Bibliography of the Natural and Cultural History of the Loess Hills of Iowa

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Bibliography of the Natural and Cultural History of the Loess Hills of Iowa

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A bibliography of literature on Iowa's Loess Hills includes references containing information on the cultural or natural history of this western Iowa landform region. The bibliography is divided into six parts: general, archaeological, botanical, geological, historical, and zoological. Annotations are included only where necessary to clarify contents. Because of their rugged topography, the Loess Hills of western Iowa have resisted large-scale conversion to agriculture. This has permitted noteworthy persistence of native prairies and woodlands, along with their associated species. This bibliography complements two special issues of the Proceedings of the Iowa Academy of Science devoted to Iowa's Loess Hills.

INDEX DESCRIPTORS: Iowa Loess Hills, Iowa archaeology, Iowa botany, Iowa geology, Iowa history, Iowa zoology.

This bibliography pertains to archaeological, botanical, geological, historical and zoological literature referable to the Loess Hills landform region in western Iowa. It was compiled as part of a study of the Loess Hills undertaken by the State Preserves Advisory Board and is the final paper in a series designed to document the special nature of this region (see Vol. 92, No. 5 and Vol. 93, No. 3, PIAS). This bibliography is by no means exhaustive, although an attempt was made to include all of the major references dealing with the Iowa Loess Hills. Annotations, included only on a limited basis to clarify content, are set off by brackets.

BRIEF DESCRIPTION OF THE LOESS HILLS

The Loess Hills are a distinctive landform region in western Iowa and northwest Missouri adjacent to the broad Missouri River floodplain. The steep, sharply ridged hills are composed of thick, wind-blown deposits of coarse silt that originated as glacial outwash in the adjacent valley. These deposits were subsequently carved by erosion into the unusual, intricately dissected landscapes seen today. While extensive deposits are also present along the Mississippi and Platte River valleys, on the loess plateau in eastern Europe, and in the Palouse region of Washington State, the great thickness and unusual topographic relief of the loess deposits found in western Iowa is equalled only in portions of The People's Republic of China. In Iowa, the area includes the steep bluffs and hills found in a narrow band through portions of Fremont, Mills, Portmdarame, Harrison, Monona, Woodbury and Plymouth counties (see PIAS 92(5):158, for a map of Iowa Loess Hills).

The climate of the Loess Hills area is mid-continental, characterized by marked seasonal variations including recurrent drought and periods of intense rainfall. The winds are mostly westerly ro northwesterly in the winter and southwesterly during the summer. Average annual temperature and precipitation records for the northern (Sioux City), central (Logan), and southern (Sidney) portions of the study area are given below (from U.S. Department of Commerce).

<table>
<thead>
<tr>
<th></th>
<th>Average Annual Temperature</th>
<th>Average Annual Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sioux City</td>
<td>9.02°C (48.23°F)</td>
<td>61.42 cm. (24.18 inches)</td>
</tr>
<tr>
<td>Logan</td>
<td>10.09°C (50.16°F)</td>
<td>79.73 cm. (31.39 inches)</td>
</tr>
<tr>
<td>Sidney</td>
<td>11.20°C (52.16°F)</td>
<td>88.85 cm. (34.98 inches)</td>
</tr>
</tbody>
</table>

These climatic conditions are important contributors to the special botanical niches and the high soil-erosion rates present in this region. The Loess Hills area lies within the tallgrass prairie association of the grassland biome. The well-drained soils, rapid surface runoff, and a high evaporation rate of the loess bluffs provide an arid microenvironment comparable to areas hundreds of miles to the west. Consequently, several western plants are at their easternmost range limit here. The topography of most of the Loess Hills region consists of a series of high-relief, corrugated hills. The most rugged bluffs are along the western edge of the area where they rise precipitously (40-100 percent slope) from the Missouri River floodplain, attaining heights of from 60 to 200 feet. These bluffs and narrow-ridge hills grade into lower, more rounded hills at the eastern margins of the area. The topography is accentuated by a dense drainage network; soil erosion, gully development, and high-sediment loads in streams are common problems associated with the easily eroded loess. Several larger streams bisect the area from a northeast to southwest direction. These stream valleys are generally wide and nearly level, presenting a great contrast to the adjacent hills. All of these streams have been channelized.

The soils of the bluffs and hills are included in the Hamburg-Ida-Monona soil association, with the Hamburg series found on the steepest slopes (>40 percent), the Ida series on 5-40 percent slopes, and the Monona series on 0-40 percent slopes. These are well drained to excessively drained, somewhat droughty, silty soils formed in loess under prairie vegetation and are very susceptible to erosion. The soils of the stream valleys are characterized by the Kennebec, McPaul, Nodaway, and Napier soil series. These are moderately well-drained soils formed in silt loess.

The Loess Hills vegetation can be divided into grassland, woodland, and cropland communities. Originally, the grassland occupied most of the Loess Hills, but it has been diminished since settlement. Morrill (1953) divided the grassland into the following communities:

1. Andropogon gerardii community: Usually occurs on the edges of woods on the lower west slopes, upper east slopes, and in sheltered gullies.
3. Andropogon scoparius-Yucca glauca community: Found on the steep, unsheltered slopes exposed to the arid west and southwest winds.
5. Verbena stricta community: Found where the grass cover had been disturbed by overgrazing on the lower west and upper east slopes and summits.
Woodlands were originally restricted to the stream valleys and the protected ravines. They have increased since settlement and, benefitting from the suppression of natural prairie fires, now cover much of the unscraped hills. Invasion by red cedar (*Juniperus virginiana L.*) has become widespread and is a threat to the continued existence of the prairies. The woodland is of the oak-hickory association, dominated by bur oak (*Quercus macrocarpa* Michx.), ash (*Fraxinus pennsylvanica* Marsh), basswood (*Tilia americana* L.) and cottonwood (*Populus deltoides* Bartrum). The amount of woodland decreases from south to north (Novacek, 1985).

The greatest acreage in the area is devoted to various agricultural crops (corn, soybeans, hay) and pasture. The crops on the lower slopes and along streams. A substantial portion of pastured acreage is native prairie.

Common animal species dependant on the vegetation of the above communities include white-tailed deer (*Odocoileus virginianus*), gray and fox squirrels (*Sciurus carolinensis*, *S. Niger*), Franklin's and thirteen-lined ground squirrels (*Spermophilus tridecemlineatus*), white-tailed jackrabbit (*Lepus townsendii*), eastern cottontail (*Sylvilagus floridanus*), and numerous small rodents. Predatory animals include coyotes (*Canis latrans*), red and gray foxes (*Vulpes vulpes*, *Urocyon cinereoargenteus*), raccoons (*Procyon lotor*), mink (*Mustela vison*), and weasels (*Mustela sp.*) (Lampe and Bowles, 1985).

Numerous streams are found in the area, but except for the Little Sioux River, their fauna has been little studied. The major species of game fish present are channel catfish (*Ictalurus punctatus*) and black bullheads (*Ictalurus melas*). Most of the streams have been channelized, destroying much of their beauty and productivity and most are heavily silt-laden due to excessive erosion from the surrounding croplands.

The Loess Hills are an important nesting area for raptors, particularly the Great-horned Owl (*Bubo virginianus*), Red-tailed Hawk (*Buteo jamaicensis*), and American Kestrel (*Falco sparverius*). The area is also important as a wintering ground for these species as well as for Rough-legged hawks (*Buteo lagopus*) and occasionally Golden Eagles (*Aquila chrysaetos*) and Prairie Falcons (*Falco mexicanus*) (Roosa and Bartelt, 1979).

The Loess Hills region is a unique geologic occurrence of materials and processes. These wind-deposited silts are unusually thick and capable of supporting a variety of plants and animals. However, certain species exist because of the prevalence of natural disturbances on the steepest slopes producing extremely dry and barren west-facing exposures.

Much of the Loess Hills area is degraded in ecological quality as a result of excessive human or domestic-animal disturbance. Land is often intensively cultivated with attendant loss and disruption of the native biota. A devastating practice is the mechanized alteration of the topography, smoothing the land surface to make it more accessible to farm machinery. Because of the steep slopes, uniformity and grain size of the loess particles, and its inherent erodibility, such practices only accentuate already serious erosion problems. The amount of soil lost to erosion on the cultivated land in the Loess Hills area is the highest in the state. Urban sprawl, especially near Council Bluffs and Sioux City, is also having a detrimental effect on the ecological quality of the area. County zoning laws would help protect the ecological integrity of this landform region.

Although considerable modification of this landform region has occurred, it does yet harbor much of the state's remnant prairie and provides habitat for a considerable number of the state's rare species.

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REFERENCES


ANOTATED BIBLIOGRAPHY

GENERAL


FISHER, A. K. 1981. Human skeletal remains...


HENNING, D. R. 1980. A prehistoric cultural resource in the proposed Perry Creek reservoir. Dept. of Anthropology, Division of Archeological Research, Tech. Rept. No. 80-10, Univ. of Nebraska, Lincoln.


CRATBY, R. I. 1924. The genus Rumex in Iowa. Proc. Iowa Acad. Sci. 31:213-216. [Includes some Fremont County records.]


FITZPATRICK, T. J. 1905a. Plants new or little known to the flora of Iowa. Iowa Nat. 1:22-24. [Mentions specimens from Fremont and Pottawattamie Counties.]


KWANG, Y. 1951. The Polemoniales of Iowa (Convolvulaceae to Verbenaceae). M. S.
thesis, Univ. of Iowa, Iowa City. [Includes distribution maps.]


SHIMEK, B. 1915. Early Iowa locality records. Proc. Iowa Acad. Sci. 22:105-119. [Geographical locations where early records of plants and animals were recorded.]

LOESS HILLS BIBLIOGRAPHY


WEAVER, J. E. and F. W. ALBERTSON. 1936. Effects of the great drought on the prairies of Iowa, Nebraska, and Kansas. Ecology 17:567-639. [Some sample stations were in the Loess Hills.]

WEAVER, J. E. and F. W. ALBERTSON. 1943. Resurvey of grasses, forbs, and under- ground plant parts at the end of the great drought. Ecol. Monogr. 13:63-117. [Some sample stations were in the Loess Hills.]

WITTROCK, G. L. 1923. Polygonum in the state of Iowa. Proc. Iowa Acad. Sci. 30:345-349. [Includes some records from the Loess Hills area.]

GEOLOGY


DAVIS, L. C., R. E. ESHELMAN, and J. C. PRIOR. 1972. A primary mammoth site


LOESS HILLS BIBLIOGRAPHY


SHIMEK, B. 1910a. Evidence that the fossiliferous gravel and sand beds of Iowa and Nebraska are Aftonian. Bull. Geol. Soc. Amer. 21:119-140.


HISTORY


ANONYMOUS. 1881. History of Mills County, Iowa. State Historical Co., Des Moines, Iowa.

ANONYMOUS. 1881. History of Fremont County, Iowa, containing a history of the county, its cities, towns, etc. Iowa Historical Co., Des Moines, Iowa.


ANONYMOUS. 1942. Woodbury County History. The Iowa Writers' Program of the Work Projects Administration in the State of Iowa.


JAMES, E. 1823. Account of an expedition from Pittsburgh to the Rocky Mountains, performed in the years 1819, 1820. By order of the Hon. J. C. Calhoun, Secretary of War, under the command of Maj. S. H. Long, of the U. S. Top Engineers. 3 vols. Longman, Hurst, Rees, Orme, and Brown, London.


ROBBINS, W. No date. Recollections of Monona County pioneers. Private publ. 82 pgs.


ZOOLOGY


BOWLES, J. B. 1970. Historical record of some Iowa mammals. Trans. Kansas Acad. Sci. 73:419-430. [Has many references to species from the Loess Hills area.]


BUREN, W. F. 1944. A list of Iowa ants. Iowa State Coll. J. Sci. 18:277-312. [Lists some Iowa species found only in the Loess Hills area.]

CHRISTIANSEN, J. L. and R. R. BURKEN. 1978. The endangered and uncommon reptiles and amphibians of Iowa. Iowa Sci. Teachers Jour. Special issue. [Has distribution maps; some species found in Loess Hills area.]


CRABB, W. D. 1938. Late fall and winter bird records, 1930 to 1938, in the upper Missouri Valley. Proc. Iowa Acad. Sci. 45:289-297. [Includes some observations from the Loess Hills area.]


DINSMORE, S., E. MUNSON, J. J. DINSMORE, and G. M. NELSON. 1987. Two television tower kills in Iowa. Iowa Bird Life 57:5-8. [One tower was located near Hinton, Plymouth County.]


HENDRICKSON, G. 1930. Studies on the insect fauna of Iowa prairies. Iowa State Coll. J. Sci. 4:49-179. [Some collecting stations were in the Loess Hills area.]


LINDSEY, A. W. 1920. Some Iowa records of Lepidoptera. Proc. Iowa Acad. Sci. 27:319-335. [Many records are from the Sioux City area.]


PETERSEN, W. J. 1971. Birds along the Missouri. Palimpsest 52:550-570. [Excerpts from Audubon's journal on the birds he found along the Missouri River bordering Iowa.]


ROOSA, D. M. 1977e. The first Iowa foray. Iowa Bird Life 47:119-123. [Introduction to the 1977 Fremont County foray.]

ROOSA, D. M. 1977f. Singing male counts. Iowa Bird Life 47:133-137. [Lists numbers and species of birds found on plots in Wau-bonnie State Park in Fremont County.]


SCHMITT, D. P. 1971. Vertical distribution of Xiphinema americanum in minimal and medial
developed Loess soil in southwest Iowa. Ph. D. dissertation, Iowa State Univ., Ames. [One study station was near Hamburg, Fremont County.]


SHIMEK, B. 1930. Land snails as indicators of ecological conditions. Ecology 11:673-686. [Mentions some distribution records of snails (modern and fossil) from the Loess Hills area.]


SPICER, C. J. 1926. Winter bird records 1922-1926, in northwestern Iowa. Proc. Iowa Acad. Sci. 24:245-258. [Annotated list of birds, some of which were observed in the Loess Hills area.]

STEPHENS, T. C. 1917. Bird records during the past winter, 1916-1917, in northwestern Iowa. Proc. Iowa Acad. Sci. 24:245-258. [Annotated list of birds, some of which were observed in the Loess Hills area.]


STEPHENS, T. C. 1944c. Another record of the Mockingbird in Woodbury County. Iowa Bird Life 14:77.

STEPHENS, T. C. and W. YOUNGWORTH. 1947. Late fall and winter bird records, for 1941 to 1947, in the upper Missouri Valley. Proc. Iowa Acad. Sci. 54:373-381.

STILES, B. F. 1937a. Magpies in western Iowa. Iowa Bird Life 7:8. [Includes records from Monona and Woodbury counties.]


YOUNGWORTH, W. 1931. Late fall and winter bird records, 1926 to 1930, in the upper Missouri Valley. Proc. Iowa Acad. Sci. 38:277-285. [Annotated list of birds, some of which were observed in the Loess Hills area.]

YOUNGWORTH, W. 1931a. Notes from Sioux City. Iowa Bird Life 1:11. [Comment on heavy flight of Lapland Longspurs.]

YOUNGWORTH, W. 1931b. Red Crossbill at Sioux City in August. Iowa Bird Life 1:47.

YOUNGWORTH, W. 1932. Fall migration dates from Sioux City, Iowa. Iowa Bird Life 2:32.


YOUNGWORTH, W. 1937. Western Iowa bird records. Iowa Bird Life 7:35. [Mockingbird and Blue Grosbeak in Plymouth and Woodbury counties.]


YOUNGWORTH, W. 1942. Summer bird notes from western Iowa. Iowa Bird Life 12:45. [Mockingbirds, Blue Grosbeaks, and Lark Bunting in the Sioux City area.]

YOUNGWORTH, W. 1946. Blue Grosbeaks and other birds. Iowa Bird Life 16:65. [Reports Blue Grosbeaks from Plymouth County and several unusual species from Waubonnie State Park, Fremont County.]


YOUNGWORTH, W. 1952b. Spring migra-
tion dates from the Sioux City region. Iowa Bird Life 22:40-42.

YOUNGWORTH, W. 1953. Summer notes from western Iowa. Iowa Bird Life 23:74-75. [Results of a trip to Waubonsie Park, Fremont County.]


