

Fort Hays State University Natural Areas

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Two natural areas are supervised by the Department of Biological Sciences at Fort Hays State University and are known as the "relict area" and the "Cedar Bluff area."

In 1900 the Federal government granted old Fort Hays to Kansas. The 35 acre (14.2 ha) relict natural area was included in the 4160 acres (1683.5 ha) that became Fort Hays State University. The area is located in the SE $\frac{1}{4}$ Sec. 1, T. 14S, R. 19W in Ellis County. The relict area has not been grazed since 1902. Ruts made by wagons coming to and from the Fort remain and can be seen cutting across the relict area.

The topography of the relict area is characterized by steep to gentle slopes bordering a central drainage area. The site contains strata of the Niobrara Chalk, particularly the Fort Hays Limestone Member. A cap of Loveland Loess overlies the Fort Hays Limestone on upland areas. Parent materials consist of loess, limestone, alluvium, and shale.

Four major communities are found in this area. The upland shortgrass community is dominated by buffalograss (*Buchloe dactyloides*), blue grama (*Bouteloua gracilis*) and western wheatgrass (*Agropyron smithii*), and occurs on deep loessial soils of the Mento series. The hillsides are dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), and side-oats grama (*Bouteloua curtipendula*). The shallow calcareous Brownell soils underlying the hillside community support diverse forb populations. A homogeneous big bluestem community parallels the major drainage and is developed on alluvial and colluvial Armo soils. A large ravine traverses the relict area and is dominated by big bluestem, kochia (*Kochia scoparia*), and common sunflower (*Helianthus annuus*). The weediness of the lowland community is possibly the result of seepage from the farm pond located on the upper end of the drainage. The lowland has alluvial Roxbury soils.

The second natural area is located near Cedar Bluff Reservoir in Trego County in W $\frac{1}{2}$ Sec. 27, T. 14S, R. 22W, and includes 176 acres (71.2 ha). The Cedar Bluff natural area was grazed rangeland prior to coming under the control of the University in 1952 through a lease from the Bureau of Reclamation. The area has been protected from grazing by domestic stock since 1952.

The Cedar Bluff area consists of level uplands and long gentle slopes traversed by a large north-south ravine. Fort Hays Limestone is exposed along the major ravines. Peorian loess overlies the Fort Hays Limestone and is the parent material for soils on the uplands.

Two communities comprise 72% of the natural area. The uplands are characterized by shortgrasses (*Buchloe-Bouteloua*) growing on loessial, non-calcareous soil. The shallow soils of the slopes are dominated by blue grama and side-oats grama. Rocky outcrops on the slopes and shallow soils support stands of little bluestem. The community occurring on lower slopes makes up 15% of the area and is dominated by side-oats grama, big bluestem and little bluestem. The lowland community occurring in the large ravine supports a dense stand of big bluestem. The soil of the ravine is developed from alluvial sediments of the upland Peorian loess and the hillside Fort Hays Limestone.

The vertebrate fauna of both the relict and Cedar Hills natural areas is typical of the Mixed Prairie. Mammals consist primarily of deer mouse (*Peromyscus maniculatus*), prairie vole (*Microtus ochrogaster*), western harvest mouse (*Reithrodontomys megalotis*), least shrew (*Cryptotis parva*), cotton rat (*Sigmodon hispidus*), coarse-haired pocket mouse (*Perognathus hispidus*), short-tailed shrew (*Blarina hylophaga*), and eastern cottontail (*Sylvilagus floridanus*). Typical reptiles consist of the eastern yellowbelly racer (*Coluber constrictor*), bull snake (*Pituophis melanoleucus*), plains rat snake (*Elaphae gutatta*), prairie rattlesnake (*Crotalus viridis*), coachwhip (*Masticophis flagellum*), and prairie-lined racerunner (*Cnemidophorus sex-lineatus*). Common bird species are morning dove, western meadow lark, lark bunting, kestrel, common night hawk, grasshopper sparrow, horned lark and ring-necked pheasant.

The relict area is the most used of the two natural areas because of its proximity to the University campus. A major use is for field trips in field biology, ecology, taxonomy of flowering plants, and range management classes.

The other use of both natural areas is in ecologic and taxonomic research by faculty and graduate students. A total of 22 M.S. degree thesis projects have been conducted on the relict area. Twelve of these were on plants and 10 on animals. Fifteen scientific papers have been published on the ecology of plants and animals in the relict area. Studies involving animals centered on small mammals, particularly population dynamics, territoriality, energy flow, secondary production and animal-plant interactions. Plant ecological studies have dealt with population dynamics, community structure, plant-soil relationships, and primary productivity. The relict area was a Comprehensive Network Site in the IBP Grassland Biome studies. Only a few research investigations have been done on the Cedar Bluff area.

The two natural areas are not intensively managed. Both areas have been continuously fenced from domestic livestock and the relict area was burned

once in an attempt to control shrubs. Several problems have occurred during management. Stray livestock have grazed the areas, particularly the Cedar Bluffs area. Brush encroachment is a continuous problem in the relict area. The proximity of the relict area to a limestone-surfaced county road has resulted in dusting near the road and an influx of bottles, cans, broken clay pigeons, shotgun shells and other assorted objects. The Cedar Bluff Area is less disturbed because it is more remotely located, although access roads for fishing do exist and some disturbance results from vehicular traffic. The Cedar Bluff Area has been burned by wildfire. Some of the small mammal traps have been vandalized in the relict area. There are no plans to change the management practices at either of the natural areas.