



# A Predation Attempt on a Florida Mud Turtle, *Kinosternon steindachneri* Siebenrock 1906, by an Invasive Argentine Black-and-White Tegu, *Salvator merianae* (Duméril and Bibron 1839), in Southern Florida, USA

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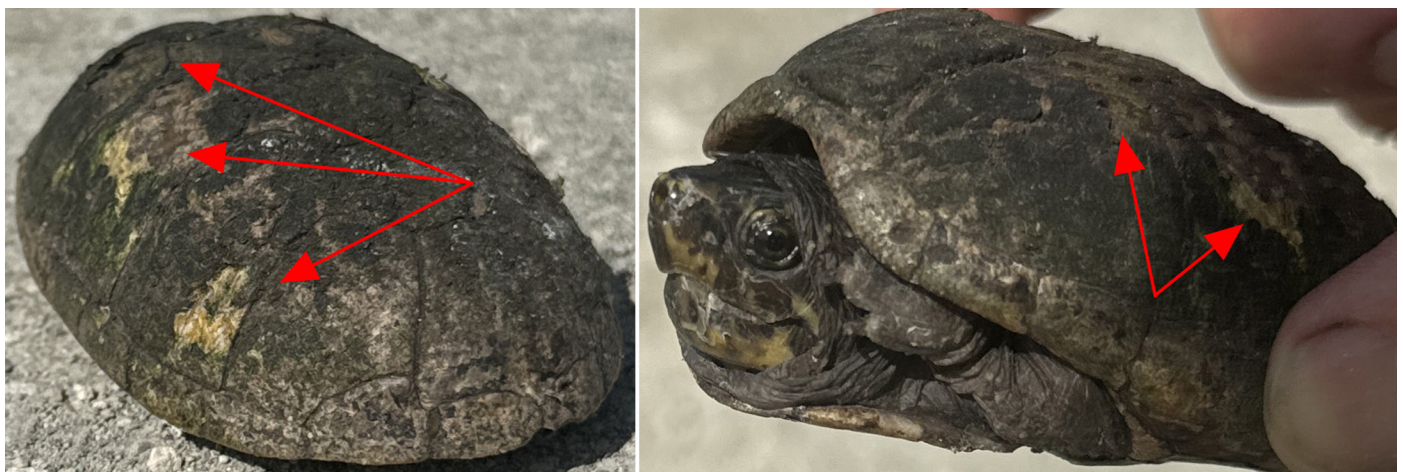
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The Argentine Black-and-white Tegu (*Salvator merianae*) is a habitat generalist with a diverse omnivorous diet and is among South Florida's most concerning invasive reptiles due to its ecological impact on native wildlife (Barraco 2015; Offner et al. 2021) and its large adult size and high reproductive output (Meshaka et al. 2020). Despite considerable uncertainty as to how far *S. merianae* will extend its invasive range beyond where it currently stands, distribution modeling and environmental analyses suggest that *S. merianae* is likely able to survive overwintering in much of the southeastern United States (Jarnevich et al. 2018; Goetz et al. 2021).

A recent analysis of gut contents of invasive *S. merianae* in central Florida identified 40 species that had been consumed by their sample of 105 individuals, including plants,

mammals, birds (including eggs), reptiles (including eggs of turtles, snakes, and the American Alligator, *Alligator mississippiensis*), amphibians, fish, molluscs, and arthropods (Offner et al. 2021). Earlier analyses of gut contents (n = 214) from 169 *S. merianae* in southern Florida in 2011–2013 (Barraco 2015) and 214 lizards from southern Florida and 61 from southwestern Florida in 2016–2021 (Harman 2023) included similar taxa. Species of Testudines taken by tegus in these studies included the Florida Box Turtle (*Terrapene carolina bauri*), Striped Mud Turtle (*Kinosternon bauri*), Gopher Tortoise (*Gopherus polyphemus*), and unidentified turtles and their eggs. Micheletti et al. (2020) reported predation on a hatchling Green Sea Turtle (*Chelonia mydas*) by *S. merianae* in the Fernando de Noronha Archipelago of Brazil, where *S.*



**Figure 1.** Postero- and anterolateral views of the damaged carapace of a Florida Mud Turtle (*Kinosternon steindachneri*) that had been in the grasp of an Argentine Black-and-white Tegu (*Salvator merianae*). The absence of algal growth on the damaged scutes is suggestive of a recent injury, likely attributable to the predation attempt. Photograph by Rainer W. Schael.

*merianae* also is considered an invasive species. Although no published studies of which we are aware address *S. merianae* preying on turtles in their native range, Sazima and D'Angelo (2013) recorded predation on turtle eggs in the native range, and Barraco (2015), Mazzotti et al. (2015), Offner et al. (2021), and Harman (2023) documented egg predation in the invasive range. Aside from the threat of predation on native species, the fecund, large-bodied *S. merianae* is likely to be a formidable competitor for resources. For example, *S. merianae* has been reported to utilize the burrows of Florida state-threatened *G. polyphemus* (Hardin 2007; APG, pers. obs.). We herein document attempted predation on a Florida Mud Turtle (*K. steindachneri*) by *S. merianae*.

At 1652 h on 3 June 2024, RWS observed an adult *S. merianae* (~ 76 cm in total length) with an adult *K. steindachneri* in its mouth in an assumed predation event. The tegu was on a gravel road along a series of power lines in an area comprising disturbed hardwood hammock and freshwater marsh habitats near the Redland agricultural area in Homestead, Miami-Dade County, Florida (25.43482, -80.39878). When RWS attempted to shoot the tegu, it dropped the turtle, aborting the predation attempt, and fled. The turtle was recovered and did not appear mortally wounded. However, we did observe damage to pleural scutes 1–3 of the carapace (Fig. 1). These injuries likely were caused by the lizard's teeth scraping across the turtle's shell.

To our knowledge, this is the first observation of *S. merianae* attempting to prey on an adult *K. steindachneri* and provides further evidence that *S. merianae* is a threat to native turtles in Florida. Florida Mud Turtles are small (maximum carapace lengths ~ 8–12 cm (Iverson 1977) and juveniles and subadults might be particularly vulnerable. In fact, native kinosternids in Florida also are known prey of invasive Nile Monitors (*Varanus niloticus*), as a Striped Mud Turtle (*K. baurii*) was recovered from the gastrointestinal tract of a monitor (Mazzotti et al. 2020). In any case, the extent to which invasive lizards in Florida present a conservation concern for native turtles at multiple life stages, especially *K. steindachneri* in light of its limited range (Thomson 2021), warrants further study.

## Literature Cited

- Barraco, L. 2015. Risk Assessment of the Nonnative Argentine Black and White Tegu, *Salvator merianae*, in South Florida. Unpubl. M.Sc. Thesis, Florida Atlantic University, Boca Raton, Florida, USA.
- Goetz, S.M., D.A. Steen, M.A. Miller, C. Guyer, J. Kottwitz, J.F. Roberts, E. Blankenship, P.R. Pearson, D.A. Warner, and R.N. Reed. 2021. Argentine Black and White Tegu (*Salvator merianae*) can survive the winter under semi-natural conditions well beyond their current invasive range. *PLoS ONE* 16: e0245877. <https://doi.org/10.1371/journal.pone.0245877>.
- Hardin, S. 2007. Managing non-native wildlife in Florida: state perspective, policy and practice, pp. 43–52. In: G.W. Witmer, W.C. Pitt, and K.A. Fagerstone (eds.), *Managing Vertebrate Invasive Species. Proceedings of an International Symposium, Fort Collins, Colorado, August 7–9, 2007*. USDA APHIS Wildlife Services, National Wildlife Research Center, Fort Collins, Colorado, USA.
- Harman M.E.A. 2023. Consumption and Consequence Analysis of Diet and Parasites in Florida's Invasive Tegus. Unpubl. M.Sc. Thesis, University of Florida, Gainesville, Florida, USA.
- Iverson, J.B. 1977. *Kinosternon subrubrum*. *Catalogue of American Amphibians and Reptiles* 193: 1–4.
- Jarnevich, C.S., M.A. Hayes, L.A. Fitzgerald, A.A. Yackel Adams, B.G. Falk, M.A. Collier, L.R. Bonewell, P.E. Klug, S. Naretto, and R.N. Reed. 2018. Modelling the distributions of tegu lizards in native and potential invasive ranges. *Scientific Reports* 8: 10193. <https://doi.org/10.1038/s41598-018-28468-w>.
- Mazzotti, F.J., M. McEachern, M. Rochford, R.N. Reed, J.K. Eckles, J. Vinci, J. Edwards, and J. Wasilewski. 2015. *Tupinambis merianae* as nest predators of crocodilians and turtles in Florida, USA. *Biological Invasions* 17: 47–50. <https://doi.org/10.1007/s10530-014-0730-1>.
- Mazzotti, F.J., J.H. Nestler, J.M. Cole, C. Closius, W.H. Kern, M.R. Rochford, E. Suarez, R. Brubaker, S.G. Platt, T. Rainwater, and J.K. Ketterlin. 2020. Diet of Nile Monitors (*Varanus niloticus*) removed from Palm Beach and Broward Counties, Florida, USA. *Journal of Herpetology* 54: 189–195. <https://doi.org/10.1670/18-115>.
- Meshaka, W.E., F.J. Mazzotti, and M.R. Rochford. 2020. Ecological plasticity and the future of the Argentine Giant Tegu (*Salvator merianae* Dumeril and Bibron, 1839) in the Southeastern US. *Southeastern Naturalist* 18: 659–676. <https://doi.org/10.1656/058.018.0417>.
- Micheletti, T., F.S. Fonseca, P.R. Mangini, P.P. Serafini, R. Krul, T.J. Mello, M.G. Freitas, R.A. Dias, J.C.R. Silva, M.F.V. Marvulo, R. Araujo, V.P.O. Gasparotto, C.R. Abrahão, R. Rebouças, L.F. Toledo, P.G.S.C. Siqueira, H.O. Duarte, M.J.C. Moura, R.C. Fernandes-Santos, and J.C. Russell. 2020. Terrestrial invasive species on Fernando de Noronha Archipelago: what we know and the way forward, pp. 51–94. In: V. Londe (ed.), *Invasive Species. Ecology, Impacts, and Potential Uses*. Nova Science Publishers, Hauppauge, New York, USA.
- Offner, M.T., T.S. Campbell, and S.A. Johnson. 2021. Diet of the Invasive Argentine Black and White Tegu in central Florida. *Southeastern Naturalist* 20: 319–337. <https://doi.org/10.1656/058.020.0210>.
- Sazima, I. and G.B. D'Angelo. 2013. Range of animal food types recorded for the tegu lizard (*Salvator merianae*) at an urban park in south-eastern Brazil. *Herpetology Notes* 6: 427–430.
- Thomson, S.A. 2021. Turtles of the world: annotated checklist and atlas of taxonomy, synonymy, distribution, and conservation status. *Phyllomedusa* 20: 225–228. <https://doi.org/10.11606/issn.2316-9079.v20i2p225-228>.