

## Catalogue of American Amphibians and Reptiles.

Graham, T.E. 1991. *Pseudemys rubriventris*.

***Pseudemys rubriventris* (LeConte)  
Redbelly Turtle**

*Testudo rubriventris* LeConte, 1830:101. Type-locality, "in the Delaware near Trenton [New Jersey]." Holotype not designated.

*Terrapene rubriventris*: Bonaparte, 1830:154.

*Emys irrigata*: Bell, In Duméril and Bibron, 1835:276.

*Emys rubriventris*: Duméril and Bibron, 1835:281.

*Emys rivulata*: Gray, 1844:22. Type-locality, "N. America", restricted to "vicinity of Trenton, New Jersey" by Schmidt (1953:103). Holotype, British Museum (Natural History) 1947.3.5.25, adult shell (see Remarks), collector and date unknown (not examined by author).

*Emys rugosa*: LeConte, 1854:189. In part.

*Ptychemys rugosa*: Agassiz, 1857:431.

*Clemmys rubriventris*: Strauch, 1865:86.

*Pseudemys rugosa*: Cope, 1875:52.

*Chrysemys rubriventris*: Boulenger, 1889:84.

*Pseudemys rubriventris*: Lönnberg, 1894:318. First use of combination.

*Pseudemys rubriventris bangsi*: Babcock, 1937:293. Type-locality, "Gunner's Exchange Pond, Plymouth [Plymouth County], Massachusetts". Holotype, Museum of Comparative Zoology, Harvard 16778, adult female, collected by H. J. Thayer, 1912 (examined by author, see Remarks).

*Pseudemys rubriventris rubriventris*: Babcock, 1937:293.

*Chrysemys (Pseudemys) rubriventris*: McDowell, 1964:274.

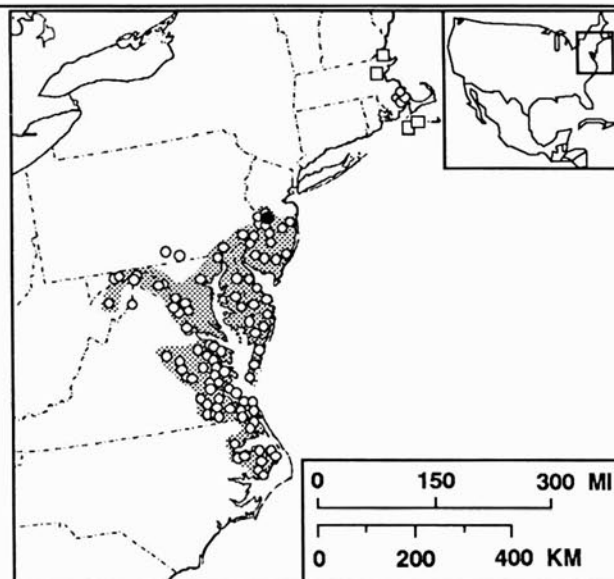
*Chrysemys rubriventris rubriventris*: Ernst and Barbour, 1972:165.

*Chrysemys rubriventris bangsi*: Ernst and Barbour, 1972:165.

*Pseudemys (Ptychemys) rubriventris*: Ward, 1984:46.

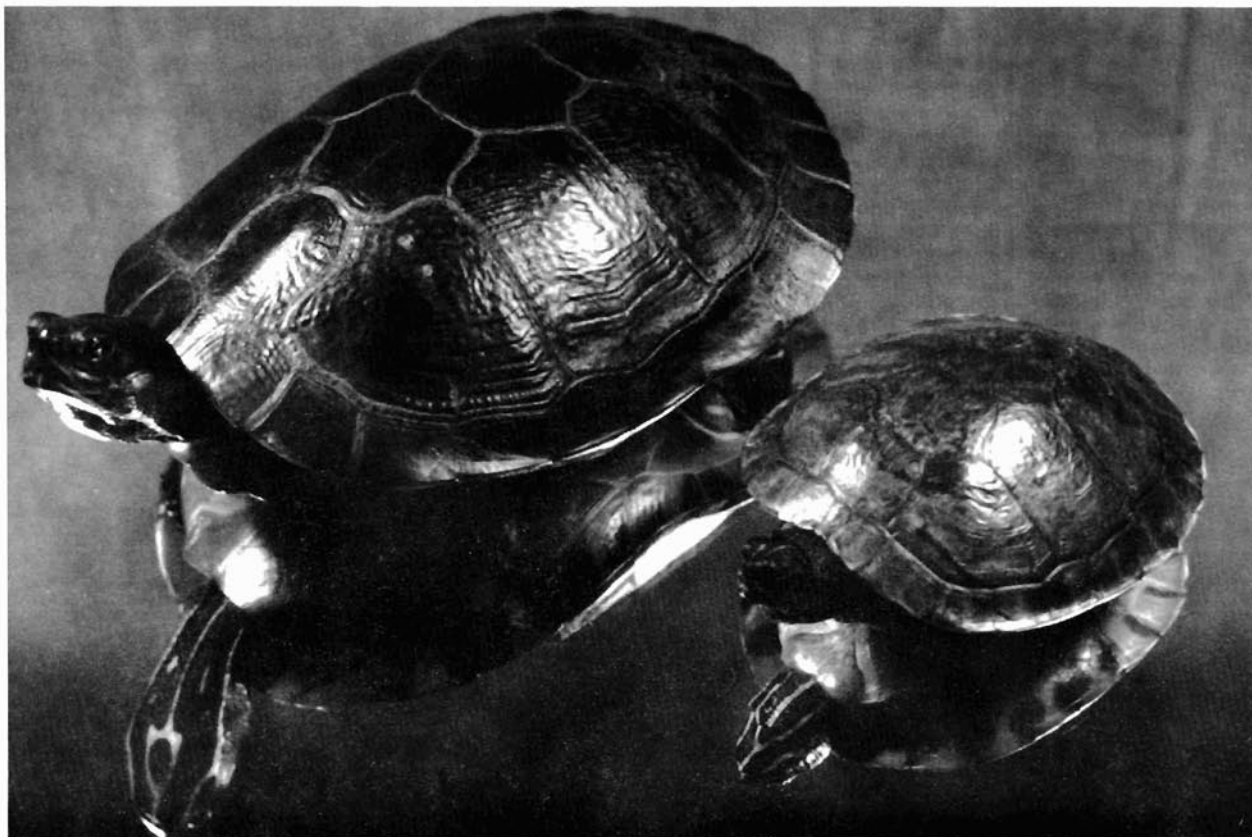
- **Content.** No subspecies are recognized. See Remarks.

• **Definition.** *Pseudemys rubriventris* is a large emydid turtle with pronounced sexual dimorphism in adult body size and scute



**Map.** Solid circle marks the type-locality; open circles show other records. Open squares indicate archeological records (see Distribution).

proportions. Females attain a maximum carapace length of roughly 337 mm, males about 312 mm. Females also have a longer plastron, a higher shell, a wider bridge, and each plastral scute (except the femoral scute) is relatively longer at the midline (Iverson and Graham, 1990). Sexual dimorphism in adults is also evidenced by the longer foreclaws, longer and thicker tail, vent opening posterior to the carapacial margin, and a greater tendency toward melanism in males. The elongated and longitudinally wrinkled or rugose carapace is highest in the middle, middorsally flattened or concave, and serrate along its posterior margin. Although pattern and coloration of both the carapace and plastron show considerable individual variation,



**Figure 1.** Subadult and juvenile *Pseudemys rubriventris* from Hoyt's Pond, Plymouth County, MA (CL=230.2 and 129.4 mm, respectively).

the adult carapace usually is mahogany to black with a distinctly forked chestnut or reddish vertical bar in each pleural scute. The male plastron normally is a pale pink overlaid with dark, often vermiform, mottling, whereas the female plastron usually is a brighter red, reddish-orange, or reddish-yellow with a gray-blotched figure bordering at least some of the seams. Ground color of head, neck, limbs, and tail is black, marked with yellow or ivory lines. On the head a prominent sagittal stripe joins the supratemporal stripes on the snout, forming a characteristic prefrontal arrow. In old males scales on the legs and lines on the soft parts often turn dull red, and males usually become progressively melanistic with age.

The upper jaw bears a prominent median notch, flanked on each side by a tooth-like cusp. The edge of the upper tomium is serrate, as is the mandible, which bears a prominent medial cusp and is flattened ventrally.

Hatchlings are more circular in outline than adults and their keeled light green carapaces bear orange vertical bars on the pleurals and marginals. The carapace is extensively marked with greenish-yellow heiroglyphics. When the young approach 50 mm in carapace length, the ground color begins to change from green to brown. Head, neck, limbs, and tail of the hatchling are green but transform to brown and then black over a two year period. The hatchling plastron is brilliant orange-red, has a variable dark central figure, and often bears a few small isolated black spots, especially on the gular and humeral scutes. The plastral figure becomes reduced with age.

• **Descriptions.** General descriptions are given by Agassiz (1857), Carr (1952), Graham (1969, 1980, 1987a), Ernst and Barbour (1972, 1989), Conant (1975), Pritchard (1979), and Conant and Collins (1991). Parsons (1960, 1968) described choanal structure whereas Zug (1966) described penial morphology.

• **Illustrations.** Black and white photographs and a color photograph of a subadult were presented by Ernst and Barbour (1972, 1989). Pope (1939), Carr (1952), Graham (1969), and Ernst and Barbour (1989) published black and white photographs of either adults or young. Lazell (1976) included black and white photographs of an adult female. Mitchell (1976) featured a color photograph of a basking adult. Agassiz (1857) provided hand-colored drawings of adults, hatchlings, and eggs, and Babcock (1919) gave colored drawings of an adult male. Conant (1975), Behler and King (1979), Pritchard (1979), Graham (1980, 1987a), and Conant and Collins (1991) presented color photographs of adults and juveniles. Graham (1980) included a color photograph of a hatchling. The skull of an

adult was illustrated by Ernst and Barbour (1972).

• **Distribution.** This species ranges on the Atlantic Coastal Plain from central New Jersey south to northeastern North Carolina and westward up the Potomac River to eastern West Virginia. An isolated colony prevails in southeastern Massachusetts where it appears restricted to ponds, whereas south of New England it is frequently riverine in habit.

In Massachusetts, the recent find of a shell (Graham, 1982a) and archaeological records reported by Waters (1962, 1966), Graham (1982a), and Rhodin and Lary (1984) suggest that *Pseudemys rubriventris* formerly inhabited a wider area in eastern Massachusetts. The suggestion that the species may occur on Naushon Island, Massachusetts (Lazell, 1976) has been questioned by Graham (1982a).

• **Fossil Record.** None.

• **Pertinent Literature.** General accounts are in Babcock (1919), Pope (1939), Carr (1952), Ernst and Barbour (1972, 1989), Conant (1975), and Graham (1980, 1987a). Additional references are listed by topic: taxonomy, Conant (1951), Carr (1952), Graham (1969), Iverson and Graham (1990); karyotype, Kiester and Childress (*in* Gorman, 1973); sexual dimorphism, Iverson and Graham (1990); eggs, Smith (1904), Conant and Bailey (1936), Graham (1971a); hatchlings, Graham (1971a), Mitchell (1974); growth, Graham (1971b); overwintering of hatchlings, Mitchell (1974), Graham (1985); winter habits of adults, Conant (1951), Graham (1985, 1987a); food, Graham (1971b, 1982b, 1984b, 1987a); nesting, Smith (1904), Richmond and Goin (1938), Richmond (1945); basking, Graham (1982b); behavior, Lovich (1988); algae and barnacles, Arndt (1975), Ernst and Norris (1978); parasites, Ernst and Barbour (1972), Ernst and Ernst (1977); predators, Graham (1982b, 1984a); tagging, Graham (1986); aquatic respiration, Graham (1987b, 1988); thermal tolerance, Hutchison et al. (1966); management, Anon. (1981), U.S. Fish and Wildlife Service (1985), Graham (1987a); research techniques, Graham (1981).

• **Remarks.** Babcock (1937) misstated the type locality of the *bangsi* holotype as "Boot Pond", Plymouth, Massachusetts; it is correctly Gunner's Exchange Pond (E. E. Williams, *in litt.*). A discrepancy exists between the carapace length of the *Emys rivulata* holotype given by Gray (1844) as 9.5 inches rather than nearly 11 inches. In fact, the plastron is 9.5 inches long (A. F. Stimson, *in litt.*). Conant (1951) and Graham (1969) questioned the validity of the subspecies *bangsi* (Babcock, 1937), and Iverson and Graham (1990)



Figure 2. Large adult female *Pseudemys rubriventris* (PL=300 mm) with newly hatched young to illustrate size extremes.



Figure 3. Adult female *Pseudemys rubriventris* depositing eggs in sandy soil in late June.

concluded that in the absence of significant discontinuities in morphological variation across the geographic range of *Pseudemys rubriventris*, the subspecies should not be recognized.

• **Etymology.** The name *rubriventris* is from the Latin words *rubidus*, reddish, and *venter*, belly, referring to the reddish plastron.

#### Literature Cited

- Agassiz, L. 1857. Contributions to the natural history of the United States of America, first monograph. Vol. 1, part 2. North American Testudinata. Little, Brown and Co., Boston.
- Anon. 1981. Recovery planning, strategy prepared for Plymouth red-bellied turtle. End. Sp. Tech. Bull. 6(6):1, 3.
- Arndt, R.G. 1975. The occurrence of barnacles and algae on the red-bellied turtle, *Chrysemys r. rubriventris* (LeConte). J. Herpetol. 9:357-359.
- Babcock, H.L. 1919. The turtles of New England. Mem. Boston Soc. Nat. Hist. 8:323-431.
- . 1937. A new subspecies of the red-bellied terrapin *Pseudemys rubriventris* (LeConte). Occ. Pap. Boston Soc. Nat. Hist. 8:293.
- Behler, J.L. and F.W. King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York.
- Bonaparte, C.L. 1830. Sulla seconda edizione del Regno Animale del Barone Cuvier. Leopoldus Arch., Genoa.
- Boulenger, G.A. 1889. Catalogue of the chelonians, rhynchocephalians, and crocodiles in the British Museum (Natural History). Taylor and Francis, London.
- Carr, A. 1952. Handbook of turtles: turtles of the United States, Canada, and Baja California. Cornell Univ. Press, Ithaca, New York.
- Conant, R. 1951. The red-bellied terrapin, *Pseudemys rubriventris* (LeConte), in Pennsylvania. Ann. Carnegie Mus. 32:281-290.
- . 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston.
- and R.M. Bailey. 1936. Some herpetological records from Monmouth and Ocean counties, New Jersey. Occ. Pap. Mus. Zool. Univ. Michigan (328):1-10.
- and J.T. Collins. 1991. A field guide to reptiles and amphibians, eastern and central North America. 3rd ed. Houghton Mifflin Co., Boston.
- Cope, E.D. 1875. Check-list of North American Batrachia and Reptilia;



Figure 4. Relative size of egg and plastron in a *Pseudemys rubriventris* (PL=297 mm) from Plymouth, MA.

- with a systematic list of the higher groups, and an essay on geographical distribution. Based on the specimens contained in the U.S. National Museum. Bull. U.S. Natl. Mus. (1):1-104.
- Duméril, A.M.C. and G. Bibron. 1835. Erpétologie générale ou histoire naturelle complète des reptiles. Vol. 2, Librairie Encyclopedique de Roret, Paris.
- Ernst, C.H. and R.W. Barbour. 1972. Turtles of the United States. Univ. Press Kentucky, Lexington.
- and —. 1989. Turtles of the world. Smithsonian Inst. Press, Washington, D. C.
- and J.N. Norris. 1978. Observations on the algal genus *Basicladia* and the red-bellied turtle, *Chrysemys rubriventris*. Estuaries 1:54-57.
- Ernst, E.M. and C.H. Ernst. 1977. Synopsis of helminths endoparasitic in native turtles of the United States. Bull. Maryland Herpetol. Soc. 13:1-75.
- Gorman, G.C. 1973. The chromosomes of the Reptilia, a cytotaxonomic interpretation, p. 349-424. In A. B. Chiarelli and E. Capanna (eds.), Cytotaxonomy and vertebrate evolution. Academic Press, New York.
- Graham, T.E. 1969. Pursuit of the Plymouth turtle. Int. Turtle & Tortoise Soc. J. 3:9-13.
- . 1971a. Eggs and hatchlings of the Plymouth red-bellied turtle, *Chrysemys rubriventris*, from Plymouth, Massachusetts. J. Herpetol. 5:59-60.
- . 1971b. Growth of the red-bellied turtle, *Chrysemys rubriventris*, at Plymouth, Massachusetts. Copeia 1971:353-356.
- . 1980. Red-belly blues. Animals 113:17-21.
- . 1981. New approaches to endangered turtle research. Bios 52: 121-126.
- . 1982a. Second find of *Pseudemys rubriventris* at Ipswich, Massachusetts, and refutation of the Naushon Island record. Herpetol. Rev. 13:82-83.
- . 1982b. Revelations on red-bellies. Sanctuary 21(9):8, 11.
- . 1984a. Life history (predation): *Pseudemys rubriventris*. Herpetol. Rev. 15:19-20.
- . 1984b. Life history (food): *Pseudemys rubriventris*. Herpetol. Rev. 15:50-51.
- . 1985. Aspects of the winter ecology of the endangered red-bellied turtle, *Pseudemys rubriventris*. Abstr., Comb. Mtg. SSAR and HL, 1985:48.
- . 1986. A warning against the use of Petersen disc tags in turtle

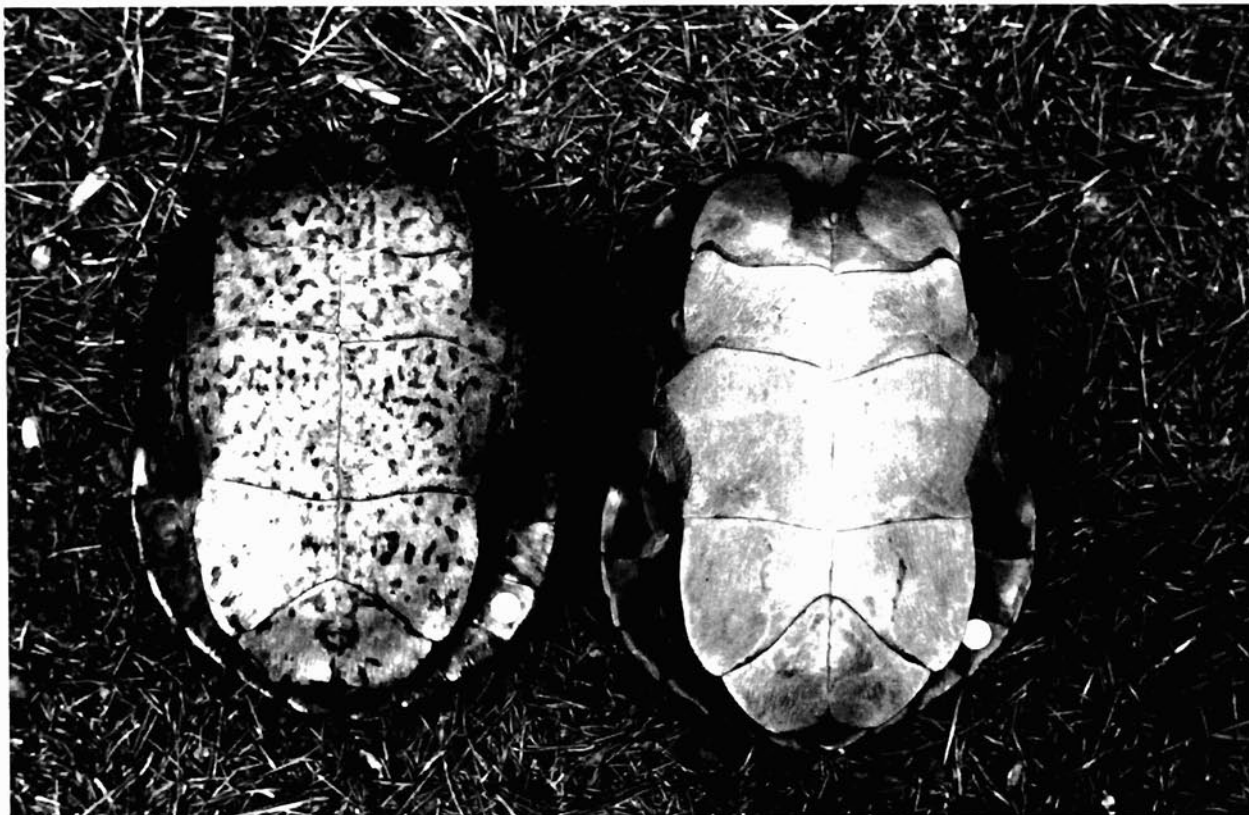


Figure 5. Intersexual comparison of adult plastron pattern and configuration in *Pseudemys rubriventris* (male on left).

- studies. *Herpetol. Rev.* 17:42-43.
- . 1987a. Recovery in red. *South Shore Magazine* 1(2):23-26, 45.
- . 1987b. Aquatic oxygen consumption in a naturally wintering redbelly turtle, *Pseudemys rubriventris*. Abstr., Joint Ann. Mtg., SSAR and HL, Comité Herpetologico Nacional, 1987:84.
- . 1988. Preliminary study of aquatic respiration in naturally wintering redbelly turtles beneath ice. *BioScene* (Worcester State College, Massachusetts) 12:31-34.
- Gray, J.E. 1844. *Catalogue of the tortoises, crocodiles, and amphibians in the collection of the British Museum*. Edward Newman, London.
- Hutchison, V.H., A. Vinegar, and R.J. Kosh. 1966. Critical thermal maxima in turtles. *Herpetologica* 22:32-41.
- Iverson, J.B. and T.E. Graham. 1990. Geographic variation in the redbelly turtle, *Pseudemys rubriventris* (Reptilia: Testudines). *Ann. Carnegie Mus.* 59:1-13.
- Lazell, J.D., Jr. 1976. *This broken archipelago. Cape Cod and the Islands. Amphibians and reptiles*. Demeter Press, Quadrangle, New York.
- LeConte, J. 1830. Description of the species of North American tortoises. *Ann. Lyceum Nat. Hist. New York* 8:91-131.
- . 1854. Description of four new species of *Kinosternum*. *Proc. Acad. Nat. Sci. Philadelphia* 7:180-190.
- Lönnerberg, E. 1894. Notes on reptiles and batrachians collected in Florida in 1892 and 1893. *Proc. U.S. Natl. Mus.* 17:317-339.
- Lovich, J. 1988. Aggressive basking behavior in eastern painted turtles (*Chrysemys picta picta*). *Herpetologica* 44:197-202.
- McDowell, S.B. 1964. Partition of the genus *Clemmys* and related problems in the taxonomy of the aquatic Testudinidae. *Proc. Zool. Soc. London* 143:239-279.
- Mitchell, J.C. 1974. Statistics of *Chrysemys rubriventris* hatchlings from Middlesex County, Virginia. *Herpetol. Rev.* 5:71.
- . 1976. Turtles of Virginia. *Virginia Wildlife* 37:17-21.
- Parsons, T.S. 1960. The structure of the choanae of the Emydinae (Testudines: Testudinidae). *Bull. Mus. Comp. Zool.* 123:113-127.
- . 1968. Variations in the choanal structure of Recent turtles. *Canad. J. Zool.* 46:1235-1263.
- Pope, C.H. 1939. *Turtles of the United States and Canada*. Alfred A. Knopf, New York.
- Pritchard, P.C.H. 1979. *Encyclopedia of turtles*. T.F.H. Publ., Neptune, New Jersey.
- Rhodin, A.G.J. and T. Largy. 1984. Prehistoric occurrence of the redbelly turtle (*Pseudemys rubriventris*) at Concord, Middlesex County, Massachusetts. *Herpetol. Rev.* 15:10.
- Richmond, N.D. 1945. Nesting habits of the mud turtle. *Copeia* 1945: 219-219.
- and C.J. Goin. 1938. Notes on a collection of amphibians and reptiles from New Kent County, Virginia. *Ann. Carnegie Mus.* 27:301-310.
- Schmidt, K.P. 1953. *A checklist of North American amphibians and reptiles*. 6th ed. ASIH.
- Smith, H.M. 1904. Notes on the breeding habits of the yellow-bellied terrapin. *Smithsonian Misc. Coll.* 45:252-253.
- Strauch, A. 1865. Die Vertheilung der Schildkröten über den Erdball. *Ein zoogeographischer Versuch. Mem. Acad. Sci. St. Petersburg* 8(13):1-207.
- U.S. Fish and Wildlife Service. 1985. *Revised Plymouth red-bellied turtle recovery plan*. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts.
- Ward, J.P. 1984. Relationships of the chrysemid turtles of North America (Testudines: Emydidae). *Spl. Publ. Mus. Texas Tech. Univ.* (21):1-50.
- Waters, J.H. 1962. Former distribution of the red-bellied turtle in the Northeast. *Copeia* 1962:649-651.
- . 1966. Second find of red-bellied turtle on Martha's Vineyard Island, Massachusetts. *Copeia* 1966:592.
- Zug, G.R. 1966. The penial morphology and the relationships of cryptodiran turtles. *Occ. Pap. Mus. Zool. Univ. Michigan* (647):1-24.

Terry E. Graham, Department of Natural & Earth Sciences, Worcester State College, Worcester, MA 01602-2597, and Wetlands & Wildlife Associates, 209 Pommagussett Road, Rutland, MA 01543.

Primary editor for this account, Carl H. Ernst.

Published 15 October 1991 and Copyright © 1991 by the Society for the Study of Amphibians and Reptiles.