

## REPTILIA: TESTUDINES: EMYDIDAE

*PSEUDEMYSS PENINSULARIS*

## Catalogue of American Amphibians and Reptiles.

Seidel, M.E. and C.H. Ernst. 1998. *Pseudemys peninsularis*.

*Pseudemys peninsularis* Carr

*Pseudemys floridana peninsularis* Carr 1938:105. Type locality, "... Crystal Springs, Pasco County, Florida ..." Holotype, Museum of Comparative Zoology (MCZ) 43849, adult female, collected 20 February 1938 by L. Marchand (not examined by authors).

*Pseudemys floridana peninsularis*: Allen 1938 (1939):105. *Ex errore*.

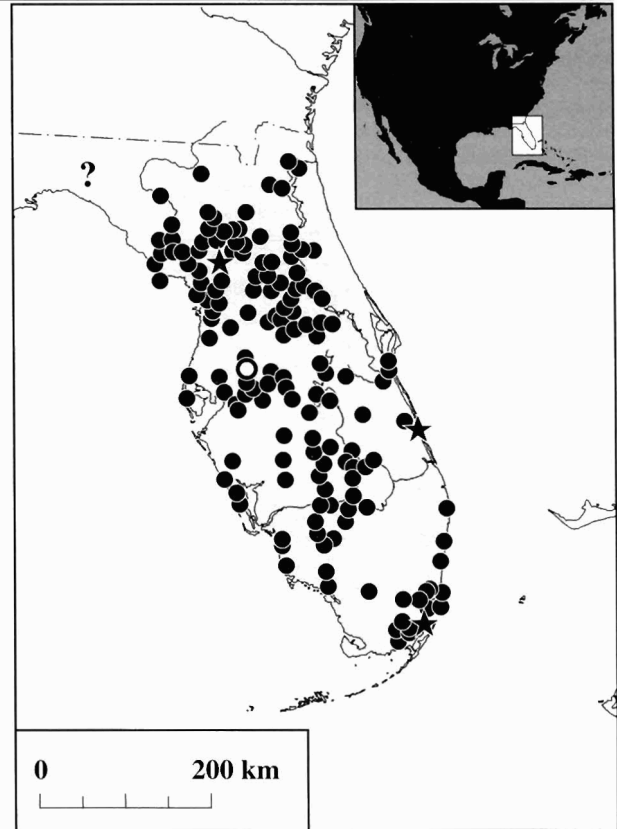
*Chrysemys floridana peninsularis*: Weaver and Rose 1967:63.

*Pseudemys peninsularis*: Seidel 1994:117. First use of present combination.

• **CONTENT.** *Pseudemys peninsularis* is a monotypic species. See Comment.

• **DEFINITION.** *Pseudemys peninsularis* is a large emydid turtle, with adult carapace length to 31 cm in males and 40 cm in females. The carapace is relatively smooth, oval as viewed dorsally, and vaulted anteriorly in lateral view. A median keel is present in young individuals, but not often in adults. The anterior medial margin of the shell is projected slightly forward (cervical scute not recessed) and the cervical/vertebral seam is broad (> 4.5% of carapace length). Marginal scutes at the posterior border of the carapace are not prominently notched or serrated. The cutting edge of the upper jaw is smooth, without cusps or notch.

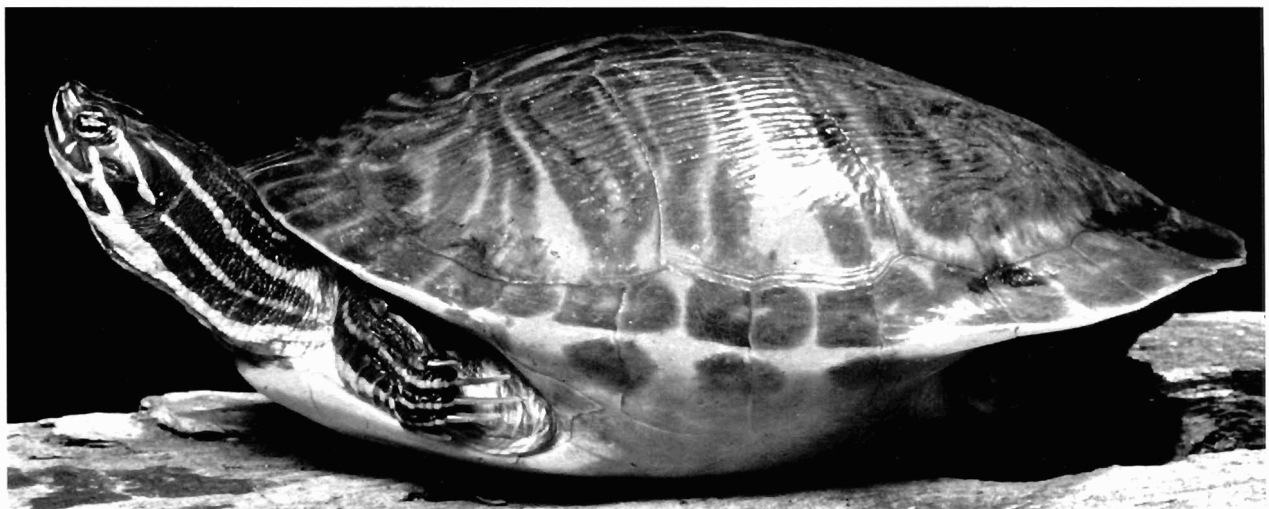
Carapacial ground color is olive or dark brown (green in hatchlings) with yellow or tan transverse bars (often wavy or forked) on the pleural scutes. The underside of marginals is yellow, and those that are anterior or near the bridge have solid gray or black circles crossing the seams. The bridge and ventral surface of posterior marginals are usually unmarked. The plastron is pale yellow and has no dark markings. The skin is dark brown or black, with yellow stripes. Usually fewer than 11 head stripes are present, and the narrow supratemporal and paramedian stripes typically join behind the eyes forming a "hair-pin" figure. The neck, limbs, and tail also are marked with yellow stripes.



**Map.** Distribution of *Pseudemys peninsularis*: the circle marks the type locality, dots indicate other selected records, stars indicate fossil localities, and the question mark indicates an area of uncertainty.

Males have long, thick tails with the vent posterior to the rim of the carapace. Females have shorter tails with the vent anterior to the carapacial rim. The foreclaws of males are elongate compared to those of females.

• **DESCRIPTIONS.** General descriptions of adults are presented in Carr (1938, 1952), Pope (1939), Carr and Goin (1955), Cochran and Goin (1970), Ernst and Barbour (1972, 1989),



**Figure.** *Pseudemys peninsularis* (photograph by Roger W. Barbour).

Behler and King (1979), Ward (1984), Ashton and Ashton (1985), Obst (1985), Ernst et al. (1994), and Conant and Collins (1998). Juveniles are described in Carr (1952), Ernst and Barbour (1972, 1989), Ashton and Ashton (1985), and Ernst et al. (1994). Nasal structure is described by Parsons (1960, 1968).

• **ILLUSTRATIONS.** Color illustrations of adults appear in Ernst and Barbour (1972), Ashton and Ashton (1985), Obst (1985), White and Curtsinger (1986), Ernst et al. (1994), and Conant and Collins (1998). Color illustrations of juveniles are presented in Ashton and Ashton (1985), Seidel (1994), and Conant and Collins (1998). Black and white photographs of adults are in Ditmars (1936), Pope (1939), Carr (1952), Carr and Goin (1955), and Ernst et al. (1994). Black and white illustrations of juveniles appear in Ernst et al. (1994). The head pattern is illustrated in Carr (1935, as *P. f. floridana*), Carr and Goin (1955), Ashton and Ashton (1985), Ernst et al. (1994), and Powell et al. (1998). Parsons (1960, 1968) illustrated the nasal choanae. A nesting female is shown in Carr (1952).

• **DISTRIBUTION.** *Pseudemys peninsularis* ranges throughout peninsular Florida, north along the Atlantic coast to the mouth of the St. John's River and northwest in the Suwannee River system. The species' occurrence in the panhandle of Florida is uncertain. Distribution maps appear in Ashton and Ashton (1985), Iverson and Etchberger (1989), Iverson (1992), and Conant and Collins (1998).

• **FOSSIL RECORD.** Pleistocene remains of Floridian *Pseudemys peninsularis* have been recorded from Rancholabrean deposits in Levy County (Holman 1996), in Indian River County (Hay 1916, 1917 [the holotype of *P. floridana persimilis*]; Weigel 1962), and at a late Rancholabrean to Recent site in Dade County (Hirschfeld 1968). Also, Meylan (1995) reported a fossil *Pseudemys* sp., possibly *peninsularis*, from the early Pleistocene (early Irvingtonian) of the Leisey Shell Pits, Hillsborough County. Paleosubfossils have been found at four archeological sites in the vicinity of the St. Johns River (Neill et al. 1956) and at a site in Sarasota County (Holman and Clausen 1984). Jackson (1976, 1977) discussed the possible relationship between *P. peninsularis* (as *P. floridana*) and the fossil species, *P. caeleta*.

• **PERTINENT LITERATURE.** Much of the literature on *Pseudemys peninsularis* has been published under *P. floridana* and *P. concinna* and cannot be distinguished. These references include much material in the general accounts by Loennberg (1894), Menne (1955), Ernst and Barbour (1972, 1989), Bancroft et al. (1983), Hlavicka (1992), and Ernst et al. (1994). General accounts published under *P. peninsularis* include Pope (1939), Carr (1940, 1952), Telford (1952), Carr and Goin (1955), Duellman and Schwartz (1958), Ashton and Ashton (1985), and White and Curtsinger (1986). Other selected references are listed by topic as follows: **systematics and evolution** (Carr 1942; Schmidt 1953; Wermuth and Mertens 1961, 1977; Ward 1984; David 1994; Seidel 1994, 1995; Jackson 1995; Seidel and Dreslik 1996; Seidel and Ernst 1996), **zoogeography** (Blaney 1971), **karyotype** (Stock 1972, Killebrew 1977), **serum cholesterol** (Holcomb et al. 1972), **skeletal strontium** (Jackson et al. 1974), **reproduction** (Netting 1929, Goff and Goff 1932, Allen 1938 [1939], Hollister 1951, Iverson 1977, Ehrenfeld 1979, Ewert 1979, Franz 1986, Jackson 1988), **growth** (Marchand 1942), **longevity** (Snider and Bowler 1992), **temperature dependent sex determination** (Ewert and Nelson 1991), **thermal and water loss ecology** (Bogert and Cowles 1947, Hutchison et al. 1966, Pritchard and Greenwood 1968, Auth 1975), **hatchling overwintering** (Jackson 1994), **populations** (Marchand 1942; Kramer 1986, 1995; Giovanetto 1992; Meylan et al. 1992), **bio-**

**mass** (Iverson 1982), **habitat** (Wilson and Porras 1983, Ashton and Ashton 1985), **predators** (Delany and Abercrombie 1986, Franz 1986, Beissinger 1990), **parasites** (Stunkard 1924, Price 1939, Damian 1961, Ernst and Ernst 1977), **algae** (Neill and Allen 1954), **behavior** (Kramer 1989), **courtship** (White and Curtsinger 1986, Seidel and Fritz 1997), **home range** (Marchand 1945, Kramer 1995), **distribution** (Duellman and Schwartz 1958, Iverson 1992, Iverson and Etchberger 1989), **common names** (Iverson 1985, Collins 1990), **bibliography** (Enge and Dodd 1992, Liner 1997).

• **ETYMOLOGY.** The name *peninsularis* (Latin) alludes to the range of this form throughout peninsular Florida.

• **COMMENT.** The most recent taxonomic study of the genus *Pseudemys* (Seidel 1994) recognized *P. peninsularis* (formerly *P. floridana peninsularis*) as a distinct species, separate from *P. concinna floridana* (Seidel and Dreslik 1996). Jackson (1995) presented an alternative interpretation suggesting that *P. peninsularis* be retained as a subspecies of *P. floridana*. This view was rebutted by Seidel (1995).

#### LITERATURE CITED

- Allen, E.R. 1938 (1939). Notes on the feeding and egg-laying habits of the *Pseudemys*. Proc. Florida Acad. Sci. 3:105-108 + 9 figs. (pl.).
- Ashton, R.E., Jr. and P.S. Ashton. 1985. Handbook of Reptiles and Amphibians of Florida. Part Two. Lizards, Turtles & Crocodylians. Windward Publ. Inc., Miami, Florida.
- Auth, D.L. 1975. Behavioral ecology of basking in the Yellow-bellied Turtle, *Chrysemys scripta scripta* (Schoepff). Bull. Florida St. Mus. Biol. Sci. 20:1-45.
- Bancroft, G.T., J.S. Godley, D.T. Gross, N.N. Rojas, D.A. Sutphen, and R.W. McDiarmid. 1983. Large-scale operations management test of use of the White Amur for control of problem aquatic plants. The herpetofauna of Lake Conway: species accounts. Final Report. U.S. Army Eng. Waterways Exp. Stn., CE, Vicksburg, Mississippi Misc. Pap. A-83-5:2 + 252 p. + 50 app.
- Behler, J.L. and F.W. King. 1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopf, New York.
- Beissinger, S.R. 1990. Alternative foods of a diet specialist, the Snail Kite. Auk 107:327-333.
- Blaney, R.M. 1971. An annotated checklist and biogeographic analysis of the insular herpetofauna of the Apalachicola Region, Florida. Herpetologica 27:406-430.
- Bogert, C.M. and R.B. Cowles. 1947. Moisture loss in relation to habitat selection in some Floridian reptiles. Amer. Mus. Nov. (1358):1-34.
- Carr, A.F., Jr. 1935. The identity and status of two turtles of the genus *Pseudemys*. Copeia 1935:147-148.
- . 1938. A new subspecies of *Pseudemys floridana*, with notes on the *floridana* complex. Copeia 1938:105-109.
- . 1940. A contribution to the herpetology of Florida. Univ. Florida Publ. Biol. Sci. ser. 3:3 + 118 p.
- . 1942. The status of *Pseudemys floridana texana*, with notes on parallelism in *Pseudemys*. Proc. New England Zool. Club 21:69-76.
- . 1952. Handbook of Turtles. The Turtles of the United States, Canada, and Baja California. Comstock Publ. Assoc., Cornell Univ. Press, Ithaca, New York.
- and C.J. Goin. 1955. A Guide to the Reptiles, Amphibians and Fresh-water Fishes of Florida. Univ. Florida Press, Gainesville.
- Cochran, D.M. and C.J. Goin. 1970. The New Field Book of Reptiles and Amphibians. G.P. Putnam's Sons, New York.
- Collins, J.T. 1990. Standard common names and current scientific names for North American amphibians and reptiles. 3rd ed. SSAR Herpetol. Circ. (19):iii + 41 p.
- Conant, R. and J.T. Collins. 1998. A Field Guide to the Reptiles and Amphibians of Eastern and Central North America. 3rd ed., expanded. Houghton Mifflin Co., Boston, Massachusetts.
- Daimian, R. 1961. *Macravestibulum kraatzi* n. sp. (Trematoda: Pronocephalidae), with revision of the genus *Macravestibulum* Mackin,

1930. *J. Parasitol.* 47:503–508.
- David, P. 1994. Liste des reptiles actuel du monde. I. Chelonii. *Dumerilia* 1:7–127.
- Delany, M.F. and C.L. Abercrombie. 1986. American Alligator food habits in northcentral Florida. *J. Wildl. Mgmt.* 50:348–353.
- Ditmars, R.L. 1936. *The Reptiles of North America. A Review of the Crocodylians, Lizards, Snakes, Turtles and Tortoises Inhabiting the United States and Northern Mexico.* Doubleday & Co., Garden City, New York.
- Duellman, W.E. and A. Schwartz. 1958. Amphibians and reptiles of southern Florida. *Bull. Florida St. Mus. Biol. Sci.* 3:181–324.
- Ehrenfeld, D.W. 1979. Behavior associated with nesting, p. 417–434. *In* M. Harless and H. Morlock (eds.), *Turtles: Perspectives and Research.* John Wiley & Sons, New York.
- Engel, K.M. and C.K. Dodd, Jr. 1992. An indexed bibliography of the herpetofauna of Florida. Florida Game Fresh Water Fish Comm. Non-game Wildlife Progr. Tech. Rep. (11):iv + 231 p.
- 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.
- , J.E. Lovich, and R.W. Barbour. 1994. *Turtles of the United States and Canada.* Smithsonian Inst. Press, Washington, D.C.
- 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.
- Ewert, M.A. 1979. The embryo and its egg: development and natural history, p. 333–413. *In* M. Harless and H. Morlock (eds.), *Turtles: Perspectives and Research.* John Wiley & Sons, New York.
- and C.E. Nelson. 1991. Sex determination in turtles: diverse patterns and some possible adaptive values. *Copeia* 1991:50–69.
- Franz, R. 1986. *Pseudemys floridana peninsularis.* Egg predation. *Herpetol. Rev.* 17:64–65.
- Giovanetto, L.A. 1992. Population ecology and relative abundance of sympatric freshwater turtles in the headwaters of two spring-fed rivers in western peninsular Florida. Ph.D. diss., Florida Inst. Tech., Melbourne.
- Goff, G.C. and D.S. Goff. 1932. Egg laying and incubation of *Pseudemys floridana.* *Copeia* 1932:92–94.
- Hay, O.P. 1916. Descriptions of some Floridian vertebrates, belonging mostly to the Pleistocene. *Ann. Rep. Florida Geol. Surv.* 8:39–76 + 9 pl.
- 1917. Vertebrata mostly from Stratum No. 3, at Vero, Florida; together with descriptions of a new species. *Ann. Rep. Florida Geol. Surv.* 9:43–68 + 1 pl.
- Hirschfeld, S.E. 1968. Vertebrate fauna of Nichol's Hammock, a natural trap. *Quart. J. Florida Acad. Sci.* 31:177–189.
- Hlavicka, P. 1992. The American terrapin *Pseudemys floridana.* *Akvarium Terarium* 35(8):18–20 (in Czech).
- Holcomb, C.M., C.G. Jackson, Jr., and M.M. Jackson. 1972. Serum cholesterol values in three species of turtles. *J. Wildl. Dis.* 8:181–182.
- Hollister, J.M. 1951. Turtles found in Florida. *Florida Nat.* 24:93–95.
- Holman, J.A. 1996. The large Pleistocene (Sangamonian) herpetofauna of the Williston III A site, north-central Florida. *Herpetol. Nat. Hist.* 4:35–47.
- and C.G. Clausen. 1984. Fossil vertebrates associated with Paleo-Indian artifact at Little Salt Spring, Florida. *J. Vert. Paleontol.* 4:146–154.
- Hutchison, V.H., A. Vinegar, and R.J. Kosh. 1966. Critical thermal maxima in turtles. *Herpetologica* 22:32–41.
- Iverson, J.B. 1977. Reproduction in freshwater and terrestrial turtles in north Florida. *Herpetologica* 33:205–212.
- 1982. Biomass in turtle populations: a neglected subject. *Oecologia (Berlin)* 55:69–76.
- 1985. Checklist of the turtles of the world, with English common names. *SSAR Herpetol. Circ.* (14):2 + 14 p.
- 1992. A Revised Checklist with Distribution Maps of the Turtles of the World. Priv. printed. Richmond, Indiana.
- and C.R. Etchberger. 1989. The distributions of the turtles of Florida. *Florida Sci.* 52:119–144.
- Jackson, C.G., Jr., C.M. Holcomb, S. Kleinbergs-Krisans, and M.M. Jackson. 1974. Variation in strontium-90 exoskeletal burdens of turtles (Reptilia: Testudines) in southeastern United States. *Herpetologica* 30:406–409.
- Jackson, D.R. 1976. The status of the Pliocene turtles *Pseudemys caelata* Hay and *Chrysemys carri* Rose and Weaver. *Copeia* 1976:655–659.
- 1977. The fossil freshwater emydid turtles of Florida. Ph.D. diss., Univ. Florida, Gainesville.
- 1988. Reproductive strategies of sympatric freshwater emydid turtles in northern peninsular Florida. *Bull. Florida St. Mus. Biol. Sci.* 33:113–158.
- 1994. Overwintering of hatchling turtles in northern Florida. *J. Herpetol.* 28:401–402.
- 1995. Systematics of the *Pseudemys concinna-floridana* complex (Testudines: Emydidae): an alternative explanation. *Chel. Cons. Biol.* 1:329–333.
- Killebrew, F.C. 1977. Mitotic chromosomes of turtles. IV. The Emydidae. *Texas J. Sci.* 29:245–253.
- Kramer, M. 1986. Field studies on a freshwater Florida turtle, *Pseudemys nelsoni*, p. 29–34. *In* L.C. Drickamer (ed.), *Behavioral Ecology and Population Biology.* E.C. Univ. Paul Sabatier, Toulouse, France.
- 1989. Individual discrimination in juveniles of two turtles, *Pseudemys nelsoni* and *Pseudemys floridana* (Chelonia, Emydidae). *Biol. Behav.* 14:148–156.
- 1995. Home range of the Florida Red-bellied Turtle (*Pseudemys nelsoni*) in a Florida spring run. *Copeia* 1995:883–890.
- Liner, E.A. 1997. Bibliography and scientific name index to the amphibians and reptiles of the Florida Academy of Sciences, Volume 1–55, 1937–1992, The Florida Field Naturalist, Volume 1–20, 1973–1992, and The Florida Naturalist, Volume 1–65, 1926–1992. *Smithsonian Herpetol. Info. Serv.* (113):1–39.
- Loennberg, E. 1894. Notes on reptiles and batrachians collected in Florida in 1892 and 1893. *Proc. U.S. Natl. Mus.* 17:317–339.
- Marchand, L.J. 1942. A contribution to the knowledge of the natural history of certain freshwater turtles. M.S. thesis, Univ. Florida, Gainesville.
- 1945. The individual range of some Florida turtles. *Copeia* 1945:75–77.
- Menne, H.A.L. 1955. Florida, eldorado voor de herpetoloog. *Lacerta* 13:62–63, 66–68, 78–80.
- Meylan, P.A. 1995. Pleistocene amphibians and reptiles from the Leisey Shell Pits, Hillsborough County, Florida, pp. 273–297. *In* R.C. Hulbert, Jr., G.S. Morgan, and S.D. Webb (eds.), *Paleontology and Geology of the Leisey Shell Pits, Early Pleistocene of Florida. Part I. Vol. 37.* *Bull. Florida Mus. Nat. Hist., Gainesville.*
- , C.A. Stevens, M.E. Barnwell, and E.D. Dohm. 1992. Observations on the turtle community of Rainbow Run, Marion Co., Florida. *Florida Sci.* 55:219–228.
- Neill, W.T. and E.R. Allen. 1954. Algae on turtles: some additional considerations. *Ecology* 35:581–584.
- , H.J. Gut, and P. Brodtkorb. 1956. Animal remains from four pre-ceramic sites in Florida. *Amer. Antiquity* 21:383–395.
- Netting, M.G. 1929. A note on the egg-laying of *Pseudemys floridana* (Le Conte). *Copeia* (170):24–25.
- Obst, F.J. 1985. *Schmuckschildkröten. Die Gattung Chrysemys.* A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany.
- Parsons, T.S. 1960. The structure of the choanae of the Emydinae (Testudines, Testudinidae). *Bull. Mus. Comp. Zool.* 123:113–127.
- 1968. Variation in the choanal structure of Recent turtles. *Can. J. Zool.* 46:1235–1263 + 5 pl.
- Pope, C.H. 1939. *Turtles of the United States and Canada.* Alfred A. Knopf, Inc., New York.
- Powell, R., J.T. Collins, and E.D. Hooper, Jr. 1998. *A Key to the Amphibians and Reptiles of the Continental United States and Canada.* Univ. Press Kansas, Lawrence.
- Price, E.W. 1939. North American monogenetic trematodes. IV. The family Polystomatidae (Polystomatoidea). *Proc. Helminthol. Soc. Washington* 6:80–92.
- Pritchard, P.C.H. and W.F. Greenwood. 1968. The sun and the turtle. *Internatl. Turtle Tortoise Soc. J.* 2(1):20–25, 34.
- Schmidt, K.P. 1953. *A Check List of North American Amphibians and Reptiles.* 6th ed. ASIH, Chicago, Illinois.
- Seidel, M.E. 1994. Morphometric analysis and taxonomy of Cooter and Red-bellied turtles in the North American genus *Pseudemys* (Emydidae). *Chel. Cons. Biol.* 1:117–130.
- 1995. How many species of Cooter Turtles and where is the scientific evidence? — a reply to Jackson. *Chel. Cons. Biol.* 1:333–336.
- and M.J. Dreslik. 1996. *Pseudemys concinna.* *Cat. Amer. Amphib. Rept.* (626):1–12.

- and C.H. Ernst. 1996. *Pseudemys*. Cat. Amer. Amphib. Rept. (625):1–7.
- and U. Fritz. 1997. Courtship behavior provides additional evidence for a monophyletic *Pseudemys*, and comments on Mesoamerican *Trachemys* (Testudines: Emydidae). Herpetol. Rev. 28:70–72.
- Snider, A.T. and J.K. Bowler. 1992. Longevity of reptiles and amphibians in North American collections. 2nd ed. SSAR Herpetol. Circ. (21):iii + 40 p.
- Stock, A.D. 1972. Karyological relationships in turtles (Reptilia: Chelonia). Can. J. Gen. Cytol. 14:859–868 + 5 pl. + 1 tab.
- Stunkard, H.W. 1924. On some trematodes from Florida turtles. Trans. Amer. Micro. Soc. 43:97–117.
- Telford, S.R., Jr. 1952. A herpetological survey in the vicinity of Lake Shipp, Polk Co., Florida. J. Florida Acad. Sci. 15:175–185.
- Ward, J.P. 1984. Relationships of chrysemyd turtles of North America (Testudines: Emydidae). Spec. Publ. Mus. Texas Tech. Univ. (21):1–50.
- Weaver, W.G., Jr. and F.L. Rose. 1967. Systematics, fossil history, and evolution of the genus *Chrysemys*. Tulane Stud. Zool. 14:63–73.
- Weigel, R.D. 1962. Fossil vertebrates of Vero, Florida. Florida Geol. Surv. Spec. Publ. (10):1–59.
- Wermuth, H. and R. Mertens. 1961. Schildkröten, Krocodile, Brückenechsen. Veb. Gustav Fischer Verlag, Jena.
- and —. 1977. Liste der rezenten Amphibien und Reptilien. Testudines, Crocodylia, Rhynchocephalia. Das Tierreich (100):vii–xxvii + 174 p.
- White, C.P. and W.R. Curtsinger. 1986. Freshwater turtles: designed for survival. Natl. Geogr. Mag. 169:40–59.
- Wilson, L.D. and L. Porras. 1983. The ecological impact of man on the South Florida herpetofauna. Univ. Kansas Mus. Nat. Hist. Spec. Publ. (9):vi + 89 p.

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Primary editor for this account, Robert Powell.

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