PRAIRIE INVENTORY

HERBERT HOOVER NATIONAL HISTORIC SITE

1998

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Introduction

Annual inventories at the Herbert Hoover NHS prairie since 1982 (with the exception of 1984) have yielded considerable information on the dynamics of prairie species under various conditions of prescribed burning, moisture, and establishment. Long transects (walking transects) and permanent 20 m plots have provided comparable data from year to year to address changes in the vegetation. In addition, since 1992 several hundred prairie forb plants have been individually marked to assess longevity and flowering.

This report continues the inventory of percent cover of species observed in transects and plots as well as prairie forb presence and flowering.

Methods

Five walking transects were sampled on 3 August, 1998. Rectangular quadrats 20 X 50 cm were sampled at 10 pace intervals on predetermined routes across the prairie (Figure 1). Species furnishing cover over each quadrat were scored in one of 5 categories; 0-5%, 5-25%. 25-50%. 50-75%, 75-95%, and 95-100% (1). Midpoints for the cover category for each occurrence of each species in a transect were totaled, and divided by the number of plots on the transect to determine percent cover. *Percent relative cover* (RC) used in comparing species and sites in this report was calculated by dividing the percent cover of a species by the total percent cover of all species for the plot. This figure gave the relative importance of each species within the plot or transect and could be compared to other plots or transects to assess relative importance.

Twelve permanent plots, each 20 m long, were sampled on 3, 4 and 5 August, 1997, at 1 m intervals using a 20 X 50 cm quadrat with the long axis perpendicular to the plot axis with the 20 cm side of the quadrat between 0.8 and 1.0 m on the left side of the measuring tape (Figure 1 and Appendix Table A4 for plot locations). Cover was determined as described above.

Two permanent forb transects were sampled between 5 and 6 August, 1998, for presence and flowering/fruiting. These transects were set out in 1988 (2), with individual plants first marked in 1992 (3). Coordinates for individual plants were measured south from the north end of the baseline and perpendicular (east or west) of the baseline. Each forb plant encountered within 10 meters on either side of the baseline was examined for an identifying marker, an aluminum tag (placed on the north side of the plant) embossed with the year of marking, transect number, and accession number for that year. If there was no marker the plant was tagged. A few plants that were located but not tagged in previous years were also noted. Plants were scored for flowering/non-flowering. Flowering percentage was based upon the total number of plants of the species extant for a particular year.

Results

Walking Transects and Permanent Plots

Prairie species provided 91% of the relative cover (RC) with prairie grasses at 48% RC and prairie forbs at 43% RC. Big bluestem (*Andropogon gerardii*) was the dominant

grass accounting for 70% of the prairie grass cover with *Indiangrass (Sorghastrum nutans)* at 10% and five other species contributing the remainder of the prairie grass cover (Tables 1 and 2).

In walking transects big bluestem dominated at 36.5% RC with Indiangrass at 10% and switchgrass (*Panicum virgatum*), Canada wildrye (*Elymus canadensis*) and side-oats grama (*Bouteloua curtipendula*) each at less than 1%RC. In permanent plots big bluestem was at 33% RC, Indiangrass was at 12.5% RC and switchgrass was at 2.25% RC. Little bluestem (*Schizachyrium scoparium*), Canada wildrye and sedge species (*Carex* spp.) were at less than 1% RC (Tables 1 and 2).

Among prairie forbs tall goldenrod (*Solidago canadensis*) dominated walking transects at 24% RC with prairie ragwort (*Senecio plattensis*) at 11% RC. Twelve other species lead by hairy aster (*Aster pilosus*), wild bergamot (*Monarda fistulosa*), and wild lettuce (*Lactuca canadensis*) contributed about 6% RC (Table 1).

Tall goldenrod also was the leading dominant among prairie forbs in the permanent plots at 25.5% RC and prairie ragwort was second at 8% RC. Hairy aster, saw-tooth sunflower (*Helianthus grosseserratus*), common horsetail (*Equisetum arvense*), and prairie sunflower (*Helianthus rigidus*), were above 1% RC and 8 other species made up the remaining 4% RC (Table 2).

Weedy grasses were at 8% RC in walking transects and 2% RC in permanent plots (Tables 1 and 2). Kentucky bluegrass was most prominent in Walk 2 with 11.5% RC and smooth brome was important in Walk 1 at 9% RC. Both species cover in the two transects was in areas where prairie species are not yet dominant (see Table A1 in the

Appendix). In permanent plots Kentucky bluegrass was important only in PP3 at 6% RC (Table 2). Foxtail grasses (*Setaria a* spp.) were not sampled in 1998.

Weedy forbs amounted less than 1% RC in both walking transects and permanent plots. Canada thistle had about 0.2% RC in both samples.

Annual and biennial forbs had about 2% RC in walking transects. Wild parsnip was the only species above 1% RC and was found in 4 of 5 transects. Five other species were sampled. In permanent plots meadow parsnip was more prominent at 2.6% RC and was especially abundant in plots 2 and 5. Four other species had less than 1% RC.

Woody cover amounted to about 1% RC with the most cover in Walking Transect 4. In permanent plots cover was also about 1% RC with raspberry (*Rubus* sp.) at 4% RC in PP3.

Permanent Plots 11-14

Permanent Plots 11 and 12, established on prairie seeded in 1992, were dominated by weedy grasses, especially Kentucky bluegrass (*Poa pratensis*), at 61% RC (Table 3). Alta fescue (*Festuca arundinacea*), also present prior to the prairie seeding, had over 4% RC. Prairie forbs had 28% RC with yellow coneflower (*Ratibida pinnata*), tall goldenrod and stiff goldenrod (*Solidago rigida*) the most important species. Prairie grasses made up the rest of the cover at 11% RC with Indian grass and big bluestem most important (Table 3).

Permanent Plot 13 was dominated by weedy grasses at 40% RC (Table 3). Reed canary grass (*Phalaris arundinacea*) was at 26% RC and redtop (*Agrostis gigantea*)

was at 9% RC. Prairie forbs were nearly as important with 35% RC (Table 3). Tall coneflower (*Rudbeckia laciniata*) and wild bergamot (*Monarda fistulosa*) were the most important species. Wild parsnip (*Pastinaca sativa*) had 25% RC and Canada wildrye had 1% RC (Table 3). PP14 was not sampled in 1998.

Forb Transects

Nineteen species were observed in Forb Transects 1 and 2 in 1998. Four plants of Compass plant (*Silphium laciniatum*) were located in Transect 1 and 6 plants were located in Transect 2. One plant in each transect flowered. Two plants were not located from the 1997 inventory in Transect 2 (Table 5).

All plants of golden alexanders (*Zizia aurea*), golden coreopsis (*Coreopsis tinctoria*), lead plant (*Amorpha canescens*), purple prairie clover (*Dalea purpurea*), rigid goldenrod, smooth aster (*Aster laevis*), and spiderwort (*Tradescantia* sp.) were located from the 1997 inventory and all plants flowered. For horsemint (wild bergamot) 4 of 4 plants located flowered but one plant was not located. For oxeye (*Heliopsis helianthoides*) 8 of 8 plants located flowered but 2 plants were not located. For tall bush clover (*Lespedeza capitata*) 3 of 5 plants flowered and 2 plants were not located. For tick trefoil (*Desmodium canadense*) 14 of 16 plants flowered but 37 plants were not located from the original survey in 1992. For white prairie clover (*Dalea candida*) 7 of 9 plants flowered but 2 plants were not located. For yellow coneflower 22 plants flowered out of 27 plants but 3 plants were not located. In the following species all plants present in 1997 were relocated and flowering was as follows: pale purple coneflower (*Echinacea pallida*), 22 of 36; rattlesnake master (*Eryngium yuccifolium*), 28 of 30; rosinweed

(*Silphium integrifolium*), 9 of 14;and tall cinquefoil (*Potentilla arguta*), 37 of 47. In Transect 1, 1 of 4 plants of white false (wild) indigo (*Baptisia lactea*) flowered. In Transect 2, 12 plants were located, 8 had been mistakenly cut by a crew cutting shrubs, 1 plant flowered, and 2 plants were not located, one of which flowered in 1997 (Table 5).

Discussion

Prairie Grasses

Big blue continued to dominate the prairie with about 34% RC in walking transects and permanent plots. Indiangrass was second but trailing at about 11% RC (Tables 1 and 2). Percent cover for the two species had not changed substantially from 1997 (4). Two areas had little cover of prairie grasses. The first was the 1992 seeding south of the gravesite where bluegrass and redtop dominated and prairie grass cover was below 11% RC (Table 3). The other area was the 1994 seeding where prairie grasses were essentially absent (Table 4) and where reed canary grass had become dominant. See the Recommendations section.

Prairie Forbs

Tall goldenrod decreased somewhat in RC from 28% RC in 1997 to 25.5% RC in 1998. The major forb increasing was prairie ragwort which increased from 3.5% RC in 1997 to 9% RC in 1998. Overall, prairie forbs increased from 40% RC in 1997 to 43% RC in 1998 (Tables 1 and 2 and (4)).

Weedy Grasses

In walking transects and permanent plots weedy grasses increased somewhat over 1997 from 5% RC in 1997 to 8% RC in 1998, while permanent plot cover increased from 1% to 2% 1998 (Tables 1 and 2 and (4)). Kentucky bluegrass was the major increaser in both cases.

In Permanent Plots 11, 12 and 13 weedy grasses were more important and changes from 1997 were more evident. In PP11 and PP12 RC of prairie grasses decreased from 18% RC in 1997 to 11% RC in 1998 while weedy grass RC increased from 53.5% RC in 1997 to 61% RC in 1998 (Table 3 and (4)). Lack of burning over the last 7 years is probably a major factor in the relative shift in cover from prairie grasses to weedy grasses. In PP13 reed canary grass increased from 19% RC in 1997 to 26% RC in 1998 (Table 3 and (4)). See Recommendations section.

Weedy Forbs

Weedy forb cover was below 1% RC for both walking transects and permanent plots. In addition cover was down slightly from 1997 (4).

Weedy Annual and Biennial Forbs

Wild parsnip was the only annual/biennial weed of consequence in sampled plots. Walk 1, Walk 5, and PP2 had the most RC at about 2% RC for the two walking transects and 14.5% RC for PP2 (Tables 1 and 2). PP2 and the portion of Walk 5 with the heaviest infestation were in the same portion of the prairie, the sourthwest corner (Figure 1,

Tables A1 and A2 in the Appendix). Wild parsnip RC is up slightly from 1997 (4) but the sample is small and not likely to be significantly different.

Trees and Shrubs

Cover of woody growth remains low and shrubs and trees seem much more evident to the casual observer than after careful sampling. Woody cover shows up most in Walk 4 and PP7, both in the eastern part of the prairie (Figure 1, Tables 1 and 2). Cutting of shrubs during the summer has enhanced the appearance of the prairie but regrowth will likely be rapid and within one or two growing seasons they will again be evident. Killing the shrubs by treating the stumps with herbicide would be more effective in the long run.

Forb Transects

Forb species continue to show longevity and persistence in flowering. Only showy tick trefoil has had significant declines in population (Table 5). Research could be undertaken to determine the rate of recruitment of new forb plants in various conditions such as interseeding with and without burns. Also, seeding at different times of the year such as fall seedings, frost seedings, etc., could be evaluated. Also, evaluation of the introduction of forb seedlings would be useful. The forb plot studies have identified a number of species that would be expected to do well and seed for the studies could be obtained from plants in the forb transects.

Recommendations

- Burn the 1992 planting to the south of the gravesite as late as possible in the spring to encourage prairie grasses and discourage cool season grasses.
- Burn the 1994 planting in the northwest part of the prairie as late as possible to encourage prairie grasses and discourage cool season grasses, especially reed canary grass.
- Treat stumps of shrubs immediately after cutting with an appropriate herbicide.
- Scatter seeds of forb species into areas burned the previous spring to encourage spread of forbs.
- Evaluate efficacy of interseeding and setting out seedling transplants to enhance prairie forb diversity.

Literature

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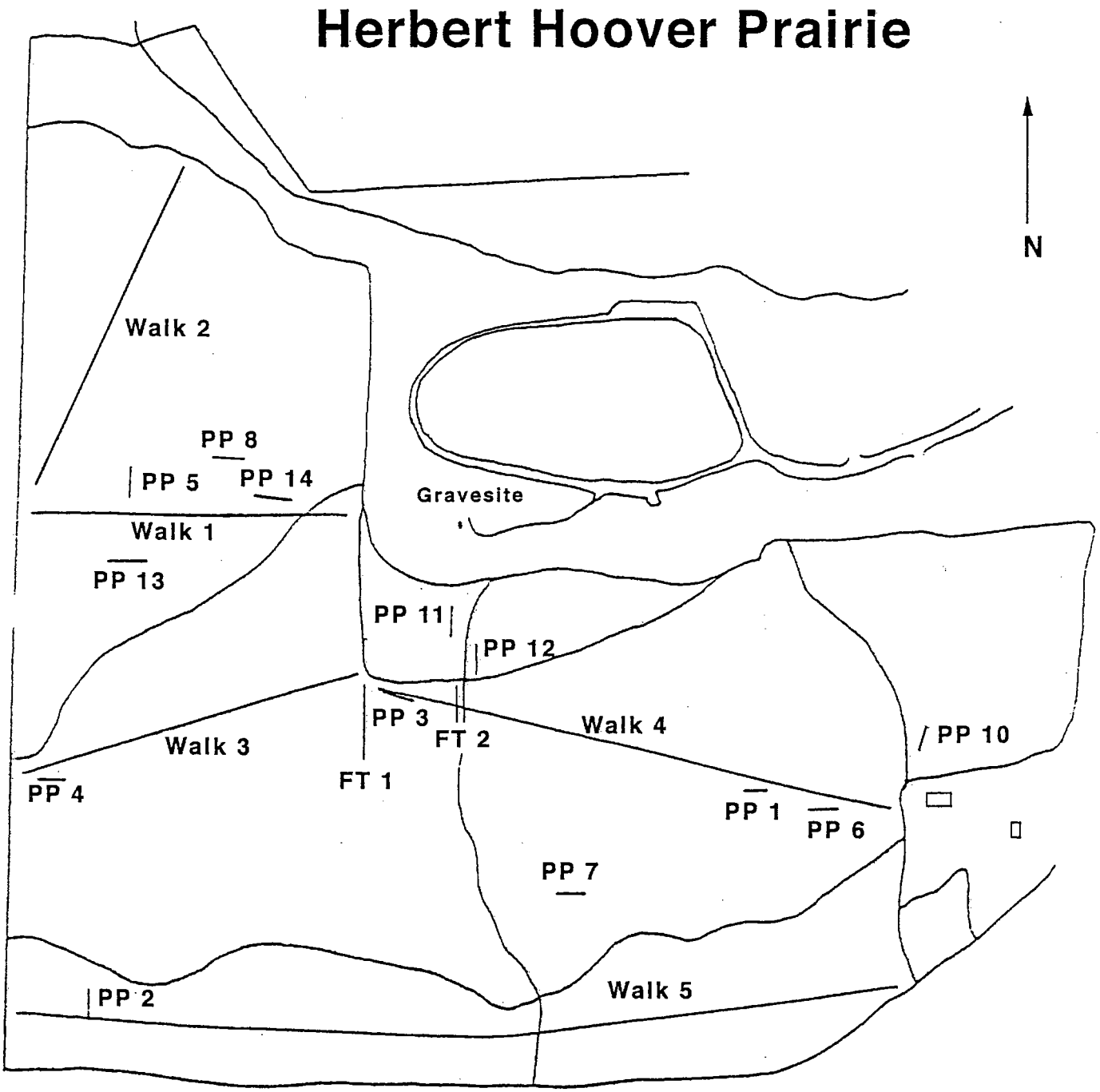

Figure 1. Location of Walking Transects, Permanent Plots, and Forb Transects.

Table 1. Composite of Percent Relative Cover of Walking Transects.

Species	Walk 1	Walk 2	Walk 3	Walk 4	Walk 5	% Rel Cover
Prairie Grasses						
big bluestem	38.53	43.95	31.68	28.82	39.57	36.50
Indian grass	6.57	4.13	18.61	5.86	11.23	9.54
switchgrass	1.07	2.99	0.69	0.14		0.71
Canada wildrye			0.69	0.42	0.69	0.44
side-oats grama		0.85				0.12
				Subtotal		**47.31**
Weedy Grasses						
Kentucky bluegrass		11.52	8.67	2.79	3.44	4.79
smooth brome	9.79	5.41		2.51	0.85	2.93
redtop		0.85				0.12
				Subtotal		**7.84**
Prairie Forbs						
tall goldenrod	18.96	16.64	15.38	27.98	30.24	24.04
prairie ragwort	5.50	0.85	18.15	23.38	6.20	10.93
hairy aster	1.83		0.69	1.47	2.65	1.60
wild bergamot	6.88	3.70				1.45
wild lettuce	1.83	2.13	1.39	0.84	0.32	1.06
field thistle	1.07		0.69	1.47	0.37	0.70
smooth goldenrod			1.73			0.26
showy tick-trefoil		1.71				0.24
golden alexanders	0.92	0.14				0.14
clammy ground cherry	0.15				0.32	0.13
tall coneflower		0.85				0.12
rosinweed		0.85				0.12
saw-tooth sunflower		0.85				0.12
cup plant	0.15					0.02
				Subtotal		**40.94**
Weedy Forbs						
field bindweed	0.92	1.71				0.37
Canada thistle					0.69	0.24
dandelion	0.31			0.42		0.13
plantain			0.12			0.02
				Subtotal		**0.76**
Annual/biennial Weeds						
wild parsnip	1.83	0.85		0.07	2.28	1.18
white sweet clover	0.92		1.39			0.33
sweet clover				1.05		0.23
Queen Anne's lace	0.92					0.12
yellow sweet clover	0.92					0.12
giant ragweed	0.92					0.12
fireweed					0.05	0.02
				Subtotal		**2.13**
Trees and Shrubs						
dogwood				2.37		0.52
smooth sumac					1.11	0.39
raspberry			0.12	0.42		0.11
Siberian elm				0.07		0.02
				Subtotal		**1.04**

Table 2. Composite of Percent Relative Cover of Permanent Plots.

Species	PP1	PP2	PP3	PP4	PP5	PP6	PP7	PP8	PP10	Average % Rel Cover
				Percent Relative Cover						
Prairie Grasses										
big bluestem	12.87	28.22	31.52	35.10	39.61	46.04	31.88	34.04	38.94	33.14
Indian grass	9.36	11.86	2.63	18.72	7.68	15.19	20.04	14.18	13.20	12.54
switchgrass	1.09	4.09	0.96	0.54	1.12	3.04	0.62	2.48	6.32	2.25
little bluestem	1.25			0.54					2.51	0.48
Canada wildrye						0.09		0.12		0.02
sedge	1.00									0.11
								Subtotal		**48.54**
Weedy Grasses										
Kentucky bluegrass	2.59		6.07	6.12					2.88	1.96
smooth brome			0.96							0.11
redtop					0.09					0.01
								Subtotal		**2.08**
Prairie Forbs										
tall goldenrod	43.61	35.58	0.96	15.57	32.87	23.66	39.56	27.42	19.80	26.56
prairie ragwort	21.22		15.80	3.87	2.90	9.12	4.67	5.79	7.25	7.85
hairy aster	3.09	0.10	2.39	1.17	3.46	2.21	0.62	4.73	1.67	2.16
saw-tooth sunflower			15.24							1.69
common horsetail			1.92	11.70			0.62			1.58
prairie sunflower			11.97							1.33
wild lettuce	3.34	2.45	0.48		0.56	0.55			1.21	0.96
field thistle			0.96	1.17	1.78			3.66		0.84
golden alexanders								5.79		0.64
clammy ground cherry					1.50			1.42	0.56	0.39
showy tick-trefoil								2.84		0.32
smooth goldenrod				2.70						0.30
annual fleabane								1.77		0.20
wild bergamot			1.44							0.16
								Subtotal		**44.97**
Weedy Forbs										
dandelion		1.23	0.96					0.71		0.32
Canada thistle		1.84								0.20
field bindweed					0.19	0.09				0.03
horse nettle								0.12		0.01
								Subtotal		**0.57**
Annual/biennial Weeds										
wild parsnip		14.62	0.48		8.24					2.59
white sweet clover				2.79					3.16	0.66
giant ragweed								0.71		0.08
horseweed							0.62			0.07
speedwell	0.08									0.01
								Subtotal		**3.41**
Trees and Shrubs										
raspberry	0.50		4.07							0.51
riverbank grape							0.10		2.51	0.29
Tartarian honeysuckle			1.20							0.13
choke cherry							0.62			0.07
dogwood							0.62			0.07
								Subtotal		**1.07**

Table 3. Percent Relative Cover of Permanent Plots 11 and 12, August, 1998.

Species	PP11	PP12	Average %RC
Kentucky bluegrass	61.10	52.28	56.69
yellow coneflower	9.12	9.49	9.31
tall goldenrod	3.72	8.42	6.07
Indian grass	4.68	5.01	4.85
alta fescue	3.96	4.74	4.35
stiff goldenrod	3.00	4.39	3.69
big bluestem	7.20		3.60
round-headed bush clover	1.80	1.88	1.84
side-oats grama	2.28	0.54	1.41
sky-blue aster		2.42	1.21
ox-eye	0.84	1.34	1.09
little bluestem		1.88	0.94
tall cinquefoil		1.88	0.94
black-eyed Susan		1.88	0.94
clammy ground cherry	0.72	1.07	0.90
arrow-leaved aster?		1.34	0.67
smooth blue aster		1.34	0.67
smooth brome	0.84	0.09	0.46
wild lettuce	0.72		0.36

Table 4. Percent Relative Cover of Permanent Plot 13, August, 1998.

Species	PP13
reed canary grass	26.24
wild parsnip	23.53
tall coneflower	12.32
redtop	9.34
wild bergamot	8.59
black-eyed Susan	3.36
orchard grass	2.89
yellow coneflower	2.24
smooth brome	1.96
tall goldenrod	1.96
stiff goldenrod	1.40
golden alexanders	1.12
Canada wildrye	1.12
obedient plant	0.56
field thistle	0.56
common horsetail	0.56
smooth goldenrod	0.56
cup plant	0.56
hairy aster	0.56
gray evening primrose	0.56

Table 5. Number of Prairie Forbs Located and Flowering in 1998.

	Forb Transect 1			ForbTransect 2		
	Located	Flower	Not Loc	Located	Flower	Not Loc
compass plant	4	1		6	1	2
golden alexanders	2	2		1	1	
golden coreopsis				2	2	
lead plant				2	2	
horsemint	4	4	2			
oxeye	2	2	1	6	6	1
pale purple coneflower	20	10		16	12	
purple prairie clover	1	1				
rattlesnake master	2	2		28	26	
rigid goldenrod	1	1				
rosinweed	5	2		9	7	
smooth aster	1	1				
spiderwort	2	2		2	2	
tall bushclover	4	2	2	1	1	
tall cinquefoil	4	4		42	33	
tick trefoil	6	5	33	10	9	4
white false indigo	3	1		12 (8 cut)	1	2
white prairie clover	8	6	2	1	1	
yellow coneflower	7	6	1	20	16	2
	76	52	41	146	120	11

Appendix

Table A1	Walking Transect Quadrat Data	A2
Table A2	Permanent Plot Quadrat Data	A6
Table A3	Forb Transect Occurrences, 1992-1998	A11
Table A4	Permanent Plot locations	A18
Table A5	Plant names	A19

Table A1. Walking Transect Quadrat Data.

Walking Transect 1 — 3 August, 1998

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	#	Percent Cover	Percent Rel Cover	Percent Frequency
smooth brome	6		4												2	11.43	9.79	14.29
field bindweed	2														1	1.07	0.92	7.14
wild parsnip	2	2													2	2.14	1.83	14.29
big bluestem		5		6			2	5	5	3	5	4	4	2	10	45.00	38.53	71.43
field thistle		2		1											2	1.25	1.07	14.29
hairy aster			2						2						2	2.14	1.83	14.29
tall goldenrod			2	2		3		2	2	2	3	3	3	5	10	22.14	18.96	71.43
Indian grass			2				2	2		4					4	7.68	6.57	28.57
wild lettuce			2									2			2	2.14	1.83	14.29
giant ragweed					2										1	1.07	0.92	7.14
yellow sweet clover					2										1	1.07	0.92	7.14
dandelion					1								1		2	0.36	0.31	14.29
cup plant					1										1	0.18	0.15	7.14
Queen Anne's lace						2									1	1.07	0.92	7.14
wild bergamot						2	6								2	8.04	6.88	14.29
golden alexanders						2									1	1.07	0.92	7.14
clammy ground cherry									1						1	0.18	0.15	7.14
prairie ragwort										3	2		3		3	6.43	5.50	21.43
white sweet clover												2			1	1.07	0.92	7.14
switchgrass													2	1	2	1.25	1.07	14.29
																116.79	100.00	

Walking Transect 2 — 3 August, 1998

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	#	Percent Cover	Percent Rel Cover	Percent Frequency
big bluestem	6		6	5	4	6	5	3	4	4	5				6	10	51.50	43.95	66.67
Indian grass	2	1		1					3		2					5	4.83	4.13	33.33
field bindweed	2	2														2	2.00	1.71	13.33
Kentucky bluegrass		5						3	2			4		1		5	13.50	11.52	33.33
smooth brome		2				2			1					4		4	6.33	5.41	26.67
tall goldenrod			2		3		1		2		3	5	4	3		8	19.50	16.64	53.33
wild lettuce				3												1	2.50	2.13	6.67
side-oats grama					2											1	1.00	0.85	6.67
wild parsnip					2											1	1.00	0.85	6.67
switchgrass							2	3								2	3.50	2.99	13.33
prairie ragwort							2									1	1.00	0.85	6.67
redtop															2	1	1.00	0.85	6.67
rosinweed												2				1	1.00	0.85	6.67
wild bergamot													4	1		2	4.33	3.70	13.33
tall coneflower													2			1	1.00	0.85	6.67
showy tick-trefoil													2		2	2	2.00	1.71	13.33
golden alexanders														1		1	0.17	0.14	6.67
saw-tooth sunflower															2	1	1.00	0.85	6.67
																	117.17	100.00	

Table A1 (cont.). Walking Transect Quadrat Data.

Walking Transect 3 — 3 August, 1998

Species	Sample Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	#	Percent Cover	Percent Rel Cover	Percent Frequency
Kentucky bluegrass	4												4			4	3	11.72	8.67	18.75
tall goldenrod	3	2				3	5	3	3	3	3	2	2	4			10	20.78	15.38	62.50
Indian grass	3		4	3	2			5	3	2	3		3	3			10	25.16	18.61	62.50
raspberry	1																1	0.16	0.12	6.25
big bluestem		6	3	4	3	3	5		2	4	3	3		2	6	4	13	42.81	31.68	81.25
wild lettuce		2								2							2	1.88	1.39	12.50
prairie ragwort			3	3	3	4		4	4	4	2	2					9	24.53	18.15	56.25
smooth goldenrod					3												1	2.34	1.73	6.25
white sweet clover					2							2					2	1.88	1.39	12.50
switchgrass									2								1	0.94	0.69	6.25
hairy aster												2					1	0.94	0.69	6.25
field thistle												2					1	0.94	0.69	6.25
Canada wildrye														2			1	0.94	0.69	6.25
plantain																1	1	0.16	0.12	6.25
																		135.16	100.00	

Walking Transect 4 — 3 August, 1998

Species	Sample Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	#	Percent Cover	Percent Rel Cover	Percent Frequency
big bluestem	2	3	6	4	4	5	4	2	2	3	6	3	2	3	2	2	2	3	3	3	3	4	6	23	44.89	28.82	100.00
Indian grass	2	2	2								2		3	3							3		3	8	9.13	5.86	34.78
tall goldenrod	3	2		2		3	3	4	5	3	2	4	2	3	5	4	4	3	6	5	4	3	2	21	43.59	27.98	91.30
prairie ragwort	6	6	2	4	5	4					2			4		5	5	5			3	5		12	36.41	23.38	52.17
smooth brome	3	2								3														3	3.91	2.51	13.04
raspberry	2																							1	0.65	0.42	4.35
Kentucky bluegrass			2							5														2	4.35	2.79	8.70
Canada wildrye					2																			1	0.65	0.42	4.35
sweet clover						3																		1	1.63	1.05	4.35
field thistle								3											2					2	2.28	1.47	8.70
wild parsnip								1																1	0.11	0.07	4.35
wild lettuce									2						2									2	1.30	0.84	8.70
hairy aster									3						2									2	2.28	1.47	8.70
switchgrass											2			1					1	2				2	0.22	0.14	8.70
dandelion											2													1	0.65	0.42	4.35
dogwood													5											1	3.70	2.37	4.35
Siberian elm																							1	1	0.11	0.07	4.35
																									155.76	100.00	

Table A1 (cont.). Walking Transect Quadrat Data.

Walking Transect 5 — 3 August, 1998

Species	Sample Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Canada thistle	2				1					2														
big bluestem	6	2	4	2	2		2	6	3	2	3	5	3	2	3	3	6	6	5	2	5		4	6
wild parsnip		4	2	2		2																		
tall goldenrod			5	3	5	5	3	3	5	2	4	5	2	4	4	5	3	2	2	4		4	3	2
field thistle				2												1								
fireweed				1																				
Canada wildrye					2																			
Indian grass					2										2						3		3	
prairie ragwort						2												2	5	3				
hairy aster							2									3								
wild lettuce							2																	
clammy ground cherry							2																	
smooth brome													3											
Kentucky bluegrass													3							4				
smooth sumac																								

Species	25	26	27	28	29	30	31	32	33	34	35	36	37	#	Percent Cover	Percent Rel Cover	Percent Frequency
Canada thistle														3	0.88	0.69	8.11
big bluestem	2	3	3	2	6	5	3	3	6	5	2	5	4	35	50.47	39.57	94.59
wild parsnip														4	2.91	2.28	10.81
tall goldenrod	3	5		2		2	2	3	3	3	4			30	38.58	30.24	81.08
field thistle														2	0.47	0.37	5.41
fireweed														1	0.07	0.05	2.70
Canada wildrye	2				1									3	0.88	0.69	8.11
Indian grass			3	4			3	4		3	4	4	4	12	14.32	11.23	32.43
prairie ragwort		4	1	3		3								8	7.91	6.20	21.62
hairy aster	3		1			2		2					1	7	3.38	2.65	18.92
wild lettuce														1	0.41	0.32	2.70
clammy ground cherry														1	0.41	0.32	2.70
smooth brome		1												2	1.08	0.85	5.41
Kentucky bluegrass			4											3	4.39	3.44	8.11
smooth sumac						3	2							2	1.42	1.11	5.41
															127.57	100.00	

Table A2. Permanent Plot Quadrat Data.

Permenent Plot 1	3 August, 1998																							
	Sample Number																					Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
tall goldenrod	6	6	6	6	5	5	5	5	5	3	5	4	4	3	4	2	3	3	2	3	20	65.25	43.61	100.00
sedge			2	2																	2	1.50	1.00	10.00
Indian grass					2	2			2	2		2		3	2	5		2	2	3	11	14.00	9.36	55.00
Kentucky bluegrass					4	2															2	3.88	2.59	10.00
wild lettuce					2		3			2	2	2	1								6	5.00	3.34	30.00
raspberry						2															1	0.75	0.50	5.00
switchgrass								2			1	2						2			3	1.63	1.09	15.00
prairie ragwort								3	3	4	5	5	5	3	3	2	3	4	2	3	13	31.75	21.22	65.00
big bluestem									3				5	2	5	2	6	2	6	3	7	19.25	12.87	35.00
hairy aster										4	2	2									3	4.63	3.09	15.00
little bluestem														3							1	1.88	1.25	5.00
speedwell															1						1	0.13	0.08	5.00
																						149.63	100.00	

Permenent Plot 2	4 August, 1998																							
	Sample Number																					Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
Indian grass	2		4					3	2		4									6	6	14.50	11.86	30.00
big bluestem	2	2				3			3		3	6	6	5	5	5		5	6	2	10	34.50	28.22	50.00
tall goldenrod	4	2	4	5	5	3	5	5	4	4	2		2	2	2	4	3	2	2		19	43.50	35.58	95.00
switchgrass	2			2				3		2							2	1			6	5.00	4.09	30.00
wild parsnip	2	2	3	2	2	5	3	3	1	3		2	2		2					2	14	17.88	14.62	70.00
dandelion	2																2				2	1.50	1.23	10.00
wild lettuce			2	2	2				2												4	3.00	2.45	20.00
Canada thistle											2	2		2							3	2.25	1.84	15.00
hairy aster													1								1	0.13	0.10	5.00
																						122.25	100.00	

Table A2 (cont.). Permanent Plot Quadrat Data.

Permenent Plot 3	4 August, 1998																							
	Sample Number																					Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
prairie sunflower	2	4	3	3	4	5	3	3													8	18.75	11.97	40.00
saw-tooth sunflower	3								4	2	4	2	4	5	2	2	2	4	2	2	13	23.88	15.24	65.00
Kentucky bluegrass	3		3	3		2	4														5	9.50	6.07	25.00
switchgrass	2															2					2	1.50	0.96	10.00
smooth brome	2	2																			2	1.50	0.96	10.00
prairie ragwort	1	2	2	3	4			2	1	3	4	5	3	1			2	2	3	2	17	24.75	15.80	85.00
big bluestem		3	3	2	4	4	2	4	4	3	3	4	3	4	5	4	5	4	4	3	19	49.38	31.52	95.00
wild bergamot		2	2	2																	3	2.25	1.44	15.00
raspberry			3	2	2	2	2						2		2						7	6.38	4.07	35.00
Indian grass						2		2					3						2		4	4.13	2.63	20.00
tall goldenrod							2		2												2	1.50	0.96	10.00
field thistle							2									2					2	1.50	0.96	10.00
hairy aster									2	2						2	2	2			5	3.75	2.39	25.00
wild parsnip									2												1	0.75	0.48	5.00
common horsetail										2	2	2	2								4	3.00	1.92	20.00
dandelion										2						2					2	1.50	0.96	10.00
Tartarian honeysuckle																				3	1	1.88	1.20	5.00
wild lettuce																				2	1	0.75	0.48	5.00
																						156.63	100.00	

Permenent Plot 4	4 August, 1998																							
	Sample Number																					Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
big bluestem	5	6	4	2	3	2	4	2	2	4	5	6	6	3	3	5	3	2	2		19	48.75	35.10	95.00
tall goldenrod	3	4			2	2	3	2	4	3	2	2	2	2	2	2	2	2	2	2	18	21.63	15.57	90.00
switchgrass	2																				1	0.75	0.54	5.00
common horsetail	3	2	3	2	4	2	2	1	4	1	2	2			2				2		14	16.25	11.70	70.00
white sweet clover	2	2	2	2	2	1															6	3.88	2.79	30.00
prairie ragwort		2													2			2		4	4	5.38	3.87	20.00
smooth goldenrod			3	3																	2	3.75	2.70	10.00
Indian grass				4	3	4	2	3	2	3				3	2	3		3	4	4	13	26.00	18.72	65.00
hairy aster				2	2						1										3	1.63	1.17	15.00
field thistle						2		2		1											3	1.63	1.17	15.00
little bluestem								2													1	0.75	0.54	5.00
Kentucky bluegrass															2		4	4	2	2	5	8.50	6.12	25.00
																						138.88	100.00	

Table A2 (cont.). Permanent Plot Quadrat Data.

Permenent Plot 5	4 August, 1998																						
	Sample Number																				Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
Indian grass	2					3					2				5		2	3			6	10.25	7.68	30.00
tall goldenrod	5	3	6	4	5	5	4	4	4	4	2		2	2	2	4	2			3	17	43.88	32.87	85.00
wild parsnip	3	2	1		2		1	2	2	2	2	3	1		1		2		2	2	15	11.00	8.24	75.00
hairy aster	2	2							2					1		2	2		2		7	4.63	3.46	35.00
redtop	1																				1	0.13	0.09	5.00
big bluestem		4	2	5	2	2	2	5	2	4	5	5	6	4		4	5	4	5	4	18	52.88	39.61	90.00
switchgrass		2						2													2	1.50	1.12	10.00
field bindweed		1					1														2	0.25	0.19	10.00
clammy ground cherry				1	3																2	2.00	1.50	10.00
field thistle									2	2								2	1		4	2.38	1.78	20.00
prairie ragwort									1		2	2		2				2	2		6	3.88	2.90	30.00
wild lettuce																		2			1	0.75	0.56	5.00
																						133.50	100.00	

Permenent Plot 6	4 August, 1998																						
	Sample Number																				Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
Indian grass	2	3	3			1		2		2		4	1	2		3	6	3	3		13	20.63	15.19	65.00
big bluestem	5	3	2	6	4	5	5	4	3	5	6	5	4	4	6	2	2	4	2	5	20	62.50	46.04	100.00
tall goldenrod	3	4	3	1	3	2	3	4	3	2	2	3	4	3	2	4	3	2	2		19	32.13	23.66	95.00
wild lettuce	2																				1	0.75	0.55	5.00
field bindweed	1																				1	0.13	0.09	5.00
switchgrass		2					2		3					2							4	4.13	3.04	20.00
hairy aster			2	2				2		2											4	3.00	2.21	20.00
prairie ragwort					1					3								3	5	5	5	12.38	9.12	25.00
Canada wildrye																1					1	0.13	0.09	5.00
																						135.75	100.00	

Table A2 (cont.). Permanent Plot Quadrat Data.

Permenent Plot 7	4 August, 1998																						
	Sample Number																				Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
Indian grass	2	4	4	3	2	5		2	2		2		2	3	2	2	4	2			15	24.13	20.04	75.00
big bluestem	2	2	2	2	5		4	5	5	4	3	3	2	2	5	2			5	3	17	38.38	31.88	85.00
tall goldenrod	4	2	3	3	2	3	4	2	2	4	5	4	2	5	3	5	3	5	4	3	20	47.63	39.56	100.00
common horsetail	2																				1	0.75	0.62	5.00
prairie ragwort	2	2					2								3				2	2	6	5.63	4.67	30.00
hairy aster		2																			1	0.75	0.62	5.00
horseweed				2																	1	0.75	0.62	5.00
riverbank grape							1			2											1	0.13	0.10	5.00
switchgrass								2													1	0.75	0.62	5.00
choke cherry																				2	1	0.75	0.62	5.00
dogwood																				2	1	0.75	0.62	5.00
																						120.38	100.00	

Permenent Plot 8	4 August, 1998																						
	Sample Number																				Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
prairie ragwort	5	3																			2	6.13	5.79	10.00
switchgrass	3	2			2		2														2	2.63	2.48	10.00
big bluestem	2	2	4	2	2	3	5	2	4	5	5		2	6	3	4	2				16	36.00	34.04	80.00
hairy aster	1	3							2						2	2	2			2	6	5.00	4.73	30.00
Indian grass		5			2			5									4	3	2		6	15.00	14.18	30.00
field thistle			2	1						2	2								2	2	6	3.88	3.66	30.00
golden alexanders			2	3									3	1	2	2					6	6.13	5.79	30.00
tall goldenrod				3	5	3	3	4	2	2		6	4	5				2	2	2	13	29.00	27.42	65.00
showy tick-trefoil					2	2	2											2			4	3.00	2.84	20.00
Canada wildrye										1											1	0.13	0.12	5.00
annual fleabane											3										1	1.88	1.77	5.00
horse nettle															1						1	0.13	0.12	5.00
clammy ground cherry																2			2		2	1.50	1.42	10.00
dandelion																2					1	0.75	0.71	5.00
giant ragweed																		2			1	0.75	0.71	5.00
																						105.75	100.00	

Table A2 (cont.). Permanent Plot Quadrat Data.

Permenent Plot 10	3 August, 1998																						
	Sample Number																				Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
wild lettuce	2								2										1		3	1.63	1.21	15.00
Indian grass	2	2	2	2	2	2	2	3	4	3	2		3	2	2	2	2				16	17.75	13.20	80.00
big bluestem	2	2	3	5	5	3	4	5	4	5	6	2	5	2	4	4	2	2	6	6	19	52.38	38.94	95.00
Kentucky bluegrass	4	2												3							2	3.88	2.88	10.00
tall goldenrod	2	2			2	2	1	1		2			2	2	4	3	5	3	4	4	17	26.63	19.80	85.00
prairie ragwort	2	3	3	2	2	2	2	2		2						2					10	9.75	7.25	50.00
riverbank grape		2	3	2																	3	3.38	2.51	15.00
little bluestem						4	1	1													3	3.38	2.51	15.00
white sweet clover									5												1	4.25	3.16	5.00
hairy aster												2		2		2					3	2.25	1.67	15.00
switchgrass												4	2	2				4		2	5	8.50	6.32	25.00
clammy ground cherry															2						1	0.75	0.56	5.00
																						134.50	100.00	
																						134.50	100.00	

Permenent Plot 11	4 August, 1998																						
	Sample Number																				Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					#	Cover	Rel Cover	Frequency
ox-eye	2				1								4								2	1.09	0.84	12.50
Kentucky bluegrass	6	5	5	5	5	5	4	5	4	5	5	5	4	4	4	6					16	79.53	61.10	100.00
smooth brome	2		1																		2	1.09	0.84	12.50
tall goldenrod	2													4							2	4.84	3.72	12.50
Indian grass	1							1			4	2				2					5	6.09	4.68	31.25
round-headed bush clover		3																			1	2.34	1.80	6.25
side-oats grama		2	2		1											2					4	2.97	2.28	25.00
alta fescue			2			2	3			2											4	5.16	3.96	25.00
big bluestem				3	3	2		2	3				2	2	2						7	9.38	7.20	43.75
wild lettuce										2											1	0.94	0.72	6.25
yellow coneflower											3	4	2	3	3						5	11.88	9.12	31.25
stiff goldenrod															4						1	3.91	3.00	6.25
clammy ground cherry															2						1	0.94	0.72	6.25
																						130.16	100.00	

Table A2 (cont.). Permanent Plot Quadrat Data.

Permenent Plot 12	4 August, 1998																							
	Sample Number																					Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
Kentucky bluegrass	6	5	5	4	4	5	5	4	6	4	4	5		6	5	6	4	4	3	5	19	73.00	52.28	95.00
tall goldenrod	2					2	2		2			2	2	2	2	2	2	5			11	11.75	8.42	55.00
alta fescue	2	2						2		2	2	1	2		2			2			9	6.13	4.39	45.00
yellow coneflower		3		3	2					2	2	2	4				2	2	3		10	13.25	9.49	50.00
little bluestem			3		2																2	2.63	1.88	10.00
sky-blue aster			2	3		2															3	3.38	2.42	15.00
smooth brome			1																		1	0.13	0.09	5.00
clammy ground cherry			2		2																2	1.50	1.07	10.00
arrow-leaved aster?				3																	1	1.88	1.34	5.00
smooth blue aster					3																1	1.88	1.34	5.00
Indian grass					3	1	2	4				2									5	6.63	4.74	25.00
stiff goldenrod						1			2	3	5										4	7.00	5.01	20.00
side-oats grama						2															1	0.75	0.54	5.00
tall cinquefoil								2						3							2	2.63	1.88	10.00
black-eyed Susan										2											2	2.63	1.88	10.00
round-headed bush clover																	2			3	2	2.63	1.88	10.00
ox-eye																			3		1	1.88	1.34	5.00
																						139.63	100.00	

Permenent Plot 13	5 August, 1998																							
	Sample Number																					Percent	Percent	Percent
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	#	Cover	Rel Cover	Frequency
tall coneflower	4	2		5	2			2	2	5							3				8	16.50	12.32	40.00
stiff goldenrod	3																				1	1.88	1.40	5.00
wild parsnip	2				2		2		4		1		3	4	4		4	3		2	11	31.50	23.53	55.00
obedient plant	2																				1	0.75	0.56	5.00
wild bergamot	3	2			3						4		4		2						6	11.50	8.59	30.00
reed canary grass		5	6	2		6	3	2				6				6			6	4	10	35.13	26.24	50.00
golden alexanders		2				2															2	1.50	1.12	10.00
orchard grass					2			4													2	3.88	2.89	10.00
smooth brome				3	2																2	2.63	1.96	10.00
field thistle					2																1	0.75	0.56	5.00
common horsetail							2														1	0.75	0.56	5.00
redtop											4										4	12.50	9.34	20.00
smooth goldenrod													2								1	0.75	0.56	5.00
cup plant														2							1	0.75	0.56	5.00
yellow coneflower														2			2	2		2	4	3.00	2.24	20.00
hairy aster														2							1	0.75	0.56	5.00
black-eyed Susan															3		2	3			3	4.50	3.36	15.00
Canada wildrye																	2	2			2	1.50	1.12	10.00
tall goldenrod																		3		2	2	2.63	1.96	10.00
gray evening primrose																		2			1	0.75	0.56	5.00
																						133.88	100.00	

‘able A3. Forb Transect Occurrences, 1992-1998.										
Forb Transect #1									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
93 (no tag)	Bigtooth sunflower		NF	NoLo	NoLo	NoLo	NoLo	NoLo	8.90?	0.75W
95-1-15	Bigtooth sunflower		*	*	*	NYF	NYF	NYF	28.10	0.85E
93 (no tag)	Bigtooth sunflower(96 EW dia 1.4		NF	*	NF	NYF	NYF	NYF	9.80	1.65E
95-1-25	Compass plant				*	*	*	NF	45.50	9.20W
94 (no tag)	Compass plant			*	NoLo	NoLo	NoLo	NoLo	16.00	9.40W
92-1-29	Compass plant	*	NoLo	*	*	*	*	*	13.55	10.25E
92-1-23	Compass plant	NF	NF	NF	*	NF	NF	NF	24.40	3.05W
92-1-62	Compass plant	*	NF	*	*	NF	*	NF	48.20	9.35W
97-1-3	Dogbane (Ap. sib.)						NF	NoLo	10.90	0.40W
93 (no tag)	Dogbane		*	NoLo	NoLo	NoLo	NoLo	NoLo	24.00	9.65E
95 (no tag)	Evening primrose 13 plants				*		NF	NoLo	45.2-47.3	1.5-3.6W
96-1-2	Golden alexanders					*	*	*	13.05	0.10E
92-1-70	Golden alexanders	*	NL	*	*	*	*	*	12.65	0.40E
92-1-27	Golden alexanders	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	12.80	4.30W
95-1-2	Horsemint				*	NYF	*	NoLo	3.75	7.90E
95-1-3	Horsemint				*	NoLo	*	NoLo	8.75	9.15E
95-1-1	Horsemint			*	*	NYF	*	*	5.00	7.90E
95-1-29	Horsemint		*	*	*	NYF	*	*	18.30	5.50W
92-1-6	Oxeye					*	*	*	26.15	5.40E
5-1-11	Oxeye				*	*	*	*	26.05	5.65E
96-1-4	Pale purple coneflower					*	dead	NF	50.55	7.20W
96-1-3	Pale purple coneflower					*	*	Dead	16.15	0.40E
95-1-21	Pale purple coneflower				*	NF	NF	NF	50.35	4.10E
95-1-24	Pale purple coneflower				NF	*	*	NF	50.55	7.20E
95-1-17	Pale purple coneflower				*	NF	NF	NF	29.10	2.50E
95-1-21	Pale purple coneflower			*	*	NF	*	NF	33.60	3.50E
95-1-13	Pale purple coneflower			*	NF	NF	*	*	26.20	8.50E
92-1-28	Pale purple coneflower	*	*	*	*	*	*	*	6.60	0.90W
92-1-1	Pale purple coneflower	*	NoLo	NF	NF	NF	NF	*	7.60	2.10E
92-1-25	Pale purple coneflower	*	NF	*	*	NF	*	NF	21.25	1.90W
92-1-24	Pale purple coneflower	*	*	NF	*	NF	*	*	22.55	3.65W
92-1-22	Pale purple coneflower	NF	*	NF	NF	*	*	NF	24.35	2.55W
92-1-4	Pale purple coneflower	*	NF	NF	NF	NF	NF	NF	25.20	2.50E
92-1-9 (tag miss	Pale purple coneflower	*	NF	*	NF	*	NF	*	27.10	0.35E
92-1-13	Pale purple coneflower	NF	*	NF	NF	*	*	NF	29.50	3.95E
92-1-30	Pale purple coneflower	*	NF	*	NF	*	*	*	30.30	3.70E
92-1-31	Pale purple coneflower	*	*	NF	NF	*	NF	NF	31.00	3.55E
92-1-32	Pale purple coneflower	*	NF	*	NF	*	*	*	31.30	2.60E
92-1-33	Pale purple coneflower	*	NF	NF	NF	*	*	*	31.30	3.15E
92-1-34	Pale purple coneflower	*	NF	*	*	*	*	*	31.60	2.95E
92-1-63	Pale purple coneflower	*	NF	*	NoLo	NF	NF	*	46.05	7.60W
92-1-39	Pale purple coneflower	*	NF	NoLo	NoLo	NoLo	NoLo	NoLo	3.70	3.70E
92-1-59	Purple prairie clover	*	*	*	*	*	*	*	54.55	0.80E
92-1-7	Rattlesnake master	NF	NF	*	*	*	NF	*	26.80	1.40E
2-1-16	Rattlesnake master	*	NoLo	*	*	*	*	*	27.75	0.95W

able A3 (cont.). Forb Transect Occurrences, 1992-1998.										
Forb Transect #1									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
97-1-1	Rigid goldenrod						*	*	6.00	7.50E
94 (no tag)	Rosinweed			*	?	NoLo	NoLo	NoLo	7.20	8.40W
95-1-10	Rosinweed			*	*	*	*	*	24.00	9.55E
92-1-20	Rosinweed	*	*	*	*	NYF	*	NYF	24.65	3.25W
92-1-17	Rosinweed	*	*	*	*	NYF	*	NF	26.40	1.10W
92-1-19	Rosinweed	*	*	*	*	NYF	*	NF	26.50	3.40W
92-1-67	Rosinweed	*	*	*	*	*	*	*	33.90	4.25W
94 (no tag)	Showy sunflower			*	*	NYF	NYF	NYF	0.00	1.8-13.9E
94 (no tag)	Showy sunflower			*	*	NYF	NYF	NYF	5.00	0.7-16.7E
92-1-71	Smooth aster	*	NoLo	*	NF	NYF	NoLo	NF	13.00	1.40E
95-1-26	Spiderwort				*	*	*	*	27.40	4.75W
92-1-26	Spiderwort	*	NF	NoLo	*	*	*	*	19.55	0.40W
95-1-9	Tall bushclover		*	*	*	NYF	*	*	23.40	1.00E
92-1-68	Tall bushclover	*	*	*	*	NYF	*	NoLo	23.35	0.70E
92-1-69	Tall bushclover	*	*	*	*	NYF	*	NoLo	23.70	0.90E
92-1-57	Tall bushclover	*	*	*	*	*	*	*	49.55	4.00E
97-1-2	Tall cinquefoil						*	*	22.30	1.50E
92-1-5	Tall cinquefoil	NF	*	*	*	*	*	*	25.90	5.25E
92-1-14	Tall cinquefoil	NF	NF	*	*	NYF	NoLo	*	29.20	4.75W
92-1-10	Tall cinquefoil	*	NF	*	*	*	*	*	29.65	5.95E
95-1-4	Tick trefoil			*	*	NYF	*	*	8.85	0.40E
95-1-6	Tick trefoil				*	NYF	*	*	11.55	2.75E
92-1-2	Tick trefoil	*	*	*	*	NYF	*	*	11.65	4.15E
95-1-5	Tick trefoil		NF	*	*	NYF	*	NF	11.90	2.00E
95-1-7	Tick trefoil			*	*	NYF	*	*	13.45	0.10W
95-1-16	Tick trefoil			*	*	NYF	*	*	28.30	0.70E
92-1-52	Tick trefoil	*	*	*	*	NYF	*	NoLo	41.70	0.75E
92-1-3	Tick trefoil	*	NF	*	*	NYF	*	NoLo	13.45	4.50E
95-1-22	Tick trefoil			*	*	NYF	NoLo	NoLo	33.35	3.65E
95-1-20	Tick trefoil			*	*	NYF	dead	NoLo	34.00	3.20E
92-1-41	Tick trefoil	*	*	*	*	NoLo	dead	NoLo	37.55	2.00E
92-1-47	Tick trefoil	NF	*	*	*	NoLo	NoLo	NoLo	40.85	2.85E
92-1-61	Tick trefoil	*	*	*	*	NYF	NoLo	NoLo	50.70	8.10W
92-1-60	Tick trefoil	*	*	*	*	NYF	dead	NoLo	57.05	4.90E
96-1-21A	Tick trefoil			*	NoLo	NF	dead	NoLo	33.50	3.80E
94 (no tag)	Tick trefoil			*	NoLo	NoLo	NoLo	NoLo	45.80	6.60E
94 (no tag)	Tick trefoil			*	NoLo	NoLo	NoLo	NoLo	46.10	6.50E
94 (no tag)	Tick trefoil			*	NoLo	NoLo	NoLo	NoLo	34.50	3.80E
92-1-46	Tick trefoil	*	*	*	NoLo	NoLo	NoLo	NoLo	40.20	4.45E
92-1-54	Tick trefoil	*	*	*	NoLo	NoLo	NoLo	NoLo	44.40	4.50E
92-1-58	Tick trefoil	*	*	NF	NoLo	NoLo	NoLo	NoLo	54.00	4.05E
92-1-50	Tick trefoil (tag lost '94)	*	*	*	NoLo	NoLo	NoLo	NoLo	41.05	2.65E
92-1-36	Tick trefoil	*	*	dead	NoLo	NF	NoLo	NoLo	33.30	5.55E
92-1-37	Tick trefoil	*	*	dead	NoLo	NoLo	NoLo	NoLo	34.30	7.05E
-1-38	Tick trefoil	*	*	dead	NoLo	NoLo	NoLo	NoLo	34.30	7.05E

Table A3 (cont.). Forb Transect Occurrences, 1992-1998.										
Forb Transect #1									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
92-1-66	Tick trefoil	*	*	NoLo	NoLo	NoLo	NoLo	NoLo	35.10	7.85W
92-1-42	Tick trefoil	*	*	NoLo	NoLo	NoLo	NoLo	NoLo	37.95	2.90E
92-1-45	Tick trefoil	*	*	NoLo	NoLo	NoLo	NoLo	NoLo	40.05	2.75E
92-1-48	Tick trefoil	NF	*	NoLo	NoLo	NoLo	NoLo	NoLo	40.40	2.80E
92-1-64	Tick trefoil	*	NoLo	*	NoLo	NoLo	NoLo	NoLo	38.50	7.85W
92-1-40	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	35.95	3.40E
92-1-65	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	36.90	0.50W
92-1-49	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	40.30	2.60E
92-1-51	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	41.15	2.05E
92-1-53	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	42.35	3.35E
92-1-55	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	45.85	6.35E
92-1-43	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	39.30	0.60E
92-1-44	Tick trefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	39.45	3.05E
95-1-20	White false indigo				*	*	*	NF	47.60	7.70E
92-1-11	White false indigo	*	*	*	*	*	*	*	29.75	5.15E
92-1-56	White false indigo	*	*	*	*	*	*	NF	46.00	3.60E
95-1-28	White prairie clover				*	*	*	*	25.50	3.25W
95-1-12	White prairie clover				*	*	*	*	26.20	1.25E
95-1-18	White prairie clover				*	*	*	*	29.45	4.70E
95-1-19	White prairie clover				*	*	*	*	33.05	2.40E
95-1-23	White prairie clover				*	*	*	*	50.70	7.10E
92-1-12	White prairie clover	*	*	*	*	*	*	*	29.70	4.90E
92-1-21	White prairie clover	*	*	*	*	*	*	Dead	25.30	3.20W
92-1-8	White prairie clover	*	*	*	*	*	Dead	Dead	26.90	0.90E
96-1-1	Yellow coneflower					*	*	*	6.00	7.40E
95-1-14	Yellow coneflower			*	*	*	*	*	26.40	8.70E
95-1-22	Yellow coneflower			*	*	*	*	*	54.55	3.80E
95-1-27	Yellow coneflower			*	*	*	*	NoLo	28.10	2.55W
95-1-8	Yellow coneflower		*	NF	*	*	*	*	22.35	5.60E
92-1-18	Yellow coneflower	*	*	NF	*	*	*	NF	26.40	2.80W
92-1-15	Yellow coneflower	*	*	*	*	*	*	*	27.45	5.30W
92-1-35	Yellow coneflower	*	*	*	*	*	*	*	32.35	2.40E

Table A3 (cont.) Forb Transect Occurrances, 1992-1998.										
orb Transect #2									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
92-2-96	??							NF	4.00	3.00W
92-2-20	??							Dead	7.60	2.45E
94-2-9	Compass plant					*	*	NoLo	15.60	13.10W
94-2-7	Compass plant					NF	*	NF	17.80	3.20W
95-2-138	Compass plant				NF	NF	*	NF	16.10	1.05W
94-2-10	Compass plant		*	NoLo	NF	*	*	*	15.00	2.35W
92-2-94	Compass plant	NF	NF	*	NF	NF	*	NF	15.10	0.30W
92-2-66	Compass plant	NF	NF	NF	*	NF	NF	NF	17.90	0.60W
92-2-60	Compass plant	NF	NF	*	*	NF	*	NF	29.30	0.50W
97-2-1	Compass plant						NF	NoLo	26.00	2.80E?W?
96-2-13	Golden alexanders					*	*	*	14.85	4.60E
94-2-11	Golden coreopsis			*	*	NYF	*	*	14.30	3.95W
94-2-8	Golden coreopsis			?	*	NYF	*	*	16.70	1.60W
94-2-6	Golden coreopsis				*	NYF	*	*	26.10	2.40E
93-2-5	Lead plant		*	*	*	*	*	*	9.90	3.10E
92-2-29	Lead plant	*	*	*	*	*	*	*	11.30	2.65E
95-2-117	Oxeye				*	*	*	*	3.80	1.60W
95-2-126	Oxeye				*	*	*	*	8.00	1.35W
95-2-119	Oxeye				*	*	*	*	5.40	0.95W
1-2-4	Oxeye			*	*	*	*	*	6.50	2.20E
3-2-4	Oxeye		*	*	*	*	*	*	4.70	7.10E
92-2-44	Oxeye	*	*	*	*	*	*	*	17.60	3.50E
92-2-92	Oxeye	*	*	*	*	*	*	NoLo	6.30	1.40W
96-2-3	Pale purple coneflower					NF	*	NF	2.25	0.85W
96-2-6	Pale purple coneflower					*	*	*	2.30	4.10E
96-2-11	Pale purple coneflower					*	NF	NF	5.70	3.85W
96-2-12	Pale purple coneflower					*	*	*	6.70	4.85W
95-2-114	Pale purple coneflower				NF	*	*	NF	1.90	2.40W
95-2-127	Pale purple coneflower				NF	NF	*	*	8.10	1.65W
95-2-128	Pale purple coneflower				NF	NF	NF	*	8.40	1.85W
95-2-136	Pale purple coneflower				*	*	*	NF	10.10	0.90W
95-2-139	Pale purple coneflower				*	*	*	*	18.30	3.60W
95-2-137	Pale purple coneflower		*	NoLo	*	*	*	*	10.20	5.40W
93-2-6	Pale purple coneflower		*	NF	*	*	*	*	19.40	4.90E
93-2-12	Pale purple coneflower		*	*	*	NF	*	*	24.80	0.90W
92-2-87	Pale purple coneflower	NF	*	NF	*	*	NF	*	7.60	2.25W
92-2-25	Pale purple coneflower	NF	*	*	*	*	*	*	9.00	2.80E
92-2-71	Pale purple coneflower	*	*	*	*	*	*	*	13.50	3.90W
92-2-50	Pale purple coneflower	*	NF	*	*	*	*	*	20.95	3.35E
92-2-31	Pale purple coneflower	*	*	NF	NoLo	NoLo	NoLo	NoLo	12.70	3.56E
92-2-7	Pale purple coneflower	*	*	NoLo	NoLo	NoLo	NoLo	NoLo	5.60	3.28E
92-2-46	Pale purple coneflower	NF	NoLo	NoLo	NoLo	NF	dead	Dead	19.20	2.15E
96-2-7	Rattlesnake master					*	NF	*	2.25	4.35E
-2-118	Rattlesnake master				*	*	*	*	4.00	8.35W
95-2-111	Rattlesnake master				*	*	NF	NF	12.40	2.30E
95-2-141	Rattlesnake master		*	NoLo	*	*	*	*	21.00	0.90W

Table A3 (cont.) Forb Transect Occurrances, 1992-1998.										
Forb Transect #2									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
95-2-121	Rattlesnake master		*	NoLo	*	*	*	*	6.20	1.02W
93-2-3	Rattlesnake master		*	NoLo	NoLo	NoLo	NoLo	NoLo	5.15	1.40E
92-2-1	Rattlesnake master	*	*	*	*	*	*	*	2.30	0.95E
92-2-2	Rattlesnake master	*	*	*	*	*	*	*	3.40	4.00E
92-2-6	Rattlesnake master	*	NF	*	*	*	*	*	5.00	6.10E
92-2-19	Rattlesnake master	*	*	*	*	*	*	*	7.50	1.75E
92-2-75	Rattlesnake master	*	*	*	*	*	*	*	10.40	7.25W
92-2-73	Rattlesnake master	*	*	*	*	*	*	*	10.50	0.00E/W
92-2-30	Rattlesnake master	*	*	*	*	*	*	*	11.70	3.25E
92-2-33	Rattlesnake master	*	NoLo	*	*	*	NF	*	13.60	2.90E
92-2-34	Rattlesnake master	*	*	*	*	*	NF	*	14.40	2.90E
92-2-69	Rattlesnake master	*	*	*	*	*	*	*	14.50	2.40W
92-2-35	Rattlesnake master	*	NoLo	NoLo	NoLo	*	NoLo	*	14.80	2.70E
92-2-36	Rattlesnake master	*	*	*	*	*	NF	NF	14.90	2.80E
92-2-67	Rattlesnake master	*	*	*	*	*	*	*	15.40	7.15W
92-2-42	Rattlesnake master	*	*	*	*	*	*	*	17.60	0.80E
92-2-63	Rattlesnake master	*	*	*	*	*	*	*	19.50	3.40W
92-2-64	Rattlesnake master	*	*	*	NoLo	*	NF	*	19.50	3.90W
92-2-47	Rattlesnake master	*	*	*	*	*	*	*	19.70	0.40E
92-2-51	Rattlesnake master	*	NF	*	*	*	*	*	20.30	5.45E
92-2-49	Rattlesnake master	*	NF	*	*	*	NF	*	20.60	3.45E
92-2-53	Rattlesnake master	*	NF	*	*	*	*	*	22.45	1.65E
92-2-54	Rattlesnake master	*	*	*	*	*	*	*	23.40	2.15E
92-2-59	Rattlesnake master	*	NF	*	*	*	NF	*	29.40	1.80W
92-2-58	Rattlesnake master	*	*	*	*	*	*	*	30.00	0.95W
92-2-3	Rosinweed	*	*	*	*	NYF	*	*	3.50	4.00E
92-2-12	Rosinweed	*	*	*	*	*	*	*	6.20	6.90E
92-2-90	Rosinweed	*	*	*	*	*	*	*	7.30	6.40W
92-2-26	Rosinweed	*	NL	*	*	*	*	NF	9.70	0.25E
92-2-70	Rosinweed	*	*	*	*	*	*	*	13.10	2.65W
92-2-40	Rosinweed	*	*	*	*	*	*	*	15.80	0.20E
92-2-43	Rosinweed	*	*	*	*	*	*	NF	17.70	2.30E
92-2-45	Rosinweed	*	*	*	*	*	*	*	19.20	2.25E
92-2-56	Rosinweed	*	*	*	*	*	*	*	27.80	4.40E
95-2-138	Spiderwort		*	*	*	*	*	*	11.60	2.30W
92-2-38/no tag	Spiderwort	*	*	NL	*	*	*	*	14.80	2.90E
93-2-8	Tall bushclover		*	*	*	*	*	*	26.70	2.00E
96-2-10	Tall cinquefoil					NF	*	NF	3.50	2.25E
95-2-109	Tall cinquefoil					*	*	*	9.20	2.80E
95-2-104	Tall cinquefoil				NF	*	NF	NF	5.40	2.75E
95-2-120	Tall cinquefoil				NF	*	*	*	5.60	2.60W
95-2-122	Tall cinquefoil				NF	NYF	*	*	6.30	2.20W
95-2-105	Tall cinquefoil				*	*	*	*	6.55	1.10E
95-2-106	Tall cinquefoil				NF	*	*	*	7.00	3.10E
95-2-123	Tall cinquefoil				*	?	*	*	7.10	2.25W
95-2-125	Tall cinquefoil				*	NF	*	*	8.20	1.00W

Table A3 (cont.) Forb Transect Occurrances, 1992-1998.										
Forb Transect #2									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
95-2-108	Tall cinquefoil				*	NoLo	NoLo	NF	8.80	6.00E
95-2-131	Tall cinquefoil				*	NF	*	*	8.90	0.60W
95-2-130	Tall cinquefoil				*	*	*	*	9.00	0.45W
95-2-132	Tall cinquefoil				*	NF	*	*	9.20	0.60W
95-2-133	Tall cinquefoil				*	NF	*	*	9.50	1.10W
95-2-114	Tall cinquefoil				*	*	*	*	14.60	4.30E
94-2-2	Tall cinquefoil			* NF	NF	NF	NoLo	*	6.05	3.55E
95-2-134	Tall cinquefoil		*	NoLo	*	NF	*	*	9.90	0.70W
95-2-135	Tall cinquefoil		*	NoLo	*	NF	*	NF	9.80	0.90W
93-2-2	Tall cinquefoil		*	*	NF	NF	NF	*	4.85	1.90E
92-2-4	Tall cinquefoil	*	*	*	*	NF	*	*	4.45	1.55E
92-2-91	Tall cinquefoil	*	NF	*	*	*	*	NF	6.20	1.80W
92-2-11	Tall cinquefoil	*	NoLo	*	*	NF	*	*	6.40	2.40E
92-2-14	Tall cinquefoil	*	*	*	*	*	*	NF	6.80	1.65E
92-2-15	Tall cinquefoil	NF	NF	*	*	*	*	*	6.90	1.00E
92-2-89	Tall cinquefoil	*	NF	*	*	*	*	NF	7.00	0.85W
92-2-13	Tall cinquefoil	*	*	*	*	*	*	*	7.00	2.30E
92-2-17	Tall cinquefoil	*	*	*	*	NF	*	*	7.40	1.95E
95-2-107	Tall cinquefoil	*	*	*	*	*	*	*	7.60	2.40E
92-2-86	Tall cinquefoil	*	*	*	*	*	*	*	7.60	2.70W
92-2-93	Tall cinquefoil	*	*	NoLo	*	NF	*	*	8.10	0.35W
92-2-21	Tall cinquefoil	*	*	*	*	NF	*	NF	8.10	3.75E
92-2-22	Tall cinquefoil	*	*	*	*	*	*	*	8.60	2.40E
92-2-23	Tall cinquefoil	*	*	*	*	*	*	NF	9.00	0.60E
92-2-24	Tall cinquefoil	*	*	*	*	*	*	*	9.20	3.95E
92-2-81	Tall cinquefoil	NF	NF	NoLo	NF	*	*	*	9.20	2.45W
92-2-27	Tall cinquefoil	*	*	*	*	NF	*	*	10.00	3.55E
92-2-74	Tall cinquefoil	*	*	*	*	*	*	*	11.50	6.65W
92-2-32	Tall cinquefoil	*	*	*	*	*	*	*	13.00	2.75E
92-2-39	Tall cinquefoil	*	*	*	*	*	*	*	15.00	0.35E
92-2-41/tag lo	Tall cinquefoil	*	*	*	*	*	*	*	16.30	2.60E
92-2-48	Tall cinquefoil	*	NF	*	NF	NF	NF	*	20.70	2.00E
92-2-55	Tall cinquefoil	*	NF	*	*	NF	*	*	25.40	1.15E
92-2-10	Tall cinquefoil	*	*	*	*	NF	*	NoLo	5.20	1.00E
92-2-37	Tall cinquefoil	*	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	14.80	2.80E
96-2-2	Tick trefoil					NF	*	*	2.30	0.40W
96-2-8	Tick trefoil					NF	NF	*	2.90	1.70E
95-2-97	Tick trefoil					NF	*	*	3.45	1.50E
96-2-5	Tick trefoil					NoLo	NoLo	*	3.50	1.35E
96-2-1	Tick trefoil					NF	*	Dead	2.15	0.15W
95-2-95	Tick trefoil				NF	*	*	*	2.70	3.60E
95-2-101	Tick trefoil				NF	NoLo	*	*	5.35	4.90E
95-2-102	Tick trefoil				NF	NYF	*	*	5.80	3.75E
5-2-100	Tick trefoil				NF	NYF	*	NF	4.40	0.60E
95-2-97	Tick trefoil				NF	NoLo	NoLo	NoLo	1.35	1.55E
95-2-99	Tick trefoil				NF	NYF	NL	NoLo	4.80	7.55E
95-2-103	Tick trefoil				NF	NYF	NF	NoLo	5.00	3.20E

Table A3 (cont.) Forb Transect Occurrances, 1992-1998.										
Forb Transect #2									5 and 6 August, 1998	
	*=flowering/fruiting, NF=not flowering, NoLo=not located, NYF=not yet flowering									
Number	Species	1992	1993	1994	1995	1996	1997	1998	Transect	Lateral
									(m)	E/W (m)
94-2-1	Tick trefoil			*	NF	NoLo	NoLo	NoLo	5.60	4.10E
93 (no tag)	Tick trefoil		*	NoLo	NoLo	NoLo	NoLo	Dead	18.15	1.65W
92-2-5	Tick trefoil	*	*	*	*	NYF	*	*	5.20	1.00E
92-2-61	Tick trefoil	*	*	*	*	NYF	*	*	27.10	1.80W
92-2-8	Tick trefoil	*	*	*	*	NYF	*	NoLo	5.55	2.80E
92-2-65	Tick trefoil	*	NoLo	*	*	NoLo	Dead	Dead	18.10	1.60W
96-2-9	White false indigo					NF	NF	*	4.20	3.10E
96-2-4	White false indigo					NF	*	NoLo	2.95	6.50W
95-2-96	White false indigo				NF	*	*	NF	2.60	4.20E
95-2-115	White false indigo				NF	NoLo	*	cut	2.90	1.80W
95-2-94	White false indigo				NF	*	*	cut	3.20	2.70E
95-2-116	White false indigo				NF	NF	*	cut	3.20	1.45W
95-2-98	White false indigo				NF	NF	*	cut	4.45	2.20E
94-2-3	White false indigo			NF	NF	NF	*	cut	6.10	3.80E
92-2-95	White false indigo	*	NF	*	*	*	*	NF	5.70	0.80W
92-2-9	White false indigo	*	NoLo	NF	*	*	*	cut	5.70	0.60E
92-2-16	White false indigo	NF	NoLo	NF	NF	NF	NF	NF	7.30	2.45E
92-2-18	White false indigo	*	*	NF	*	*	*	cut	7.50	1.85E
92-2-68	White false indigo	*	NF	*	*	*	*	cut	15.30	6.90W
92-2-88	White false indigo	NF	NoLo	NoLo	NoLo	NoLo	NoLo	NoLo	7.55	3.20W
93 (no tags)	White false indigo--58 seedlings								6.65	1.40E
93-2-1	White prairie clover		*	*	*	*	*	*	3.40	3.85E
95-2-124	Yellow coneflower				*	*	*	*	7.30	2.80W
95-2-110	Yellow coneflower				*	*	*	*	9.60	5.20E
95-2-113	Yellow coneflower				*	*	*	*	15.30	2.00E
95-2-140	Yellow coneflower				*	*	*	*	19.30	1.0W
95-2-129	Yellow coneflower			*	*	*	*	NF	9.40	5.50W
93-2-7	Yellow coneflower		*	*	*	*	*	*	20.95	1.50E
93-2-11	Yellow coneflower		*	*	*	*	*	*	26.40	5.10W
93-2-10	Yellow coneflower		*	*	*	NF	*	*	27.10	1.30W
93-2-9	Yellow coneflower		*	*	*	*	*	NF	28.80	0.20E
92-2-85	Yellow coneflower	NoLo	NoLo	*	*	*	*	NF	8.80	4.10W
92-2-83	Yellow coneflower	NF	NF	*	*	*	*	*	9.00	2.65W
92-2-76	Yellow coneflower	NF	NF	*	*	*	*	NF	9.30	2.40W
92-2-79	Yellow coneflower	NF	*	*	*	*	*	*	9.40	3.30W
92-2-77	Yellow coneflower	NF	*	NoLo	*	*	NF	*	9.50	3.10W
92-2-78	Yellow coneflower	NF	*	NoLo	*	NF	*	*	9.70	2.70W
92-2-72	Yellow coneflower	NF	*	*	*	*	*	*	10.40	1.60W
92-2-28	Yellow coneflower	NF	*	*	*	*	*	*	10.50	2.35E
92-2-52	Yellow coneflower	NF	NF	*	*	*	*	*	20.90	5.35E
92-2-62	Yellow coneflower	NF	*	*	*	*	*	*	26.50	0.20E
92-2-57	Yellow coneflower	NF	*	*	*	*	*	*	28.20	6.40E
92-2-84	Yellow coneflower	NF	*	*	*	*	*	NoLo	9.00	4.10E
92-2-82	Yellow coneflower	NF	NF	NoLo	*	Gone	NoLo	Dead	9.10	2.65W
92-2-80	Yellow coneflower	NF	*	NL	NF	NL	NF	Dead	9.40	3.00W

Table A4. Permanent plot locations.

Permanent plot #1. 138.3 m (453.75 ft) WNW of Miles Farmstead machine shed on line with south-most ash tree in restored prairie south of gravesite; near bottom of draw; Plot runs 270°.

Permanent plot #2. Due north 33.5 m from a point 55 m east of SW corner of prairie Plot runs south to north.

Permanent plot #3. 19.8 m south of ash tree in SW corner of newly reconstructed prairie south of gravesite. Plot runs NW to SE.

Permanent plot #4. 201.2 m (660 ft) north of SW corner of the prairie and 9.1 m east. Plot runs ESE toward Miles Farmstead.

Permanent plot #5. 50.3 m (165 ft) east from west fence line directly west from southern-most white pine SW of gravesite. Plot runs NNE toward new city water tower.

Permanent plot #6. 61.5 m W of SW corner of Miles Farmstead barn. Plot runs east to west.

Permanent plot #7. 132.5 m north of south fence line from a point directly south of new city water tower; AMOCO service station sign bears 084° from plot. Plot runs east to west.

Permanent plot #10. 44 m , 330° from NW corner of Miles Farmstead barn. Plot runs SSW to NNE.

Permanent plot #11. about 30 m south of the gravesite on the west side of the firebreak, and on the top of the ridge. Plot runs north to south.

Permanent plot #12. about 15 m south of permanent plot #11, on the east side of the firebreak; on east facing slope near ridge top. Plot runs north to south

Permanent plot #13. west of grave site; 25 m north of railroad tie fence post in west boundary fence (near center of draw), then 50 m east. Plot runs west to east.

Permanent plot #14. 25 m west of north white pine in row west of grave site, bearing 272° to roof peak of white house. Plot runs east to west 272°.

Table A5. Plant Names.

Species	Common name	Plant family
Agrostis gigantea	redtop	Poaceae
Ambrosia trifida	giant ragweed	Asteraceae
Amorpha canescens	lead plant	Fabaceae
Andropogon gerardii	big bluestem	Poaceae
Aster azureus	sky-blue aster	Asteraceae
Aster laevis	smooth blue aster	Asteraceae
Aster pilosus	hairy aster	Asteraceae
Aster sagittifolius	arrow-leaved aster	Asteraceae
Baptisia lactea	white wild indigo	Fabaceae
Bouteloua curtipendula	side-oats grama	Poaceae
Bromus inermis	smooth brome	Poaceae
Calystegia sepium	field bindweed	Convolvulaceae
Carex sp.	sedge	Cyperaceae
Cirsium arvense	Canada thistle	Asteraceae
Cirsium discolor	field thistle	Asteraceae
Conyza canadensis	horseweed	Asteraceae
Coreopsis tinctoria	golden coreopsis	Asteraceae
Cornus sp.	dogwood	Cornaceae
Dactylis glomerata	orchard grass	Poaceae
Dalea candida	white prairie clover	Fabaceae
Dalea purpurea	purple prairie clover	Fabaceae
Daucus carota	Queen Anne's lace	Apiaceae
Desmodium canadense	showy tick-trefoil	Fabaceae
Echinacea pallida	pale coneflower	Asteraceae
Elymus canadensis	Canada wildrye	Poaceae
Equisetum arvense	common horsetail	Equisetaceae
Erechtites hieracifolia	fireweed	Asteraceae
Erigeron annuus	annual fleabane	Asteraceae
Eryngium yuccifolium	rattlesnake master	Apiaceae
Festuca arundinacea	alta fescue	Poaceae
Helianthus grosseserratus	saw-tooth sunflower	Asteraceae
Helianthus rigidus	prairie sunflower	Asteraceae
Heliopsis helianthoides	ox-eye	Asteraceae
Lactuca canadensis	wild lettuce	Asteraceae
Lespedeza capitata	round-headed bush clover	Fabaceae
Lonicera tatarica	Tartarian honeysuckle	Caprifoliaceae
Melilotus alba	white sweet clover	Fabaceae
Melilotus officinalis	yellow sweet clover	Fabaceae
Melilotus sp.	sweet clover	Fabaceae
Monarda fistulosa	wild bergamot	Lamiaceae
Oenothera villosa	gray evening primrose	Onagraceae
Panicum virgatum	switchgrass	Poaceae
Pastinaca sativa	wild parsnip	Apiaceae
Phalaris arundinacea	reed canary grass	Poaceae

Table A5 (cont.). Plant Names.

Species	Common name	Plant family
Physalis heterophylla	clammy ground cherry	Solanaceae
Physostegia parviflora	obedient plant	Lamiaceae
Plantago major	plantain	Plantaginaceae
Poa pratensis	Kentucky bluegrass	Poaceae
Potentilla arguta	tall cinquefoil	Rosaceae
Prunus virginiana	choke cherry	Rosaceae
Ratibida pinnata	yellow coneflower	Asteraceae
Rhus glabra	smooth sumac	Anacardiaceae
Rubus sp.	raspberry	Rosaceae
Rudbeckia hirta	black-eyed Susan	Asteraceae
Rudbeckia laciniata	tall coneflower	Asteraceae
Schizachyrium scoparium	little bluestem	Poaceae
Senecio plattensis	prairie ragwort	Asteraceae
Silphium integrifolium	rosinweed	Asteraceae
Silphium laciniatum	compass plant	Asteraceae
Silphium perfoliatum	cup plant	Asteraceae
Solanum carolinense	horse nettle	Solanaceae
Solidago canadensis	tall goldenrod	Asteraceae
Solidago gigantea	smooth goldenrod	Asteraceae
Solidago rigida	stiff goldenrod	Asteraceae
Sorghastrum nutans	Indian grass	Poaceae
Taraxacum officinale	dandelion	Asteraceae
Tradescantia sp.	spiderwort	Commelinaceae
Ulmus pumila	Siberian elm	Ulmaceae
Veronica sp.	speedwell	Scrophulariaceae
Vitis riparia	riverbank grape	Vitaceae
Zizia aurea	golden alexanders	Apiaceae