KANSAS GEOLOGICAL SURVEY
OPEN-FILE REPORT 94-33

KANSAS ACADEMY OF SCIENCE
MULTIDISPLINARY GUIDEBOOK 7

FALL FIELD TRIP IN MARION COUNTY, CENTRAL KANSAS

by

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Printed by Emporia State Press
1200 Commercial
Emporia, Kansas 66801

INTRODUCTION

The 1994 Kansas Academy of Science Fall Field Trip is set in Marion County (see location map, p. 2), in the western Flint Hills area of south-central Kansas. The field trip focuses on Marion Reservoir, Marion County Lake, and Terman Environmental Study Area, along with other sites. Marion County is rich in biological, geological, and historical features of interest to Kansas Academy of Science members. The flora and fauna are typical of those found in the grassland biome of the Flint Hills. Permian bedrock crops out in many places, and alluvial deposits record changing drainage patterns during the past few million years. Historically, Marion County is replete with events associated with the opening of the frontier in the 1860s and 70s.

The field trip begins at 9:30 a.m in Hillsboro at the Visitor's Center near the Pioneer Adobe House in the City Park. At this time, introductory remarks will be made about the Hillsboro area. From here, a stop will be made at Tabor College near a historic Mennonite Brethren Church, the founding denomination of Tabor College. We will then proceed to Marion Reservoir and a nature walk at Cottonwood Point.

Marion County Lake will be our next stop where physical, hydrological, and geological features will be discussed. Lunch will take place back in the Hillsboro City Park. Following, lunch we will see the Goessel Plain and stop at a sand pit. The group then will tour Terman Environmental Study Area and learn about a passive solar earth-sheltered home. The trip concludes at the Visitor's Center around 4:00 p.m.

Faculty from Tabor College and Emporia State University cooperated in preparing and publishing of this guidebook. The assistance of Paul Jantzen, retired Hillsboro High School biology teacher, is also very much appreciated. This guidebook is dedicated in memory of Virleen Bailey, who was an ecologist at Tabor College and a long-time member of the Kansas Academy of Science.

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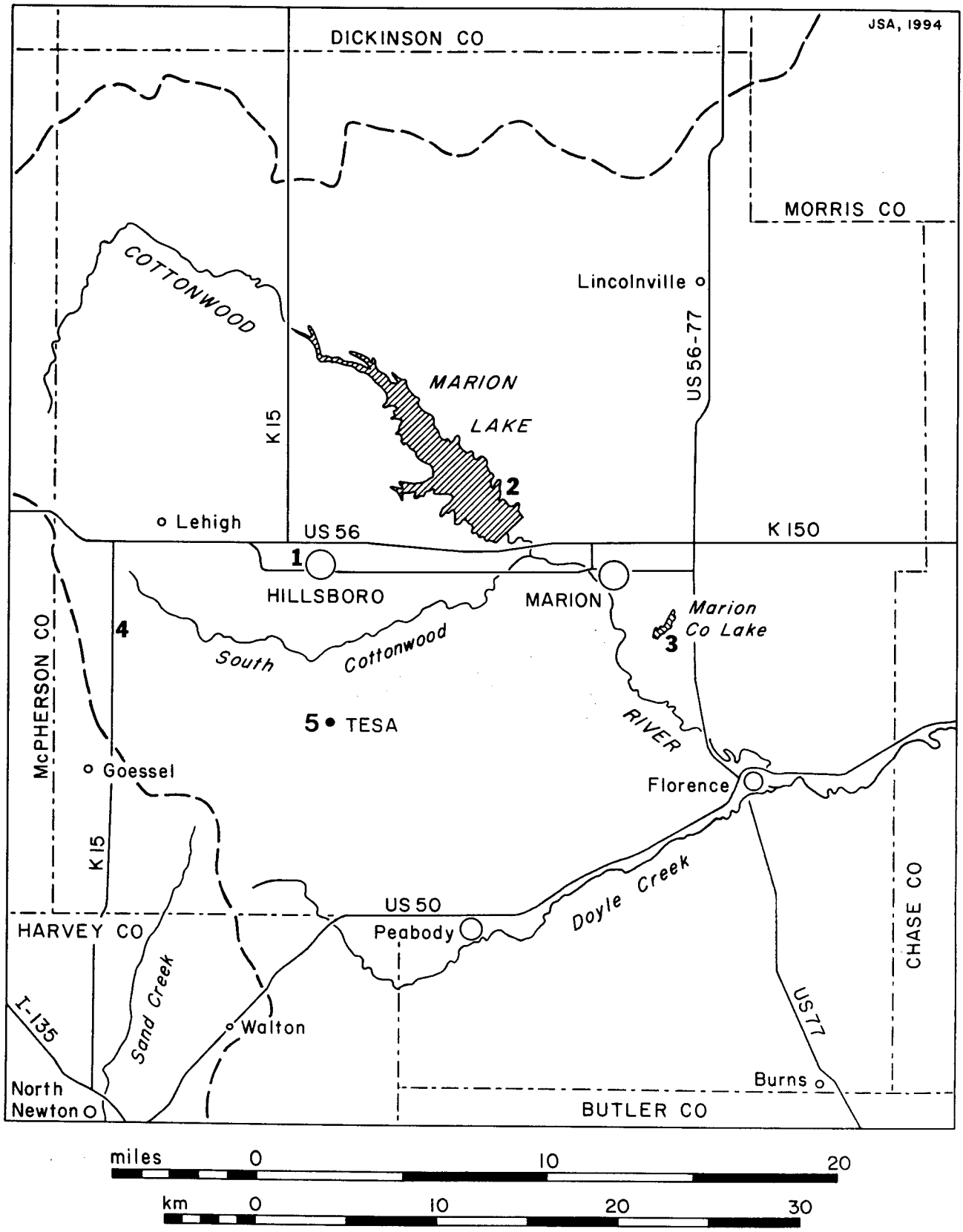


Location map for fall field-trip sites (numbered), location of Terman Environmental Study Area (TESA), and general geography of Marion County, Kansas. Dashed lines are main drainage divides.

PART I. BIOLOGICAL ENVIRONMENT OF MARION COUNTY

Max R. Terman

STUDIES OF THE FLORA AND FAUNA

Studies on the flora and fauna of Marion County have been performed primarily by biologists at Tabor College, Hillsboro High School, state agencies, and visiting graduate students from other universities.

Tabor College is Marion County's only post-secondary institution. Since its founding in 1908, the biologists who have taught at Tabor College include: Dr. S.L. Loewen, parasitologist (1921-1972), Dr. Clarence Harms, parasitologist (1958-1969); Dr. Lee Klaassen, physiologist (1975-1989); Dr. Beverley Stockton, physiologist (1972-1975); Dr. Max Terman, ecologist (1969-present); and Dr. Richard Wall, entomologist and cell biologist (1977-present). The Biology Department was also fortunate to have the services of Virleen Bailey, ecologist, as instructor and research assistant from 1980 until the time of her death in 1993.

Collections of Marion County plants and animals at Tabor consist of the Bailey Herbarium and Wall Insect Collection. The Bailey Herbarium contains over 90 families of plants, many of Marion County, collected by Virleen Bailey and other faculty and students. The Wall Insect Collection, curated by Richard Wall, is an extensive collection of insects that also has many Marion County specimens. The department also maintains a live snake collection and a collection of study skins, mostly of rodents. Bethel College in North Newton also has some plant specimens collected from Marion County by J.G. Ewert in the late 1800s and early 1900s.

Max Terman, along with Virleen Bailey, have done most of the field work on the native plants and animals of Marion County. Several of these studies have been published (see references) while other data are on file with Max Terman. Small mammal surveys have been conducted on wildlife areas associated with Marion Reservoir, Terman Environmental Study Area (TESA)--a natural area located 5½ miles south of Hillsboro, and on rangeland formerly owned by the college south of Hillsboro. A long-term study of a prairie chicken lek on the Marion Airport is on-going, as is a six-year study of the movements of a hand-reared great horned owl.

The College has just recently secured permission to study a riparian woodland along the South Cottonwood River south of Hillsboro referred to as the Cottonwood Area. Aquatic sampling associated with ecology courses has been done on Marion Reservoir, area ponds, and a stream behind the Hillsboro Sewage Treatment plant.

Paul Jantzen, retired high school biology teacher and author of several text books and nature accounts of the Flint Hills area, has accumulated many natural observations of the area in a book *Prairie Wanderings: The Land and Creatures of the Grasslands,* available in many local bookstores. He has also put together an herbarium of plants from the county housed in the science laboratories at Hillsboro High School. Max Terman, Paul Jantzen, and Dave Ranney, reporter for the Wichita Eagle and local bird enthusiast, have compiled a list of birds for Marion County.

Since the completion of Marion Reservoir in 1968, some studies have been done by the Kansas Department of Wildlife and Parks on the reservoir's wildlife (see Hansen 1983). The State Biological Survey of Kansas has also collected in the county and has records of Marion County fauna (see appendix) and flora. U.S. Environmental Protection Agency impact statements about the construction of Marion Reservoir are also available.

Emporia State University has performed studies on the fish populations in the reservoir (see Brungardt 1988; Prather and Prophet 1969). Graduate students from Indiana University (Terry Derting, 1984) and Oklahoma State University (Steven Sheffield, 1994) have also done short-term small-mammal trapping at Marion Reservoir in the French Creek area.

VEGETATION

Marion County has a total area of 959 miles^2 (613,760 acres) and about 76 percent of it is considered prime farmland and 32 percent rangeland. The eastern third and the northwestern and northeastern parts of the county contain the more extensive grasslands. The rest of the county is heavily cultivated with scattered smaller tracts of rangeland. Since the mid-1980s, much erodible land has been returned to native grasses under the Conservation Reserve Program. Approximately 15,300 acres (2.4%) is forested, mostly along streams and waterways (Horsch and McFall 1983).

The Cottonwood River and its tributaries are the dominant waterways. They drain about two-thirds of the county from northwest to southeast. Early settlers remarked in their letters about the "featureless prairie" and the absence of trees. One account (see Van Meter 1972) tells of settlers plowing a 25 mile long furrow between farms in Marion and McPherson Counties so that travellers would not get lost on the open plains. Fires were evidently more frequent and excluded woody vegetation even from the banks of streams.

With the advance of agriculture in post-settlement times, the habitat has become a mosaic of tall and mixed grass prairie, wooded streams, isolated pastures, hedge rows, and croplands.

Farm ponds and other impoundments have added additional aquatic habitat (open water, marsh, and swamps). The biota of Marion County reflects a composition of typical grassland species and those from other biomes that take advantage of the more wooded and varied habitat of present times. Furthermore, many of the streams have been heavily impacted with agricultural runoff and sedimentation.

Marion County lies in the Flint Hills Uplands physiographic region of east-central Kansas. The landscape of the Flint Hills is dominated by mixed-grass prairie in the west and tall-grass prairie in the east. Predominant grasses are big and little bluestem, switchgrass, Indian grass, western wheatgrass, sideoats grama, prairie dropseed, tall dropseed, Scribner panicum, porcupine needlegrass, prairie junegrass, Kentucky bluegrass, and buffalo grass. Japanese brome, Johnsongrass, and crabgrass have invaded many disturbed habitats. The grasses begin to elongate flowering heads in mid-August and attain full growth in late September or early October (Riser *et al.* 1981).

Characteristic spring flowers include ragwort, yarrow, spiderwort, violet woodsorrel, and prairie violet. Midsummer flowers that are obvious are tall gayfeather, prairie coneflower, and purple prairie clover. In the autumn a large number of asters, goldenrods, and sunflowers appear (Riser *et al.* 1981).

Predominant trees and shrubs are eastern cottonwood, black willow, American elm, red elm, Siberian elm, bur oak, box elder, Kentucky coffeetree, Russian mulberry, silver maple, honey locust, black walnut, green ash, hackberry, eastern red cedar, various pines, spruces, black locust, green ash, lilac, Russian-olive, autumn-olive, plum, crabapple, fragrant sumac, gooseberry, dogwood, buckbrush, prairie rose, sumac, and osage orange. Wetland plants include smartweed, cattails, saltgrass, prairie cordgrass, rushes, sedges, and reeds (Horsh and McFall 1983).

WILDLIFE

Mammals:

Most of the mammalian fauna of this region is dominated by species adapted to grassland habitats and forest adapted species that are extending their range. Changing climatic and land use patterns assure Marion County of a dynamic situation regarding faunal composition. The information below comes from the trapping and observation records of Max Terman, Virleen Bailey, and Steve Sheffield (Oklahoma State University).

Common smaller mammal species that might be encountered in Marion County natural areas include moles (*Scalopus aquaticus*) and shrews (*Blarina hylophaga* and *Cryptotis parva*), bats (little studied in county), thirteen-lined ground squirrel (*Spermophilis*

tridecemlineatus), fox squirrel (*Sciurus niger*), beaver (*Castor canadensis*), plains pocket gopher (*Geomys bursarius*), eastern woodrats (*Neotoma floridana*), deer mice (*Peromyscus maniculatus*), white-footed mice (*P. leucopus*), prairie voles, (*Microtus ochrogaster*), bog lemming (*Synaptomys cooperi*), muskrats (*Ondatra zibethicus*), cotton rats (*Sigmodon hispidus*), and harvest mice (*Reithrodontomys montanus* and *R. megalotis*). House mice and Norway rats (*Mus musculus* and *Rattus norvegicus*) occur commonly around human habitations.

Larger mammals that could be seen include coyotes (*Canis latrans*), red and gray fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), eastern cottontail rabbits (*Sylvilagus floridanus*), raccoons (*Procyon lotor*), badgers (*Taxidea taxus*), and oppossum (*Didelphis virginiana*). White-tailed deer (*Odocoileus virginianus*) are commonly seen.

It is unusual to encounter animals such as woodland voles (*Microtus pinetorum*), pocket mice (*Chaetodipus hispidus,* formerly common), nine-banded armadillo (*Dasypus novemcinctus*), black-tailed jackrabbit (*Lepus californicus,* formerly common) and bobcat (*Lynx rufus*). Word-of-mouth accounts of mountain lion (*Felis concolor*) sightings circulate, although little seems to be known about its possible return to this area. Most sightings of mountain lion and bobcat have occurred in the northwest part of Marion County.

Some eastern woodland adapted species of mammals have been recently noted in Marion County (*e.g.* woodchuck *Marmota monax*) as has the least weasel (*Mustela nivalis campestri*), an animal of more northerly environments. See Terman (1974, 1978) and Terman and Bailey (1985) for more information on small mammals in Marion County.

Birds:

Grasslands are generally characterized by simple and meager avifauna because of the relative simplicity of prairie habitats (Risser *et al.* 1981). Because of increased woody plant invasion, Marion County's avifauna may be more diverse now than in pre-settlement times. Most of the birds in Marion County are not year-round residents, and thus the bird composition of any habitat will vary with the season. A great many bird species have been recorded in the county (see appendix). The information below comes from the observation records of Max Terman, Virleen Bailey, and Paul Jantzen.

Common names of typical species seen in grassland and riparian habitats in Marion County in the summer include: dickcissel, eastern and western meadowlarks, mourning doves, northern cardinals, brown thrashers, eastern bluebird, scissor-

tailed flycatcher, house wren, Bewick's wren, American robins, black-capped chicadee, barn swallow, bluejay, chipping sparrow, red-headed woodpeckers, red-bellied woodpeckers, downy woodpeckers, hairy woodpeckers, northern flickers, and grasshopper sparrow.

Also seen in summer are the: red-tailed hawk, ring-neck pheasant, northern bobwhite, starling, wild turkey, great crested flycatcher, greater prairie chicken, Bell's vireo, loggerhead shrike, northern harrier, American kestrel, great horned owl, barred owl, turkey vultures, eastern screech owl, white-breasted nuthatch, American crow, gray catbird, eastern kingbird, western kingbird, yellow-billed cuckoo, black-billed cuckoo, northern mockingbird, and upland sandpiper. During the winter, the grassland is sparse in birds except for American tree sparrows and juncos. Wooded habitats harbor juncos, northern cardinals, black-capped chickadee, Harris Sparrows, blue jays, and tufted titmouse.

Aquatic habitats harbor Canada geese, wood ducks, belted kingfishers, mallards, green-winged teal, blue-winged teal, common merganser, great blue heron, and shorebirds (especially during spring and fall migrations). Marion Reservoir commonly has American coots, canvasbacks, gadwalls, mallards, cormorants, white pelicans, ring-billed gulls, Franklin's gulls, common terns, common egrets, cattle egrets, great blue herons, and least sandpipers. Hansen (1983) found many tree sparrows, Harris sparrows, robins, mourning doves, white-crowned sparrows, slate-colored juncos, song sparrows, brown-headed cowbirds, brown thrashers, cardinals, Bell's vireos, field sparrows, dickcissels, American goldfinches, and red-shafted flickers in his September study of wildlife plantings at Marion Reservoir.

A continuing study on greater prairie chicken numbers inhabiting a lek on Marion Airport is in its thirteenth year. Numbers on this lek have varied from a high of 16 birds to a low of 4. A study of the behavior of a hand-reared great horned owl released to the wild is in its sixth year. This "imprinted bird" was able to survive and reproduce in the wild, a quite unexpected outcome as imprinted owls seldom survive on their own. See Terman and Bailey (1983) for a study on great blue heron behavior.

Fish, Amphibians, and Reptiles:

The native populations of fish, amphibians, and reptiles have not been studied extensively by biologists in Marion County. The Cottonwood River in Marion County harbors ubiquitous fish species, such as red shiner, channel catfish, and orangespotted sunfish, and may host threatened species such as Topeka shiner and blue sucker. Farm ponds and large impoundments provide habitat for white bass, suckers, crappie, freshwater drum,

walleye, northern pike, and carp. Striped bass have been studied by Brungardt (1988). Fish caught commonly at Marion Reservoir and Marion County Lake include largemouth bass, bluegill, channel cat, bullhead, flathead catfish, crappie, walleye, white bass, and striped bass (Horsch and McFall 1983).

Amphibians noted in the course of other activities include the tiger salamander (*Ambystoma tigrinum*), Woodhouse's toad (*Bufo woodhousii*), and bullfrogs (*Rana catesbiana*). Dominant reptiles include great plains skink (*Eumeces obsoletus*), black rat snake (*Elaphe obsoletus*), and bull snake (*Pituophis melanoleucus*). Rattlesnakes (massasauga, prairie rattlesnakes) are common in more contiguous grassland habitats but are not regularly encountered near areas of cultivated cropland.

Tabor College is known for its collection of living snakes, some of which have had record longevity (Bailey *et al.* 1989). See the appendix for a list of Marion County vertebrates cataloged by Craig Freeman of the State Biological Survey of Kansas.

Invertebrates:

Prather and Prophet (1969) studied zooplankton populations at Marion Reservoir in 1968. Common species noted were *Diaptomus siciloides, Keratella sp., Bosmina coregoni,* and *Daphnia pulex.* Of the lakes studied, Marion Reservoir had the most abundant populations of zooplanktons. Otherwise, invertebrates have not been studied extensively in Marion County.

* * *

PART II. PHYSICAL ENVIRONMENT OF MARION COUNTY

James S. Aber

CLIMATE

General conditions:

Climate of Marion County is continental with large daily, monthly, and yearly variations in temperature and precipitation (Bark *in* Horsch and McFall 1983). Winters are short with frequent outbreaks of cold Arctic air. Summers are long and hot; transitional seasons between winter and summer are generally short. Prevailing wind is southerly; March and April typically have the strongest winds of the year. The coldest recorded temperature is -29°F (-33.8°C), which occurred in Marion (2/12/1899), and the hottest temperature of 115°F (46.1°C) was measured at Florence (7/14/1954).

The region averages around 33 inches (84 cm) of precipitation per year, most of which comes during the growing season, April through September. Average seasonal snowfall is about 18 inches (46 cm), but snowfall varies greatly from year to year. Strong thunderstorms along with hail and tornadoes occur occasionally, particularly during late spring and early summer. However, hail damage in Marion County is generally less than farther west in Kansas. Rivers of the region are susceptible to flooding due to relatively impermeable clayey soils and shaly bedrock and to high precipitation rates (inches per hour) during severe storms.

Climatic change in Kansas:

Long-term climatic data are available for many sites in Kansas (Flora 1948), including Leavenworth, Manhattan, Independence, and Dodge City. Decadal averages for mean January, mean July, and mean annual temperatures display notable changes since the 1830s (Fig. II-1). The 1930s was clearly the hottest decade, the 1980s was the second hottest decade, and the 1880s was by far the coldest decade of the past 160 years. Decadal average January temperatures exhibit more variation than do July or annual temperatures.

The most significant long-term change was an increase in temperatures at the end of the 1800s. Decadal average annual temperatures were a constant 54°F during the 1800s, but increased to 55°F or higher during the 1900s. The change is most dramatic for January temperatures of the 1880s to early 1900s period. The temperature shift at the the turn of the century is consistent with global warming at the end of the Little Ice Age in the late 1800s.

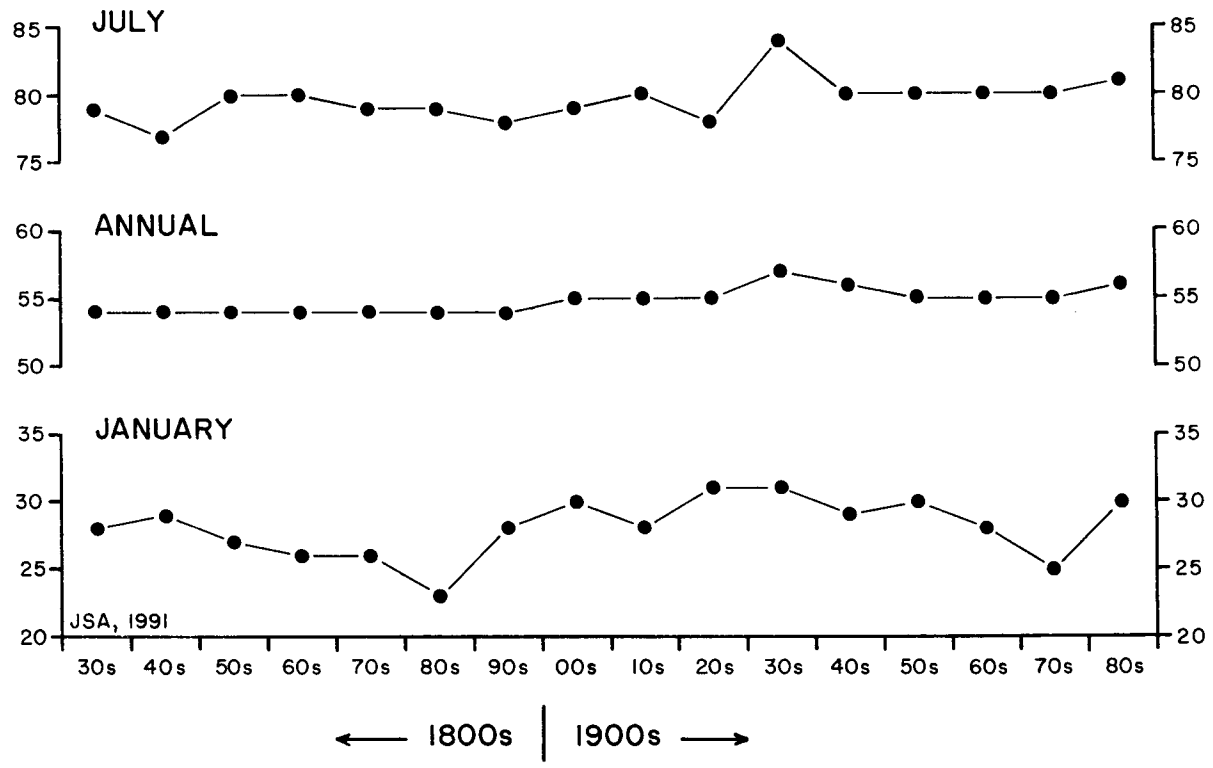
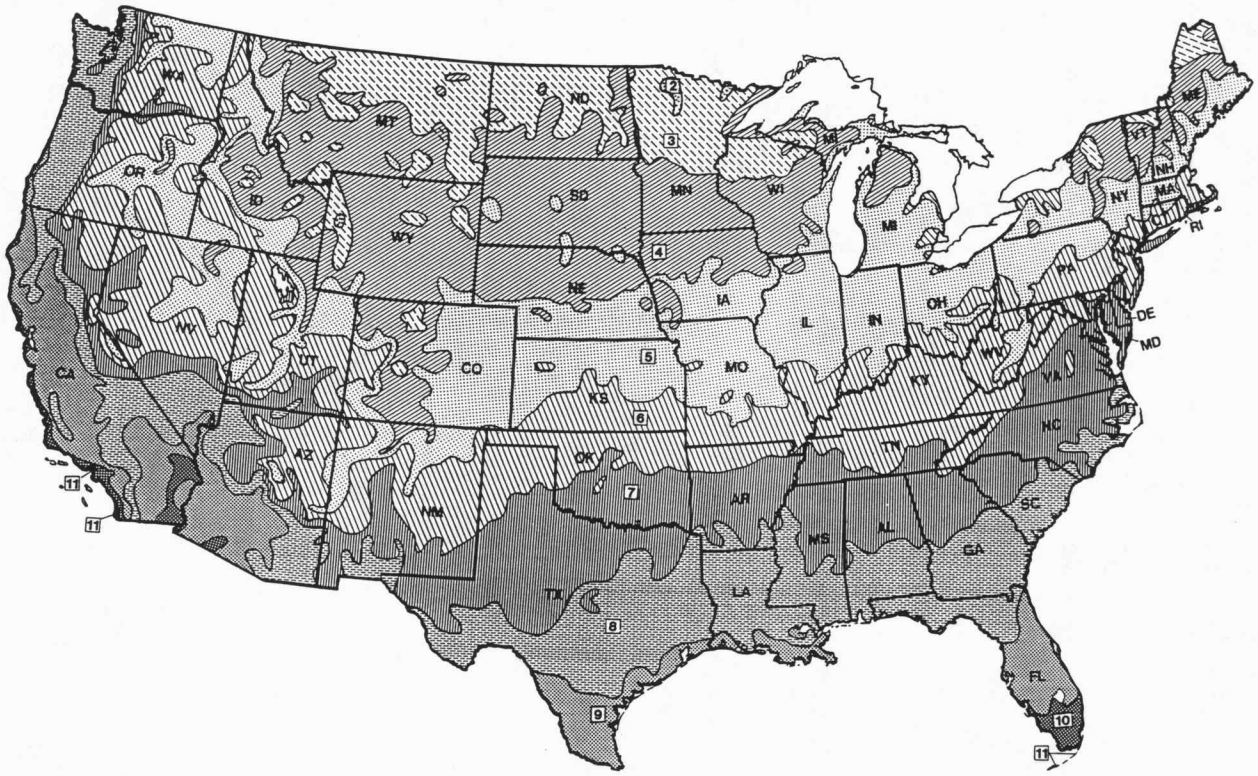


Figure II-1. Decadal average values for mean January, mean July, and mean annual temperatures (F°) for Kansas. This record is a composite based on Leavenworth (1827-1989), Manhattan (1860-1989), Independence (1876-1989), and Dodge City (1875-1989). Note sharp increase in winter temperature at end of the Little Ice Age between the 1880s and 1900. The 1930s was the hottest decade of historical record in Kansas. Based on data from Flora (1948) and from *Climatological Data Annual Summaries for Kansas* of the National Climatic Data Center.

Global climate during the Little Ice Age (1600s-1800s) is estimated to have been 1-2°C cooler than in the 20th century (Grove 1988). Little Ice Age climate was apparently caused by reduced solar output and increased volcanic eruptions. Little Ice Age climate evidently ended in Kansas in the 1890s.

Following the extraordinary heat of the 1930s, a slight cooling trend took place, which culminated in the 1970s with the lowest average January temperature since the 1880s. The 1980s and early '90s show a return to slightly warmer conditions, comparable to the 1940s and '50s, but not so warm as the 1930s.

The results of the mid-century cooling trend are reflected in the new *Plant Hardiness Zone Map* of the U.S. Department of Agriculture (1990). The zones are based on winter hardiness as the most critical factor for plant survival in the environment. Hardiness zones for garden plants are based on average annual minimum temperatures. The first such map was issued in 1960; a



RANGE OF AVERAGE ANNUAL MINIMUM TEMPERATURES FOR EACH ZONE	
ZONE 1	BELOW -50°F
ZONE 2	-50° TO -40°
ZONE 3	-40° TO -30°
ZONE 4	-30° TO -20°
ZONE 5	-20° TO -10°
ZONE 6	-10° TO 0°
ZONE 7	0° TO 10°
ZONE 8	10° TO 20°
ZONE 9	20° TO 30°
ZONE 10	30° TO 40°
ZONE 11	ABOVE 40°

Figure II-2. Portion of the *USDA Plant Hardiness Zone Map,* edition of 1990. These zones are based on average minimum temperatures for the 1970-80s period. These zones were revised southward from the previous map of 1965, because of colder winter conditions.

revised map was published in 1990 (Fig. II-2). The revised map was necessary because the landscape was losing many plants that apparently had survived during the 1940s through 1960s. The ranges of temperature and moisture were larger during the 1970s and 1980s than those recorded for the previous decades.

The region of Marion County was previously classified in zone 6 (-10° to 0°F), but is now indicated as zone 5 (-20° to -10°F). This type of evidence contradicts the notion that simple greenhouse warming is now taking place in the central United States. Indeed, the second half of the 20th century has been cooler overall in Kansas compared to the first half of the century.

SURFICIAL GEOLOGY

Introduction:

The surficial bedrock of Marion County is made up largely of Lower Permian strata, which consist of shale with interbedded chalky and cherty limestone. The area of Permian strata is part of the Flint Hills (Fig. II-3). Lower Cretaceous rocks, comprised of shale and sandstone, occur in northwestern Marion County, as part of the Smoky Hills. Unconsolidated sediments of late Tertiary and Pleistocene age mantle the southwestern portion of the county. This area, called here the *Goessel Plain,* is part of the Wellington-McPherson Lowlands of central Kansas.

Flint Hills region:

The Flint Hills exhibit a cuesta-style topography (Fig. II-4), as a result of differential erosion of limestone and shale beds that dip gently toward the west. Lower Permian strata in Marion County include the Chase Group overlain by the Wellington

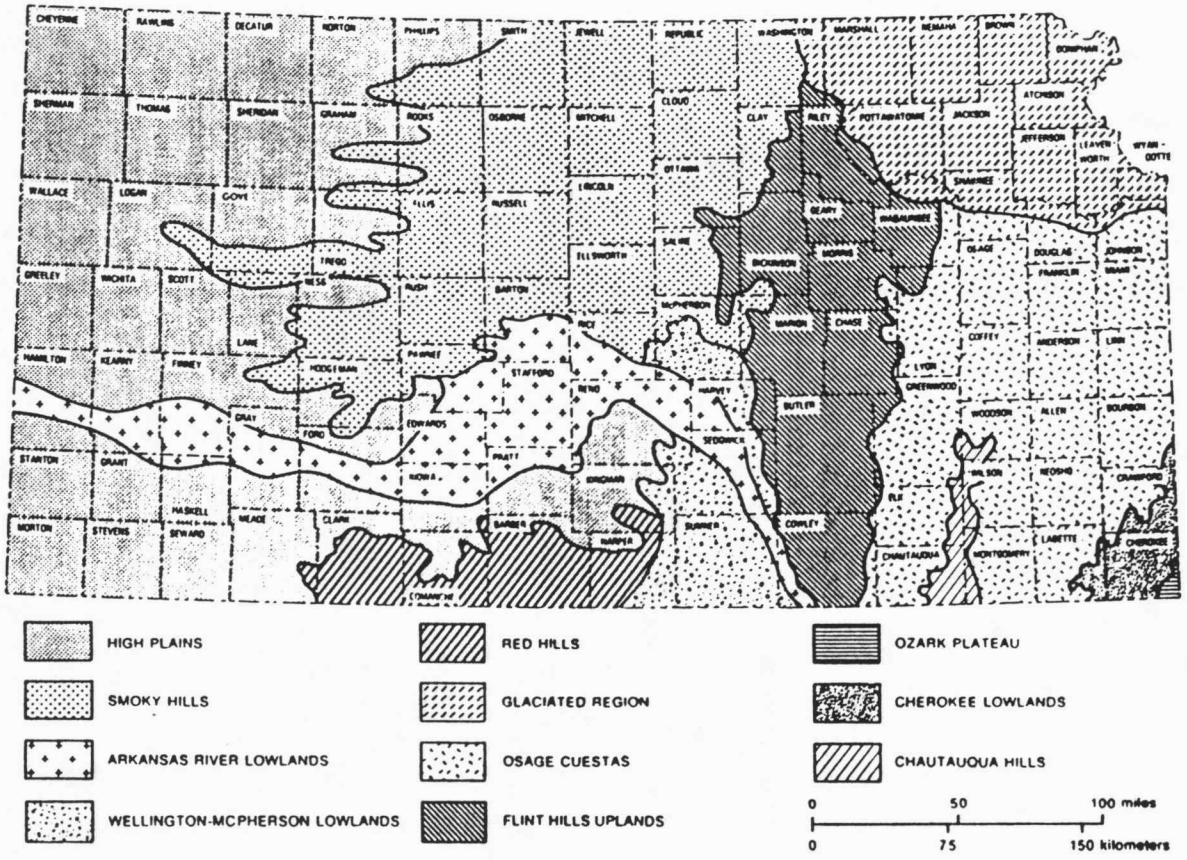


Figure II-3. Generalized physiographic map of Kansas. Marion County includes parts of the Flint Hills, Smoky Hills, and Wellington-McPherson Lowlands. Taken from Buchanan and McCauley (1987, p. 12).

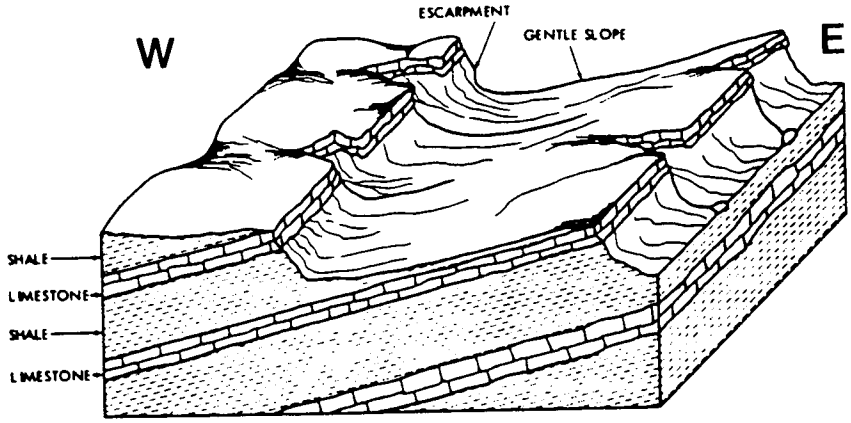


Figure II-4. Schematic illustration of cuesta topography formed on limestone and shale bedrock of the Flint Hills region. Thick, cherty limestones cap steep escarpments that generally face eastward. Adapted from Buchanan and McCauley (1987, p. 321).

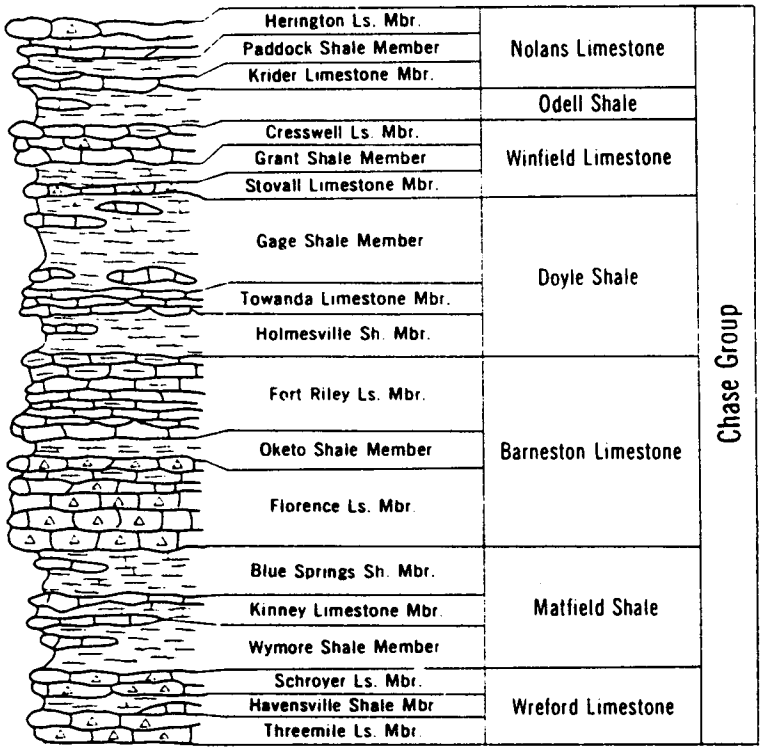


Figure II-5. Standard stratigraphic column for Lower Permian units of the Chase Group, Flint Hills region. Adapted from Lutz-Garihan and Cuffey (1979, fig. 3).

Shale of the Sumner Group. The Chase Group comprises about 100 m of limestone and dolomitic limestone alternating with shale (Fig. II-5). Thick, chert-bearing limestones form prominent escarpments and buttes in eastern portions of Marion County. The classic stone buildings of Marion are constructed mainly from the Herrington Limestone Member of the Nolands Limestone.

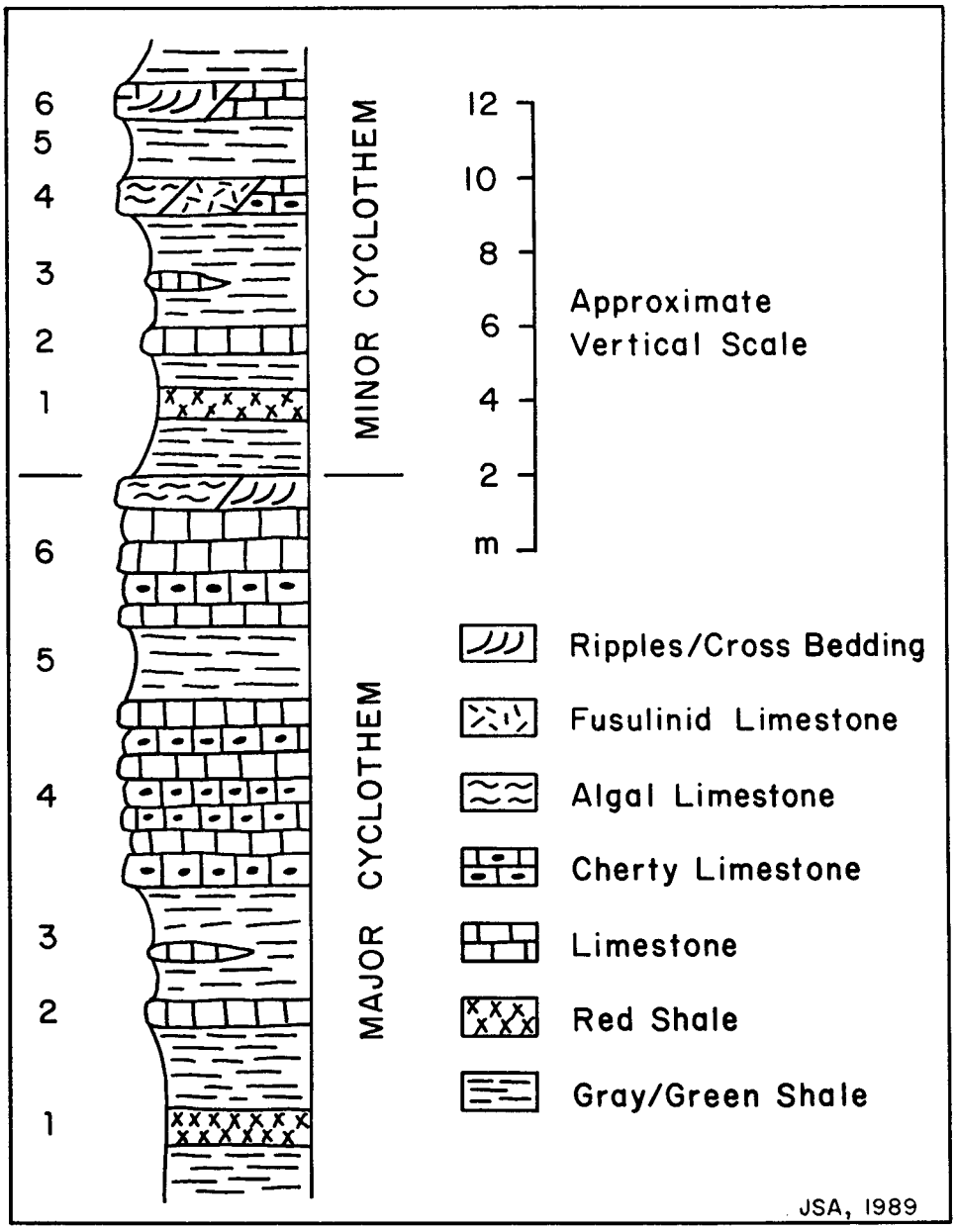


Figure II-6. Ideal major and minor cyclothems for Chase Group, Lower Permian, Flint Hills region. Based on many sources, particularly Moore (1964). Taken from Aber and Johnston (1990, fig. 4-5).

Chase Group strata are interbedded in repetitive sequences, called *cyclothems*. These cyclothems are the products of repeated transgressions and regressions by shallow seas over a nearly flat depositional surface during the early Permian. A general model for lithology, fossils, and paleoenvironments of Chase Group cyclothems includes six limestone and shale units, from the top down (Fig. II-6):

6. Limestone: tan to gray, platy to massive, fossiliferous limestone, chalky limestone, or dolomitic limestone; cross bedding, ripple marks, or oolites common; locally cherty toward base with algal bed toward top; diverse fossils. Examples: Schroyer, Ft. Riley, and Herrington. Environment: offshore regressive sea to shallow, high-salinity, lagoon.

5. Shale: gray or green, fissile to platy, calcareous, fossiliferous shale or shaly limestone; diverse fossils including trilobites. Examples: Havensville, Grant, and Paddock. Environment: farthest offshore sea of maximum transgression.

4. Cherty limestone: tan or light gray, platy to massive, fossiliferous limestone or chalky limestone; scarce to abundant nodules or beds of chert; locally may display algal banding or cross bedding; diverse fossils including many echinoids and fusulinids. Examples: Threemile and Florence. Environment: far offshore, shallow sea of near-maximum transgression.

3. Shale: gray, tan or green, platy, fossiliferous, calcareous shale and shaly limestone; abundant brachiopod and mollusk fossils. Examples: upper Wymore, upper Blue Springs, and upper Gage. Environment: shallow, normal salinity, transgressive sea.

2. Limestone: one or more, thin, gray or tan, blocky, chalky or coquina, fossiliferous limestones; abundant brachiopods and mollusks. Examples: middle Blue Springs and middle Gage. Environment: shallow to estuarine, low-salinity, transgressive sea.

1. Shale: platy, somewhat calcareous, maroon or red shale above green and black shale; generally few fossils, black shale has inarticulate brachiopods, maroon shale lacks marine fossils. Examples: lower Wymore, lower Blue Springs, and lower Gage. Environment: lagoon or estuarine (green or black) to emergent tidal flat or sabhka (maroon).

Major cyclothems are 15-30 m thick and include thick, cherty limestone units. The Blue Springs/Barneston and Gage/Winfield cyclothems are typical examples in the field-trip area. Minor cyclothems are usually only 8-12 m thick; thin limestones of variable lithology are typical. The Wymore/Kinney and Odell/ Nolans cyclothems are good examples in the field-trip region.

Lower Permian cyclothems are similar to Upper Pennsylvanian cyclothems of eastern Kansas; however, some lithologic differences are notable. Red shale, cherty limestone, and evaporites (subsurface) are more prominent in Lower Permian cyclothems. Coal, sandstone, and black shale are common in Upper Pennsylvanian cyclothems, but are scarce to absent in the Lower Permian.

The lithologic differences between Upper Pennsylvanian and Lower Permian cyclothems are thought to reflect: (1) increasing aridity of the climate, (2) decreasing supply of clastic sediment, and (3) decreasing amplitude of transgressive/ regressive cycles during early Permian time. The total range of relative sea-level change between the exposed sabhka stage (unit 1) and maximum transgression (units 4 & 5) was probably ≤30 m (McCrone 1964).

Many explanations for Pennsylvanian and Permian cyclothems of the midcontinent have been proposed. These explanations generally fall into three categories: crustal movements, glacioeustatic sea-level changes, and delta-lobe shifting. Lower Permian cyclothems do not contain features associated with deltaic sedimentation, and the remarkable lateral consistency of units argues against significant local crustal movements during the early Permian (Fig. II-7). The only reasonable explanation for repeated marine transgressions and regressions is glacioeustasy related to widespread Permian glaciation in Gondwana.

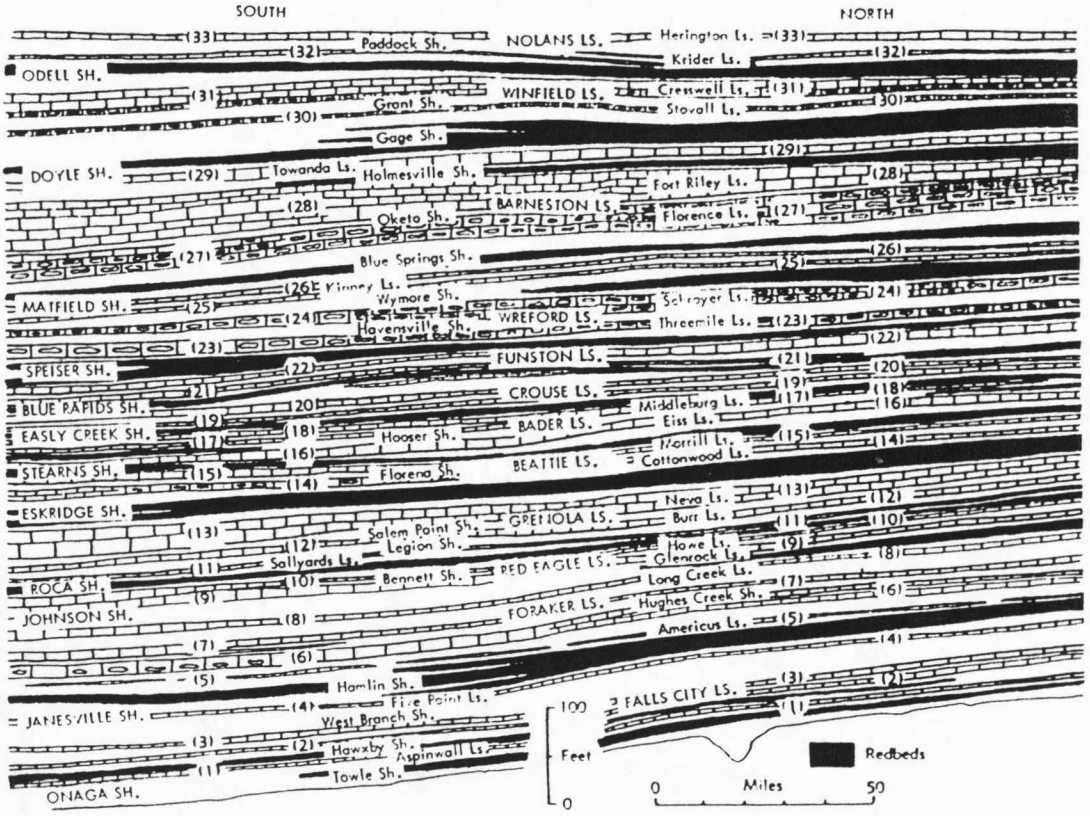


Figure II-7. South-north cross section of Lower Permian and uppermost Pennsylvanian strata in Kansas. Slight thickening of overall sequence is visible toward the south. Taken from Moore (1964, fig. 43).

Wellington Shale crops out across much of the western portion of the county. This shale is variously colored--gray, green, and red. Thin beds of chalky or dolomitic limestone are present, among which the Carlton Limestone Member is most prominent. The Carlton forms a minor escarpment at about 450 m (1500 feet) elevation, west and southwest of Hillsboro. Fossil insects of fresh-water affinity occur in the Carlton Limestone. The Wellington Shale contains many small folds and other disturbances, as a consequence of collapse due to past subsurface solution of the Hutchinson Salt Member. The Wellington Shale represents a change to more continental, hyper-arid conditions during the Permian.

Goessel Plain:

The highest part of Marion County is the flat plain in the Goessel vicinity at around 470 m (1565 feet) elevation. This plain is formed by unconsolidated sediments, up to 15 m (50 feet) thick, which rest on underlying Wellington Shale (O'Conner and Chaffee 1983). These sediments are mainly alluvial sand and gravel of arkosic composition, which were derived from the Rocky Mountains. They are of late Tertiary and/or early Pleistocene age. The alluvial deposits are covered by a thin veneer of loess, and subdued sand dunes of presumed late Pleistocene or Holocene age are present locally.

The edge of the Goessel Plain marks the divide between the Cottonwood and Arkansas drainage systems. This edge is slowly retreating westward, due to steeper gradients and more agressive erosion in headwaters of the Cottonwood system. At one time, the alluvial plain must have sloped gently eastward across the bedrock terrain of central and eastern Marion County (Fig. II-8). Subsequent fluvial erosion has removed nearly all of the alluvial plain in Marion County and has deeply dissected bedrock in the Flint Hills region.

Remnants of alluvial gravel can be seen in upland fields of eastern Marion County. Scattered pebbles are resistant types--quartzite, chert and milky quartz, which bear glossy polish of wind abrasion. Some have ventifact shapes. The chert and milky quartz are derived from local bedrock, specifically cherty limestones. The quartzite pebbles were, however, transported from western sources in the High Plains and/or Rocky Mountains (Aber 1988, 1992).

Quartzite pebbles on hill tops of eastern Marion County are all that remain of a once-extensive alluvial plain that reached from the Goessel vicinity eastward across what is now the Flint Hills. Chert gravel bearing exotic quartzite pebbles is also preserved in high positions of the Flint Hills in western Chase and eastern Butler counties at elevations up to 450 m. Quartzite pebbles in these areas are further evidence for former alluvial transportation across Marion County.

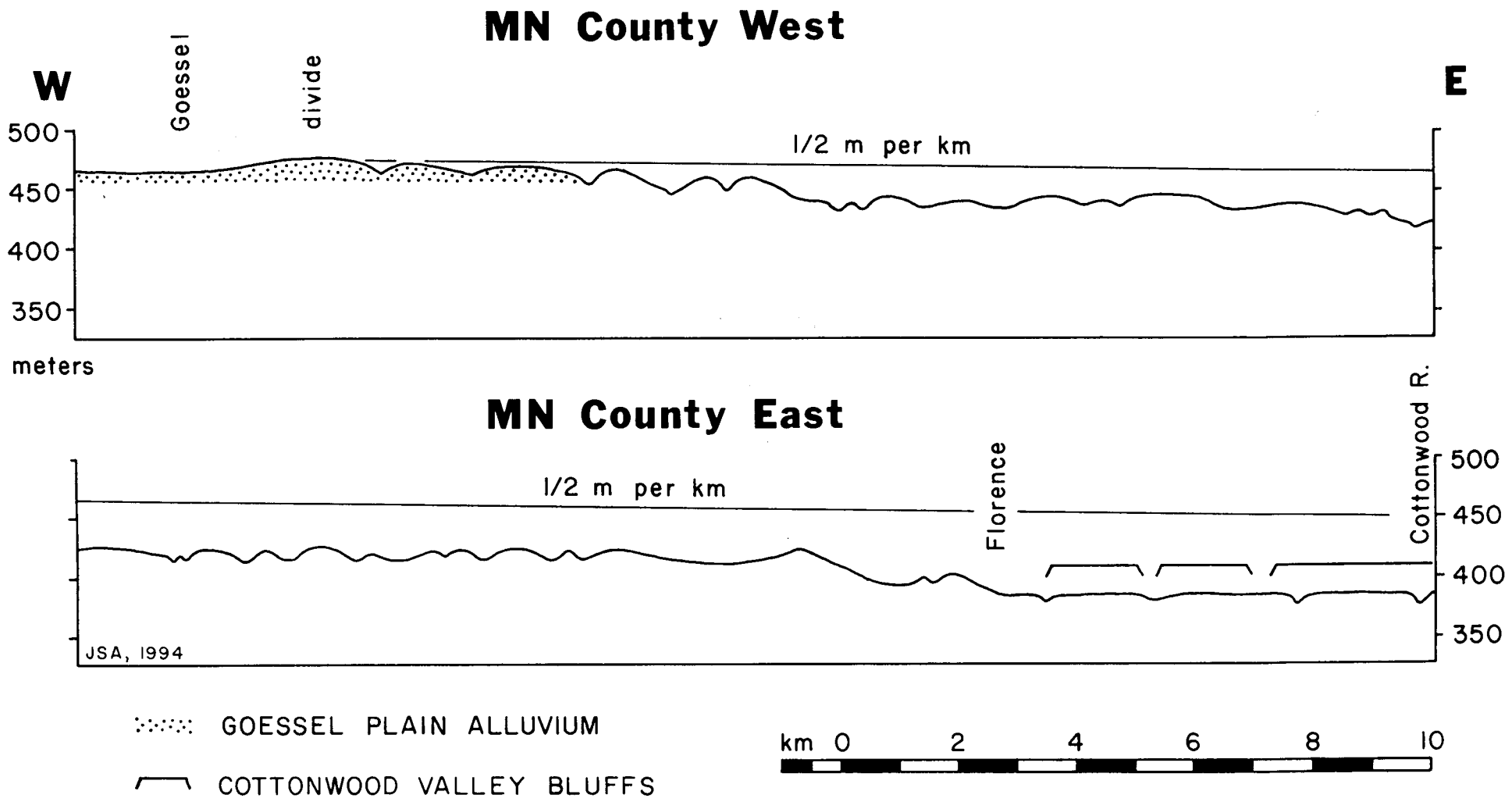


Figure II-8. West-east topographic profile across southern Marion County from Goessel, through Florence, to the Cottowood River valley. Alluvial plain at Goessel is projected with slope of ½ m per km, from 470 m near Goessel to 450 m in eastern Marion County. Vertical exaggeration = 20 X.

Ground-water hydrology:

Ground water is readily available throughout Marion County. Most wells produce 10 to 100 gpm. Production of 100 to 500 gpm is common in the central portion, including Hillsboro and Marion (*KGS Map* M-4a). Principal aquifers in the Flint Hills are the Nolands, Winfield, and Barneston Limestones (see fig. II-5). Sink holes are common where these units crop out in uplands, and springs emerge from these units in valleys and stream channels (O'Conner and Chaffee 1983).

Crystal Spring, near Florence, is one of the largest single springs in Marion County. This spring supplies water for the city of Florence; the spring house has a pumping capacity of 370 gpm, and excess water flows into a nearby stream (O'Conner and Chaffee 1983). The spring emerges near the base of the Barneston Limestone on the northern side of the Cottonwood River valley.

Ground-water migration is generally from east to west. Recharge takes place where aquifers outcrop to the east, and water moves down the regional bedrock dip toward the west. The bedrock aquifers are separated by relatively impermeable shale units. This leads to confined conditions, in which each aquifer may have a different hydraulic head. In the central part of the county, both the Winfield (upper) and Barneston (lower) aquifers supply water to wells. In these cases, it is not uncommon for water from the Winfield aquifer to drain down the well into the Barneston (O'Conner and Chaffee 1983).

The vicinity of Chingawassa Springs, about four miles northeast of Marion, displays unusual ground-water conditions. The Barneston aquifer is confined and produces sulfur water. The Winfield aquifer, in contrast, is unconfined and has fresh water. Both types of water discharge in Chingawassa Springs. A nearby artesian well produces sulfur water from the Barneston, while springs close to the well discharge fresh water from the Winfield. Artesian and spring flows combine for about 2000 gpm total discharge in this vicinity (O'Conner and Chaffee 1983).

Alluvial deposits beneath the Goessel Plain are part of an extensive formation, known as the *Equus Beds.* The Equus Beds form a major aquifer in central Kansas, which is connected with the High Plains aquifer system of western Kansas. The Equus Beds are an important source for irrigation water, as well as for the municipal supply of Wichita and many other cities in the area. Ground water withdrawal is managed for "sustained yield" by the *Equus Beds Groundwater Management District* No. 2, which includes parts of McPherson, Harvey, Reno, Rice, and Segdwick counties. The district extends to within two miles of southwestern Marion County. Ground-water levels have risen throughout most of the district during the past two years, as a result of increased precipitation and reduced pumping demand.

SOILS

Introduction:

The landscape of Marion County may be grouped into eight general associations that have distinctive patterns of soils, relief, and drainage. Each soil association represents certain broad similarities in parent material, land slope, surface and subsurface drainage, and time of development. Individual soil series appear predominantly in one association, but may also be present in other associations. The eight associations are summarized briefly below, based mainly on Horsch and McFall (1983).

Irwin-Ladysmith association:

This association is located on uplands of the Flint Hills region. Irwin and Ladysmith soils predominate along with several other minor soils. These soils are deep, nearly level to moderately sloping (0-6%), and moderately well drained to somewhat poorly drained. They have a clayey subsoil developed from weathered shale with some loess. This association is located in eastern and central portions of the county.

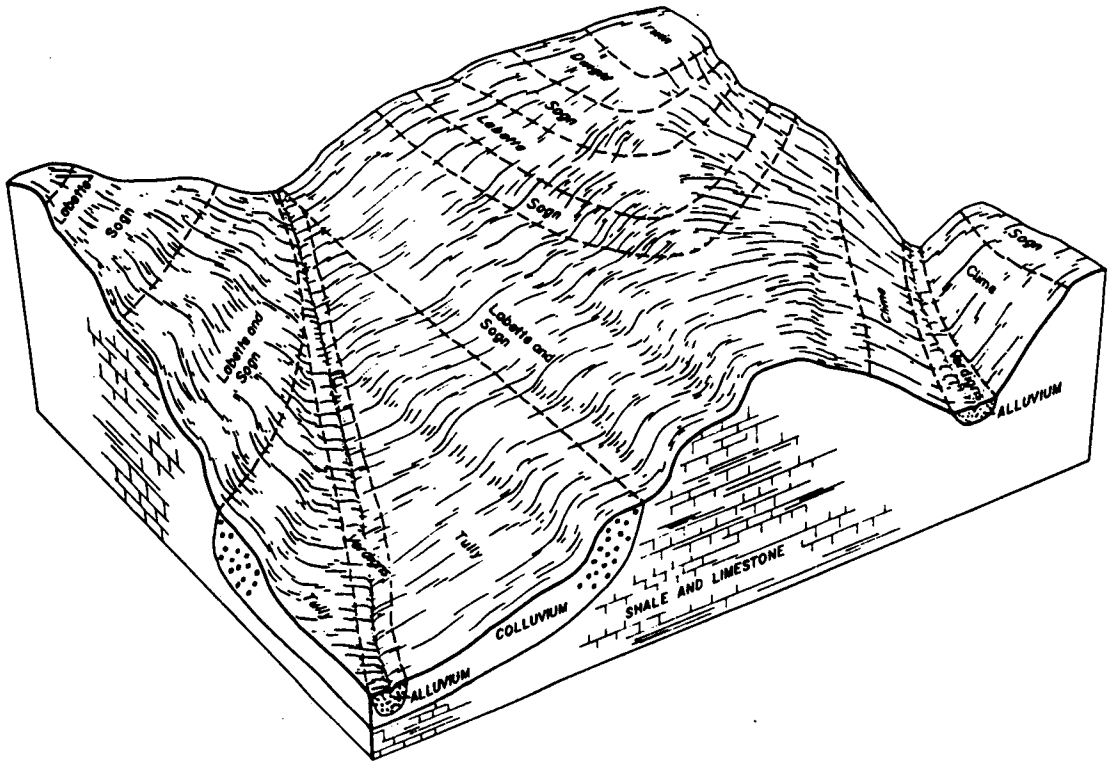


Figure II-9. Typical pattern of soils and parent materials for the Labette-Tully-Sogn association in Marion County. Taken from Horsch and McFall (1983, fig. 3).

Labette-Tully-Sogn association:

Ridge tops and side slopes of the Flint Hills are the sites for this association. The soils are deep to shallow, nearly level to steeply sloping (0-15%), and well drained to somewhat excessively drained. They have a clayey or silty subsoil that formed in loess or weathered shale over limestone or limestone colluvium at a depth of 1 m or less (Fig. II-9). Outcrops of limestone are common. This association is found in the eastern one-third of Marion County.

Verdigris-Chase-Reading association:

Soils of this association are developed in stream valleys, on floodplains and low terraces. The soils are deep, nearly level (0-2% slopes), and well drained to somewhat poorly drained. They have silty to clayey subsoils derived from alluvial deposits. This association is confined to the Cottonwood River valley in the vicinity of Marion and downstream.

Wells-Verdigris association:

This association is also developed in stream valleys, on adjacent side slopes, and on nearby uplands. Soils of this association are deep, nearly level to moderately sloping (0-7%), and well drained to moderately well drained. They have loamy to silty subsoils from alluvium or reworked loess material. This association is found in the Cottonwood River valley upstream from Marion, as well as in tributary valleys: South Cottonwood River, Doyle Creek, and Antelope Creek.

Ladysmith-Goessel association:

Soils of this association are found on flat uplands in the southwestern part of Marion County. They are deep, nearly level (0-2% slopes), and somewhat poorly drained to moderately well drained soils, which have a clayey or loamy subsoil (Fig. II-10). This association is developed in wind-blown sand and loess that cap alluvial sediments of the Goessel Plain.

Lancaster-Hedville association:

This association includes shallow to moderately deep, gently to strongly sloping (1-20%), well drained to somewhat excessively drained soils. They have a loamy subsoil that is derived from shale and sandstone bedrock; sandstone crops out locally. This association is located on ridge tops and side slopes in the Smoky Hill region in the northwestern portion of the county.

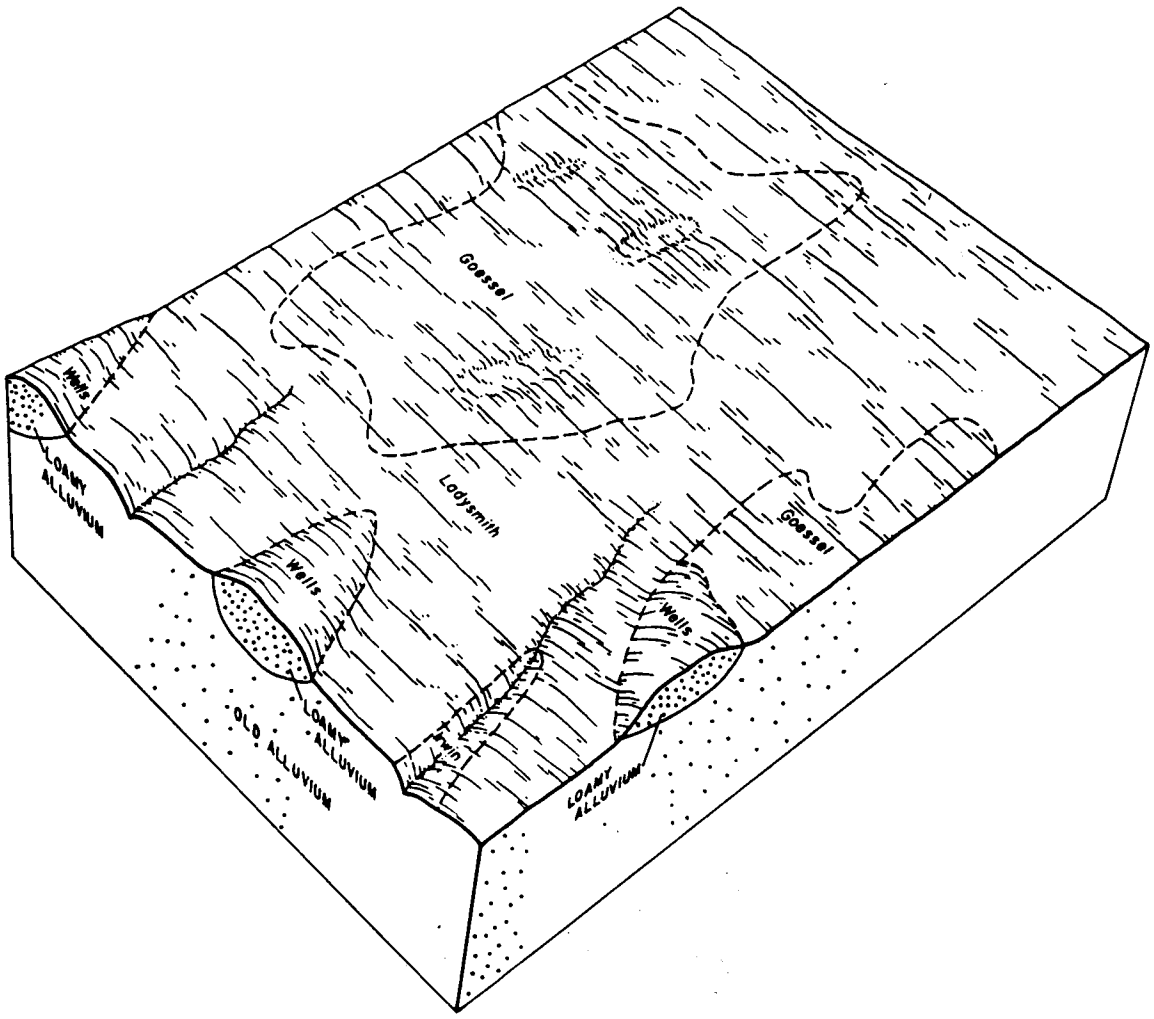


Figure II-10. Typical pattern of soils and parent materials for the Ladysmith-Goessel association in Marion County. Taken from Horsch and McFall (1983, fig. 4).

Irwin-Clime association:

This association consists of soils that are deep to moderately deep, gently sloping to moderately steep (1-20%), and moderately well drained to well drained. The soils have clayey to silty subsoils derived from weathered shale, loess, and/or alluvium (Fig. II-11). The association is developed on uplands throughout the central and west-central portion of the county, including the Hillsboro vicinity.

Goessel-Rosehill association:

This association is located in two small areas in the center and north-central parts of Marion County. The soils are deep to moderately deep, nearly level to gently sloping (0-3%), and moderately well drained. They have clayey subsoils formed in loess on broad upland hill tops.

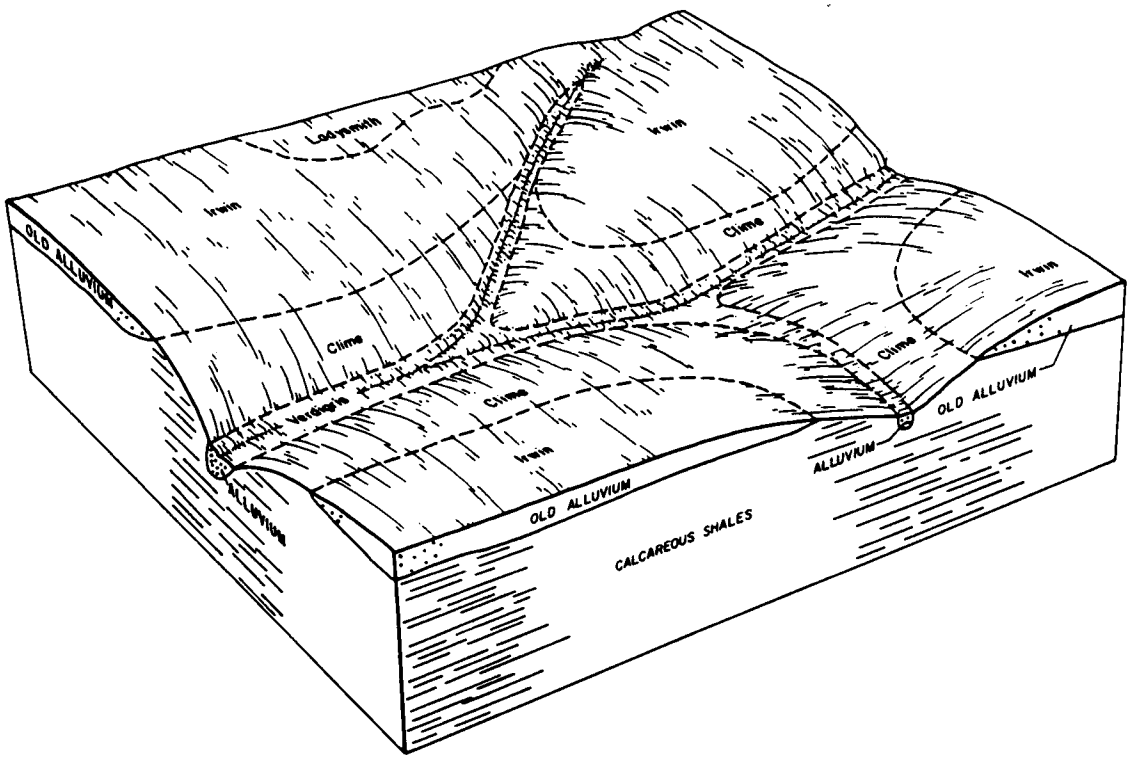


Figure II-11. Typical pattern of soils and parent materials for the Irwin-Clime association in Marion County. Taken from Horsch and McFall (1983, fig. 6).

* * *

PART III. FIELD-TRIP SITES IN MARION COUNTY

Site 1: MARION COUNTY, HILLSBORO, AND TABOR COLLEGE

Max R. Terman

The territory of Kansas was created July 1854. The boundaries of Marion County were first defined in 1855, officially surveyed in 1859, changed in 1860, 1865, and 1867. Not until 1872 were the present boundary lines finally decided upon (see map, p. 40). The county was named in honor of the American Revolutionary War Hero, Francis Marion of South Carolina, the renowned "Swamp Fox" (Van Meter 1972).

Marion County was a center of cross-country travel, since the old Santa Fe Trail crossed the northern portion of Marion County from east to west and the Chisholm Trail of 1870 crossed the county from south to north. Before this, the Kaw Indian trail crossed the county from northeast to southwest. The historic Cottonwood Crossing of the Santa Fe Trail was in the northwestern part of the county near Durham. Ruts of the old Trail may still be seen.

Following the Civil War (1861-1865) and the decline of conflicts with Indians, immigrants began moving into Kansas. The population of Marion County in 1865 was 162, in 1880, 12,457--nearly what it was in 1980 (14,209). A high of over 20,000 persons occurred during the oil booms of the 1920s.

In the 1870s, the prime farmland of the county attracted thousands of European-born immigrants. The largest number of immigrants were Mennonites of Dutch or German descent and born either in German-speaking areas of Europe or Russia. Factors encouraging emigration were overcrowded conditions, famine, political oppression, conscription practices, and restrictions of religious, social and political freedoms. These industrious people and others like them prospered in agriculture and related endeavors. The decendants of these early settlers make up a large proportion of the present population of the county.

The town of Hillsboro was founded in 1879 by John G. Hill, who purchased 80 acres of land from a landowner in Ohio. The important aspect of this land was its location on the route of the Marion and McPherson Railroad, and Hill decided to plat a town. From that time Hillsboro has had a steady but moderate growth. The population in 1880 was 133. It is now around 2800.

When the Mennonites from Russia came to Marion County, they found little lumber to build with. The prairie was a vast expanse of nearly featureless landscape. A number of families built adobe homes made with straw-reinforced clay bricks coated with limestone plaster. The Adobe House Museum consists of one such home, built in 1876 and moved to Hillsboro in the 1950's.

Tabor College was founded in 1908 by H.W. Lohrenz, a leader in the Mennonite Brethren Church and an entomologist. It is now owned and operated by the Mennonite Brethren Church. Enrollment is around 500 and most of the students come from Mennonite backgrounds. Academic rigor and a strong sense of community based on religious and moral values have been hallmarks of the institution since its founding.

Site 2: MARION RESERVOIR AND DAM WILLOW WALK NATURE TRAIL AT COTTONWOOD POINT

Max R. Terman

Marion Dam is located on the Cottonwood River approximately three miles northwest of the city of Marion. It was authorized by the Flood Control Act of 1950 and was placed in full operation in 1968. The drainage area above the dam consists of 200 miles^2 and the total lake storage is 143,840 acre-feet. The total shore length of the reservoir is 60 miles. The maximum height of the dam above the streambed is 67 feet. The reservoir supplies the water to the towns of Marion and Hillsboro. Approximately 3,500 acres of project lands are used for wildlife management and public hunting.

Cottonwood Point is one of five park areas. The Willow Walk Trail was recently completed in 1993 by the U.S. Army Corps of Engineers, Tulsa District. Tame grass pastures are gradually giving way, returning to native grasses which have been reseeded. Former hillsides are now a wooded corridor beside the lake. Many successional changes are occurring. A trail guide is available at the Trail Head Parking Lot.

Site 3: MARION COUNTY LAKE VICINITY

James S. Aber

Marion County Park and Lake are located 2 miles south and 1½ miles east of the city of Marion. The lake and dam were constructed in 1936-37 by the Civilian Conservation Corps, and the lake was officially openned in 1940. The park includes 300 acres; the lake is 153 acres in extent and up to 40 feet deep. The park is developed for fishing, camping, boating, and other recreational activities. There are some 170 homes and cottages, more than half of which are occupied year round, along with a marina and restaurant.

The lake basin is situated in the Winfield Limestone, which can be seen around the lake and in the floor of the spillway. The bedrock is fossiliferous, chalky limestone that contains numerous nodules of gray chert. The Winfield is a major aquifer in the region, and the lake undoubtedly interacts with local ground-water movement within the aquifer. During drought, the aquifer may discharge into the lake; whereas, the lake may recharge the aquifer during wet times.

Site 4: GOESSEL PLAIN SAND PITS

James S. Aber

One active and several inactive sand pits are located on the northeastern edge of the Goessel Plain, on either side of K15 highway 5 miles north of Goessel, at elevations of 460 to 470 m. Cross-bedded, coarse sand and gravelly sand are exposed. The sand and gravel consist mainly of quartz, feldspar, and granitic rock fragments derived from the High Plains and Rocky Mountain region to the west. This sediment is typical for the Equus Beds aquifer to the south and west. Although the Equus Beds are well known for mammalian fossils (horse teeth), such fossils are not common at this site.

The alluvial sediments are capped with at least two soils. The lower is a well-developed paleosol of distinctive red-brown color. The age and environment of this paleosol are unknown, but it likely represents a long interval of development, perhaps during early or middle Pleistocene, under conditions more humid than today. The surficial soil is brown and developed in thin loess. It probably formed during the late Pleistocene and/or Holocene.

Site 5: TERMAN ENVIRONMENTAL STUDY AREA

Max R. Terman

Terman Environmental Study Area (TESA) is owned and maintained by Dr. Max R. Terman, professor of biology at Tabor College, Hillsboro, Kansas. The area is managed for a diverse wildlife population and is used as an outdoor laboratory for the college's science division. Established in 1980 and located 5½ miles south of Hillsboro in Marion County (R2E, T20S, section 34, NW¼), the rectangular 15-acre (6-hectare) area consists of approximately 70 percent native mixed prairie, 10 percent hedge row, 5 percent aquatic (pond, marsh), and 15 percent residential area--naturally landscaped earth-sheltered home and yard. Bounded on the west by a road and cropland, the north by agricultural and, and on the south and east by pasture and riparian woodland, TESA is a terminal habitat point on a network of wildlife movement corridors formed by streams and woodlands associated with the South Cottonwood River drainage area.

Dominant species in the grassland are big bluestem (*Andropogon gerardii*), little bluestem (*Schyzacchrium scoparius*), switchgrass (*Panicum virgatum*), sideoats grama (*Bouteloua curtipendula*), Indian grass (*Sorghastrum nutans*), dropseed (*Sporobolus asper*), western wheatgrass (*Agropyron smithii*), and cheat (*Bromus sp.*). Common forbs include sage (*Artemesia ludoviciana*), aster (*Aster sp.*), catsclaw (*Schrankia nuttalli*), light poppy mallow (*Callirohoe alceoides*), gay feather (*Liatris punctata*), death camus (*Zygadenus nuttalli*), false indigo (*Baptisia australas*), prairie clover (*Pentalostem sp.*), wild indigo (*Baptisia lucantha*), yarrow (*Achillea millefolium*), ground plummilk vetch (*Astragalus crassicarupus*), spiderwort (*Tradescantiaohiensis*), green antelope horn milkweed (*Asclepias viridis*), ironweed (*Vernonia baldwinii*), ragweed (*Ambrosia sp.*), yellow goatsbeard (*Tragopogon dubius*), daisy fleabane (*Erigeron sp.*), and snow-on-the-mountain (*Euphorbia marginata*).

Hedge rows consist primarily of osage orange (*Maclura pomifera*). The pond edge supports mainly various species of sunflower (*Helianthus sp.*), sumpweed (*Iva sp.*), and an introduced cover plant, crown vetch (*Coronilla varia*), which also surrounds much of the house and sewage lagoon. Grasses surrounding and on the earth-sheltered house are mainly fescue (*Festuca sp.*) and buffalo grass (*Buchloe dactyloides*).

Major faunal species are small mammals (*Peromyscus maniculatus, P. leucopus, Microtus ochrogaster, Sigmodon hispidus, Reithrodontomys montanus, R. megalotis, Blarina hylophaga, Cryptotis parva, Sylvilagus floridanus, Scalopus aquaticus, Didelphis virginiana*), and 28 species of birds, mostly passerinesand raptors. Dominant reptiles include great plains skink (*Eumeces obsoletus*), black rat snake (*Elaphe obsoletus*), and bull snake (*Pituophis melanoleucus*). Common amphibians include the tiger salamander (*Ambystoma tigrinum*), Woodhouse's

toad (*Bufo woodhousii*), and bullfrogs (*Rana catesbiana*). Many species of invertebrates (mainly insects) have yet to be identified.

Special animal species utilizing the area are wild turkeys (*Meleagris gallopavo*), bog lemmings (*Synaptomys cooperi*), loggerhead shrikes (*Lanius ludovicianus*), least weasels (*Mustela nivalis*), badger (*Taxidea taxis*) and bobcat (*Lynx rufus*). Soils are of the Irwin silty clay loam association commonly found in the western Flint Hills area. Permian limestone and shale underlies the soil layers. Important streams in the area are the South Cottonwood River, Antelope Creek, and Spring Branch Creek. A small (0.35 hectares) pond (stocked with channel catfish) is on site.

In the past the area was used for pasturing cattle and horses. The praire has never been cultivated. TESA presently is used by Dr. Terman as a residence and outdoor laboratory for the college biology and agriculture departments. Occasionally, public tours are scheduled. Research on site includes studies on avian and small mammal ecology and an ongoing program of identifying and cataloging fauna and flora. In addition, an investigation of the impact of the earth-sheltered residence on wild-life behavior and movements is being carried out.

The area is being preserved and managed as a wildlife study area by regulating use, controlled burning, mowing and haying, supplemental wildlife plantings, and added nest boxes and nest sites such as brush piles. The site is mowed every third year and burned every seventh. This schedule is being examined to determine if it serves to produce maximum forb and grass diversity as well as habitat patchiness.

Facilities on site are trapping transects, observation and rearing cages, weather instruments, an observation tower, and a nature trail. The house, barn, and machinery on site are used as needed.

This area is used to test the idea that naturally landscaped, low-profile housing is compatible with wildlife food, shelter, and movement needs. The book *Earth Sheltered Housing: Principles in Practice,* by Max R. Terman (1985 Van Nostrand Reinhold), describes the building of the earth-sheltered house and its potential ecological impact (see also Terman 1981). An update on the least weasel (Bailey and Terman 1986) includes more information about the area. For additional information, contact Dr. Max R. Terman.

* * *

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APPENDIX OF MARION COUNTY VERTEBRATE FAUNA

Paul Jantzen

VERTEBRATES LISTED IN MARION COUNTY BY THE STATE BIOLOGICAL SURVEY OF KANSAS

Scientific Name	Common Name	Federal Status	State Status
FISH			
LEPISOSTEUS OSSEUS	LONGNOSE GAR		
DOROSOMA CEPEDIANUM	GIZZARD SHAD		
CAMPOSTOMA ANOMALUM	CENTRAL STONEROLLER		
CARASSIUS AURATUS	GOLDFISH		
CTENOPHARYNGODON IDELLA	GRASS CARP		
CYPRINUS CARPIO	COMMON CARP		
NOCOMIS ASPER	REDSPOT CHUB		T
NOTEMIGONUS CRYSOLEUCAS	GOLDEN SHINER		
NOTROPIS BUCHANANI	GHOST SHINER		
NOTROPIS RUBELLUS	ROSYFACE SHINER		
NOTROPIS STRAMINEUS	SAND SHINER		
NOTROPIS TOPEKA	TOPEKA SHINER	C2	C
PHENACOBIUS MIRABILIS	SUCKERMOUTH MINNOW		
PIMEPHALES NOTATUS	BLUNTNOSE MINNOW		
PIMEPHALES PROMELAS	FATHEAD MINNOW		
PIMEPHALES TENELLUS	SLIM MINNOW		
SEMOTILUS ATROMACULATUS	CREEK CHUB		
CYPRINELLA CAMURA	BLUNTFACE SHINER		
CYPRINELLA LUTRENSIS	RED SHINER		
ERIMYSTAX X-PUNCTATUS	GRAVEL CHUB		C
LYTHRURUS UMBRATILIS	REDFIN SHINER		
CARPIODES CARPIO	RIVER CARPSUCKER		
ICTIOBUS BUBALUS	SMALLMOUTH BUFFALO		
ICTIOBUS CYPRINELLUS	BIGMOUTH BUFFALO		
ICTIOBUS NIGER	BLACK BUFFALO		
MINYTREMA MELANOPS	SPOTTED SUCKER		C
MOXOSTOMA ERYTHRURUM	GOLDEN REDHORSE		
MOXOSTOMA MACROLEPIDOTUM	SHORTHEAD REDHORSE		
ICTALURUS FURCATUS	BLUE CATFISH		
ICTALURUS PUNCTATUS	CHANNEL CATFISH		
NOTURUS FLAVUS	STONECAT		
NOTURUS NOCTURNUS	FRECKLED MADTOM		
PYLODICTIS OLIVARIS	FLATHEAD CATFISH		
AMEIURUS MELAS	BLACK BULLHEAD		
AMEIURUS NATALIS	YELLOW BULLHEAD		
FUNDULUS NOTATUS	BLACKSTRIPE TOPMINNOW		
FUNDULUS ZEBRINUS	PLAINS KILLIFISH		
GAMBUSIA AFFINIS	WESTERN MOSQUITOFISH		
LABIDESTHES SICCULUS	BROOK SILVERSIDE		
MORONE CHRYSOPS	WHITE BASS		
LEPOMIS CYANELLUS	GREEN SUNFISH		

Scientific Name	Common Name	Federal Status	State Status
LEPOMIS HUMILIS	ORANGESPOTTED SUNFISH		
LEPOMIS MACROCHIRUS	BLUEGILL		
LEPOMIS MEGALOTIS	LONGEAR SUNFISH		
MICROPTERUS DOLOMIEU	SMALLMOUTH BASS		
MICROPTERUS PUNCTULATUS	SPOTTED BASS		
MICROPTERUS SALMOIDES	LARGEMOUTH BASS		
POMOXIS ANNULARIS	WHITE CRAPPIE		
POMOXIS NIGROMACULATUS	BLACK CRAPPIE		
ETHEOSTOMA FLABELLARE	FANTAIL DARTER		
ETHEOSTOMA SPECTABILE	ORANGETHROAT DARTER		
PERCA FLAVESCENS	YELLOW PERCH		
PERCINA CAPRODES	LOGPERCH		
PERCINA COPELANDI	CHANNEL DARTER		
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER		
STIZOSTEDION VITREUM	WALLEYE		
APLODINOTUS GRUNNIENS	FRESHWATER DRUM		
AMPHIBIANS			
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		
BUFO COGNATUS	GREAT PLAINS TOAD		
BUFO WOODHOUSEI	WOODHOUSE'S TOAD		
ACRIS CREPITANS	NORTHERN CRICKET FROG		
PSEUDACRIS TRISERIATA	WESTERN CHORUS FROG		
GASTROPHRYNE OLIVACEA	GREAT PLAINS NARROWMOUTH TOAD		
SPEA BOMBIFRONS	PLAINS SPADEFOOT		
RANA BLAIRI	PLAINS LEOPARD FROG		
RANA CATESBEIANA	BULLFROG		
REPTILES			
CHELYDRA SERPENTINA	SNAPPING TURTLE		
MACROCLEMYS TEMMINCKII	ALLIGATOR SNAPPING TURTLE	C2	C
CHRYSEMYS PICTA	PAINTED TURTLE		
PSEUDEMYS CONCINNA	RIVER COOTER		
TERRAPENE ORNATA	ORNATE BOX TURTLE		
TRACHEMYS SCRIPTA	SLIDER		
KINOSTERNON FLAVESCENS	YELLOW MUD TURTLE		
APALONE MUTICA	SMOOTH SOFTSHELL		
APALONE SPINIFERA	SPINY SOFTSHELL		
OPHISAURUS ATTENUATUS	WESTERN SLENDER GLASS LIZARD		
CROTAPHYTUS COLLARIS	COLLARED LIZARD		
HOLBROOKIA MACULATA	LESSER EARLESS LIZARD		
PHRYNOSOMA CORNUTUM	TEXAS HORNED LIZARD	C2	
SCELOPORUS UNDULATUS	PRAIRIE LIZARD		
EUMECES FASCIATUS	FIVE-LINED SKINK		
EUMECES SEPTENTRIONALIS	PRAIRIE SKINK		
EUMECES OBSOLETUS	GREAT PLAINS SKINK		
SCINCELLA LATERALIS	GROUND SKINK		

Scientific Name	Common Name	Federal Status	State Status
CNEMIDOPHORUS SEXLINEATUS	SIX-LINED RACERUNNER		
CARPHOPHIS AMOENUS	WESTERN WORM SNAKE		
COLUBER CONSTRICTOR	RACER		
DIADOPHIS PUNCTATUS	RINGNECK SNAKE		
ELAPHE GUTTATA	GREAT PLAINS RAT SNAKE		
ELAPHE OBSOLETA	RAT SNAKE		
HETERODON NASICUS	WESTERN HOGNOSE SNAKE		C
HETERODON PLATIRHINOS	EASTERN HOGNOSE SNAKE		C
LAMPROPELTIS CALLIGASTER	PRAIRIE KINGSNAKE		
LAMPROPELTIS GETULA	COMMON KINGSNAKE		
LAMPROPELTIS TRIANGULUM	MILK SNAKE		
NERODIA ERYTHROGASTER	PLAINBELLY WATER SNAKE		
NERODIA RHOMBIFER	DIAMONDBACK WATER SNAKE		
NERODIA SIPEDON	NORTHERN WATER SNAKE		
PITUOPHIS MELANOLEUCUS	GOPHER SNAKE		
REGINA GRAHAMII	GRAHAM'S CRAYFISH SNAKE		
SONORA SEMIANNULATA	GROUND SNAKE		
STORERIA DEKAYI	BROWN SNAKE		
TANTILLA GRACILIS	FLATHEAD SNAKE		
TANTILLA NIGRICEPS	PLAINS BLACKHEAD SNAKE		
THAMNOPHIS PROXIMUS	WESTERN RIBBON SNAKE		
THAMNOPHIS RADIX	PLAINS GARTER SNAKE		
THAMNOPHIS SIRTALIS	COMMON GARTER SNAKE		
TROPIDOCLONION LINEATUM	LINED SNAKE		
AGKISTRODON CONTORTRIX	COPPERHEAD		
CROTALUS HORRIDUS	TIMBER RATTLESNAKE		C
SISTRURUS CATENATUS	MASSASAUGA		

BIRDS

GAVIA IMMER	COMMON LOON		
PODILYMBUS PODICEPS	PIED-BILLED GREBE		
PODICEPS AURITUS	HORNED GREBE		
PODICEPS NIGRICOLLIS	EARED GREBE		
PELECANUS ERYTHRORHYNCHOS	AMERICAN WHITE PELICAN		
PHALACROCORAX AURITUS	DOUBLE-CRESTED CORMORANT		
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN		
IXOBRYCHUS EXILIS	LEAST BITTERN		
ARDEA HERODIAS	GREAT BLUE HERON		
CASMERODIUS ALBUS	GREAT EGRET		
EGRETTA THULA	SNOWY EGRET		
EGRETTA CAERULEA	LITTLE BLUE HERON		
BUBULCUS IBIS	CATTLE EGRET		
BUTORIDES STRIATUS	GREEN-BACKED HERON		
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON		
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON		
ANSER ALBIFRONS	GREATER WHITE-FRONTED GOOSE		
CHEN CAERULESCENS	SNOW GOOSE		
CHEN ROSSII	ROSS' GOOSE		
BRANTA BERNICLA	BRANT		

Scientific Name	Common Name	Federal Status	State Status
BRANTA CANADENSIS	CANADA GOOSE		
AIX SPONSA	WOOD DUCK		
ANAS CRECCA	GREEN-WINGED TEAL		
ANAS RUBRIPES	AMERICAN BLACK DUCK		
ANAS PLATYRHYNCHOS	MALLARD		
ANAS ACUTA	NORTHERN PINTAIL		
ANAS DISCORS	BLUE-WINGED TEAL		
ANAS CLYPEATA	NORTHERN SHOVELER		
ANAS STREPERA	GADWALL		
ANAS AMERICANA	AMERICAN WIGEON		
AYTHYA VALISINERIA	CANVASBACK		
AYTHYA AMERICANA	REDHEAD		
AYTHYA COLLARIS	RING-NECKED DUCK		
AYTHYA MARILA	GREATER SCAUP		
AYTHYA AFFINIS	LESSER SCAUP		
MELANITTA FUSCA	WHITE-WINGED SCOTER		
BUCEPHALA CLANGULA	COMMON GOLDENEYE		
BUCEPHALA ALBEOLA	BUFFLEHEAD		
LOPHODYTES CUCULLATUS	HOODED MERGANSER		
MERGUS MERGANSER	COMMON MERGANSER		
OXYURA JAMAICENSIS	RUDDY DUCK		
CATHARTES AURA	TURKEY VULTURE		
PANDION HALIAETUS	OSPREY		
ICTINIA MISSISSIPPIENSIS	MISSISSIPPI KITE		
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LELT	E
CIRCUS CYANEUS	NORTHERN HARRIER		
ACCIPITER STRIATUS	SHARP-SHINNED HAWK		
ACCIPITER COOPERII	COOPER'S HAWK		
BUTEO PLATYPTERUS	BROAD-WINGED HAWK		
BUTEO SWAINSONI	SWAINSON'S HAWK	3C	
BUTEO JAMAICENSIS	RED-TAILED HAWK		
BUTEO REGALIS	FERRUGINOUS HAWK	C2	C
BUTEO LAGOPUS	ROUGH-LEGGED HAWK		
FALCO SPARVERIUS	AMERICAN KESTREL		
FALCO COLUMBARIUS	MERLIN		
FALCO PEREGRINUS	PEREGRINE FALCON	LE/SA	E
FALCO MEXICANUS	PRAIRIE FALCON		
PHASIANUS COLCHICUS	RING-NECKED PHEASANT		
TYMPANUCHUS CUPIDO	GREATER PRAIRIE-CHICKEN		
MELEAGRIS GALLOPAVO	WILD TURKEY		
COLINUS VIRGINIANUS	NORTHERN BOBWHITE		
LATERALLUS JAMAICENSIS	BLACK RAIL	C2	C
RALLUS ELEGANS	KING RAIL		
RALLUS LIMICOLA	VIRGINIA RAIL		
PORZANA CAROLINA	SORA		
FULICA AMERICANA	AMERICAN COOT		
GRUS CANADENSIS	SANDHILL CRANE		
GRUS AMERICANA	WHOOPING CRANE	LE	E
PLUVIALIS SQUATAROLA	BLACK-BELLIED PLOVER		
PLUVIALIS DOMINICA	LESSER GOLDEN-PLOVER		
CHARADRIUS ALEXANDRINUS	SNOWY PLOVER		T

Scientific Name	Common Name	Federal Status	State Status
CHARADRIUS SEMIPALMATUS	SEMIPALMATED PLOVER		
CHARADRIUS VOCIFERUS	KILLDEER		
HIMANTOPUS MEXICANUS	BLACK-NECKED STILT		
RECURVIROSTRA AMERICANA	AMERICAN AVOCET		
TRINGA MELANOLEUCA	GREATER YELLOWLEGS		
TRINGA FLAVIPES	LESSER YELLOWLEGS		
TRINGA SOLITARIA	SOLITARY SANDPIPER		
CATOPTROPHORUS SEMIPALMATUS	WILLET		
ACTITIS MACULARIA	SPOTTED SANDPIPER		
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		
LIMOSA HAEMASTICA	HUDSONIAN GODWIT		
LIMOSA FEDOA	MARBLED GODWIT		
CALIDRIS ALBA	SANDERLING		
CALIDRIS PUSILLA	SEMIPALMATED SANDPIPER		
CALIDRIS MAURI	WESTERN SANDPIPER		
CALIDRIS MINUTILLA	LEAST SANDPIPER		
CALIDRIS FUSCICOLLIS	WHITE-RUMPED SANDPIPER		
CALIDRIS BAIRDII	BAIRD'S SANDPIPER		
CALIDRIS MELANOTOS	PECTORAL SANDPIPER		
CALIDRIS ALPINA	DUNLIN		
CALIDRIS HIMANTOPUS	STILT SANDPIPER		
TRYNGITES SUBRUFICOLLIS	BUFF-BREASTED SANDPIPER		
LIMNODROMUS SCOLOPACEUS	LONG-BILLED DOWITCHER		
GALLINAGO GALLINAGO	COMMON SNIPE		
SCOLOPAX MINOR	AMERICAN WOODCOCK		
PHALAROPUS TRICOLOR	WILSON'S PHALAROPE		
PHALAROPUS LOBATUS	RED-NECKED PHALAROPE		
LARUS ATRICILLA	LAUGHING GULL		
LARUS PIPIXCAN	FRANKLIN'S GULL		
LARUS PHILADELPHIA	BONAPARTE'S GULL		
LARUS DELAWARENSIS	RING-BILLED GULL		
LARUS ARGENTATUS	HERRING GULL		
LARUS HYPERBOREUS	GLAUCOUS GULL		
XEMA SABINI	SABINE'S GULL		
STERNA CASPIA	CASPIAN TERN		
STERNA FORSTERI	FORSTER'S TERN		
STERNA ANTILLARUM	LEAST TERN		E
CHLIDONIAS NIGER	BLACK TERN	C2	C
TYTO ALBA	BARN OWL		
OTUS ASIO	EASTERN SCREECH-OWL		
BUBO VIRGINIANUS	GREAT HORNED OWL		
NYCTEA SCANDIACA	SNOWY OWL		
SPEOTYTO CUNICULARIA	BURROWING OWL		
STRIX VARIA	BARRED OWL		
ASIO OTUS	LONG-EARED OWL		
ASIO FLAMMEUS	SHORT-EARED OWL		C
CHORDEILES MINOR	COMMON NIGHTHAWK		
PHALAENOPTILUS NUTTALLII	COMMON POORWILL		
CHAETURA PELAGICA	CHIMNEY SWIFT		
ARCHILOCHUS COLUBRIS	RUBY-THROATED HUMMINGBIRD		
CERYLE ALCYON	BELTED KINGFISHER		

Scientific Name	Common Name	Federal Status	State Status
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		
MELANERPES CAROLINUS	RED-BELLIED WOODPECKER		
SPHYRAPICUS VARIUS	YELLOW-BELLIED SAPSUCKER		
PICOIDES PUBESCENS	DOWNY WOODPECKER		
CONTOPUS BOREALIS	OLIVE-SIDED FLYCATCHER		
CONTOPUS SORDIDULUS	WESTERN WOOD-PEWEE		
EMPIDONAX TRAILLII	WILLOW FLYCATCHER		
EMPIDONAX MINIMUS	LEAST FLYCATCHER		
SAYORNIS PHOEBE	EASTERN PHOEBE		
MYIARCHUS CRINITUS	GREAT CRESTED FLYCATCHER		
TYRANNUS FORFICATUS	SCISSOR-TAILED FLYCATCHER		
EREMOPHILA ALPESTRIS	HORNED LARK		
STELGIDOPTERYX SERRIPENNIS	NORTHERN ROUGH-WINGED SWALLOW		
RIPARIA RIPARIA	BANK SWALLOW		
CYANOCITTA CRISTATA	BLUE JAY		
GYMNORHINUS CYANOCEPHALUS	PINYON JAY		
NUCIFRAGA COLUMBIANA	CLARK'S NUTCRACKER		
PICA PICA	BLACK-BILLED MAGPIE		
PARUS BICOLOR	TUFTED TITMOUSE		
SITTA CANADENSIS	RED-BREASTED NUTHATCH		
CERTHIA AMERICANA	BROWN CREEPER		
TROGLODYTES AEDON	HOUSE WREN		
TROGLODYTES TROGLODYTES	WINTER WREN		
REGULUS SATRAPA	GOLDEN-CROWNED KINGLET		
REGULUS CALENDULA	RUBY-CROWNED KINGLET		
SIALIA SIALIS	EASTERN BLUEBIRD		
SIALIA CURRUCOIDES	MOUNTAIN BLUEBIRD		
MYADESTES TOWNSENDI	TOWNSEND'S SOLITAIRE		
CATHARUS FUSCESCENS	VEERY		
CATHARUS MINIMUS	GRAY-CHEEKED THRUSH		
CATHARUS USTULATUS	SWAINSON'S THRUSH		
HYLOCICHLA MUSTELINA	WOOD THRUSH		
TURDUS MIGRATORIUS	AMERICAN ROBIN		
LANIUS LUDOVICIANUS	LOGGERHEAD SHRIKE		C2
STURNUS VULGARIS	EUROPEAN STARLING		
VIREO GRISEUS	WHITE-EYED VIREO		
VIREO BELLII	BELL'S VIREO		
VIREO SOLITARIUS	SOLITARY VIREO		
VIREO GILVUS	WARBLING VIREO		
VIREO PHILADELPHICUS	PHILADELPHIA VIREO		
VIREO OLIVACEUS	RED-EYED VIREO		
VERMIVORA PINUS	BLUE-WINGED WARBLER		
VERMIVORA CHRYSOPTERA	GOLDEN-WINGED WARBLER		
VERMIVORA PEREGRINA	TENNESSEE WARBLER		
VERMIVORA CELATA	ORANGE-CROWNED WARBLER		
VERMIVORA RUFICAPILLA	NASHVILLE WARBLER		
PARULA AMERICANA	NORTHERN PARULA		
DENDROICA PETECHIA	YELLOW WARBLER		
DENDROICA PENSYLVANICA	CHESTNUT-SIDED WARBLER		
DENDROICA MAGNOLIA	MAGNOLIA WARBLER		
DENDROICA CORONATA	YELLOW-RUMPED WARBLER		

Scientific Name	Common Name	Federal Status	State Status
DENDROICA VIRENS	BLACK-THROATED GREEN WARBLER		
DENDROICA FUSCA	BLACKBURNIAN WARBLER		
DENDROICA PALMARUM	PALM WARBLER		
DENDROICA CASTANEA	BAY-BREASTED WARBLER		
DENDROICA STRIATA	BLACKPOLL WARBLER		
MNIOTILTA VARIA	BLACK-AND-WHITE WARBLER		
SETOPHAGA RUTICILLA	AMERICAN REDSTART		
HELMITHEROS VERMIVORUS	WORM-EATING WARBLER		
SEIURUS AUROCAPILLUS	OVENBIRD		
SEIURUS NOVEBORACENSIS	NORTHERN WATERTHRUSH		
SEIURUS MOTACILLA	LOUISIANA WATERTHRUSH		
OPORORNIS FORMOSUS	KENTUCKY WARBLER		
OPORORNIS PHILADELPHIA	MOURNING WARBLER		
GEOTHLYPIS TRICHAS	COMMON YELLOWTHROAT		
WILSONIA PUSILLA	WILSON'S WARBLER		
ICTERIA VIRENS	YELLOW-BREASTED CHAT		
CARDINALIS CARDINALIS	NORTHERN CARDINAL		
PHEUCTICUS LUDOVICIANUS	ROSE-BREASTED GROSBEAK		
GUIRACA CAERULEA	BLUE GROSBEAK		
PASSERINA CYANEA	INDIGO BUNTING		
PASSERINA CIRIS	PAINTED BUNTING		
SPIZA AMERICANA	DICKCISSEL		
PIPILO ERYTHROPHTHALMUS	RUFOUS-SIDED TOWHEE		
SPIZELLA ARBOREA	AMERICAN TREE SPARROW		
SPIZELLA PASSERINA	CHIPPING SPARROW		
SPIZELLA PALLIDA	CLAY-COLORED SPARROW		
SPIZELLA PUSILLA	FIELD SPARROW		
POOECETES GRAMINEUS	VESPER SPARROW		
CHONDESTES GRAMMACUS	LARK SPARROW		
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		
AMMODRAMUS BAIRDII	BAIRD'S SPARROW	C2	
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW	C2	C
AMMODRAMUS LECONTEII	LE CONTE'S SPARROW		
PASSERELLA ILIACA	FOX SPARROW		
MELOSPIZA MELODIA	SONG SPARROW		
MELOSPIZA LINCOLNII	LINCOLN'S SPARROW		
MELOSPIZA GEORGIANA	SWAMP SPARROW		
ZONOTRICHIA ALBICOLLIS	WHITE-THROATED SPARROW		
ZONOTRICHIA LEUCOPHRYS	WHITE-CROWNED SPARROW		
ZONOTRICHIA QUERULA	HARRIS' SPARROW		
JUNCO HYEMALIS	DARK-EYED JUNCO		
CALCARIUS LAPPONICUS	LAPLAND LONGSPUR		
CALCARIUS PICTUS	SMITH'S LONGSPUR		
CALCARIUS ORNATUS	CHESTNUT-COLLARED LONGSPUR		
DOLICHONYX ORYZIVORUS	BOBOLINK		C
AGELAIUS PHOENICEUS	RED-WINGED BLACKBIRD		
STURNELLA MAGNA	EASTERN MEADOWLARK		
STURNELLA NEGLECTA	WESTERN MEADOWLARK		
XANTHOCEPHALUS XANTHOCEPHALUS	YELLOW-HEADED BLACKBIRD		
EUPHAGUS CAROLINUS	RUSTY BLACKBIRD		

Scientific Name	Common Name	Federal Status	State Status
EUPHAGUS CYANOCEPHALUS	BREWER'S BLACKBIRD		
QUISCALUS MEXICANUS	GREAT-TAILED GRACKLE		
QUISCALUS QUISCULA	COMMON GRACKLE		
MOLOTHRUS ATER	BROWN-HEADED COWBIRD		
ICTERUS SPURIUS	ORCHARD ORIOLE		
ICTERUS GALBULA	NORTHERN ORIOLE		
CARPODACUS PURPUREUS	PURPLE FINCH		
LOXIA CURVIROSTRA	RED CROSSBILL		
CARDUELIS FLAMMEA	COMMON REDPOLL		
CARDUELIS PINUS	PINE SISKIN		
CARDUELIS TRISTIS	AMERICAN GOLDFINCH		
PASSER DOMESTICUS	HOUSE SPARROW		
MAMMALS			
DIDELPHIS VIRGINIANA	VIRGINIA OPOSSUM		
CRYPTOTIS PARVA	LEAST SHREW		
SCALOPUS AQUATICUS	EASTERN MOLE		
MYOTIS LUCIFUGUS	LITTLE BROWN MYOTIS		
MYOTIS SEPTENTRIONALIS	NORTHERN LONG-EARED MYOTIS		
EPTESICUS FUSCUS	BIG BROWN BAT		
LASIURUS BOREALIS	RED BAT		
LASIURUS CINEREUS	HOARY BAT		
NYCTICEIUS HUMERALIS	EVENING BAT		
TADARIDA BRASILIENSIS	BRAZILIAN FREE-TAILED BAT		
DASYPUS NOVEMCINCTUS	NINE-BANDED ARMADILLO		
SYLVILAGUS FLORIDANUS	EASTERN COTTONTAIL		
LEPUS CALIFORNICUS	BLACK-TAILED JACK RABBIT		
MARMOTA MONAX	WOODCHUCK		
SPERMOPHILUS TRIDECEMLINEATUS	THIRTEEN-LINED GROUND SQUIRREL		
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL		C
CYNOMYS LUDOVICIANUS	BLACK-TAILED PRAIRIE DOG		
SCIURUS NIGER	FOX SQUIRREL		
GEOMYS BURSARIUS	PLAINS POCKET GOPHER		
PEROGNATHUS FLAVESCENS	PLAINS POCKET MOUSE		
CHAETODIPUS HISPIDUS	HISPID POCKET MOUSE		
CASTOR CANADENSIS	BEAVER		
REITHRODONTOMYS MONTANUS	PLAINS HARVEST MOUSE		
REITHRODONTOMYS MEGALOTIS	WESTERN HARVEST MOUSE		
PEROMYSCUS MANICULATUS	DEER MOUSE		
PEROMYSCUS LEUCOPUS	WHITE-FOOTED MOUSE		
ONYCHOMYS LEUCOGASTER	NORTHERN GRASSHOPPER MOUSE		
SIGMODON HISPIDUS	HISPID COTTON RAT		
NEOTOMA FLORIDANA	EASTERN WOODRAT		
MICROTUS OCHROGASTER	PRAIRIE VOLE		
MICROTUS PINETORUM	WOODLAND VOLE		
ONDATRA ZIBETHICUS	MUSKRAT		
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING		C
ZAPUS HUDSONIUS	MEADOW JUMPING MOUSE		
ERETHIZON DORSATUM	PORCUPINE		

Scientific Name	Common Name	Federal Status	State Status
CANIS LATRANS	COYOTE		
VULPES VULPES	RED FOX		
UROCYON CINEREOARGENTEUS	GRAY FOX		
PROCYON LOTOR	RACCOON		
MUSTELA NIVALIS	LEAST WEASEL		
MUSTELA FRENATA	LONG-TAILED WEASEL		
MUSTELA VISON	MINK		
TAXIDEA TAXUS	BADGER		
SPILOGALE PUTORIUS	EASTERN SPOTTED SKUNK		T
MEPHITIS MEPHITIS	STRIPED SKUNK		
FELIS CONCOLOR	MOUNTAIN LION		
ODOCOILEUS VIRGINIANUS	WHITE-TAILED DEER		

396 Total Species

EXPLANATION OF FEDERAL AND STATE STATUS CODES

Federal:

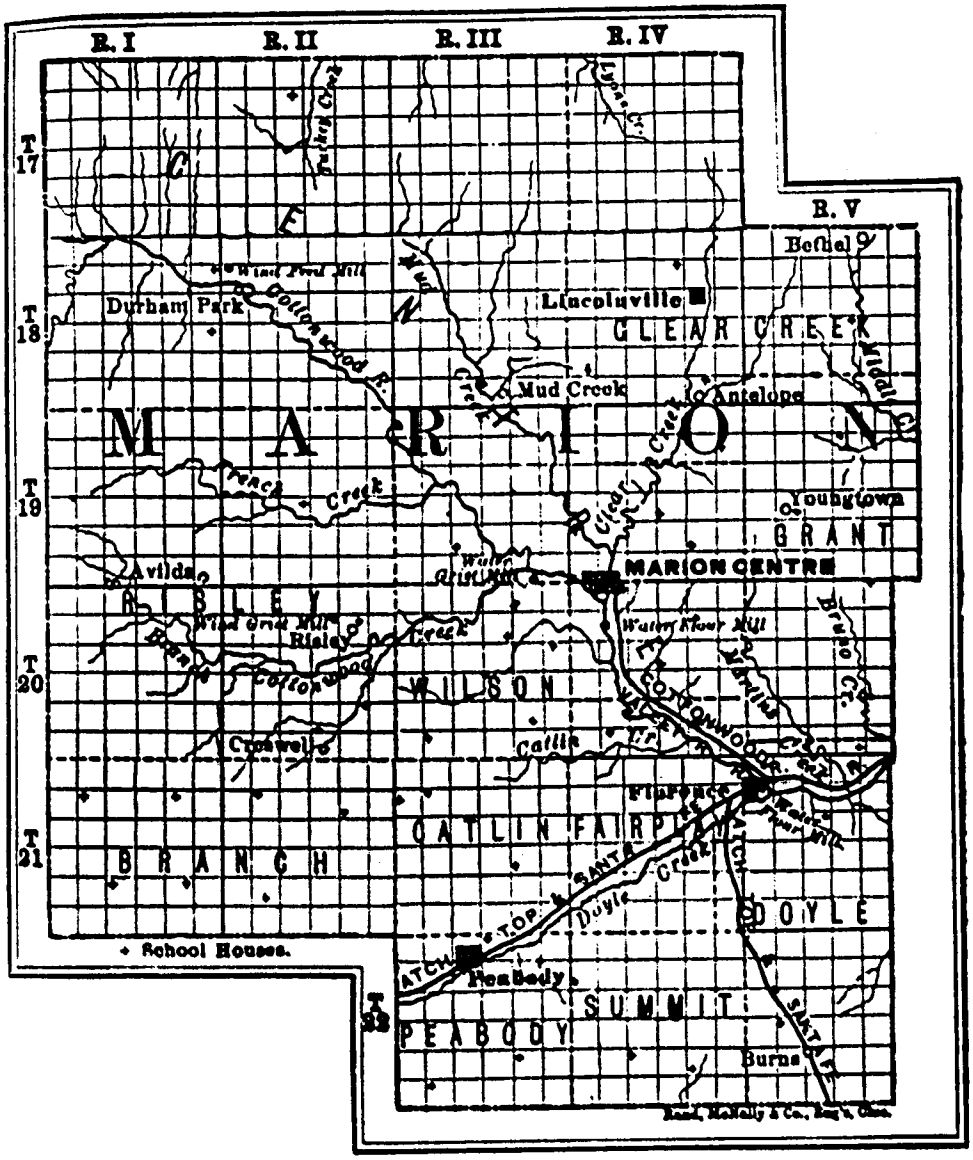
LE Listed endangered.
PE Proposed for listing as endangered.
LT Listed threatened.
PT Proposed for listing as threatened.
LELT Listed endangered in some regions and threatened in others.

C1 Species determined to be in need of protection by listing as endangered or threatened.
C2 Species needs additional study to determine whether it should be listed as threatened or endangered.
3C Evidence indicates species does not warrant listing as threatened or endangered.
SA Accidental or causal.

State:

E Endangered species.
T Threatened species.
C Species in need of conservation.

* * *



Map of Marion County, Kansas, as it existed in 1878, before Hillsboro was established. Taken from *State Board of Agriculture, First Biennial Report* (1878, p. 205).

PLANTS AND ANIMALS REPORTED FROM MARION COUNTY, KANSAS

CONTENTS

These lists are designed to supplement the Kansas Academy of Science Multidisciplinary Guide Book for the 1994 Fall Field Trip in Marion County, Kansas, by Max R. Terman and James S. Aber. We thought the lists might be useful not only to field trip participants but also to biology teachers and students in the county as well as others with particular interest in the flora and fauna of the region. We appreciate the special help given this effort by Craig C. Freeman, Ronald L. McGregor, Dwight R. Platt, Dave Ranney, Dale Snell, Stephen L. Timme, and Neal Whitaker.

Paul G. Jantzen
Max R. Terman

Plants of Marion County, Kansas

Based on Specimens in the R.L. McGregor Herbarium, University of Kansas

R.L. McGregor Herbarium/Kansas Biological Survey Plant Database

Acanthaceae

Justicia americana (L.) M. Vahl water willow
Ruellia humilis Nutt. fringeleaf ruellia

Aceraceae

Acer negundo L. var. violaceum (Kirchner) Jaeger violet boxelder
Acer saccharinum L. silver maple

Agavaceae

Yucca glauca Nutt. small soapweed

Alismataceae

Sagittaria brevirostra Mackenzie & Bush shortbeak arrowhead

Amaranthaceae

Amaranthus albus L. tumble pigweed
Amaranthus palmeri S. Watson Palmer's pigweed
Amaranthus retroflexus L. rough pigweed
Amaranthus rudis J. Sauer water hemp
Amaranthus spinosus L. spiny pigweed

Anacardiaceae

Rhus aromatica Aiton subsp. serotina (E. Greene) R.E. Brooks late aromatic sumac
Rhus glabra L. smooth sumac
Toxicodendron radicans (L.) Kuntze subsp. negundo (E. Greene) Gillis common poison ivy
Toxicodendron rydbergii (Small ex Rydb.) E. Greene Rydberg's poison ivy

Apiaceae

Berula erecta (Hudson) Cov. var. incisa (Torrey) Cronq. water parsnip
Chaerophyllum procumbens (L.) Crantz spreading chervil
Cicuta maculata L. sensu lato common water hemlock
Conium maculatum L. poison hemlock
Eryngium leavenworthii Torrey & A. Gray Leavenworth's eryngo
Lomatium foeniculaceum (Nutt.) J. Coulter & Rose var. daucifolium (Nutt. ex Torrey & A. Gray) Cronq. carrotleaf lomatium
Lomatium foeniculaceum (Nutt.) J. Coulter & Rose var. foeniculaceum common lomatium
Sanicula canadensis L. var. canadensis Canada sanicle
Spermolepis inermis (Nutt.) Mathias & Constance spreading spermolepis
Torilis arvensis (Hudson) Link hedge parsley
Zizia aurea (L.) Koch golden zizia

Apocynaceae

Apocynum cannabinum L. hemp dogbane

Asclepiadaceae

Asclepias incarnata L. swamp milkweed
Asclepias tuberosa L. var. interior (Woodson) Shinn. butterfly milkweed
Asclepias verticillata L. whorled milkweed
Asclepias viridiflora Raf. green-flowered milkweed
Asclepias viridis Walter green milkweed
Cynanchum laeve (Michx.) Pers. climbing milkweed

Asteraceae

Achillea millefolium L. subsp. lanulosa (Nutt.) Piper western yarrow
Ambrosia artemisiifolia L. common ragweed
Ambrosia psilostachya DC. western ragweed
Ambrosia trifida L. giant ragweed
Amphiachyris dracunculoides (DC.) Nutt. annual broomweed
Antennaria neglecta E. Greene field pussytoes
Artemisia dracunculus L. false tarragon sagewort
Artemisia ludoviciana Nutt. var. ludoviciana Louisiana sagewort
Artemisia ludoviciana Nutt. var. mexicana (Willd.) Fern. Mexican sagewort
Aster drummondii Lindley in Hook. subsp. drummondii Drummond's aster
Aster ericoides L. subsp. ericoides var. ericoides heath aster
Aster lanceolatus Willd. subsp. lanceolatus common panicled aster
Aster oblongifolius Nutt. var. oblongifolius aromatic aster
Aster pilosus Willd. subsp. pilosus hairy aster
Aster sericeus Vent. silky aster
Aster subulatus Michx. var. ligulatus Shinn. saltmarsh aster
Bidens cernua L. nodding beggartick
Bidens comosa (A. Gray) Wieg. leafybract beggartick
Bidens connata Muhlenb. ex Willd. var. petiolata (Nutt.) Farw. purplestem beggartick
Bidens frondosa L. devil's beggartick
Brickellia eupatorioides (L.) Shinn. var. corymbulosa (Torrey & A. Gray) Shinn. corymbulose false boneset
Cacalia plantaginea (Raf.) Shinn. tuberous Indian plantain
Carduus nutans L. subsp. leiophyllus (Petrovic) Stoy. & Stefanoff musk thistle
Centaurea solstitialis L. yellow star thistle
Chrysanthemum leucanthemum L. ox-eye daisy
Cirsium altissimum (L.) Sprengel tall thistle
Cirsium undulatum (Nutt.) Sprengel wavyleaf thistle
Cirsium vulgare (Savi) Ten. bull thistle
Conyza canadensis (L.) Cronq. Canada horseweed
Conyza ramosissima Cronq. lawn horseweed
Croptilon hookerianum (Torrey & A. Gray) House var. validum (Rydb.) E.B. Smith slender goldenweed
Echinacea angustifolia DC. var. angustifolia narrowleaf purple coneflower
Eclipta prostrata (L.) L. yerba de tajo
Erechtites hieracifolia (L.) Raf. ex DC. American burnweed
Erigeron philadelphicus L. Philadelphia fleabane
Erigeron strigosus Muhlenb. ex Willd. daisy fleabane
Eupatorium altissimum L. tall joe-pye-weed
Eupatorium perfoliatum L. boneset
Eupatorium rugosum Houtt. white snakeroot
Eupatorium serotinum Michx. late eupatorium
Gnaphalium obtusifolium L. fragrant cudweed
Grindelia squarrosa (Pursh) Dun. var. squarrosa curlytop gumweed
Helianthus annuus L. common sunflower
Helianthus maximilianii Schrad. Maximilian's sunflower
Helianthus pauciflorus Nutt. var. pauciflorus stiff sunflower
Helianthus petiolaris Nutt. prairie sunflower
Helianthus salicifolius A. Dietr. willowleaf sunflower
Helianthus tuberosus L. Jerusalem artichoke
Helianthus x laetiflorus Pers.
Heterotheca latifolia Buckley var. macgregoris Wagenkn. camphorweed
Hymenopappus scabioseus L'Her. var. corymbosus (Torrey & A. Gray) B.L. Turner flattop hymenopappus
Iva annua L. annual sumpweed
Lactuca ludoviciana (Nutt.) Ridd. Louisiana lettuce
Lactuca saligna L. willowleaf lettuce
Lactuca serriola L. prickly lettuce
Liatris mucronata DC. pointed gayfeather
Nothocalais cuspidata (Pursh) Greene prairie dandelion
Prionopsis ciliata (Nutt.) Nutt. wax goldenweed
Ratibida columnifera (Nutt.) Woot. & Standley yellow prairie coneflower
Senecio plattensis Nutt. plains groundsel

Asteraceae

Senecio plattensis Nutt. plains groundsel
Silphium speciosum Nutt. showy rosinweed
Solidago canadensis L. var. scabra (Muhl.) Torrey & A. Gray rough Canada goldenrod
Solidago gigantea Ait. var. serotina (O. Ktze.) Cronq.
Solidago missouriensis Nutt. var. fasciculata Holz. Missouri goldenrod
Solidago nemoralis Ait. var. nemoralis gray goldenrod
Solidago petiolaris Ait. var. petiolaris downy goldenrod
Solidago rigida L. var. rigida stiff goldenrod
Sonchus asper (L.) Hill prickly sowthistle
Taraxacum officinale Webber ex Wiggers common dandelion
Thelesperma filifolium (Hook.) A. Gray var. filifolium threadleaf greenthread
Tragopogon dubius Scop. western salsify
Verbesina alternifolia (L.) Britton wingstem crownbeard
Vernonia baldwinii Torrey subsp. interior (Small) Faust. inland ironweed
Xanthium strumarium L. common cocklebur

Bignoniaceae

Catalpa speciosa (Warder ex Barney) Engelm. catalpa

Boraginaceae

Lithospermum arvense L. corn gromwell
Lithospermum incisum Lehm. narrowleaf gromwell
Onosmodium molle Michx. var. occidentale (MacM.) I.M. Johnst. western marbleseed

Brassicaceae

Alliaria petiolata (Bieb.) Cavara & Grande garlic mustard
Barbarea vulgaris R. Br. winter cress
Camelina microcarpa Andrz. small-seeded false flax
Capsella bursa-pastoris (L.) Medic. shepherd's purse
Cardaria draba (L.) Desv. hoary cress
Descurainia pinnata (Walt.) Britt. var. brachycarpa (Richards.) Fern. tansy mustard
Draba brachycarpa Nutt. shortpod draba
Draba reptans (Lam.) Fern. var. micrantha (Nutt.) Fern.
Erysimum repandum L. bushy wallflower
Lepidium campestre (L.) R. Br. field peppergrass
Lepidium densiflorum Schrad. peppergrass
Lepidium oblongum Small
Nasturtium officinale R. Br. watercress
Rorippa palustris (L.) Bess. subsp. glabra (Schulz) Stuckey var. fernaldiana (Butt. & Abbe) Stuckey bog yellowcress
Rorippa sessiliflora (Nutt.) Hitchc. stalkless yellowcress
Rorippa sinuata (Nutt.) Hitchc. spreading yellowcress
Thlaspi arvense L. pennycress

Cactaceae

Coryphantha missouriensis (Sweet) Britton & Rose Missouri coryphantha
Opuntia macrorhiza Engelm. bigroot prickly pear

Caesalpiniaceae

Cercis canadensis L. redbud
Chamaecrista fasciculata (Michx.) E. Greene showy partridge pea
Gleditsia triacanthos L. honey locust
Gymnocladus dioica (L.) Koch Kentucky coffee-tree

Campanulaceae

Lobelia cardinalis L. cardinal flower
Lobelia siphilitica L. blue lobelia

Capparaceae

Polanisia dodecandra (L.) DC. subsp. trachysperma (Torrey & A. Gray) H.H. Iltis clammyweed
Polanisia jamesii (Torrey & A. Gray) H.H. Iltis cristatella

Caprifoliaceae

Sambucus canadensis L. common elderberry
Symphoricarpos orbiculatus Moench. buckbrush

Caryophyllaceae

Arenaria serpyllifolia L. thyme-leaved sandwort
Cerastium brachypodum (Engelm.) Robins. shortstalk cerastium
Holosteum umbellatum L. jagged chickweed
Silene antirrhina L. sleepy catchfly
Stellaria media (L.) Cyr. chickweed

Celastraceae

Celastrus scandens L. American bittersweet

Ceratophyllaceae

Ceratophyllum demersum L. common hornwort

Chenopodiaceae

Chenopodium missouriense Aellen Missouri goosefoot
Chenopodium simplex (Torrey) Raf. maple-leaved goosefoot
Kochia scoparia (L.) Schrader summer cypress
Monolepis nuttalliana (Roemer & Schultes) E. Greene Nuttall's povertweed
Salsola collina Pallas Russian thistle
Salsola iberica Sennen & Pau Russian thistle

Commelinaceae

Commelina erecta L. var. erecta erect dayflower
Tradescantia bracteata Small bracted spiderwort
Tradescantia ohiensis Raf. Ohio spiderwort

Convolvulaceae

Calystegia macounii (E. Greene) Brummitt Macoun's bindweed
Convolvulus arvensis L. field bindweed
Evolvulus nuttallianus Roemer & Schultes Nuttall's evolvulus
Ipomoea lacunosa L. white morning-glory

Cornaceae

Cornus amomum Miller subsp. obliqua (Raf.) J. Wilson pale dogwood
Cornus drummondii C. Meyer roughleaf dogwood

Cucurbitaceae

Cucurbita foetidissima Humb., Bonp. & Kunth buffalo gourd
Echinocystis lobata (Michx.) Torrey & A. Gray wild cucumber
Sicyos angulatus L. bur cucumber

Cupressaceae

Juniperus virginiana L. red cedar

Cyperaceae

Carex amphibola Steud. var. turgida Fern. narrowleaf sedge
Carex emoryi Dewey emory sedge
Carex gravida Bailey var. lunelliana (Mack.) Herm. Lunell's sedge
Carex meadii Dewey Mead's sedge

Cyperaceae

Carex meadii Dewey Mead's sedge
Carex molesta Mackenzie
Carex pellita Muhlenb. ex Willd. woolly sedge
Carex stipata Muhlenb. ex Willd. sawbeak sedge
Carex vulpinoidea Michx. fox sedge
Cyperus bipartitus Torrey brook flatsedge
Cyperus lupulinus (Spreng.) Marcks
Cyperus odoratus L. slender flatsedge
Cyperus squarrosus L. awned flatsedge
Cyperus strigosus L. false nutsedge
Eleocharis macrostachya Britton longstem spikesedge
Fuirena simplex M. Vahl var. aristulata (Torr.) Kral
Schoenoplectus tabernaemontani (Gmelin) Palla subsp. validus (M. Vahl) S.G. Sm. softstem bulrush

Dryopteridaceae

Cystopteris tennesseensis Shaver Tennessee bladder fern

Elaeagnaceae

Elaeagnus angustifolia L. Russian olive

Equisetaceae

Equisetum arvense L. field horsetail
Equisetum laevigatum A. Braun smooth scouring-rush

Euphorbiaceae

Acalypha ostryifolia Riddell rough-pod copperleaf
Acalypha rhomboidea Raf. rhombic copperleaf
Argythamnia mercurialina (Nutt.) Muell. Arg. Mercury's argythamnia
Chamaesyce maculata (L.) Small spotted spurge
Chamaesyce missurica (Raf.) Shinn. var. intermedia (Engelm.) Wheeler
Chamaesyce nutans (Lag.) Small eyebane
Chamaesyce serpens (Humb., Bonp. & Kunth) Small round-leaved spurge
Chamaesyce stictospora (Engelm.) Small mat spurge
Croton capitatus Michx. var. capitatus woolly croton
Croton monanthogynus Michx. one-seeded croton
Euphorbia corollata L. flowering spurge
Euphorbia dentata Michx. toothed spurge
Euphorbia marginata Pursh snow-on-the-mountain
Euphorbia x pseudovirgata (Schur) Soo
Tragia ramosa Torrey stalked noseburn

Fabaceae

Amorpha canescens Pursh lead plant
Amorpha fruticosa L. false indigo
Apios americana Medic. American potato bean
Astragalus crassicarpus Nutt. var. crassicarpus common ground plum
Astragalus lotiflorus Hook. lotus milkvetch
Astragalus plattensis Nutt. ex Torrey & A. Gray Platte river milkvetch
Baptisia australis (L.) R. Br. var. minor (Lehm.) Fern. blue false indigo
Baptisia bracteata Muhlenb. ex Elliott var. leucophaea (Nutt.) Kartesz & Gandhi plains wild indigo
Coronilla varia L. crown vetch
Dalea aurea Nutt. ex Pursh silktop dalea
Dalea candida Michx. ex Willd. var. candida white prairie clover
Dalea purpurea Vent. var. purpurea purple prairie clover
Desmodium illinoense A. Gray Illinois tickclover
Lespedeza capitata Michx. round-head lespedeza
Lespedeza stipulacea Maxim. Korean lespedeza

Fabaceae

Medicago lupulina L. black medick
Medicago sativa L. subsp. sativa alfalfa
Melilotus albus Medikus white sweet clover
Melilotus officinalis (L.) Pall. yellow sweet clover
Pediomelum esculentum (Pursh) Rydb. prairie turnip
Psoralidium tenuiflorum (Pursh) Rydb. many-flowered scurfpea
Robinia pseudoacacia L. black locust
Strophostyles leiosperma (T. & G.) Piper slick-seed bean
Trifolium pratense L. red clover
Trifolium repens L. white clover
Vicia americana Muhl. ex Willd. var. minor (Hook.) C.R. Gunn American vetch

Fagaceae

Quercus macrocarpa Michx. bur oak
Quercus muehlenbergii Engelm. chinquapin oak

Fumariaceae

Corydalis curvisiliqua Engelm. subsp. grandibracteata (Fedde) G. Ownbey large-bracted corydalis

Geraniaceae

Geranium carolinianum L. Carolina cranesbill
Geranium pusillum L. small cranesbill

Grossulariaceae

Ribes missouriense Nutt. ex Torrey & A. Gray Missouri gooseberry
Ribes odoratum Wendl. f. golden current

Hippocastanaceae

Aesculus glabra Willd. var. arguta (Buckl.) Robins. western buckeye

Hydrophyllaceae

Ellisia nyctelea L. waterpod

Iridaceae

Sisyrinchium campestre Bickn. prairie blue-eyed grass

Juglandaceae

Carya tomentosa (Poiret) Nutt. mockernut hickory
Juglans nigra L. black walnut

Juncaceae

Juncus dudleyi Wieg. Dudley's rush
Juncus interior Wieg. inland rush
Juncus torreyi Cov. Torrey's rush

Lamiaceae

Hedeoma hispida Pursh rough false pennyroyal
Lamium amplexicaule L. henbit
Lycopus americanus Muhlenb. ex W.P.G. Barton American bugleweed
Monarda fistulosa L. var. fistulosa wild bergamot
Nepeta cataria L. catnip
Salvia azurea Lam. blue sage
Scutellaria lateriflora L. sideflower skullcap
Scutellaria parvula Michx. var. leonardii (Epling) Fern. Leonard's small skullcap
Teucrium canadense L. var. canadense American germander

Lemnaceae

Lemna minor L. lesser duckweed
Lemna turionifera Landolt turion duckweed
Spirodela polyrhiza (L.) Schleiden greater duckmeat

Lentibulariaceae

Utricularia gibba L. cone-spur bladderwort

Liliaceae

Allium canadense L. var. fraseri F. Ownbey Fraser's wild onion
Allium canadense L. var. lavendulare (Bates) F. Ownbey & Aase lavender wild onion
Androstephium caeruleum (Scheele) Torrey blue funnel lily
Asparagus officinalis L. asparagus
Nothoscordum bivalve (L.) Britton false garlic
Polygonatum biflorum (Walter) Elliott Solomon's seal
Zigadenus nuttallii A. Gray ex S. Watson Nuttall's death camas

Linaceae

Linum compactum Nelson compact stiffstem flax
Linum lewisii Pursh blue flax
Linum sulcatum Riddell grooved flax

Loasaceae

Mentzelia oligosperma Nutt. ex Sims stickleaf mentzelia

Lythraceae

Ammannia robusta Heer & Regel purple ammannia

Malvaceae

Abutilon theophrasti Medikus velvet-leaf
Callirhoe alcaeoides (Michx.) A. Gray pale poppy mallow
Callirhoe involucrata (Nutt. ex Torrey) A. Gray purple poppy mallow
Hibiscus trionum L. flower-of-an-hour
Malva neglecta Wallr. common mallow
Malvastrum hispidum (Pursh) Hochr. hairy false mallow

Menispermaceae

Menispermum canadense L. moonseed

Mimosaceae

Desmanthus illinoensis (Michx.) MacMillan ex Robinson & Fern. Illinois bundleflower
Mimosa quadrivalvis L. var. nuttallii (DC.) Beard ex Barneby catclaw sensitive brier

Molluginaceae

Mollugo verticillata L. carpetweed

Moraceae

Maclura pomifera (Raf.) C. Schneider Osage orange
Morus alba L. white mulberry
Morus rubra L. red mulberry

Najadaceae

Najas guadalupensis (Sprengel) Morong southern naiad

Nyctaginaceae

Mirabilis albida (Walter) Heimerl white four-o'clock

Nyctaginaceae

Mirabilis carletonii (Standley) Standley Carleton's four-o'clock
Mirabilis nyctaginea (Michx.) MacMillan wild four-o'clock

Oleaceae

Fraxinus pennsylvanica Marshall var. subintegerrima (M. Vahl) Fern. green ash

Onagraceae

Calylophus serrulatus (Nutt.) Raven plains yellow evening primrose
Gaura parviflora Douglas velvety gaura
Oenothera macrocarpa Nutt. subsp. macrocarpa Missouri evening primrose
Oenothera speciosa Nutt. white evening primrose
Stenosiphon linifolius (Nutt.) Heynh. stenosiphon

Ophioglossaceae

Ophioglossum engelmannii Prantl Engelmann's adder's-tongue

Orchidaceae

Spiranthes cernua (L.) Rich. nodding ladies'-tresses

Oxalidaceae

Oxalis dillenii Jacq. green wood sorrel
Oxalis violacea L. violet wood sorrel

Phytolaccaceae

Phytolacca americana L. var. americana pokeweed

Plantaginaceae

Plantago aristata Michx. bottlebrush plantain
Plantago rhodosperma Decne. red-seeded plantain
Plantago rugelii Decne. Rugel's plantain
Plantago virginica L. pale-seeded plantain

Platanaceae

Platanus occidentalis L. sycamore

Poaceae

Aegilops cylindrica Host jointed goatgrass
Agrostis hyemalis (Walter) Britton, Sterns, & Pogg. var. hyemalis winter bentgrass
Agrostis stolonifera L. redtop
Alopecurus carolinianus Walter Carolina foxtail
Andropogon gerardii Vitman big bluestem
Aristida oligantha Michx. prairie threeawn
Bothriochloa laguroides (DC.) Herter subsp. torreyana (Steudel) Allred & Gould silver bluestem
Bouteloua curtipendula (Michx.) Torrey side-oats grama
Bouteloua gracilis (Humb., Bonpl. & Kunth) Lagasca ex Steud blue grama
Bouteloua hirsuta Lagasca hairy grama
Bromus inermis Leysser subsp. inermis smooth brome
Bromus japonicus Thunb. ex Murray Japanese brome
Bromus secalinus L. rye brome
Bromus tectorum L. downy brome
Buchloe dactyloides (Nutt.) Engelm. buffalograss
Cenchrus longispinus (Hackel) Fern. longspine sandbur
Chloris verticillata Nutt. windmillgrass
Cynodon dactylon (L.) Pers. bermudagrass
Dactylis glomerata L. orchardgrass

Poaceae

Dichanthelium oligosanthes (Schultes) Gould var. scribnerianum (Nash) Gould Scribner's dichanthelium
Digitaria ciliaris (Retz.) Koeler southern crabgrass
Digitaria cognata (Schultes) Pilger var. cognata fall witchgrass
Digitaria ischaemum (Schreber ex Schweigg) Schreber ex Muhl. smooth crabgrass
Digitaria sanguinalis (L.) Scop. hairy crabgrass
Echinochloa crusgalli (L.) P. Beauv. var. crusgalli common barnyardgrass
Echinochloa muricata (Pal.) Fern. var. microstachya Wieg.
Echinochloa muricata (Pal.) Fern. var. muricata prickly barnyardgrass
Eleusine indica (L.) Gaertner goosegrass
Elymus canadensis L. Canada wildrye
Elymus virginicus L. var. virginicus Virginia wildrye
Elymus x maltei Bowden
Eragrostis cilianensis (All.) E. Mosher stinkgrass
Eragrostis hypnoides (Lam.) Britton, Sterns & Pogg. teal lovegrass
Eragrostis pectinacea (Michx.) Nees var. miserrima (Fourn.) J. Reeder Carolina lovegrass
Eragrostis pectinacea (Michx.) Nees var. pectinacea Carolina lovegrass
Eragrostis spectabilis (Pursh) Steudel purple lovegrass
Eragrostis trichodes (Nutt.) Alph. Wood sand lovegrass
Eriochloa contracta A. Hitchc. prairie cupgrass
Festuca arundinacea Schreber tall fescue
Hordeum jubatum L. foxtail barley
Hordeum pusillum Nutt. little barley
Leersia oryzoides (L.) Sw. rice cutgrass
Leersia virginica Willd. whitegrass
Leptochloa fascicularis (Lam.) A. Gray bearded sprangletop
Muhlenbergia asperifolia (Nees & Meyen) Parodi scratchgrass
Muhlenbergia frondosa (Poiret) Fern. wirestem muhly
Muhlenbergia racemosa (Michx.) Britton, Sterns, & Pogg. marsh muhly
Muhlenbergia schreberi Gmel. nimblewill
Muhlenbergia sobolifera (Muhlenb.) Trin. rock muhly
Panicum capillare L. var. brevifolium Vasey ex Rydb. & Shear
Panicum dichotomiflorum Michx. fall panicum
Panicum virgatum L. switchgrass
Pascopyrum smithii (Rydb.) Love western wheatgrass
Paspalum pubiflorum Rupr. ex Fourn. var. glabrum Vasey ex Scribn.
Poa annua L. annual bluegrass
Poa compressa L. Canada bluegrass
Poa pratensis L. Kentucky bluegrass
Schedonnardus paniculatus (Nutt.) Trel. tumblegrass
Schizachyrium scoparium (Michx.) Nash little bluestem
Setaria parviflora (Poiret) Kerguelen knotroot bristlegrass
Setaria pumila (Poiret) Romer & Schultes yellow foxtail
Setaria viridis (L.) P. Beauv. green foxtail
Sorghastrum nutans (L.) Nash Indiangrass
Sorghum halepense (L.) Pers. Johnsongrass
Spartina pectinata Link prairie cordgrass
Sphenopholis obtusata (Michx.) Scribner var. obtusata prairie wedgegrass
Sporobolus asper (Michx.) Kunth var. asper rough dropseed
Sporobolus asper (Michx.) Kunth var. drummondii (Trin.) Vasey Drummond's dropseed
Sporobolus cryptandrus (Torrey) A. Gray sand dropseed
Sporobolus neglectus Nash puffsheath dropseed
Sporobolus vaginiflorus (Torrey) Alph. Wood povertygrass
Tridens flavus (L.) A. Hitchc. purpletop
Triplasis purpurea (Walter) Chapman purple sandgrass
Tripsacum dactyloides (L.) L. eastern gammagrass

Polygalaceae

Polygala verticillata L. whorled milkwort

Polygonaceae

Eriogonum annuum Nutt. annual eriogonum
Polygonum amphibium L. var. emersum Michx. swamp smartweed
Polygonum arenastrum Jord. ex Bor. prostrate knotweed
Polygonum bicorne Raf. longstyle smartweed
Polygonum convolvulus L. wild buckwheat
Polygonum lapathifolium L. pale smartweed
Polygonum pensylvanicum L. Pennsylvania smartweed
Polygonum persicaria L. lady's-thumb smartweed
Polygonum prolificum (Small) Robinson
Polygonum punctatum Elliott dotted smartweed
Polygonum ramosissimum Michx. bush knotweed
Polygonum scandens L. climbing false buckwheat
Polygonum tenue Michx. slender knowtweed
Rumex altissimus Alph. Wood pale dock
Rumex crispus L. curly dock
Rumex patientia L. patience dock
Rumex stenophyllus Ledeb. narrowleaved dock

Portulacaceae

Claytonia virginica L. Virginia spring beauty

Potamogetonaceae

Potamogeton crispus L. curly muckweed
Potamogeton foliosus Raf. leafy pondweed
Potamogeton nodosus Poiret longleaf pondweed

Ranunculaceae

Anemone caroliniana Walter Carolina anemone
Clematis pitcheri Torrey & A. Gray Pitcher's clematis
Delphinium carolinianum Walter subsp. penardii (Huth) M. Warn. plains larkspur
Delphinium carolinianum Walter subsp. virescens (Nutt.) R.E. Brooks plains larkspur
Ranunculus sceleratus L. var. sceleratus cursed buttercup
Thalictrum dasycarpum Fischer & Ave-Lall. purple meadow rue

Rhamnaceae

Ceanothus herbaceus Raf. var. pubescens (Torrey & A. Gray) Shinn. inland New Jersey tea

Rosaceae

Agrimonia parviflora Sol. many-flowered agrimony
Geum canadense Jacq. white avens
Prunus americana Marshall wild plum
Prunus persica (L.) Batsch peach
Rosa arkansana Porter prairie wild rose
Rubus flagellaris Willd. northern dewberry

Rubiaceae

Cephalanthus occidentalis L. buttonbush
Diodia teres Walter rough buttonweed
Galium aparine L. catchweed bedstraw
Hedyotis nigricans (Lam.) Fosb. var. nigricans narrowleaf bluets
Houstonia pusilla Schoepf small bluets

Salicaceae

Populus deltoides Bartram ex Marshall subsp. monilifera (Aiton) Eckenwalder plains cottonwood
Salix amygdaloides Andersson peach-leaved willow
Salix exigua Nutt. subsp. interior (Rowlee) Cronq. interior sandbar willow
Salix nigra Marshall black willow

Scrophulariaceae

Agalinis tenuifolia (M. Vahl) Raf. slender agalinis
Chaenorrhinum minus (L.) Lange dwarf snapdragon
Leucospora multifida (Michx.) Nutt. paleseed
Lindernia dubia (L.) Pennell yellow false pimpernel
Penstemon cobaea Nutt. var. cobaea cobaea beardtongue
Penstemon grandiflorus Nutt. shell-leaf beardtongue
Verbascum thapsus L. woolly mullein
Veronica arvensis L. corn speedwell
Veronica peregrina L. var. peregrina purslane speedwell
Veronica peregrina L. var. xalapensis (Humb., Bonpl. & Kunth) St. John & Warren hairy purslane
Veronica polita Fries wayside speedwell

Simaroubaceae

Ailanthus altissima (Miller) Swingle tree-of-heaven

Smilacaceae

Smilax herbacea L. var. lasioneura (Hook.) A. DC.
Smilax hispida Muhlenb. ex Torrey bristly greenbrier

Solanaceae

Datura stramonium L. jimsonweed
Physalis longifolia Nutt. var. longifolia common groundcherry
Physalis longifolia Nutt. var. subglabrata (Mack. & Bush) Cronq.
Physalis pumila Nutt. subsp. pumila hairy groundcherry
Physalis virginiana Miller var. subglabrata (Mackenzie & Bush) Waterf. smooth Virginia groundcherry
Solanum carolinense L. Carolina horse nettle
Solanum ptycanthum Dunal ex DC. black nightshade
Solanum rostratum Dunal buffalo bur

Typhaceae

Typha domingensis Pers. southern cattail
Typha latifolia L. common cattail

Ulmaceae

Celtis occidentalis L. common hackberry
Ulmus americana L. American elm
Ulmus pumila L. Siberian elm
Ulmus rubra Muhlenb. slippery elm

Urticaceae

Boehmeria cylindrica (L.) Sw. bog hemp
Laportea canadensis (L.) Wedd. wood nettle
Parietaria pensylvanica Muhlenb. ex Willd. Pennsylvania pellitory
Pilea pumila (L.) A. Gray clearweed
Urtica dioica L. subsp. gracilis (Aiton) Selander stinging nettle

Valerianaceae

Valerianella radiata (L.) Dufr. corn salad

Verbenaceae

Phyla lanceolata (Michx.) Greene lanceleaf frogfruit
Verbena bipinnatifida Nutt. Dakota verbena
Verbena bracteata Lagasca & Rodriguez prostrate verbena
Verbena stricta Vent. woolly verbena
Verbena urticifolia L. white verbena

Violaceae

Hybanthus verticillatus (Ortega) Baillon North American calceolaria
Viola rafinesquii E. Greene Johnny-jump-up
Viola sororia Willd. downy blue violet

Vitaceae

Parthenocissus quinquefolia (L.) Planchon Virginia creeper
Vitis riparia Michx. riverbank grape
Vitis vulpina L. winter grape

Zygophyllaceae

Tribulus terrestris L. puncture vine

Bryophytes of Marion County, Kansas

Stephen L. Timme
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Pittsburg State University
Pittsburg, Kansas 66762

Forty-nine species of bryophytes are published for Marion County, Kansas (Churchill 1985; McGregor 1955; Bowers and Honer 1992; Timme and Saliba 1992). Churchill (1985) collected in Marion County but only listed two mosses. McGregor's publication (1955) list five species of liverworts, but this work is far out-of-date. Bowers and Honer (1992) record 39 species of mosses for the county, while Timme and Saliba (1992) record 5 hepatics. Obviously, detailed studies of Marion County will result in a significant increase in the bryoflora. This is exemplified by the work of Nonnenmacher (1992) who studied the bryoflora of Neosho County, Kansas. The published reports at the beginning of his study were 12 species of mosses and 11 species of hepatics. Upon completion of his study, 60 species of mosses and 17 species of hepatics were reported, among them two state records. This same senario is likely for Marion County.

HEPATICAE (liverworts)

Jubulaceae

Frullania inflata Gott.

Marchantiaceae

Marchantia polymorpha L.

Ricciaceae

Riccia beyrichiana Hampe
Riccia frostii Aust.
Riccia lamellosa Radd.

MUSCI (mosses)

Amblystegiaceae

Amblystegium varium (Hedw.) Lindb.
Campylium chrysophyllum (Brid.) J. Lange
Campylium hispidulum (Brid.) Mitt.
Hygroamblystegium tenax (Hedw.) Jenn.
Letodictyum humile (P.-Beauv.) Ochyra
Letodictyum riparium (Hedw.) Warnst.

Bartramiaceae

Philonotis marchica (Hedw.) Brid.

Brachytheciaceae

Steerecleus serrulatus (Hedw.) Robins.

Bryaceae

Bryum argenteum Hedw.
Bryum caespiticium Hedw.
Bryum lisae var. *cuspidatum* (Bruch & Schimp. in B.S.G.) Marg.
Bryum pseudotriquetrum (Hedw.) Gaertn. et al.
Pohlia nutans (Hedw.) Lindb.
Pohlia wahlenbergii (Web. & Mohr) Andrews

Ditrichaceae

Ceratodon purpureus (Hedw.) Brid.

Entodontaceae

Entodon cladorrhizans (Hedw.) C. Mull.
Entodon compressus (Hedw.) C. Mull.
Entodon seductrix (Hedw.) C. Mull.

Ephemeraceae

Ephemerum spinulosum Bruch & Schimp. in Schimp.

Fissidentaceae

Fissidens dubius P.-Beauv.
Fissidens fontanus (B. Pyl.) Steud.
Fissidens obtusifolius Wils.
Fissidens taxifolius Hedw.

Grimmiaceae

Jaffueliobryum wrightii (Sull. in Gray) Ther.
Schistidium agassizii Sull. & Lesq. in Sull.

Hypnaceae

Homomallium adnatum (Hedw.) Broth.

Leskeaceae

Leskea gracilescens Hedw.
Lindbergia brachyptera (Mitt.) Kindb.

Mniaceae

Plagiomnium cuspidatum (Hedw.) T. Kop.

Orthtrichaceae

Orthotrichum diaphanus Brid.
Orthotrichum pumilum Sw.

Polytrichaceae

Pogonatum brachyphyllum (Michx.) P.-Beauv.
Pogonatum pensilvanicum (Hedw.) P.-Beauv.
Polytrichum juniperinum Hedw.

Pottiaceae

Astomum muhlenbergianum (Sw.) Grout
Atrichum angustatum (Brid.) Bruch & Schimp. in B.S.G.
Barbula unguiculata Hedw.
Desmatodon obtusifolius (Schwaegr.) Schimp.
Desmatodon plinthobius Sull. & Lesq. in Sull.
Didymodon tophaceus (Brid.) Lisa
Phascum cuspidatum Hedw.
Tortula pagorum (Milde) De Not.
Weissia controversa Hedw.

Thuidiaceae

Anomodon minor (Hedw.) Furnr.

References

Bowers, F. D. and M. M. Honer. 1992. Preliminary atlas of Kansas Mosses. Biology Dept., University of Wisconsin, Stevens Point.

Churchill, S. P. 1985. A synopsis of the Kansas mosses with keys and distribution maps. Univ. Kansas Science Bull. 53: 1-64.

McGregor, R. L. 1955. Taxonomy and ecology of Kansas Hepatice. Univ. Kansas Science Bull. 37: 55-141.

Nonnenmacher, H. F. 1992. A bryofloristic survey of Neosho County, Kansas with ecological notes. MS Thesis, Pittsburg State University.

Timme, S. L. and M. Saliba. 1992. Preliminary atlas of Kansas Liverworts and Hornworts. T. M. Sperry Herbarium, Pittsburg State University, KS.

PLANTS COLLECTED FROM MARION COUNTY, KANSAS IN 1896 AND DEPOSITED IN THE BETHEL COLLEGE HERBARIUM AT NORTH NEWTON, KANSAS

(compiled in November 1977 by Dwight R. Platt, Department of Biology)

In the Bethel College Herbarium are 379 specimens of vascular plants collected in Harvey, Marion, McPherson Counties, Kansas, in the late nineteenth century. Only the Marion County specimens are included here. They were collected by J.G. Ewert in 1896.

In addition to Native Plants, and Weeds and Other Naturalized Plants included here, the original list included Garden and Field Crops, Cultivated Herbs, and Ornamental and Landscape Plants. The collection also includes 46 specimens collected in various of the three counties in 1889 and 1893 by G.A. Haury.

Authority for the botanical names and the introduced or native status of species in the list is:

McGregor, Ronald L., Ralph L. Brooks and Larry A. Hauser. 1976. Checklist of Kansas Vascular Plants. Technical Publ. State Biological Survey No. 2.

Common names of wild plants were mostly taken from:

Barkley, T.M., et al. 1977. Atlas of the Flora of the Great Plains. Iowa State University Press.

Botanical names, common names and country of origin of cultivated plants were taken, with a few exceptions, from:

Bailey, L.H. 1949. Manual of Cultivated Plants. MacMillan Publishing Co.

VASCULAR PLANTS

Scouring Rush Family (Equisetaceae)

1. Scouring Rush Equisetum hyemale
2. Smooth Horsetail Equisetum laevigatum

Poppy Family (Papaveraceae)

3. Prickly Poppy Argemone polyanthemos

Elm Family (Ulmaceae)

4. American Elm Ulmus americanus

Nettle Family (Urticaceae)

5. Stinging Nettle Urtica dioica

Goosefoot Family (Chenopodiaceae)

6. Pitseed Goosefoot Chenopodium berlandieri ?
7. Maple-leaved Goosefoot Chenopodium hybridum
8. Goosefoot Chenopodium pallescens
9. Winged Pigweed Cycloloma atriplicifolium

Pigweed Family (Amaranthaceae)
10. Tumbleweed Amaranthus albus
11. Tumbleweed Amaranthus graecizans

Buckwheat Family (Polygonaceae)
12. Pale Smartweed Polygonum lapathifolium
13. Pennsylvania Smartweed Polygonum pensylvanicum
14. Water Smartweed Polygonum punctatum
15. Bushy Knotweed Polygonum ramosissimum

Gourd Family (Cucurbitaceae)
16. Wild Cucumber Echinocystis lobata
17. Buffalo Gourd Cucurbita foetidissima

Willow Family (Salicaceae)
18. Cottonwood Populus deltoides

Rose Family (Rosaceae)
19. Dewberry Rubus flagellaris

Bean Family (Leguminosae)
20. Bundleflower Desmanthus illinoensis
21. Partridge Pea Cassia fasciculata
22. Leadplant Amorpha canescens
23. False Indigo Amorpha fruticosa
24. Silktop Dalea Dalea aurea
25. Illinois Tickclover Desmodium illinoense
26. Bush Clover Lespedeza capitata
27. White Prairie Clover Petalostemon candidum
28. Purple Prairie Clover Petalostemon purpureum
29. Round-headed Prairie Clover Petalostemon multiflorum
30. Smoothseed Wild Bean Strophostyles leiosperma

Evening Primrose Family (Onagraceae)
31. Ozark Sundrops Oenothera macrocarpa

Spurge Family (Euphorbiaceae)
32. One-seeded Croton Croton monanthogynous
33. Flowering Spurge Euphorbia corollata
34. Toothed Spurge Euphorbia dentata
35. Snow-on-the-Mountain Euphorbia marginata
36. Spurge Euphorbia nutans
37. Round-leaved Spurge Euphorbia serpens

Buckthorn Family (Rhamnaceae)
38. New Jersey Tea Ceanothus herbaceus var. pubescens

Grape Family (Vitaceae)
39. Virginia Creeper Parthenocissus quinquefolia ?

Cashew Family (Anacardiaceae)
40. Smooth Sumac Rhus glabra

Parsley Family (Umbelliferae)
41. Water Hemlock Cicuta maculata
42. Hemp Dogbane Apocynum cannabinum
43. Narrow-leaved Milkweed Asclepias stenophylla
44. Common Milkweed Asclepias syriaca
45. Butterfly Milkweed Asclepias tuberosa
46. Whorled Milkweed Asclepias verticillata
47. Green Milkweed Asclepias viridiflora

Nightshade Family (Solanaceae)
48. Clammy Ground Cherry Physalia heterophylla ?
49. Black Nightshade Solanum americanum
50. Horse Nettle Solanum dimidiatum

Convolvulus Family (Convolvulaceae)
51. Cluster Dodder Cuscuta glomerata
52. Smartweed Dodder Cuscuta polygonorum
53. Dodder Cuscuta sp.

Borage Family (Boraginaceae)
54. False Gromwell Onosmodium molle var. occidentale

Vervain Family (Verbenaceae)
55. Hoary Vervain Verbena stricta
56. Nettle-leaved Vervain Verbena urticifolia

Mint Family (Labiatae)
57. American Bugleweed Lycopus americanus
58. Wild Bergamot Monarda fistulosa
59. Pitcher's Sage Salvia pitcheri
60. Lance-Leaved Sage Salvia reflexa
61. Blue Skullcap Scutellaria lateriflora
62. American Germander Teucrium canadense

Plantain Family (Plantaginaceae)
63. Rugel's Plantain Plantago rugelii

Figwort Family (Scrophulariaceae)
64. Cobaea Penstemon Penstemon cobaea

Acanthus Family (Acanthaceae)
65. Fringe-leaf Ruellia Ruellia humilis

Bellflower Family (Campanulaceae)
66. Cardinal Flower Lobelia cardinalis

Madder Family (Rubiaceae)
67. Buttonbush Cephalanthus occidentalis
68. Narrowleaf Bluets Hedyotis nigricans

Honeysuckle Family (Caprifoliaceae)
69. Elderberry Sambucus canadensis
70. Buckbrush Symphoricarpos orbiculatus

Sunflower Family (Compositae)
71. Western Ragweed Ambrosia psilostachya ?
72. White or Heath Aster Aster ericoides
73. Aromatic Aster Aster oblongifolius
74. Tall Thistle Cirsium altissimum ?
75. Wavyleaf Thistle Cirsium undulatum
76. Plains Coreopsis Coreopsis tinctoria
77. Purple Coneflower Echinacea angustifolia
78. Stiff Sunflower Helianthus rigidus
79. False Boneset Kuhnia eupatorioides
80. Western Wild Lettuce Lactuca ludoviciana
81. Late Goldenrod Solidago gigantea
82. Prairie Goldenrod Solidago missouriensis
83. Rigid Goldenrod Solidago rigida
84. Cocklebur Xanthium strumarium

Spiderwort Family (Commelinaceae)
85. Erect Dayflower Commelina erecta ?

Sedge Family (Cyperaceae)
86. Soft-stem Bulrush Scirpus validus ?

Grass Family (Gramineae)
87. Buffalo Grass Buchloe dactyloides
88. Field Sandbur Cenchrus longispinus
89. Witchgrass Panicum capillare
90. Green Foxtail Setaria viridis

Cattail Family (Typhaceae)
91. Common Cattail Typha latifolia

Lily Family (Liliaceae)
92. Yucca Yucca glauca

INTRODUCED PLANTS

		Origin
1.	Apple-of-Peru Nicandra physaloides	Peru
2.	Carpetweed Mollugo verticillata	South America
3.	Common Knotweed Polygonum arenastrum	Europe
4.	Common Mallow Malva rotundifolia	Europe
5.	Common Purslane Portulaca oleracea	Europe
6.	Crabgrass Digitaria sanguinalis	Europe
7.	Field Bindweed Convolvulus arvensis	Eurasia
8.	Flower-of-an-Hour Hibiscus trionum	Europe
9.	Jimsonweed Datura stramonium	Tropical America
10.	Prickly Sida Sida spinosa	Tropics
11.	Rough Pigweed Amaranthus retroflexus	Tropical America
12.	Slender Pigweed Amaranthus hybridus	Tropical America
13.	Spiny Sow Thistle Sonchus asper	Europe
14.	Stinkgrass Eragrostis cilianensis	Europe
15.	Velvet-leaf Abutilon theophrasti	India
16.	Virginia Peppergrass Lepidium virginicum	Europe
17.	White Clover Trifolium repens	Europe
18.	Winter Cress Barbarea vulgaris	Europe
19.	Wild Buckwheat Polygonum convolvulus	Europe

Typist: Debra Nelson

VERTEBRATES OF MARION COUNTY as listed by the Kansas Biological Survey

1994 May 19

Scientific Name	Common Name	Federal Status	State Statu
		(Explanations end of list)	
***			
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		
BUFO COGNATUS	GREAT PLAINS TOAD		
BUFO WOODHOUSEI	WOODHOUSE'S TOAD		
ACRIS CREPITANS	NORTHERN CRICKET FROG		
PSEUDACRIS TRISERIATA	WESTERN CHORUS FROG		
GASTROPHRYNE OLIVACEA	GREAT PLAINS NARROWMOUTH TOAD		
SPEA BOMBIFRONS	PLAINS SPADEFOOT		
RANA BLAIRI	PLAINS LEOPARD FROG		
RANA CATESBEIANA	BULLFROG		
***			
GAVIA IMMER	COMMON LOON		
PODILYMBUS PODICEPS	PIED-BILLED GREBE		
PODICEPS AURITUS	HORNED GREBE		
PODICEPS NIGRICOLLIS	EARED GREBE		
PELECANUS ERYTHRORHYNCHOS	AMERICAN WHITE PELICAN		
PHALACROCORAX AURITUS	DOUBLE-CRESTED CORMORANT		
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN		
IXOBRYCHUS EXILIS	LEAST BITTERN		
ARDEA HERODIAS	GREAT BLUE HERON		
CASMERODIUS ALBUS	GREAT EGRET		
EGRETTA THULA	SNOWY EGRET		
EGRETTA CAERULEA	LITTLE BLUE HERON		
BUBULCUS IBIS	CATTLE EGRET		
BUTORIDES STRIATUS	GREEN-BACKED HERON		
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON		
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON		
ANSER ALBIFRONS	GREATER WHITE-FRONTED GOOSE		
CHEN CAERULESCENS	SNOW GOOSE		
CHEN ROSSII	ROSS' GOOSE		
BRANTA BERNICLA	BRANT		
BRANTA CANADENSIS	CANADA GOOSE		
AIX SPONSA	WOOD DUCK		
ANAS CRECCA	GREEN-WINGED TEAL		
ANAS RUBRIPES	AMERICAN BLACK DUCK		
ANAS PLATYRHYNCHOS	MALLARD		
ANAS ACUTA	NORTHERN PINTAIL		
ANAS DISCORS	BLUE-WINGED TEAL		
ANAS CLYPEATA	NORTHERN SHOVELER		
ANAS STREPERA	GADWALL		
ANAS AMERICANA	AMERICAN WIGEON		
AYTHYA VALISINERIA	CANVASBACK		
AYTHYA AMERICANA	REDHEAD		
AYTHYA COLLARIS	RING-NECKED DUCK		
AYTHYA MARILA	GREATER SCAUP		

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Vertebrates of Marion County

Scientific Name	Common Name	Federal Status	State Statu
AYTHYA AFFINIS	LESSER SCAUP		
MELANITTA FUSCA	WHITE-WINGED SCOTER		
BUCEPHALA CLANGULA	COMMON GOLDENEYE		
BUCEPHALA ALBEOLA	BUFFLEHEAD		
LOPHODYTES CUCULLATUS	HOODED MERGANSER		
MERGUS MERGANSER	COMMON MERGANSER		
OXYURA JAMAICENSIS	RUDDY DUCK		
CATHARTES AURA	TURKEY VULTURE		
PANDION HALIAETUS	OSPREY		
ICTINIA MISSISSIPPIENSIS	MISSISSIPPI KITE		
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LELT	E
CIRCUS CYANEUS	NORTHERN HARRIER		
ACCIPITER STRIATUS	SHARP-SHINNED HAWK		
ACCIPITER COOPERII	COOPER'S HAWK		
BUTEO PLATYPTERUS	BROAD-WINGED HAWK		
BUTEO SWAINSONI	SWAINSON'S HAWK	3C	
BUTEO JAMAICENSIS	RED-TAILED HAWK		
BUTEO REGALIS	FERRUGINOUS HAWK	C2	C
BUTEO LAGOPUS	ROUGH-LEGGED HAWK		
FALCO SPARVERIUS	AMERICAN KESTREL		
FALCO COLUMBARIUS	MERLIN		
FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E
FALCO MEXICANUS	PRAIRIE FALCON		
PHASIANUS COLCHICUS	RING-NECKED PHEASANT		
TYMPANUCHUS CUPIDO	GREATER PRAIRIE-CHICKEN		
MELEAGRIS GALLOPAVO	WILD TURKEY		
COLINUS VIRGINIANUS	NORTHERN BOBWHITE		
LATERALLUS JAMAICENSIS	BLACK RAIL	C2	C
RALLUS ELEGANS	KING RAIL		
RALLUS LIMICOLA	VIRGINIA RAIL		
PORZANA CAROLINA	SORA		
FULICA AMERICANA	AMERICAN COOT		
GRUS CANADENSIS	SANDHILL CRANE		
GRUS AMERICANA	WHOOPING CRANE	LE	E
PLUVIALIS SQUATAROLA	BLACK-BELLIED PLOVER		
PLUVIALIS DOMINICA	LESSER GOLDEN-PLOVER		
CHARADRIUS ALEXANDRINUS	SNOWY PLOVER		T
CHARADRIUS SEMIPALMATUS	SEMIPALMATED PLOVER		
CHARADRIUS VOCIFERUS	KILLDEER		
HIMANTOPUS MEXICANUS	BLACK-NECKED STILT		
RECURVIROSTRA AMERICANA	AMERICAN AVOCET		
TRINGA MELANOLEUCA	GREATER YELLOWLEGS		
TRINGA FLAVIPES	LESSER YELLOWLEGS		
TRINGA SOLITARIA	SOLITARY SANDPIPER		
CATOPTROPHORUS SEMIPALMATUS	WILLET		
ACTITIS MACULARIA	SPOTTED SANDPIPER		
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		
LIMOSA HAEMASTICA	HUDSONIAN GODWIT		
LIMOSA FEDOA	MARBLED GODWIT		
CALIDRIS ALBA	SANDERLING		

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Vertebrates of Marion County

Scientific Name	Common Name	Federal Status	State Status
CALIDRIS PUSILLA	SEMIPALMATED SANDPIPER		
CALIDRIS MAURI	WESTERN SANDPIPER		
CALIDRIS MINUTILLA	LEAST SANDPIPER		
CALIDRIS FUSCICOLLIS	WHITE-RUMPED SANDPIPER		
CALIDRIS BAIRDII	BAIRD'S SANDPIPER		
CALIDRIS MELANOTOS	PECTORAL SANDPIPER		
CALIDRIS ALPINA	DUNLIN		
CALIDRIS HIMANTOPUS	STILT SANDPIPER		
TRYNGITES SUBRUFICOLLIS	BUFF-BREASTED SANDPIPER		
LIMNODROMUS SCOLOPACEUS	LONG-BILLED DOWITCHER		
GALLINAGO GALLINAGO	COMMON SNIPE		
SCOLOPAX MINOR	AMERICAN WOODCOCK		
PHALAROPUS TRICOLOR	WILSON'S PHALAROPE		
PHALAROPUS LOBATUS	RED-NECKED PHALAROPE		
LARUS ATRICILLA	LAUGHING GULL		
LARUS PIPIXCAN	FRANKLIN'S GULL		
LARUS PHILADELPHIA	BONAPARTE'S GULL		
LARUS DELAWARENSIS	RING-BILLED GULL		
LARUS ARGENTATUS	HERRING GULL		
LARUS HYPERBOREUS	GLAUCOUS GULL		
XEMA SABINI	SABINE'S GULL		
STERNA CASPIA	CASPIAN TERN		
STERNA FORSTERI	FORSTER'S TERN		
STERNA ANTILLARUM	LEAST TERN		E
CHLIDONIAS NIGER	BLACK TERN	C2	C
TYTO ALBA	BARN OWL		
OTUS ASIO	EASTERN SCREECH-OWL		
BUBO VIRGINIANUS	GREAT HORNED OWL		
NYCTEA SCANDIACA	SNOWY OWL		
SPEOTYTO CUNICULARIA	BURROWING OWL		
STRIX VARIA	BARRED OWL		
ASIO OTUS	LONG-EARED OWL		
ASIO FLAMMEUS	SHORT-EARED OWL		C
CHORDEILES MINOR	COMMON NIGHTHAWK		
PHALAENOPTILUS NUTTALLII	COMMON POORWILL		
CHAETURA PELAGICA	CHIMNEY SWIFT		
ARCHILOCHUS COLUBRIS	RUBY-THROATED HUMMINGBIRD		
CERYLE ALCYON	BELTED KINGFISHER		
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		
MELANERPES CAROLINUS	RED-BELLIED WOODPECKER		
SPHYRAPICUS VARIUS	YELLOW-BELLIED SAPSUCKER		
PICOIDES PUBESCENS	DOWNY WOODPECKER		
CONTOPUS BOREALIS	OLIVE-SIDED FLYCATCHER		
CONTOPUS SORDIDULUS	WESTERN WOOD-PEWEE		
EMPIDONAX TRAILLII	WILLOW FLYCATCHER		
EMPIDONAX MINIMUS	LEAST FLYCATCHER		
SAYORNIS PHOEBE	EASTERN PHOEBE		
MYIARCHUS CRINITUS	GREAT CRESTED FLYCATCHER		
TYRANNUS FORFICATUS	SCISSOR-TAILED FLYCATCHER		
EREMOPHILA ALPESTRIS	HORNED LARK		

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Vertebrates of Marion County

Scientific Name	Common Name	Federal Status	Sta Sta
STELGIDOPTERYX SERRIPENNIS	NORTHERN ROUGH-WINGED SWALLOW		
RIPARIA RIPARIA	BANK SWALLOW		
CYANOCITTA CRISTATA	BLUE JAY		
GYMNORHINUS CYANOCEPHALUS	PINYON JAY		
NUCIFRAGA COLUMBIANA	CLARK'S NUTCRACKER		
PICA PICA	BLACK-BILLED MAGPIE		
PARUS BICOLOR	TUFTED TITMOUSE		
SITTA CANADENSIS	RED-BREASTED NUTHATCH		
CERTHIA AMERICANA	BROWN CREEPER		
TROGLODYTES AEDON	HOUSE WREN		
TROGLODYTES TROGLODYTES	WINTER WREN		
REGULUS SATRAPA	GOLDEN-CROWNED KINGLET		
REGULUS CALENDULA	RUBY-CROWNED KINGLET		
SIALIA SIALIS	EASTERN BLUEBIRD		
SIALIA CURRUCOIDES	MOUNTAIN BLUEBIRD		
MYADESTES TOWNSENDI	TOWNSEND'S SOLITAIRE		
CATHARUS FUSCESCENS	VEERY		
CATHARUS MINIMUS	GRAY-CHEEKED THRUSH		
CATHARUS USTULATUS	SWAINSON'S THRUSH		
HYLOCICHLA MUSTELINA	WOOD THRUSH		
TURDUS MIGRATORIUS	AMERICAN ROBIN		
LANIUS LUDOVICIANUS	LOGGERHEAD SHRIKE	C2	
STURNUS VULGARIS	EUROPEAN STARLING		
VIREO GRISEUS	WHITE-EYED VIREO		
VIREO BELLII	BELL'S VIREO		
VIREO SOLITARIUS	SOLITARY VIREO		
VIREO GILVUS	WARBLING VIREO		
VIREO PHILADELPHICUS	PHILADELPHIA VIREO		
VIREO OLIVACEUS	RED-EYED VIREO		
VERMIVORA PINUS	BLUE-WINGED WARBLER		
VERMIVORA CHRYSOPTERA	GOLDEN-WINGED WARBLER		
VERMIVORA PEREGRINA	TENNESSEE WARBLER		
VERMIVORA CELATA	ORANGE-CROWNED WARBLER		
VERMIVORA RUFICAPILLA	NASHVILLE WARBLER		
PARULA AMERICANA	NORTHERN PARULA		
DENDROICA PETECHIA	YELLOW WARBLER		
DENDROICA PENSYLVANICA	CHESTNUT-SIDED WARBLER		
DENDROICA MAGNOLIA	MAGNOLIA WARBLER		
DENDROICA CORONATA	YELLOW-RUMPED WARBLER		
DENDROICA VIRENS	BLACK-THROATED GREEN WARBLER		
DENDROICA FUSCA	BLACKBURNIAN WARBLER		
DENDROICA PALMARUM	PALM WARBLER		
DENDROICA CASTANEA	BAY-BREASTED WARBLER		
DENDROICA STRIATA	BLACKPOLL WARBLER		
MNIOTILTA VARIA	BLACK-AND-WHITE WARBLER		
SETOPHAGA RUTICILLA	AMERICAN REDSTART		
HELMITHEROS VERMIVORUS	WORM-EATING WARBLER		
SEIURUS AUROCAPILLUS	OVENBIRD		
SEIURUS NOVEBORACENSIS	NORTHERN WATERTHRUSH		
SEIURUS MOTACILLA	LOUISIANA WATERTHRUSH		

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Vertebrates of Marion County

Scientific Name	Common Name	Federal Status	State Statu
OPORORNIS FORMOSUS	KENTUCKY WARBLER		
OPORORNIS PHILADELPHIA	MOURNING WARBLER		
GEOTHLYPIS TRICHAS	COMMON YELLOWTHROAT		
WILSONIA PUSILLA	WILSON'S WARBLER		
ICTERIA VIRENS	YELLOW-BREASTED CHAT		
CARDINALIS CARDINALIS	NORTHERN CARDINAL		
PHEUCTICUS LUDOVICIANUS	ROSE-BREASTED GROSBEAK		
GUIRACA CAERULEA	BLUE GROSBEAK		
PASSERINA CYANEA	INDIGO BUNTING		
PASSERINA CIRIS	PAINTED BUNTING		
SPIZA AMERICANA	DICKCISSEL		
PIPILO ERYTHROPHTHALMUS	RUFOUS-SIDED TOWHEE		
SPIZELLA ARBOREA	AMERICAN TREE SPARROW		
SPIZELLA PASSERINA	CHIPPING SPARROW		
SPIZELLA PALLIDA	CLAY-COLORED SPARROW		
SPIZELLA PUSILLA	FIELD SPARROW		
POOECETES GRAMINEUS	VESPER SPARROW		
CHONDESTES GRAMMACUS	LARK SPARROW		
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		
AMMODRAMUS BAIRDII	BAIRD'S SPARROW	C2	
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW	C2	C
AMMODRAMUS LECONTEII	LE CONTE'S SPARROW		
PASSERELLA ILIACA	FOX SPARROW		
MELOSPIZA MELODIA	SONG SPARROW		
MELOSPIZA LINCOLNII	LINCOLN'S SPARROW		
MELOSPIZA GEORGIANA	SWAMP SPARROW		
ZONOTRICHIA ALBICOLLIS	WHITE-THROATED SPARROW		
ZONOTRICHIA LEUCOPHRYS	WHITE-CROWNED SPARROW		
ZONOTRICHIA QUERULA	HARRIS' SPARROW		
JUNCO HYEMALIS	DARK-EYED JUNCO		
CALCARIUS LAPPONICUS	LAPLAND LONGSPUR		
CALCARIUS PICTUS	SMITH'S LONGSPUR		
CALCARIUS ORNATUS	CHESTNUT-COLLARED LONGSPUR		
DOLICHONYX ORYZIVORUS	BOBOLINK		C
AGELAIUS PHOENICEUS	RED-WINGED BLACKBIRD		
STURNELLA MAGNA	EASTERN MEADOWLARK		
STURNELLA NEGLECTA	WESTERN MEADOWLARK		
XANTHOCEPHALUS XANTHOCEPHALUS	YELLOW-HEADED BLACKBIRD		
EUPHAGUS CAROLINUS	RUSTY BLACKBIRD		
EUPHAGUS CYANOCEPHALUS	BREWER'S BLACKBIRD		
QUISCALUS MEXICANUS	GREAT-TAILED GRACKLE		
QUISCALUS QUISCULA	COMMON GRACKLE		
MOLOTHRUS ATER	BROWN-HEADED COWBIRD		
ICTERUS SPURIUS	ORCHARD ORIOLE		
ICTERUS GALBULA	NORTHERN ORIOLE		
CARPODACUS PURPUREUS	PURPLE FINCH		
LOXIA CURVIROSTRA	RED CROSSBILL		
CARDUELIS FLAMMEA	COMMON REDPOLL		
CARDUELIS PINUS	PINE SISKIN		

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Scientific Name	Common Name	Federal Status	State Statu
CARDUELIS TRISTIS	AMERICAN GOLDFINCH		
PASSER DOMESTICUS	HOUSE SPARROW		
***			
DIDELPHIS VIRGINIANA	VIRGINIA OPOSSUM		
CRYPTOTIS PARVA	LEAST SHREW		
SCALOPUS AQUATICUS	EASTERN MOLE		
MYOTIS LUCIFUGUS	LITTLE BROWN MYOTIS		
MYOTIS SEPTENTRIONALIS	NORTHERN LONG-EARED MYOTIS		
EPTESICUS FUSCUS	BIG BROWN BAT		
LASIURUS BOREALIS	RED BAT		
LASIURUS CINEREUS	HOARY BAT		
NYCTICEIUS HUMERALIS	EVENING BAT		
TADARIDA BRASILIENSIS	BRAZILIAN FREE-TAILED BAT		
DASYPUS NOVEMCINCTUS	NINE-BANDED ARMADILLO		
SYLVILAGUS FLORIDANUS	EASTERN COTTONTAIL		
LEPUS CALIFORNICUS	BLACK-TAILED JACK RABBIT		
MARMOTA MONAX	WOODCHUCK		
SPERMOPHILUS TRIDECEMLINEATUS	THIRTEEN-LINED GROUND SQUIRREL		
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL		C
CYNOMYS LUDOVICIANUS	BLACK-TAILED PRAIRIE DOG		
SCIURUS NIGER	FOX SQUIRREL		
GEOMYS BURSARIUS	PLAINS POCKET GOPHER		
PEROGNATHUS FLAVESCENS	PLAINS POCKET MOUSE		
CHAETODIPUS HISPIDUS	HISPID POCKET MOUSE		
CASTOR CANADENSIS	BEAVER		
REITHRODONTOMYS MONTANUS	PLAINS HARVEST MOUSE		
REITHRODONTOMYS MEGALOTIS	WESTERN HARVEST MOUSE		
PEROMYSCUS MANICULATUS	DEER MOUSE		
PEROMYSCUS LEUCOPUS	WHITE-FOOTED MOUSE		
ONYCHOMYS LEUCOGASTER	NORTHERN GRASSHOPPER MOUSE		
SIGMODON HISPIDUS	HISPID COTTON RAT		
NEOTOMA FLORIDANA	EASTERN WOODRAT		
MICROTUS OCHROGASTER	PRAIRIE VOLE		
MICROTUS PINETORUM	WOODLAND VOLE		
ONDATRA ZIBETHICUS	MUSKRAT		
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING		C
ZAPUS HUDSONIUS	MEADOW JUMPING MOUSE		
ERETHIZON DORSATUM	PORCUPINE		
CANIS LATRANS	COYOTE		
VULPES VULPES	RED FOX		
UROCYON CINEREOARGENTEUS	GRAY FOX		
PROCYON LOTOR	RACCOON		
MUSTELA NIVALIS	LEAST WEASEL		
MUSTELA FRENATA	LONG-TAILED WEASEL		
MUSTELA VISON	MINK		
TAXIDEA TAXUS	BADGER		
SPILOGALE PUTORIUS	EASTERN SPOTTED SKUNK		T
MEPHITIS MEPHITIS	STRIPED SKUNK		
FELIS CONCOLOR	MOUNTAIN LION		

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Vertebrates of Marion County

Scientific Name	Common Name	Federal Status	Sta Sta
ODOCOILEUS VIRGINIANUS	WHITE-TAILED DEER		
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LEPISOSTEUS OSSEUS	LONGNOSE GAR		
DOROSOMA CEPEDIANUM	GIZZARD SHAD		
CAMPOSTOMA ANOMALUM	CENTRAL STONEROLLER		
CARASSIUS AURATUS	GOLDFISH		
CTENOPHARYNGODON IDELLA	GRASS CARP		
CYPRINUS CARPIO	COMMON CARP		
NOCOMIS ASPER	REDSPOT CHUB		T
NOTEMIGONUS CRYSOLEUCAS	GOLDEN SHINER		
NOTROPIS BUCHANANI	GHOST SHINER		
NOTROPIS RUBELLUS	ROSYFACE SHINER		
NOTROPIS STRAMINEUS	SAND SHINER		
NOTROPIS TOPEKA	TOPEKA SHINER	C2	C
PHENACOBIUS MIRABILIS	SUCKERMOUTH MINNOW		
PIMEPHALES NOTATUS	BLUNTNOSE MINNOW		
PIMEPHALES PROMELAS	FATHEAD MINNOW		
PIMEPHALES TENELLUS	SLIM MINNOW		
SEMOTILUS ATROMACULATUS	CREEK CHUB		
CYPRINELLA CAMURA	BLUNTFACE SHINER		
CYPRINELLA LUTRENSIS	RED SHINER		
ERIMYSTAX X-PUNCTATUS	GRAVEL CHUB		C
LYTHRURUS UMBRATILIS	REDFIN SHINER		
CARPIODES CARPIO	RIVER CARPSUCKER		
ICTIOBUS BUBALUS	SMALLMOUTH BUFFALO		
ICTIOBUS CYPRINELLUS	BIGMOUTH BUFFALO		
ICTIOBUS NIGER	BLACK BUFFALO		
MINYTREMA MELANOPS	SPOTTED SUCKER		C
MOXOSTOMA ERYTHRURUM	GOLDEN REDHORSE		
MOXOSTOMA MACROLEPIDOTUM	SHORTHEAD REDHORSE		
ICTALURUS FURCATUS	BLUE CATFISH		
ICTALURUS PUNCTATUS	CHANNEL CATFISH		
NOTURUS FLAVUS	STONECAT		
NOTURUS NOCTURNUS	FRECKLED MADTOM		
PYLODICTIS OLIVARIS	FLATHEAD CATFISH		
AMEIURUS MELAS	BLACK BULLHEAD		
AMEIURUS NATALIS	YELLOW BULLHEAD		
FUNDULUS NOTATUS	BLACKSTRIPE TOPMINNOW		
FUNDULUS ZEBRINUS	PLAINS KILLIFISH		
GAMBUSIA AFFINIS	WESTERN MOSQUITOFISH		
LABIDESTHES SICCULUS	BROOK SILVERSIDE		
MORONE CHRYSOPS	WHITE BASS		
LEPOMIS CYANELLUS	GREEN SUNFISH		
LEPOMIS HUMILIS	ORANGESPOTTED SUNFISH		
LEPOMIS MACROCHIRUS	BLUEGILL		
LEPOMIS MEGALOTIS	LONGEAR SUNFISH		
MICROPTERUS DOLOMIEU	SMALLMOUTH BASS		
MICROPTERUS PUNCTULATUS	SPOTTED BASS		
MICROPTERUS SALMOIDES	LARGEMOUTH BASS		

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Vertebrates of Marion County

Scientific Name	Common Name	Federal Status	Sta Sta
POMOXIS ANNULARIS	WHITE CRAPPIE		
POMOXIS NIGROMACULATUS	BLACK CRAPPIE		
ETHEOSTOMA FLABELLARE	FANTAIL DARTER		
ETHEOSTOMA SPECTABILE	ORANGETHROAT DARTER		
PERCA FLAVESCENS	YELLOW PERCH		
PERCINA CAPRODES	LOGPERCH		
PERCINA COPELANDI	CHANNEL DARTER		
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER		
STIZOSTEDION VITREUM	WALLEYE		
APLODINOTUS GRUNNIENS	FRESHWATER DRUM		
***			
CHELYDRA SERPENTINA	SNAPPING TURTLE		
MACROCLEMYS TEMMINCKII	ALLIGATOR SNAPPING TURTLE	C2	C
CHRYSEMYS PICTA	PAINTED TURTLE		
PSEUDEMYS CONCINNA	RIVER COOTER		
TERRAPENE ORNATA	ORNATE BOX TURTLE		
TRACHEMYS SCRIPTA	SLIDER		
KINOSTERNON FLAVESCENS	YELLOW MUD TURTLE		
APALONE MUTICA	SMOOTH SOFTSHELL		
APALONE SPINIFERA	SPINY SOFTSHELL		
OPHISAURUS ATTENUATUS	WESTERN SLENDER GLASS LIZARD		
CROTAPHYTUS COLLARIS	COLLARED LIZARD		
HOLBROOKIA MACULATA	LESSER EARLESS LIZARD		
PHRYNOSOMA CORNUTUM	TEXAS HORNED LIZARD	C2	
SCELOPORUS UNDULATUS	PRAIRIE LIZARD		
EUMECES FASCIATUS	FIVE-LINED SKINK		
EUMECES SEPTENTRIONALIS	PRAIRIE SKINK		
EUMECES OBSOLETUS	GREAT PLAINS SKINK		
SCINCELLA LATERALIS	GROUND SKINK		
CNEMIDOPHORUS SEXLINEATUS	SIX-LINED RACERUNNER		
CARPHOPHIS AMOENUS	WESTERN WORM SNAKE		
COLUBER CONSTRICTOR	RACER		
DIADOPHIS PUNCTATUS	RINGNECK SNAKE		
ELAPHE GUTTATA	GREAT PLAINS RAT SNAKE		
ELAPHE OBSOLETA	RAT SNAKE		
HETERODON NASICUS	WESTERN HOGNOSE SNAKE		C
HETERODON PLATIRHINOS	EASTERN HOGNOSE SNAKE		C
LAMPROPELTIS CALLIGASTER	PRAIRIE KINGSNAKE		
LAMPROPELTIS GETULA	COMMON KINGSNAKE		
LAMPROPELTIS TRIANGULUM	MILK SNAKE		
NERODIA ERYTHROGASTER	PLAINBELLY WATER SNAKE		
NERODIA RHOMBIFER	DIAMONDBACK WATER SNAKE		
NERODIA SIPEDON	NORTHERN WATER SNAKE		
PITUOPHIS MELANOLEUCUS	GOPHER SNAKE		
REGINA GRAHAMII	GRAHAM'S CRAYFISH SNAKE		
SONORA SEMIANNULATA	GROUND SNAKE		
STORERIA DEKAYI	BROWN SNAKE		
TANTILLA GRACILIS	FLATHEAD SNAKE		
TANTILLA NIGRICEPS	PLAINS BLACKHEAD SNAKE		

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Scientific Name	Common Name	Federal Status	Stat Stat
THAMNOPHIS PROXIMUS	WESTERN RIBBON SNAKE		
THAMNOPHIS RADIX	PLAINS GARTER SNAKE		
THAMNOPHIS SIRTALIS	COMMON GARTER SNAKE		
TROPIDOCLONION LINEATUM	LINED SNAKE		
AGKISTRODON CONTORTRIX	COPPERHEAD		
CROTALUS HORRIDUS	TIMBER RATTLESNAKE		C
SISTRURUS CATENATUS	MASSASAUGA		

396 Records Processed

EXPLANATION OF FEDERAL AND STATE STATUS CODES

Federal[1]

LE = Listed Endangered

PE = Proposed for listing as Endangered

LT = Listed Threatened

PT = Proposed for listing as Threatened

LELT = Listed Endangered in some regions and listed Threatened in other regions

C1 = Category 1 species for listing. Species determined to be in need of protection by listing the species as Endangered or Threatened.

C2 = Category 2 species for listing. Species needs additional study to determine whether it should be listed as Threatened or Endangered.

C2* = Category 2 species recommended for elevation to C1 status

3C = Category 3 species. Evidence indicates the species does not warrant listing as Threatened or Endangered.

SA = Accidental or Causal

State[2]

E = Endangered

T = Threatened

C = Species In Need of Conservation

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[1] Status determined by U.S. Fish & Wildlife Service, Office of Endangered Species

[2] Status determined by Kansas Department of Wildlife & Parks, RR 2 Box 54A, Pratt, KS 67124

BIRDS OBSERVED IN MARION COUNTY, KANSAS, ACCORDING TO FOUR OCCASIONAL BIRD WATCHERS AS OF JUNE 1994.

Notations apply to nearby Lyon County, Kansas, as of June 1984 according to Emporia State University, Division of Biological Sciences.

M=Migrant (Spring and Fall)	V=Visitant (irruptive)
P=Permanent (nonmigrant)	W=Winter
R=Resident (nests in Kansas)	1=Common
*=Lyon County nest record	2=Uncommon/regionally common
S=Summer	3=Rare/locally common

GAVIIFORMES
Gaviidae
Common Loon M2

PODICIPEDIFORMES
Podicipedidae
Eared Grebe M2,SV3
Pied-billed Grebe MSR2,W3

PELECANIFORMES
Pelecanidae
American White Pelican M1
Brown Pelican (Durham Cove)
Phalacrocoracidae
Double-crested Cormorant M1,SR3

CICONIIFORMES
Ardeidae
Great Blue Heron W2,MSR1*
Green-backed Heron MSR1*
Cattle Egret MSR3,SV2
Great Egret MSR3
Snowy Egret MSR3
Black-crowned Night-Heron MSR2
Yellow-crowned Night-Heron MSR3
Least Bittern MSR2*
American Bittern MSR3
Threskiornithidae
Glossy Ibis (Hillsboro Cove)

ANSERIFORMES
Anatidae
Canada Goose M1,WSR3
Greater White-fronted Goose M1
Snow "Blue" Goose M1
Mallard MWSR1*
Gadwall M1,WSR3
Northern Pintail M1,WSR2
Green-winged Teal M1,WSR3
Blue-winged Teal M1,SR2
Cinnamon Teal MSR3
American Wigeon M1
Northern Shoveler M1,SR3
Wood Duck MSR2*
Redhead MW2,SR3
Ring-necked Duck M2
Canvasback M2
Greater Scaup M3
Lesser Scaup M1,W2
Common Goldeneye MW2
Bufflehead M2
Ruddy Duck M1,SR3
Hooded Merganser MW2,SR3
Common Merganser MW1

FALCONIFORMES
Carthartidae
Turkey Vulture MSR1*
Accipitridae
Osprey M2
Northern Goshawk WV3
Sharp-shinned Hawk MW2
Cooper's Hawk MWSR2
Red-tailed Hawk MWSR1*
Red-shouldered Hawk MSR3
Broad-winged Hawk MSR3

Swainson's Hawk MSR1*
Rough-legged Hawk MW1
Golden Eagle MW2,SR3
Bald Eagle MW2
Northern Harrier MWSR2*
Falconidae
Peregrine Falcon M3
American Kestrel MWSR1*

GALLIFORMES
Phasianidae
Greater Prairie-Chicken PR1*
Lesser Prairie-Chicken PR2
Northern Bobwhite PR1*
Ring-necked Pheasant PR1*
Scaled Quail PR3
Wild Turkey PR2

GRUIFORMES
Gruidae
Whooping Crane M3
Sandhill Crane M2
Rallidae
Sora MSR2
American Coot M2,WSR3

CHARADRIIFORMES
Recurvirostridae
American Avocet MSR2
Charadriidae
Killdeer W2,MSR1*
Scolopacidae
Long-billed Curlew MSR3
Upland Sandpiper MSR1*
Greater Yellowlegs M1
Lesser Yellowlegs M1
Solitary Sandpiper M1
American Woodcock MSR3*
Common Snipe MW3
Short-billed Dowitcher M3
Long-billed Dowitcher M2
Semipalmated Sandpiper M1
Western Sandpiper M2
Least Sandpiper M1
Pectoral Sandpiper M2
Laridae
Herring Gull M2
Ring-billed Gull MW1
Franklin's Gull M1,SV2
Bonaparte's Gull M3
Common Tern MSR3
Black Tern MSR3,SV2

COLUMBIFORMES
Columbidae
Rock Dove "Pigeon" PR1*
Mourning Dove MWSR1*

CUCULIFORMES
Cuculidae
Yellow-billed Cuckoo MSR1*
Back-billed Cuckoo MSR2*

STRIGIFORMES
Strigidae
Eastern Screech-Owl PR1*
Great Horned Owl PR1*
Snowy Owl WV3
Burrowing Owl MSR3
Barred Owl PR2*
Long-eared Owl MWSR2

CAPRIMULGIFORMES
Caprimulgidae
Whip-poor-will MSR3
Common Nighthawk MSR1*

APODIFORMES
Apodidae
Chimney Swift MSR1*
Trochilidae
Ruby-throated Hummingbird MSR2*

CORACIIFORMES
Alcedinidae
Belted Kingfisher MWSR2*

PICIFORMES
Picidae
Northern Flicker PR1*
Red-bellied Woodpecker PR1*
Red-headed Woodpecker W3,MSR1*
Yellow-bellied Sapsucker MW2
Hairy Woodpecker PR1*
Downy Woodpecker PR1*

PASSERIFORMES
Tyrannidae
Eastern Kingbird MSR1*
Western Kingbird MSR1*
Scissor-tailed Flycatcher MSR1*
Eastern Phoebe MSR1*
Alaudidae
Horned Lark MWSR1*
Hirundinidae
Tree Swallow MSR3
Northern Rough-winged Swallow MSR1*
Barn Swallow MSR1*
Cliff Swallow MSR2
Purple Martin MSR1*
Corvidae
Blue Jay PR1*
Black-billed Magpie PR2
American Crow MWSR1*
Paridae
Black-capped Chickadee PR1*
Tufted Titmouse PR2*
Sittidae
White-breast Nuthatch PR2*
Red-breast Nuthatch MW2
Certhiidae
Brown Creeper MW2
Troglodytidae
House Wren MSR1*
Carolina Wren PR2*
Muscicapidae
Ruby-crowned Kinglet MW3
American Robin MWSR1*
Wood Thrush MSR2*
Hermit Thrush MW3
Swainson's Thrush M1
Eastern Bluebird MSR1*,W3
Mimidae
Northern Mockingbird PR1*
Gray Catbird MSR1*
Brown Thrasher MSR1*
Bombycillidae
Cedar Waxwing MW1
Laniidae
Loggerhead Shrike MWSR1*
Sturnidae
European Starling MWSR1*
Vireonidae
Warbling Vireo MSR1*
Emberizidae
Yellow Warbler MSR2*
Yellow-rumped Warbler M2,W3
Cerulean Warbler M2
Northern Cardinal PR1*
Indigo Bunting MSR1*
Painted Bunting MSR3
Dickcissel MSR1*
Rufous-sided Towhee MWSR2*
Lark Bunting MSR2
Grasshopper Sparrow MSR1*
Lark Sparrow MSR1*
Dark-eyed Junco MW1
American Tree Sparrow MW1
Chipping Sparrow MSR2
Field Sparrow W2,MSR1*
Harris' Sparrow MW1
White-crowned Sparrow MW1
White-throated Sparrow MW2
Fox Sparrow M2,W3
Lincoln's Sparrow MW2
Song Sparrow MW1
Eastern Meadowlark MWSR1*
Western Meadowlark MWSR1*
Yellow-headed Blackbird MSR2
Red-winged Blackbird MWSR1*
Rusty Blackbird MW2
Brewer's Blackbird MW2
Great-tailed Grackle MSWR2*

Common Grackle MWSR1*
Brown-headed Cowbird MWSR1*
Orchard Oriole MSR1*
Northern Oriole MSR1*
Fringillidae
Purple Finch MW3
House Finch MSR3
Pine Siskin MW2,SR3*
American Goldfinch MWSR1*
Passeridae
House Sparrow PR1*

Observers: Paul Jantzen, Hillsboro,compiler; Dave Ranney, Hillsboro; Dale Snell, Lake Manager, Marion County Lake; Neal Whitaker, Park Ranger, Marion Reservoir. Typist: Judy Goering.