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COMPARISON OF PLANT SPECIES COMPOSITION OF MORMON ISLAND CRANE MEADOWS AND LILLIAN ANNETTE ROWE SANCTUARY IN CENTRAL NEBRASKA

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Mormon Island Crane Meadows (MICM) and Lillian Annette Rowe Sanctuary (LARS) are both western extensions of true prairie vegetation and are sandhill crane sanctuaries. Both are located on the Platte River, 35 km (22 mi) apart, in central Nebraska. MICM is about 827 ha (2100 ac) and is owned by the Platte River Whooping Crane Habitat Maintenance Trust. LARS is about 324 ha (800 ac) and is owned by the National Audubon Society.

Plants were collected and vegetation was sampled with square meter cover quadrats (N = 314 on MICM and 204 on LARS) in 1980 and 1981. Both areas are on alluvial soils and primarily on subirrigated range site. MICM has about 29% on wetland range site, whereas LARS has very little wetland and more wooded habitat.

On MICM, 317 vascular plant species were collected; on LARS 273 species. Sorensen's Coefficient (percentage of similarity of species collected) was 75%.

Both areas are dominated by true prairie species. Percent species composition is as follows for MICM (LARS): Big bluestem 11.4 (8.1), sedges 7.8 (2.7), switchgrass 6.4 (7.0), prairie cordgrass 3.3 (4.7), and Indiangrass 3.6 (5.1). Horn's Index of Community Overlap (based upon species composition) was only 56%.

† † †

INTRODUCTION

The Platte River in central Nebraska has become nationally recognized as important habitat for migratory waterfowl and other birds. Because of this interest in wildlife habitat, the vegetation on Platte River islands has been the subject of several recent papers (Anonymous, 1981a; Currier, 1981; Nagel et al., 1980).

The vegetation of the floodplains has not been as well documented. At the time of settlement, the Platte River had few vegetated islands and the floodplain had extensive wet meadows and tallgrass prairie when compared to the condition today (Mattes, 1969). Today, the channel of the Platte is choked with wooded islands, most of the wet meadows have dried, and much of the extensive tallgrass prairie that paralleled the Platte has been plowed or severely overgrazed.

Much of the change seen in the Platte River Valley over the last 100 years is due to reduction in flows to only about 25% of historic flows (Williams, 1978) by water consumption upstream. These reduced flows have reduced the scouring action of the river, allowing vegetation to establish on the islands. Reduced flows have also lowered the water table along the river, eliminating wet meadow habitat and lowering the water in subirrigated habitat.

Only a few remmants of this riparian prairie exist in good condition today. This paper describes and compares two of these prairies. Only floodplain data are presented; river island vegetation is excluded.

STUDY AREAS

Location

Mormon Island Crane Meadows (MICM) is a 827 ha crane sanctuary located in Sections 26, 27, 33, 34 and 35 T1ON, R10W in Hall County, Nebraska. It is located between two major channels of the Platte River about 8 km southwest of Grand Island (Fig. 1).

Lillian Annette Rowe Sanctuary (LARS) is a 324 ha crane sanctuary located in Sections 8, 10, 11, 15 and 17 T8N, R14W in Buffalo County, Nebraska. The east edge of the sanctuary is about 6 km south of Gibbon.

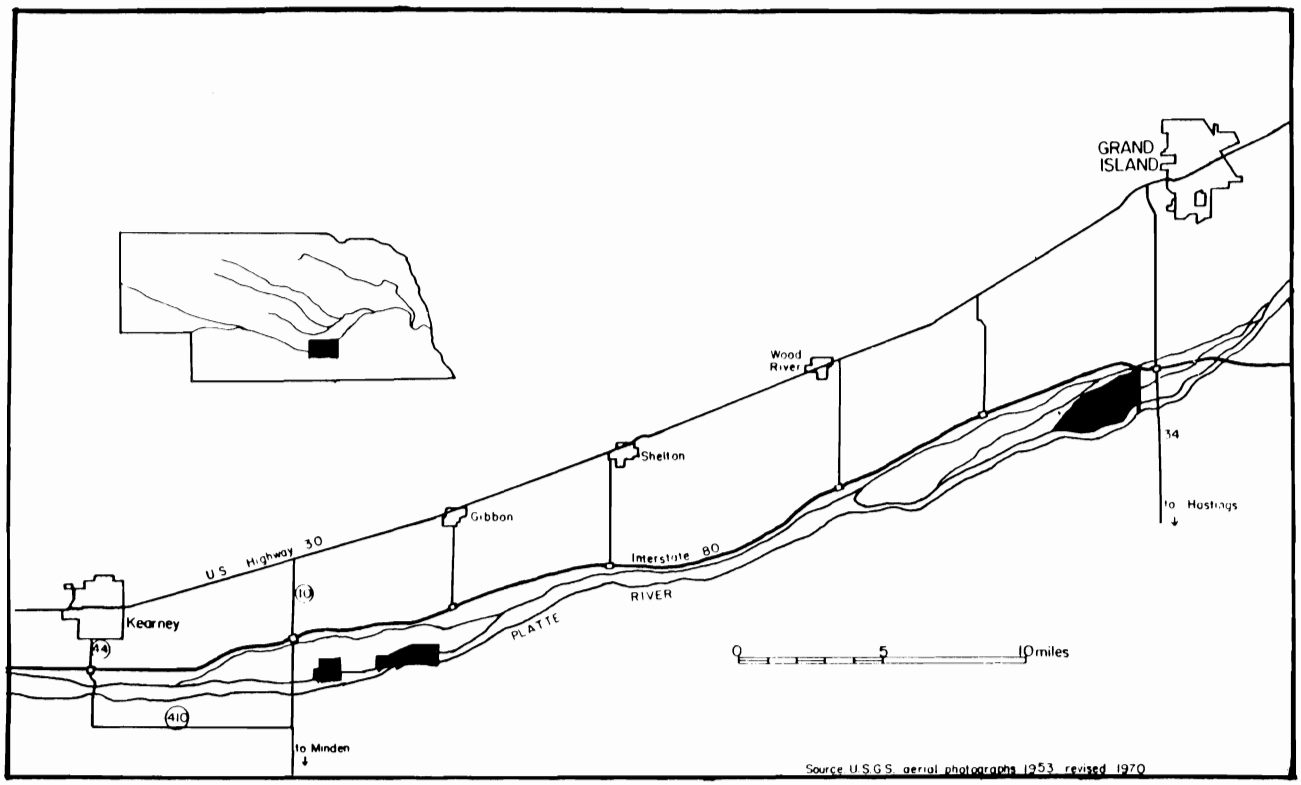

FIGURE 1. Location of Mormon Island Crane Meadows (east) and Lillian Annette Rowe Sanctuary.

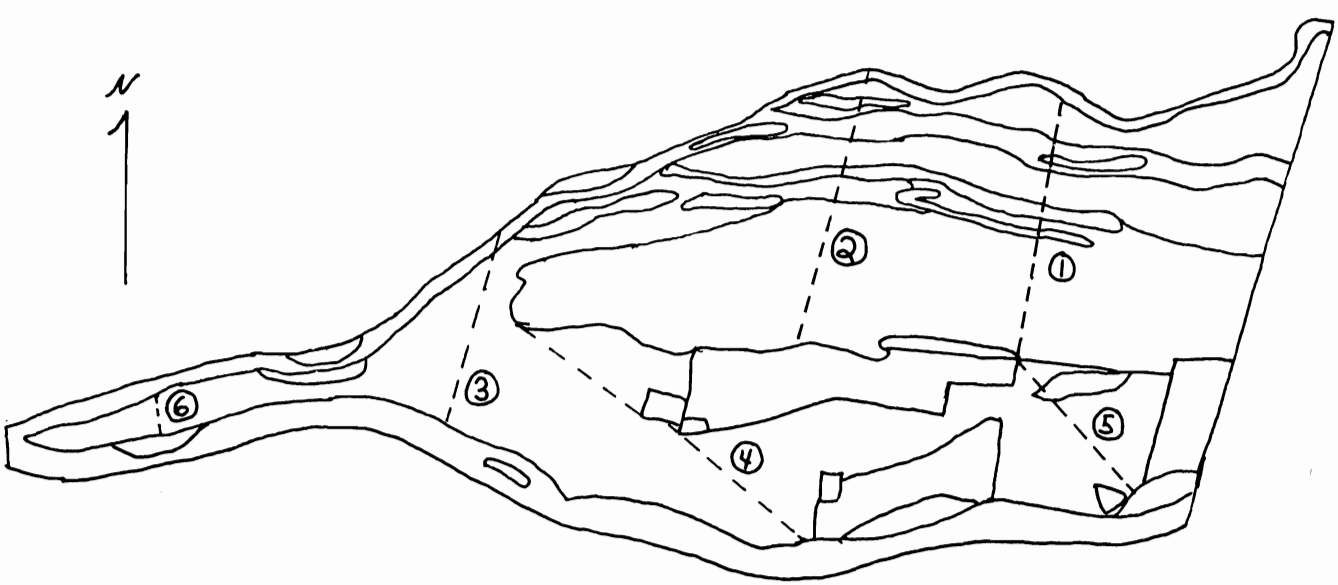

FIGURE 2. Transect numbers and locations (dashed lines) on Mormon Island Crane Meadows.

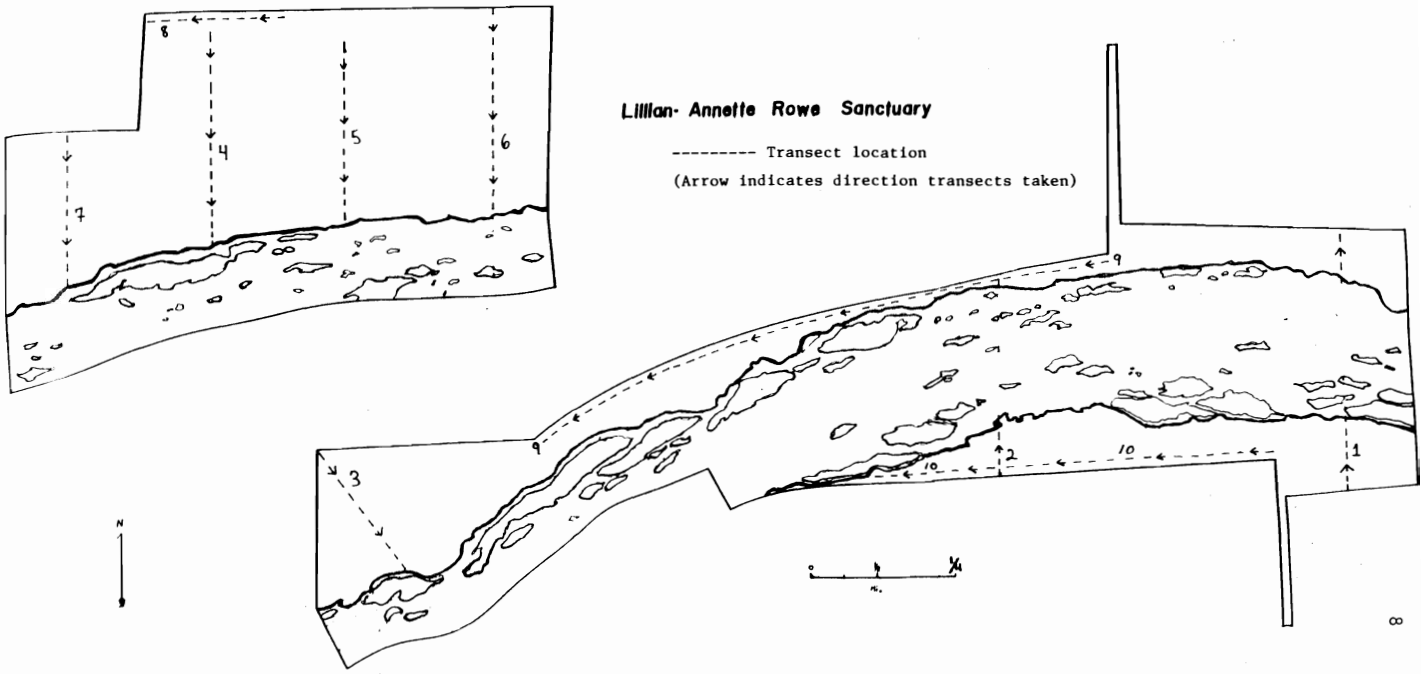

FIGURE 3. Location and numbers of vegetative transects taken on Lillian Annette Rowe Sanctuary.

Climate

The study areas are located in mixed prairie region (Weaver and Bruner, 1954) in floodplain prairie (Kaul, 1975). The climate is continental, and is characterized by wide seasonal temperature fluctuations, averaging 10°C. Precipitation is heaviest in spring and early summer and averages 60 cm per year (Buller et al., 1974; Yost et al., 1962).

Surface Geology and Soils

Both areas occur on level to gently rolling Platte River alluvial deposits with small ridges of recently deposited aeolian sand interspersed. The substrate is coarse sand to mixed sand and gravel.

Rowe Sanctuary is mostly on Platte and loamy alluvium soil series (89% of area), which have a water table usually from 25 cm to 120 cm below the surface. Practically all of Rowe Sanctuary is on subirrigated range site with only a trace of wetland and sandy range sites (Buller et al., 1974; for definition of these range sites, see Anonymous, 1981b).

Crane Meadows also has mostly subirrigated range site (77% of area), on mostly Wann and Platte soil series. About 29% of MICM is on wetland range sites (Barney soil series) where the water table is above the surface during high flows in the Platte. About 4% of MICM is on sands or sandy range site (Sarpy and Cass soil series, Yost et al., 1962). Depth to water table rarely exceeds 120 cm, except under higher elevation dunes.

Surface soil textures on both sites range from silty loam to pure sand, but are loam to sandy loam on most of the area. Both areas are dissected by abandoned river channels which may still carry water during high flow in the Platte River.

Land Use

Both sites contain some cultivated land, but these areas were not sampled. Most of each site was used as pasture until purchased for use as sandhill and whooping crane sanctuaries. MICM was purchased in 1979 by The Nature Conservancy through money provided by the Platte River Whooping Crane Critical Habitat Maintenance Trust. LARS was purchased in 1973 and 1974 by The National Audubon Society. The prairie has been rested from time of purchase until our sampling, except for 2 years of haying and 2 years of spring burning.

METHODS

Quadrat Sampling

Permanent transects were established across all major soil types on both sites; these are shown in Figures 2 and 3. Sampling was done in square–meter quadrats along these transects. Quadrats were taken at 20 m intervals except for transects 9 and 10 on LARS, where 40 m intervals were used. At each quadrat, a species list of vascular plants was made. Unknown plants were collected for comparison with a reference collection. Foliage cover was estimated for each species in the quadrat using the following ranges: **6** = 95–100% cover by the

species, **5** = 75–95%, **4** = 50–75%, **3** = 25–50%, **2** = 5–25% and **1** = 0–5% cover (Mueller–Dombois and Ellenberg, 1974). At least 2 (usually 3) experienced people made estimates and an average was recorded for each species. Woody vegetation with a stem diameter of less than 1 cm was included in the quadrat data; stems larger than 1 cm were excluded.

Sampling was done on MICM during July, 1980, when 314 square–meter quadrats were taken. In July of 1981, 204 square–meter quadrats were taken on LARS.

Species composition was calculated by using percentage midpoint for each range (e.g., a rating of one would be calculated as 2.5%, which is the midpoint of 0–5% cover).

Flora List

Intensive collections were made from May through September in 1980 on MICM and 1981 on LARS. Less intensive collecting has been done since then on both areas. Voucher specimens from both sites are housed in the Kearney State College Herbarium. Nomenclature is according to Great Plains Flora Association (1986).

RESULTS AND DISCUSSION

Flora List

Three hundred sixty seven plant species were collected and identified from both sites: MICM, 317 species; LARS, 273 species (Table II). No new records for Nebraska were found. A few rare species were found in the floras, notably prairie fringed orchid *(Habenaria leucophaea)* found on MICM. Broomrape *(Orobanche ludoviciana)* and prairie gentian *(Eustoma grandiflorum),* found on LARS, were considered uncommon for this part of the State by Sutherland (1974). One hundred twenty two new county records were established.

Species Composition

Table II gives species composition data for quadrats taken in floodplain habitat on both areas, as determined by foliage cover quadrats.

Both sites are dominated by prairie vegetation. According to the Soil Conservation Service (Anonymous, 1981b), climax subirrigated range sites should have about 75% grass, 10% grasslike plant, 10% forb and 5% shrub biomass. Both sites had less grass (MICM 53%, LARS 54%), more forb (MICM 28%, LARS 35%) and less shrub composition (MICM 3%, LARS 2%). Grasslike plants (sedges, rushes, etc.) were about as expected for LARS (9%) but greater on MICM (16%), probably reflecting the higher proportion of wetland range sites there.

The reduced percentage of grass and greater percentage of forbs when compared to climax conditions are probably due mostly to past overgrazing, which favors many forb species. Range condition averaged 52% on LARS and 45% on MICM, indicating only high fair (MICM) to low good (LARS) range condition.

Big and little bluestem, *Andropogon gerardii* and *A. scoparius,* and Indiangrass, *Sorghastrum nutans,* were well below the species composition amount expected under climax conditions (Anonymous, 1981b) on both LARS and MICM.

Community Similarity

Species List. Using the plant collection lists from Table II, we calculated the similarity between the two lists by two methods. The Jaccard Coefficient (CCJ = C/S1 + S1–C = 60.3% similarity) and Sorensen Coefficient (CCS = 2C/S1 + S2 = 75.3% similarity) where S1 and S2 are number of species in stand 1 and 2, and C is number of species found in common at both sites (Brower and Zar, 1977). The range for these two indices is 0 (no species in common) to 1.0 (all species in common).

The two sites have similar soils, water table depth, climate, and past land use, and so should have quite similar floras, but 95 species on MICM are not on LARS (Table I). This floral dissimilarity is due, in part, to the fact that MICM is over twice the size of LARS, and uncommon plants would be less likely to occur on the smaller area.

TABLE I. Analysis of species present in one area, but not in the other.

HYPOTHESIZED REASON	NO. SPECIES	% OF SPECIES DIFFERENCE
ON ROWE SANCTUARY, BUT NOT ON CRANE MEADOWS		
Eastern Edge of Distribution	5	10
River Species	6	12
Forest Species	5	10
Introduced Species	4	8
Unknown (including rareness)	30	60
Total	50	100
ON CRANE MEADOWS, BUT NOT ON ROWE SANCTUARY		
Western Edge of Distribution	34	36
Wetland Species	18	19
Dry Sandy Prairie Species	18	19
Introduced Species	5	5
Unknown (including rareness)	20	21
Total	95	100

Although located only 35 km apart, one would expect some plant species to be found at the eastern edge of their distribution on LARS (Fig. 1) but not on MICM. Likewise, some species at the western edge of their distribution may be on MICM, but not on LARS. This hypothesis for explaining species difference was investigated by looking at range maps for each species in Great Plains Flora Association (1977). Table I shows the limit of range accounts for only 10% of species list dissimilarity for eastern edge of distribution but 36% for western edge of distribution.

LARS had more mature forest than did MICM; this may have accounted for 5 species (10% of total) that occurred on LARS but not MICM. LARS also contains far more vegetated river habitat than MICM, which had fairly open channels. Species found mostly in river habitat may have explained 12% of the discrepancy.

Introduced (intentionally or accidentally) species accounted for 5 to 8% of the species discrepancies between the two areas (Table I).

MICM had far more extensive wetlands than LARS. Some species are found only in that habitat. Wetland species accounted for 19% of the difference in species (Table I). MICM also had far more extensive sands and sandy range sites (aeolian deposits) than did LARS. These sandy dunes had been overgrazed on MICM and ungrazed on LARS, resulting in different species, and accounted for 19% of the difference (Table I).

For many of the species differences, no obvious explanation could be found. The unknown category accounted for the majority of species found on LARS, but not on MICM (60%, Table I), but only 21% of those on MICM, and not on LARS.

Species composition. Three measures of community similarity based upon species composition data (Table II) were calculated. Horn's "Index of Community Overlap" is a commonly used index of similarity between communities based upon information theory (see Horn [1966] or Brower and Zar [1977] for equations). In addition, Percent Similarity was calculated where PS = lowest percentage for each species. A modified Sorensen's Coefficient was also used on species composition data. (CCs = 2C/S1 + S2, where C equals the mean of species composition for a species found in quadrats of both sites, and S1 and S2 are the sum of species composition for all species at site 1 and site 2, i.e. 100% in both cases.)

Horn's coefficient was 56%, PS = 59% and CCs = 90%, where each index = 0% when 2 communities have no species in common and is a maximum of 100% when the species lists are identical and each species has the same importance in both sites.

TABLE II. Checklist of vascular plants collected on Crane Meadows and Rowe Sanctuary with species composition.

		Collected at		Species Composition	
SCIENTIFIC NAME	COMMON NAME	Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Abutilon theophrasti Medic.	Velvet-leaf		X		
Acer negundo L.	Box elder	X	X		
Acer saccharinum L.	Silver maple	X	X		
Achillea millefolium L.	Yarrow	X	X		
Agalinis tenuifolia (Vahl) Raf.		X	X		
Agropyron caninum (L.) Beauv.	Slender wheatgrass	a		T	
Agropyron elongatum (Host) Beauv.	Tall wheatgrass		X		2.7
Agropyron repens (L.) Beauv.	Quackgrass	X	X	.8	.3
Agropyron smithii Rydb.	Western wheatgrass	X	X		.4
Agrostis stolonifera L.	Redtop	X	X	4.8	1.9
Alisma subcordatum Raf.	Water plantain	X			
Allium canadense L.	Wild onion	X	X		
Allium textile A. Nels & Macbr.	White wild onion	X			
Alopecurus aequalis Sobol.	Shortawn foxtail	X	X		T
Amaranthus arenicola I. M. Johnst.	Sandhills amaranth	X	X		
Amaranthus retroflexus L.	Rough pigweed	X	X		
Ambrosia artemisiifolia L.	Common ragweed	X	X	3.5	2.5
Ambrosia psilostachya DC.	Western ragweed	X	X	.9	.3
Ambrosia trifida L.	Giant ragweed	X	X	.1	T
Ammannia coccinea Rottb.	Tooth-cup (Purple ammannia)	X			
Amorpha canescens Pursh	Leadplant		X		.2
Amorpha fruticosa L.	False indigo	X	X	.2	T
Andropogon gerardi Vitman	Big bluestem	X	X	11.4	8.1
Andropogon scoparius Michx.	Little bluestem	X	X	.6	.7
Anemone canadensis L.	Meadow anemone	X	X		
Antennaria neglecta Greene	Field pussytoes	a			

SCIENTIFIC NAME	COMMON NAME	Collected at		Species Composition	
		Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Apios americana Medic.	Ground nut	a			
Apocynum cannabinum L.	Hemp dogbane	a			
Arabis glabra (L.) Bernh.	Tower mustard	a			
Arctium minus Bernh.	Common burdock	X	X		
Aristida oligantha Michx.	Prairie threeawn	X			
Artemisia ludoviciana Nutt.	White sage	X	X		
Asclepias incarnata L.	Swamp milkweed	X	X	.3	.1
Asclepias speciosa Torr.	Showy milkweed	X	X	.1	2
Asclepias syriaca L.	Common milkweed	a	X		T
Asclepias verticillata L.	Whorled milkweed	X	X	.1	T
Asparagus officinalis L.	Asparagus	X	X	T	T
Aster ericoides L.	White aster (Heath aster)	X	X	2.5	1.8
Aster praealtus Poir.	Willowleaf aster	a			
Aster simplex Willd.	Panicled aster	X		.3	
Astragalus canadensis L.	Canada milkvetch	X			
Avena fatua L.	Wild oat	X			
Bidens cernua L.	Nodding beggarticks (Stick–tight)	a	X		
Bidens comosa (A. Gray) Wiegand	Beggarticks	X			
Bidens connata Muhl. ex Willd.	Sticktight (Beggarticks)		X		
Bidens frondosa L.	Beggarticks	X	X		
Boehmeria cylindrica (L.) Sw.	Bog hemp		X		
Bouteloua curtipendula (Michx.) Torr.	Side–oats grama		X	.2	.1
Bouteloua gracilis (H.B.K.) Lag. ex. Griffiths	Blue grama	X		.1	
Bouteloua hirsuta Lag.	Hairy grama	a			
Bromus inermis Leyss.	Smooth brome	X	X	5.4	2.3
Bromus japonicus Thunb. ex Murr.	Japanese brome	X	X	.1	1.1
Bromus tectorum L.	Downy brome	X	X	.1	.7
Calamagrostis stricta (Timm.) Koel.	Northern reedgrass	X	X	.5	.4
Calamovilfa longifolia (Hook.) Scribn.	Prairie sandreed	X	X	.1	.4
Callirhoe alcaeoides (Michx) A. Gray	Pink poppy mallow	X		.3	
Callirhoe involucrata (T. & G.) A. Gray	Purple poppy mallow	X	X	.1	.7
Calylophus serrulatus (Nutt.) Raven	Yellow evening primrose		X		
Calystegia sepium (L.) R. Br.	Hedge bindweed	X	X		
Cannabis sativa L.	Marijuana	X	X	.1	.2
Capsella bursa-pastoris (L.) Medic.	Shepherd's purse	X	X		
Carduus nutans L.	Musk thistle	X	X		
Carex spp.	Sedge			7.8	2.7
Carex aquatilis Wahl.	Water sedge	X	X		
Carex blanda Dew.	Woodland sedge	a			
Carex brevior (Dewey) Mack. ex Lunell	Fescue sedge	X	X		
Carex eleocharis Bailey	Needleleaf sedge	X			
Carex gravida Bailey	Heavy sedge	X			
Carex hallii Olney		X	X		
Carex lanuginosa Michx.	Woolly sedge	X	X		
Carex meadii Dew.	Mead's sedge	X	X		
Carex molesta Mack.		X			
Carex praegracilis W. Boott	Clustered-field sedge	X	X		
Carex scoparia Schkuhr ex Willd.	Broom sedge	X	X		
Carex stipata Muhl.	Saw–beak sedge	X			
Carex vulpinoidea Michx.	Fox sedge	X	X		
Catalpa speciosa Warder	Catalpa		X		
Celastrus scandens L.	Climbing bittersweet	X			
Celtis occidentalis L.	Hackberry	X	X		
Cenchrus longispinus (Hack.) Fern.	Field sandbur	X	X		.5
Cerastium brachypodum (Engelm. ex A. Gray) Robins.	Mouse–ear chickweed		X		
Chenopodium album L.	Lamb's quarters	X	X		
Chenopodium desiccatum A. Nels.	Pale goosefoot		X		
Chenopodium glaucum L.	Oak–leaved goosefoot	X	X		
Chenopodium missouriense Aellen		X			
Chenopodium standleyanum Aellen	Goosefoot	X			

SCIENTIFIC NAME	COMMON NAME	Collected at		Species Composition	
		Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Chloris verticillata Nutt.	Windmill grass	X		.2	
Chorispora tenella (Pall.) DC.	Blue mustard	X			
Chrysanthemum leucanthemum L.	Ox-eye daisy	X			
Chrysopsis villosa (Pursh) Nutt.	Golden aster	X			
Cicuta maculata L.	Water hemlock	X	X	.1	
Cirsium flodmanii (Rydb.) Arthur	Prairie thistle	X	X	.5	.4
Cleome serrulata Pursh	Rocky mountain beeplant	X			
Conium maculatum L.	Poison hemlock		X		
Convolvulus arvensis L.	Field bindweed	X	X	T	
Conyza canadensis (L.) Cronq.	Horseweed	X			
Conyza ramosissima Cronq.	Spreading fleabane		X		
Coreopsis tinctoria Nutt.	Plains coreopsis	X	X		.6
Cornus drummondii C. A. Mey.	Rough–leaved dogwood	X	X	.2	T
Cornus stolonifera Michx.	Red osier	X	X	.2	
Crepis runcinata (James) T. & G.	Hawk's–beard	X	X		
Croton texensis (Kl.) Muell. Arg.	Texas croton	X	X		
Cuscuta glomerata Choisy	Cluster dodder	X			
Cuscuta indecora Choisy	Large alfalfa dodder		X		
Cycloloma atriplicifolium (Spreng.) Coult.	Winged pigweed	X	X		
Cyperus spp.				T	.3
Cyperus aristatus Rottb.		X	X		
Cyperus esculentus L.	Yellow nutsedge	X			
Cyperus lupulinus (Spreng.) Marcks	Houghton flatsedge		X		
Cyperus odoratus L.		X	X		
Cyperus schweinitzii Torr.	Schweinitz flatsedge	X	X		
Dactylis glomerata L.	Orchardgrass		X		
Dalea candida Michx. ex Willd.	White prairie clover	X	X	.1	.1
Dalea purpurea Vent.	Purple prairie clover	X	X	.1	.6
Daucus carota L.	Wild carrot	X			
Delphinium virescens Nutt.	Prairie larkspur	X			
Descurainia pinnata (Walt.) Britt.	Tansy mustard	X	X		
Descurainia sophia (L.) Webb	Flixweed	X	X	T	
Desmanthus illinoensis (Michx.) MacM.	Bundleflower	X	X	.6	1.6
Desmodium glutinosum (Muhl. ex Willd.) Wood	Large–flowered tickclover	X			
Dichanthelium clandestinum (L.) Gould	Panicgrass	X	X	.7	
Dichanthelium oligosanthes (Schult.) Gould	Small panicgrass	X	X	1.5	1.3
Digitaria sanguinalis (L.) Scop.	Crabgrass	X	X		T
Distichlis spicata (L.) Greene	Seashore salt–grass	X	X	.8	2.2
Echinochloa crusgalli (L.) Beauv.	Barnyardgrass	X	X		
Echinocystis lobata (Michx.) T. & G.	Wild cucumber	X	X		
Elaeagnus angustifolia L.	Russian olive	X	X		.4
Eleocharis spp.				4	2
Eleocharis acicularis (L.) R. & S.	Needle spikesedge	X			
Eleocharis compressa Sulliv.	Flatstem spike sedge	X	X		
Eleocharis erythropoda Steud.	Spike rush		X		
Eleocharis macrostachya Britt.	Spike rush	X			
Eleusine indica (L.) Gaertn.	Goosegrass	X			
Ellisia nyctelea L.	Waterpod	X			
Elymus canadensis L.	Canada wild rye	X	X	.2	T
Elymus virginicus L.	Virginia wild rye	X	X	.1	
Elymus villosus Muhl. ex Willd.	Slender wild rye		X		
Equisetum arvense L.	Field horsetail	X	X	1.2	T
Equisestum laevigatum A. Br.	Smooth horsetail	X	X	.4	.9
Eragrostis spp.	Lovegrass			.1	
Eragrostis cilianensis (All.) E. Mosher	Stinkgrass	X	X		
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	X	X		
Eragrostis spectabilis (Pursh) Steud.	Purple lovegrass	X			
Erigeron philadelphicus L.	Philadelphia Fleabane	X	X		
Erigeron strigosus Muhl. ex Willd.	Daisy fleabane	X	X	.2	.1
Eupatorium perfoliatum L.	Boneset	X			

SCIENTIFIC NAME	COMMON NAME	Collected at		Species Composition	
		Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Euphorbia spp.	Spurge			T	.1
Euphorbia dentata Michx.	Toothed spurge	X			
Euphorbia glyptosperma Engelm.	Ridge–seeded spurge	X	X		
Euphorbia maculata L.	Spotted spurge		X		
Euphorbia marginata Pursh.	Snow–on–the–mountain		X		
Euphorbia serpyllifolia Pers.	Thyme–leaved spurge		X		
Eustoma grandiflorum (Raf.) Shinners	Prairie gentian	X	X	T	T
Euthamia graminifolia (L.) Nutt.	Narrow–leaved goldenrod	X			
Festuca octoflora Walt.	Six-weeks fescue	X	X	T	.1
Festuca pratensis Huds.	Meadow fescue	X	X		
Fimbristylis puberula (Michx.) Vahl.		X	X	T	
Fragaria sp.	Wild strawberry		X		
Fraxinus pennsylvanica Marsh.	Green ash	X	X	.1	
Galium aparine L.	Catchweed bedstraw	X	X	T	
Galium circaezans Michx.	Woods bedstraw		X		
Gaura parviflora Dougl.	Velvety gaura	X	X	.2	T
Geum canadense Jacq.	White avens	X	X		
Gleditsia triacanthos L.	Honey locust	X			
Glyceria striata (Lam.) Hitchc.	Fowl mannagrass	a			
Glycyrrhiza lepidota Pursh	Wild licorice	X	X	.5	
Grindelia squarrosa (Pursh) Dun.	Curly–top gumweed	X			
			.1		
Habenaria leucophaea (Nutt.) A. Gray	Prairie fringed orchid	a			
Hedeoma hispidum Pursh	Rough pennyroyal	X	X		
Helenium autumnale L.	Sneezeweed	X	X	1.1	
Helianthus annuus L.	Common sunflower	X	X		1
Helianthus grosseserratus Martens	Sawtooth sunflower	X			
Helianthus maximilianii Scrad.	Maximillian sunflower	X		.2	
Helianthus petiolaris Nutt.	Plains sunflower	X	X		.9
Helianthus tuberosus L.	Jerusaleum artichoke	X			
Heliopsis helianthoides (L.) Sweet	False sunflower	a	X		
Hibiscus trionum L.	Flower–of–an–hour	X	X		
Hierochloë odorata (L.) Beauv.	Sweetgrass	a			
Hordeum jubatum L.	Foxtail barley	X	X	.4	.2
Hordeum pusillum Nutt.	Little barley	X	X		
Hypoxis hirsuta (L.) Cov.	Yellow stargrass	X	X	T	
Ipomoea purpurea (L.) Roth	Common morning–glory	X			
Iva annua L.	Sumpweed	X	X	.5	
Iva xanthifolia Nutt.	Marsh elder	X			
Juncus spp.	Rush			.7	.3
Juncus balticus Willd.	Baltic rush	X	X		
Juncus bufonius L.	Toad rush	X	X		
Juncus dudleyi Wieg.	Dudley rush	X	X		
Juncus nodosus L.	Knotted rush	X			
Juncus torreyi Cov.	Torrey's rush	X	X		
Juniperus virginiana L.	Red cedar	X	X		
Kochia scoparia (L.) Schrad.	Kochia (firebush)	X	X	T	1
Koeleria pyramidata (Lam.) Beauv.	Junegrass	X	X	T	
Lactuca canadensis L.	Wild lettuce	X			
Lactuca ludoviciana (Nutt.) Ridd.	Western wild lettuce		X		
Lactuca oblongifolia Nutt.	Blue lettuce	X	X		.3
Lactuca serriola L.	Prickly lettuce	X	X	T	.8
Leersia virginica Willd.	Whitegrass	X			
Lepidium densiflorum Schrad.	Peppergrass	X	X	.1	
Leptochloa fasicularis (Lam.) A. Gray	Bearded sprangletop	X			

SCIENTIFIC NAME	COMMON NAME	Collected at		Species Composition	
		Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Pao pratensis L.	Kentucky bluegrass	X	X	5.5	4.5
Polygonatum biflorum (Walt.) Ell.	Solomon's seal		X		
Polygonum spp.	Knotweed			.4	.2
Polygonum amphibian L.	Swamp smartweed	X			
Polygonum arenastrum Jord. ex Bor.	Common knotweed	X	X		
Polygonum convolvulus L.	Wild buckwheat	X	X		
Polygonum lapathifolium L.	Pale smartweed	a	X		
Polygonum persicaria L.	Lady's thumb	X	X		
Polygonum punctatum Ell.	Water smartweed	X			
Polygonum ramosissimum Michx.	Bushy knotweed		X		
Polypogon monspeliensis (L.) Desf.	Rabbitfoot grass	a	X		
Populus deltoides Marsh.	Cottonwood	X	X	.8	T
Potentilla norvegica L.	Strawberry weed	a			
Potentilla paradoxa Nutt.	Bushy cinquefoil	a	X		
Prunella vulgaris L.	Selfheal	X		.1	
Prunus americana Marsh.	Wild plum		X		
Pycnanthemum virginianum Dur. & Jackson ex Robins. & Fern.	Mountain mint	X	X		
Ranunculus spp.				T	T
Ranunculus cymbalaria Pursh	Shore buttercup	X			
Ranunculus macounii Britt.	Macoun's buttercup	a	X		
Ranunculus rhomboideus Goldie	Prairie buttercup		X		
Ranunculus sceleratus L.	Cursed crowfoot		X		
Ratibida columnifera (Nutt.) Woot. & Standl.	Prairie coneflower	X	X	.1	
Rhus glabra L.	Smooth sumac	X			
Rorippa palustris (L.) Bess.	Bog yellow cress	a	X		
Rorippa sinuata (Nutt.) Hitchc.	Spreading yellow cress		X		
Rosa arkansana Porter	Prairie wild rose	X	X		
Rosa woodsii Lindl.	Western wild rose	X	X	.4	.2
Rubus occidentalis L.	Black raspberry	X			
Rudbeckia hirta L.	Black–eyed susan	X	X	.3	.2
Rumex spp.	Dock			.1	T
Rumex acetosella L.	Sheep sorrel		X		
Rumex altissimus Wood	Pale dock		X		
Rumex crispus L.	Curly dock	X	X		
Rumex obtusifolius L.	Bitter dock		X		
Sagittaria cuneata Sheld.	Duck potato arrowhead		X		
Sagittaria latifolia Willd.	Common arrowhead	X			
Salix amygdaloides Anderss.	Peach–leaved willow	X	X	.3	T
Salix eriocephala Michx.	Diamond willow		X		
Salix exigua Nutt.	Coyote willow	X	X		
Sambucus canadensis L.	Elderberry	X	X		
Sanicula canadensis L.	Canada sanicle	X	X		
Scirpus spp.	Bulrush			2.1	.4
Scirpus acutus Muhl.	Hard–stem bulrush		X		
Scirpus atrovirens Willd.	Darkgreen bulrush	X	X		
Scirpus fluviatilis (Torr.) A. Gray	River bulrush	X	X		
Scirpus maritimus L.	Prairie bulrush	X	X		
Scirpus pungens Vahl	Common threesquare	X	X		
Scirpus validus Vahl	Soft-stem bulrush	X	X		
Scutellaria galericulata L.	Marsh skullcap		X		
Scutellaria lateriflora L.	Blue skullcap	a	X		
Senecio plattensis Nutt.	Prairie ragwort	X	X		
Setaria glauca (L.) Beauv.	Yellow foxtail	X	X	T	.7
Setaria verticillata (L.) Beauv.	Bristly foxtail		X		
Setaria viridis (L.) Beauv.	Green foxtail		X		
Shepherdia argentea (Pursh) Nutt.	Buffaloberry	a	X		
Silene antirrhina L.	Sleepy catchfly	a	X		
Silphium integrifolium Michx.	Wholeleaf rosinweed	a			
Sisymbrium altissimum L.	Tumbling mustard		X		
Sisymbrium loeselii L.	Tall hedge mustard	X			

SCIENTIFIC NAME	COMMON NAME	Collected at		Species Composition	
		Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Sisyrinchium angustifolium P. Mill.	Blue–eyed grass	X	X	.1	T
Sisyrinchium campestre Bickn.	White–eyed grass	X			
Sium suave Walt.	Water parsnip	a			
Smilacina stellata (L.) Desf.	Spikenard	X	X	.1	.4
Smilax hispida Muhl.	Bristly greenbriar	X			
Solanum interius Rydb.	Black night shade	X	X		
Solanum rostratum Dun.	Buffalo bur	X	X		
Solidago spp.	Goldenrod			3.6	5.8
Solidago canadensis L.	Canada goldenrod	X	X		
Solidago gigantea Ait.	Late goldenrod	X	X		
Solidago missouriensis Nutt.	Prairie goldenrod	a			
Solidago rigida L.	Rigid goldenrod	a	X		
Sonchus asper (L.) Hill	Spiny sow thistle	X			
Sorghastrum nutans (L.) Nash	Indian–grass	X	X	3.6	5.1
Sparganium eurycarpum Englem.	Giant burr–reed	X	X		
Spartina pectinata Link	Prairie cordgrass	X	X	3.3	4.7
Sphenopholis obtusata (Michx.) Scribn.	Prairie wedgegrass	X	X	.1	T
Spiranthes cernua (L.) Rich.	Ladies–tresses	X	X		
Sporobolus airoides (Torr.) Torr.	Alkali sacaton	a			
Sporobolus asper (Michx.) Kunth	Tall dropseed	X	X	1.6	3.8
Sporobolus cryptandrus (Torr.) A. Gray	Sand dropseed	X	X	.2	.5
Stachys palustris L.	Hedgenettle	a			
Stellaria media (L.) Cyr.	Common chickweed		X		
Stipa comata Trin. & Rupr.	Needle–and–thread	X	X		.2
Stipa spartea Trin.	Porcupine grass	a	X		
Strophostyles leiosperma (T. & G.) Piper	Smoothseed wild bean	X	X		
Symphoricarpos occidentalis Hook.	Western snowberry	a	X		
Talinum parviflorum Nutt.	Prairie flameflower	X			
Taraxacum officinale Weber	Dandelion	X	X	.2	T
Teucrium canadense L.	American germander	X	X	.1	
Thalictrum dasycarpum Fisch. & Ave-Lall.	Meadow rue	a	X		
Thelypteris palustris Schott	Marsh fern	X			
Thlaspi arvense L.	Penny cress	X	X		
Toxicodendron radicans (L.) O. Ktze.	Poison ivy	X	X	.9	.4
Tradescantia bracteata Small	Spiderwort	X	X		T
Tradscantia occidentalis (Britt.) Smyth	Prairie spiderwort	a	X		
Tragopogon dubius Scop.	Goatsbeard	X	X	T	.1
Tribulus terrestris L.	Puncture vine	X	X	T	
Trifolium hybridum L.	Alsike clover	a			
Trifolium pratense L.	Red clover	X	X	2.5	
Trifolium repens L.	White clover	X		.7	T
Triglochin maritima L.	Arrowgrass	X	X		
Triodanis perfoliata (L.) Nieuw.	Venus' looking–glass	a	X		
Triplasis purpurea (Walt.) Chapm.	Sandgrass	X			
Typha angustifolia L.	Narrow–leaved cattail		X		
Typha latifolia L.	Common cattail		X		
Ulmus americana L.	American elm	X	X	.1	
Urtica dioica L.	Stinging nettle	X			
Verbascum thapsus L.	Mullein	a	X		
Verbena bracteata Lag. & Rodr.	Bracted vervain	X	X		
Verbena hastata L.	Blue vervain	X	X	.4	
Verbena stricta Vent.	Hoary vervain	X	X	.1	T
Verbena urticifolia L.	Nettle–leaved vervain	X	X		
Vernonia baldwinii Torr.	Western ironweed	a			
Vernonia fasciculata Michx.	Ironweed	X	X	1.0	.5
Veronica anagallis–aquatica L.	Water speedwell	a	X		
Veronica peregrina L.	Purslane speedwell		X		
Viola pratincola Greene	Meadow violet	X	X	1.3	.2
Vitis riparia Michx.	River–bank grape	X	X	T	

SCIENTIFIC NAME	COMMON NAME	Collected at		Species Composition	
		Crane Meadows	Rowe Sanctuary	Crane Meadows	Rowe Sanctuary
Xanthium strumarium L.	Cocklebur	X	X	.4	.5
Zanthoxylum americanum P. Mill.	Prickly ash	X			
Unknown taxa				.4	1.6
TOTAL				100.7	98.2

FOOTNOTES:
a = collection made by Dr. Paul Currier, Platte River Whooping Crane Habitat Maintenance Trust, Grand Island, NE.
T = trace; less than 0.05% species composition from quadrat sampling.

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