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New County Records and Habitat Preferences of Amphibians and Reptiles from the Sandsage Prairie in Finney County, Kansas

MICHAEL S. RUSH, STEVEN M. ROYAL, AND EUGENE D. FLEHARTY
Fort Hays State University, Museum of the High Plains
Hays, Kansas 67601

ABSTRACT

During the summer of 1980 a study of the herpetofauna of the sandsage prairie was conducted south of Holcomb, Finney County, Kansas. Seven new county records, the barred tiger salamander (*Ambystoma tigrinum mavortium*), yellow mud turtle (*Kinosternon flavescens flavescens*), eastern yellowbelly racer (*Coluber constrictor flaviventris*), western coachwhip (*Masticophis flagellum testaceus*), central plains milk snake (*Lampropeltis triangulum gentilis*), Texas longnose snake (*Rhinocheilus lecontei tessellatus*), and massasauga (*Sistrurus catenatus*) along with habitat data are reported.

The sandsage prairie primarily occupies portions of 16 counties in the southwestern portion of Kansas with the largest areas, south of the Arkansas River in Hamilton, Kearny, Finney, Gray, and Ford counties (Küchler, 1974). In 1980 a baseline study of the herpetofauna was conducted on an eight square mile section of the sandsage prairie south of Holcomb in Finney County (T.24S, R.33W, secs. 17, 18, 19, 20, 29, 30, 31, 32) and on an uncultivated area 2.9 mi. W, 11 mi. S Holcomb (T.26S, R.34W, center sec. 4). During this study 18 species of amphibians and reptiles were collected.

A perusal of the literature (Collins, 1974, 1979, 1980; Collins and Caldwell, 1976, 1978; Caldwell and Collins, 1977) indicates that seven of these species represent new county records. These species are reported to (1) record the habitat preference of these species within the sandsage prairie and to (2) update the distributional record of Kansas herpetofauna.

All specimens are housed in the Museum of the High Plains (MHP), Fort Hays State University, Hays, Kansas, with the exception of a previously unreported massasauga not from our study site. This specimen is housed in The Musuem of Natural History (KU), University of Kansas, Lawrence, Kansas. All common and scientific names of animals were taken from Collins et al. (1978). All common and scientific names of plants were taken from Barkley (1968).

Habitat

The primary study area encompassed eight square miles, two miles wide, abutting on the Arkansas River bottom, and extending four miles south. Three major habitats were distinguishable within the study site, (1) floodplain, on the north; (2) choppy dunes; and (3) level sands on the south. Additional studies were conducted on an uncultivated "island" of land, left among four center pivot irrigators, that contained a habitat somewhat distinct from the above.

Description of Habitat

Floodplain. The Arkansas River at the northern end of the primary study site has been without permanently running water since 1965 (Soil Conservation Service, pers. comm.), resulting in the death of most of the native riparian woody vegetation (predominantly plains cottonwood, *Populus sargentii*), leaving an introduced species of tamarisk (*Tamarix gallica*) as the dominant woody species (Dr. G. K. Hulett, pers. comm.). The river bottom itself consists of loose open sand with grasses encroaching into it. It is composed of Lincoln soils inhabited by unstable vegatation (Harner et al., 1965).

The floodplain habitat covers approximately the first one-half mile south of the river bottom. It is characterized by packed loamy soils of the Las-Las Animas complex (Harner et al., 1965), rich in nutrients, and covered by a lush growth of cool season grasses characteristic of the Saline Subirrigated range site. The major vegetational components include little barley (*Hordeum pusillum*), buffalograss (*Buchloe dactyloides*), western wheatgrass (*Agropyron smithii*), and vinemesquite (*Panicum obtusum*). Sand dropseed (*Sporobolus cryptandrus*), buffalobur nightshade (*Solanum rostratum*), and tumble lovegrass (*Eragrostis sessilispica*) were among the other characteristic components (Dr. G. K. Hulett, pers. comm.). The floodplain also contains a few plains cottonwoods, and is flanked on the south by a compacted sand road.

Choppy dunes. Approximately one-half mile south of the river the floodplain intergrades into the choppy dunes habitat. These dunes are characterized by low to medium height brushy vegetation with interspersed mixed grasses typical of the Choppy Sands range site (Harner et al., 1965) ranging from open brush to dense grass with a few scattered trees. The soil is classified as Tivoli fine sand (Harner et al., 1965). Sand bluestem (*Andropogon hallii*), little bluestem (*Schizachyrium scoparium*), sandhill sage (*Artemisia filifolia*), and sandreed (*Calamovilfa longifolia*) comprise the dominant vegetation (Küchler, 1974). Other characteristic components listed are wormwood (*Artemisia caudata*), sand milkweed (*Asclepias arenaria*), side oats grama (*Bouteloua curtipendula*), blue grama (*B. gracilis*), hairy grama (*B. hirsuta*), sedge (*Carex heliophila*), sand lovegrass (*Eragrostis trichodes*),

fleabane (*Erigeron bellidiastrum*), white flower gilia (*Gilia longiflora*), Indian rice grass (*Oryzopsis hymenoides*), switchgrass (*Panicum virgatum*), prairie clover (*Petalostemon villosum*), chickasaw plum (*Prunus angustifolia*), sand dropseed (*Sporobolus cryptandrus*), needle and thread (*Stipa comata*), and small soapweed (*Yucca glauca*).

Level sands. The choppy dunes intergrade into level sands in the southern one-third of the study site and is characterized by Tivoli-vona loamy fine sands (Harner et al., 1965). The vegetation is composed of the same basic components as the Choppy Dunes Habitat; however, the grassy species are more plentiful thus providing a more dense ground cover. The species are characteristic of the Sands range site (Harner et al., 1965).

Uncultivated islands. In the sandsage prairie there are many center-pivot irrigation systems that permit the growing of field corn. Without an expensive corner arm, 120 acres of each section (18%) cannot be irrigated. These unirrigated "islands" lie at the corners of each section and at the intersection of the quarter mile diameter irrigation circles. Thus where two irrigators meet there is a 15 acre "island" and where four meet, a 30 acre "island." These "islands" usually are not disturbed because without irrigation any loss of vegetation would facilitate heavy wind erosion.

The vegetation on the "island" herein studied differed slightly from the main study site. Differences may be linked to increased grazing, disturbance by machinery, or slightly increased moisture levels due to the surrounding irrigation. The soil is of the Tivoli-vona loamy fine sand type (Harner et al., 1965).

Plants which were common included Louisiana sagewort (*Artemisia ludoviciana*), Kansas milkweed (*Asclepias syriaca*), partridge pea (*Cassia fasiculata*), sand lovegrass, prairie sunflower (*Helianthus petiolaris*), bush morning glory (*Ipomoea leptophylla*), false buffalo grass (*Munroa squarrosa*), and sand dropseed, whereas those that decreased significantly in density included sandhill sage, little bluestem, and needle and thread. Adjacent to the corn fields is a zone approximately 20 feet in width of grass composed mainly of sixweeks fescue (*Festuca octoflora*). This is an invader typical of disturbed habitats. It most likely forms this zone due to the disturbance of the edge of these "islands" during various farming procedures.

County Records

Of the 18 species of amphibians and reptiles collected, seven were county records.

Barred Tiger Salamander (*Ambystoma tigrinum mavortium*)

Although this terrestrial salamander has been found over the western 80% of the state, there are several counties from which it has not been recorded. This record serves to fill in one of these gaps.

In Kansas the tiger salamander is active during cool, wet periods especially at night. During hot, dry periods it inhabits mammal burrows where humidity is sufficient to prevent desiccation (Collins, 1974). In addition to breeding in permanent water it utilizes temporary pools, so populations were not unexpected in the dry, sandy environment of the sandsage prairie. In the spring, temporary pools are interspersed throughout the prairie, particularly in low lying spots on sandy roads.

Three adults and over 100 larval specimens were found. The larvae were in two (approx. 1 m^2) rapidly evaporating muddy pools on a road in the *level sands habitat*. One hundred or more larvae were lying dead around the pools from desiccation. The living animals were emerging at a somewhat stunted size as compared to emerging adults in more stable aquatic environments.

The three adult specimens were found in the *level sands* and the *floodplain habitat*. The first (MHP 6274) was collected by hand at 0100 hours from a temporary pool during a spring rain shower. The air and water temperatures were 13°C, and wind speed was approximately 25–30 mph. The second specimen (MHP 6277) was taken on a clear spring afternoon while seining a temporary pool at 1800 hours. Air temperature was 35°C and water temperature 32°C. The third specimen was collected on the night of 20 June after a rainstorm in a drift fence on the floodplain approximately 50 m south of the river bottom.

This species requires water in which to breed. However, it is evident that it can survive long periods without water as are common on the sandsage prairie. Stable populations probably exist near those areas where water collection is sufficient for breeding purposes.

Specimens collected (5). FINNEY COUNTY: ½ mi. (0.8 km) S Holcomb (T.24S, R.33W, SW ¼ sec. 17), 27 May 1980, S. M. Royal, collector, 1, MHP 6283; 4 mi. (6.4 km) S Holcomb (T.24S, R.33W, E ½ sec. 31), 20 May 1980, M. S. Rush and S. M. Royal, collectors, 1, MHP 6274; 5 mi. (8.0 km) S Holcomb (T.24S, R.33W, SE ¼ sec. 31), 23 May 1980, M. S. Rush, collector, 1, MHP 6277; 5 mi. (8 km) S, 1 mi. (1.6 km) E Holcomb (T.24S, R.33W, SW ¼ sec. 32), 10 July 1980, M. S. Rush and S. M. Royal, collectors, 2, MHP 6284, 6285.

Yellow Mud Turtle (*Kinosternon flavescens flavescens*)

Both Smith (1950) and Collins (1974) note that in Kansas this turtle prefers aquatic habitats with mud or sand bottoms and utilizes aquatic or semi-aquatic organisms as food items. In the study area there is no habitat of this type. However, two adult specimens of this turtle were found. This might be explained as a relict population that has somehow survived in a terrestrial situation after the river dried up.

Both specimens were found on the sandy road at the intergrade between

the *floodplain* and the *choppy dunes habitats* approximately one-half mile south of the river bed; one on 12 July and the other on 21 July. Only the latter specimen was collected. The former was keyed out and reported by two coworkers. The climate was extremely harsh. It was hot and dry with no standing water in the vicinity, except for two ephemeral pools that had evaporated by late May. Both animals were found shortly after sunrise, before the temperature had risen above 85°F (29°C).

We do not know whether the specimens collected represent a breeding population or not, although one of the specimens appeared to be either stunted or subadult. An accurate measurement of the collected specimen was not possible as it had been run over by a vehicle.

Specimen collected (1). FINNEY COUNTY: 1½ mi. (2.4 km) S, ½ mi. (0.8 km) E Holcomb (T.24S, R.33W, NW ¼ sec. 18), 21 July 1980, D. L. Carnahan and C. A. Jones, collectors, 1, MHP 6275.

Eastern Yellowbelly Racer (*Coluber constrictor flaviventris*)

This species inhabits grassy lowlands and prairies in Kansas (Collins, 1974) and is generally restricted to mixed grass where it forages for insects and other food items during the day. Collins (1974) noted that during the cooler months it inhabits rocky wooded hillsides, and spends the winter in deep rock crevices. This type of habitat does not exist on the study area. Apparently survival is possible without rocky cover by overwintering in mammal burrows in the sandsage prairie.

Six adults of the eastern yellowbelly racer were collected from dense grassy patches in low lying areas dominated by sand dropseed, blue grama, and needle and thread. These areas are interspersed throughout all of the habitat types. On the floodplain they were found in areas dominated by buffalo grass and little barley. No evidence of this species was found in areas dominated by sand sage. Although juveniles of this species were not collected we have no reason to believe that this is a non-breeding population.

One specimen (MHP 6276) was collected in a moist grassy area in the *choppy dunes habitat* on 19 May near sunset at 2000 hours. The air temperature was 21°C and the sky was clear. A second (MHP 6291) was taken in a grassy area in the *level sands habitat* also in the evening at 1830 hours on 24 May. The air temperature was 32°C, it was clear and sunny, and the wind was 15–30 mph. On 5 June a road killed specimen (MHP 6292) was found between two cultivated plots of land 6 miles south of the study area. On 6 July three dead specimens (MHP 6278–6280) were removed from the same funnel trap in the *floodplain habitat*. They apparently died from the heat as the air temperature at this time (1545 hours) was 40°C and the soil surface temperature 60°C. It is believed that trapped reptiles of certain kinds (including blue racers) might attract other members of the same species by

sight or smell (Fitch, 1951) thus possibly accounting for the three specimens in this trap.

Specimens collected (6). FINNEY COUNTY: 1 mi. (1.6 km) S, 1½ mi. (2.4 km) E Holcomb (T.24S, R.33W, NE ¼ sec. 17), 6 July 1980, S. M. Royal, collector, 3, MHP 6278–6280; 3 mi. (4.8 km) S, 1 mi. (1.6 km) E Holcomb (T.24S, R.33W, SE ¼ sec. 29), 19 May 1980, M. S. Rush and S. M. Royal, collectors, 1, MHP 6276; 10 mi. (16 km) S, 1 mi. (1.6 km) W Holcomb (T.25S, R.34W, NW ¼ sec. 36), 5 June 1980, M. S. Rush, collector, 1, MHP 6292; 5 mi. (8 km) S Holcomb (T.24S, R.33W, SE ¼ sec. 31), 24 May 1980, M. S. Rush, collector, 1, MHP 6291.

Western Coachwhip (*Masticophis flagellum testaceus*)

Conant (1975) noted that the western coachwhip occurs in more or less open habitats such as grasslands and arid brushlands. In western Kansas, they inhabit open prairies (Collins, 1974), generally avoiding dense vegetation, but are not restricted to any particular habitat (Schmidt and Davis, 1941). They were generally found throughout the sandsage prairie particularly in the *choppy dunes habitat* where sandhill sage dominated. When alarmed, they sought cover in sandhill sage plants. Of the four specimens collected, two were found dead on paved roads and two were captured alive from the *choppy dunes habitat*. One of the specimens found dead was on a bridge above the dry Arkansas River and the other was from a highway surrounded by cultivated land north of the study area. Of the specimens collected alive, one was taken on 30 May, early in the morning under a calm, cloudless sky with an air temperature of 25°C. The other was collected on 12 June but environmental data was not noted.

Specimens collected (4). FINNEY COUNTY: 1 mi. (1.6 km) S Holcomb (T.24S, R.33W, NW ¼ sec. 18), 20 May 1980, S. M. Royal, collector, 1, MHP 6281; 1 mi. (1.6 km) S, ½ mi. (0.8 km) E Holcomb (T.24S, R.33W, NE ¼ sec. 18), 12 June 1980, J. Freeborn, collector, 1, MHP 6282; 1½ mi. (2.4 km) S Holcomb (T.24S, R.33W, SE ¼ sec. 18), 30 May 1980, M. S. Rush, collector, 1, MHP 6286; 1½ mi. (2.4 km) E Holcomb (T.24S, R.33W, SE ¼ sec. 5), 5 June 1980, M. S. Rush, collector, 1, MHP 6287.

Central Plains Milk Snake (*Lampropeltis triangulum gentilis*)

The central plains milk snake occurs on rocky ledges of canyons along streams (Collins, 1974), wooded stream valleys (Conant, 1975) and in open prairies.

During the study only two specimens were collected (one released) both from the *uncultivated "island."* Fitch and Fleet (1970) note that milk snakes generally prefer areas where flat rocks, stumps, logs, boards, or other debris provide shelter. However, there was little debris in this particular area, and cover was available only from the vegetation or the sandy soil.

These uncultivated "islands" might be preferred over the other habitats studied because of increased moisture and food supply. In addition to the water from infrequent rains, the uncultivated "island" receives drift from adjacent irrigated fields. Milk snakes have small heads and can only ingest smaller prey (Fitch and Fleet, 1970), consisting of small vertebrates such as rodents, lizards, and other snakes. Rodent species on the uncultivated "islands" included a greater number of smaller rodents such as plains pocket mice (*Perognathus flavescens*) and western harvest mice (*Reithrodontomys megalotis*) than were found in the other habitats. Additionally prairie-lined racerunners (*Cnemidophorus sexlineatus*) and great plains skinks (*Eumeces obsoletus*), were available.

Specimen collected (1). FINNEY COUNTY: 11½ mi. (18.4 km) S, 3 mi. (4.8 km) W Holcomb (T.26S, R.34W, sec. 4), 4 June 1980, M. S. Rush, collector, 1, MHP 6293.

Texas Longnose Snake (*Rhinocheilus lecontei tessellatus*)

The Texas longnose snake occurs on open prairies and sandy areas of the Red Hills and High Plains of southwestern Kansas (Collins, 1974). Klauber (1941) reported this species from Finney County, Kansas; however, the specimen was unverified and therefore not included by Collins (1974). The specimen herein reported represents the northernmost record in Kansas and strongly suggests the likelihood of its occurrence in sandy areas of surrounding counties.

This snake is active from April to September (Collins, 1974) and is nocturnal (Smith, 1950), retreating to burrows during the day. We observed one individual (uncollected) burrowing into sand soon after sunrise. Of the three specimens collected, two were from the dry, loose sand of the *choppy dunes habitat*. One, collected on 24 May, was found at 0630 hours under a calm, humid, and overcast sky with an air temperature of 21°C. The other, collected on 31 May, was found at 0730 hours under a humid, partly cloudy sky with an air temperature of 27°C and the wind speed 10–20 mph. The third specimen was found dead on an unpaved road south of the study area surrounded by cultivated land.

Food of the Texas longnose snake primarily consists of lizards, but also includes small rodents, lizard eggs, small snakes, and insects (Collins, 1974; Conant, 1975). Observed specimens in captivity readily fed on northern earless lizards (*Holbrookia maculata*), a common inhabitant of this area.

Specimens collected (3). FINNEY COUNTY: 1½ mi. (2.4 km) S, 1 mi. (1.6 km) E Holcomb (T.24S, R.33W, SW ¼ sec. 17), 24 and 31 May 1980, M. S. Rush and S. M. Royal, collectors, 2, MHP 6289, 6290; 12 mi. (19.2 km) S, 2 mi. (3.2 km) W Holcomb (T.26S, R.34W, NE ¼ sec. 3), 24 May 1980, collector, 1, MHP 6288.

Massasauga (*Sistrurus catenatus*)

This species was inadventently omitted from records of Finney County when Collins (1974) published his handbook. The present report includes a specimen from the University of Kansas collected in 1965 and a road killed specimen from the present study. Both specimens appear to be intergrades between the *tergeminus* and *edwardsi* subspecies of *Sistrurus catenatus* (Collins, pers. comm.), although the desert subspecies, *S. c. edwardsi*, is known to occur in the sandsage prairie (Stebbins, 1966; Collins, 1974).

The KU specimen was found four miles west of the study area in habitat virtually the same as the *floodplain habitat* described previously. Our specimen was collected DOR from a well traveled road in the *level sands habitat*.

Specimens collected (2). FINNEY COUNTY: 4 mi. (6.4 km) E Deerfield (T.24S, R.34W, sec. 9), 16 June 1965, J. D. Rising, collector, 1, KU 98374; 5½ mi. (8.6 km) S, 1 mi. (1.6 km) W, Holcomb (T.25S, R.34W, NW ¼ sec. 1), 1 June 1980, M. S. Rush and S. M. Royal, collectors, 1, MHP 6263.

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