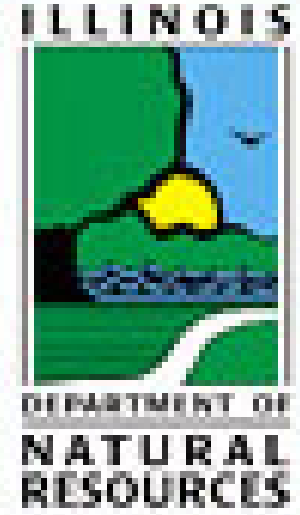
BOTANICAL INVENTORY OF PRAIRIE RIDGE STATE NATURAL AREA, JASPER COUNTY, ILLINOIS



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Penstemon tubaeflorus (beardtongue), a new state record discovered by Bob Edgin at Prairie Ridge.

- *Asclepias tuberosa*, one of eight species of *Asclepias* (milkweed) at Prairie Ridge.

Abstract

- Prairie Ridge State Natural Area comprises 2700 acres in the Southern Till Plain Natural Division of Illinois. Prairie Ridge is rated as one of the five most significant grassland habitat complexes in Illinois and is well known for supporting the only population of Greater Prairie Chickens in the state. Our study had two goals: complete inventory of species and quantitative study of plant communities. We found a total of 512 vascular plant species. Of these, 408 are native. We found two new state records (*Penstemon tubaeflorus* and *Schoenoplectus americanus*). No other state listed rare species were found. The percentage of exotic species (19%) is substantially less than that of Illinois as a whole (31%). The average coefficient of conservatism (following the method of Taft for Illinois) was 3.1 for all species and 3.75 for native species only. Vegetation transects were sampled in late summer 2005. The average number of species per transect was 12.75 (range: 9 to 18). Grassland communities fell into two types: cool season grasslands, managed by mowing and dominated by *Bromus inermis* and *Agrostis gigantea* and warm season grasslands, managed by fire or mowing, and dominated by *Panicum virgatum* and *Sorghastrum nutans*. The number of exotics that are genuinely plentiful and widespread at the preserve is small. Woody exotics are few in the grassland areas, apparently effectively controlled by mowing and burning practices.

Introduction

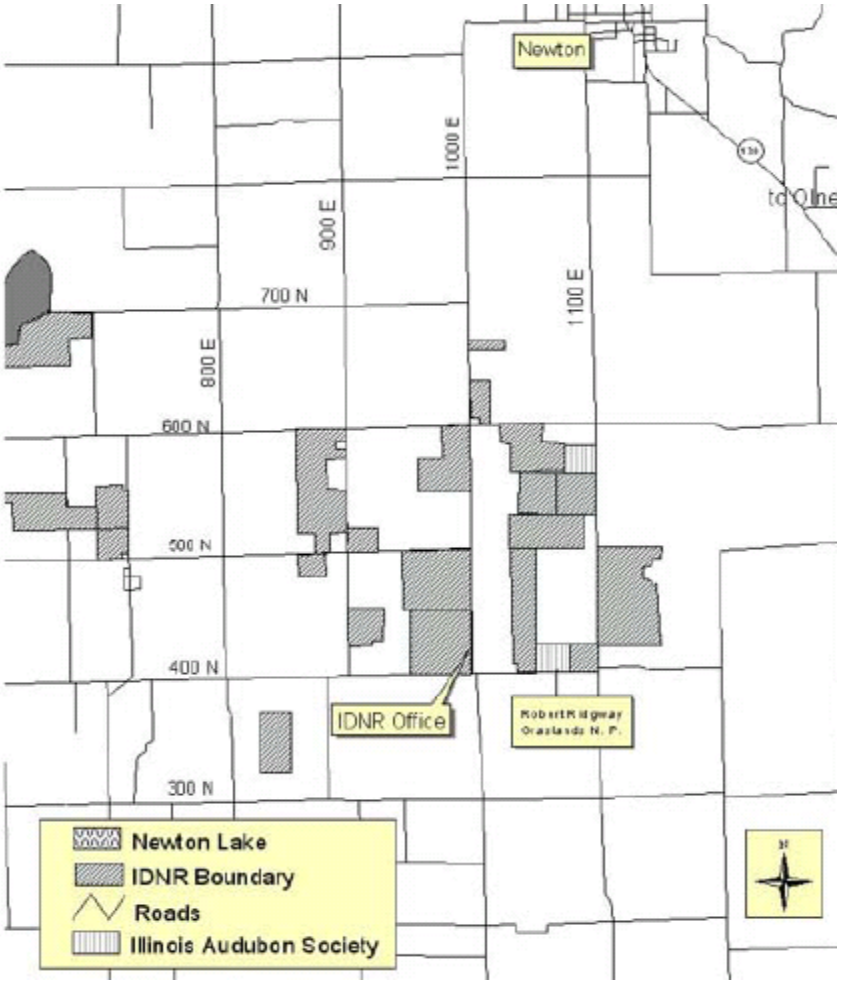
Prairie Ridge State Natural Area comprises 2400 acres in the Southern Till Plain Natural Division. Of this, 567 acres have been set aside as dedicated nature preserve.

Prairie Ridge is included in the Illinois Natural Areas Inventory (INAI) and is rated as one of the five most significant grassland habitat complexes in Illinois (Simpson & Esker, 1997).

- http://dnr.state.il.us/orc/prairieridge/index.htm

- Prairie Ridge is well known for supporting the only population of Greater Prairie Chickens in the state.
- There is abundant information on the site's fauna, especially breeding birds (Simpson, 1998). However, only two studies have focused on the plant life.
- A natural prairie restoration was studied by Edgin & Ebinger (2000).
- The five tracts of man-made prairie restorations were surveyed by Kessler, Tucker & Ebinger (2001).
- In total, these two studies dealt with only about 20% of the preserve.

Location


Newton
1000 E
900 E
800 E
1100 E
700 N
600 N
500 N
400 N
300 N
IDNR Office
Robert Ridgway Grasslands N. P.
Newton Lake
IDNR Boundary
Roads
Illinois Audubon Society


Winnebago
Jo Daviess
Stephenson
Boone
McHenry
Lake
Carroll
Ogle
DeKalb
Kane
Cook
Whiteside
Lee
Kendall
La Salle
Will
Rock Island
Henry
Bureau
Grundy
Mercer
Putnam
Knox
Stark
Marshall
Livingston
Iroquois
Henderson
Warren
Peoria
Woodford
Fulton
Tazewell
McLean
Ford
Mc Donough
Hancock
Schuyler
Mason
Logan
De Witt
Champaign
Vermilion
Adams
Brown
Cass
Menard
Macon
Piatt
Pike
Scott
Sangamon
Douglas
Edgar
Morgan
Christian
Moultrie
Coles
Greene
Shelby
Cumberland
Clark
Montgomery
Macoupin
Calhoun
Jersey
Fayette
Effingham
Crawford
Madison
Bond
Clay
Lawrence
Richland
Marion
Clinton
St. Clair
Wayne
Edwards
Wabash
Washington
Jefferson
Monroe
Randolph
Perry
Franklin
Hamilton
White
Jackson
Williamson
Saline
Gallatin
Union
Johnson
Pope
Hardin
Massac
Alexander
Pulaski

Avian Habitat

Grassland habitats come at a premium in Illinois, and so do many grassland birds. Prairie Ridge, tucked away in southeastern Illinois, is the best place to find many of these species. The main attraction is the group of displaying male Greater Prairie-Chickens in spring. Fortunately, the “booming ground” locations are predictable and visible from roadsides, so visitors from March to early May are not likely to leave disappointed. Besides hosting the last populations of Greater Prairie-Chickens in Illinois, the state natural area also has the largest wintering and breeding populations of Northern Harriers and Short-eared Owls. Also breeding on the site are King Rails, American Bitterns, Upland Sandpipers, and a growing population of Henslow’s Sparrows, all endangered in Illinois. While the grasslands and marshes of Prairie Ridge are the most unique feature of this area, a wide variety of habitats is nearby, including shrubby areas, small woodlots, and Newton Lake,

Methods

The incentive of the present study was to complete an inventory of the vascular plant species, as well as providing quantitative data on the grassland communities at the preserve.

The site was visited by the PI 25 times during the growing seasons of 2005 and 2006, to observe and collect plant specimens. Field work cover the growing season from April through October. Specimens are labeled, and accessioned into the Stover-Ebinger Herbarium of Eastern Illinois University. Vegetation sampling of the community was carried out using standard methods (Mueller-Dombois& Ellenberg, 1974). Quantitative abundance of herbaceous and woody species was determined using standard methods (Bailey & Poulton, 1968).

John Ebinger reviews the species list. Sept. 2005

- Vegetation sampling was carried out following standard methods. Transects were sampled from late August through early October 2005. A total of 12 50 m transects was sampled in grassland areas. The locations and data are presented in Appendix 1. The average number of species per transect was 12.75, with a range from 9 to 18.

Table 1. Floristic integrity assessment summary data comparing various prairie tracts at Prairie Ridge State Natural Area, Jasper County, Illinois

Parameter	Galbreath	Lew's	McGraw	Frohning	Fuson
Restoration Age (Years)	7	30	9	1	25
Size (Hectares)	2.4	2.0	1.6	4.0	2.4
Total Species Richness	81	62	41	29	29
Native Species Richness	67	50	35	26	20
% Adventive	17.28	19.40	14.63	10.34	31.0
Floristic Quality Index (FQI)	25.20	21.57	18.12	13.57	9.85
FQI (natives only)	27.75	24.04	19.58	14.33	11.85
Mean Conservatism (C)	2.80	2.74	2.83	2.52	1.83
Mean C (natives only)	3.39	3.40	3.31	2.81	2.65

Table 2. Comparison of Warm and Cool Season Grasslands; importance values (out of 200) are given for an example of each type, with summary for all 12 tracts of grasslands at Prairie Ridge. Exotic species are marked with an asterisk.

Species	Cool Season	Warm Season	Average
	Galbreath	CIPS	12 tracts
Solidago canadensis	55.7	61.2	52.9
Sorghastrum nutans	53.5	55.3	26.9
Andropogon gerardii	--	44.3	14.9
Schizachyrium scoparium	--	--	11.6
**Festuca arundinacea*	33.1	--	9.4
Ambrosia artemisifolia	--	--	8.2
Rubus allegheniensis	6.6	17.9	7.7
Aster pilosus	--	--	5.6
**Setaria glauca*	--	--	4.0
**Poa pratensis*	23	--	3.4
**Bromus inermis*	--	--	3.3

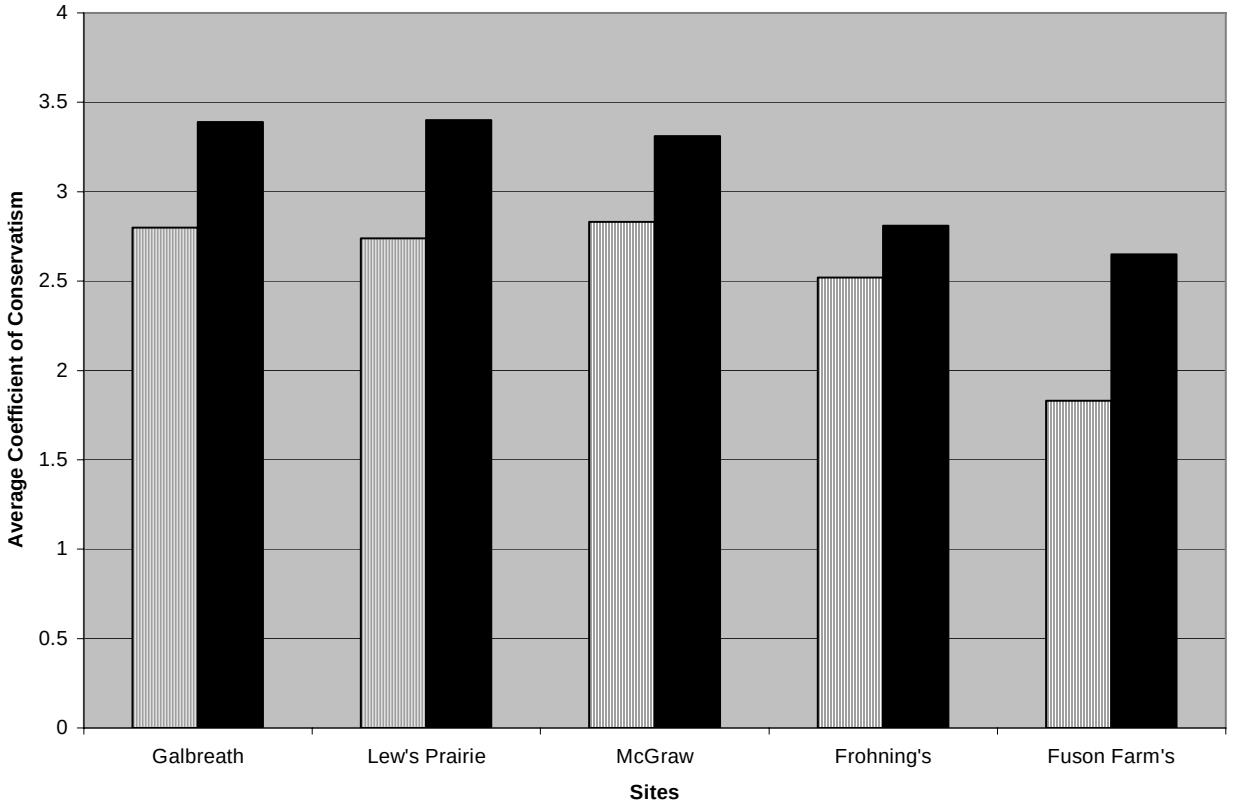


Figure 3. Comparison of Coefficient of Conservatism values (cf. Taft et al., 1998) for selected sites. Solid bars indicate native species; hatched bars indicate all species.

Cool Season Grassland

Floristic Summary

- The preserve supports a total of 508 vascular plant species.
- Of these, 407 are native species. Thus, the percentage of exotic species here, 19%, is substantially less than that of Illinois as a whole, which is 31% (Mohlenbrock, 2002).
- The average coefficient of conservatism for all species was determined following Teft et al. (1999). This was 3.1 for all species and 3.75 for native species only.
- The Floristic Quality Index, calculated by the same method, was 60. However, the FQI is designed to assess smaller tracts, and the high value is probably not meaningful.

Exotic species

- These are sometimes a problem in grassland, forest, and wetlands, and in site management plans. Exact inventory and identification allow for appropriate measures for any that might need to be removed, controlled, or managed. The number of exotics that are genuinely plentiful and widespread at the preserve is few. *Phragmites australis* occurs at one tract in a localized tract that could be removed. Woody exotics are few in the grassland areas, apparently effectively controlled by mowing and burning practices.

Notable Species

- We found a total of 40 new county records for Jasper County. No state listed species were found, but a number of interesting species were seen, including two orchids, *Platanthera peramoena* and *Liparis lilifolia*.
- Some genera are especially well represented. We are not aware of any other site in the state that has so many species of *Asclepias* (milkweed) as does Prairie Ridge.
- The hybrid of two common *Silphium* species was found in 2005. This hybrid is not listed by Mohlenbrock (2002) for Illinois. This population includes both parent species, as well as F1 and F2 individuals. Unfortunately, this site is on a roadside and mowing has prevented us from collecting flowering and fruit specimens for morphometric study.

Silphium

- *Silphium laciniatum*
- Compass plant

Silphium

- *Silphium terebinthinaceum*
- Rosinweed

Silphium

- *Silphium* X *deamii*
- hybrid of rosinweed and compass plant

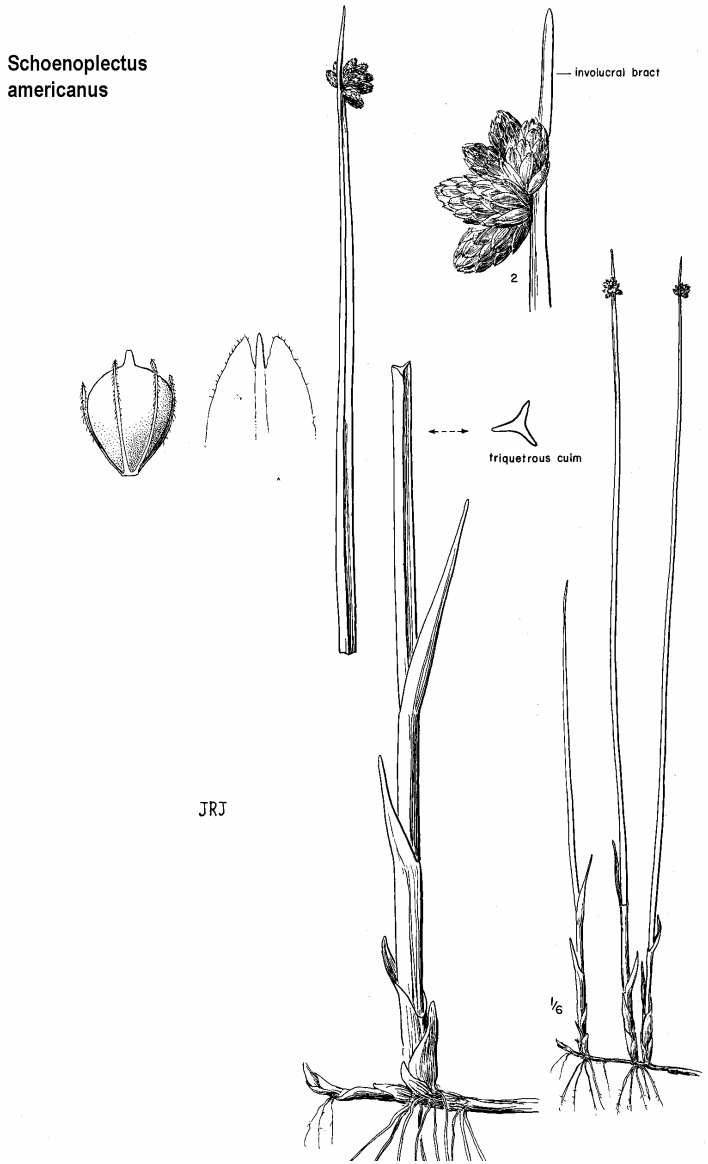
Silphium hybrid variation

Wetland Plants

- Wetlands restoration are important features of the preserve. A survey by the Tucker and EIU Taxonomy class in September, 2000 found several wetland plants that were new county records: *Potamogeton illinoiensis*, *Scirpus georgianus*, *Scirpus purshianus*, and the non-native *Scirpus mucronatus*.
- Additionally a new state record was found (Tucker 2001): *Scirpus americanus* (*S. olneyi*), which was probably brought in by migrating waterfowl, as was the case in neighboring Missouri (Yatskievych, 2001).

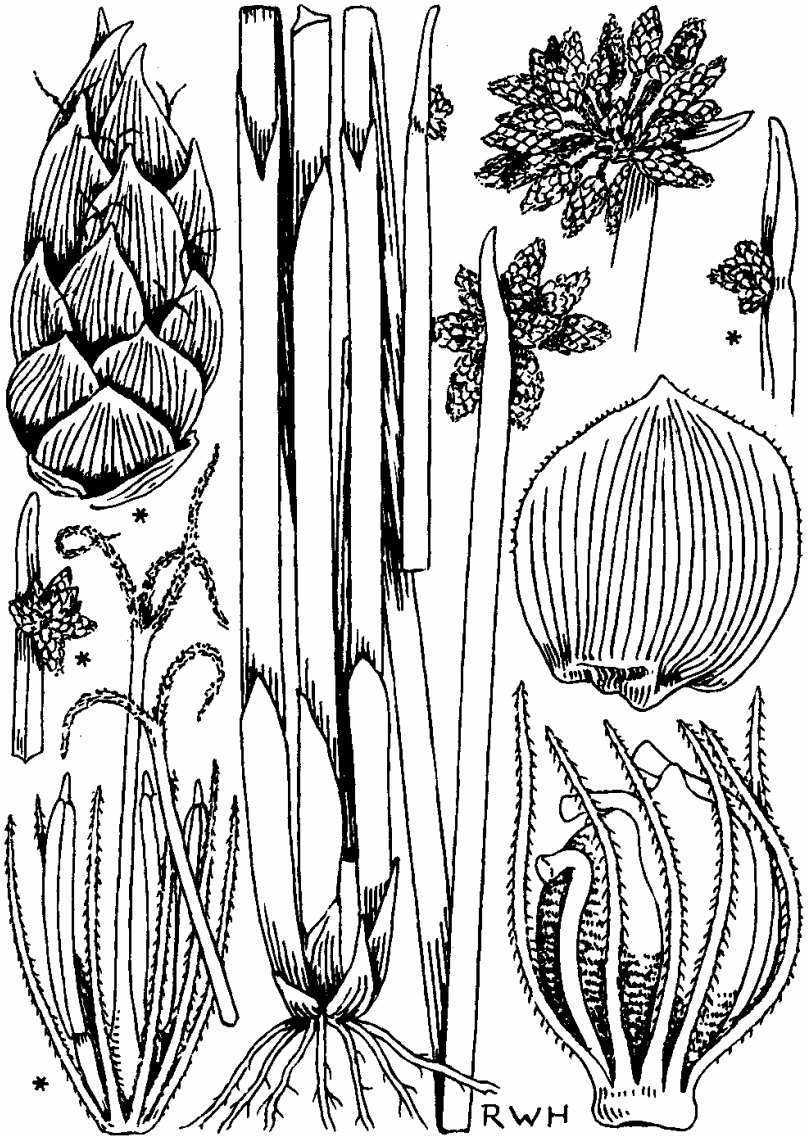
Saltmarsh bulrush

often 2 m tall
bract only a little longer than spikelets
coastal species recently found in Jasper Co.



European Clubrush

Native to Europe and Asia
sparingly naturalized in
N. America
stem 3-sided unlike *S. hallii*
Infl. bract turns outward or
deflexed
found in Mason Co. in 1976
Alexander Co. in 1992
Shelby Co. in 1998
Jasper Co. in 2000



Further Research Plans

- The results of this study will be submitted for publication in a suitable peer-reviewed journal, in 2008. Because the 2005 season included several weeks of drought, we are making regular visits to Prairie Ridge during the 2006 growing season, to search for species that may not have been evident last year.
- Also, we plan to monitor the wetlands for additional species. This is especially important because a series of vernal pool wetlands was created in 2006 for amphibian breeding habitat; these sites may well be a source of additional species.

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