Fig. 1. *Actinemys marmorata* with its head trapped in fencing from Washington, USA.

Actinemys marmorata is one of only two freshwater turtles native to Washington, USA (Ernst and Lovich 2009. Turtles of the United States and Canada. Second edition. Johns Hopkins University Press, Baltimore, Maryland. 827 pp.) and is listed as state endangered and currently under review for federal listing. All known populations of *A. marmorata* in Washington are augmented with captive bred and headstarted individuals at established recovery sites on protected land (Hallock et al. 2017. Periodic status review for the western pond turtle in Washington. Washington Department of Fish and Wildlife. 4 pp.). At an undisclosed location in western Washington, a long-term study which includes radiotelemetry has been ongoing since 1990 (Hays et al. 1999. Washington state recovery plan for the western pond turtle. Washington Department of Fish and Wildlife. 66 pp.). This site is surrounded by fencing to prevent turtles from leaving the study area and entering nearby roadways.

On 5 May 2020 a researcher tracked a gravid female *A. marmorata* at this site and found her suspended by her head in the hexagon shaped chicken wire fence that surrounds the property. The turtle had been located at 1818 h against the fence, but not entangled in it. A researcher relocated her at 1915 h and found her head trapped in the fence. The turtle trapped herself ca. 30 cm above the ground, preventing her legs from reaching the ground and offering support. The turtle appeared to have partly scaled the fence and extended her neck through one of holes, trapping its head between the right squamosal bone and the left prefrontal bone. Upon discovering her condition, the researcher quickly retrieved wire cutters and freed the turtle from the fence. She immediately took refuge under some nearby thatch. The researcher returned the turtle to the water later that evening; it basked and attempted to nest the following day. We do not believe that this event will negatively impact the turtle's long-term survival. According to the site managers, this population has been intensively monitored over 30 years and this situation has not occurred in the past.

With many chelonian species becoming rare and in need of protection and recovery, it is important to consider the potential risks associated with materials used in recovery efforts including fencing. Site managers should consider whether solid fencing or small mesh size that prevents entanglement meets their site management objectives.

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***APALONE MUTICA* (Smooth Softshell). PREDATORY ESCAPE.** Predators are often unsuccessful in their efforts to capture a given prey item (Langerhans 2007. *In* Elewa [ed.], Predation in Organisms: A Distinct Phenomenon, pp. 177–220. Springer, Berlin). Targeted prey may occasionally escape despite being significantly injured in the predation encounter, a scenario suggested by the following observations.

On 14 October 1972 at 1300 h, I found a hatchling *Apalone mutica* (42 mm carapace length; Fig. 1) resting on the surface of a sandbar at the shoreline of the Kansas River in Lawrence, Douglas County, Kansas, USA. Hatchling *A. mutica* at this site average 35 mm carapace length in late August (Fitch and Plummer 1975. Israel J. Zool. 24:28–42), thus this turtle was probably ca. 1.5–2 mo old. The day was windy and sunny with an air temperature of 17.6°C at discovery. The turtle's body temperature was 20.8°C. The turtle was alert when sighted and attempted normal locomotor escape behavior as I approached.

The *A. mutica* had large, inverted V-shaped wounds on the carapace (Fig. 1A) and plastron (Fig. 1B). The two wounds were oriented similarly and aligned dorso-ventrally. In addition, there was a fresh puncture wound at the apex of the V-shaped wound on the carapace (Fig. 1A). Because the shape and placement of the wounds would be the expected pattern left by the bite of a bird beak, I judged the wounded hatchling to have survived an encounter with an unknown bird predator. Various species of birds are known to eat hatchling aquatic turtles (Jones 2006. Chelon. Conserv. Biol. 5:195–209; Tomillo et al. 2010. Chelon. Conserv. Biol. 9:18–25; Burger and Gochfeld 2014. Copeia 2014:109–122) to the extent of being an important source of mortality affecting turtle life history evolution (Janzen et al. 2000. J. Evol. Biol. 13:947–954).

The question of which bird species made the predatory attack on the *A. mutica* is difficult to determine. Sparkman

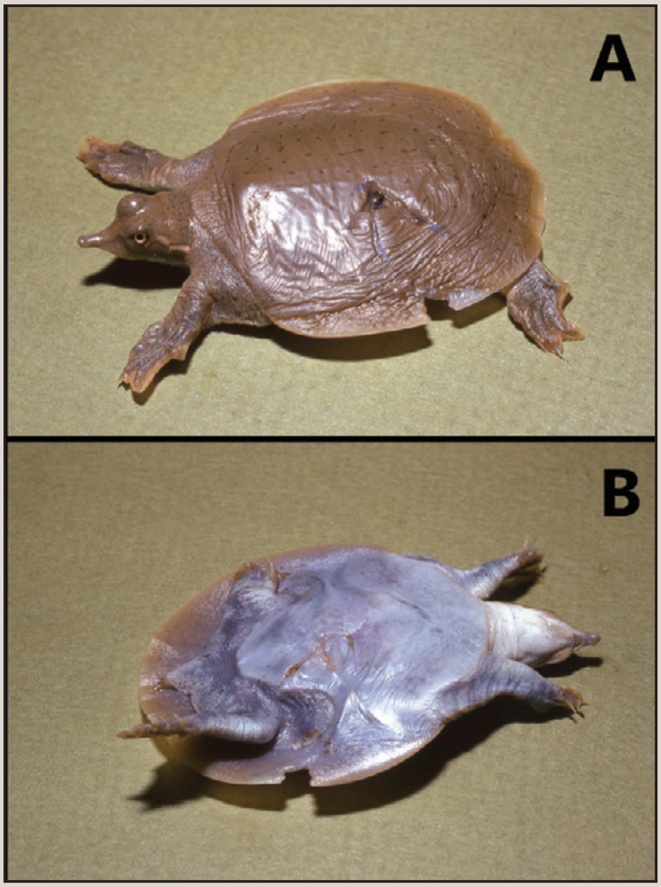

Fig. 1. A hatchling *Apalone mutica* showing wounds that appear to have resulted from a predation attempt by an avian predator: A) carapace view; B) plastron view.

et al. (2013. Am. Midl. Nat. 170:66–85) developed a novel quantitative method for inferring putative avian predators on living *Thamnophis elegans* (Western Terrestrial Garter Snake) by fitting geometric trapezoids to the predatory beak marks on the snakes and comparing them to trapezoid data obtained from the beaks of various local bird species. In a similar manner, I attempted to identify the putative avian predator on the turtle by fitting a trapezoid to the upper beak mark obtained from the *A. mutica* image (Fig. 1A) and calculating an apex angle formed from extensions of the converging trapezoid legs. I then compared the apex angle obtained to a reference collection of known beak data from 20 bird species provided by Steve Arnold from the Sparkman et al. (2013, *op. cit.*) data set. Application of the model to the carapacial beak mark yielded an apex angle of 35°. Although this angle did not closely match that of any of the 20 known bird species, some insight may be gained from comparisons that permit narrowing the list of potential predators. For example, the match was poor for the slender beaks (apex angles <10°) of common wading birds of the area that were known to eat hatchling turtles (e.g., Great Blue Heron; Tomillo et al. 2010, *op. cit.*; Niemela and Bury 2012. Northwest. Nat. 93:84–85). The best fit was with the wider beaks of large raptors (hawks, eagles, vultures) with apex angles of 31–34°. Supporting this assignment was the presence of the puncture wound of the carapacial V-mark, which could have been made by the hooked upper beak of a raptor. I also compared the beak marks on the *A. mutica* with the beak profiles of various local turtles. The only candidate with a roughly comparable beak profile and a hooked upper beak was a small juvenile (102 mm carapace length) of the Alligator Snapping Turtle (*Macrochelys temminckii*) with an apex angle of ca. 39°.

Positively identifying the predator in this case is not possible due to the inherent uncertainty in the application of the Sparkman model (Sparkman et al. 2013, *op. cit.*) and to the fact that the beak measurements obtained from the turtle were possibly distorted because they were made on a photograph that was not taken from directly above the turtle. Nevertheless, the available data suggest the predator responsible for the wounds made on the hatchling *A. mutica* apparently was an unknown species of raptor, which are known to eat small turtles (Beissinger 1990. The Auk 107:327–333; Cooper and Simmons 2010. J. Raptor Res. 44:75–77).

I thank Steve Arnold for providing reference beak data and Scott Plummer for assistance in applying the Sparkman model to the marks on the hatchling *A. mutica*.

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***BATAGUR TRIVITTATA* (Burmese Roofed Turtle). PREDATION.** *Batagur trivittata* is a large (carapace length to at least 620 mm; Platt et al. 2019. Herpetol. Rev. 50:553–555), highly aquatic turtle endemic to the major river systems of Myanmar (Ernst and Barbour 1989. Turtles of the World. Smithsonian Institution Press, Washington, D.C. 313 pp.). Although known to be abundant in the recent past (Smith 1931. The Fauna of British India, including Ceylon and Burma. Vol. 1. Loricata and Testudines. Taylor and Francis, London. 185 pp.), *B. trivittata* populations precipitously declined owing to a combination of factors, including incidental mortality associated with fishing nets, destruction of critical sandbank nesting habitat by seasonal agriculturalists, and chronic over-collection of eggs for human consumption (Platt et al. 2017. Herpetol. Rev. 48:420–422). Today, fewer than 10 reproductively mature females are thought to survive in the wild (Çilingir et al. 2018. Conserv. Biol. 31:1469–1476), and *B. trivittata* is ranked as one of the most critically endangered turtles in the world (Stanford et al. 2018. Turtles in Trouble: The World's 25+ Most Endangered Tortoises and Freshwater Turtles - 2018. IUCN Tortoise and Freshwater Turtle Specialist Group, Ojai, California. 79 pp.). Despite its perilous conservation status, very little is known concerning the natural history of *B. trivittata*, and there is a notable paucity of information on the predators of eggs and hatchlings. We here report predation of a newly emerged hatchling *B. trivittata* by a Javan Rat Snake (*Ptyas korros*).

Our observation occurred at Lawkanandar Wildlife Park (LWP) in Bagan, Myanmar where an assurance colony (*sensu* Platt et al. 2017. Herpetol. Rev. 48:570–575) of *B. trivittata* is maintained for conservation-breeding in a 1-ha natural lake on the banks of the Ayeyarwady (formerly Irrawaddy) River. LWP encompasses 47 ha of natural and planted forest with a dense understory in most places, and importantly (see Conway 1995. Biodiver. Conserv. 4:573–594) is located within the known historic geographic range of *B. trivittata* (Smith 1931, *op. cit.*). The lake is surrounded by a chain-link fence to prevent the turtles from escaping and an artificial sandbank (12 × 12 m; ca. 90 cm sand depth) is available for nesting along the shore. After egg-laying is concluded (late March), the sandbank is enclosed by a low (ca. 45 cm) wire-mesh (mesh size = 2.5 cm) fence to contain the hatchlings. Once hatching is underway, curatorial staff inspect the sandbank twice daily (early morning and late afternoon), collect any hatchlings