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Remnant Grasslands of the Fayette Prairie, Texas

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ABSTRACT: Twenty-five remnant grasslands from across the Fayette Prairie of SE Texas were sampled for species frequency and basal cover as well as selected soil and topographic properties. Polar ordination was used to elucidate stand and species patterns and plant-environmental interrelationships. Three major topo-edapho-vegetation complexes were defined. Upland clay soils (Vertisols and Mollisols) were characterized by *Andropogon gerardii* var. *gerardii, Bouteloua curtipendula* var. *curtipendula* and *Carex microdonta.* Upland sandy clay loam and clay loam soils (Alfisols) had *Paspalum plicatulum, Coelorachis cylindrica* and *Fimbristylis puberula* var. *puberula* as characteristic species. *Schizachyrium scoparium* var. *frequens* and *Sorghastrum nutans* were ubiquitous dominants or codominants in all upland communities. *Panicum virgatum* and *Tripsacum dactyloides* dominated lowland clay soils (Vertisols). The Fayette Prairie should be classified as a southern extension of the True Prairie Grassland Association.

INTRODUCTION

The Fayette Prairie is located in SE Texas (Fig. 1). It is isolated from the Blackland Prairie to the N and the Coastal Prairie to the S by narrow strips of Post Oak Savanna. To the E it borders on the southeastern Evergreen Forest (Braun, 1950) and to the W it grades into the South Texas Plains (Godfrey *et al.*, 1970). It once contained approximately 1.5 million ha of native grassland (Godfrey *et al.*, 1970), but little undisturbed vegetation remains (Johnson, 1931; Launchbaugh, 1955). No quantitative analysis of the vegetation exists for the area and, as a result, available data are insufficient to adequately describe or classify the prairie. The purpose of this study is to: (1) provide a quantitative ecological analysis of remnant vegetation and soil; (2) relate differences in vegetational composition to edaphic and topographic factors, and (3) evaluate ecological affinities and determine the appropriate classification of the prairie.

STUDY AREA

The Fayette Prairie is characterized by a flat to gently rolling topography. Two rivers, the Brazos and the Colorado, cross the area. Uplands were historically prairie although *Quercus stellata* and *Q. virginiana* occurred occasionally as scattered individuals or in small clumps. Lowlands were dominated by stands of hardwood forest including *Q. stellata, Ulmus crassifolia, Fraxinus* spp. and *Carya illinoiensis.* Current land use is primarily for native and tame pasture with limited cropland.

Geologically, the Fayette Prairie consists of material deposited in the middle to upper Miocene (Geol. Atlas Tex., 1974). Three major formations occur: the Fleming, Oakville Sandstone and Cook Mountain (Fig. 1). The Fleming formation underlies most of the area except the western margin. Laid down in the upper Miocene, it consists of a 400-m-thick layer of calcareous silty clay sediment with some medium to coarse grained sandstone. The Oakville Sandstone is slightly older. It is found as a narrow strip on the NW side and in the S-central portion of the prairie, and consists of a

65-m-thick layer of medium grained calcareous sandstone with some calcareous clay. The Cook Mountain is the oldest formation. It occurs at the southwestern tip of the Prairie and consists of a 30-m-thick layer of clay and fine grained sandstone. River and stream floodplains are covered with Quaternary alluvium.

Soils of the uplands are of two general types: those derived from the Fleming Formation are mostly neutral to basic, noncalcareous to calcareous, clayey soils, while those derived from the Oakville Sandstone and Cook Mountain formations are slightly acid with clay loam and sandy clay loam surface layers and cracking clayey subsoils. Soils of the first type are in the Frelsburg-Bleiblerville Association and are classified as fine, smectic, thermic Udothentic and Udic Pellusterts. Soils of the second type are in the Wilson-Crockett Association and are classified as fine, smectic, thermic Udertic Paleustalfs. Stream bottom alluvial soils in the Trinity series are fine, smectic, thermic Typic Pellusterts (Chervenka *et al.*, 1981).

The frostfree period of the area is ca. 270 days and begins near 1 March and continues through early December. Average January low is 6 C whereas the average July high is 35 C. Average annual precipitation ranges from 85 cm/year in the W to 110

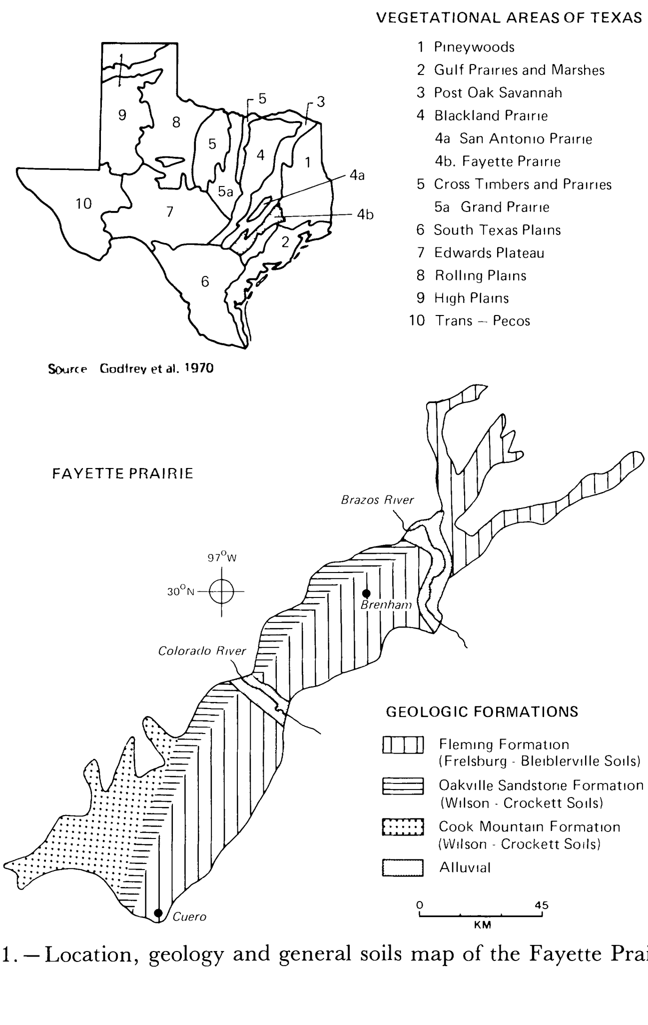

Fig. 1.—Location, geology and general soils map of the Fayette Prairie

cm/year in the E. The wettest months are May, June and September; the driest are March, November, December and January (NOAA, 1978).

METHODS

With the assistance of personnel of the U.S. Dep. Agric. Soil Conservation Service, an extensive survey of the Fayette Prairie was conducted during 1977 and 1978 in order to locate remnant native grassland sites. Stands were selected from these sites for detailed study. Criteria for stand selection were: (1) the areas must have unbroken native sod as established from the historical record; (2) they must have no discernible history of overgrazing and no current grazing by domestic livestock; (3) they must be larger than 2 ha, which is considered to be sufficiently large to reduce effects of nearby agricultural activities (Collins *et al.,* 1975); (4) they must consist of visually homogeneous vegetation, topographic position and soil type, and (5) they must have no record of treatment with herbicides or fertilizers. All areas selected are currently used as hay meadows and are mowed once or twice each year. None have been burned within the past 20 years. Although mowing may have an impact on composition of grasslands (Weaver and Fitzpatrick, 1934; Drew, 1947; Robocker and Miller, 1955; Smeins, 1973), hay meadows are considered the best approximation of remnant prairie plant communities (Launchbaugh, 1955).

In the spring and early summer of 1979 stands were sampled with 25 rectangular 25 x 50 cm quadrats to obtain frequency data for all flowering plant species (Ray, 1959; Dix and Smeins, 1967). The point quadrat method (300 points) was used to estimate total basal cover and to determine dominant species (Levy and Madden, 1933; Collins *et al.,* 1975). Quadrats and points were located in a stratified random manner by establishing several equidistant parallel lines across each stand. Along each line the positions of quadrats and points were randomly selected. A complete presence list was made for each stand and specimens of all flowering plants that occurred within any stand were collected, identified and stored in the Biology Department Herbarium at Texas A&M University. Taxonomic nomenclature for grasses follows Gould (1975) and for all other taxa, Correll and Johnston (1970).

The soil profile of each stand was classified by soil scientists from the Soil Conservation Service. Soil samples from 0-15 cm were taken from several locations in each stand and pooled for a composite sample. Soil texture, organic matter content and *p*H were determined in the laboratory (Black, 1965). Topographic position, percent slope, aspect and notes on past history of the sites were recorded.

Vegetation data were subjected to indirect gradient analysis using ordination techniques (Gauch, 1977). Principal components analysis and polar ordination (using percentage dissimilarity, complemented coefficient of community and Euclidian distance for comparison of stands) were applied to the data. Analytical species measurements used to compare stands included: absolute frequency (AF), relative frequency (RF), absolute basal cover (AC), relative basal cover (RC) and importance values (IV = RF + RC).

A total of 88 species were encountered in quadrats. All short-lived annuals and perennials that die back to the soil surface early in the growing season were eliminated from the ordination analyses because of their great temporal variation. The remaining 51 long-lived annuals and perennials were used for initial ordination analyses. This number was sequentially reduced to the 37 species that occurred with an absolute frequency of 10% or more in at least one stand. This reduction had little impact on stand arrangement within the ordinations. Ordinations based on absolute and relative cover and importance values produced inconsistent patterns of stand arrangement and were not used for further analysis. Absolute frequency was chosen as the analytical measure for stand comparisons; however, comparisons based on relative frequency produced nearly identical results.

Ordination results from polar ordination using percentage dissimilarity and complemented coefficient of community were similar to results from principal components analysis. Polar ordination using Euclidian distance produced tighter clustering of stands. Polar ordination using percentage dissimilarity was chosen for presentation of results, since the spacial arrangement of stands from this display seemed ecologically most meaningful. Extraction of more than two axes did not provide additional information and, thus results are presented in two dimensions.

Pearson correlation coefficients were calculated between stand positions on the first axis and edaphic variables for stands to assess the relationship of edaphic factors to the ordination. Correlation coefficients were also calculated between stand position on the first ordination axis and species frequency values in order to assess relationships between the derived axis and species distribution.

To ascertain relationships among measured environmental factors and species distribution patterns, correlation coefficients were calculated between species frequency values for stands and corresponding edaphic variables. In all analyses, species fre-

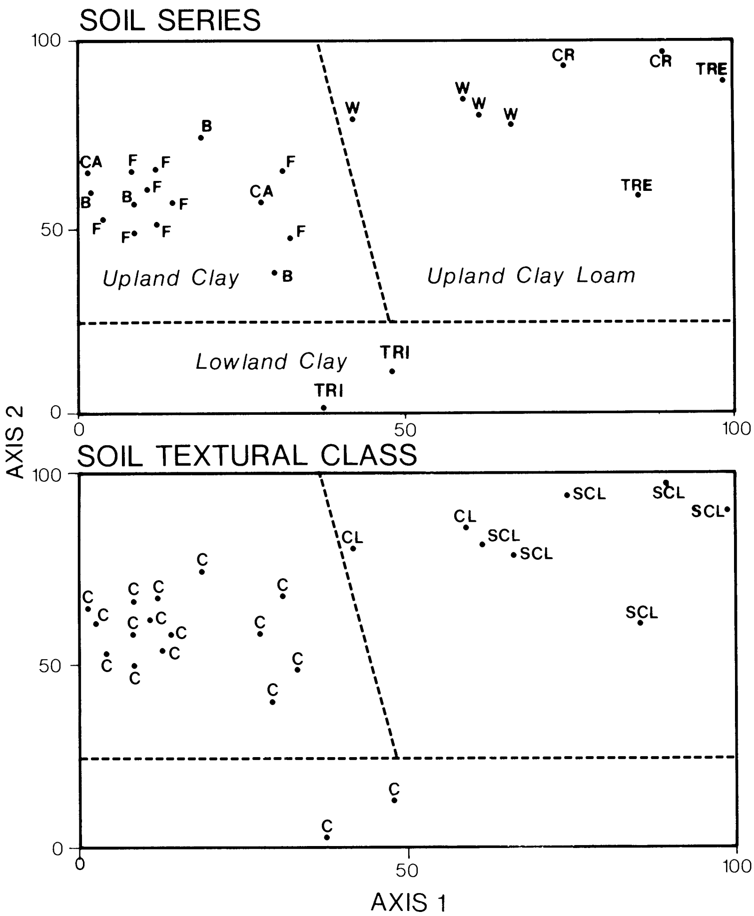

Fig. 2.—Location of stands with associated soil textural class and soil series within the two-dimensional polar ordination. Soil textural classes: C = clay, CL = clay loam and SCL = sandy clay loam. Soil series: B = Bleiblerville, CA = Carbengle, CR = Crockett, F = Frelsburg, TRE = Tremona, TRI = Trinity and W = Wilson. Stand positions and axes are the same for all following ordination displays

quency values were modified by using an arcsin transformation before correlation coefficients were calculated.

RESULTS AND DISCUSSION

Twenty-five remnant grasslands met the criteria for stand selection. The stands ranged in size from 2-20 ha and represented major soil-topographic conditions that exist across the Fayette Prairie. A total of 143 taxa, including 34 graminoids, 107 forbs and two woody shrubs, were observed on the 25 grassland remnants. Eighty-eight of these species occurred in quadrats. To relate these stands to each other and to depict vegetation-environmental relationships, a two-dimensional polar ordination was generated (Fig. 2). The position of each of the 25 stands is plotted in the following figures.

Environment-ordination relationships.—Soils identified included the Bleiblerville, Carbengle, Crockett, Frelsburg, Tremona, Trinity and Wilson series (Table 1, Fig. 1). Location of stands characterized by these soil series within the two-axis ordination showed that most stands of the same series cluster together, although Carbengle, Bleiblerville and Frelsburg soils intermix (Fig. 2). These soils have similar physical and chemical characteristics and topographic positions which explain this grouping (Table 1).

Surface soil texture corresponded to the x-axis position, and the ordination display was divided into clay and clay loam sections (Fig. 2). While these two soil groups were generally distinct from each other, transitional soils with corresponding transitional plant communities also occurred. For example, the stand located just to the right of the dashed line in Figure 2 was classified in the field as a Wilson clay loam but it only marginally fit the description for this soil series. In fact, it had soil properties tending toward the clayey soils to the left of the ordination.

The y-axis distinguished between uplands and periodically flooded lowlands. Correspondingly, the ordination diagram was divided into upland and lowland sections. Within the uplands there was little variation in topographic position. Slope ranged from 0-7% and stands were moderately well to somewhat poorly drained.

Surface soil textural fractions from all soils ranged from 6-58% sand, 8-28% silt and 22-71% clay. Organic matter content ranged from 1.9-6.0% and *p*H from 5.4-7.8% (Table 1). Correlation coefficients between the x-axis position for upland stands and corresponding soil characteristics showed a highly significant positive relationship with percent sand ($r = 0.92$), while percent clay ($r = -0.90$), organic matter content ($r = -0.85$) and *p*H ($r = -0.87$) showed highly significant negative relationships (Diamond, 1980). These correlations suggest that vegetation pattern along the x-axis, based on species frequency, is closely related to a gradient of physical soil features and associated chemical properties.

Vegetation-ordination relationship.—To test how species distribution related to edaphic variables and to stand position within the polar ordination display, species frequency values were plotted against the two-axis ordination (Fig. 3). In addition, correlation coefficients between species frequencies in stands and corresponding edaphic variables and stand position on the x-axis were calculated (Table 2). Since the vegetation of the two lowland stands was greatly different from that of the upland stands, they were excluded from correlation analysis.

Several species had particularly strong relationships with the x-axis and edaphic variables, while others showed almost no relationship. Among species with a strong positive relationship to the x-axis were *Coelorachis cylindrica, Dichanthelium* spp., *Fimbristylis puberula* var. *puberula, Paspalum plicatulum, P. setaceum* var. *stramineum* and *Schrankia uncinata.* These species occurred with high frequencies on upland sandy clay loam and clay loam soils and were positively correlated with percent sand but negatively correlated with percent clay, *p*H and percent organic matter. Species with a strong inverse relationship with the x-axis included *Andropogon gerardii* var. *gerardii, Bouteloua*

TABLE 1.—Mean values for selected physical and chemical properties of soil series within the Fayette Prairie

Number of stands	2 Trinity	9 Frelsburg	4 Bleiblerville	2 Carbengle	4 Wilson	2 Crockett	2 Tremona
Soil order	Vertisol	Vertisol	Vertisol	Mollisol	Alfisol	Alfisol	Alfisol
Surface texture (0-15) cm	Clay	Clay	Clay	Clay	Clay loam and sandy clay loam	Sandy clay loam	Sandy clay loam
Textural fraction							
Sand (%)	10	19	19	28	44	55	58
Silt (%)	25	18	20	19	23	21	19
Clay (%)	65	63	61	53	33	24	23
Organic matter (%)	3.6	4.5	4.9	4.7	3.1	2.8	2.0
*p*H	7.7	7.4	7.3	7.4	6.0	5.8	5.6
Drainage	Somewhat poorly drained	Well-drained	Moderately well-drained	Well-drained	Somewhat poorly drained	Moderately well-drained	Somewhat poorly drained

curtipendula var. *curtipendula, Carex microdonta, Acacia hirta, Hedyotis nigricans* and *Stipa leucotricha.* These species occurred primarily on upland clay soils. They were negatively correlated with the sand fraction but positively correlated with percent clay, *p*H and percent organic matter. Among species with little correlation to the x-axis were *Cacalia plantaginea, Marshallia caespitosa* var. *caespitosa, Schizachyrium scoparium* var. *frequens, Paspalum floridanum* var. *glabratum* and *Sporobolus asper* (Table 2).

A plot of species basal cover values within the ordination produced a display similar to the frequency plot (Diamond, 1980). Thus, frequency values arranged the plant communities in an order that expressed dominance as well as frequency relationships.

Based on differences in topography, soil characteristics and species composition, as expressed in the ordination, three topo-edapho-vegetation complexes were distinguished: a lowland clay vegetation complex, an upland clay vegetation complex and an upland clay loam vegetation complex.

Lowland clay vegetation complex.—The lowland clay vegetation was dominated by *Tripsacum dactyloides* and *Panicum virgatum,* which had mean relative basal cover values of 41% and 18%, respectively (Table 3). Also important were *Sorghastrum nutans* and *Paspalum floridanum* var. *glabratum,* with mean relative basal cover values of 10% and 5%, respectively. *Sporobolus asper* and *Eleocharis montevidensis* had average absolute fre-

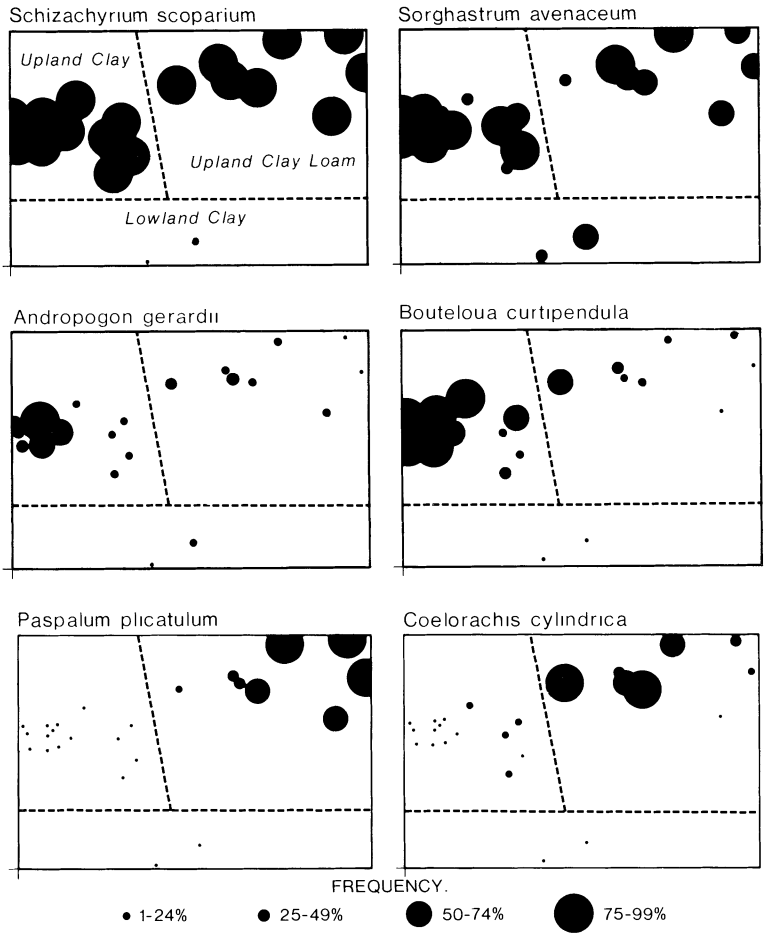

Fig. 3.—Polar ordination with selected species frequencies plotted against stand position

quencies of 48% and 23%, respectively. *Desmanthus illinoiensis* was an abundant forb. Average total basal cover for lowland stands was 18%. Number of species encountered in quadrats was 22 while 31 species were present.

Upland clay vegetation complex.—The most important species, as determined by relative basal cover and frequency values, were *Schizachyrium scoparium* var. *frequens, Sorghastrum nutans, Bouteloua curtipendula* var. *curtipendula, Carex microdonta, Andropogon gerardii* var. *gerardii* and *Sporobolus asper* (Table 3). Other graminoids that occurred in quadrats in at least 50% of the stands of this complex included *Paspalum floridanum* var. *glabratum* and *Stipa leucotricha. Argythamnia humilis* var. *humilis, Bifora americana, Cacalia plantaginea* and *Physostegia intermedia* were common forbs. The average total basal cover for these stands was 22%. Number of species encountered in quadrats was 72, while 120 species were present in these stands.

Upland clay loam vegetation complex.—Important species of this complex were *Schizachyrium scoparium* var. *frequens, Paspalum plicatulum, Sorghastrum nutans, Coelorachis cylindrica, Sporobolus asper* and *Fimbristylis puberula* var. *puberula* (Table 3). Other graminoids which occurred in frequency quadrats in at least 50% of the stands of this complex included *Andropogon gerardii* var. *gerardii, Bouteloua curtipendula* var. *curtipendula, Carex microdonta, Dichanthelium* spp., *Eragrostis intermedia, Paspalum floridanum* var. *glabratum, P. setaceum* var. *stramineum* and *Scleria ciliata. Bifora americana, Cacalia plantaginea, Krigia occidentalis* and *Marshallia caespitosa* var. *caespitosa* were among the common forbs. The average basal cover for upland clay loam stands was 22%. Sixty-five species were recorded in quadrats and 123 species were present.

Ecological affinities and classification.—Tall-grass prairies of Texas include the Blackland, Grand, San Antonio, Fayette and Coastal prairies (Gould, 1975). Dyksterhuis (1946) investigated the Grand Prairie and concluded that *Schizachyrium scoparium* var. *frequens* was the climax dominant with less *Bouteloua curtipendula* and *Sorghastrum nutans.* The Blackland Prairie was divided into seven community types

TABLE 2.—Correlation coefficients between the absolute frequency of selected species, x-axis position on the ordination and soil characteristics for upland stands

	x-axis	% Clay	% Sand	*p*H	% OM
More frequent on clays					
Acacia hirta	−0.54**	0.47*	−0.61**	0.52*	0.63*
Andropogon gerardii var. *gerardii*	−0.67**	0.61*	−0.44*	0.45*	0.69**
Bouteloua curtipendula var. *curtipendula*	−0.78**	0.66**	−0.61**	0.66**	0.62*
Carex microdonta	−0.42*	0.56*	−0.48*	0.57*	0.19
Hedyotis nigricans	−0.53*	0.48*	−0.51*	0.61*	0.56*
Stipa leucotricha	−0.66**	0.75**	−0.69**	0.53*	0.69**
More frequent on clay loams					
Coelorachis cylindrica	0.44*	−0.55*	0.48*	−0.56*	−0.45*
Dichanthelium spp.[1]	0.66**	−0.61**	0.62**	−0.61**	−0.48*
Fimbristylis puberula var. *puberula*	0.61*	−0.64*	0.62*	−0.63*	−0.48**
Paspalum plicatulum	0.87**	−0.77**	0.82**	−0.76**	−0.72**
Paspalum setaceum var. *stramineum*	0.80**	−0.65**	0.71**	−0.68**	−0.37*
Schrankia uncinata	0.46*	−0.40*	0.45*	−0.35*	−0.60**
Widely distributed					
Cacalia plantaginea	−0.38	0.33	−0.35	0.39	0.18
Marshallia caespitosa var. *caespitosa*	0.06	−0.02	0.18	0.12	−0.17
Paspalum floridanum var. *glabratum*	0.22	−0.10	0.15	−0.24	−0.37
Schizachyrium scoparium var. *frequens*	−0.09	0.11	−0.03	0.15	0.20
Sporobolus asper var. *asper* and var. *drummondii*	0.20	−0.19	0.27	−0.19	−0.20

*$p < 0.05$
**$p < 0.001$
[1]*Dichanthelium angustifolium* and *D. sphaerocarpon*

TABLE 3.—Mean absolute percent frequency and mean relative percent basal cover for species by topo-edapho complex. The first number of each pair is the number of stands of occurrence while the second is the average percent frequency or cover in those stands. Only species that occurred in six stands or had an average frequency of at least 15% in one complex are included

	Topo-Edapho Complex					
	UPLAND CLAY		UPLAND CLAY LOAM AND SANDY CLAY LOAM		LOWLAND CLAY	
Number of stands	15		8		2	
	Frequency	Cover	Frequency	Cover	Frequency	Cover
Graminoids						
Andropogon gerardii var. *gerardii*	15-33	11-3	6-20	4-3	1-5	—
A. ternarius	—	—	2-20	—	—	—
Aristida purpurescens	—	—	2-30	—	—	—
Bouteloua curtipendula var. *curtipendula*	15-69	12-9	6-24	3-2	—	—
Carex microdonta	15-63	13-8	5-18	—	2-15	—
Coelorachis cylindrica	4-14	1-2	7-57	6-4	—	—
Dichanthelium angustifolium and *D. sphaerocarpon*	3-7	—	8-39	4-3	—	—
Eleocharis montevidensis	3-12	2-3	—	—	2-23	2-3
Eragrostis intermedia	—	—	5-19	1-1	—	—
Eriochloa sericea	3-14	3-3	—	—	—	—
Fimbristylis puberula var. *puberula*	3-7	—	8-41	4-4	—	—
Limnodia arkansana	4-17	—	2-5	—	—	—
Muhlenbergia capillaris	—	—	2-18	2-5	—	—
Panicum obtusum	1-12	—	—	—	2-18	—
P. virgatum	—	—	—	—	2-50	2-18
Paspalum floridanum var. *glabratum*	12-22	5-4	6-26	3-4	2-28	2-5
P. plicatulum	—	—	8-60	8-13	—	—
P. setaceum var. *stramineum*	—	—	6-37	2-5	—	—
Schizachyrium scoparium var. *frequens*	15-97	15-61	8-99	8-56	1-5	—
Scleria ciliata	—	—	4-22	2-4	—	—
Sorghastrum nutans	15-77	15-11	8-64	8-11	2-50	2-10
Sporobolus asper var. *asper* and var. *drummondii*	15-23	10-4	8-29	5-4	2-48	2-2
Stipa leucotricha	12-37	6-4	4-13	1-2	—	—
Tripsacum dactyloides	2-41	2-23	—	—	2-48	2-41

TABLE 3.—(continued).

	Topo-Edapho Complex					
	UPLAND CLAY		UPLAND CLAY LOAM AND SANDY CLAY LOAM		LOWLAND CLAY	
Number of stands	15		8		2	
	Frequency	Cover	Frequency	Cover	Frequency	Cover
Forbs						
Acacia hirta	15-19	—	4-9	—	—	—
Argythamnia humilis var. *humilis*	11-9	2-2	1-3	—	—	—
Aster ericoides	4-4	—	2-12	—	—	—
A. patens	1-3	—	4-70	—	—	—
Biforia americana	14-76	—	5-38	1-2	—	—
Cacalia plantaginea	11-10	2-1	4-6	—	—	—
Castilleja indivisa	4-7	—	4-10	—	—	—
Cirsium spp.	9-15	—	4-7	—	—	—
Delphinium virescens var. *macroceratilis*	2-24	—	4-23	—	—	—
Desmanthus illinoensis	—	—	—	—	2-99	2-2
Dyschoriste linearis	1-33	1-4	—	—	—	—
Echinacea angustifolia var. *angustifolia*	3-6	1-2	—	—	—	—
Engelmannia pinnatifida	8-5	—	—	—	—	—
Euphorbia spathulata	9-12	—	4-8	—	—	—
Hedyotis crassifolia	2-25	—	—	—	—	—
Helianthus maximiliani	7-18	—	1-3	—	—	—
Heterotheca pilosa	—	—	2-50	—	—	—
Indigophera miniata var. *leptosepala*	10-15	—	1-14	—	—	—
Iva annua	—	—	—	—	2-30	—
Krigia occidentalis	9-14	2-2	4-22	1-2	—	—
Linum medium var. *texanum*	1-3	—	5-14	—	—	—
L. rigidum var. *berlandieri*	14-14	—	2-4	—	—	—
Lygodesmia texana	1-33	—	—	—	—	—
Marshallia caespitosa var. *caespitosa*	7-27	2-6	4-20	2-2	—	—

TABLE 3.—(continued).

	Topo-Edapho Complex					
	UPLAND CLAY		UPLAND CLAY LOAM AND SANDY CLAY LOAM		LOWLAND CLAY	
Number of stands	15		8		2	
	Frequency	Cover	Frequency	Cover	Frequency	Cover
Forbs						
Oxallis dillenii	9-18	—	8-23	—	—	—
Phyllanthus polygonoides	6-12	—	1-5	—	—	—
Physostegia intermedia	15-50	1-2	3-17	—	1-5	—
Plantago virginica	1-7	—	5-11	—	—	—
Pyrrhopappus carolinianus	10-9	—	1-3	—	—	—
Ratibida columnaris	6-21	—	—	—	2-10	—
Rudbeckia hirta var. *pulcherrima*	—	—	2-25	1-4	—	—
Ruellia humilis var. *longiflora* and *Ruellia nudiflora* var. *nudiflora*	6-9	1-2	2-35	—	—	—
Sabatia campestris	2-6	—	1-28	—	—	—
Schrankia uncinata	2-5	—	6-18	—	—	—
Scutellaria drummondii	7-23	—	—	—	—	—
Sisyrinchium pruinosum	8-10	—	1-12	—	—	—
Tradescantia hirsutiflora	4-12	—	2-18	—	—	—
Triodanis perfoliata	4-12	—	2-18	—	—	—

based on differences in climate, soils and vegetation (Collins *et al.*, 1975). *Schizachyrium scoparium* var. *frequens, Sorghastrum nutans* and *Andropogon gerardii* var. *gerardii* were climax dominants across most upland communities. Launchbaugh (1955) determined *Schizachyrium scoparium* var. *frequens* to be the prevailing dominant of the San Antonio Prairie. All of these studies concluded that these tall-grass prairies in Texas were southern extensions of the True Prairie Association.

Earlier classifications suggested that *Bothriochloa saccharoides, Stipa leucotricha* and *Buchloe dactyloides* were climax dominants of the Fayette Prairie (Tharp, 1926; Johnson, 1931; Warner, 1942; Kuchler, 1964). These interpretations have been largely discounted since it has been shown that these are successional species in the Grand, Blackland and San Antonio prairies (Dyksterhuis, 1946; Launchbaugh, 1955) and behave similarly in the Fayette Prairie. They are present in climax communities in only low quantity or are completely absent. All tend to increase as a result of overgrazing or other disturbances, and may become dominants over large areas under such conditions.

Data presented here are the first to provide a detailed ecological analysis of the Fayette Prairie. Prevailing dominants on uplands are *Schizachyrium scoparium* var. *frequens* and *Sorghastrum nutans.* Secondary grasses of remnant communities on clay soils (Vertisols) are *Andropogon gerardii* var. *gerardii, Sporobolus asper* and *Bouteloua curtipendula* var. *curtipendula.* These data show a close ecological relationship to other tall-grass prairies in Texas and to the True Prairie (Weaver and Fitzpatrick, 1934). Correspondingly, the Fayette Prairie should be considered a southern extension of the True Prairie.

Despite an overall similarity to Texas tall-grass prairies to the N, uplands of the Fayette Prairie share some important elements in common with the Coastal Prairie. *Paspalum plicatulum* is a secondary species of upland clay loam soils (Alfisols) and is also an important component of Coastal Prairie communities (Butler, 1979). *Coelorachis cylindrica* is another secondary species which occurs in the clay loam complex and in remnant Coastal Prairie communities but is less important northward.

Lowlands of the Fayette Prairie, dominated by *Tripsacum dactyloides* and *Panicum virgatum,* are similar to communities over poorly drained soils throughout the tall-grass prairies of Texas and northward, into Kansas and Nebraska. Thus, lowlands, as well as uplands, of the Fayette Prairie should also be considered southern extensions of the True Prairie into Texas.

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