

Catalogue of American Amphibians and Reptiles.

Ennen, J.R., J.E. Lovich, and R. Birkhead. 2012. *Graptemys pearlensis*.

***Graptemys pearlensis* Ennen, Lovich,
Kreiser, Selman, and Qualls
Pearl River Map Turtle**

Graptemys pulchra: Cagle 1952:223 (part).

Graptemys gibbonsi: Lovich and McCoy 1992:293 (part).

Graptemys pearlensis Ennen, Lovich, Kreiser, Selman, and Qualls 2010:104. Type-locality, "Pearl River at State Highway 28, near Georgetown, Copiah County, Mississippi, USA". Holotype, Carnegie Museum of Natural History (CM) 62162, an adult male, collected by T.E. Magers on 23 September 1967.

• **CONTENT.** No subspecies are recognized.

• **DEFINITION.** The Pearl River Map Turtle, *Graptemys pearlensis*, is a large aquatic species with maximum carapace length (CL) reaching 295 mm in females and a maximum CL of 120.7 mm in males (Ennen et al. 2010). The high-domed shell has a pronounced median keel with a complete black or brown stripe and prominent spines on the posterior portions of the 2nd and 3rd vertebral scutes. Dorsally, the marginal scutes have a relatively narrow vertical yellow bar without secondary pigmentation or conspicuous, concentric rings as in *Graptemys gibbonsi*. The 12th marginal scutes possess a vertical yellow bar that is usually 50% or less than the scute's length. However, when the bar is greater than 50%, it is distally located from the seam between the 12th marginal scutes. The carapace is olive green with the first 3 pleural scutes sometimes possessing yellow pigmentation (circular markings and vermiculations) on the distal parts. The plastron is pale yellow reaching 250 mm in females and 106 mm in males. Ground color and patterns of the head and limbs are very similar to those of *G. gibbonsi*. However, *G. pearlensis* is more likely to possess a nasal trident, a three-pronged yellow blotch on top of the snout.

Like other members of the *G. pulchra* clade, *G. pearlensis* exhibits sexual dimorphism with mean CL of adult females (247 mm) being larger than mean CL of males (102 mm) (Gibbons and Lovich 1990). In addition, females possess a wider head (36.4 mm, SD = 16.5) and wider alveolar surface (11.2 mm, SD = 5.3) than adult males (head width 15.5 mm, SD = 1.7 mm; alveolar width 3.8 mm, SD = 0.5; Lindeman, unpublished data). Both sexes have relatively flat plastrons.

• **DESCRIPTIONS.** A complete description is given in Ennen et al. (2010) and composite descriptions are given by Ernst et al. (1994), Ernst and Lovich (2009), Lovich and McCoy (1992, 1994), and Lovich et al. (2009). These earlier descriptions are obscured

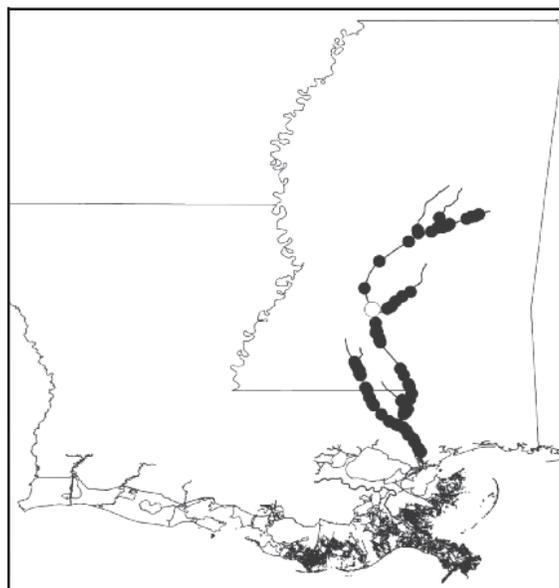


FIGURE 1. A female *Graptemys pearlensis* from the Pearl River in Louisiana, specific locality unknown. Photograph by Cris Hagen.

because *G. pearlensis* was not recognized at the time, and was included within *G. gibbonsi* from the Pascagoula River (Ennen et al. 2010). Detailed descriptions of the differences between the two species are given in Ennen et al. (2010).

• **ILLUSTRATIONS.** Color photographs of *Graptemys pearlensis* are found in Bonin et al (2006), Buhlmann et al. (2008), Ennen et al. (2010), and Mara (1996). Black-and-white illustrations of *G. pearlensis* are in Cagle (1952; as *G. pulchra*) and Powell et al. (2012).

• **DISTRIBUTION.** *Graptemys pearlensis* inhabits large to medium-sized waterways in the Pearl River system, Mississippi and eastern Louisiana, USA (Boyd and Vickers 1963; Iverson 1992; Lovich et al. 2009). Within the Pearl River, individuals occur as far north as Neshoba County, Mississippi (Keiser 2000) and as far south as Hancock County and St. Tam-



MAP. The open circle marks the type-locality for *Graptemys pearlensis*. Other selected localities are from Lindeman (2011).

many Parish, Louisiana approximately 20 river miles north of the Gulf of Mexico (Dickerson and Reine 1996; W. Selman, pers. comm.). *Graptemys pearlensis* also occurs in large tributaries such as Bogue Chitto River in Louisiana (Shively 1999; Lindeman 2010) and smaller tributaries in Mississippi and Louisiana including the Yockanookany River (Lindeman 1998), Pushepatapa Creek (Carr and Messinger 2002), Lobutch Creek, Strong River, and Topisaw Creek (P. Lindeman, pers. comm.). The Tickfaw River record (Dundee and Rossman 1989) was questioned by Lovich and McCoy (1992) because the species is absent in the tributaries between the Tickfaw and Bogue Chitto rivers (i.e., Tangipahoa, Tchefuncte, and Amite rivers: Cagle 1952; Cliburn 1971). A more detailed account of the distribution of *G. pearlensis* is given in Ennen et al. (2010).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Prior to Ennen et al. (2010), literature on *Graptemys pearlensis* was included under that of either *G. pulchra* or *G. gibbonsi*. Lovich (1985) summarized the known literature for *G. pulchra* (*sensu lato*), which included specimens from the Pearl River. Literature including specimens formerly recognized as *G. pulchra* or *G. gibbonsi* from the Pearl River but now recognized as *G. pearlensis* is listed by topic: **scute morphology** (Ennen et al. 2010; Little 1973; Lovich and Ernst 1989; Lovich and McCoy 1992; Tinkle 1962), **collecting techniques** (Chaney and Smith 1950), **hatchling behavior** (Anderson 1958), **natural history data on reproduction, diet, habitat, basking, and conservation** (Buhlmann and Gibbons 1997, 2006; Buhlmann et al. 2009; Cagle 1952; Cheung and Dudgeon 2006; Dundee and Rossman 1989; Ernst and Lovich 2009; Lindeman 1998, 1999, 2000; Lindeman and Sharkey 2001; Lovich and Gibbons 1997; Lovich et al. 2009; Selman and Qualls 2007; U.S. Fish and Wildlife Service 2005; Selman et al. 2009), **sexual size dimorphism** (Gibbons and Lovich 1990), **systematics and taxonomy** (Ennen et al. 2010; Lamb et al. 1994; Lovich and McCoy 1992; Wiens et al. 2010), **hematology** (Perpinán et al. 2008), and **zoogeography** (Walker and Avise 1998).

The species is included in **general works** (e.g., checklists, keys) by Rhodin et al. (2010), van Dijk et al. (2011), and Powell et al. (2012).

• **REMARKS.** *Graptemys pearlensis* is listed as endangered (EN) on the IUCN Red List of Threatened Species (van Dijk 2011) and in CITES Appendix 3 (CITES 2011; UNEP-WCMC 2012).

• **ETYMOLOGY.** The specific epithet *pearlensis* is a toponym referring to the Pearl River drainage, which the species inhabits.

• **COMMENT.** With the recognition of *G. pearlensis* by Ennen et al. (2010), each member of the *G. pulchra* clade (broad headed group) is largely endemic to a single major drainage system of the Gulf coast.

The only exceptions occur in satellite drainages adjacent to the major system (e.g., *G. ernsti* populations in the Escambia, and Choctawhatchee rivers and *G. barbouri* in the Apalachicola, Choctawhatchee, Aucilla, and Ochlockonee rivers). However, the identity of the Choctawhatchee River population is not clearly resolved (J. Godwin pers. comm.), and the Aucilla, Wacissa, and Ochlockonee river populations could have been introduced by humans (Jackson 2003). Each species in the broad headed group is differentiated by mitochondrial DNA, morphology, and pigmentation.

LITERATURE CITED

- Anderson, P.K. 1958. The photic response and water-approach behavior of hatchling turtles. *Copeia* 1958:211–215.
- Bonin, F., B. Devaux, and A. Dupré. 2006. *Turtles of the World*. Johns Hopkins Univ. Press, Baltimore, Maryland.
- Boyd, C.E. and D.H. Vickers. 1963. Distribution of some Mississippi amphibians and reptiles. *Herpetologica* 19:202–205.
- Buhlmann, K.A., T.S.B. Akre, J.B. Iverson, D. Karapatakis, R.A. Mittermeier, A. Georges, A.G.J. Rhodin, P.P. van Dijk, and J.W. Gibbons. 2009. A global analysis of tortoises and freshwater turtle distributions with identification of priority conservation areas. *Chelonian Conserv. Biol.* 8:116–149.
- and J.W. Gibbons. 1997. Imperiled aquatic reptiles of the southeastern United States: Historical review and current conservation status, p. 201–231. *In* G.W. Benz and D.E. Collins (eds.), *Aquatic Fauna in Peril; The Southeastern Perspective*. Spec. Publ. Southeast Aquatic Res. Inst., Decatur, Georgia.
- and –. 2006. *Habitat Management Recommendations for Turtles of Conservation Concern on National Wildlife Refuges*. Report to U.S. National Fish and Wildlife Foundation, Washington, D.C.
- , T. Tuberville, and J.W. Gibbons. 2008. *Turtles of the Southeastern United States*. Univ. of Georgia Press, Athens, Georgia.
- Cagle, F.R. 1952. The status of the turtles *Graptemys pulchra* Baur and *Graptemys barbouri* Carr and Marchand, with notes on their natural history. *Copeia* 1952:223–234.
- Carr, J.L. and M.A. Messinger. 2002. *Graptemys gibbonsi*. *Predation*. *Herpetol. Rev.* 33:201–202.
- Chaney, A. and C.L. Smith. 1950. Methods for collecting map turtles. *Copeia* 1950:323–324.
- Cheung, S.M. and D. Dudgeon. 2006. Quantifying the Asian turtle crisis: market surveys in southern China, 2000–2003. *Aquatic Conserv.: Mar. Freshw. Ecosy.* 16:751–770.
- CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). 2011. Appendices I, II and III. www.cites.org/eng/app/appendices.php.
- Cliburn, J.W. 1971. The ranges of four species of *Graptemys* in Mississippi. *J. Mississippi Acad. Sci.* 16:16–19.

- Dickerson, D.D. and K.J. Reine. 1996. Habitat assessment and relative abundance estimates for the Ringed Sawback Turtle (*Graptemys oculifera*) in dredging sites of the West Pearl River Navigation Project (Louisiana). Final Report U.S. Army Engineer District, Vicksburg, Mississippi.
- Dundee, H.A. and D.A. Rossman. 1989. The Amphibians and Reptiles of Louisiana. Louisiana St. Univ. Press, Baton Rouge.
- Ennen, J.R., J.E. Lovich, B.R. Kreiser, W.W. Selman, and C.P. Qualls. 2010. Genetic and morphological variation between populations of the Pascagoula Map Turtle (*Graptemys gibbonsi*) in the Pearl and Pascagoula Rivers with description of a new species. *Chelonian Conserv. Biol.* 9:98–113.
- Ernst, C.H. and J.E. Lovich. 2009. Turtles of the United States and Canada. Johns Hopkins Univ. Press, Baltimore, Maryland.
- , –, and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Inst. Press, Washington, D.C.
- Gibbons, J.W. and J.E. Lovich. 1990. Sexual dimorphism in turtles with emphasis on the slider turtle (*Trachemys scripta*). *Herpetol. Monogr.* 4:1–29.
- Iverson, J.B. 1992. A Revised Checklist with Distribution Maps of the Turtles of the World. Privately Printed, Richmond, Indiana.
- Jackson, D.R. 2003. Geographic distribution: *Graptemys barbouri* (Barbour's Map Turtle). *Herpetol. Rev.* 34:164.
- Keiser, E.D. 2000. A survey on the Nanih Waiya Wildlife Management Area to locate turtles and turtle nesting sites, with emphasis on the Ringed Map Turtle (*Graptemys oculifera*). Final Report Mississippi Museum of Natural Science, Jackson.
- Lamb, T., C. Lydeard, R.B. Walker, and J.W. Gibbons. 1994. Molecular systematics of map turtles (*Graptemys*): a comparison of mitochondrial restriction site versus sequence data. *Syst. Biol.* 43:543–559.
- Lindeman, P.V. 1998. Of deadwood and map turtles (*Graptemys*): an analysis of species status for five species in three river drainages using replicated spotting-scope counts of basking turtles. *Chelonian Conserv. Biol.* 3:137–141.
- . 1999. Surveys of basking map turtles *Graptemys* spp. in three river drainages and the importance of deadwood abundance. *Biol. Conserv.* 88:33–42.
- . 2000. Evolution of the relative width of the head and alveolar surfaces in map turtles (Testudines: Emydidae: *Graptemys*). *Biol. J. Linn. Soc.* 69: 549–576.
- . 2010. Geographic distribution: *Graptemys gibbonsi*. *Herpetol. Rev.* 41:105.
- . 2011. The Map Turtle and Sawback Atlas: Ecology, Evolution, Distribution, and Conservation of the Genus *Graptemys*. Univ. Oklahoma Press, Norman.
- and M.J. Sharkey. 2001. Comparative analyses of functional relationships in the evolution of trophic morphology in the map turtles (Emydidae: *Graptemys*). *Herpetologica* 57:313–318.
- Little, R.B. 1973. Variation in the plastral scutellation of *Graptemys pulchra* (Reptilia, Chelonia, Emydidae). *A.S.B. Bull.* 20:65–66.
- Lovich, J.E. 1985. *Graptemys pulchra* Baur. Alabama Map Turtle. *Cat. Amer. Amphib. Rept.* (360):1–2.
- and C.H. Ernst. 1989. Variation in the plastral formulae of selected turtles with comments on taxonomic utility. *Copeia* 1989:304–318.
- and J.W. Gibbons. 1997. Conservation of covert species: protecting species we don't even know, p. 426–429. *In* J. van Abbema (ed.). *Proceedings: Conservation, Restoration and Management of Turtles and Tortoises – an International Conference*. St. Univ. New York, Purchase.
- and C.J. McCoy. 1992. Review of the *Graptemys pulchra* group (Reptilia, Testudines, Emydidae), with descriptions of two new species. *Ann. Carnegie Mus.* 61:293–315.
- and –. 1994. *Graptemys gibbonsi*. *Cat. Amer. Amphib. Rept.* (586):1–2.
- , W. Selman, and C.J. McCoy. 2009. *Graptemys gibbonsi* Lovich and McCoy 1992 – Pascagoula Map Turtle, Pearl River Map Turtle, Gibbon's Map Turtle, p. 029.1–029.8. *In* A.G.J. Rhodin, P.C.H. Pritchard, P.P. van Dijk, R.A. Saumure, K.A. Buhlmann, J.B. Iverson, and R.A. Mittermeier (eds.), *Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group*. *Chelonian Res. Monogr.* (5). doi:10.3854/crm.5.029.gibbonsi.v1.2009, <http://www.iucn-tftsg.org/cbftt/>.
- Mara, W.P. 1996. Map Turtles and Diamondback Terapins. T.F.H. Publ., Neptune City, New Jersey.
- Perpinán, D., S.M. Hernandez-Divers, K.S. Latimer, T. Akre, C. Hagen, K.A. Buhlmann, and S.J. Hernandez-Divers. 2008. Hematology of the Pascagoula Map Turtle (*Graptemys gibbonsi*) and the southeast Asian Box Turtle (*Cuora amboinensis*). *J. Zoo Wildl. Med.* 39:460–463.
- Powell, R., J.T. Collins, and E.D. Hooper. 2012. Key to the Herpetofauna of the Continental United States and Canada. 2nd ed, revised and updated. Univ. Press Kansas, Lawrence.
- Rhodin, A.G.J., P.P. van Dijk, J.B. Iverson, and H.B. Shaffer (Turtle Taxonomy Working Group). 2010. Turtles of the World, 2010 Update: Annotated Checklist of Taxonomy, Synonymy, Distribution, and Conservation Status. *Chelonian Research Monographs* (ISSN 1088-7105) No. 5:000.85–000.164.
- Selman, W. and C. Qualls. 2007. Distribution, status, and conservation of the Pascagoula Map Turtle (*Graptemys gibbonsi*). Unpubl. Rep., Mississippi Dept. Wildl. Fish. Parks, Jackson.
- , –, and M.T. Mendonça. 2009. Impact assessment of Hurricane Katrina on the Yellow-blotched Sawback (*Graptemys flavimaculata*): Year 2. Report to U.S. Fish Wildl. Serv. and Mississippi Dept. Wildl. Fish. Parks, Jackson.
- Shively, S.H. 1999. Survey for the Ringed Map Turtle (*Graptemys oculifera*) in the Bogue Chitto River, Louisiana. Unpubl. Report to Louisiana Natural

- Heritage Program and Louisiana Dept. Wildl. Fish., Baton Rouge.
- Tinkle, D.W. 1962. Variation in shell morphology of North American turtles. I. The carapacial seam arrangements. *Tulane Stud. Zool.* 9:331–349.
- UNEP-WCMC (United Nations Environment Programme-World Conservation Monitoring Centre). 2012. Fauna: New species and other taxonomic changes relating to species listed in the EC wildlife trade regulations. A report to the European Commission. UNEP-WCMC, Cambridge, UK.
- U.S. Fish and Wildlife Service. 2005. Inclusion of Alligator Snapping Turtle (*Macrolemys* [= *Macrochelys*] *temminckii*) and all species of map turtle (*Graptemys* spp.) in Appendix III to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. *Fed. Reg.* 70: 74700–74712.
- van Dijk, P.P. 2011. *Graptemys pearlensis*. In IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2., www.iucnredlist.org.
- , J.B. Iverson, H.B. Shaffer, R. Bour, and A.G.J. Rhodin (Turtle Taxonomy Working Group). 2011. *Turtles of the World, 2011 Update: Annotated Checklist of Taxonomy, Synonymy, Distribution, and Conservation Status*. *Chelonian Research Monographs* (ISSN 1088-7105) No. 5: 000.165–000.242.
- Walker, D. and J.C. Avise. 1998. Principles of phylogeography as illustrated by freshwater and terrestrial turtles in the southeastern United States. *Ann. Rev. Ecol. Syst.* 29:23–58.
- Wiens, J.J., C.A. Kuczynski, and P.R. Stephens. 2010. Discordant mitochondrial and nuclear gene phylogenies in emydid turtles: implications for speciation and conservation. *Biol. J. Linn. Soc.* 99:445–461.

Joshua R. Ennen, United States Geologic Survey, Southwest Biological Science Center, Northern Arizona University, Applied Research and Development Building Suite 150, P.O. 5614, Flagstaff, AZ, USA, 86011, [jjennen@usgs.gov], **Jeffrey E. Lovich**, United States Geologic Survey, Southwest Biological Science Center, Northern Arizona University, Applied Research and Development Building Suite 150, P.O. 5614, Flagstaff, AZ, USA, 86011, [jeffrey_lovich@usgs.gov] and **Roger Birkhead**, Alabama Science in Motion, 206 Allison Lab, Auburn University, AL 36849 [birkhrd@auburn.edu].

Primary editor for this account, Michael E. Seidel.

Published 30 April 2012 and Copyright © 2012 by the Society for the Study of Amphibians and Reptiles.
