					
Opuntia fragilis	70.00	P	P	P	P	P	P	P			
Opuntia macrorhiza	60.00		P	P			P	P	P	P	
TOTAL SUCCULENT	90.0	P	P	P	P	P	P	P	P	P	--
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 13.1 Std.Dev.= 2.3)		13	14	17	12	16	15	11	11	11	11

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
SUCCULENT											
Echinocereus viridiflorus	100.00	P	P	P	P	P	P	P	P	P	P
Opuntia fragilis	70.00	P	P		P	P	P	P	P		
Opuntia macrorhiza	60.00		P	P	P			P		P	P
TOTAL SUCCULENT	100.0	P	P	P	P	P	P	P	P	P	P
AGAVOIDS											
Yucca glauca	20.00		P					P			
TOTAL AGAVOIDS	20.0	--	P	--	--	--	--	P	--	--	--
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 12.5 Std.Dev.= 2.3)		11	15	11	13	12	12	17	14	10	10

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

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				
TOTAL NATIVE ANN. & BIEN. FORBS	10.0	—	—	—	—	—	P	—	—	—	—
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Dianthus armeria</i>	20.00		P			P					
<i>Erodium cicutarium</i>	20.00						P	P			
<i>Plantago lanceolata</i>	10.00			P							
<i>Tragopogon dubius</i> ssp. <i>major</i>	20.00					P					P
TOTAL INTRO. ANN. & BIEN. FORBS	60.0	—	P	P	—	P	P	P	—	—	P
NATIVE PERENNIAL FORBS											
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	70.00	P	P			P	P	P		P	P
<i>Artemisia ludoviciana</i>	40.00	P	P					P	P		
<i>Comandra umbellata</i> ssp. <i>pallida</i>	20.00	P				P					
<i>Dalea purpurea</i>	20.00		P	P							
<i>Gaura coccinea</i>	10.00	P									
<i>Liatris punctata</i>	20.00	P	P								
<i>Oxalis dillenii</i>	20.00	P				P					
<i>Oxybaphus linearis</i>	10.00	P									
<i>Psoraleidium tenuiflorum</i>	40.00					P	P	P			P
<i>Symphyotrichum porteri</i>	10.00	P									
<i>Virgulus ericoides</i> group	20.00						P				P
TOTAL NATIVE PERENNIAL FORBS	90.0	P	P	P	—	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Cichorium intybus</i>	40.00					P	P			P	P
<i>Hypericum perforatum</i>	10.00	P									
TOTAL INTRO. PERENNIAL FORBS	50.0	P	—	—	—	P	P	—	—	P	P
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	40.00		P		P		P	P			
<i>Juncus arcticus</i> ssp. <i>ater</i>	30.00				P				P		P
<i>Poa agassizensis</i>	40.00	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>Andropogon gerardii</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Aristida purpurea</i>	20.00								P	P	
<i>Bouteloua curtipendula</i>	50.00		P		P		P		P	P	
<i>Buchloe dactyloides</i>	20.00		P							P	
<i>Chondrosium gracile</i>	90.00	P	P	P	P		P	P	P	P	P
<i>Panicum virgatum</i>	50.00		P			P	P		P	P	
<i>Sorghastrum avenaceum</i>	10.00		P								
<i>Sporobolus asper</i>	30.00	P	P	P							
<i>Sporobolus heterolepis</i>	40.00	P			P	P		P			
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P
SUCCULENT											
<i>Opuntia macrorhiza</i>	70.00	P	P	P	P		P	P		P	
TOTAL SUCCULENT	70.0	P	P	P	P	—	P	P	—	P	—
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 10.0 Std.Dev.= 3.2)		15	15	6	7	11	12	9	7	10	8

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
Ambrosia artemisiifolia var. elatior	30.00							P	P	P	
Lactuca serriola	20.00					P	P				
Neolepia campestre	20.00				P	P					
Plantago lanceolata	20.00							P		P	
Tragopogon dubius ssp. major	40.00	P	P			P				P	
TOTAL INTRO. ANN. & BIEN. FORBS	80.0	P	P	--	P	P	P	P	P	P	--
INTRODUCED ANNUAL GRASSES											
Bromus japonicus	20.00					P	P				
TOTAL INTRO. ANN. GRASSES	20.0	--	--	--	--	P	P	--	--	--	--
NATIVE PERENNIAL FORBS											
Achillea lanulosa	30.00	P			P	P					
Ambrosia psilostachya var. coronopifolia	50.00	P	P		P	P	P				
Artemisia ludoviciana	20.00		P					P			
Geranium richardsonii	20.00			P	P						
Heterotheca villosa	10.00					P					
Liatris punctata	10.00			P							
Lithospermum incisum	10.00				P						
Psoraleidum tenuiflorum	30.00	P	P		P						
Ratibida columnifera	20.00			P	P						
Thermopsis divaricarpa	30.00					P	P	P			
Virgulus ericoides group	10.00						P				
TOTAL NATIVE PERENNIAL FORBS	70.0	P	P	P	P	P	P	P	--	--	--
INTRODUCED PERENNIAL FORBS											
Breaa arvensis	10.00										P
Cichorium intybus	50.00				P	P	P	P		P	
Convolvulus arvensis	60.00			P	P	P	P	P	P		
TOTAL INTRO. PERENNIAL FORBS	80.0	--	--	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)											
Carex pensylvanica ssp. heliophila	20.00	P		P							
Juncus arcticus ssp. ater	90.00	P	P	P	P	P	P	P	P		P
Pascopyrum smithii	20.00							P		P	
Poa agassizensis	30.00	P	P			P					
TOTAL NATIVE PERENNIAL GRASSES (c)	100.0	P	P	P	P	P	P	P	P	P	P
INTRODUCED PERENNIAL GRASSES (cool)											
Bromopsis inermis	10.00										P
TOTAL INTRO. PERENNIAL GRASSES (c)	10.0	--	--	--	--	--	--	--	--	--	P
NATIVE PERENNIAL GRASSES (warm)											
Andropogon gerardii	50.00	P	P	P	P	P					
Bouteloua curtipendula	30.00		P	P		P					
Chondrosium gracile	50.00	P	P	P	P	P					
Panicum virgatum	100.00	P	P	P	P	P	P	P	P	P	P
Spartina pectinata	50.00						P	P	P	P	P
Sporobolus heterolepis	10.00									P	
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE SHRUBS											
Rosa sayi	30.00					P	P				P
Rosa woodsii	20.00		P				P				
Symphoricarpos occidentalis	10.00			P							
TOTAL NATIVE SHRUBS	50.0	--	P	P	--	P	P	--	--	--	P
SUCCULENT											
Opuntia macrorhiza	50.00	P	P		P	P	P				
TOTAL SUCCULENT	50.0	P	P	--	P	P	P	--	--	--	--
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 10.8 Std.Dev.= 3.9)		11	12	11	14	18	13	10	5	8	6

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
SUCCULENT											
Echinocereus viridiflorus	30.00		P	P	P						
Opuntia macrorhiza	90.00	P	P	P		P	P	P	P	P	P
TOTAL SUCCULENT	100.0	P	P	P	P	P	P	P	P	P	P
AGAVOIDS											
Yucca glauca	20.00	P					P				
TOTAL AGAVOIDS	20.0	P	—	—	—	—	P	—	—	—	—
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 11.1 Std.Dev.= 2.0)		12	11	12	10	13	9	9	11	15	9

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	30.00		P	P			P				
<i>Plantago lanceolata</i>	70.00	P	P	P	P		P	P	P		
TOTAL INTRO. ANN. & BIEN. FORBS	70.0	P	P	P	P	—	P	P	P	—	—
NATIVE PERENNIAL FORBS											
<i>Iris missouriensis</i>	10.00									P	
<i>Thermopsis divaricarpa</i>	30.00		P							P	P
<i>Virgulus ericoides</i> group	80.00	P	P		P	P	P	P	P	P	
TOTAL NATIVE PERENNIAL FORBS	90.0	P	P	—	P	P	P	P	P	P	P
INTRODUCED PERENNIAL FORBS											
<i>Cichorium intybus</i>	60.00	P	P	P		P	P		P		
TOTAL INTRO. PERENNIAL FORBS	60.0	P	P	P	—	P	P	—	P	—	—
NATIVE PERENNIAL GRASSES (cool)											
<i>Agrostis</i> spp.	10.00	P									
<i>Carex douglasii</i>	20.00	P					P				
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	10.00							P			
<i>Juncus arcticus</i> ssp. <i>ater</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Poa agassizensis</i>	50.00	P		P	P	P			P		
<i>Poa compressa</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>Andropogon gerardii</i>	40.00	P		P						P	P
<i>Chondrosium gracile</i>	10.00					P					
<i>Muhlenbergia cuspidata</i>	30.00			P			P		P		
<i>Panicum virgatum</i>	100.00	P	P	P	P	P	P	P	P	P	P
<i>Schizachyrium scoparium</i>	10.00	P									
<i>Sorghastrum avenaceum</i>	70.00	P	P	P	P			P		P	P
<i>Sporobolus heterolepis</i>	100.00	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
NATIVE SHRUBS											
<i>Rosa sayi</i>	60.00	P	P	P					P	P	P
TOTAL NATIVE SHRUBS	60.0	P	P	P	—	—	—	—	P	P	P
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 9.0 Std.Dev.= 2.1)		13	10	11	7	7	9	7	10	9	7

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
NATIVE ANNUAL & BIENNIAL FORBS											
<i>Chenopodium leptophyllum</i>	30.00	P	P	P							
<i>Gaura parviflora</i>	50.00	P	P	P		P			P		
TOTAL NATIVE ANN. & BIEN. FORBS	50.0	P	P	P	---	P	---	---	P	---	---
INTRODUCED ANNUAL & BIENNIAL FORBS											
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	80.00	P	P	P	P	P	P	P			P
<i>Fallopia convolvulus</i>	10.00		P								
<i>Lactuca scariola</i>	30.00	P	P		P						
<i>Melilotus officinalis</i>	10.00	P									
TOTAL INTRO. ANN. & BIEN. FORBS	80.0	P	P	P	P	P	P	P	---	---	P
NATIVE PERENNIAL FORBS											
<i>Mentha arvensis</i>	20.00	P	P								
<i>Verbena hastata</i>	100.00	P	P	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>Breea arvensis</i>	30.00	P	P	P							
<i>Trifolium pratense</i>	10.00		P								
TOTAL INTRO. PERENNIAL FORBS	30.0	P	P	P	---	---	---	---	---	---	---
NATIVE PERENNIAL GRASSES (cool)											
<i>Carex nebrascensis</i>	10.00					P					
<i>Eleocharis palustris</i>	40.00		P	P	P	P					
<i>Juncus arcticus</i> ssp. <i>ater</i>	50.00	P			P	P		P	P		
<i>Juncus longistylis</i>	20.00	P						P			
TOTAL NATIVE PERENNIAL GRASSES (c)	70.0	P	P	P	P	P	---	P	P	---	---
NATIVE PERENNIAL GRASSES (warm)											
<i>Spartina pectinata</i>	100.00	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
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 5.9 Std.Dev.= 3.2)		11	11	7	6	7	3	5	4	2	3

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		—Sample Number—									
		1	2	3	4	5	6	7	8	9	10
NATIVE PERENNIAL GRASSES (warm)											
<i>Andropogon gerardii</i>	100.00	P	P	P	P	P	P	P	P	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>	80.00			P	P	P	P	P	P	P	P
<i>Panicum virgatum</i>	30.00		P			P					P
<i>Schizachyrium scoparium</i>	70.00	P		P	P	P	P			P	P
<i>Sorghastrum avenaceum</i>	20.00	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
NATIVE SUBSHRUBS											
<i>Artemisia frigida</i>	50.00				P	P	P	P	P		
<i>Gutierrezia sarothrae</i>	30.00					P		P		P	
TOTAL NATIVE SUBSHRUBS	60.0	—	—	—	P	P	P	P	P	P	—
NATIVE SHRUBS											
<i>Amorpha nana</i>	20.00							P	P		
<i>Rosa sayi</i>	30.00	P					P	P			
TOTAL NATIVE SHRUBS	40.0	P	—	—	—	—	P	P	P	—	—
SUCCULENT											
<i>Opuntia macrorhiza</i>	30.00					P		P			P
TOTAL SUCCULENT	30.0	—	—	—	—	P	—	P	—	—	P
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 17.6 Std.Dev.= 3.8)		21	15	16	14	25	12	20	18	19	16

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

PLANT SPECIES	FREQUENCY (%)	PRESENCE*									
		---Sample Number---									
		1	2	3	4	5	6	7	8	9	10
NATIVE PERENNIAL GRASSES (warm)											
Andropogon gerardii	50.00	P		P		P	P	P			
Aristida purpurea	30.00			P						P	P
Bouteloua curtipendula	70.00	P	P		P	P	P	P	P		
Chondrosium gracile	100.00	P	P	P	P	P	P	P	P	P	P
Muhlenbergia cuspidata	10.00		P								
Muhlenbergia montana	10.00					P					
Panicum virgatum	50.00		P			P	P	P	P		
Schizachyrium scoparium	20.00					P					P
Sorghastrum avenaceum	20.00				P				P		
Sporobolus cryptandrus	50.00	P	P		P	P				P	
TOTAL NATIVE PERENNIAL GRASSES (w)	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE SUBSHRUBS											
Artemisia frigida	100.00	P	P	P	P	P	P	P	P	P	P
TOTAL NATIVE SUBSHRUBS	100.0	P	P	P	P	P	P	P	P	P	P
NATIVE SHRUBS											
Rosa woodsii	10.00						P				
TOTAL NATIVE SHRUBS	50.0	--	P	--	--	P	P	P	P	--	--
INTRODUCED SHRUBS											
Rhamnus cathartica	20.00									P	P
TOTAL INTRODUCED SHRUBS	20.0	--	--	--	--	--	--	--	--	P	P
SUCCULENT											
Echinocereus viridiflorus	50.00			P	P		P	P		P	
Opuntia fragilis	60.00	P	P	P	P		P		P		
Opuntia macrorhiza	80.00	P	P	P	P	P	P		P	P	
TOTAL SUCCULENT	90.0	P	P	P	P	P	P	P	P	P	--
AGAVOIDS											
Yucca glauca	10.00	P									
TOTAL AGAVOIDS	10.0	P	--	--	--	--	--	--	--	--	--
SPECIES DENSITY (# of species/100 sq.m.)		24	25	23	28	29	24	21	19	22	20
(AVERAGE= 23.5 Std.Dev.= 3.2)											

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

Species Name	Common Name	Synonym	Area 3						Area 6	
			1	2	3	4	5	6	1	2
Native Annual and Biennial Forbs										
<i>Chenopodium berlandieri</i>	pitseed goosefoot									
<i>Chenopodium leptophyllum</i>	goosefoot									
<i>Cirsium undulatum</i>	wavyleaf thistle									
<i>Erigeron divergens</i>	spreading fleabane									
<i>Gaura parviflora</i>	willow gaura		X			X				
<i>Grindelia squarrosa</i>	gumweed						X			
<i>Plantago patagonica</i>	woolly plantain									
<i>Pterogonum alatum</i>	winged buckwheat	<i>Eriogonum alatum</i>		X						
<i>Silene antirrhina</i>	sleepy catchfly									
Introduced Annual and Biennial Forbs										
<i>Acosta diffusa</i>	diffuse knapweed	<i>Centaurea diffusa</i>		X						
<i>Alyssum desertorum</i>	alyssum									
<i>Alyssum parviflorum</i>	alyssum	<i>A. minus</i>								
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	common ragweed						X			
<i>Camelina microcarpa</i>	littlepod falseflax									
<i>Conyza canadensis</i>	horseweed									
<i>Cynoglossum officinale</i>	hound's tongue									
<i>Dianthus armeria</i>	deptford pink			X						
<i>Erodium cicutarium</i>	filaree									
<i>Fallopia convolvulus</i>	black bindweed									
<i>Lactuca serriola</i>	prickly lettuce		X		X					
<i>Lepidium densiflorum</i>	denseflower pepperweed									
<i>Medicago lupulina</i>	black medic				X		X			
<i>Melilotus alba</i>	white sweet-clover								X	X
<i>Melilotus officinalis</i>	yellow sweetclover				X					
<i>Neolepia campestre</i>	field pepperweed	<i>Lepidium campestre</i>		X						
<i>Plantago lanceolata</i>	buckhorn plantain		X	X	X	X	X	X	X	
<i>Sisymbrium altissimum</i>	Jim Hill mustard									
<i>Sonchus asper</i>	spiny sow-thistle					X				
<i>Tragopogon dubius</i> ssp. <i>major</i>	salsify		X	X						
Introduced Annual Grasses										
<i>Panicum capillare</i>	witchgrass		X			X	X	X	X	
<i>Anisantha tectorum</i>	cheatgrass	<i>Bromus tectorum</i>								
<i>Bromus japonicus</i>	Japanese brome			X						

Species Name	Common Name	Synonym	Area 3						Area 6	
			1	2	3	4	5	6	1	2
Native Perennial Forbs (continued)										
<i>Oxybaphus linearis</i>	umbrellawort									
<i>Oxybaphus nyctagineus</i>	umbrellawort									
<i>Paronychia jamesii</i>	nailwort									
<i>Penstemon secundiflorus</i>	sidebells beard-tongue									
<i>Phyla cuneifolia</i>	fogfruit									
<i>Potentilla hippiana</i>	horse cinquefoil									
<i>Psoralea tenuiflora</i>	scurfpea	<i>Psoralea tenuiflora</i>		X	X			X	X	
<i>Ratibida columnifera</i>	prairie coneflower								X	
<i>Senecio spartioides</i>	threadleaf groundsel									
<i>Solidago speciosa</i> var. <i>pallida</i>	noble goldenrod			X						
<i>Symphyotrichum laeve</i>	smooth aster	<i>Aster laevis</i> var. <i>geyeri</i>		X						
<i>Symphyotrichum lanceolatum</i> ssp. <i>hesperius</i>	aster	<i>Aster hesperius</i> , <i>A. lanceolatus</i>				X				
<i>Symphyotrichum porteri</i>	porter aster	<i>Aster porteri</i>		X					X	
<i>Thelesperma megapotamicum</i>	Colorado greenthread									
<i>Thermopsis divaricarpa</i>	golden banner		X						X	
<i>Tithymalus brachyceras</i>	robust spurge	<i>Tithymalus montanus</i>								
<i>Tragia ramosa</i>	noseburn									
<i>Verbena hastata</i>	blue vervain		X			X				
<i>Virgulus ericoides</i>	heath aster	<i>Aster ericoides</i>								
<i>Virgulus ericoides</i> group	white prairie aster	<i>Aster ericoides</i> (group)		X	X	X		X	X	
<i>Virgulus falcatus</i>	falcate aster	<i>Aster falcatus</i>					X			
Introduced Perennial Forbs										
<i>Acetosella vulgaris</i>	sheep sorrel	<i>Rumex acetosella</i>		X						
<i>Breea arvensis</i>	Canada thistle	<i>Cirsium arvense</i>	X		X	X	X	X	X	X
<i>Cichorium intybus</i>	chicory		X	X	X	X	X	X		
<i>Convolvulus arvensis</i>	field bindweed			X	X		X	X	X	
<i>Daucus carota</i>	Queen Anne's lace			X	X	X	X	X		
<i>Hypericum perforatum</i>	Klamath weed, St. johnswort			X						
<i>Medicago sativa</i>	alfalfa							X		
<i>Rumex crispus</i>	curly dock		X							X
<i>Taraxacum officinale</i>	common dandelion		X				X			X
<i>Trifolium pratense</i>	red clover							X		
<i>Trifolium repens</i>	white dutch clover			X						
<i>Verbena bracteata</i>	vervain									

Species Name	Common Name	Synonym	Area 3						Area 6	
			1	2	3	4	5	6	1	2
			Native Perennial Grasses (cool)							
<i>Agrostis</i> spp.	bentgrass									
<i>Carex brevior</i>	sedge			X						X
<i>Carex douglasii</i>	sedge									
<i>Carex lanuginosa</i>	sedge		X							
<i>Carex microptera</i>	smallwing sedge			X						
<i>Carex nebrascensis</i>	nebraska sedge									
<i>Carex pensylvanica</i> ssp. <i>heliophila</i>	sun sedge	<i>Carex heliophila</i>		X						
<i>Carex praeegracilis</i>	silver sedge		X							X
<i>Carex vulpinoidea</i>	fox sedge									X
<i>Critesion jubatum</i>	foxtail barley	<i>Hordeum jubatum</i>	X							
<i>Cyperus erythrorhizos</i>	redroot nutsedge		X							
<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	dichanthelium									
<i>Eleocharis palustris</i>	spikerush	<i>Eleocharis macrostachya</i>	X							X
<i>Elymus trachycaulus</i>	slender wheatgrass	<i>Agropyron trachycaulum</i>	X							X
<i>Hesperostipa comata</i>	needle-and-thread	<i>Stipa comata</i>								
<i>Juncus arcticus</i> ssp. <i>ater</i>	baltic rush	<i>Juncus ater</i>	X	X	X	X	X	X	X	X
<i>Juncus interior</i>	rush		X							
<i>Juncus longistylis</i>	rush		X							X
<i>Juncus saximontanus</i>	rush		X							
<i>Koeleria macrantha</i>	Junegrass	<i>Koeleria cristata</i>								
<i>Pascopyrum smithii</i>	western wheatgrass	<i>Agropyron smithii</i>					X			
<i>Poa agassizensis</i>	Agassiz bluegrass		X	X	X	X	X	X	X	X
<i>Poa compressa</i>	Canada bluegrass		X	X	X	X	X	X		
<i>Poa secunda</i>	Sandberg bluegrass	<i>P. ampla</i> , <i>P. juncifolia</i>								
<i>Typha latifolia</i>	broadleaf cattail		X				X			
Introduced Perennial Grasses (cool)										
<i>Agrostis gigantea</i>	redtop	<i>A. alba</i>								
<i>Agrostis stolonifera</i>	redtop	<i>A. palustris</i>	X							
<i>Bromopsis inermis</i>	smooth brome	<i>Bromus inermis</i>			X					
<i>Dactylis glomerata</i>	orchard grass			X	X				X	
<i>Phleum pratense</i>	Timothy			X	X				X	X

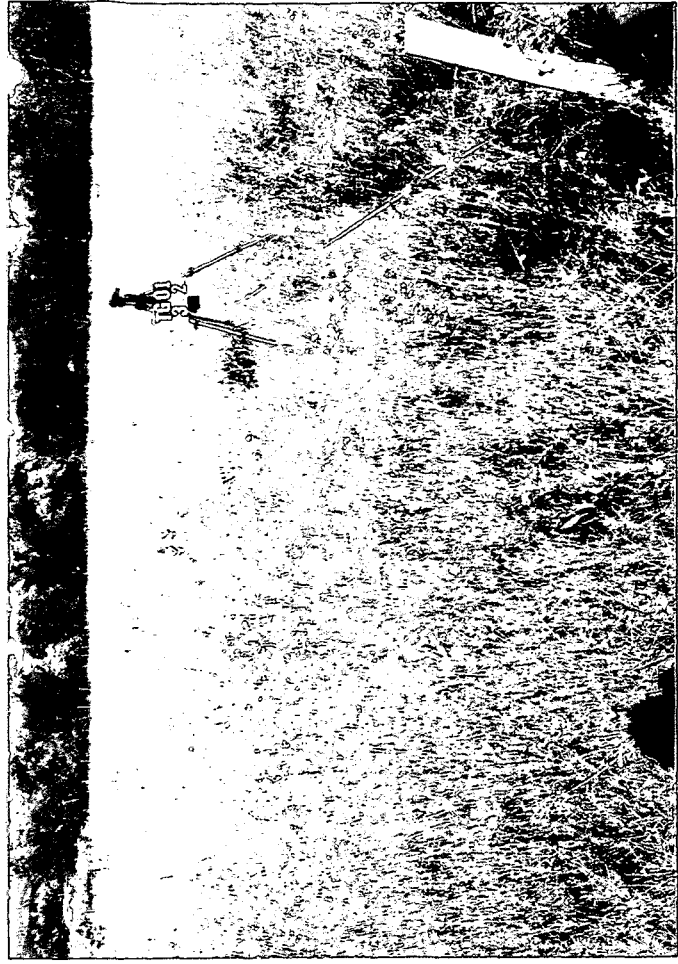
Species Name	Common Name	Synonym	Area 3						Area 6	
			1	2	3	4	5	6	1	2
Succulent										
<i>Echinocereus viridiflorus</i>	hen-and-chickens									
<i>Opuntia fragilis</i>	brittle cactus									
<i>Opuntia macrorhiza</i>	prickly-pear cactus			X						
Agavoids										
<i>Yucca glauca</i>	Spanish bayonet			X						

Table 22. Species Present - All Tallgrass Areas, City of Boulder Open Space and Mountain Parks Dept., CO - 2001

Species Name	Common Name	Synonym	Area 7									
			1	2	3	4	5	6	7	8	9	10
Native Annual and Biennial Forbs												
<i>Chenopodium berlandieri</i>	pitseed goosefoot											
<i>Chenopodium leptophyllum</i>	goosefoot								X			
<i>Cirsium undulatum</i>	wayleaf thistle		X	X						X		
<i>Erigeron divergens</i>	spreading fleabane		X	X								
<i>Gaura parviflora</i>	willow gaura				X						X	
<i>Grindelia squarrosa</i>	gumweed		X	X								X
<i>Plantago patagonica</i>	woolly plantain					X						
<i>Pterogonum alatum</i>	winged buckwheat	<i>Eriogonum alatum</i>	X	X								
<i>Silene antirrhina</i>	sleepy catchfly		X	X								
Introduced Annual and Biennial Forbs												
<i>Acosta diffusa</i>	diffuse knapweed	<i>Centaurea diffusa</i>										X
<i>Alyssum desertorum</i>	alyssum											X
<i>Alyssum parviflorum</i>	alyssum	<i>A. minus</i>	X	X								
<i>Ambrosia artemisiifolia</i> var. <i>elator</i>	common ragweed		X	X			X			X		
<i>Camelina microcarpa</i>	littlepod falseflax		X	X								
<i>Conyza canadensis</i>	horseweed				X							
<i>Cynoglossum officinale</i>	hound's tongue								X			
<i>Dianthus armeria</i>	deftford pink		X					X				
<i>Erodium cicutarium</i>	filaree		X	X			X					X
<i>Fallopia convolvulus</i>	black bindweed		X	X			X				X	
<i>Lactuca scariola</i>	prickly lettuce		X	X			X				X	
<i>Lepidium densiflorum</i>	denseflower pepperweed		X	X			X				X	
<i>Medicago lupulina</i>	black medic		X	X			X					
<i>Melilotus alba</i>	white sweet-clover											
<i>Melilotus officinalis</i>	yellow sweetclover											
<i>Neolepia campestre</i>	field pepperweed	<i>Lepidium campestre</i>								X		
<i>Plantago lanceolata</i>	buckhorn plantain		X	X			X			X		X
<i>Sisymbrium altissimum</i>	Jim Hill mustard				X					X		
<i>Sonchus asper</i>	spiny sow-thistle											
<i>Tragopogon dubius</i> ssp. <i>major</i>	salsify		X	X			X		X			X
Introduced Annual Grasses												
<i>Panicum capillare</i>	witchgrass											
<i>Anisantha tectorum</i>	cheatgrass	<i>Bromus tectorum</i>			X				X			
<i>Bromus japonicus</i>	Japanese brome		X	X			X					X



Photograph 1. Area 3. Sample 1 - 2001



Photograph 2. Area 3. Sample 2 - 2001



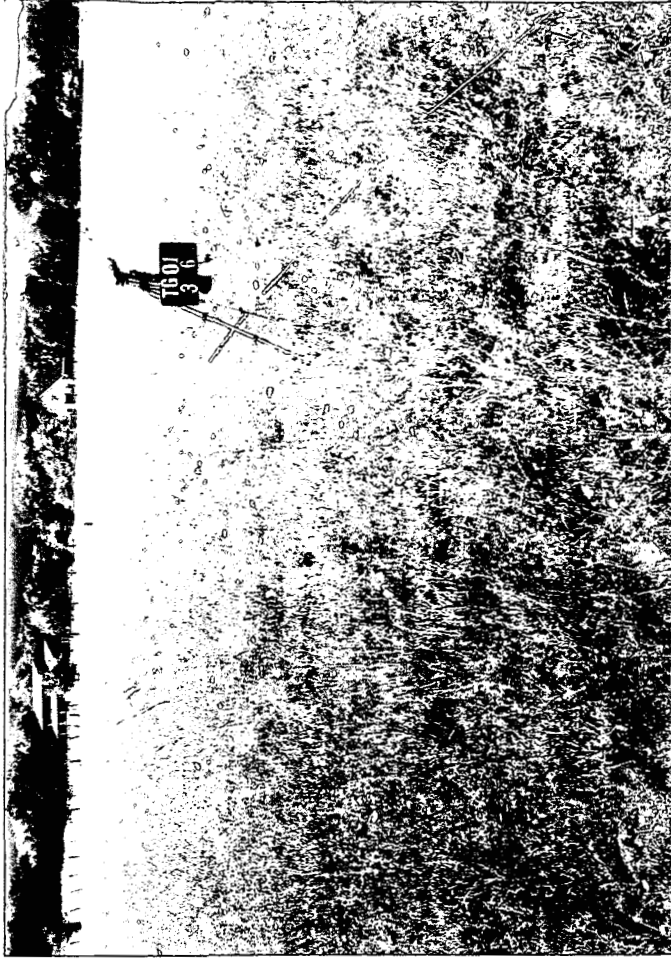
Photograph 3. Area 3. Sample 3 - 2001



Photograph 4. Area 3. Sample 4 - 2001



Photograph 5. Area 3. Sample 5 - 2001



Photograph 6. Area 3. Sample 6 - 2001



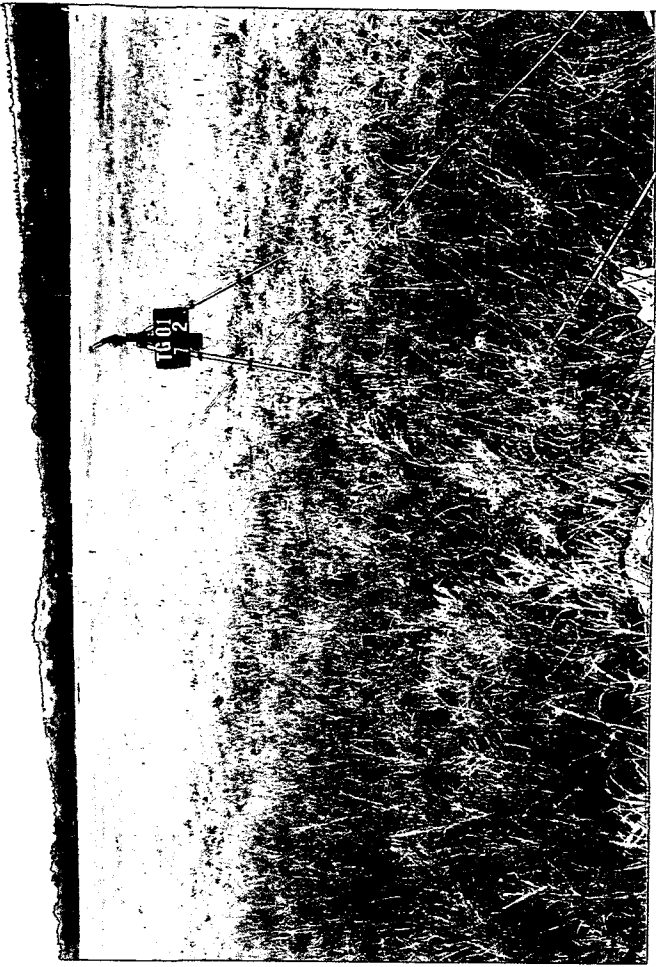
Photograph 7. Area 6. Sample 1 - 2001



Photograph 8. Area 6. Sample 2 - 2001



Photograph 9. Area 7. Sample 1 - 2001



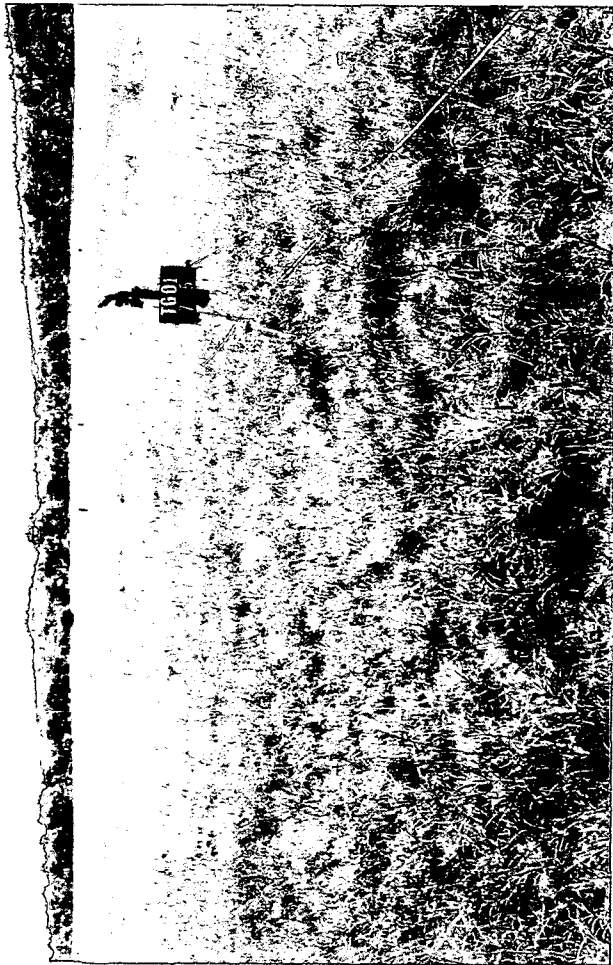
Photograph 10. Area 7. Sample 2 - 2001



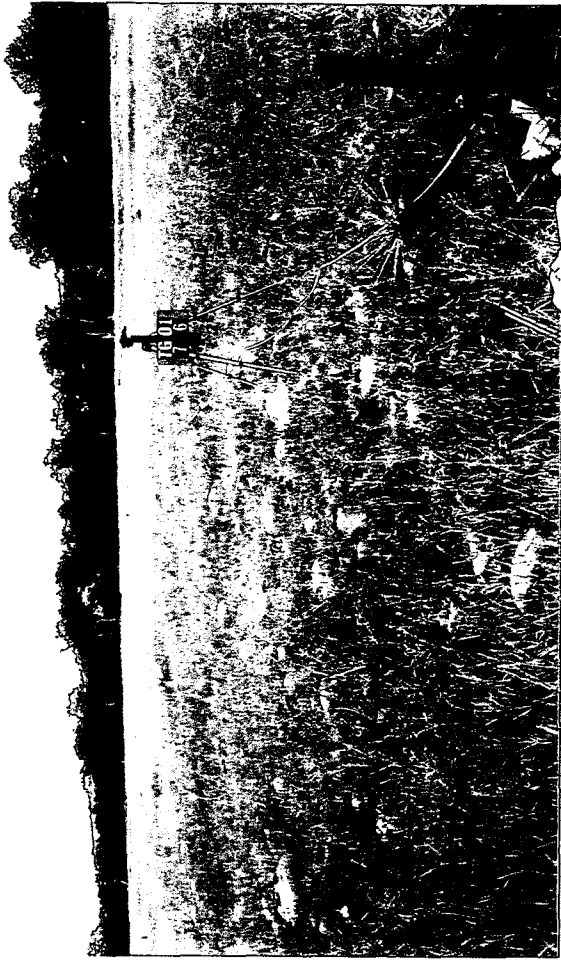
Photograph 11. Area 7. Sample 3 - 2001



Photograph 12. Area 7. Sample 4 - 2001



Photograph 13. Area 7. Sample 5 - 2001



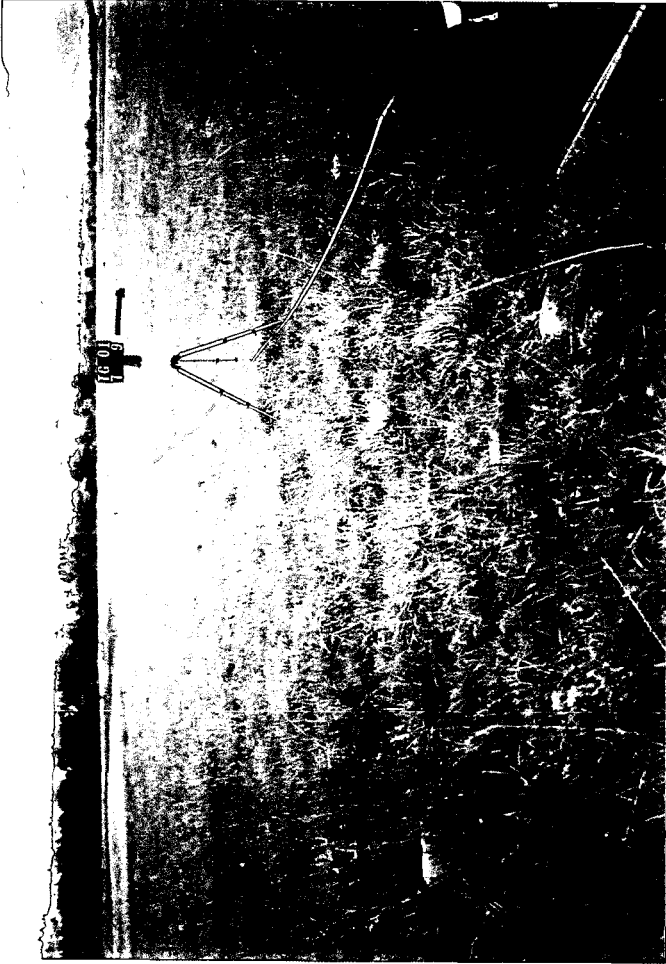
Photograph 14. Area 7. Sample 6 - 2001



Photograph 15. Area 7. Sample 7 - 2001



Photograph 16. Area 7. Sample 8 - 2001



Photograph 17. Area 7. Sample 9 - 2001

PHOTO NOT AVAILABLE

Photograph 18. Area 7. Sample 10 - 2001