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A NEW SUBSPECIES OF THE FOX SNAKE, *ELAPHE VULPINA* BAIRD AND GIRARD

ROGER CONANT
Zoological Society of Philadelphia

The peculiar distribution and marked habitat preferences of *Elaphe vulpina* in the eastern part of its range have interested me for several years. In Ohio, where I have done considerable collecting, this snake apparently is restricted to the extensive marshes (and their immediate environs) which border the southwestern shore of Lake Erie. In Ontario and the southern peninsula of Michigan there is a similar hugging of Great Lakes shores and the same predilection for marshes. In the western part of its range, however, this serpent occupies a variety of habitats including woods, stream valleys, prairies, farm lands, and the dune country rimming portions of Lake Michigan. Its distribution is more or less general over a considerable portion of the Central Lowland Province.

Recently I have examined 221 fox snakes representing a wide variety of localities. From studies made upon these it is evident that specimens from eastern localities differ from typical *vulpina* not only in habitat, but also in pattern, and that an eastern race is distinguishable from a western one.

The name *vulpina* (type locality Racine, Wisconsin) can be restricted to the western race, but for the eastern race a new name must be found. In searching for such I have investigated *Coluber ovivorus* Linnaeus (1758, 223) which I find unidentifiable, and *Elaphis rubriceps* Duméril and Bibron (1854, 270). The unique type of the latter, the exact origin of which is not known although "il est de l'Amérique du Nord d'ou il a été rapporté par M. de Castelnau," no longer is extant according to F.

Angel, of the Paris Museum, who kindly endeavored to locate the specimen for me. Castelnau's biography (Le Grande Encyclopédie, IX, 741) mentions much of his travels in South America but nothing of visits to North America. The description of *rubriceps* agrees rather closely with *vulpina*, but it is not possible to determine to which of the two races of *vulpina* the name *rubriceps* might be applied. For the eastern race, therefore, I propose the name:

***Elaphe vulpina gloydi*, subsp. nov.**

EASTERN FOX SNAKE

Plate I, Figures 1 and 2.

Diagnosis: A large snake, similar in pattern and scutellation to *Elaphe vulpina vulpina* Baird and Girard, but differing chiefly in the smaller number and larger size of its dorsal body blotches. These average 34.5 as compared with 40.9 in *vulpina*, and anteriorly they are 4, 5, or 6 scales in length, as compared with 3 or 4 (and more rarely 5) scales in length in *vulpina*. The number of tail blotches also is less in *gloydi*. Specimens of *gloydi* attain a somewhat greater maximum length and appear to be more robust in form.

Type Specimen: Academy of Natural Sciences of Philadelphia, Number 21650 (original number 1086), adult female collected on Little Cedar Point, Jerusalem Township, Lucas County, Ohio, May 27, 1939, by Robert H. Mattlin. *Allotype:* Academy of Natural Sciences, Number 21651 (original number 1088), adult male, same collector and locality, August 5, 1939. *Paratypes:* Academy of Natural Sciences of Philadelphia, Numbers 21652-21661, Chicago Academy of Sciences, Number 6935, and Iowa State College, Number 7.

Description of type specimen: Rostral wider than high, somewhat notched below for the passage of the tongue. Nasal divided, the nostril centered between the anterior and posterior halves. Loreal longer than high, sub-trapezoidal in shape. One preocular, two postoculars. Temporals, two in the first row, four in the second, and five in the third. Internasals two, each about one-third the size of the corresponding prefrontal. Frontal about as long as wide, roughly bell-shaped, its base directed forward. Supraoculars about twice as long as wide. Parietals one and a half times as long as frontal, somewhat rugose and slightly irregular posteriorly. Supralabials 8, the seventh largest and the fourth and fifth entering the orbit. Infralabials 11 on the left and 12 on the

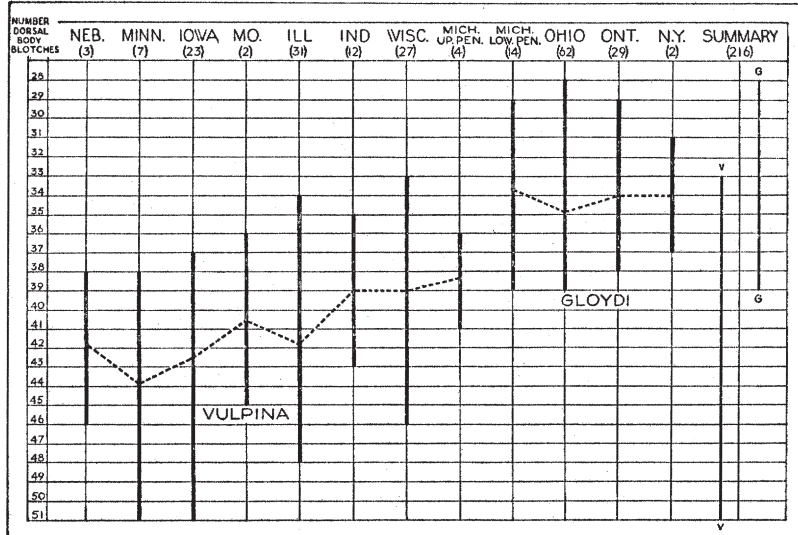
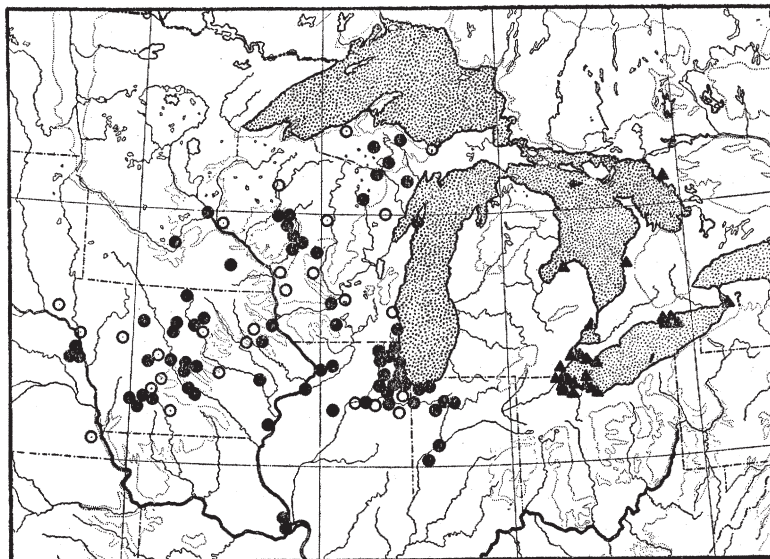


Fig. 1. Variation in the number of dorsal blotches in the subspecies of *Elaphe vulpina*. The heavy vertical lines show the range of variation in each state or division thereof; the dotted lines connect the averages. The small numbers in parentheses give the number of specimens from each area.



Map 1. Distribution of the subspecies of *Elaphe vulpina*. Circles indicate locality records for *Elaphe vulpina vulpina* and triangles for *Elaphe vulpina gloydi*.

blotches, but sometimes uniting with them. Length 1167 mm., tail 157 mm., tail/length 13.5%. Capitalized color names are those of Ridgway's "Color Standards and Nomenclature."

One of the paratypes (CA 6935) has the prefrontals split longitudinally so that there are actually four prefrontals all subequal in size. Another, a juvenile (ANSP 21656) has the dorsal ground color Snuff Brown and the blotches Seal Brown. Black greatly predominates on the belly, and the lighter areas below, including the chin, are suffused with brown.

Range: *Elaphe vulpina gloydi* occurs in suitable localities along and near the shores of Lakes Huron and Erie, from Georgian and Saginaw Bays southward to north central Ohio, and eastward along the northern shore of Lake Erie to Long Point and perhaps Buffalo (Map 1). Locality records are as follows:

MICHIGAN: *Huron Co.*: Sand Point (MCZ 29036; UMMZ 37625-30, 37745). *Monroe Co.*: (UMMZ 44629). *St. Clair Co.*: Harsons Isle (UMMZ 36050); Pearl Beach (UMMZ 35851). *Wayne Co.*: Grosse Isle (UMMZ 42495; USNM 1570); below Trenton (UMMZ 61721).

NEW YORK: "Near Buffalo" (ANSP 3779-80). It is quite possible that these specimens may have come from Ontario rather than from New York.

OHIO: (USNM 83450-1). *Erie Co.*: Sandusky (AMNH 3502; Baylor 1842); Margareta Twp. (AMNH 49901). *Lucas Co.*: Little Cedar Point, Jerusalem Twp. (ANSP 21650-21661; CA 6935; ISC 7). Also all localities listed on page 62 of the "Reptiles of Ohio" (Conant, 1938).

ONTARIO: *Bruce S.*: Lucknow (USNM 56610). *Essex S.*: Auld (ROMZ 2186); Colchester (USNM 48540); Kingsville (ROMZ 4585-6); Point Pelee (ROMZ 1803; UMMZ 40673-4). *Norfolk*: Long Point (ROMZ 2096-2100, 2148, 2666, 3672, 3677, 3687, 5469); Port Rowan (CM 16785); St. Williams (ROMZ 2675); Turkey Point (ROMZ 3698, 3802). *Parry Sound*: Point Au Baril (ROMZ 5187, 5196, 5470-1).

Through the courtesy of E. R. Dunn and Gilbert Congdon Wood, I have seen the specimen of *Elaphe vulpina* from Wenham, Massachusetts (BSNH 1209) which was received by the Museum of Comparative Zoology in 1861 from James Bartlett and first reported by Allen (1868). This snake has 43 body blotches, a number that definitely places it in *vulpina* rather than in *gloydi*, which latter might be expected in Massachusetts if the range extended that far to the east. Brown (1902) commented on this specimen, but not having seen it he considered it to be misidentified. I find the identification to be correct but undoubtedly the locality is in error.

Variation: The chief diagnostic characteristic of the two subspecies of *vulpina* is in the number of dorsal blotches, counting from the head to a point directly above the anus. The results of such counts, made on 216 specimens, are indicated in graphic form (Fig. 1). In *gloydi* the

to specialized habitats paralleling shores of the Great Lakes. Isolation or selective environmental factors (or both) have resulted in relatively slight differences in scutellation and size and a significant difference in the number of dorsal blotches. An intergrading population is lacking but the considerable overlapping of the two forms in almost all characteristics is too great to admit the consideration of *gloydi* and *vulpina* as distinct species.

Elaphe vulpina vulpina Baird and Girard
WESTERN FOX SNAKE

Plate I, Fig. 3.

Diagnosis: A large *Elaphe* with a reddish or reddish-brown head. Pattern consisting of a medium series of large chocolate or black blotches 33 to 51 (av. 40.9) in number and flanked on each side of body by two alternating rows of smaller blotches. Ground color above yellowish or light brown; belly yellow, checked with black. Distinguished from *E. v. gloydi* by the greater number and smaller size of the dorsal blotches (av. 34.5 in *gloydi*); from *E. o. obsoleta* by its different coloration and smaller number of ventrals (216 or less in *vulpina*; 221 or more in *obsoleta*), and from *E. laeta* by the lack of forward extensions from the first dorsal blotch which traverse the parietals and unite on the frontal. Baird and Girard's type, formerly in the collection of the Smithsonian Institution, apparently cannot now be found in the National Museum. It therefore appears advisable to designate as neotype, USNM 9969, Racine, Wisconsin, P. R. Hoy, collector. In this specimen the scale rows are 25-23-21, ventrals 202, subcaudals 65, upper labials 8, lower labials 11 on left - 12 on right, oculars 1-2, temporals 2-3, dorsal blotches 46, tail blotches 17, length 1242 mm., tail 183 mm., tail/length 14.9%.

Range: Northwestern Indiana and the northern peninsula of Michigan southwestward to eastern Missouri, eastern Nebraska and southeastern South Dakota (Map 1).

Locality records are:

ILLINOIS: (AMNH 44509; ANSP 16968-9; MCZ 5574). *Bureau Co.:* Milo (USNM 17955). *Cook Co.:* Argo (FMNH 21739); Bloom Twp. (FMNH 23545); Chicago (CA 945, 2644); Chicago Ridge (FMNH 8279); Evanston (CA 65); Hazelcrest (FMNH 17843); Homewood (FMNH 15990); Lemont (FMNH 27275); Palos Park (Schmidt & Necker, 1935, 69); West Northfield (UMMZ 3745; USNM 1620). *DuPage Co.:* Naperville (FMNH 22735). *Grundy Co.:* Pequot (Necker, 1939, 7). *Kankakee Co.:* Aroma Park (Necker, 1939, 7). *Lake Co.:* Barrington (FMNH 25295); Beach (CA 1490, 2503; FMNH 19171); Volo, Sayer Bog (Necker, 1939, 7). *LaSalle Co.:* 4 mi. E of LaSalle (Burt & Hoyle, 1934, 208); 3 mi. E of Marseilles (USNM 83962); 4 mi. E of Ottawa (UMMZ