

AMPHIBIANS, REPTILES and TURTLES

of the
Cimarron National Grassland
Kansas

Second (Revised) Edition

Joseph T. Collins | Suzanne L. Collins | Travis W. Taggart



U.S. Forest Service
The Center for North American Herpetology

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The Center for North American Herpetology, Lawrence, Kansas.

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By

Joseph T. Collins
Kansas Biological Survey
The University of Kansas
Lawrence

Suzanne L. Collins
The Center for
North American Herpetology
Lawrence

Travis W. Taggart
Sternberg Museum of Natural History
Fort Hays State University
Hays

With Photographs by Suzanne L. Collins



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U.S. Forest Service, U.S. Department of Agriculture



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The Center for North American Herpetology



To

Joseph F. Hartman

for his Dedication

to Conserving the

Cimarron National Grassland



PREFACE

Since the appearance of *Reptiles and Amphibians of the Cimarron National Grassland, Morton County, Kansas* (Collins and Collins, 1991), new information has accumulated on the diversity, distribution and biology of amphibians, reptiles, and turtles native to our state, including those known to inhabit the Cimarron National Grassland. Through the efforts of various field-oriented individuals and a search of major North American herpetological collections, we now have a more precise knowledge of the distribution of these animals in the southwestern part of the state. More articles have been published since 1991 that refer to amphibians, reptiles, and turtles in the Cimarron River Valley, and the data contained in them has permitted us to refine and clarify the information contained herein for most of the accounts of Grassland species. Articles with direct reference to amphibians, reptiles, and turtles in the Grassland or in Morton County, Kansas, are listed in the bibliography at the end of this book.

This book is about the 32 species of amphibians, reptiles, and turtles known to occur, either now or in the past, in the Cimarron National Grassland of Morton County, Kansas. Although the increase in diversity since 1991 was only one species (Speckled Kingsnake), the numerous additional localities recorded for these animals in the Grassland more than merits a new edition of the book, and allows us to include distribution maps, a feature that was not in the prior edition. We have written this book to provide knowledge about the amphibians, reptiles, and turtles found in the Grassland, so that residents of and visitors to the southwestern part of the state will have a readily available source of current information about these animals. The bibliography, list of current scientific and common names, and endangered or threatened species designations, may be useful to biologists and historians, but this book is written primarily for the people who will visit the Grassland, in the hope that they will be stimulated to learn more about the amphibians, reptiles, and turtles of this rugged and scenic area, and will appreciate the natural place of these creatures in such an environment.

During the last two decades we have re-visited the Grassland on a number of occasions, exploring its canyons and prairies, and observing amphibians, reptiles, and turtles at every opportunity. All of the photographs of amphibians, reptiles, and turtles for this book were taken by one of us (SLC), and most were of Kansas examples of amphibians, reptiles, and turtles; all other images and figures are the work of TWT. We are indebted to a number of people for their companionship and field assistance. They are the late Ray E. Ashton, the late Frank B. Cross, Errol D. Hooper, Jr., Kelly J. Irwin, C. E. Judd, the late Alan H. Kamb, Steve Kamb, Larry L. Miller, Randall E. Moss, Curtis J. Schmidt, and Terry D. Schwaner. We are most grateful to these individuals, for without their help and encouragement the writing of this book would have been much more difficult. In addition, we acknowledge the Kansas Herpetological Society, whose 2000 spring field trip to the Grassland provided many new locality records for most of the species known from there.

Jenny Taggart demonstrated extraordinary forbearance and patience as one of us (TWT) spent long hours in the field.

Many of our colleagues, both past and present at the University of Kansas, have assisted us in a variety of ways. Space does not permit us to thank them all, but we particularly wish to remember the late Edward H. Taylor, whose field work in Morton County in the 1920s provided much of the impetus for this book.

Many individuals associated with museum and university herpetological collections generously supplied us with lists of their holdings of specimens of amphibians, reptiles, and turtles from the Cimarron National Grassland, or loaned us material for examination. We are indebted to David Wake and Jimmy A. McGuire (Museum of Vertebrate Zoology, University of California, Berkeley), Curtis J. Schmidt (Sternberg Museum of Natural History, Fort Hays State University, Kansas), W. Ronald Heyer and George Zug (National Museum of Natural History, Smithsonian Institution, Washington, D. C.), Dorothy Smith (University of Illinois, Urbana), Jerry D. Johnson and Robert G. Webb (University of Texas, El Paso), Greg Schneider (University of Michigan Museum of Zoology), Alan E. Leviton (California Academy of Sciences, San Francisco), Steve Rogers (Carnegie Museum of Natural History, Pittsburgh), Jack Sites (Monte L. Bean Museum, Brigham Young University, Provo, Utah), Alan Resetar (Field Museum of Natural History, Chicago, and Rafe Brown (Natural History Museum, The University of Kansas, Lawrence).

Personnel of the State Biological Survey of Kansas (Lawrence) and the Kansas Department of Wildlife and Parks (Pratt) were most helpful during the gathering of information for this book, and we thank them.

During our various trips to the Grassland, Joe Hartman, USDA Forest Service District Ranger, and his excellent staff extended to us a variety of courtesies, services, and information, and to them we are most thankful. In particular, Joe Hartman encouraged us to write this book, and provided us with a wealth of information about the Grassland.

The late Philip S. Humphrey, formerly director of the Museum of Natural History, University of Kansas, gave us steady support in the preparation of the first edition of this book. To him we are deeply grateful. The late Jerry Choate, Director Emeritus, and Reese Barrick, current Director of the Sternberg Museum of Natural History at Fort Hays State University, provided us with support, logistical and otherwise, and made the gathering of this information much easier. Finally, we express our fullest appreciation to the U. S. Forest Service and The Center for North American Herpetology, for the financial support necessary to publish this work.

Joseph T. Collins
Suzanne L. Collins
Travis W. Taggart

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INTRODUCTION

Worldwide, there are over 9,000 species of amphibians, reptiles and turtles, of which approximately 620 kinds are known to occur within the continental United States and Canada. The living amphibians, reptiles, and turtles found in Kansas consist of 99 species of salamanders, frogs and toads, lizards, snakes, and turtles. Of these, 32 species have been verified as occurring on the Cimarron National Grassland in Morton County, in the extreme southwestern corner of Kansas.

Amphibians, reptiles, and turtles are vertebrates, which means they have a backbone consisting of numerous vertebrae that provide their body with flexible support. They share this characteristic with fishes, birds, and mammals. Amphibians, reptiles, and turtles are generally terrestrial, primarily living near or entering water only to catch food, escape predators, or to regulate their body temperature and water balance. They differ from birds and mammals in lacking feathers or hair, being covered instead with either moist skin (amphibians) or scales (reptiles) or shells (turtles). Amphibians, reptiles, and turtles are similar to fishes in that all three groups are poikilothermic, which means their body temperature is primarily regulated either by the surrounding air temperature or by the temperature of the soil, rocks, or water where they sit or swim. This is not true of birds and mammals, which are homeothermic and can maintain a stable body temperature independent of the temperature of their surroundings. Since salamanders, frogs and toads, lizards, snakes, and turtles cannot regulate significantly their own body temperature, they are inactive during cold winter months. During this time they retreat beneath the ground or water to avoid freezing temperatures. Those individual animals that do not retire deeply enough will perish.

Amphibians, reptiles, and turtles are generally shy and retiring. Most are completely harmless. Only one of the 32 species found on the Cimarron National Grassland can be considered dangerous to humans, and it is the venomous Prairie Rattlesnake.

Accumulating information on all of the species of amphibians, reptiles, and turtles known to occur on the Grassland was accomplished by field work in the area, observing living animals, examining preserved museum specimens, gathering locality data, and searching for pertinent information in technical and popular articles written about these creatures.

A HISTORY OF GRASSLAND HERPETOLOGY

Kansas became a state in 1861, but it wasn't until late 1886 that Morton County was organized. Coincidentally, during that same year the first published reference of the Morton County herpetofauna was made. Dr. Francis Cragin noted the appearance of Green Toads "in great abundance and activity" during September rain showers as he traveled along the Cimarron River. He apparently collected no specimens.

The first verified specimen of an amphibian, reptile, or turtle reported from Morton County was a Great Plains Toad collected in the county in August 1911 and presented to the Natural History Museum at the University of Kansas by an anonymous donor. It would be 15 years before another amphibian, reptile, or turtle was collected in Morton County, and a quarter of a century before this political unit in the extreme southwestern corner of the state would become home to the Cimarron National Grassland.

No concentrated field work on amphibians, reptiles, and turtles was apparently done in Morton County until the Kansas Biological Survey began conducting field research centered at Wood Walsh Ranch during August of 1926. Subsequent trips were also made in June of 1927, June of 1928, and August of 1928. Edward H. Taylor, a professor at the University of Kansas, was the principle herpetologist on these forays and was aided by T. White, H. Burt, and A. Lunceford, Jr. The herpetological results of these trips were reported in a single paper by Taylor in 1929 in the *University of Kansas Science Bulletin*, and was the first published list of the amphibians, reptiles, and turtles in Morton County. Taylor recorded 25 species from the county, two of which, the Green Toad and the Checkered Garter Snake, were new to the state based on preserved specimens. Apparently he overlooked a third addition to the Kansas amphibian fauna, collected also in Morton County by his colleagues in 1927. This was a single example of the Red-spotted Toad, discovered amongst the collections, but whose presence in Kansas was not reported until later by J. Eric Hill in a 1931 issue of *Science*.

Then came the drought of the 1930s, a time when the wildlife in the Cimarron River Valley of Morton County suffered severe damage. A decade of dust storms and hot winds sucked much moisture from the earth and its sandy tributaries, and some animals, such as the Green Toad and the Red-spotted Toad haven't been seen since. Too much sod had been broken to plant too much wheat, and the wheat eventually sold for too little. Action by the Federal Government was needed, and the 75th Congress responded. In 1936, the government began buying the worst of the "dustbowl" land, and by 1939 had acquired tens of thousands of acres. This land, administered by the Soil Conservation Service until early 1954, eventually came under the control of the U. S. Forest Service, and in 1960 it was formally designated the Cimarron National Grassland. The Grassland, composed of 108,175 acres primarily in Morton County and spilling over slightly into neighboring Stevens County, has undergone a tremendous rebirth. Virtually all of the native wildlife in the region depends on it for food and shelter.

Even as the drought wreaked havoc on the Cimarron River Valley ecosystem, at least one interested naturalist visited the parched region to explore for amphibians, reptiles, and turtles; the first Longnose Snake was discovered there on 27 May 1934 by Charles E. Burt of Topeka. But, after 1940, as the river valley continued its recovery, little field work was done on amphibians, reptiles, and turtles. Taylor's (1929) list of species remained the only basic information available about these creatures on the Grassland for three decades. Beginning

in the 1970s, individual species of amphibians, reptiles, and turtles were added sporadically to the faunal list. The Bullfrog and Northern Painted Turtle were first reported from the Grassland in 1974, based on examples found by the late Ray E. Ashton, Jr. and S. Roth during July. In April of 1978, the first Blanchard's Cricket Frogs were discovered by R. B. Wilhelm on the Grassland at two different localities. A field trip to the Grassland in May–June of 1987 yielded an addition to the fauna of this rugged wilderness when Kelly J. Irwin and Errol D. Hooper, Jr. discovered the first New Mexico Blind Snakes from the Grassland (and Morton County) on 31 May 1987. That field trip (Figure 1), from 31 May to 5 June 1987, resulted in the collection of 20 of the 30 kinds of amphibians, reptiles, and turtles previously recorded from the Grassland. In 1992, Robert Ball collected the first Speckled Kingsnakes from the Grassland, bringing to 32 the number of herpetofaunal species known from the Grassland. During 1992 and 1993, a Green Toad repatriation project was carried out by Taggart (1997). Sponsored by the Kansas Department of Wildlife and Parks and the U.S. Forest Service, this effort resulted in the release of over 440 adult Green Toads and over 1,200 eggs, all originally taken from Kansas sites to the north. However, no evidence exists that the repatriation attempt was successful (Collins et al., 2009). Although no new species have been discovered on the Grassland since 1992, the *Kansas Herpetological Society* held its 2000 spring field trip there in May–June and added many new locality records to our database.

But the list is not complete. More field work may reveal yet other kinds of these creatures inhabiting the Cimarron River Valley. And as the search for them goes on, maybe more people will become interested in the amphibians, reptiles, and turtles of this region — not only for the opportunity to



Figure 1. Members of the 1987 Cimarron National Grassland field crew. Left to right: Larry L. Miller, Errol D. Hooper, Jr., Steve Kamb, Joseph T. Collins, Suzanne L. Collins, and Kelly J. Irwin. Not pictured: the late Alan H. Kamb.

visit and observe them in their native haunts, but for as long as knowledge of these creatures, as well as their cousins, the birds and mammals, will enable us to better understand and appreciate the great grassland prairies and sand rivers of southwestern Kansas. With understanding, appreciation, and determination to conserve the Cimarron National Grassland, the dustbowl will remain an historical anomaly — without it, the dark, dry windstorms will surely once again loom to the west, ready to wreak destruction on the beautiful valley.

THE GRASSLAND LANDSCAPE

Climate

The Cimarron National Grassland is semiarid with hot summers, cool winters, meager rainfall, and much wind. During the December and January the average low temperature hovers around 20°F while the daytime temperature typically reach the mid-forties. The average high temperatures during July and August are over 90°F, though it typically cools down to the mid-60s at night (Figure 2). USFS precipitation measurements taken at Elkhart from 1900 to 2009 (Figure 3) average 19.30 inches annually, and range from 34.84 inches in 1915 to 9.03 inches in 1937. Most of the Grassland rains fall during May (2.80 inches), June (2.90 inches), July (2.81 inches), and August (2.54 inches) (Figure 1). Droughts are common in the Grassland area.

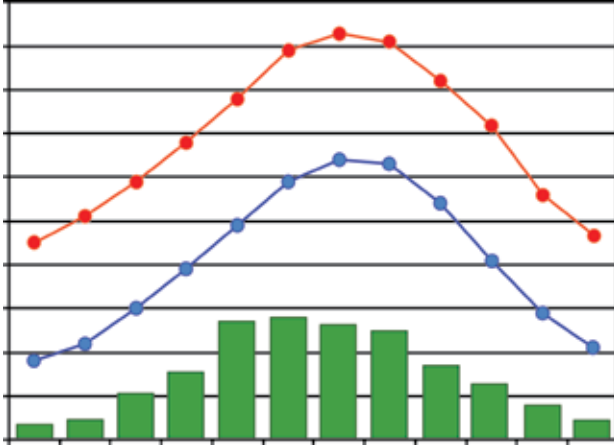


Figure 2. Monthly average daily high temperature (red dots), daily low temperature (blue dots), and precipitation (green bars; L-R: January to December) as recorded by NOAA at Elkhart, Kansas.

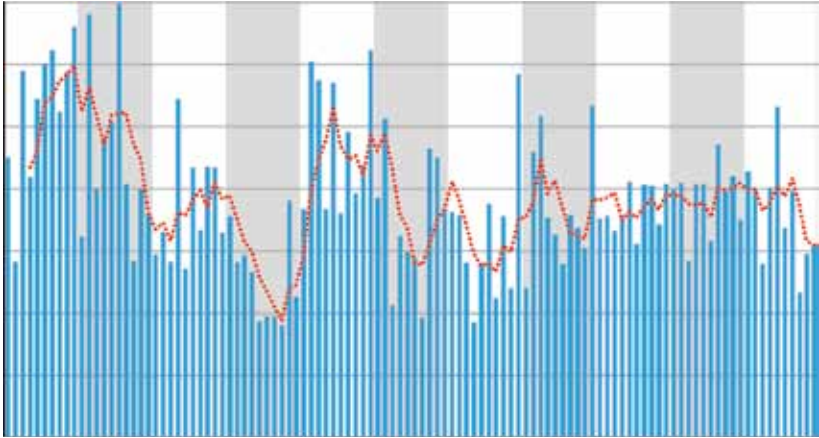


Figure 3. Total precipitation recorded in inches at Elkhart each year from 1900 through 2009. The red-dotted line represents the previous 4 year average annual precipitation. The average annual precipitation through the entire period is 19.30 inches. Source USFS data.

Habitats

The diverse landscape upon which the Grassland presently sits has changed greatly since the Federal Government first began buying the desolate and barren patches of farm ground in the 1930s. Under the auspices and management of the Natural Resource Conservation Service and the USDA Forest Services the Grassland more resembles what it must have looked like to those first settlers blazing the Santa Fe trail.

Shortgrass Prairie

Most of the shortgrass prairie that could be broken out for crops has had this done at some point in the past; the remainder was usually left because the topography was too rugged or rocky to farm. Upon reclaiming the land in 1938, the federal government began reseeding the shortgrass prairies to protect the fragile topsoil. Much of the flat expanse of Grassland north of the Cimarron River is currently shortgrass prairie (Figure 4) and lies in stark contrast to the irrigated croplands adjacent to the Grassland border. Buffalo grass and blue gramma are the dominant sod-forming grasses on the loess soils. The shortgrass prairie is essentially treeless, except around windmill ponds and abandoned farmsteads. At the transition between the Cimarron River valley and the shortgrass prairie to the north, extensive rock outcrops of the Ogallala formation (Figure 5) can be found. Herpetofaunal species that favor the shortgrass prairie include the Coachwhip, New Mexico Blind Snake, Green Toad, and Plains Blackhead Snake.

Sandsage Prairie

To the south of the Cimarron River and in isolated pockets north of the river lie Sandsage Prairies, formed by sands blown south from the rivers and



Figure 4. Shortgrass prairie habitat north of the Cimarron River near the Colorado border. The essentially featureless plain supports populations of every snake found on the Grassland.



Figure 5. The rocks associated with the Ogalla formation cap many of the rugged valleys along the tributaries north of the Cimarron River. Toads, lizards, and snakes take refuge under them.

deposited as dunes typically from 20 to 40 feet tall (Figure 6). On the grassland, few of the dunes are bare during wetter climate cycles, instead being covered by sagebrush, soap weed, sunflower, sand bluestem, little bluestem, dropseed, and sand lovegrass. During the drier cycles on the Grassland, the dunes become active because they are more open and exposed to erosion.



Figure 6. The rolling Sand Sage Prairie extends for miles south of the Cimarron River on the Cimarron National Grassland. Such species as the Eastern Glossy Snake, Longnose Snake, and Ornate Box Turtle are particularly abundant in this habitat.



Figure 7. The limits of the riparian alluvial valley along the Cimarron River are quite apparent from the overlook at Point of Rocks. The cottonwood and willow trees are relatively new colonizers to the Grassland; they were not present when the first settlers arrived.

The sand sage prairie supports the highest densities of Ornate Box Turtles, Longnose Snakes, Eastern Glossy Snakes, Lesser Earless Lizards, and Six-lined Racerunners on the Cimarron National Grassland.

Riparian

Riparian habitat on the Grassland is confined to the alluvial deposits of the Cimarron River which flows 24 to 48 inches under the sand (Figure 7) and abounds with cottonwoods and willows. The Cimarron River seldom flows above its sandy alluvial bed. Reports from settlers and naturalists that visited the region during the late 1800s and early 1900s indicated that the river rarely ran to the surface except after especially heavy rains upstream, and



Figure 8. A dug out pond at the Cimarron Grassland Recreational Area. These ponds not only provide valuable recreational fishing and camping opportunities, but support stable populations of Yellow Mud Turtles and Common Snapping Turtles.

that there were no trees present. The lack of reliable surface water severely limits the type of semi-aquatic animals that can persist, especially during times of drought. Despite this, the Common Snapping Turtle and Yellow Mud Turtle have managed to exist in this arid landscape. They have been helped by the recent creation of a series of ponds dug into the alluvial valley. The Point of Rocks ponds were built by the Kansas Department of Wildlife and Parks to provide public fishing access in the early 1970s. Subsequently ponds were dug at the Cimarron Recreation Area and at two places to the east (Mallard and Wilburton ponds) to provide additional hunting, fishing, camping, and wildlife viewing opportunities (Figure 8). Non-aquatic species that favor riparian areas are Prairie Lizards and Eastern Hognose Snakes.

Windmill Ponds

Nearly 200 windmills dot the Grassland landscape to provide water to the leased herds of cattle (Figure 9). Associated with every active windmill are shallow overflow ponds (up to an acre) in size that provide amphibians, reptiles, and turtles with a source of surface water previously only available at the few springs on the Grassland. Many amphibians use the ponds



Figure 9. A windmill pond in Sandsage Prairie. Note the abundance of surface water and wetland vegetation. When this picture was taken, the water was literally boiling with Plains Spadefoot tadpoles nearing metamorphosis.

to breed and at certain times of the year they teem with the eggs or larvae of Barred Tiger Salamanders, Woodhouse's Toads, Great Plains Toads, and Plains Spadefoots. In turn, the Plains Garter Snake can often be discovered while it crawls through the vegetation surrounding the ponds in search of amphibians to eat.

How the Species Accounts are Organized and a Checklist

The accounts in this book are presented in the same sequence as that used in *Amphibians, Reptiles, and Turtles in Kansas* (Collins, Collins, and Taggart 2010) within each main group (frogs and toads, salamanders, lizards and snakes, and turtles). Within each genus, the species are in alphabetical order. Each account is a compact unit of information about an animal. These accounts will supply basic information needed to help identify an amphibian, reptile, or turtle and provide a view of its natural history or life style. Each account of an animal gives its standard common name and information on its natural history, and is supplemented by color photographs.

Common and scientific names: Each account begins with the common name. All common names are those standardized nationwide for U.S. species by Collins and Taggart (2009). Effort should be made by all schools and libraries to use only the standardized common name when referring to a particular amphibian, reptile, or turtle. This prevents much confusion and allows for easy recognition of an amphibian, reptile, or turtle in conversation and reading.

The scientific name is the formal name of each species, and is shown in italics in the Cimarron National Grassland checklist of amphibians, reptiles, and turtles that follows.

Amphibians

Class Amphibia

Order Caudata (Salamanders)

- Family Ambystomatidae – Mole Salamanders
Barred Tiger Salamander *Ambystoma mavortium*

Order Anura (Frogs and Toads)

- Family Scaphiophidae – North American Spadefoots
Plains Spadefoot *Spea bombifrons*
- Family Bufonidae – True Toads
Great Plains Toad *Anaxyrus cognatus*
Green Toad *Anaxyrus debilis*
Red-spotted Toad *Anaxyrus punctatus*
Woodhouse's Toad *Anaxyrus woodhousii*
- Family Hylidae – Treefrogs, Cricket Frogs, and Chorus Frogs
Blanchard's Cricket Frog *Acris blanchardi*
- Family Ranidae – True Frogs
Plains Leopard Frog *Lithobates blairi*
Bullfrog *Lithobates catesbeianus*

Reptiles

Class Reptilia

Order Squamata (Lizards)

- Family Phrynosomatidae – Spiny Lizards
Lesser Earless Lizard *Holbrookia maculata*
Texas Horned Lizard *Phrynosoma cornutum*
Prairie Lizard *Sceloporus consobrinus*
- Family Scincidae – North American Skinks
Great Plains Skink *Plestiodon obsoletus*
- Family Teiidae – Racerunners and Whiptails
Six-lined Racerunner *Aspidoscelis sexlineata*

Order Squamata (Snakes)

- Family Leptotyphlopidae – Slender Blind Snakes
New Mexico Blind Snake *Rena dissecta*
- Family Colubridae – Harmless Egg-laying Snakes
Eastern Glossy Snake *Arizona elegans*
Eastern Racer *Coluber constrictor*
Speckled Kingsnake *Lampropeltis holbrooki*
Milk Snake *Lampropeltis triangulum*
Coachwhip *Masticophis flagellum*
Gopher Snake (aka Bullsnake) *Pituophis catenifer*
Longnose Snake *Rhinocheilus lecontei*
Plains Blackhead Snake *Tantilla nigriceps*
- Family Dipsadidae – Harmless Rear-fanged Snakes
Western Hognose Snake *Heterodon nasicus*
Eastern Hognose Snake *Heterodon platirhinos*
- Family Natricidae – Harmless Live-bearing Snakes
Checkered Garter Snake *Thamnophis marcianus*

Plains Garter Snake *Thamnophis radix*
Family Crotalidae – Pitvipers (venomous)
Prairie Rattlesnake *Crotalus viridis*

Turtles

Class Chelonia

Order Cryptodira (Straightneck Turtles)
Family Chelydridae – Snapping Turtles
Common Snapping Turtle *Chelydra serpentina*
Family Kinosternidae – Mud and Musk Turtles
Yellow Mud Turtle *Kinosternon flavescens*
Family Emydidae – Basking Turtles
Northern Painted Turtle *Chrysemys picta*
Ornate Box Turtle *Terrapene ornata*

Endangered and Threatened Species

Under the authority of the Kansas Nongame, Threatened and Endangered Species Act, passed in 1975 by the Kansas Legislature, the Kansas Department of Wildlife and Parks has developed a list of Kansas amphibians, reptiles, and turtles that may be in danger of disappearing from our state, or are in need of conservation. Although no species of amphibian, reptile, or turtle known to occur in Kansas is now considered endangered or threatened on the national level, the interest and concern inherent in having a state list, particularly one that includes herpetofauna, indicates an environmental sensitivity and awareness of the fact that these creatures deserve equal protection under the laws of nature and people.

The most recent version of the Endangered and Threatened Species List for Kansas includes the following four species that are known to occur on the Cimarron National Grassland:

Endangered: None

Threatened:

Green Toad
New Mexico Blind Snake
Longnose Snake
Checkered Garter Snake

Endangered status indicates a higher priority than designation as Threatened. The four species listed above are protected by state regulations, and a permit issued by the Kansas Department of Wildlife and Parks is required to collect them for scientific purposes. Indeed, of the four, the Green Toad may already be gone from the Grassland, a victim of the drought of the 1930s. In addition to these, four other species, the Red-spotted Toad, Eastern Glossy Snake, Eastern Hognose Snake, and the Western Hognose Snake, are considered by the state to be “in need of conservation,” but this attention may have come too late for the Red-spotted Toad. It may no longer occur on the Grassland, yet another victim of the “dustbowl” days.

How to Find and Observe Amphibians, Reptiles, and Turtles

There are numerous techniques for observing amphibians, reptiles, and turtles. Each person, as experience is gained, becomes more competent at locating these interesting creatures. The following paragraphs describes the more common methods used to find and observe these animals.

At certain times of the year, much success can be realized by slowly driving along highways at night, carefully scrutinizing the area of the road lighted by the headlights. With experience, even the tiniest snakes can be seen by this means, and of course all manner of larger snakes and amphibians may be found. Success varies with the speed of driving, alertness of the observers, intensity of the lights, nature of the road, darkness of the night, air temperature, ground temperature, and humidity. Attention to these factors will result in more animals discovered, and will increase the enjoyment of an evening drive. During the spring road-cruising is most effective by day, especially as temperatures begin to rise during mid-morning. During the hottest days of the summer, great success can be had by traveling after dusk; your chances of discovering a snake this way are further enhanced by previous recent rainy weather, a new or late rising moon, and wind. Fall may present the greatest opportunity to find snakes on the Grassland roads, as the young have been produced and more snakes are on the Grassland than at any other time. Road-cruising at night during and immediately after a rain shower is generally productive for discovering amphibians and, to a lesser extent, snakes.

Many amphibians are easily discovered at night when they are breeding or searching for food. Use of a flashlight is highly recommended as an aid in observing them. In the spring and early summer, choruses of frogs and toads will lead to their discovery; at such times it is profitable to drive about until voices of interest are heard. At other times any pond, marsh, or other body of water may be expected to contain individuals. Barred Tiger Salamanders may be found at the mouths of mammal burrows where they spend the day, but from which they may wander a short distance at night.

Flashlights are also valuable when observing nocturnal snakes on flat plains or Grassland and along streams. In these open areas, one should watch both far ahead for fleeting glimpses of wary snakes, and near at hand for the motionless bodies of sluggish or temporarily blinded species. Snakes along the Cimarron River may remain motionless when approached at night, but at other times will glide quickly away.

Another effective field technique is the seining of marshes, ponds, and rivers. The tadpoles of frogs and toads, and often Barred Tiger Salamanders and their larvae, may be found by this means. Any closely packed debris or vegetation present near the borders of the bodies of water should be hauled onto the shore and carefully inspected. This procedure is often extremely successful.

The most important field technique is to keep a sharp eye on the entire surroundings and turn every conceivable type of cover. Stones, logs, cardboard, junk, tin, and any other movable surface cover may conceal some seldom seen amphibian, reptile, or turtle. An alert observer never leaves cover unturned and always replaces it. In early spring, and to a lesser extent in the fall, one may expect good results from this effort. In the summer, the ground under such cover is often too dry and hot, and little will be seen. At such times of the year it is by far the best practice to be about early in the morning, before the heat of the sun has penetrated through cover to the ground. Often, much more will be present under such cover early in the morning than at any other time.

In certain areas, removal of debris from the ground reveals many specimens. Accumulations of vegetation, twigs, and even flood deposits often conceal amphibians, reptiles, or turtles. Bales of hay drying in fields may conceal snakes and make it profitable for the observer to be present when the hay is being removed.

All amphibians occurring on the Grassland may be captured and handled with safety. However, care should be taken to avoid any possible contact of the skin secretions with a person's eyes, nose, or mouth, because the skin secretions of True Toads (genus *Anaxyrus*) and Spadefoots (genus *Spea*) are poisonous if ingested and irritate mucous membranes.

No lizard in the state is venomous, but all can bite. On the Grassland, only the Great Plains Skink has jaws powerful enough to deliver painful bites. All other lizards have jaws so small that no precaution is necessary.

Harmless snakes can be temporarily captured for closer examination by picking them up quickly by any part of the body — but don't pick them up by the tail because this may hurt them. Be aware that any snake more than sixteen inches long may be capable of giving a painful bite, and some precaution may be desired. Gloves should be worn to protect against such bites.

Snakes, however, include the dangerous Prairie Rattlesnake, easily identified because it is the only snake on the Grassland with a rattle. Wanton destruction of snakes (venomous or non-venomous) is deplorable, for all are of considerable value in the balance of nature and to people in controlling their really important enemies and pests among the insects and small mammals. It is unfortunate that people rarely appreciate the beneficial role of all snakes.

AMPHIBIANS

SALAMANDERS

Barred Tiger Salamander

Ambystoma mavortium

The Barred Tiger Salamander is the only salamander found on the Grassland. It is a chubby amphibian, easily identified by the yellow or orange-yellow bars or blotches, which contrast with its robust black body. The bars or blotches on the sides of the body usually extend onto the belly, creating a yellow and black mottled pattern. During the breeding season females can be distinguished from males by their heavier bodies, and males have swollen cloacal lips. Females have slightly longer bodies than males, but males have proportionately longer tails than females.

Adult Barred Tiger Salamanders are 6–8 inches in total length. The largest terrestrial adult from Kansas was an 11 1/2 inch female taken by Theodore White and Edward H. Taylor on 20 August 1926 from the 81 Ranch on what would eventually become the Cimarron National Grassland.

The Barred Tiger Salamander occurs throughout the western three-fourths of Kansas, and is the only salamander found in the western half of the state. It was first discovered on the Grassland in August 1926, and was observed as recently as 2009. A Kansas Herpetological Society (KHS) field trip in 2002 discovered an adult plus numerous larvae on the Grassland.

Adult Barred Tiger Salamanders generally spend much of the summer and winter months beneath the ground, often in the burrows of other animals such as prairie dogs, where they avoid temperature and moisture extremes. These amphibians frequently emerge from their burrows at night or during rains, even when temperatures approach freezing.

Barred Tiger Salamanders do not appear to have a regular annual activity period, having been found in Kansas during most months of the year when temperatures are optimal. Grassland observations of this salamander have



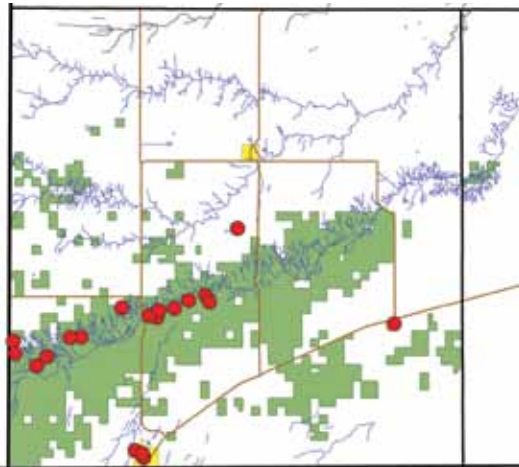
been made during April, May, July, and August, but this may reflect only the times observers have been present. Little is known of the size of this salamander's home range.

An adult Barred Tiger Salamander (*Ambystoma mavortium*).

After sufficient rains this amphibian seeks a breeding site, generally ditches or shallow ponds. Livestock water tanks are also used when accessible. Breeding probably occurs throughout the year, weather permitting. Courtship by the Barred Tiger Salamander takes place in water and consists of males and females rubbing bodies with occasional “nips” at each other. Much lashing about of bodies and tails may occur, and this “foreplay” eventually stimulates the male to swim in front of the female who follows with her snout near his cloaca. The male deposits a spermatophore, which the female swims over and picks up with her cloacal lips. The many fishless windmill ponds are prime breeding sites for Barred Tiger Salamanders on the Grassland, and the larvae can be netted from them throughout the year.

Eggs are deposited singly or in small clumps of two or three, and are attached to sticks and weed masses along water’s edge. A female can lay up to 1000 eggs. The eggs hatch in a few weeks, and the gilled larvae may metamorphose into adults the same summer, over-winter until their second summer, or achieve sexual maturity as larvae and remain in that state their entire lives. This latter condition, called neoteny, usually occurs when terrestrial conditions are harsh and habitat for salamanders is minimal. However, neoteny has not been observed in the Grassland population.

The Barred Tiger Salamander is opportunistic in its feeding, preying upon any animal small enough for it to swallow, including insects, earthworms, fishes, tadpoles, frogs, toads, other salamanders, and mice. Conversely, this amphibian keeps alert for snakes, large birds, and small mammals, all of which like to eat salamanders.



Map 1. The Barred Tiger Salamander is most often encountered on the rugged slopes along the north side of the Cimarron River. It may be found during and after heavy rains, particularly in the hot summer months. Larvae of this amphibian are often encountered in the overflow pools of cattle tanks.

FROGS AND TOADS

Plains Spadefoot

Spea bombifrons

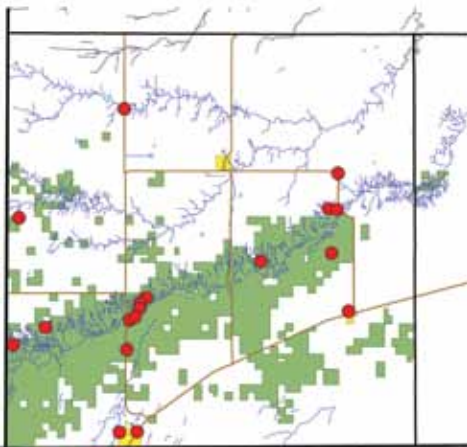
The Plains Spadefoot differs from other Grassland frogs and toads in two ways — its eyes (which are vertically slit when exposed to strong light) and by the presence of a distinct black spur at the base of each hind foot. Overall, this amphibian is light to medium gray with irregular darker markings and two poorly defined light lines down the back, and a white belly. Males have dark throats during the breeding season, and females have heavier bodies than males.



An adult Plains Spadefoot (*Spea bombifrons*).

Adult Plains Spadefoots normally are 1 1/2 to 2 inches in total length. The largest specimen from Kansas measured 2 1/2 inches.

The Plains Spadefoot ranges throughout western Kansas, and is seasonally abundant in the Grassland. It is an inhabitant of prairies and open floodplains, and prefers areas of loose soil or sand into which it burrows during daylight hours, and from which it emerges in the evening to forage, particularly after rain. The first Plains Spadefoots recorded from the Grassland were found in August 1926. Known months of activity on the Grassland are May, June, July, and August.



Map 2. The Plains Spadefoot is found throughout the Cimarron National Grassland. It should be looked for during and after heavy rains, particularly in the hot summer months. Tadpoles of this amphibian may be encountered in the overflow pools of cattle tanks and adults may be found crossing roads and highways at night.

The Plains Spadefoot is an opportunistic breeder in the Grassland, emerging from its underground retreats for this purpose after any rainfall. Males loudly chorus for females around temporary rain-pools. The male mounts a female, clasping her around the groin with his front limbs. The female deposits the eggs and the male arches his body and fertilizes them in the water. Each female may lay up to 2000 eggs in masses of 10–250 each; they are attached to partly submerged vegetation or other protruding objects. After the eggs hatch, metamorphosis occurs at widely varying intervals depending on water temperature and oxygen content, and competition for food between tadpoles. Evidently, tadpoles of this frog are cannibalistic under crowded conditions.

Beetles, crickets, grasshoppers, ants, and other small insects are the preferred food of this amphibian. It apparently has few predators, possibly because of its distasteful skin secretions.

Great Plains Toad

Anaxyrus cognatus



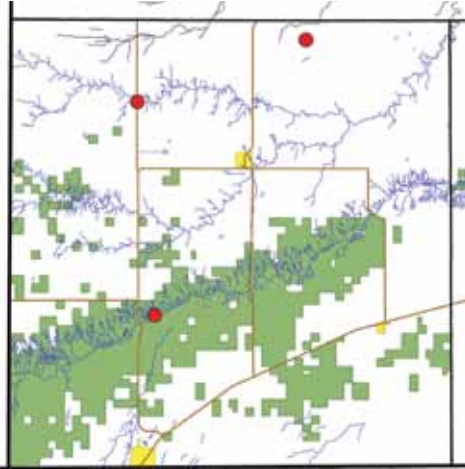
An adult Great Plains Toad (*Anaxyrus cognatus*).

The Great Plains Toad can be distinguished from other Grassland frogs and toads by the presence of bony crests between its eyes which merge on the snout to form a flat, raised knob or “boss,” and by its pairs of large black, dark green or dark brown blotches outlined with cream or yellow on the back and sides. Its belly is cream or yellow with few or no dark spots on the chest. Females of this species

reach larger sizes than males. During the breeding season males have dark throats and horny pads on the inner fingers of each hand.

Adult Great Plains Toads normally are 2 to 3 3/8 inches in total length. The largest specimen from Kansas measured 4 inches.

This toad is found throughout western Kansas. It is a resident of upland short-grass prairies and open floodplains. Like most toads, it remains hidden beneath the ground during the day, emerging on warm nights to search for food. The Great Plains Toad digs its burrows in the shape of a question-mark in bare, sandy areas, with the toad resting at the end of the upper curve. Statewide, it is active from April to September, spending the colder months beneath the ground.



Map 3. The Great Plains Toad is scarce in the Cimarron National Grassland. It should be looked for during and after heavy rains, particularly in the hot summer months. Tadpoles of this amphibian may be encountered in the overflow pools of cattle tanks and adults may be found crossing roads and highways at night.

Great Plains Toads are apparently uncommon in the Grassland. An unknown collector first found this animal in Morton County in August 1911. Since that initial record, only three additional examples of this toad have been encountered in the Grassland, one in August 1926, another in June 1928, and the latest in July 1979. It has not been observed since.

The Great Plains Toad is an opportunistic breeder, congregating at suitable breeding sites such as temporary pools, ditches, or shallow ponds. Once at the breeding site, males begin to chorus. They attract females and clasp them beneath their front limbs. The eggs, laid and fertilized in the water, are deposited in long strings. Each female may produce up to 20,000 eggs. After hatching, the young tadpoles grow in the pond until they metamorphose to begin life on land.

The Great Plains Toad eats large numbers of insects, a diet that makes it an important part of any environment.

Green Toad

Anaxyrus debilis

Timiest of Kansas toads, the Green Toad is very distinctive from its other Grassland relatives. Its head, body and limbs are green or greenish yellow with black spots or streaks, which may form a network pattern, the only toad in Kansas so colored and patterned. The belly is yellowish and may or may not be darkly spotted. Males have dark throats during the breeding season. Females have yellowish throats and are larger in size than males.

Adult Green Toads are 1 1/4 to 1 7/8 inches in total length. The largest specimen from Kansas was a 1 3/4 inch female collected by Theodore E. White and Edward H. Taylor on 15 August 1928 along the Cimarron River bluffs in Morton County.

The Green Toad is restricted in Kansas to the High Plains of the extreme western part of the state. It generally inhabits regions of open grass plains at elevations of 2000 to 2500 feet or higher and with an average annual rainfall of under twenty inches. It is very secretive and normally is only active at night. It was reportedly abundant during

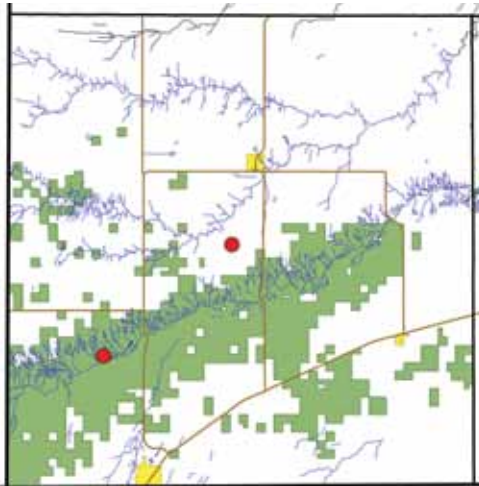


An adult female Green Toad (*Anaxyrus debilis*).

rainy weather in September 1886 in Morton County, along the Cimarron River, but the first actual Kansas specimens were collected in August 1926. That same month, some dead individuals (evidently killed by hail) were reported in a small temporary pool north of the Cimarron River in Morton County. More examples of this small bright-colored toad were discovered beneath rocks on the north bluffs of the Cimarron River in August 1928, but these were the last ever seen from Morton County.

The Green Toad is an opportunistic breeder, and mating probably occurs throughout the warmer months during and after rainfall. This toad evidently breeds in shallow ditches, flooded fields, along intermittent streams, and other temporary pools. The eggs are laid singly or in short strings, which form clumps, and hatch into tadpoles, which later metamorphose.

This small toad devours large quantities of small insects.



Map 4. Historically, the Green Toad was recorded in the Cimarron National Grassland area at two localities, both collected prior to the 1930s. Apparently, this amphibian did not survive the great drought of the 1930s and the success of a re-patriation effort in the 1980s has not been verified. If still present on the Grassland, adults and tadpoles of this toad may be encountered in the overflow pools of cattle tanks. It should be looked for during and after heavy rains, particularly in the hot summer months.

Red-spotted Toad

Anaxyrus punctatus

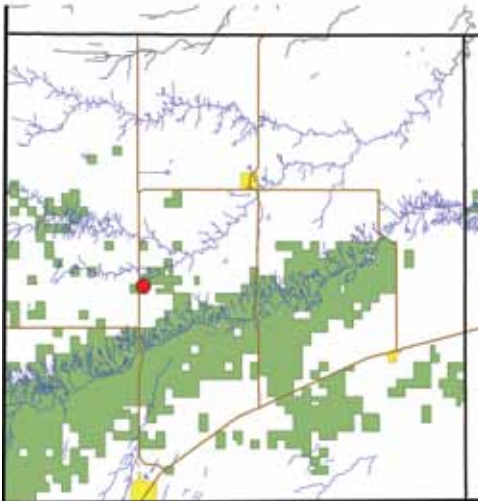


An adult Red-spotted Toad (*Anaxyrus punctatus*).

belly is yellowish with small dark spots. Males have a dark throat during the breeding season, and are smaller than females.

Adult Red-spotted Toads are 1 $\frac{1}{4}$ to 2 $\frac{1}{2}$ inches in total length. The largest specimen from Kansas was a 2 $\frac{3}{16}$ inch female.

This toad is restricted in Kansas to the Red Hills and extreme southern High Plains. It is a species that inhabits rocky areas of dry prairies and canyons. Like most toads, it is nocturnal. During the day it hides beneath rocks where the soil is fairly moist. This toad is often active after rainfall. Red-spotted Toads are apparently very rare in the Grassland. Only one example has ever been found, and it was taken on the Wood Walsh Ranch prior to the 1930s drought.



Map 5. The Red-spotted Toad is known from a single record in the Cimarron National Grassland. It should be looked for during and after heavy rains, particularly in the hot summer months. Tadpoles of this amphibian may be encountered in the overflow pools of cattle tanks and adults may be found crossing roads and highways at night.

The Red-spotted Toad is an opportunistic breeder. After any rainfall, but particularly during spring or summer, this species congregates in small numbers around canyon pools and streams to mate. Males begin calling and attract a female. The male mounts the female and secures his front limbs around her groin. The female deposits her eggs singly as the male fertilizes them. The eggs adhere to vegetation, other objects, and sometimes to each other to form a small, single-layered mass, or may be scattered in shallow water. After hatching, the free-swimming tadpoles metamorphose to life on land.

Adults emerge from burrows shortly after sundown, and forage along canyon walls and in arroyos. This toad eats beetles, ants, and bees, with ants the preferred food.

Woodhouse's Toad

Anaxyrus woodhousii

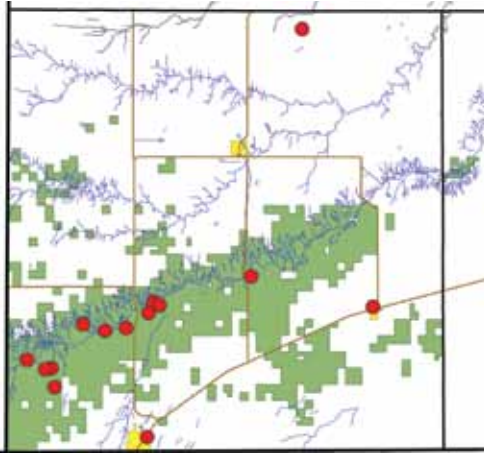


An adult Woodhouse's Toad (*Anaxyrus woodhousii*).

with indistinct dark green-gray or dark brown spots. A dull white or yellowish stripe extends down the back. The belly is white or cream. During the breeding season, males have dark throats and an enlarged, horny pad on the inner finger of each hand; they are smaller than females.

Adult Woodhouse's Toads are 2 1/2 to 4 inches in total length. The largest specimen from Kansas was 4 3/4 inches.

This species is found throughout western Kansas, and occurs anywhere that suitable habitat exists. It appears to prefer lowlands and sandy areas, and is generally the only toad found on the floodplains of streams and rivers. Like most toads, it remains hidden during the day and emerges at night to hunt for food. This species, like many other amphibians and reptiles in western Kansas, appears to use the burrows of small mammals as retreats. Statewide, the Woodhouse's Toad is normally active between March and late September, although dates of observation in the Grassland fall in May, June, July,



Map 6. Woodhouse's Toad is the most abundant toad in the Cimarron National Grassland. It should be looked for during and after heavy rains, particularly in the hot summer months. Tadpoles of this amphibian may be encountered in the overflow pools of cattle tanks and adults may be found crossing roads and highways at night.

and August only. This amphibian was first discovered in Morton County on the 41 Ranch near Rolla on 11 August 1926.

This toad breeds opportunistically and appears to prefer pools on river floodplains. Male Woodhouse's Toads congregate in small numbers at suitable breeding sites when rainfall and temperatures permit. Chorusing begins, a female is attracted, and the male toad mounts her, clasping her behind the front legs with his forelimbs. A female may lay up to 25,000 eggs. The eggs hatch and the free-swimming tadpoles metamorphose to life on land.

This toad eats bees, beetles, insect larvae, spiders, and ants. Its abundance, combined with its preferred diet of insects, makes it an economically important species, which can consume as much as two-thirds of its own weight in insects in a single day.

Blanchard's Cricket Frog

Acris blanchardi

Blanchard's Cricket Frog is the smallest frog in the Grassland, and is distinguished from other frogs and toads because it has a dark triangular mark between the eyes coupled with a stripe extending from behind the triangular mark (where it is widest) down the back (where it is most narrow). Two other characters useful in identifying this creature



An adult Blanchard's Cricket Frog (*Acris blanchardi*).

are an irregular, black, length-wise stripe on the inside of each thigh, and the pattern on its upper lip, which exhibits alternating light and dark bars. The body, head, and limbs of this species are gray or brown. The triangular mark between the eyes is dark brown. The stripe down the back is quite variable, and may be whitish gray, green, brown, or reddish. The belly is white and the chin of males may be spotted and yellowish during the breeding season.

Adult Blanchard's Cricket Frogs are the smallest amphibians in Kansas, and normally are 1 to 1 1/4 inches in total length. The largest specimen from Kansas was 1 5/16 inches.

The Blanchard's Cricket Frog occurs throughout Kansas, but is least abundant on the arid High Plains. The activity period of these frogs is from March to November, but a few warm days will cause them to be active during the colder months. The preferred habitat of this tiny frog is muddy, beach-like edges of small, shallow streams and ponds. It avoids deep water. Blanchard's Cricket Frogs are scarce in the Grassland, and are relative newcomers. Only two examples of this frog have ever been recorded there, both taken on 8 April 1978, but each at a different location.

Blanchard's Cricket Frogs congregate to breed from April to July around ponds, marshes, roadside ditches, rain pools, springs, and streams. Warm temperatures are necessary to stimulate chorusing. A male calls, attracts a female, and mounts on her back, clasping her behind the front limbs with his front legs. The female lays eggs and the male fertilizes them in the water. Each female may lay up to 400 eggs, deposited singly or in small clusters of 2-7 eggs each. The eggs hatch after 3-4 days into tiny, solitary, secretive tadpoles. The tadpoles metamorphose within five to ten weeks.

Insects and spiders are the preferred foods of this amphibian. Based on the presence of bottom-dwelling aquatic insects found in the stomachs of these frogs, it is possible they feed both underwater and on the surface. Raccoons, skunks, and opossums probably prey on Blanchard's Cricket Frogs around ponds.



Map 7. Blanchard's Cricket Frog is rare in the Cimarron National Grassland, represented by only two records. It should be looked for around permanent springs and ponds, and possibly the more stable overflow pools of cattle tanks.

Plains Leopard Frog

Lithobates blairi



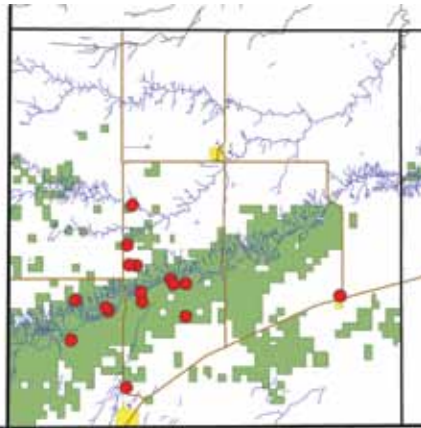
An adult Plains Leopard Frog (*Lithobates blairi*).

The Plains Leopard Frog is distinct from other Grassland frogs and toads because it has an irregular pattern of distinct scattered spots on its back and sides, and a raised fold or ridge of skin on each side of the back running from behind the eyes down to the thighs where it is broken, the posterior portion being set inward toward the middle of the back.

The head, body, and limbs are gray or tan with dark gray, brown, or black spots, sometimes narrowly edged with black. The hind limbs are darkly banded. The raised fold or ridge on each side of the back is light yellow, gray, or whitish. The belly is white, although the area around the groin may be yellowish. Adult females grow to a larger size than males.

Adult Plains Leopard Frogs are 2 1/2 to 4 inches in total length. The largest specimen from Kansas measured 4 inches.

The Plains Leopard Frog is common throughout Kansas and is found in nearly every aquatic situation, both permanent and temporary. It sometimes wanders a good distance away from water, especially during the summer. Statewide, it is active from February to October within a wide range of temperatures. In the Grassland, it has been observed from April to August.



Map 8. The Plains Leopard Frog is abundant in the Cimarron National Grassland. Tadpoles and adults should be looked for around permanent springs and ponds, and possibly the more stable overflow pools of cattle tanks; adults may also be found crossing roads and highways at night.

Like Blanchard's Cricket Frog, it is sometimes active during the winter, but normally it digs into the mud and vegetation of pond and river bottoms during winter months, and remains there until warmer weather. These frogs are common in the Grassland. They were first recorded in Morton County in August 1926 by the Taylor Expedition.

This frog normally begins breeding as early as February and may continue into summer. During the breeding season males begin to chorus, attract females, and mount them by clasping the females behind their front limbs. Each female may lay up to 6500 eggs in small masses attached to stems and plants just below the water's surface. The eggs hatch within three weeks, and the tadpoles may metamorphose during the summer, or overwinter and transform the following spring.

The Plains Leopard Frog feeds primarily on insects. Its predators include raccoons, opossums, and skunks.

Bullfrog

Lithobates catesbeianus



An adult Bullfrog (*Lithobates catesbeianus*).

The Bullfrog is the largest frog in the Grassland. Its large size, generally uniform color, and the lack of a raised fold of skin on each side of the back running from behind the eye to the thigh, make it easy to identify. It does have a prominent raised fold of skin behind each eye, but the fold curves down around the large distinct circular ear

membrane, instead of continuing down the back, as in the Plains Leopard Frog. The head, body, and front limbs of Bullfrog are green, olive, or brown with large or small indistinct darker spots or blotches. The hind limbs are darkly banded. The throat and belly are white or yellow with gray mottling. Males have much larger ear membranes than females.

Adult Bullfrogs normally are 5–6 inches in total length. The largest specimen from Kansas was a female with a total length of 7 1/4 inches. The heaviest Kansas example weighed 1 1/2 pounds.

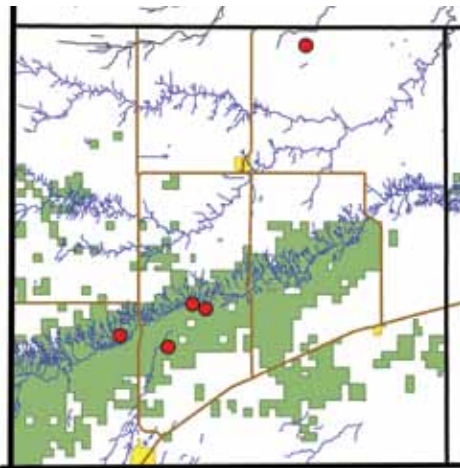
The Bullfrog is found throughout Kansas, but is least wide-spread on the High Plains where it is confined to more permanent aquatic situations. Statewide, this amphibian is active from March to October and is restricted to ponds and rivers. In the Grassland, it has been observed from April to

September. It may live also near permanently filled stock tanks. Bullfrogs apparently spend the winter months burrowed in mud beneath the water of ponds and rivers. Adult Bullfrogs respond to distress calls of smaller Bullfrogs and Plains Leopard Frogs for the purpose of preying on them. This frog is a recent addition to Grassland wildlife. This frog was first collected in the Grassland from Middle Spring on 9 July 1974. The adults and tadpoles are now observably abundant around any permanent Grassland water bodies.

The Bullfrog breeds later than other frogs and toads in the Grassland. Males are territorial during the breeding season, and defend their territory against other Bullfrogs by kicking, bumping, and biting. Breeding occurs from late April until mid-July when warm temperatures stimulate the males to chorus around permanent ponds and pools. The male mounts the female, clasping her with his front limbs behind her front limbs. Females may lay up to 40,000 eggs in masses from 1–2 1/2 square feet. The eggs hatch in four or five days and the free-swimming tadpoles spend three to fourteen months in the water before metamorphosing.

Other small frogs are an important part of the diet of the Bullfrog, but it is an opportunistic predator, eating anything that it can swallow.

This frog is considered a game animal in Kansas and can be hunted only from 1 July to 30 September with a valid Kansas fishing license. Its hind limbs are the well-known “frog-legs” served in many restaurants. Natural predators of the Bullfrog include snakes, opossums, raccoons, and skunks.



Map 9. The Bullfrog is found near permanent water, such as springs, lakes, ponds, and the more stable pools made from the overflow of cattle tanks. Historically, it probably occurred naturally near springs, but this frog has probably become more abundant on the Cimarron National Grassland over the last century with the construction of impoundments, large and small, and the creation of numerous cattle tank overflow ponds; adults may also be found crossing roads and highways at night.

REPTILES

LIZARDS

Lesser Earless Lizard

Holbrookia maculata

The Lesser Earless Lizard differs from all other Grassland lizards because it lacks an ear opening on each side of the head. The head, body, limbs, and tail of this species are light gray or gray-brown. The upper surface of the neck, back and tail base are patterned with 9–14 dark brown spots. The belly is grayish and unmarked except for two or three blue-bordered, short, black bars, which barely extend up onto the sides of the lizard. Adult males have grayer throats than females. Pregnant females develop an orangish coloration on their sides.

Adult Lesser Earless Lizards normally attain 4 to 5 inches in total length. The largest specimen from Kansas was a female with a total length of 4 1/2 inches.

The Lesser Earless Lizard is found across the western two-thirds of Kansas. It prefers flat, sandy, or gravelly areas of loose soil with little or no vegetation. Statewide, this species is active from April to September when optimal temperatures prevail.

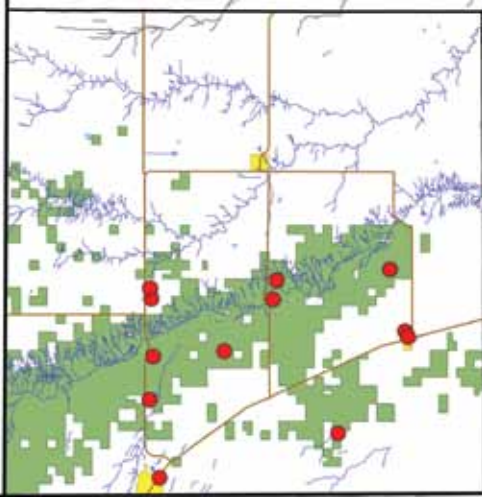


An adult male Lesser Earless Lizard (*Holbrookia maculata*).

In the Grassland, it has been observed abundantly from May to August. The colder months are spent beneath the ground to avoid adverse temperatures. This reptile was first discovered in Morton County in June 1925.

Lesser Earless Lizards love to bask in the sun, and spend most of their time engaged in this and foraging for food in sparsely vegetated uplands, rocky areas, or open sand dunes. During the extremely hot afternoon, these lizards frequently retreat to the shade of burrows. Like many lizards, this species has a home range and is territorial. Males of this species display dominance by executing “push-ups” or “bobbing” in a distinct cadence.

A courting male Lesser Earless Lizard rapidly nods his head upon approaching a female and may nudge her on the side or beneath the tail with his nose. The male then grasps the receptive female by the loose skin between



Map 10. The Lesser Earless Lizard is common in the Cimarron National Grassland. This reptile should be looked for in and around areas of bare sand and/or soil, particularly the loose siltlike soil of blowouts. This lizard is diurnal and spends much time basking in the sun during the warmer months.

her shoulders and curls the rear of his body beneath her tail until their cloacae meet. Females lay two to ten eggs during May or June. The eggs hatch in one to two months.

Three-quarters of the diet of this lizard consists of grasshoppers and bugs. Evidently this species consumes large numbers of harmful insects, making it beneficial to farmers. Predators of the Lesser Earless Lizard include birds, small mammals, snakes, and larger lizards.

Texas Horned Lizard

Phrynosoma cornutum



An adult Texas Horned Lizard (*Phrynosoma cornutum*).

The squat, chubby Texas Horned Lizard is the only Grassland lizard with large spines projecting from the back of its head. The general color of this lizard ranges from yellowish brown to reddish brown. There is a dark brown blotch on each side of the neck and a series of dark spots on each side of the back separated by a yellow or white line. The belly is white with a variable

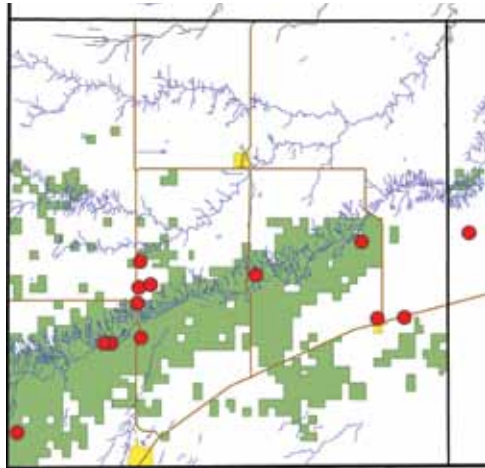
amount of small gray spots. External sexual differences are few, but females grow slightly larger than males and their tails are much thinner at the base.

Adult Texas Horned Lizards normally are 2 1/4 to 4 inches in total length. The largest specimen from Kansas was a male with a total length of 5 1/8 inches.

This lizard occurs across southern Kansas from the Cherokee Plain west to the High Plains (south of the Arkansas River). It generally inhabits dry, flat areas with a sandy or rocky surface and little vegetation. Statewide, it is active from April to September—in the Grassland it has been observed during the hot months of June, July, and August. This reptile is strictly diurnal, spending the day basking in the sun, foraging for food, or hiding just below the soil surface. Its coloration makes it difficult to observe. Little is known of its daily cycle, but its temperature preference may be higher than that of many other lizards. This lizard is not territorial. It was first found in Morton County in July 1926, and remains an abundant member of the grassland herpetofauna.

Although this lizard is well known to many people, few observations on its breeding habits have been made. Mating probably occurs no earlier than May or June. Courtship is unknown. Each female probably lays a single clutch of eggs per season (with an average of 22 eggs per clutch), in a nest dug in loose soil or under rocks.

Ants make up the major part of this lizard's diet, but other small insects and spiders are also eaten. Although the Texas Horned Lizard is widespread in Kansas, it does not make a good indoor pet.



Map 11. The Texas Horned Lizard is abundant in the Cimarron National Grassland. This reptile prefers open areas with sparse grass and shrubbery. It is diurnal and spends much time basking in the sun during the warmer months.

The Texas Horned Lizard, when surprised or disturbed, may squirt a small stream or several drops of blood from its eyes. This behavior occurs naturally when the lizard's head reaches a higher temperature than that of the body, and release of the blood in this manner permits the lizard to achieve a cooler overall temperature. When handled, any slight pressure may induce an overheated lizard of this species to exhibit this behavior.

Predators of the Texas Horned Lizard included birds, mammals, and snakes.

Prairie Lizard

Sceloporus consobrinus

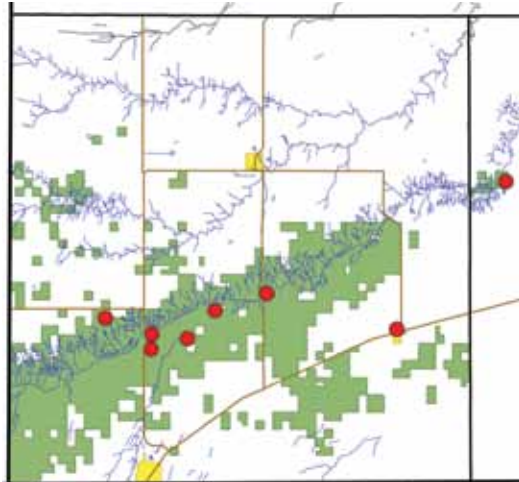
Unlike the Lesser Earless Lizard, the Prairie Lizard has an ear opening on each side of the head. Its upper body is covered with rough, raised scales, like a Texas Horned Lizard, but it lacks horns sticking out from the back of its head. The head, body, limbs, and tail vary from gray to brown, with a pattern of narrow, dark irregular crossbands, dark spots, or dark and light stripes on the back. The belly and throat are gray-white, sometimes with bright bluish green or blue patches on each side. These patches are more brilliant in males and indistinct or absent in females. Females grow larger than males.

Adult Prairie Lizards normally are 4 to 6 1/2 inches in total length. The largest example of this species from Kansas was a female with a total length of 6 5/6 inches.

In Kansas, the Prairie Lizard is found throughout the western three-quarters of Kansas eastward along the Kansas River into Missouri. There is an isolated population in extreme southeastern Kansas. It inhabits low, sandy regions and frequently is found along rock outcrops. Statewide, these lizards are active from March to October at temperatures above 70°F. In the Grassland they have been observed as abundant from April to August. During winter months they burrow beneath the ground to avoid cold temperatures. This lizard is active during the day, and has a small home range of one-tenth of an acre. Each male generally has a harem of two to three females within his territory. The Prairie Lizard spends much time



A juvenile Prairie Lizard (*Sceloporus undulatus*).



Map 12. The Prairie Lizard is common in the Cimarron National Grassland. This reptile prefers open areas with sparse grass and shrubbery. It is diurnal and spends much time basking in the sun during the warmer months.

basking on rocks and looking for food. In the Grassland, it is active from late morning to early afternoon, avoiding the extreme mid-afternoon heat, and is again active in late afternoon. This reptile was first found in Morton County in August 1926. It is found commonly along the wooded dry Cimarron River bed and in the rocks to the north of the river.

Breeding takes place during the warm months from May to August, and females probably produce two or three clutches of eggs per season. Courtship involves the male quickly approaching the female, mounting her, and curling his hindquarters beneath her tail until their cloacae meet and copulation occurs. Four to seventeen eggs are laid in nests in loose soil, and hatch in about two months.

The Prairie Lizard feeds on ants and other small insects, as well as spiders. Predators of this lizard include larger lizards, snakes, birds, and small mammals.

Great Plains Skink

Plestiodon obsoletus

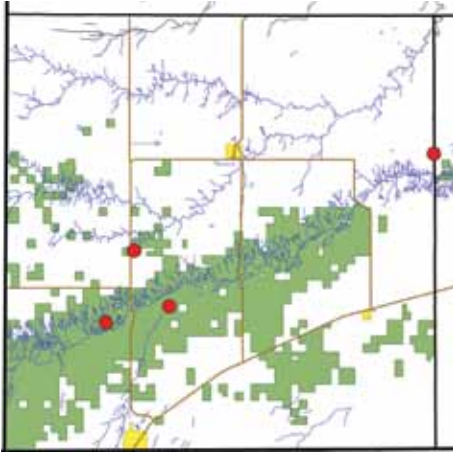
The sleek and shiny Great Plains Skink differs from other Grassland lizards by having flat, smooth black-tipped scales on its body, a pattern of dark spots that may create a striped appearance, and by having the scales around the mid-body of uniform size. The head, body, limbs, and tail are gray with dark borders on each scale that create a light and dark striped pattern. The unpatterned belly is whitish gray. Young are jet black, have blue tails, and display small bluish-white to orange spots on the sides of the head. Distinguishing between males and females is extremely difficult. During breeding the heads of males are slightly swollen.



An adult Great Plains Skink (*Plestiodon obsoletus*).

Great Plains Skinks are the largest of North American skinks. Adults normally are 6 1/2 to 9 inches in total length. The largest specimen recorded from Kansas was a female with a total length of 13 3/4 inches.

The Great Plains Skink is found throughout Kansas, where it lives on open rocky hillsides with low vegetation. It is active from March to early October, providing high enough temperatures prevail. Only seven examples of this lizard have been recorded from the Grassland, all during May and June.



Map 13. The Great Plains Skink is less often observed than other kinds of lizards in the Cimarron National Grassland, but is probably just as common. This reptile prefers to spend its time hidden beneath cover; it rarely basks in the sun.

This probably reflects the secretive nature of this animal and the minimal amount of available cover in which to find them. During the winter this species burrows beneath the soil or into crevices where it remains deep enough to avoid freezing temperatures. Adult males emerge earlier in the spring than females. Great Plains Skinks generally remain hidden beneath rocks, other surface cover, or in the burrow of other animals. They rarely bask in open sunlight. The first specimen reported from Morton County was discovered in 1926.

Great Plains Skinks breed in May. Courtship is brief, consisting of the male approaching the female and touching her with flicks of his tongue. After pursuit, the male grasps the female with his mouth, bites the loose skin on her shoulder, and loops his hindquarters beneath hers. Copulation occurs for several minutes. Evidence indicates that some females do not breed each year. Pregnant females dig deep burrows beneath large boulders. In the nest a female lays about eleven eggs and remains with them during their one to two month incubation period.

The Great Plains Skink eats beetles, roaches, grasshoppers, spiders, and snails. In captivity it will eat small rodents and other lizards. Predators of the Great Plains Skink consist of snakes, birds, and small mammals. Mortality from predation in this species is evidently slight due to its habit of remaining hidden beneath cover during much of its yearly activity period.

Six-lined Racerunner

Aspidoscelis sexlineata

The swift Six-lined Racerunner has smooth, tiny granular scales on the back (which are much smaller than those on the belly) and seven light stripes running down the back, one in the middle and three on each side. By these characters it can be distinguished from other Grassland lizards. The stripes range from greenish blue to yellow, and may be indistinct in older adult

males. Areas between the stripes vary from brown to dark green. The throat, chest, and forward sides of the body are suffused with bluish green, particularly in males. The tail is brownish. Adult males have a broader head than females, and females are heavier-bodied.



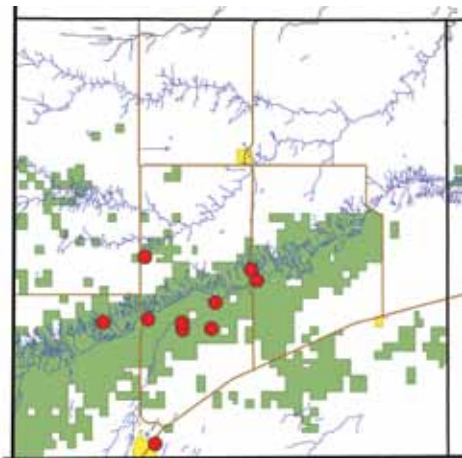
An adult Six-lined Racerunner (*Aspidoscelis sexlineata*).

Adult Six-lined Racerunners normally are 6–8 inches in total length. The largest specimen from Kansas was a male with a total length of 9 inches.

This reptile is abundant in the Grassland, where it prefers dry, open, sandy areas with little vegetation. It also inhabits open, rocky, grazed regions, and is often abundant in sandy basins. In order to remain active, this lizard requires warmer weather than most other Kansas species. It prefers an optimal air temperature near 93°F and is active from May to September. Six-lined Racerunners are fast, nervous animals active only during the day; they exhibit a peak of activity during the hottest, sunniest part of the day. During extreme heat, however, even this lizard rests in shade provided by vegetation or small mammal burrows. These reptiles have a home range of less than one-fourth of an acre, and are not territorial. This lizard was first found in Morton County in June 1927.

Six-lined Racerunners mate in May and June. Courtship initially involves the male displaying his brightly colored throat and chest. He bites the

Map 14. The swift Six-lined Racerunner is abundant in the Cimarron National Grassland. This reptile prefers open areas with sparse grass and shrubbery. It is diurnal and spends much time active in the sun during the warmer months. This reptile is most often observed dashing across roads and highways; some of the slower ones become a permanent part of the pavement.



female on the neck or flank, pinions her, and twists his rear body around and under her tail until their cloacal openings meet. Copulation is brief, lasting only a few minutes. Female Six-lined Racerunners nest in June or July and may produce more than one clutch of eggs per season. The eggs are buried a few inches deep in sandy soil and hatch in two months. Each female lays two to six white eggs with an average of three per clutch.

Spiders, snails, and insects such as grasshoppers and moths are eaten by this lizard. Predators of the Six-lined Racerunner include snakes, birds, and small mammals.

SNAKES

New Mexico Blind Snake

Rena dissecta

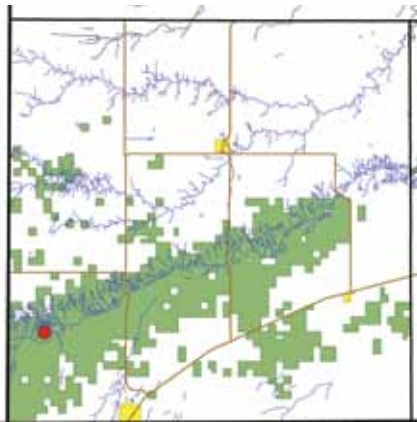
The New Mexico Blind Snake looks like a pinkish tan worm. It is distinguished from other Grassland snakes by its belly scales, which are the same size as the scales on its upper body. The eyes of this subterranean reptile are tiny black dots. Males have slightly longer tails than females.



An adult New Mexico Blind Snake (*Rena dissecta*).

Adult New Mexico

Blind Snakes normally are 5 to 8 inches in total length. The largest example from Kansas was a female with a total length of 10 5/8 inches.



Map 15. The New Mexico Blind Snake is known in the Grassland from four specimens, all found on the same date in 1987. This highly secretive, burrowing snake is undoubtedly common throughout the Cimarron River valley, but is not easily detected because of its subterranean habits.

This snake is found along the southern border of Kansas from the Red Hills of Sumner County west to the Cimarron National Grassland. New Mexico Blind Snakes are secretive creatures that frequent ant burrows. They prefer moist areas and sometimes are found in loose soil or sand beneath rocks. Nothing is known of the annual activity cycle of this snake. This creature uses an interesting defensive technique to withstand attacks by ants. If bitten or attacked, it assumes a ball-like coil and writhes, smearing cloacal fluid over its body; the fluid repels further ant attacks.

The New Mexico Blind Snake was first discovered in the Grassland on 31 May 1987, when four examples of this secretive reptile were discovered under rocks.

Because of its subterranean habits, nothing is known of courtship and mating in this snake. Females brood their eggs in small colonies within cavities beneath the ground at depths ranging from 18–30 inches.

New Mexico Blind Snakes feed on the eggs, pupae, and larvae of ants, and on termites. Predators of this reptile include other snakes, birds, and small mammals.

Eastern Glossy Snake

Arizona elegans



An adult Glossy Snake (*Arizona elegans*).

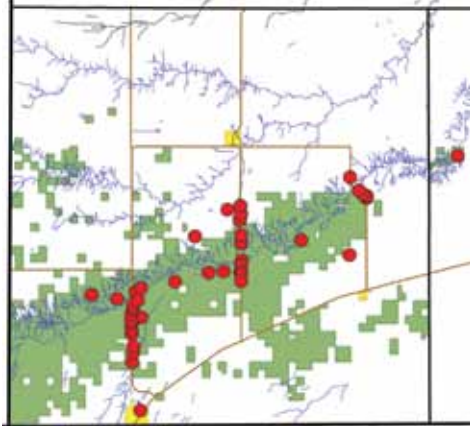
The Eastern Glossy Snake has a double row of scales on the underside of the tail, a uniform white belly, a pattern of 39–69 distinct dark gray or brown, black-edged blotches on its body, and a smooth, “glossy” appearance, hence its name. In addition to the blotches on the back there are two alternat-

ing rows of dark spots on each side of the body. A dark line extends from the angle of each jaw forward through the eyes. Males have slightly longer tails than females.

Adult Eastern Glossy Snakes normally are 27–36 inches in total length. The largest specimen from Kansas was a male with a total length of 46 inches.

The primary range of the Eastern Glossy Snake is the sandy prairies south of the Arkansas River in Kansas. Isolated populations exist in sandsage prairies

located along the Smoky Hill River in west central Kansas and the Republican River in extreme northwestern Kansas. It is found in dry, open, sandy areas. During the day it retires beneath rocks or into mammal burrows to avoid heat and predators. Apparently it is active from April to October and is primarily nocturnal, prowling for food. In the Cimarron National Grassland it has been observed most often at night following hot daytime temperatures. This reptile was first recorded in Morton County on 25 June 1927.



Map 16. The Eastern Glossy Snake is most abundant in the sand dunes south of the Cimarron River. It is typically observed during the nighttime hours after warm days.

This snake mates during May, June, or July following emergence from winter inactivity. Courtship has not been observed. The female evidently lays a single clutch of eggs during the summer. The number of eggs per clutch ranges from 3–23 with an average of eight. The eggs hatch in two to three months.

The Eastern Glossy Snake kills its food by constriction, and feeds primarily on lizards and small rodents. Its predators probably include snakes, small mammals, and owls.

Eastern Racer

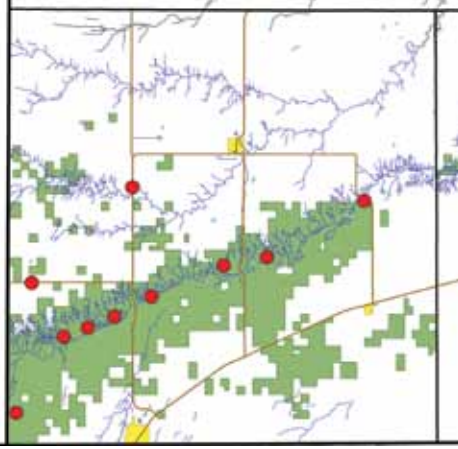
Coluber constrictor



An adult Eastern Racer (*Coluber constrictor*).

Young of this reptile, however, have a pattern of large, light-edged blotches on the back alternating with smaller spots on the sides. This pattern

The swift and slender Eastern Racer has smooth scales, a uniform yellow or yellowish belly with no pattern on adults, and a uniform blue-gray or greenish blue upper body. No other Grassland serpent resembles it.



Map 17. The Eastern Racer is common in all habitats in the Cimarron National Grassland. It is diurnal and often active around water.

is distinct on the front half of the body and fades toward the rear. Young specimens also have scattered dark speckles on the belly. As they grow older, young Eastern Racers lose their pattern and attain the uniform appearance of adults. Adult males have slightly longer tails than females, and females grow slightly larger than males.

Adult Eastern Racers grow 30 to 48 inches in total length. The largest specimen from Kansas was a female with a total length (snout to tip of tail) of 55 1/2 inches.

This snake is found everywhere in Kansas, preferring open grassland, pasture and prairie areas. Statewide, it is normally active from April to mid-November at air temperatures ranging from 60–90°F. The Eastern Racer is diurnal, spending the day basking in the sun or gliding over the ground in search of food. This snake has an average home range of 25 acres, but does not appear to be territorial. During winter these reptiles crawl deep into rock crevices on hillsides where they remain inactive until spring. The number of snakes in a single den can exceed one hundred. The Eastern Racer was first reported from Morton County in 1926 and remains a common, yet elusive, inhabitant.

Breeding in this species occurs in May. Courtship involves a male positioning himself alongside the female and rippling his body spasmodically as he positions his cloaca beneath her tail. Once cloacal contact is made copulation occurs and lasts several minutes. While copulating the female may move forward slowly, dragging the attached male with her. Females lay their eggs from mid-June to early August usually in tunnels or burrows of small mammals such as moles. More than one female may use the same nest site at the same time. The number of eggs per clutch ranges from 8 to 22, and averages 11-12. Incubation takes from two to three months.

The Eastern Racer relies primarily on sight to locate food. Any small animal that moves is pursued and eaten. This snake eats lizards, mice, frogs, other snakes, and insects. In turn, it is eaten by hawks and small mammals.

The Eastern Racer is one of the fastest snakes in Kansas, but relies on distracting its predators plus speed to make its escape. A surprised specimen thrashes vigorously in one spot, attracting the predator's vision to that area, then quickly and quietly glides away into rocks and brush.

Speckled Kingsnake

Lampropeltis holbrooki



An adult Speckled Kingsnake (*Lampropeltis holbrooki*).

The Speckled Kingsnake sports a glistening jet black body covered with striking yellow spots. No other serpent on the Grassland resembles it. The belly is yellow and irregularly patterned with black. Occasionally the yellow speckling on the back fuses to form narrow crossbars in adults; these crossbars are always present in young specimens.

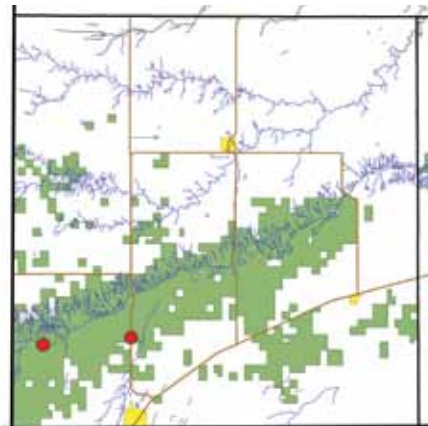
Adult Speckled Kingsnakes grow 36 to 48 inches in total length. The largest specimen from Kansas was

a male from the southwestern part of the state with a total length of 49 3/4 inches. Maximum length for this snake is 49 5/8 inches.

Speckled Kingsnakes live wherever cover is available on the Grassland, and readily use small mammal burrows as retreats. During spring and fall, they are active mostly during the day. The hot summer temperatures, however, cause this snake to become nocturnal. During the winter, it crawls into burrows deep beneath the ground to avoid the cold.

The Speckled Kingsnake is rarely encountered in the Grassland and was first reported when two specimens were collected at two different localities eight days apart in May of 1991. Visitors are encouraged to report any observations of this species to the Grassland headquarters.

Using constriction to overpower prey, Speckled Kingsnakes eat rodents, small birds, birds eggs, reptile eggs, lizards, and



Map 18. The Speckled Kingsnake is rarely encountered on the Cimarron National Grassland. Two of them were found by a local high school biology teacher during the 1990s. This secretive serpent spends much time beneath cover.

other snakes. Raptors, water birds, and small mammals eat adult Speckled Kingsnakes. The young are also consumed with relish by large frogs and other snakes. The eggs of this reptile are eaten by small mammals and other snakes. Like many serpents, this creature rapidly vibrates its tail when threatened. Male Speckled Kingsnakes engage in elaborate combat dances to establish dominance over others of their sex.

Adult male Speckled Kingsnakes have slightly longer tails and grow larger than females. This reptile mates in the spring and lays its eggs in summer. The eggs, which number from two to seventeen, generally hatch in the fall. Little is known of courtship in this species in Kansas, but apparently the male bites the female to hold her during mating.

Milk Snake

Lampropeltis triangulum



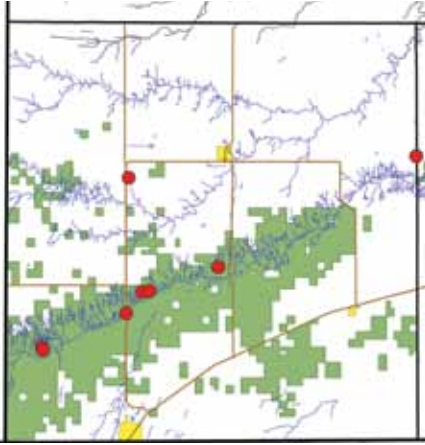
A juvenile Milk Snake (*Lampropeltis triangulum*).

The Milk Snake is strikingly different from other Grassland snakes. It has slick smooth scales, a bold white and black pattern on the belly, the top of its head is black or orange with a black snout, and it has 20 to 32 orange-red bands on the body. The orange-red bands are interspaced with narrower yellow,

white, or cream bands, and these are bordered by narrow black bands. Adult males grow larger than females.

Adult Milk Snakes normally are 16 to 28 inches in total length. The largest Milk Snake from Kansas was a male with a total length of 33 3/4 inches.

The Milk Snake is found throughout western Kansas, where it inhabits the rocky outcrops and ledges of prairie canyons and hillsides. It is active statewide from April to November, but all eighteen records of this serpent from the Grassland were found in May and June. This reptile normally prowls actively by day, but during the hot summer it may become nocturnal. It rarely basks in the sun, preferring to remain hidden beneath sun-warmed rocks to maintain its optimal body temperature. Most specimens have been observed in association with rock outcrops, however this species also occurs in open grassland and dune areas. During winter the Milk Snake retreats into dens on rocky hillsides or into mammal burrows to avoid cold temperatures. First found in Morton County on 9 June 1928 by the Taylor Expedition.



Map 19. The Milk Snake makes use of a wide variety of habitats on the Cimarron National Grassland. Most are discovered by lifting rocks and other surface cover along the Cimarron River, but they occasionally may be found in the open in other habitats.

on small lizards and snakes, but also eats newborn mice. Specific diet items include the Prairie Lizard and Six-lined Racerunner, both residents of the Grassland. Predators of Milk Snakes include birds, mammals, and larger snakes.

Mating in this species occurs during spring after emergence from winter inactivity. Little is known about courtship except that the male bites the female on the neck a few inches behind the head to hold her during copulation. The eggs are laid in nests during June or July, and the number of eggs per clutch varies from 5–9 with an average of six to seven. A female from the Grassland laid four eggs on 3 July 1987; all four eggs hatched on 4 September and the young were about 8 1/2 inches in total length. Incubation probably requires one to two months, depending on the prevailing temperature.

Prey is killed by constriction in this species. It feeds primarily

Coachwhip

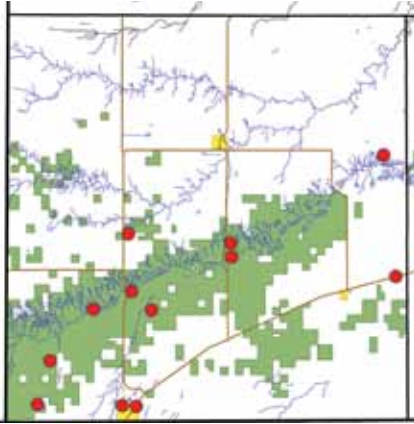
Masticophis flagellum



An adult Coachwhip (*Masticophis flagellum*).

The Coachwhip differs from other Grassland snakes because it has a slender body that is always yellowish brown, and its body scales have a braided appearance, hence the name “coachwhip.” The belly is whitish with indistinct small spots. Young specimens, differently colored and patterned than adults, are yellowish brown, with poorly defined

dark brown crossbands on the front of the body that fade and disappear on the rear. The belly is white with two rows of dark spots on the front half.



Map 20. The swift Coachwhip is an abundantly-observed species throughout the Cimarron National Grassland. Seeing one, and catching it are two completely different things, and may account for the paucity of records for such a common snake.

Adult males have longer tails than females.

Adult Coachwhips normally are 42–60 inches in total length. The largest specimen from Kansas was a male with a total length of 70 1/2 inches.

The Coachwhip ranges throughout Kansas west of the Flint Hills. It is a large, alert, and active snake, found in open grassland prairies. These serpents are active statewide from April to October — on the Grassland they have been observed during the hot months of June, July, and August. They are completely diurnal, foraging for food even during the hottest hours of the day. When surprised, Coachwhips race away from an intruder with considerable speed and when cornered they rapidly vibrate their tail and strike repeatedly. During winter this species enters deep crevices on rocky hillsides or small mammal burrows on open prairies to avoid cold weather. This creature was first discovered in Morton County on 20 August 1926 by the Taylor Expedition. It remains an abundant inhabitant of the Grassland, and is commonly encountered during the day.

Little has been observed of the breeding habits of this species in Kansas; courtship is unknown. Mating probably occurs in April or May followed by egg-laying in summer and hatching in fall. The eggs are laid in loose soil, sometimes as much as a foot below the surface.

Although this is probably the fastest snake in Kansas, it cannot move as fast as person can run. It feeds on bats, mice, birds, lizards, and smaller snakes.

Gopher Snake (aka Bullsnake)

Pituophis catenifer

The Gopher Snake is the largest snake in the Grassland, and can be distinguished from other species by its keeled scales and pattern of 33–73 large brown or black blotches on the brownish yellow body. The tail has alternating yellow and black bands. The belly is yellowish with variable dark mottling. Adult males have longer tails than females.

Adult Gopher Snakes normally are 48 to 66 inches in total length. The largest specimen from Kansas was a female with a total length of 88 3/4 inches and a weight of nearly eight pounds.

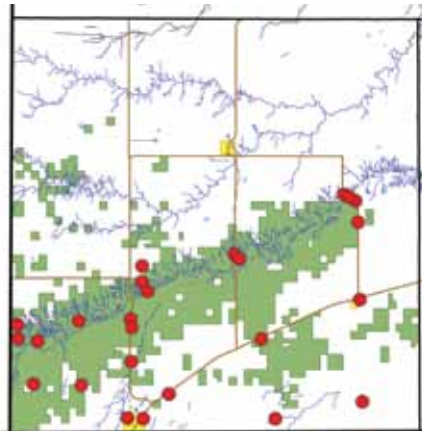
The Gopher Snake is found everywhere in Kansas, preferring to live in open grassland, but also in open woods along rivers. It is also common in cultivated fields where there is an abundance of rodents, its preferred food. This snake is active from April to November at air temperatures above



An adult Bullsnake (*Pituophis catenifer*).

60°F. It is generally diurnal, although it may be active at night also. During the day this snake basks in the sun or forages for food. With the approach of winter it seeks out deep crevices on rocky hillsides or the burrows of small mammals where it normally remains inactive until spring. This is one of the most abundant snakes in the Grassland. It was first reported from Morton County by the Taylor Expedition on 15 August 1926. The Gopher Snake is the most observably abundant snake on the Grassland, and is most often encountered as they slowly cross a road. Consequently, they are also the most commonly encountered road-killed serpent on the Grassland as well.

Gopher Snakes mate during April and May after emergence from winter inactivity. Courtship involves the male crawling along and over the female until he eventually rests almost entirely on top of her. During this process the male exhibits jerking body movements. The female is passive except for elevating and waving her tail. Just prior to copulation the male may seize the female with his mouth, biting her on the head or neck. He curls his tail beneath hers until their cloacal openings meet; copulation commences and



Map 21. The Gopher Snake (aka Bullsnake) is the most commonly-observed snake on the Cimarron National Grassland. You can expect to see one crossing a road at any time when it is not too cold or extremely hot. They are also often encountered off-road when hiking through the Grassland.

may last over an hour. Female Gopher Snakes lay their eggs in soft earth beneath large rocks or logs. The number of eggs per clutch ranges from 5 to 19, with 12 being the average; the young are about eleven inches long.

The Gopher Snake is a small mammal specialist, eating pocket gophers, rats, mice, rabbits, and ground squirrels. It also occasionally eats birds and bird eggs. Like Hognose Snakes, it will emit a loud “hiss” when disturbed or frightened. Predators of Gopher Snakes include large carnivorous birds and mammals. Young Gopher Snakes may also be eaten by larger snakes.

Longnose Snake

Rhinocheilus lecontei

The Longnose Snake is easily distinguished from other Grassland snakes.

The ground color of this brightly colored serpent is yellowish or cream with 18–35 black blotches on its body separated by pink or reddish interspaces.

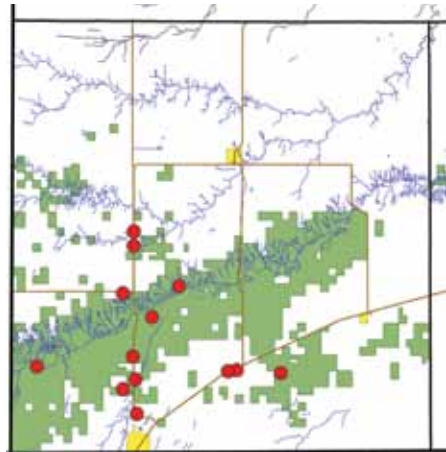
In addition, at least half the scales on the underside of the tail are not divided into two rows, a character not found in any other harmless snake in Kansas. The tail has 6–17 blotches. It normally has a white, unpatterned belly, but occasional specimens have black or brown markings. Adult males have slightly longer tails and grow larger than females.

Adult Longnose Snakes are 22 to 30 inches in total length. The largest specimen from Kansas was a male with a total length of 29 inches.

This reptile is restricted to the Red Hills and southern High Plains of southwestern Kansas. An isolated population inhabits the sandsage prairies of west central Kansas along the Smoky Hill River. It is secretive and rarely observed where it occurs



An adult Longnose Snake (*Rhinocheilus lecontei*).



Map 22. The Longnose Snake is found throughout the Cimarron National Grassland, but is more often observed in the sand dunes south of the Cimarron River.

in the state, and subsequently, little is known of its habits. Probably it is active from April to September on open prairies, sandy regions, and beneath rocks along the slopes of canyons. Longnose Snakes are nocturnal, retreating to underground burrows during the day. During winter this snake avoids cold temperatures by burrowing deep beneath the ground. The first example of this snake in Morton County was recorded in May 1934; a total of fifteen observations have been made since then.

Mating in this species occurs during spring after emergence from winter inactivity. A female lays from four to nine eggs (average six) in an underground nest and the eggs hatch in two to three months.

These snakes feed on small rodents, lizards and lizard eggs, small snakes, and occasionally insects. Predators of this species include large birds, mammals, and other snakes.

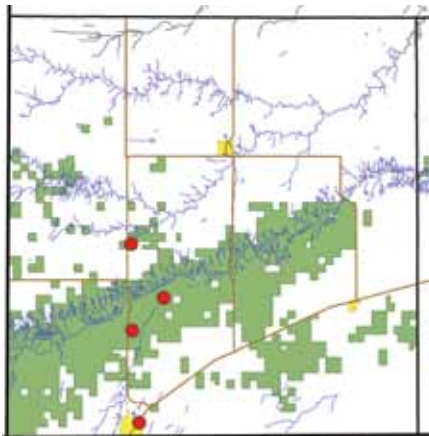
Plains Blackhead Snake

Tantilla nigriceps



The Plains Blackhead Snake differs from other Grassland snakes because it has a dark head in sharp contrast with its unpatterned light yellowish brown body, and its belly is pink. Adult males have slightly longer tails than females.

An adult Plains Blackhead Snake (*Tantilla nigriceps*).



Map 23. The Plains Blackhead Snake is another fossorial burrowing serpent found throughout the Cimmaron River valley. Very few observations have been made of this secretive snake because of its subterranean habits.

Adult Plains Blackhead Snakes normally are 7 to 10 inches in total length. The largest example from Kansas was a female with a total length of 14 3/4 inches.

Found in Kansas from the Flint Hills westward, the Plains Blackhead Snake inhabits rocky hillsides of grassland prairies. It is secretive, spending most of the day beneath flat rocks. This species is active from April to October, and is probably nocturnal, but little is known of its day-to-day activity. During winter it burrows beneath the ground, sometimes to a depth of at least eight feet, to avoid cold temperatures. Only six examples of this snake have been recorded from Morton County, the first near Elkhart in August of 1910, the next two records also near Elkhart during the summer of 1926 by the Taylor Expedition, a fourth from the Walsh Ranch in June 1928, the fifth from the Cimarron River bluffs north of Elkhart in 1971, and most recently from the Grassland on 31 May 1987.

Nothing is known of the breeding habits of this species. Presumably it mates during the spring, females deposit their egg clutches in nests during summer, and the eggs hatch in late summer or fall.

The Plains Blackhead Snake eats centipedes, and probably soft-bodied grubs as well. Predators of this snake are birds, small mammals, lizards, and other snakes.

Western Hognose Snake

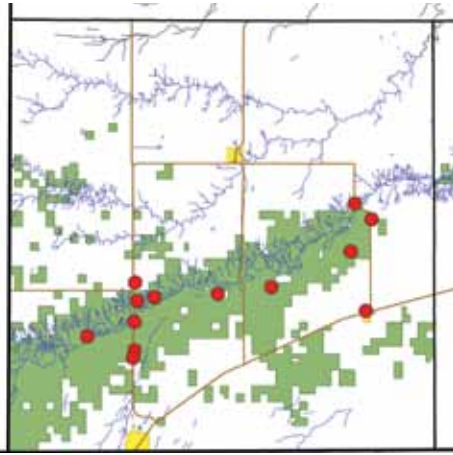
Heterodon nasicus



An adult Western Hognose Snake (*Heterodon nasicus*) showing the belly pattern.

The Western Hognose Snake is distinguished from other Grassland snakes by its keeled body scales, sharply turned up snout, and by having its belly and the underside of the tail extensively colored jet black. The body, head, and tail vary from gray to yellow or light brown. There are 23–50 dark brown

blotches down the back, and rows of smaller, similarly colored spots alternating on the sides. The jet black areas on the belly and underside of the tail may be edged with yellow. Adult males have fewer blotches on the back and longer tails than females. Females grow larger than males.



Map 24. The Western Hognose Snake is most commonly associated with the sand dune habitat south of the Cimarron River.

Adult Western Hognose Snakes normally are 14 3/4 to 27 5/8 inches in total length. The largest specimen from Kansas was a female with a total length of 34 inches.

Western Hognose Snakes occur throughout the western two-thirds of Kansas. They generally are found in grassland or sand prairie and are active from mid-April to October at optimal air temperatures of 70–95°F. When not active this snake burrows beneath sandy loose soil to maintain an optimal body temperature. The home range of Western Hognose Snakes is quite variable,

depending on available habitat and food. This animal is not territorial. During winter it burrows deep beneath the ground to avoid cold temperatures. The Taylor Expedition found the first two of these serpents in August 1926 and another one in July 1927, all in Morton County. The Western Hognose Snakes remains a common member of the Grassland herpetofauna.

The Western Hognose Snake usually mates during May after emergence from winter inactivity. The number of eggs per clutch varies from 4–23 (with an average of nine); eggs are laid in July in nests a few inches below the soil. Evidently females deposit a clutch every other year. Incubation time for the eggs is 50–60 days. Courtship has not been observed.

This reptile detects its prey by smell, digging a food item from its burrow beneath the soil. The up-turned snout of this species makes it very efficient at digging up toads, reptile eggs, and small lizards and snakes, all of which are eaten. In addition, this snake consumes rodents and birds when it can capture them. Predators of Western Hognose Snakes are not well known.

This snake exhibits an interesting behavior when disturbed. If approached too closely it generally attempts to escape by crawling clumsily away. When more closely threatened it may attempt to conceal its head beneath its coils. If this does not dissuade an aggressor, the snake spreads a “hood” by flattening its neck, and will hiss loudly. Occasionally the snake may “strike” at the aggressor, but in all instances the strike is short and the mouth is closed. If this fails to frighten the aggressor the Western Hognose Snake will writhe and contort, disgorge recently eaten food, and roll over on its back and “play dead.” The snake may feign death for up to five minutes. If left alone it rolls over on its belly and crawls away.

Eastern Hognose Snake

Heterodon platirhinos

The Eastern Hognose Snake is a very rare Grassland snake, and is now probably extirpated. Its roughly keeled scales and sharply up-turned snout serve to distinguish it from other Grassland serpents, and its dark-colored belly (with the underside of the tail much lighter) separate it



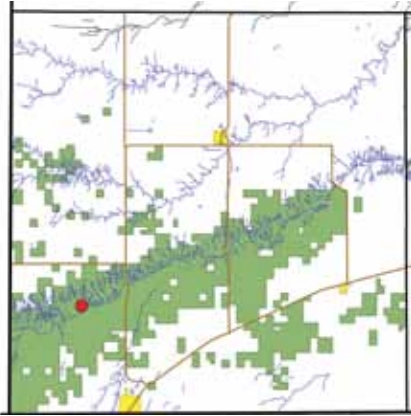
An adult Eastern Hognose Snake (*Heterodon platirhinos*).

from the Plains Hognose Snake. The Eastern Hognose is highly variable in color. The back, head, and tail may be yellow, brown, reddish, olive, or gray with a series of 20–30 dark brown or black blotches on the back and similarly colored bands on the tail. The sides of the body have two or three series of small, dark spots, which alternate with the blotches on the back. The belly is yellowish, gray, olive, or reddish and becomes darker toward the cloaca. The undersides of the tail and the chin are usually much lighter than the belly.

Adult males have longer tails and fewer blotches on the back than females. Females grow larger than males.

Adult Eastern Hognose Snakes normally are 18 to 30 inches in total length. The largest specimen from Kansas was a female with a total length of 42 inches.

The Eastern Hognose Snake lives along rivers, and reaches the western limit of its range in the United States in the Grassland. Most of Kansas (except along the eastern border) is not optimal habitat for this snake and populations of this species in western Kansas may be isolated. Eastern Hognose Snakes are active from late April to October at optimal air temperatures of 65–95°F. This species has a daily activity period and habits similar to that of the



Map 25. The Eastern Hognose Snake is known from the Cimarron National Grassland due to one specimen collected near Point of Rocks in 1927. More recently, a single juvenile example of this serpent was found on the southern edge of Elkhart in Oklahoma. If populations still remain on the Grassland, they should be looked for along the Cimarron River corridor.

Plains Hognose Snake. Home ranges of the Eastern Hognose Snake are larger than those of the western species, but are poorly defined. Population density in the Eastern Hognose Snake is no more than one per acre. During winter months this snake burrows deep into loose soil or sand to avoid cold temperatures. Only one example of this fascinating snake has been found in Morton County. It was discovered on the 81 Ranch in July 1927 by the Taylor Expedition. The drought conditions of the 1930s may have decimated populations of this snake in the Cimarron River Valley in Morton County. It is highly dependent on toads for food and toad populations do not fare well during dry times. This snake is still common along the Cimarron River just to the east in Seward and Meade counties, and a single juvenile specimen was found in 1996 in the southern outskirts of Elkhart in Oklahoma.

Mating in the Eastern Hognose Snake occurs during April and May after emergence from winter inactivity. Courtship is not known. Females lay a single clutch of eggs each year; the number of eggs varies from 4–61 with an average of twenty-two. The eggs are deposited in late June or July in nests burrowed out by the female several inches deep in the soil or sand. Incubation requires 50–65 days.

This species feeds primarily on toads, although in Kansas it has been recorded eating a Barred Tiger Salamander. Primary predators of the Eastern Hognose Snake are hawks and large snakes.

The Eastern Hognose Snake exhibits a defensive pattern similar to that of its western cousin except that immediate attempts to escape by crawling away or to hide the head beneath body coils are not used as frequently. Instead the Eastern Hognose Snake more readily spreads its “hood,” hisses, and “strikes.” Apparently it engages in “playing dead” for much longer periods than the Plains Hognose Snake.

Checkered Garter Snake

Thamnophis marcianus



An adult Checkered Garter Snake (*Thamnophis marcianus*).

The Checkered Garter Snake differs from other Grassland snakes by the large, yellow or cream crescent-shaped mark on each side of the head behind the angle of the jaws, and by the stripe on each side of the body being situated on the second

and third scale rows (counting from the belly up). In addition to the narrow yellowish stripes on each side of the body, there is a similarly colored stripe down the middle of the back, which is often partially obscured by the encroachment of adjacent black blotches. All three stripes start at the head and run down the body onto the tail. The area between and below the stripes is brownish yellow with a bold checkered pattern of dark brown or black spots. The belly is yellowish with no pattern. Adult males have longer tails than females. Females grow larger than males. This snake is easily confused with the more common Western Plains Garter Snake.

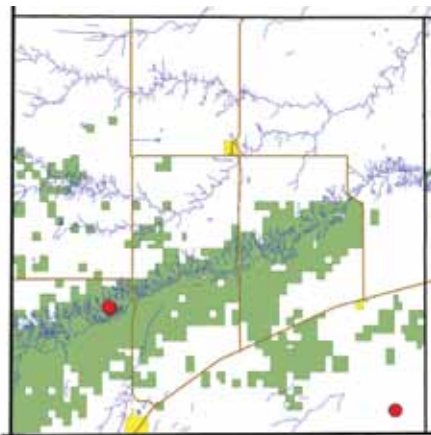
Adult Checkered Garter Snakes are 18 to 24 inches in total length. The largest specimen from Kansas was a female with a total length (snout to tip of tail) of 33 1/4 inches.

The Checkered Garter Snake is restricted in Kansas to the southern border of the state from the Flint Hills west to the Cimarron National Grassland. The Taylor Expedition made the earliest (and only) habitat observations on this rare species in Kansas. Their two specimens were collected 18 August 1926 near springs in Morton County on what is now the Grassland. But this reptile has not been reported from the Grassland since. A specimen was discovered in southeastern Morton County in June of 2010.

The Checkered Garter Snake is active from April to October. It forages for food by day around water, but may become nocturnal during extremely hot weather. During winter it retreats into small mammal burrows or deep in crevices on rocky hillsides to avoid cold temperatures.

Mating in this species occurs during the spring after emergency from winter inactivity. Courtship is not known. Each female may produce from 6-18 young during June, July, or August.

The Checkered Garter Snake feeds on frogs, toads, and small rodents. Its predators include large birds, mammals, and other snakes.



Map 26. The Checkered Garter Snake was collected in the Cimarron National Grassland at Spring Creek in 1926 and 1928. More recently, a single example of this snake was found in southeastern Morton County in 2010. This is a secretive reptile; few have ever been observed in Kansas.

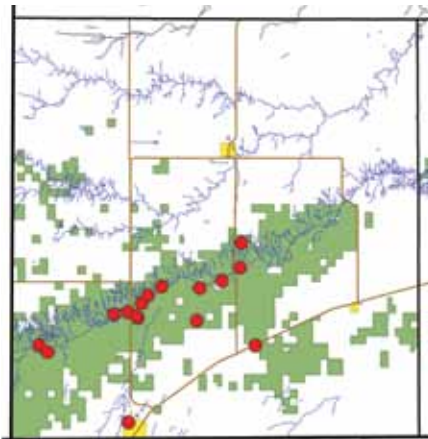
Plains Garter Snake

Thamnophis radix



An adult Plains Garter Snake (*Thamnophis radix*).

lips, and alternating rows of black spots between the stripes on the back. It is greenish gray, light olive, or tan with black spots between the three stripes on the body. The well-defined stripe running down the middle of the back may be bright yellow or orange whereas the stripes on the sides are normally yellow. The belly is white, grayish, or greenish with a row of black spots down each side. Adult males have longer tails than females. Females grow slightly larger than males.



Map 27. The Plains Garter Snake is commonly encountered throughout the Cimarron National Grassland and can often be found in association with cattle tank overflow ponds.

The Plains Garter Snake is distinguished from other Grassland snakes, particularly the Checkered Garter Snake, because the stripe on each side of its body is situated on the third and fourth scale rows (counting from the belly up). This serpent has dark vertical bars on the upper

Adult Western Plains Garter Snakes normally are 20 to 28 inches long. The largest specimen from Kansas was a female with a total length of 36 3/4 inches.

This reptile is most abundant west of the Flint Hills in Kansas. Western Plains Garter Snakes prefer open grassy prairies, particularly along the edges of springs and ponds. They are normally active from March to November, but during a warm spell in the coldest winter months they will emerge from their underground retreats. This snake is usually active during the day, basking in the sun or foraging for food. This reptile has been recorded more often

than any other snake in the Grassland. It was first found in Morton County by the Taylor Expedition on 16 August 1926.

This snake mates during April and May and sometimes in the fall. One or more courting males crawl over and alongside a female with jerking, writhing movements of their bodies. A successful male curls his tail beneath the female's until their cloacal openings meet and copulation occurs. More than one male may mate with a female. During late July, August or September each female gives birth to a litter of young, which may range in number from 5–60.

The Plains Garter Snake feeds on earthworms, toads, frogs, salamanders, fish, and small rodents. Predators of this harmless reptile include large birds, mammals, and other snakes.

Prairie Rattlesnake

Crotalus viridis



An adult Prairie Rattlesnake (*Crotalus viridis*).

VENOMOUS. The Prairie Rattlesnake is distinguished from other Grassland snakes by the rattle on its tail. The head, body and tail are greenish gray to brown. There are 30–55 dark gray or brown blotches on the back. The tail bands are similar in color to the body blotches. The belly is grayish or white. Adult males have longer and thicker tails than females. This is the only snake found on the Grassland that may be harmful to people.

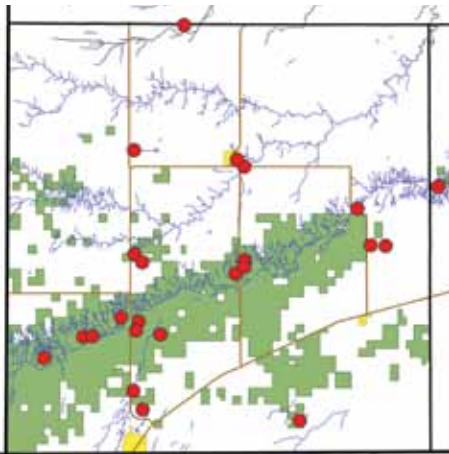
Adult Prairie Rattlesnakes normally are 35 to 45 inches in total length. The largest specimen from Kansas was a male with a total length of 48 ³/₈ inches.

The Prairie Rattlesnake is common on the arid High Plains of western Kansas. It prefers rocky canyons or open prairies with an abundance of small burrows, particularly those of rodents. Statewide, this reptile is active from April to October at preferred air temperatures of 80–90°F. During the summer this snake is primarily nocturnal and is often encountered as it crosses roads in search of prey. By day they coil up under cover or in mammal burrows. Little is known of its home range or habits in Kansas. During extremely hot daytime temperatures it retreats into small mammal burrows. In winter it again uses these burrows to avoid extreme cold. The Taylor Expedition first reported this snake from Morton County on 22 August 1926.

Prairie Rattlesnakes mate in early spring after emergence from winter inactivity, or in the fall. Females produce litters only every other year. The young are born in spring, summer, or fall (depending on time of mating) and are venomous at birth. The average number of young per litter is eleven. Each newborn rattlesnake has a single button and gains an additional segment each time it sheds its skin.

This snake feeds on rats, mice, gophers, young prairie dogs, and small lizards.

Male Prairie Rattlesnakes engage in combat dances, possibly to establish dominance. Prairie Rattlesnakes are defensive when surprised or provoked, and they have a quick temper. They usually rattle when approached too closely, and should be recognized as the only dangerous snake found in the Grassland. However, they will not attack people! Should you encounter this snake, leave it alone. Above all, do not kill it. If you do so, the balance of nature will be just that much more off-center. People are the main predators of Prairie Rattlesnakes, and they shouldn't be.



Map 28. The Prairie Rattlesnake is abundant in all habitats in the Cimarron National Grassland, and spends much time in adjacent croplands during the summer months. It is very active at night during the summer months and at that time is often encountered crawling across roads and highways.

TURTLES

STRAIGHTNECK TURTLES

Common Snapping Turtle

Chelydra serpentina



A young adult Common Snapping Turtle (*Chelydra serpentina*).

The Common Snapping Turtle is aquatic, and is distinguished from other Grassland turtles because it has a large upper shell when compared with its much smaller lower shell. Further, it has a very long (at least half the length of the upper shell) saw-toothed tail. The upper shell is tan or brown, and frequently is covered with mud and algae.

The small lower shell is white or yellowish. Head, limbs, and tail are brown. Females reach a slightly larger size than males. Adult Common Snapping Turtles have an upper shell length of 8–12 inches. The largest example from Kansas was a female with a shell length of 14 1/8 inches.

The hardy Common Snapping Turtle is plentiful throughout eastern Kansas, but less abundant on the arid High Plains; it is rare in the Grassland. It is found in every aquatic situation, but prefers ponds with a soft mud bottom,



Map 29. The Common Snapping Turtle is restricted to permanent springs, ponds, and the larger overflow ponds in the Cimarron National Grassland.

and sunken logs and branches. It spends much of its time buried in mud in water about the same depth as its long neck, allowing it to raise its head to the surface to breathe. Common Snapping Turtles are active from March to November, digging beneath the mud of ponds and lakes during the coldest months of winter. Previously, the only verified record of this turtle from Morton County was a single example found by the Taylor Expedition on 15 August 1926; in June of 2002, another adult was discovered in a pool along the Cimarron River in the Grassland.

Mating generally occurs at any time between April and November. These animals mate in the water when water temperatures are high enough. Courtship is variable, but usually a pair of turtles will face each other and wave their heads and necks sideways in opposite directions from each other. They may gulp water and violently expel it through their nostrils, causing turbulence at the surface. A male mounts a female by gripping her upper shell with his claws. He curls his tail beneath hers until their cloacal openings are in contact. The female may retain potent sperm for several years. She lays 25–30 white, round eggs (maximum is 83) and may produce two clutches per season. The eggs are laid on land in nests dug by the female. The eggs hatch in 55–125 days, depending on temperature and humidity, and the young turtles have a shell length of 1–1 1/2 inches at birth.

The Common Snapping Turtle is evidently omnivorous, eating whatever is available including aquatic plants, insects, crayfish, earthworms, clams, snails, fish, frogs, toads, salamanders, snakes, other turtles, birds, small mammals, and carrion.

Common Snapping Turtles have a nasty disposition. Large individuals exhibit an unhappy temper when cornered on land, and can inflict a painful bite if approached too closely. In addition, when disturbed, this turtle emits a foul-smelling musk. But despite its annoying habits it is excellent to eat, and is probably the only reptile in Kansas of any commercial value due to its abundance and large size. Predators on the eggs and young of the Common Snapping Turtle are numerous, and include skunks, raccoons, crows, herons, hawks, bullfrogs, large fish, and snakes. The main predators of adult turtles are humans.

Yellow Mud Turtle

Kinosternon flavescens

The Yellow Mud Turtle is aquatic, and can be easily identified because its short tail ends in a horny, claw-like tip, and because its lower shell has a distinct movable hinge. The only other Grassland turtle with a movable hinge on the lower shell is the terrestrial Ornate Box Turtle. The upper shell of the Yellow Mud Turtle is plain brown or olive-brown with dark brown margins around each scute. The lower shell is yellowish-brown with dark brown margins around each scute. The head, limbs, and tail are grayish, and the chin is yellow. Adult males have longer and thicker tails, and grow slightly larger than females.



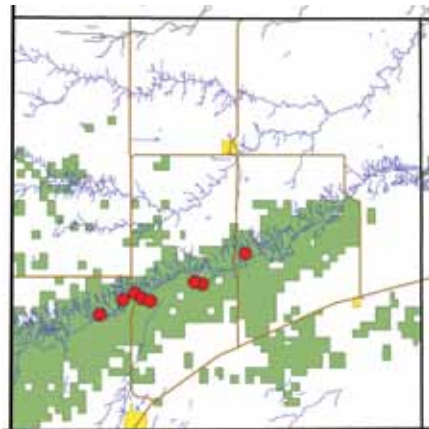
A young adult Yellow Mud Turtle (*Kinosternon flavescens*).

Adult Yellow Mud Turtles normally have an upper shell length of 4 to 5 inches. The largest individual from Kansas was a male with a shell length of 5 1/4 inches.

The Yellow Mud Turtle does well in aquatic situations in the Grassland. It prefers quiet ponds with a mud or sand bottom, and has

been found in sloughs, backwaters, swamps, sinkholes, rivers, cisterns, roadside ditches, and cattle tanks. Yellow Mud Turtles are active at air temperatures from 65–90°F. They have been found between May and August in the Grassland, but are probably active as early as April and as late as September. Apparently their daily activity is divided into two periods — from afternoon to dusk and from midnight to sunrise. This species may forage on land, and is frequently found crawling from one body of water to another. It is also known to bask on brush or logs at the waters edge. During winter, Yellow Mud Turtles select various burrows in which to reside. They sometimes burrow in mud above or below water, or reside in muskrat dens or old stump

holes. This is the most common aquatic turtle in the Grassland. It was first discovered in Morton County on 15 August 1926 by the Taylor Expedition.



Map 30. The Yellow Mud Turtle is found in any aquatic situation in the Cimarron National Grassland but prefers the habitat along the Cimarron River. It is one of the few aquatic turtles adapted to life on a desert grassland.

Breeding in this species probably takes place before June of each year. Courtship involves the male approaching other turtles from the rear and smelling their tails, evidently to determine sex. Upon discovering a female, the male moves to her side and nudges the underedge of her shell with his nose. The male mounts atop the female by clasping her shell with his clawed feet. He pins her tail up between his rear legs and positions his cloaca to hers. During copulation the male extends his head forward and rubs and bites

the females head. Nesting probably occurs in June. Females lay one to four elongate, white eggs, which hatch within three months.

Yellow Mud Turtles are omnivorous, eating insects, crayfish, snails, earthworms, amphibians, dead fish, and aquatic vegetation. Their acute sense of underwater smell aids them in locating food. Fish, other turtles, and snakes eat young Yellow Mud Turtles. Humans are the only major predators on adult turtles. This turtle can emit a foul-smelling musk when excited.

Northern Painted Turtle

Chrysemys picta

The aquatic Northern Painted Turtle is distinguished from other Grassland turtles because it has a pattern of bright red on the edges of the lower shell. The upper shell is gray, brown, or green with red markings around the edge. The lower shell is yellow with a bold gray and red pattern. Head, limbs, and tail are dark gray or green with yellow lines. Adult males are smaller than females and have very long claws on the front feet.

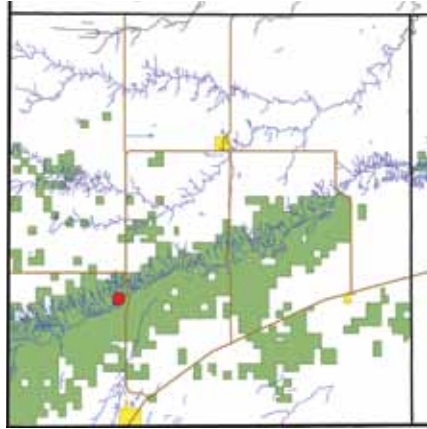


An adult Northern Painted Turtle (*Chrysemys picta*).

Adult Northern Painted Turtles normally are 4 to 7 inches in upper shell length. The largest individual from Kansas had a shell length of 8 1/8 inches.

The Northern Painted Turtle is abundant throughout Kansas, but is least common on the southern High Plains. This reptile resides in slow-moving shallow rivers and shallow ponds having soft bottoms with aquatic plants and emergent logs and branches on which to bask in the sun. Usually it is active at air temperatures of 68°F or above, but it has occasionally been observed actively swimming at a temperature as low as 50°F. During the cold winter months it burrows as deep as 1 1/2 feet beneath the mud in the bottoms of streams and ponds. Throughout its active season, the Northern Painted Turtle is diurnal, sleeping at night beneath the water on submerged logs or on the bottom. It divides its daytime hours between basking and feeding. The Northern Painted Turtle is uncommon in the Grassland, and was only recently discovered there. The shell of a single individual was found along the Cimarron River on 10 July 1974.

Mating in this species normally occurs from March to June, but may continue into the summer. Courtship starts with a slow pursuit of the female by the male. Upon catching up with her, the male faces her and strokes her head and neck with the long claws on his front feet. The male periodically swims away as if trying to entice the female to follow. After a period of time the female sinks to the bottom and the male swims down and mounts her back. He secures himself on her upper shell with his claws, curls his tail down under hers until their cloacal openings meet, and copulation occurs.



Map 31. The Northern Painted Turtle is restricted to permanent springs, ponds, and the larger overflow ponds in the Cimarron National Grassland.

A female lays 4–20 elongate, white eggs in a nest, sometime between May and July. The nest is dug in soft soil by the female, who uses her hind limbs to excavate the earth. The eggs generally hatch in 2–2 1/2 months, and the young turtles dig free of the nest and rapidly crawl to the water. However, the eggs may not hatch immediately, or if they do, the young may not emerge until late fall during cold weather. In the latter case they remain in the nest during the winter and hatch or emerge the following spring.

The Northern Painted Turtle is omnivorous, but the young are more carnivorous than adults. This creature eats plant and animal matter. Enemies of adult Northern Painted Turtles are primarily humans and their pesticides. The eggs and young are eaten by squirrels, skunks, badgers, raccoons, muskrats, crows, snakes, other turtles, Bullfrogs, and large fish.

Ornate Box Turtle

Terrapene ornata

The Ornate Box Turtle is an official State Symbol of Kansas, having received this formal designation by action of the Kansas Legislature and the Governor in April of 1986. Because of this legislation, it joins our other state symbols, the Buffalo (State Mammal), Meadowlark (State Bird), Honeybee (State Insect), Cottonwood (State Tree), and Common Sunflower (State Flower), as representatives of natural Kansas.

This terrestrial creature has distinct light radiating lines on the upper and lower shells, a pattern and color possessed by no other Grassland turtle. The upper shell is dark brown or reddish brown (sometimes with a yellow line down the middle), and both upper and lower shells are covered with yellow or yellow-orange radiating lines. The lower shell has a movable hinge, more

movable than that of the Yellow Mud Turtle. The head and limbs are dark brown, gray, or greenish, and are covered with yellow or orange-yellow spots. The dark tail may have a yellow stripe on its upper surface. Adult males have red eyes whereas those of females are yellowish brown. Females grow slightly larger than males.



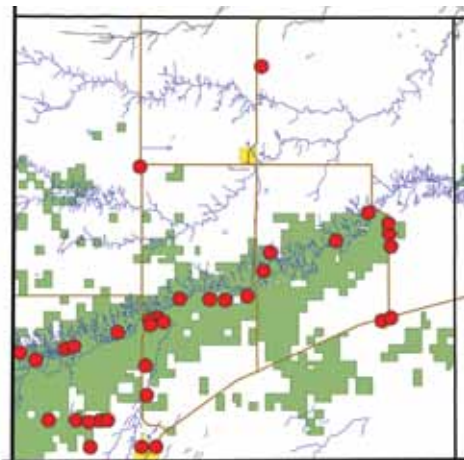
An adult female Ornate Box Turtle (*Terrapene ornata*).

Adult Ornate Box Turtles normally are 4 to 5 inches in upper shell length. The largest example recorded from Kansas was a female with an upper shell length of 6 1/8 inches.

Ornate Box Turtles are found throughout Kansas, reaching their greatest abundance on the western open

prairie. This turtle is normally active at air temperatures ranging from 60–95°F, and is particularly observable in the Grassland during the hot months of June, July, and August. With the approach of winter, it digs beneath the ground or enters the dens or burrows of other animals. In open Grassland it may dig to a depth of 18 inches. Ornate Box Turtles are diurnal, spending the daytime basking, feeding, and at rest. These reptiles have an individual home range of about five acres, but are not possessive of this plot of land, several turtles utilizing the same general area.

Map 32. The Ornate Box Turtle is the only terrestrial chelonian in the Cimarron National Grassland. It is an abundant, easily-observed turtle that is active by day and is often seen crossing the roads and highways in and near the Grassland. Its slow movement across roads may lower its numbers, but it is quite prolific and soon replenishes the population.



Mating in Ornate Box Turtles occurs most commonly in the spring and autumn, but may take place throughout the summer. In courtship the male mounts the female, hooking his claws on the rear edge of her lower shell. The female secures the males hind limbs by wrapping her own about them. The male positions his cloaca against that of the female and copulation occurs. Frequently, when dismounting from the female, the male will fall on his back, but generally he can right himself with little difficulty. Nesting and egg deposition occur at least once a year in all females, and probably a third of the females lay a second clutch in the same season. Nesting is most common in June, but may occur from May to July. Each female lays from two to eight elongate, white eggs that hatch in a little over two months. The young become sexually mature at 7–8 years of age, and may live to over thirty years of age.

The Ornate Box Turtle is primarily carnivorous, feeding on beetles, caterpillars, grasshoppers, cicadas, earthworms, and dead vertebrates. Also, it is fond of berries and other fruits. People appear to be the chief predators of our State Reptile, slaughtering them in great numbers on Kansas roads and highways. Other mammals, such as coyotes and skunks, prey on this turtle for food.



Bibliography of Grassland Amphibians, Reptiles, and Turtles

This is a bibliography of the amphibians, reptiles, and turtles of the Grassland, a list of books or papers that in some way deals with or mentions specifically amphibians, reptiles, and turtles collected or observed in Morton County, Kansas. This compilation is reasonably complete, and should be referred to when more in-depth information is desired about the Grassland herpetofauna.

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