

## Catalogue of American Amphibians and Reptiles.

Powell, Robert. 1990. *Elaphe vulpina*.

adults and blotches are edged with black or darker brown. Lateral head markings are distinct and include dark transverse lines anterior to the eyes and from the eye to the angle of the jaw.

*Scotophis vulpinus* Baird and Girard, 1853:75. Type locality, "Racine, Wisconsin". Holotype, U. S. National Museum 202 + 1.68.25.32.7, collected by Dr. P. R. Hoy; no date of collection given (the specimen has since been lost).

*Coluber vulpinus*: Yarrow, 1883:101.

*Elaphe guttatus vulpinus*: Garman, 1892:292-3.

*Coluber spiloides*: McLain, 1899:3 (*nec* Duméril, Bibron, and Duméril).

*Elaphe vulpinus*: Hurter, 1911:178.

*Elaphe vulpina*: Stejneger and Barbour, 1917:84.

• **Content.** Two subspecies, *vulpina* and *gloydi*, are recognized.

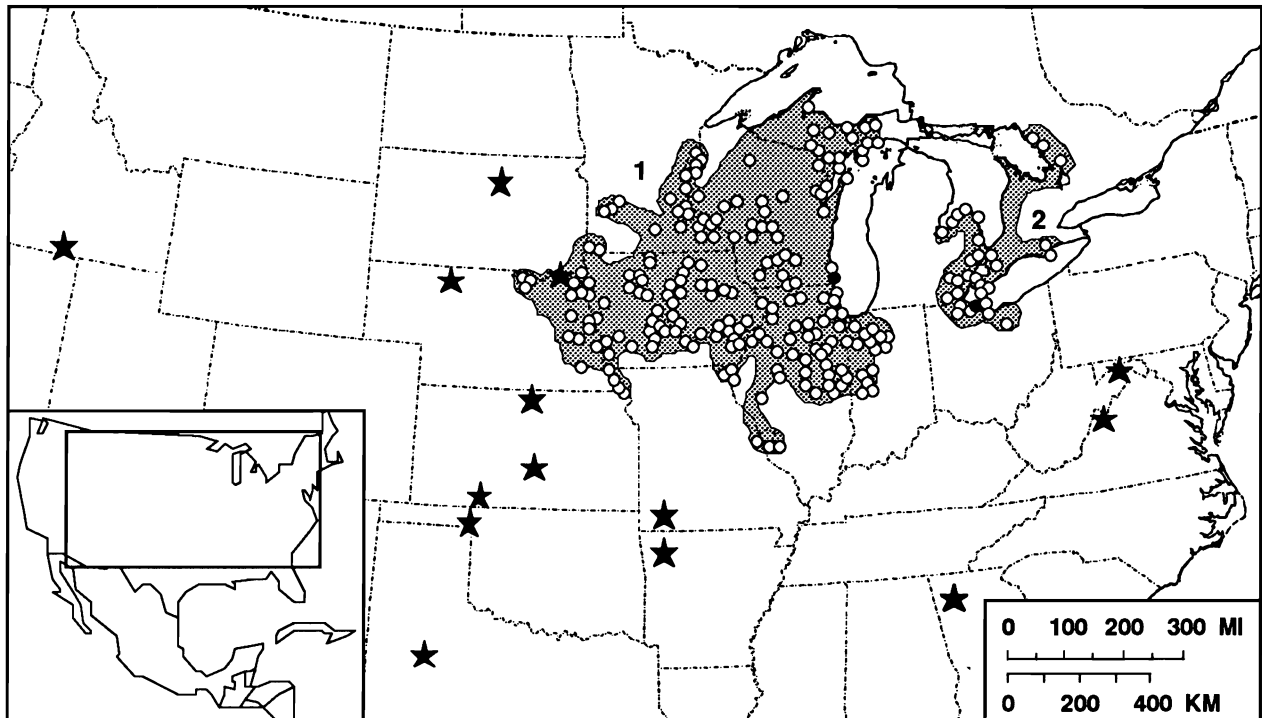
• **Definition.** *Elaphe vulpina* is a medium to large snake attaining a maximum total length of 1791 mm (Conant, 1975). The head is somewhat distinct from the neck; the eyes are medium in size. The body is moderately slender in juveniles but becomes stout to robust in adults. The tail is short (13-19% of body length in males, 12-17% in females) and terminates in a spine. Head plates are normal: usually 8 (7-9) upper labials, 11 (9-12) lower labials, one preocular (rarely two), two postoculars, temporals 2-3 + 3-4, and two nasals with the nostril between them and laterally placed; a loreal is present. Dorsal scale rows are most frequently 25-23-21, rarely as many as 27 anteriorly or reduced to as few as 19 near the vent. Scales are smooth to weakly keeled, with keels not apparent in juveniles. Ventrals number 190-212 (males), 198-216 (females), subcaudals 52-71 (males), 45-60 (females). The anal is divided. There are 16-17 teeth on each maxilla. The fringed hemipenis has numerous calyces and an undivided sulcus spermaticus.

Ground color varies from yellowish to pale brown with 28-44 bold dorsal blotches ranging from brown to black. The top of the head in adults ranges in color from brown to distinctly reddish, markings are usually lacking. The venter is yellowish and distinctly checkered with black. Juveniles have a paler ground color than do

head and in having fewer than 216 ventrals.

• **Descriptions and Illustrations.** The original descriptions are in Baird and Girard (1853) and Conant (1940). Descriptions and color photographs are in Behler and King (1979), Vogt (1981), Johnson (1987), Mehtens (1987), and Ernst and Barbour (1989). A color photograph of a captive specimen is in Radford (1989). Black and white photos are in Ditmars (1936, 1945), Wright and Wright (1957), Smith (1961), Anderson (1965), Froom (1972), and Minton (1972). Wright and Wright (1957) also provided photographs of an egg and a hatchling. Color illustrations are provided by Conant (1975), Smith and Brodie (1982), and Johnson (1989). Breckenridge (1944) provided line drawings of the head and of dorsal and ventral patterns. Gillingham (1974) illustrated courtship and mating. Illustrations of fossil vertebrae are in Holman (1981, 1987b, c).

• **Distribution.** The range of *Elaphe vulpina* extends from southern Ontario to northern Ohio and from the upper peninsula of Michigan through Wisconsin to eastern Nebraska, South Dakota, and northwestern Missouri and through northern Illinois to northwestern Indiana. Conant (1938) cited two records from near Buffalo, New York, but Conant (1940) stated that these may have come from Ontario and that a Massachusetts locality probably represented an error of location rather than identification. The range is illustrated in Wright and Wright (1957), Conant (1975), Behler and King (1979), Smith and Brodie (1982), and Ernst and Barbour (1989). Holman (1981) illustrated both the recent and Pleistocene range. The species is listed in numerous regional guides, including those by Conant (1951) and Morose (1958) for Ohio, Minton (1972) for Indiana, Olson (1956) and Smith (1961) for Illinois, Dickinson (1950) and Vogt (1981) for Wisconsin, Fishbeck and Underhill (1959) for South Dakota, Anderson (1965) and Johnson (1987) for Missouri, Hudson (1942) for Nebraska, Breckenridge (1944) for Minnesota, and Bleakney (1958) and Cook (1984) for Canada. King (1987) and Langlois (1964) discussed distribution on islands in Lake Erie. Collins (1964) stated that the species is not in Kentucky. Collins (1982) indicated that it may be found in extreme northeastern Kansas.



Map. Solid circles mark type-localities, open circles indicate other localities. Stars mark fossil sites.

• **Fossil Record.** *Elaphe vulpina* is known from the Pliocene of Idaho, Texas, and Nebraska (Holman, 1968, 1979, 1982a; Rogers, 1976) and from the Pleistocene of Arkansas, Georgia, Kansas, Maryland, Missouri, Nebraska, Oklahoma, South Dakota, and West Virginia (Dowling, 1958; Eshelman, 1975; Holman, 1965, 1972, 1977a, b, 1981, 1982b, 1984, 1985a, b, 1986a, b, 1987a, b, c; Hood and Hawksley, 1975; Parmalee et al., 1969).

• **Pertinent Literature.** In addition to those in regional guides, general overviews are in Ditmars (1936, 1945), Wright and Wright (1957), Froom (1972), and Ernst and Barbour (1989). Dowling (1952) noted the locations of type specimens. Smith (1956) discussed geographic variation in blotch counts. Dennis (1958) noted a minimum size record from Ohio. Vogt (1981) described natural history of Wisconsin populations. Ecological aspects of Ontario populations were discussed by Evans and Roecker (1951), Adams and Clark (1958), Freedman and Catling (1978), Freedman and Catling (1979), and Catling and Freedman (1980a, 1980b). Conant (1965) provided measurements of *E. vulpina gloydi* from Kelleys Island in Lake Erie. Reproduction was discussed by Carpenter (1947), Arnold (1948), Simonson (1951), Perkins (1952), Zehr (1969), and Gillingham (1974, 1977, 1979). Triplehorn (1955), Brown and Brown (1975), and Zarella (1978) described young, climbing ability, and an hibernaculum, respectively. Notes on food habits are in Markezich (1962) and Wheeler (1984). Hensely (1959) noted an incident of albinism, Kraus and Schuett (1983) described a melanistic individual, Dill (1972) discussed individual variations in core temperatures, Burghardt and Abeshaheen (1971) investigated responses to chemical stimuli of prey in hatchlings, Bowler (1977) listed a longevity record, and Minton and Salanito (1972) performed immunoelectrophoretic studies. Meeks (1968) discussed DDT accumulation and Karstad (1967) described fatal poisoning from a toad. Holman (1968) discussed distinction of fossil vertebrae.

• **Etymology.** Conant (1940) suggested that *vulpina* is a patronym honoring Rev. Charles Fox, whose name was translated instead of Latinized. Froom (1972), however, stated that the snake is so named because it secretes a strong-smelling fluid suggestive of the odor of foxes. The subspecific name *gloydi* honors the late Howard K. Gloyd.

• **Remarks.** Since the subspecies are allopatric, with no evidence of gene exchange, they may represent full species.

## 1. *Elaphe vulpina vulpina* (Baird and Girard) Western Fox Snake

*Scotophis vulpinus* Baird and Girard, 1853:75. See species synonymy.

*Coleber vulpinus*: Yarrow, 1883:101.

*Elaphe guttatus vulpinus*: Garman, 1892:292-3.

*Coleber spiloides*: McLain, 1899:3 (*nec* Duméril, Bibron, and Duméril).

*Elaphe vulpinus*: Hurter, 1911:178.

*Elaphe vulpina*: Stejneger and Barbour, 1917:84.

*Elaphe vulpina vulpina*: Conant, 1940:10-11.

• **Definition.** Dorsal blotches on body number 33-51,  $\bar{x}$  = 41.

## 2. *Elaphe vulpina gloydi* Conant Eastern Fox Snake

*Elaphe vulpina gloydi* Conant 1940:2-10. Type-locality, "Little Cedar Point, Jerusalem Township, Lucas County, Ohio". Holotype, Academy of Natural Sciences of Philadelphia (ANSP) 21650 (original number 1086), an adult female, collected by Robert H. Matlin on 27 May 1939 (not examined by author).

• **Definition.** Dorsal blotches on body number 28-39,  $\bar{x}$  = 34.5. The head is very likely to be reddish.

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