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*Illinois Natural History Survey, Urbana*

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## A New Frog and a New Turtle from the Western Illinois Sand Prairies

Philip W. Smith

*Illinois Natural History Survey, Urbana*

The accumulation of herpetological specimens, resulting from field work in Illinois over the past four years, has led to a preliminary analysis of distribution of the herpetofauna and the relationships of eastern and western elements within the state. The intermediate position of Illinois between eastern deciduous forest and central plains, the interdigitation of prairie and woodland over most of the state, and the presence of isolated sand prairies which closely resemble habitats found in the Great Plains are reflected by more than a quarter of the Illinois species and subspecies. Each of these 28 forms either has a subspecific break or reaches the eastern or western limit of its range in this ecotone.

Among the more striking examples of western elements in the Illinois herpetofauna are those animals with distinct discontinuity of range; in some cases the hiatus between Illinois and Great Plains populations is three to four hundred miles. These extremes are species believed to be restricted in eastern distribution to the sand prairies of northern and western Illinois. Two of these, a chorus frog and a mud turtle, differ subspecifically from the Great Plains populations and are described herein.

I am indebted to Robert W. Reese, Paul W. Parmalee, and Louis W. Ramsey for their kindness in supplying living material for comparative purposes; to Ottys Sanders, Clifford H. Pope, Donald F. Hoffmeister, and Mr. Ramsey for the loan of preserved specimens in their personal collections or in their charge. Mr. Sanders generously transcribed detailed color notes of Texas *Pseudacris streckeri* from his field notes and made these available to me. W. Leslie Burger and William B. Robertson kindly took measurements for me on specimens at other institutions. Drs. Hobart M. Smith and Herbert H. Ross have given advice and encouragement on numerous occasions, and both have my gratitude for their assistance in the preparation of this manuscript.

Museums cited are abbreviated as follows: INHS, Illinois Natural History Survey; UIMNH, University of Illinois Museum of Natural History; CNHM, Chicago Natural History Museum; CA, Chicago Academy of Sciences; UMMZ, University of Michigan Museum of Zoology, and USNM, United States National Museum.

*Pseudacris streckeri illinoensis*, new subspecies

Plate 1

*Pseudacris brachyphona* (nec Cope), Weed, Copeia, no. 116, p. 49, 1923. Misidentification.

*Pseudacris* sp., Walker, Ohio Journ. Sci., vol. 32, no. 4, p. 382, 1932. Listed as "not *brachyphona*."

*Holotype*. INHS 5982, male from three miles north of Meredosia, Morgan County, Illinois, collected May 19, 1950, by members of a University of Illinois herpetology class.

*Paratypes*. Thirty-two specimens as follows: INHS 5684, topotype collected March 6, 1951, by P. W. Smith; CNHM 3266, Meredosia, Morgan County, September, 1922, by A. C. Weed; INHS 5768-76, Chandlerville, Cass County, Illinois, by D. A. Langebartel and P. W. Smith; INHS 5678-83, UIMNH 24034-9, UMMZ 103088(2), CA 15685-6, CNHM 64654, three miles east of Beardstown, Cass County, Illinois, taken March 6, 1951, by P. W. and D. M. Smith; and INHS 5685-9, same locality, March 22, 1951, by M. W. Sanderson and P. W. Smith.

*Diagnosis*. A relict population of *Pseudacris streckeri* occurring in the Illinois sand areas, differing from western *P. streckeri* by the absence of yellow or orange-yellow groin color (in life), uniform distribution of pigment in the groin (in preserved specimens), reduction of the lateral dark stripe (82 per cent have lateral stripe no greater in extent than the postorbital dark stripe; 50 per cent in *P. s. streckeri*), general pallid color, and smaller 5th row of labial teeth in the larvae.

*Description of the type*. Head broader than long; snout bluntly pointed; canthus rostralis rounded, loreal surface slightly concave; eye one-half its vertical diameter above edge of lip, removed from snout tip by  $1\frac{1}{3}$  its horizontal diameter; nostrils prominent, two-thirds distance from anterior edge of eye to snout tip; internasal distance equal to horizontal diameter of eye; vomerine teeth in two round patches, each slightly larger than choana, located between and slightly behind choanae; tympanum higher than wide, two-thirds size of orbit, nearer angle of jaws than orbit, posterior edge overlapped by vertical folds between angle of jaws and shoulder; supratympanic fold well developed; eyelids somewhat rugose; interorbital space with minute longitudinal ridges,

*Kinosternon flavescens spooneri*, new subspecies\*

## Plate 2

*Holotype.* INHS 4244, female from Henderson County State Forest, 7 miles north of Oquawka, Illinois, collected June 9, 1949, by P. W. Smith.

*Paratypes.* Twenty-three as follows: INHS 4245, same data as holotype; INHS 3220-2, 2 miles south of Oquawka, Henderson County, Illinois, June 24, 1948, L. J. Stannard and P. W. Smith; INHS 5898, 6010-1, CA 15687, UMMZ 103089, Cimco Farms, 3 miles northeast of Havana, Mason County, Illinois, June 11, 1951, P. W. Smith; CNHM 37992-3, Snicarte Slough, Mason County, Illinois, C. H. Pope, May 31, 1941; INHS 5587-9, UIMNH 2252-6, USNM 83190, UMMZ 74654, Meredosia, Morgan County, Illinois, D. H. Thompson, June, 1927; INHS 5987-8, 1 mi. south Beardstown, Cass County, Illinois, P. W. Smith, June 21, 1951.

*Diagnosis.* A subspecies of *Kinosternon flavescens* occurring in relict populations on the Illinois sand prairies, differing from the typical subspecies by the black color of the soft parts, dark brown carapace, dark gray chin and neck with yellow restricted to the barbels and anterior half of the lower jaw, enlarged gular plate (51 per cent length of the anterior lobe of plastron; 41 per cent in *K. f. flavescens*†), and larger size; differing from *K. f. stejnegeri* by the shorter femoral suture and smaller nuchal and gular plates (63 per cent anterior plastral lobe in *stejnegeri*).

*Description of type.* Carapace smooth, obtusely oval, and depressed; dark olive above with narrow black margins anterior to sutures; carapace length 110 mm., width 90 mm., greatest depth 54 mm.; 4th costals less than half size of anterior costals; 4th and 5th vertebrae subequal and slightly smaller than anterior vertebrae, 1st and 5th pentagonal, 2nd, 3rd, and 4th hexagonal; nuchal less than size of eye; marginals 2-7 and 11 subequal and shorter than marginals 1, 8, 9, and 10; 9th marginal more than twice height of 8th; axillary approximately  $\frac{2}{3}$  size of inguinal; postinguinal on left side only.

\*It is a pleasure to name this new turtle after my friend and former teacher, Dr. Charles S. Spooner, formerly head of the zoology department of Eastern Illinois State College, Charleston, Illinois.

†Data from Hartweg, 1938, p. 4.



Plastron 106 mm. in length, 72 mm. at greatest width; gular 21 mm. in length; interhumeral suture 15 mm.; pectoral suture 2 mm.; abdominal 26 mm.; interfemoral 3 mm.; anal 33 mm.; humeral plates rectangular, abdominals square, other plastral plates triangular; lateral processes of bridge deeply grooved longitudinally; posterior edge of plastron slightly notched; worn surfaces of plastron light horn color, remainder of plastron black.

Alveola of upper jaw one-third larger than that of lower jaw; lower mandible with projecting apex fitting into depression in alveola of upper jaw; top of head smooth and black with faint tinge of dark olive; sides of head dirty gray suffused with dull olive-yellow; a posterior dull yellow mark extending from rear edge of upper mandible posteroventrad; iris yellow above and below a black horizontal bar; chin and underside of neck gray suffused with dirty yellow; 4 pairs of barbels and anterior portion of lower mandible yellow; soft parts dark olive-gray, upper surfaces of head, legs, and tail black; feet strongly webbed, posterior free flange continuous with webs on each foot; front claws in order of decreasing size 2, 1, 3, 4, 5; hind claws 2, 1, 3, 4.

*Comparisons.* The dark soft parts and reduced amount of yellow on the neck and chin provide the easiest character for separating this subspecies from *K. f. flavescens*. Both features are more pronounced in living than in preserved specimens and apparently more marked in subadults than in extremely large specimens. Living specimens at hand from 79 to 110 mm. in carapace length are readily separable from Kansas and Texas turtles of corresponding sizes. The top of the head, legs, and tail are dull black in *K. f. spooneri*, yellow-gray to slate color in *K. f. flavescens*. The sides of the head are olive mottled with black, and the chin has a yellow tinge. Sides of the head, chin, and undersurfaces of the neck in living specimens from Kansas and Texas are immaculate light yellow. *K. f. flavescens* and *spooneri* are nevertheless more closely related than is either race to *K. f. stejnegeri* (see diagnosis). It is interesting to note, however, that the gular plate in *K. f. spooneri* is intermediate in size between Mexican *K. f. stejnegeri* and *K. f. flavescens* of western United States.

*Variation.* The largest example of *K. f. flavescens* in the comparative material available was an Oklahoma specimen with a carapace length of 135 mm. Almost one-third of the paratypes of *K. f. spooneri* exceed that length. Variation in the size of the gular plate of 18 paratypes is given in Table I. Data on five other paratypes are not tabulated because of damaged plates or their present unavailability.

Table 1. Variation in Paratype *K. f. spooneri*.

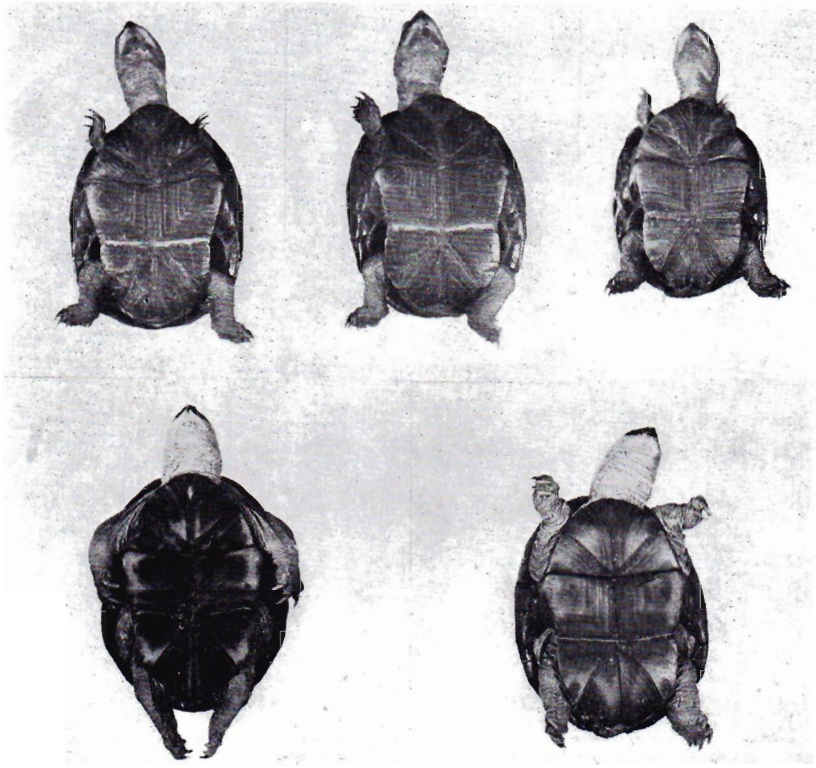
Museum	Number	Locality	Sex	Carapace Length	Gular Length	Interthumeral seam length	Gular length Ant. lobe length
INHS	5587	Morgan Co.	♂	142.0	22.0	20.0	52.0 per cent
"	5588	"	♂	140.0	23.0	18.0	51.0 "
"	5589	"	♂	138.0	?	19.5	?
UIMNH	2252	"	♂	145.5	20.2	19.0	49.4 per cent
"	2253	"	♂	128.0	22.5	16.0	54.5 "
"	2254	"	♂	140.0	21.0	21.2	47.7 "
"	2255	"	♂	143.5	21.0	18.0	51.2 "
"	2256	"	♂	132.0	20.0	19.0	52.5 "
INHS	4245	Henderson Co.	♀	119.0	23.0	19.0	54.8 "
"	3220	"	?	70.0	13.0	12.5	48.2 "
"	3221	"	?	61.0	10.5	11.2	50.0 "
"	6010	Mason Co.	♂	88.0	14.2	14.2	45.8 "
UMMZ	103089	"	♀	79.0	14.5	13.0	53.7 "
CA	15687	"	♀	83.5	15.8	15.0	51.0 "
INHS	6011	"	♂	110.5	20.5	17.0	55.5 "
"	5989	"	♀	100.0	18.5	17.0	53.6 "
"	5987	Cass Co.	♀	92.0	15.0	18.0	43.0 "
"	5988	"	♀	93.0	15.0	16.0	45.5 "

*Remarks.* Cahn (1931, p. 120-123) first reported this species from localities between Meredosia and Peoria along the Illinois River. Smith (1948, p. 3) added the Oquawka sand area adjacent to the Mississippi River to the known range of the species. It is virtually a certainty that intergradation at present does not occur inasmuch as the nearest published record for the occurrence of the typical subspecies is Cherokee County, Kansas (Smith, 1950, p. 125). It seems preferable to regard the Illinois populations as a subspecies, however, in view of the probable past history of the species and the slight morphological differentiation.

Specimens taken over the past four years have all been collected in June. On two occasions DOR specimens have been found some distance from permanent water. Both times followed heavy rains. Specimens taken in the Oquawka region were in shallow, muddy sloughs adjacent to the river; specimens from Mason County were found in a small pond in the sand hills approximately three miles from the Illinois River. Those found in river sloughs were tracked by following the mussel-like furrows the foraging turtles plowed in the silty bottoms.

Two females collected June 9, 1949, were kept alive throughout the summer. Seven hard shelled eggs were deposited by one or both specimens during the third and fourth weeks of July. These symmetrically elliptical eggs ranged from 16 to 17 mm. in width and 28 to 29 mm. in length. Unfortunately all seven failed to develop.

*Discussion.* The two subspecies described herein are notable examples of animals whose present ranges suggest that more arid conditions prevailed in the Mid-West following the last glacial advance. The reduction in ranges of both species to relicts associated with sand prairie and removed from the Great Plains populations by a hiatus of three to four hundred miles contributes further evidence to the prairie peninsula hypothesis. The subspecific differentiation may have occurred with the geographical isolation which followed the xeric period or may have occurred earlier leaving the present populations as remnants of formerly widespread subspecies. The latter seems the more probable since one of the two, *K. f. spooneri*, is now known to occur in two separate sand areas, and both may be found in other sand prairies when these are more thoroughly investigated.



Ventral view of paratypic *Kinosternon f. spooneri* and *K. f. flavescens*. Upper row, INHS 5987-8 from Cass County, Illinois, and INHS 6011 from Mason County, Illinois; bottom row INHS 5952-3 from Morton County, Kansas.



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