

Technical Report No. 41
COMPREHENSIVE NETWORK SITE DESCRIPTION
HAYS

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GRASSLANDS BIOME
U. S. International Biological Program

I. *Site name:* HAYS

The HAYS site consists of an ungrazed and a grazed stand of mixed prairie vegetation on the farm of Fort Hays Kansas State College. The remnant prairie consists of 35 acres of grassland which has been free of grazing and burning for more than 60 years. The grazed site is part of a large well-managed pasture of about 1000 acres operated by Fort Hays Kansas State College.

II. *Location and size*

The study areas on both sites are located on long, gentle east facing slopes. Approximately five acres along each slope have been selected and enclosed for intensive study of primary production. The two areas are on similar soils and separated by less than one-fourth mile.

Both study areas are approximately two miles southwest of the city of Hays in west central Kansas. They are both readily accessible on good gravel roads.

III. *Type*

The two study areas are a part of the mixed prairie originally described by Albertson (1937). The grasses consist of a mixture of short, mid and tall species. The ungrazed prairie is dominated by big bluestem (*Andropogon gerardi*), little bluestem (*Andropogon scoparius*) and side-oats grama (*Bouteloua curtipendula*). Other less abundant grasses include Indian grass (*Sorghastrum nutans*), blue grama (*Bouteloua gracilis*)

and hairy grama (*Bouteloua hirsuta*). Numerous forbs typical of this region are found throughout the study area. The grazed area is dominated by side-oats grama (*B. curtipendula*) and blue grama (*B. gracilis*). Other common grasses are buffalo grass (*Buchloe dactyloides*) and three awn (*Aristida* sp.). Numerous forbs are also present.

The principal rodents in the ungrazed area are the white footed mouse (*Peromyscus maniculatus*), cotton rat (*Sigmodon hispidus*), meadow vole (*Microtus ochrogaster*) and harvest mouse (*Reithodonomys montanus*). On the grazed area the white footed mouse, harvest mouse and the thirteen lined ground squirrel (*Citellus tridecimilineatus*) are most common. Larger mammals crossing both areas include the coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*) and least weasel (*Mustela frenata*). Common birds on both areas are the meadow lark (*Strumella neglecta*), horned lark (*Otocoris alpestris*), grasshopper sparrow (*Ammodramus savannarum perpallidus*) and lark bunting (*Calamospiza melanocorys*). Common birds of prey are the marsh hawk (*Circus hudsonius*), Swainson's hawk (*Buteo swainsoni*), sparrow hawk (*Falco sparverius sparveius*), American roughlegged hawk (*Buteo lagopus santi-johannis*) and the great horned owl (*Bubo virginianus virginianus*). The most common orders of insects are the Orthoptera, Diptera and Hemiptera (Branson, 1942).

IV. *Climate*

The precipitation averages nearly 23 inches annually with a variation from nine to nearly 44 inches. Most of the rainfall occurs during the growing season (April to September). The

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growing season lasts for 160 to 170 days. The mean annual temperature is 54°F with a mean of 69°F for the growing season. Temperatures may range from 110°F in mid-summer to 20°F in mid-winter. The nearest U. S. Weather Station is at the Fort Hays Experiment Station between one and two miles from the study area.

V. *Soils*

Geologically the study areas contain strata of the Cretaceous age, particularly materials of the Niobrara formation. The prominent strata exposed belong to the Fort Hays Limestone, which is a cream-colored chalk or very chalky limestone. The immature, rocky soils recently have been classified as Armo soils. They contain only an A-C horizon and vary in depth from six to over 30 inches.

The soils contain small limestone fragments throughout the profile and are calcareous to the surface. The study areas are located on a long, gentle east-facing slope.

VI. *Physical facilities*

The facilities at Fort Hays Kansas State College are conveniently located and readily available for use. Standard types of equipment such as drying ovens, Berlese funnels, soil probes, mist nets, etc., are available. Laboratory and office space are limited but lodging facilities are readily available in Hays. Permanent personnel include G. W. Tomanek and G. K. Hulett, Division of Natural Sciences and Mathematics, Fort Hays Kansas State College, Hays, Kansas. (Phone 913-625-5611).

VII. *Previous studies*

Studies have been conducted by the staff at Fort Hays State on similar areas since 1932. More than 200 publications have appeared on grasslands in this general area. The studies include changes in cover and composition of the prairies over a period of 37 years. Other studies include primary production, animal population, producer-consumer relationships, effects of drought, effects of grazing and many other topics.

VIII. *Publications*

- Albertson, F. W. 1937. Ecology of mixed prairie in west central Kansas. *Ecol. Monogr.* 7:481-577. (out of print)
- Albertson, F. W. and G. W. Tomanek. 1965. Vegetation changes during a 30 year period on grassland communities near Hays, Kansas. *Ecology* 46:714-720.
- Dwyer, Don D. 1958. Competition between forbs and grasses. *J. Range Manage.* 11.
- Fleharty, Eugene D. and Lawrence E. Olson. 1969. Summer food habits of *Microtus ochrogaster* and *Sigmodon hispidus*. *J. Mammal.* 50:475-486.
- Hopkins, Harold H., F. W. Albertson, and D. A. Riegel. 1952. Ecology of grassland utilization in a mixed prairie. *Kansas Acad. Sci., Trans.* 54:395-418.
- Hulett, G. K., G. L. VanAmburg, and G. W. Tomanek. 1969. Soil depth-vegetation relationships on a shallow limy range site in western Kansas. *J. Range Manage.* 22:196-199.
- Hulett, G. K. and G. W. Tomanek. 1969. Remnant prairies on the shallow limy range site in north central Kansas. *J. Range Manage.* 22:19-23.

- Martin, Edwin Perry. 1960. Distribution of native mammals among the communities of the mixed prairie. Fort Hays Stud. Sci. Ser. No. 1.
- Patel, K. R., F. W. Albertson, and G. W. Tomanek. 1964. Microclimate and vegetation responses on three big bluestem (*Andropogon gerardi* vitman) habitats near Hays, Kansas. Kansas Acad. Sci., Trans. 67: 41-49.
- Tomanek, G. W. and F. W. Albertson. 1953. Some effects of different intensities of grazing on mixed prairies near Hays, Kansas. J. Range Manage. 6:299-306.

FORT HAYS KANSAS STATE COLLEGE FARM
Section 1-14-19 and adjoining areas.
1949-Reprint from air photo.

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Scale: 8" per mile.

