Catalogue of American Amphibians and Reptiles.

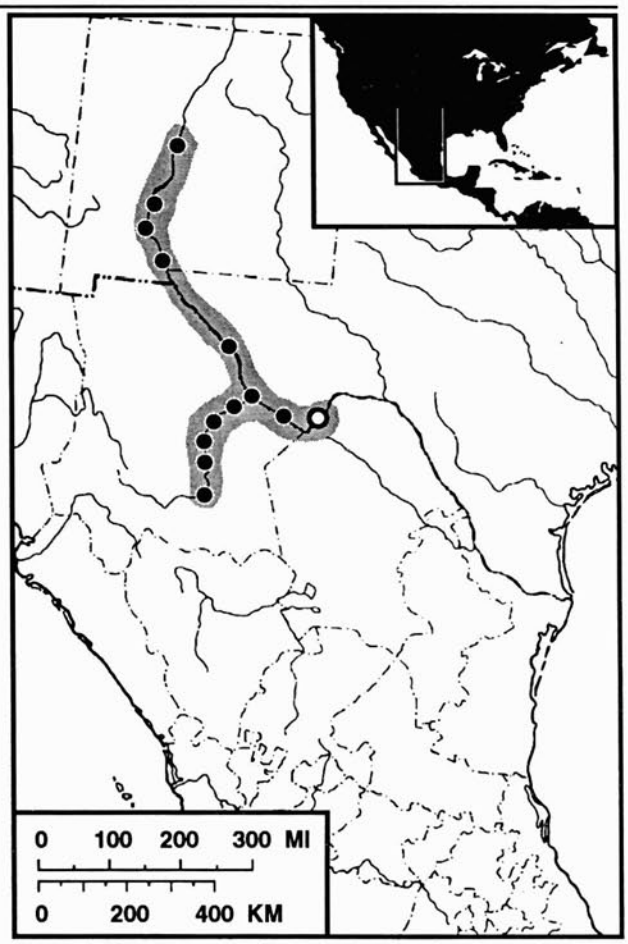
Ernst, C.H. 1992. *Trachemys gaigeae.*

Trachemys gaigeae (Hartweg)
Big Bend Slider

Pseudemys scripta gaigeae Hartweg, 1939a:1. Type-locality, "Boquillas, Rio Grande River, Brewster County, Texas." Holotype, University of Michigan Museum of Zoology 66472, an adult female collected by Helen T. Gaige on 15-17 July, 1928 (examined by author).
Pseudemys gaigeae: Stejneger and Barbour, 1939:165.
Chrysemys scripta gaigeae: Smith and Taylor, 1966:11.
Pseudemys scripta gagei: Ernst, 1967:35. *Lapsus calami.*
Chrysemys gaigeae: Weaver and Rose, 1967:63.
Chrysemys gaigeae gaigeae: Weaver and Rose, 1967:70.
Pseudemys scripta gaigea: Degenhardt and Christiansen, 1974:38. *Ex error.*
Chrysemys gaigae: Ashton et al., 1976:51. *Ex error.*
Chrysemys gaigea: Morafka, 1977:70. *Ex error.*
Chrysemys scripta gaigae: Morafka, 1977:71. *Ex error.*
Trachemys n.[=nebulosa] gaigeae: Ward, 1984:45.
Tigaigene: Ward, 1984:47. *Ex error.*
Trachemys gaigeae: Dixon, 1987:85. First use of present combination.
Trachemys scripta gaigeae: Alderton, 1988:177.

• **Content.** *Trachemys gaigeae* is monotypic.

• **Definition.** Adults reach over 22 cm in carapace length. The oval carapace is weakly keeled in juveniles but usually smooth in adults, posteriorly serrated, highest at the middle, and widest posterior to the middle. The vertebrals are wider than long. The carapace is light olive-brown with a reticulate pattern of curved orange lines, often surrounding small ocelli, on the pleurals and vertebrals. A dark spot is present on each of the first three pleural scutes, and usually present on the fourth. Each marginal has a single, curved, orange bar and a dark-bordered ocellus at the lower, posterior corner of its upper surface. At least in males, melanism may develop with age. The ventral surfaces of the marginals have large dark-bordered ocelli at the seams, and the bridge is patterned with narrow, transverse dark lines. The hingeless plastron is cream to orange or light olive, usually with a large, dark, central figure formed by a series of elongated narrow lines that may spread laterally along the transverse seams. This central figure is usually continuous from the gulars posteriorly to



Map. The large open circle marks the type-locality; solid circles indicate other records. Shaded area represents the probable range.

Figure 1. Dorsal view of *Trachemys gaigeae.* Photograph by Roger W. Barbour.

the anals. The gular and pectoral scutes average 12% and 16% of carapace length, respectively; normally the abdominal is the longest plastral scute and the anal scute is second longest (Legler, 1990). The skin is light olive to orange-brown; the forelegs are striped with yellow or orange; and vertical yellow or orange stripes occur on the hind quarters. An oval, black-bordered, red to orange postorbital spot is well separated from the orbit. The chin is medially striped, with lateral stripes shortened to ovals that are almost ocelli. The upper jaw is slightly notched, and the toes are webbed.

Males have smaller carapaces which are less domed than that of females. Males have long, thick tails with the vent beyond the carapacial rim, and slightly concave plastrons. Mature males lack the elongated foreclaws found in male *Trachemys scripta* from the United States. The female has a short tail with the vent beneath the posterior marginals, and a flat plastron.

• **Descriptions.** Descriptions of adults are given by Behler and King (1979), Carr (1952), Chrapliwy and Fugler (1955), Cochran and Goin (1970), Conant and Collins (1991), Ernst (1990), Ernst and Barbour (1972, 1989), Ernst et al. (in press), Garrett and Barker (1987), Hartweg (1939a, 1939b), Legler (1960a), Legler and Webb (1970), Obst (1983), Pritchard (1979), Smith and Brodie (1982), Smith and Smith (1980), Stebbins (1985), Weaver and Rose (1967), and Williams et al. (1960). Juveniles are described by Carr (1952). Parsons (1968) provides a description of the choanae.

• **Illustrations.** Color photographs or drawings of adults can be found in Ernst et al. (in press), Garrett and Barker (1987), and Smith and Brodie (1982). Color drawings of the carapacial and plastral patterns are in Obst (1983). Black and white photographs or drawings of adults are provided by Casas-Andreu (1967), Ernst and Barbour (1972), and Ernst et al. (in press). Black and white photographs or drawings of the lateral head pattern are presented by Conant and Collins (1991), Obst (1983), and Pritchard (1979). Juveniles are illustrated in black and white by Carr (1952) and Smith and Smith (1980).

• **Distribution.** The species occurs in the Rio Grande (from the Big Bend upstream to at least the Bosque del Apache Refuge, New Mexico) and the Rio Conchos drainages of western Texas, New Mexico, Chihuahua, and Coahuila. Maps documenting the distribution are presented in Conant and Collins (1991), Degenhardt and Christiansen (1974), Dixon (1987), Ernst et al. (in press), Legler (1990), Smith and Smith (1980), and Stebbins (1985). Degenhardt and Christiansen (1974) discussed the range in New Mexico; Axtell (1959), Brown (1950), Carr (1952), Dixon (1987), Garrett and Barker (1987), Hamilton (1947), Legler (1960b), Minton (1959), and Raun and Gehlbach (1972) listed Texas localities; and Casas-Andreu (1967), Chrapliwy and Fugler (1955), Legler (1960b), Smith et al. (1963), Smith and Smith (1980), and Williams et al. (1960) discussed the distribution in northern México.

• **Fossil Record.** None.

• **Pertinent Literature.** General accounts are in Dixon (1987), Ernst et al. (in press), Garrett and Barker (1987), Raun and Gehlbach (1972), and Wauer (1980). Additional references are listed by topic: systematics (Brown, 1971; Hartweg, 1939a, 1939b; Holman, 1977; Legler, 1990; Legler and Webb, 1970; Moll and Legler, 1971; Obst, 1983; Price and Hillis, 1989; Smith and Smith, 1975, 1980; Ward, 1980, 1984; Weaver and Rose, 1967; Williams, 1956), zoogeography (Smith and Buechner, 1947), collection methods (Legler, 1960b), habitat (Carr, 1952; Degenhardt and Christiansen, 1974; Garrett and Barker, 1987; Legler, 1960b; Minton, 1959; Williams et al., 1960), behavior (Garrett and Barker, 1987; Legler, 1960b), reproduction (Garrett and Barker, 1987; Legler, 1960b), food habits (Legler, 1960b; Parmenter and Avery, 1990), nasal structure (Parsons, 1968), and conservation status (Ashton et al., 1976).

• **Etymology.** The feminine name *gaigeae* is a genitive matronym honoring Dr. Helen Thompson Gaige, the collector of the holotype and colleague of Dr. Norman Hartweg at the University of Michigan Museum of Zoology.

• **Remarks.** *Trachemys gaigeae* was described as a subspecies of *Pseudemys scripta* by Hartweg (1939a). Stejneger and Barbour (1939) first elevated it to specific rank (*Pseudemys gaigeae*), but gave no reason for their decision. This arrangement was virtually ignored until Weaver and Rose (1967) re-elevated it to a full species on morphological grounds, placing *gaigeae* in the genus *Chrysemys*. They included *Chrysemys s. hiltoni* and *C. s. taylori* in *C. gaigeae* as subspecies, believing that these three turtles were morphologically

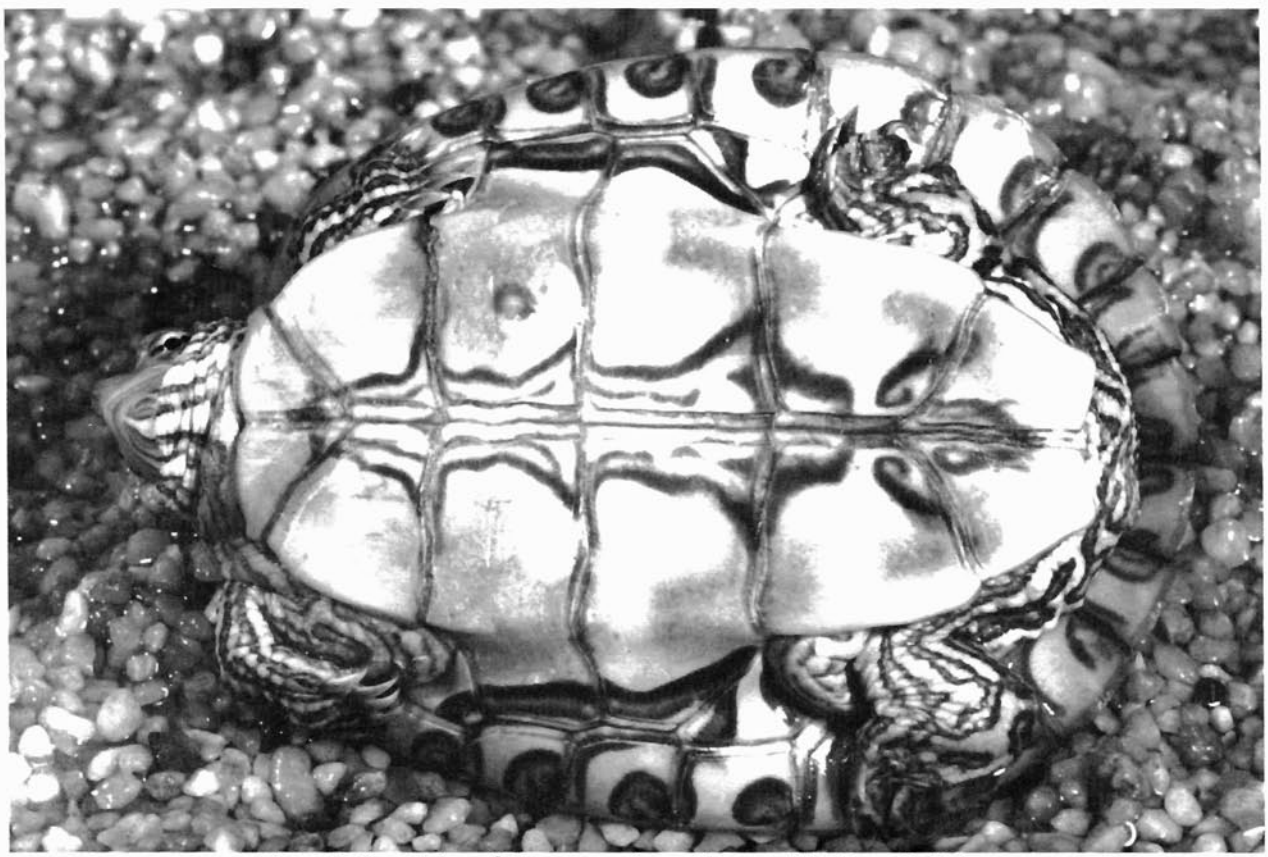


Figure 2. Ventral view of *Trachemys gaigeae*. Photograph by Roger W. Barbour.

closer to the *Pseudemys floridana* group than to *Trachemys scripta*. Holman (1977) also thought this arrangement more natural. However, specific status for *T. gaigeae* was not generally accepted. Smith and Smith (1980) thought this species, along with *T. s. biltoni* and *T. s. nebulosa*, and the undescribed endemic subspecies of the Río Nazas, *T. s. hartwegi* (= *Pseudemys s. hartwegi* Legler, 1990:89), a member of a distinctive "*gaigeae*" group of sliders, as first noted by Legler and Webb (1970). Ward (1980, 1984), recognizing that *Trachemys gaigeae* is a different taxon than *T. scripta*, separated the two on morphological evidence, but placed *T. gaigeae* in the species *T. nebulosa* (although his designation is obscured by several spelling errors in his 1984 publication). Dixon (1987) later listed *T. gaigeae* as a separate species, without giving a reason, and Price and Hillis (1989) reported that at least one fixed allelic difference exists between *T. gaigeae* and *T. scripta*. Legler (1990) considered *T. gaigeae* a subspecies of the "polytypic, monophyletic species" *Pseudemys scripta* (= *T. scripta*), while acknowledging that this was only one conservative approach to the "immense amount of variation and extensive geographic range" of *P. scripta*, and that others had considered one or more of its many subspecies to be full species (Stejneger and Barbour, 1939; Weaver and Rose, 1967; Ward, 1984; Dixon, 1987). Conant and Collins (1991) also recognized *T. gaigeae* as a full species, apparently on the basis of its supposed allopatry. However, the species is not entirely allopatric and occurs together with *T. scripta elegans* in at least one impoundment in New Mexico without gene exchange (Charles W. Painter, in litt.). This is not surprising because the courtship behaviors of the two turtles are dissimilar. That of *T. gaigeae* does not include the frontal face stroking of *T. s. elegans*, and is more similar to that of *T. s. taylori* with a pursuit from the rear and possible biting (pers. obs.). Generally a species does not have more than one courtship pattern (Ernst, 1990). The assumed intergradation between these two taxa (Hamilton, 1947; Hartweg, 1939b; Shannon and Smith, 1949; and Smith and Smith, 1980) does not occur; based on the ranges of *gaigeae* and *scripta* in Texas (Dixon, 1987), reported intergrades are probably variant *T. s. elegans*. In Texas, *T. gaigeae* does not venture farther inland than the flood plain of the Rio Grande, whereas *T. s. elegans* occurs farther east in more upland waterways, thus the two turtles are effectively separated. The morphological differences between *T. gaigeae* and *T. scripta* noted by Weaver and Rose (1967) and Ward (1980, 1984), and the allelic differences reported by Price and Hillis (1989), along with the different courtship behavior, and sympatry without gene exchange, support separation of the two taxa. This approach has been followed by Ernst et al. (in press).

The relationships between *Trachemys gaigeae* and *T. s. hartwegi*, *T. s. biltoni*, *T. s. nebulosa*, and *T. s. taylori* require additional study; possibly *T. s. hartwegi* may prove to be a subspecies of *T. gaigeae*. Legler (1990:91) included as paratypes of *T. s. hartwegi* U.S. National Museum specimens 60921 and 103706 (as 103760) and Museum of Comparative Zoology specimens 4550 and 4551, all of which were listed as paratypes of *T. gaigeae* by Hartweg (1939a:1).

As can be seen from the synonomy, the name *gaigeae* has been one of the most frequently misspelled names of any North American turtle.

The life history of *Trachemys gaigeae* is virtually unknown; a good ecological and behavioral study is needed.

Literature Cited

Alderton, D. 1988. Turtles & tortoises of the world. Facts on File Publ., New York.

Ashton, R.E. Jr., S.E. Edwards, and G.R. Pisani. 1976. Endangered and threatened amphibians and reptiles in the United States. Soc. Stud. Amphib. Rept. Misc. Publ., Herpetol. Circ. (5):1-65.

Axtell, R.W. 1959. Amphibians and reptiles of the Black Gap Wildlife Management Area, Brewster County, Texas. Southwest. Nat. 4: 88-109.

Behler, J.L. and F.W. King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York.

Brown, B.C. 1950. An annotated check-list of the reptiles and amphibians of Texas. Baylor Univ. Stud., Baylor Univ. Press, Waco, Texas.

Brown, P.R. 1971. A quick survey of the present status of the United States chelonians—or—the mysterious ways of the turtle taxonomists. Herpetology 5:35-38.

Carr, A.F. 1952. Handbook of turtles. The turtles of the United States, Canada, and Baja California. Comstock Publ. Assoc., Cornell Univ. Press, Ithaca, New York.

Casas-Andreu, G. 1967. Contribución al conocimiento de las tortugas dulce acuicolas de México. Univ. Nac. Auton. México, Fac. Ciencias, Dept. Biol., México, D.F.

Chrapliwy, P.S. and C.M. Fugler. 1955. Amphibians and reptiles collected in Mexico in the summer of 1953. Herpetologica 11:121-128.

Cochran, D.M. and C.J. Goin. 1970. The new field book of reptiles and amphibians. G.P. Putnam's Sons, New York.

Conant, R. and J.T. Collins. 1991. A field guide to reptiles and amphibians: eastern and central North America. Houghton Mifflin Co., Boston.

Degenhardt, W.G. and J.L. Christiansen. 1974. Distribution and habitats of turtles in New Mexico. Southwest. Nat. 19:21-46.

Dixon, J.R. 1987. Amphibians and reptiles of Texas, with keys, taxonomic synopses, bibliography, and distribution maps. Texas A & M Univ. Press, College Station.

Ernst, C.H. 1967. Serum protein analysis: a taxonomic tool. Internatl. Turtle Tort. Soc. J. 1(3):34-36.

——. 1990. Systematics, taxonomy, variation, and geographic distribution of the slider turtle, p. 57-67. *In* J.W. Gibbons (ed.), Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C.

—— 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. In press. Turtles of the United States and Canada. Smithsonian Inst. Press, Washington, D.C.

Garrett, J.M. and D.G. Barker. 1987. A field guide to reptiles and amphibians of Texas. Texas Monthly Press, Austin.

Hamilton, R.D. 1947. The range of *Pseudemys scripta gaigeae*. Copeia 1947:65-66.

Hartweg, N. 1939a. A new American *Pseudemys*. Occ. Pap. Mus. Zool. Univ. Michigan (397):1-4.

——. 1939b. Further notes on the *Pseudemys scripta* complex. Copeia 1939:55.

Holman, J.A. 1977. Comments on turtles of the Genus *Chrysemys* Gray. Herpetologica 33:274-276.

Legler, J.M. 1960a. A new subspecies of slider turtle (*Pseudemys scripta*) from Coahuila, México. Univ. Kansas Publ. Mus. Nat. Hist. 13:73-84.

——. 1960b. Remarks on the natural history of the Big Bend Slider, *Pseudemys scripta gaigeae* Hartweg. Herpetologica 16:139-140.

——. 1990. The Genus *Pseudemys* in Mesoamerica: taxonomy, distribution, and origins, p. 82-105. *In* J.W. Gibbons (ed.), Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C.

—— and R.G. Webb. 1970. A new slider (*Pseudemys scripta*) from Sonora, México. Herpetologica 26:157-168.

Minton, S.A. 1959. Observations on amphibians and reptiles of the Big Bend region of Texas. Southwest. Nat. (1958) 3:28-54.

Moll, E.O. and J.M. Legler. 1971. The life history of a neotropical slider turtle, *Pseudemys scripta* (Schoepff), in Panama. Bull. Los Angeles Co. Mus. Nat. Hist. (11):1-102.

Morafka, D.J. 1977. A biogeographical analysis of the Chihuahuan Desert through its herpetofauna. Biogeographica 9:1-313.

Obst, F.J. 1983. Schmuckschildkröten: die Gattung *Chrysemys*. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany.

Parmenter, R.R. and H.W. Avery. 1990. The feeding ecology of the slider turtle, p. 257-266. *In* J.W. Gibbons (ed.), Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C.

Parsons, T.S. 1968. Variation in the choanal structure of Recent turtles. Can. J. Zool. 46:1235-1263.

Price, A.H. and D.M. Hillis. 1989. Biochemical genetics and taxonomic status of *Trachemys gaigeae* and of the *Trachemys scripta* complex in Texas. Abstr. First World Congr. Herpetol., Canterbury, United Kingdom.

Pritchard, P.C.H. 1979. Encyclopedia of turtles. T.F.H. Publ., Inc., Neptune, New Jersey.

Raun, G.G. and F.R. Gehlbach. 1972. Amphibians and reptiles in Texas. Taxonomic synopsis, bibliography, and county distribution maps. Dallas Mus. Nat. Hist. Bull. (2):ii + 1-61 p., 140 maps.

Shannon, F.A. and H.M. Smith. 1949. Herpetological results of the University of Illinois field expedition, spring 1949. Trans. Kansas Acad. Sci. 52:494-509.

Smith, H.M. and E.D. Brodie, Jr. 1982. A guide to field identification.

Reptiles of North America. Golden Press, New York.
——and H.K. Buechner. 1947. The influence of the Balcones Escarpment on the distribution of amphibians and reptiles in Texas. Bull. Chicago Acad. Sci. 8:1-16.
——and R.B. Smith. 1975. An analysis of the knowledge of the turtle fauna of Mexico. Chelonia 2(3):3-8.
——and——. 1980. Synopsis of the herpetofauna of Mexico. Vol. VI. Guide to Mexican turtles. Bibliographic Addendum III. John Johnson, North Bennington, Vermont. [1979].
——and E.H. Taylor. 1966. Herpetology of Mexico. Annotated checklists and keys to the amphibians and reptiles. A reprint of Bulletins 187, 194, and 199 of the U.S. National Museum with a list of subsequent taxonomic innovations. Eric Lundberg, Ashton, Maryland.
——, K.L. Williams, and E.O. Moll. 1963. Herpetological explorations on the Rio Conchos, Chihuahua, Mexico. Herpetologica 19:205-215.
Stebbins, R. 1985. A field guide to western reptiles and amphibians. 2nd ed. Houghton Mifflin Co., Boston.
Stejneger, L. and T. Barbour. 1939. A check list of North American amphibians and reptiles. 4th ed. Harvard Univ. Press, Cambridge, Massachusetts.
Ward, J.P. 1980. Comparative cranial morphology of the freshwater turtle subfamily Emydinae: an analysis of the feeding mechanisms and systematics. Ph.D. Diss., North Carolina St. Univ., Raleigh.
——. 1984. Relationships of chrysemyd turtles of North America (Testudines: Emydidae). Spec. Publ. Mus. Texas Tech. Univ. (21):1-50.
Wauer, R.H. 1980. Naturalist's Big Bend. An introduction to the trees and shrubs, wildflowers, cacti, mammals, birds, reptiles and amphibians, fish, and insects. Texas A. M. Univ. Press, College Station.
Weaver, W.G. Jr. and F.L. Rose. 1967. Systematics, fossil history, and evolution of the Genus *Chrysemys*. Tulane Stud. Zool. 14:63-73.
Williams, E.E. 1956. *Pseudemys scripta callirostris* from Venezuela with a general survey of the *scripta* series. Bull. Mus. Comp. Zool. 115:145-160.
Williams, K.L., H.M. Smith, and P.S. Chrapliwy. 1960. Turtles and lizards from northern Mexico. Trans. Illinois St. Acad. Sci. 53:36-45.

Carl H. Ernst, Department of Biology, George Mason University, Fairfax, Virginia 22030.

Primary editor for this account, Michael W. Klemens.

Published 30 November 1992 and Copyright © 1992 by the Society for the Study of Amphibians and Reptiles.