**REPTILIA: SQUAMATA: SERPENTES: COLUMBRAE**

**NERODIA RHOMBIFERA**

Catalogue of American Amphibians and Reptiles.


*Nerodia rhombifera* (Hallowell)  
**Diamondback Water Snake**


*Natrix rhombifera*: Cope, 1892:668, 673.  
*Nerodia rhombifera*: Rossman and Eberle, 1977:42.

- **DESCRIPTION.** Conant (1969) completely described the characteristics of all subspecies. Additional descriptions are provided in numerous state herpetological manuals and other publications including: Hallowell (1852), Cope (1900), Brown (1901), Clay (1938a, 1938b), Ditmars (1939), Wright and Wright (1957) and Mount and Schwaner (1970). Detailed morphological descriptions are available on: the hemipenes (Blanchard, 1931; Conant, 1969); Duvernoy’s gland (Tauber, 1967); skull osteology (Marx and Rabb, 1972; Rossman, 1980); chromosomes (Eberle, 1972); and cranial musculature (Varkey, 1979).
- **ILLUSTRATIONS.** Black and white illustrations or photographs include: all subspecies, intergrades and juveniles (Conant, 1969), *blanchardi* (Clay, 1938a), and *rhombifera* (Parker, 1937; Clay, 1938a; Ditmars, 1939; Schmidt and Davis, 1941; Davenport, 1943; Pope, 1946; Wright and Wright, 1957; Smith, 1961; Minton, 1972; Mount, 1975; Christiansen and Burken, 1978; Collins, 1982). Conant (1969, 1975) and other field guides provide color illustrations. Available ink drawings of either line or stipple and line include: the hemipenes (Cope, 1895; Wright and Wright, 1957); skull (Boulynger, 1894; Cundall and Gans, 1979); chin papillae of the male (Blanchard, 1931; Schmidt and Davis, 1941; Conant, 1975); dorsal pattern (Conant, 1975); cranial morphology (Oldham et al., 1970; Cundall and Gans, 1979; Varkey, 1979); heart anatomy (Holmes, 1975); electromyography (Cundall and Gans, 1979); and feeding maneuvers (Kofron and Dixon, 1980).
- **DISTRIBUTION.** *Nerodia rhombifera* ranges from eastern Kansas, extreme southeastern Iowa, southern Illinois and southwestern Indiana southward through western Kentucky and Tennessee, central Alabama, Mississippi, Missouri, Arkansas, Oklahoma and the eastern two-thirds of Texas into Mexico to Tabasco and southwest Co., Indiana, U.S. Nat. Mus. 1330 (Minton, 1972); Cook Co., Illinois, specimen unknown (Garman, 1892); Brewster Co., Calhoun Creek, Texas, specimen unknown and Reeves Co., Pecos River, Texas, Acad. Natur. Sci. Philadelphia 12097, 12107 (see Conant, 1969, 1978).
- **FOSSIL RECORD.** None.
- **PERTINENT LITERATURE.** The most thorough review of *N. rhombifera* is provided by Conant (1969). Extensive literature is available and includes information on: systematics (Brown, 1901; Clay, 1938a; Conant, 1969; Mahnert, 1953; Cribb, 1956, 1960; Mahnert, 1953; Gari, 1955; Mount and Schwaner, 1970; Rossman and Eberle, 1977; Romano, 1980); comparative ecology (Nakamura and Smith, 1960; Preston, 1970); food habits (Bowers, 1966; Kofron, 1978 and references therein); ontogeny of the diet (Mushinsky et al., 1982; Plummer and Goy, 1984 and references therein); spatial and thermal ecology (Mushinsky et al., 1982); parasites (Bart, 1932; Hughes et al., 1942; Thatcher, 1966; Wacha and Christiansen, 1974; Brooks, 1978; Petterline et al., 1984); ecogeography (Morafka, 1977; Lee, 1980); chemical preferences and responses (Czaplicki and Porter, 1974; Porter and Czaplicki, 1973); and fish population ecology (Czaplicki et al., 1973; Clapham, 1974; Porter and Czaplicki, 1974; Czaplicki, 1975; Mushinsky and Lotz, 1980); habitat partitioning (Hebrard and Mushinsky, 1978); reproduction (Guidry, 1955; Carpen, 1955; Carpen, 1970; Hebrard and Kofron, 1979); ovarian histology (Betz, 1965); behavior (Wolfe and Brown, 1940; Mushinsky and Hebrard, 1977a; Mushinsky et al., 1980; Scudder and Burghardt, 1983); seasonal activity (Mushinsky and Hebrard, 1977b); diving physiology (Jacob 1980); and many other aspects of the biology of *Nerodia rhombifera*.
and McDonald, 1976; Baeyens et al., 1978, 1979, 1980) on pupillary responses (Stovall and Kennedy, 1979); renal physiology (Dantztler, 1970; Clark and Dantztler, 1972); metabolic physiology (Gratz and Hutchison, 1977; Pough, 1977; Gratz, 1978, 1979); thyroid physiology (Harderode et al., 1971); thermal acclimation (Jacobson and Whitford, 1970; Turner and Tipton, 1972); surgical anesthesia (Boyles, 1952; Bowers, 1966; McGrew, 1963); variation (Boyles, 1952; Cliburn, 1953); thymic cell staining substance (Daly and Calhoun, 1978); blood chemistry (Dessauer and Fox, 1964; Garnett, 1979); karyology (Cundall, 1970; Eberle, 1972; Killpatrick and Zimmerman, 1973); adrenal response (Fickness, 1963); predation (McGre, 1963); tongue histology (Morgans and Heidt, 1978); sex-linked dimorphism (Quinn, 1979); introduced populations (Conant, 1977); endangered populations (Boosa, 1977; Christiansen, 1981); red blood cell staining substance (Daly and Calhoun, 1978); chemical (Dessauer, 1970); vertebral form (Johnson, 1955); skull ontogeny (Dessauer, 1970); variation (Boyles, 1952; Cliburn, 1953); thymic cell staining substance (Daly and Calhoun, 1978); blood chemistry (Dessauer, 1970); vertebral form (Johnson, 1955); skull ontogeny (Rossman, 1980); and pesticide mortality (Ferguson, 1963).

## Erythrom. The specific name rhombifer is derived from the Greek rhombs (rhomb), referring to the diamond-shaped dorsal pattern. The subspecific names Blanchardi and werleri are patronyms honoring Frank N. Blanchard and John E. Werler, respectively.

1. **Nerodia rhombifera Blanchardi** Clay


**DEFINITION.** A subspecies characterized by a marked reduction in the intensity of the dorsal pattern. The dorsal coloration varies from dull brown to dark olive. The ventral markings are immaculate, often represented by dark smudgy spots in adults. Typically, the venter ranges in color from a buff or dull yellow to pale gray. There is a single preocular (rarely 2) and usually 3 postoculars (rarely 3) and usually 3 postoculars (rarely 4). The ventrals number 141 to 152 (mean 146.0) in males, 137 to 146 (mean 141.8) in females; subcaudals number 76 to 88 (mean 81.3) in males, 63 to 73 (mean 68.6) in females.

2. **Nerodia rhombifera werleri** (Hallowell)

*Tropidinotus* rhombifer Hallowell, 1852:177. See species synonymy.

*Natrix rhombifera* werleri: Cliburn, 1938a:251. (First use of tri-nomial).

**DEFINITION.** A subspecies characterized by a strongly contrasting dorsal netlike pattern of dark brown markings on an olive-brown ground coloration. The venter is intensely patterned with dark gray, brown or black pigment in the form of semilunar spots. There is a single preocular (rarely 2) and usually 3 postoculatrs (rarely 2 or 4). The ventrals number 139 to 150 (mean 143.2) in males, 136 to 150 (mean 141.1) in females; subcaudals number 76 to 88 (mean 81.3) in males, 63 to 73 (mean 68.6) in females.

3. **Nerodia rhombifera werleri** Conant


**DEFINITION.** A subspecies characterized by a conspicuous dor-sal pattern of black or dark brown middorsal markings. The ground color of the venter is yellowish and includes faint gray, greenish gray or black semilunar spots which become darker and more numerous under the tail. There are normally 2 precocals (rarely 1 or 3) and usually 3 postoculatrs (rarely 4). The ventrals number 137 to 145 (mean 141.4) in males, 135 to 142 (mean 138.5) in females; subcaudals number 78 to 86 (mean 82.2) in males, 64 to 73 (mean 68.0) in females.

### LITERATURE CITED


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