CONSERVATION BIOLOGY OF FRESHWATER TURTLES AND TORTOISES

A Compilation Project of the IUCN SSC Tortoise and Freshwater Turtle Specialist Group

Edited by

Anders G.J. Rhodin, John B. Iverson, Peter Paul van Dijk,
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Hydromedusa maximiliani (Mikan 1825) –
Brazilian Snake-necked Turtle, Maximilian's Snake-necked Turtle,
Cágado-da-Serra, Cágado-Pescoço-de-Cobra

Shirley Famelli and Franco Leandro Souza

Chelonian Research Monographs
Number 5 (Installment 20) 2026: Account 136

Published by
Chelonian Research Foundation and Turtle Conservancy

in association with
IUCN SSC Tortoise and Freshwater Turtle Specialist Group, Re:wild,
Turtle Conservation Fund, and International Union for Conservation of Nature / Species Survival Commission

Chelonian Research Monographs
Contributions in Turtle and Tortoise Research

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Rhodin, Iverson, van Dijk, Stanford, Goode, Buhlmann, and Mittermeier (Eds.)
Chelonian Research Monographs (ISSN 1088-7105) No. 5 (Installment 20), doi:10.3854/crm.5.136.maximiliani.v2.2026

Hydromedusa maximiliani (Mikan 1825) – Brazilian Snake-necked Turtle, Maximilian's Snake-necked Turtle, Cágado-da-Serra, Cágado-Pescoço-de-Cobra

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Summary. – Maximilian's Snake-necked Turtle or the Brazilian Snake-necked Turtle, *Hydromedusa maximiliani* (family Chelidae), is a relatively small freshwater turtle species, with male and female straight-line carapace lengths (SCL) up to 203 mm and 169 mm, respectively. The species occurs primarily in higher-elevation lotic environments, and is endemic to the Atlantic rainforest of southeastern and eastern Brazil, inhabiting streams and rivers in hilly terrain, often using submerged logs, rocks, and streambank crevices as refuges. Individuals are largely sedentary, although males and gravid females exhibit large seasonal movements associated with reproductive periods. Clutch size ranges from 1–3 eggs, but usually two. The species is carnivorous, feeding on aquatic macroinvertebrates, crustaceans, insects, and other small prey, as well as carrion. Habitat loss from deforestation, mining, burning, and pollution are major threats, and populations from outside protected areas are more vulnerable to decline. Conservation efforts need to focus on habitat protection and monitoring of populations.

Distribution. – Brazil. Endemic to hilly regions of the southeastern and eastern Brazilian Atlantic Rainforest, occurring in Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo.

Synonymy. – *Emys maximiliani* Mikan 1825*, Chelodina maximiliani, Hydromedusa maximiliani, Hydraspis maximiliani; Emys maximiliana* Gray 1830 *(nomen novum), Hydromedusa maximiliana; Chelodina flavilabris* Duméril and Bibron 1835*, Hydromedusa flavilabris, Chelomedusa flavilabris; Hydromedusa subdepressa* Gray 1854*; Hydromedusa depressa* Gray 1856 *(nomen novum), Chelomedusa depressa; Hydromedusa bankae* Giebel 1866.

Subspecies. – None recognized.

Status. – IUCN 2026 Red List: Endangered (EN A2ce+4ce; assessed 2023 [in press]); Previously: Vulnerable (VU, assessed 1996); CITES: not listed; Brazil: Least Concern (LC) (national), LC (São Paulo); VU (Minas Gerais); VU (Espírito Santo); EN (Bahia).

Taxonomy. — *Hydromedusa maximiliani*, commonly known as the Brazilian Snake-necked Turtle or Maximilian's Snake-necked Turtle, was originally described as *Emys maximiliani* by Mikan (1825) (see TTWG 2025). The type locality is near Pôrto Feliz, São Paulo, Brazil, with the holotype cataloged as NMW 23391. It is the type species of the genus *Hydromedusa* Wagler 1830, established by original monotypy. The species has historically been referred to under several other names, including *Hydromedusa maximiliana, Hydromedusa depressa, Hydromedusa subdepressa, Hydromedusa flavilabris*, and *Hydromedusa bankae*, all now considered synonyms or misidentifications of *H. maximiliani*.

Within the genus *Hydromedusa*, only one other species is recognized, *H. tectifera*. Together, these two species comprise the entire subfamily Hydromedusinae Baur 1893 in the family Chelidae (TTWG 2025). No subspecies are recognized, and none have been described, but at least one evolutionarily significant unit (ESU) has been genetically identified for the population inhabiting the eastern part of the range in São Paulo (Souza et al. 2003).

Description. — The following description is taken largely from the previous CBFTT account for this species (Souza and Martins 2009), with updated research carried out since its publication.

The long and slender neck of *H. maximiliani* has inspired the common names of the species. Conical protuberances are conspicuous along its neck. The carapace is dorsoventrally flattened and oval, displaying a uniformly brown or dark gray coloration (Ernst and Barbour 1989; Brito et al. 2025). According to Yamashita (1990), it closely resembles a dead leaf or the surrounding substrate. The dorsal surfaces of the head, neck, and limbs are brown or olive green, while the ventral and lateral regions are cream-colored. The plastron is predominantly yellow when adult (Ernst and Barbour 1989; Brito et al. 2025), with

Figure 1. Adult female Maximilian's Snake-necked Turtle (*Hydromedusa maximiliani*) from Parque Estadual Carlos Botelho, São Paulo, Brazil, showing details of its long neck with conical protuberances and the large recessed nuchal scute. Photo by Shirley Famelli.

brown marks that gradually disappear with growth. However, colors can vary across the geographical distribution of the species, with individuals in Minas Gerais having darker shades of brown and a darker brown plastron than elsewhere in the range.

The carapace of *H. maximiliani* has a significantly enlarged nuchal scute (almost resembling an extra anterior vertebral scute) recessed behind the anterior marginal scutes that meet in the midline instead of being separated by the nuchal, a condition unique for the genus *Hydromedusa* and shared with *H. tectifera*. Additionally, the nuchal bone is also recessed behind the peripheral bones, unique for *H. maximiliani*, as opposed to the condition in the congener *H. tectifera*, where the nuchal bone still reaches the anterior carapacial margin (see Wood and Moody 1976, figs. 1–2, but figures mistakenly reversed).

Sexual Dimorphism, Body Size, and Age at Sexual Maturity. — Males have a plastral concavity, a longer tail, and are typically larger than females (Souza 1995a, 1995b; Brito et al. 2025). The straight-line carapace length (SCL) is generally <200 mm, with males larger (173.7 ± 13 mm, range 135–203) than females (144.1 ± 8.4 mm, range 134–169), mean weight is about 248.13 ± 38.7 g in females and 356.2 ± 66.4 g in males (Souza 1995a; Famelli 2013; Famelli et al. 2014). Females reach sexual maturity with a minimum plastron size of 103 mm (ca. 134 mm SCL), corresponding to approximately 13 yrs old when they are found to be gravid (Famelli et al. 2014). Males are estimated to reach sexual maturity at a minimum plastron size of around 102 mm (ca. 135 mm SCL), equivalent to 14 yrs old (Martins and Souza 2008). Based on an estimated age at maturity of 13 yrs and the regression equation proposed by Iverson (2024), the generation time for the species is calculated to be approximately 25–30 years.

Hatchlings. — At hatching, turtles have a soft carapace with mean size of approximately 43.4 mm SCL and mass of 11.4 g (range 40.0–47.3 mm; 7.8–15.0 g) (Souza 1995b; Novelli and Sousa 2008). Unlike in adults, the posterior marginal scutes of juveniles, starting from the seventh marginal scute, are arranged in a way that gives the posterior edge of the carapace a "toothed" or serrated appearance (Yamashita 1990; Souza 1995b). The coloration of juveniles differs only in the plastron, which is light yellow with peripheral black spots or entirely dark (Souza 1995a).

Figure 2. Hatchling *Hydromedusa maximiliani* from Parque Estadual Carlos Botelho, São Paulo, Brazil. Photo by Shirley Famelli.

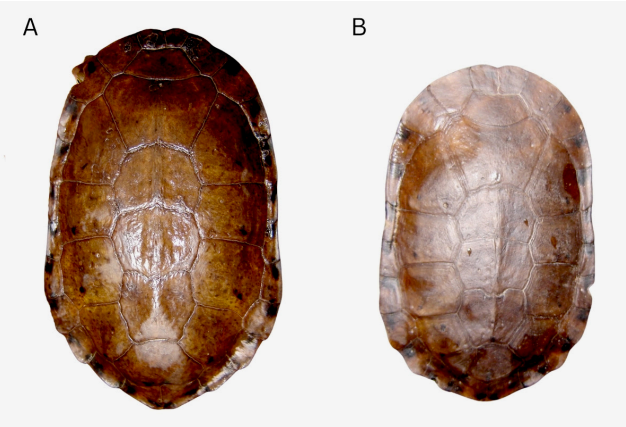

Figure 3. Carapace of adult male (**A**) and adult female (**B**) of *Hydromedusa maximiliani*. Photos by Shirley Famelli.

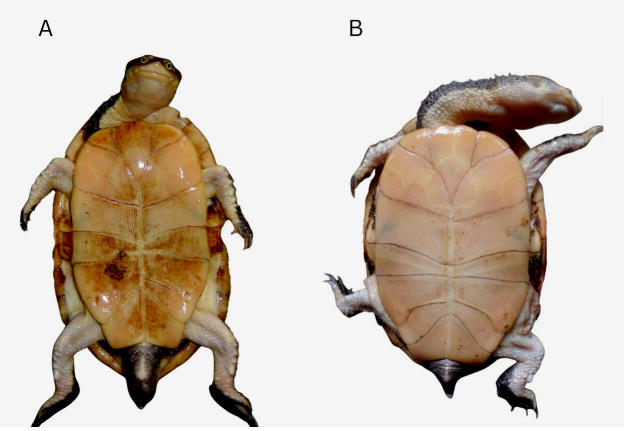

Figure 4. Plastron of adult male (**A**) and adult female (**B**) of *Hydromedusa maximiliani*. Photos by Shirley Famelli.

Distribution. — *Hydromedusa maximiliani* is endemic to hilly regions of the Atlantic Rainforest in eastern Brazil, including parts of northeastern, eastern, southeastern, and southern coastal regions, with recorded occurrences in the States of Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo (Costa et al. 2015; TTWG 2021, 2025; Brito et al. 2025). The species occurs at elevations ranging from 4 to 1,499 m above sea level (Muller et al. 2024; Brito et al. 2025), with its distribution influenced by environmental factors such as temperature, precipitation, and terrain slope (Costa et al. 2015; Muller et al. 2024; Brito et al. 2025).

When the species is found in sympatry with *H. tectifera, H. maximiliani* is restricted to areas above 600 m. In regions where *H. tectifera* is absent, *H. maximiliani* can also be found in coastal rivers at elevations below 100 m. The species can also be found on oceanic islands close to the mainland, such as Ilha Bela in the state of São Paulo and Ilha Grande in the state of Rio de Janeiro (Souza 2005).

Habitat and Ecology. — *Hydromedusa maximiliani* inhabits freshwater environments, preferring clear mountain streams (0.8 to 12 meters wide; 0.5 to 2 meters depth) with sandy or rocky bottoms. It utilizes both aquatic and terrestrial habitats and frequently seeks refuge among submerged debris, rocks, and logs, or in streambank crevices (Famelli et al. 2016, 2025, 2026a). Being a habitat specialist, it is extremely sensitive to environmental changes, consequently, its presence, abundance, and health can reflect habitat quality, highlighting its value as a bioindicator (Famelli et al. 2026b). The species also plays a key ecological role as a predator and recycler, supporting ecosystem stability (Famelli et al. 2026b).

Behavior and Feeding. — Due to the dense understory and canopy common in the ridges and valleys inhabited by the species, *H. maximiliani* does not commonly exhibit basking behavior (Souza and Martins 2009; Famelli et al. 2016). The species uses shallow waters of streams, perhaps to regulate body temperature, with measured body temperatures in streams (18.6 ± 1.8ºC; $n = 45$) averaging

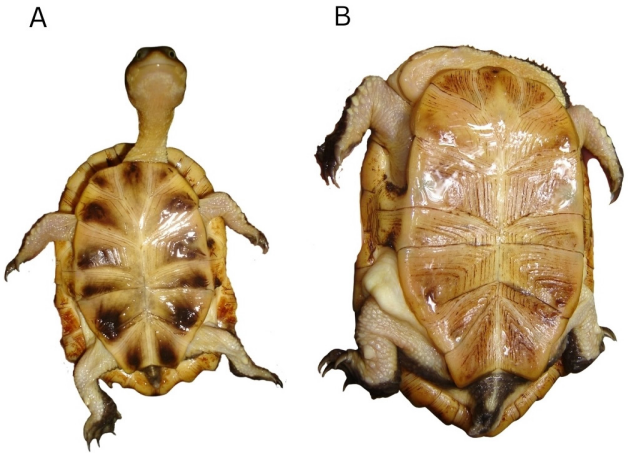

Figure 5. Plastron view of a juvenile (**A**) and a young male (**B**) of *Hydromedusa maximiliani* from Parque Estadual Carlos Botelho, São Paulo, Brazil. Photos by Shirley Famelli.

Figure 6. Carapace and plastron of hatchling *Hydromedusa maximiliani*. Note the extra partial vertebral scute in this specimen. Photos by Shirley Famelli.

1.2ºC higher than the stream waters (17.4 ± 1.1ºC; $n = 45$) (Souza and Martins 2006). This strategy demonstrates the strong association and dependence of this species on aquatic habitats (Souza and Martins 2006), which is substantiated by its feeding habits.

Hydromedusa maximiliani is an active hunter, foraging mainly in calm waters with a heavy accumulation of decaying leaves (Souza 1995a). It is carnivorous, feeding

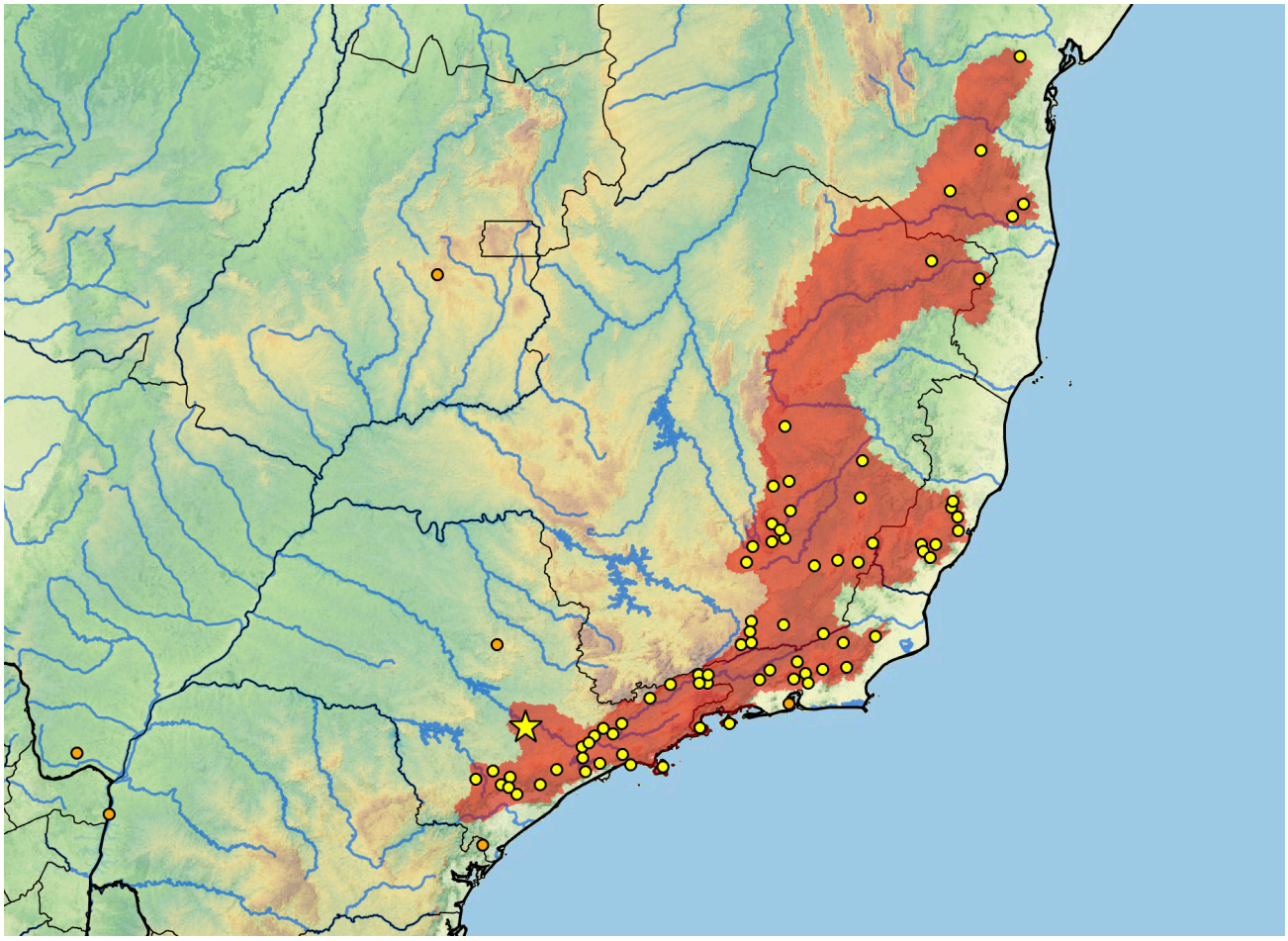

Figure 7. Estimated historical indigenous distribution of *Hydromedusa maximiliani* in Brazil, including parts of northeastern, southern, eastern, and southeastern coastal regions, with records in Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo. Yellow dots = museum and current and historical occurrence records of presumed native populations based on literature and online records (TTWG 2025); orange dots = probable non-native introductions, translocations, or erroneous records; yellow star = type locality for *Emys maximiliani* (Mikan 1825; TTWG 2025). Colored shading = estimated historical indigenous range. Distribution is based on fine-scaled GIS-defined level 12 HUCs (hydrologic unit compartments) constructed around localities and then adding HUCs that connect point localities in the same watershed or physiographic region, and similar habitats and elevations as verified HUCs, based on TTWG (2021, 2025) and adjusted based on data from the authors. Map by Chelonian Research Foundation.

primarily on small macroinvertebrates such as aquatic insect larvae, crustaceans, annelids, spiders, carrion, amphibians and their eggs, and terrestrial invertebrates that fall into the water (Yamashita 1990; Guix et al. 1992; Souza 1995a; Souza and Abe 1995, 1998; Novelli et al. 2013).

The species' elongated neck is thought to aid in capturing fast-moving prey by allowing rapid extension toward potential targets (Pritchard 1979; Molina 1990; Souza 2004; Novelli et al. 2013). Feeding occurs mostly underwater (Novelli et al. 2013). Foraging behavior includes a distinctive underwater turning movement, in which the turtle pivots its body using one hind limb as a fixed point on the substrate (Rocha-Barbosa et al. 2013). This behavior, combined with slow neck extension, scanning movements of the head in arcs up to 180º, and rapid strikes with the head and neck, likely enhances its prey capture efficiency (Novelli et al. 2013; Rocha-Barbosa et al. 2013). Juveniles and smaller individuals consume proportionally more microcrustaceans and are more frequently observed with full stomachs than adults (Souza and Abe 1998; Martins and Souza 2008).

Hydromedusa maximiliani individuals are largely sedentary, relying extensively on refuges in the network of roots, burrows and crevices along the river, rocks, and overhanging vegetation along riverbanks. Radio-tracking showed that turtles repeatedly use the same shelters along the stream margin (Famelli et al. 2016, 2025), especially during the period of low activity in winter.

However, intensive use of shelters was observed all year. Undercut banks along the stream margins provided critical shelter for turtles of all size classes and both sexes year-round (Famelli et al. 2025). Because areas of low activity are not necessarily less used or less important in reptiles, correctly identifying refuges and core areas of use is essential for understanding the species' spatial ecology (Silva et al. 2018).

Figure 8. Young (*left*) and hatchling (*right*) of *Hydromedusa maximiliani* in the wild. Note the similarities with its habitats. Photos by Shirley Famelli.

Home Range. — Home range estimates vary considerably depending on the method applied, with values ranging from 0.40 to 137.40 ha (Famelli et al. 2025). Female home ranges ranged from 0.40 to 118.44 ha, whereas males ranged from 0.66 to 137.40 ha, with no significant differences between them. Nevertheless, males exhibited greater overlap in space use, both with other males and with females (Famelli et al. 2025). Seasonally, the mean home range was 2.7 ha during the wet season and 2.0 ha in the dry season, with no significant differences between periods despite reduced activity during the colder, drier months (Famelli et al. 2016, 2025).

Activity, Movements, and Mating Season. —Using capture-recapture methods, the average daily displacement of these turtles in water was estimated to be only about 2 m a day (Souza 1995a; Souza and Abe 1997; Souza et al. 2002a, 2002b). However, daily movement distances in water ranged from 0 to 179 m based on radio-tracking and from 1.5 to 201 m using thread-bobbins (Famelli et al. 2016). The linear use range of the species varies from 70 to 760 m during a year of monitoring, following the river course (Famelli et al. 2025). Animals were captured mostly in water with few observations in terrestrial habitats (Famelli et al. 2016, 2025).

Mating of *H. maximiliani* occurs during the rainy season, specifically from September to December, with a peak of activity observed in November (Souza and Abe 1997; Famelli et al. 2014, 2016). During the mating season (September–November), males tended to move farther than females, whereas females showed increased movements during the nesting period (December–February) (Famelli et al. 2014, 2016).

Despite these seasonal peaks of activity, overall movement distances did not differ significantly between the sexes (Famelli et al. 2016). In both cases, movements were closely linked to reproductive behavior, with males traveling more extensively in search of mates and females making longer movements related to egg-laying (Famelli et al. 2014, 2016). Monitoring hatchlings and juveniles could provide additional insights into movement ecology, as patterns of activity and resource partitioning have already been documented among males, females, and juveniles of *H. maximiliani* (Souza and Abe 1998; Famelli et al. 2016).

Clutch Size and Nesting Season. — Clutch sizes typically range from 1 to 3 brittle-shelled eggs, with most (55%) females producing 2 eggs (Famelli et al. 2014). Nesting occurs from late spring to early summer, typically in November and December (Famelli et al. 2014), coinciding with the period of increased movements by females (Famelli et al. 2016, 2025). While nests of this species have not been recorded in the wild, terrestrial excursions by gravid females during this time suggest they are actively searching for suitable nesting sites (Guix et al. 1992; Famelli et al. 2014), including excursions of over 70 m from the water (Famelli et al. 2016).

Hatchlings have been observed in September and October. Incubation time remains unknown; durations of 250–300 days suggested by Souza and Abe (1997) and Famelli et al. (2014) are speculative, and perhaps erroneous.

Egg Dimensions. — Based on radiography, eggs of *H. maximiliani* are elliptical, with an average length-to-width ratio of 1.81:1. Egg positions in the oviduct appear to depend on clutch size: for 1 or 2 eggs, they were oriented longitudinally, whereas in a single female with 3 eggs, two were arranged longitudinally and one transversely to the body's midline. Egg lengths based on uncorrected radiographic measurements ranged from 33.1 to 45.4 mm (mean ± SE: 40.3 ± 0.44 mm; n = 53), and egg widths ranged from 19.9 to 25.0 mm (22.3 ± 0.19 mm; n = 53). Estimated total egg volume per clutch, as measured on radiographs, varied from 7,789 to 13,090 mm³ (mean ± SE: 10,521 ± 279.2 mm³; n = 53). There is a significant

Figure 9. Typical habitats of *Hydromedusa maximiliani* at Parque Estadual Carlos Botelho (PECB), São Paulo, Brazil. **Top left.** Mountain range and ecological complex of the Atlantic Rainforest in the southern region of São Paulo State, covered by dense ombrophilous forest. Photo by Leonardo Ramos Adriano. **Top right.** Forest canopy within the study area at PECB. Photo by Shirley Famelli. **Bottom row (left, center, and right).** Typical stream habitats of *H. maximiliani*. Photos by Shirley Famelli.

positive correlation between female body size and clutch size (Famelli et al. 2014).

As of yet, no nests or eggs of *H. maximiliani* have been recorded in the wild. Souza (2004) verified that small species of South American Chelidae typically have a small clutch size (<5 eggs), and it has been observed that the depth of the nests for these species is very shallow (up to 5 cm) or that the eggs are laid in the leaf litter or between trunks and roots. For instance, *Platemys platycephala* lays a single egg and females do not excavate a nest; instead, they either make a shallow groove in the ground or lay the eggs directly on the ground. For that species, nesting often occurs in decaying leaves and eggs may remain partially or fully exposed (Pritchard and Trebbau 1984). Therefore, it is possible that in small species that inhabit forest areas such as *H. maximiliani*, where the soil is covered by leaf litter, its nest may be restricted to a shallow pit. Further investigation is needed to understand the use of terrestrial habitat and potential nesting sites for *H. maximiliani*.

Growth. — *Hydromedusa maximiliani* follows a similar growth pattern to many turtle species, characterized by rapid juvenile growth, slower adult growth, and a progressive decline in growth rate with increasing body size. Males, females, and juveniles have significant differences in growth, with juveniles having markedly higher growth rates than adults in both body size and body mass (Martins and Souza 2008). However, the growth constants estimated for both male and female *H. maximiliani* were lower than those reported for other chelid turtles (Martins and Souza 2008). The negative correlation between body size and growth rate, together with sex-related differences, can be partly attributed to the onset of sexual maturity (Martins and Souza 2008). As individuals grow and reach reproductive age, energy is increasingly allocated to reproduction rather than growth, leading to a marked reduction in growth rate as size or age increases (Dunham and Gibbons 1990; Martins and Souza 2008).

Figure 10. Male *Hydromedusa maximiliani* with a radio transmitter using a crevice in the undercut stream margin of the stream at the study area at Parque Estadual Carlos Botelho, São Paulo, Brazil. Photo by Shirley Famelli.

Longevity. — Both males and females of *H. maximiliani* have been estimated to live for about 100 years, based on the von Bertalanffy growth model applied to the largest individuals captured (plastron midline length of 139.4 mm for males and 128.1 mm for females (ca. 198 mm and 170 mm SCL; Martins and Souza 2008). This estimate is consistent with the long life spans reported for other chelid turtles (Kennett 1996; Spencer 2002).

In contrast, Reinke et al. (2022) proposed a much shorter average lifespan of approximately 22.3 years for *H. maximiliani*, calculated as the number of years between first reproduction and the point at which 95% of adults in a given cohort had died, rather than relying on the age of the oldest known individuals. Such controversial lifespan estimates only highlight the necessity for more studies on ecology and natural history records for the species.

Based on the regression equation by Iverson (2024) and age at sexual maturity of 13 years, the generation time of *H. maximiliani* could be estimated to be approximately 25–30 years (Famelli et al. in press).

Hematology. — According to Hurtado (2018), *H. maximiliani* has large and ellipsoidal erythrocytes typical of chelonian species, with size differences between males, females, and juveniles (larger in males). Juveniles showed a higher total red blood cell count compared to adults, as well as higher number of leukocytes and increased alkaline phosphatase and aspartate aminotransferase levels, likely associated with greater osteoblastic and muscular activity. Males, in contrast, exhibited fewer leucocytes and a higher proportion of lymphocytes. Females and juveniles had a greater number of heterophils relative to lymphocytes, indicating a higher chronic stress index.

The hematological patterns observed in *H. maximiliani* reflect differences in physiology, life stage, and possibly environmental pressures among males, females, and juveniles (Hurtado 2018). Together, these hematological patterns can provide insight into the health, development, and ecological pressures acting on the species, which may vary across the geographical distribution of the species.

Predators and Parasites. — Potential predators of *H. maximiliani* are medium to large carnivores found in the Atlantic Rainforest, such as Coati (*Nasua nasua*), Puma (*Puma concolor*), Jaguars (*Panthera onca*), Raccoons (*Procyon cancrivorous*), and River Otters (*Lontra longicaudis*) (Souza and Martins 2009).

Leeches of the order Rhynchobdellida have been recorded on the plastron of *H. maximiliani*. *Temnocephala*

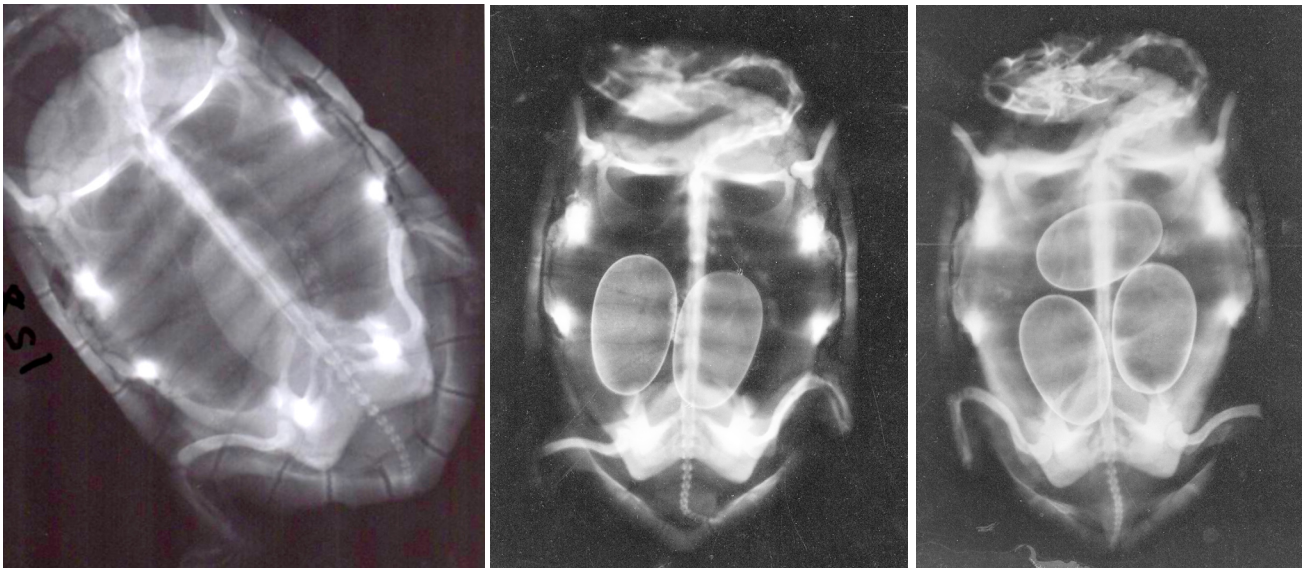

Figure 11. X-ray radiographs of female *Hydromedusa maximiliani* with one, two, and three eggs (Famelli et al. 2014). Radiographs by André de Paula Reis.

brevicornis (Temnocephalidae) stands out as a species commonly associated with several neotropical turtle species, and is found on the plastron and skin of *H. maximiliani* (Novelli et al. 2009; Monteiro 2019; Famelli et al. 2026b). Microalgae have also been commonly observed on the carapace (Famelli et al. 2026b).

Population Status. — Population density and biomass of the species can be very high in some areas. However, information on the number and size of *H. maximiliani* subpopulations and the degree of fragmentation across its natural range is limited. Research on the vulnerability of Brazilian chelonians by Pinto et al. (2024) indicated that the species' area of occupancy (AOO) is highly fragmented, with habitat patches too small to ensure long-term persistence. Nevertheless, local population stability has been observed in studies conducted at Parque Estadual Carlos Botelho (PECB) (Martins and Souza 2009) and Parque Estadual da Serra do Mar (PESM) in southeastern Brazil (Famelli et al. 2011).

Based on these studies, mean local population sizes were estimated at approximately 230 to 320 individuals within areas of around 250 ha, corresponding to ca. 90–130 individuals / sq. km. The PECB population exhibited a female-biased sex ratio of roughly 1:2 (Souza and Abe 1997; Martins and Souza 2009; Famelli et al. 2011). Martins and Souza (2009) estimated an annual population growth rate (λ) of 1.012 (SE ± 0.020) for the PECB population, with near-zero temporal process variance, indicating a stable, healthy population likely supported by the protected status of the area.

However, Population Viability Analysis scenarios have indicated a measurable risk of local extinction due to deforestation and lack of protection within conservation units (Famelli et al. 2012). This is a concern for this species, which has recently been assessed as Endangered on the Red List of Threatened Species of the International Union for Conservation of Nature (TTWG 2025; Famelli et al. in press).

Catastrophic dam failures, such as the 2015 Fundão Dam in Mariana and the 2019 Brumadinho Dam in Minas Gerais, have released millions of cubic meters of mud tailings, devastating riparian habitats, contaminating waterways, destroying hundreds of hectares of forest and open vegetation, and affecting areas inhabited by this sensitive species (Fernandes et al. 2016; Carmo et al. 2017). Recent monitoring reports in the Rio Doce region following the Fundão Dam disaster are still being released, but records indicate only a few remaining individual *H. maximiliani* in unaffected stream sections, highlighting sensitivity to habitat disturbance (EKOS 2020). Populations outside protected areas, particularly in Minas Gerais, appear to be declining due to anthropogenic pressures (EKOS 2020; Famelli et al. 2012).

Threats to Survival. — While the species is relatively common in some protected areas, populations outside these zones face significant threats from habitat destruction, deforestation, pollution, infrastructure development, and other anthropogenic activities (Famelli et al. 2012). Mining, despite its smaller extent, poses severe indirect impacts on aquatic and terrestrial ecosystems. Restoration efforts and ongoing monitoring are being implemented in affected streams, especially in Minas Gerais after the dam rupture. Understanding regional threats and population dynamics is critical for designing effective conservation strategies to ensure the long-term survival of *H. maximiliani*.

No official records exist on the use or trade of *H. maximiliani*. Nevertheless, illegal and unsustainable wildlife trade remains a major conservation concern. Global pet markets contribute significantly to this trade, posing risks not only to targeted species but also to non-target species (Cardoso et al. 2021).

Conservation Measures Taken. — *Hydromedusa maximiliani* was recently assessed by the IUCN Tortoise and Freshwater Turtle Specialist Group as being Endangered (EN) on the IUCN Red List of Threatened Species (Famelli et al. in press; publication expected 2026). It was previously assessed as Vulnerable (VU) on the Red List (TFTSG 1996). In Brazil, it is categorized as follows: Least Concern (LC) nationally (ICMBio 2025); Least Concern (LC) in São Paulo (SEMIL 2009); Vulnerable (VU) in Minas Gerais (COPAM 2010); Vulnerable (VU) in Espírito Santo (IEMA 2022); and Endangered (EN) in Bahia (SEMA 2017). It is not listed on CITES. However, the species is prohibited from commercial trade and export from Brazil under Brazilian Law No. 5.197/1967: Protection of Fauna; Law No. 9.605/1998: Defines Crimes Against the Environment; and Decree No. 11.349/2023: Animal Rights.

The species occurs in several federal, state, and municipal conservation units with different levels of protection, including Área de Proteção Ambiental Serra da Mantiqueira (extending through parts of São Paulo, Minas Gerais, and Rio de Janeiro); Parque Nacional da Serra dos Órgãos (Rio de Janeiro), and Augusto Ruschi Biological Reserve (Espírito Santo), among others. At the state level, other important areas include Parque Estadual de Intervales (São Paulo); Parque Estadual Itacolomi (Minas Gerais); Área de Proteção Ambiental do Alto Iguaçu (Rio de Janeiro). The species is also present in Terra Indígena do Ribeirao Silveira, an indigenous reserve in Bertioga, São Paulo (Famelli et al. 2026a).

The following National Action Plans (PANs), in which *H. maximiliani* is listed, have been implemented to conserve threatened herpetofauna in Brazil and provide a coordinated framework for the protection, monitoring, and management of these species across diverse regions and ecosystems: the PAN for the Conservation of Herpetofauna of the Espinhaço Mineiro (2nd cycle, currently in execution); the PAN for the Conservation

of Threatened Herpetofauna of the Atlantic Forest in the Southeast Region of Brazil (in execution); the PAN for the Conservation of Threatened Herpetofauna of the Northeastern Atlantic Forest (completed); and the PAN for the Conservation of Threatened Reptiles and Amphibians of the Espinhaço Mountain Range (completed) (ICMBio 2025).

Focused research on the species has also been important for its conservation. It has been extensively researched at Parque Estadual Carlos Botelho, an Atlantic Rainforest reserve in São Paulo, southeastern Brazil, notably including natural history (Yamashita 1990; Guix et al. 1992; Souza 1995a, 1995b; Souza and Abe 1995), ecology (Souza and Abe 1997a, 1997b, 1998; Souza and Martins 2006), molecular ecology (Souza et al. 2002a, 2002b, 2003), growth rates and age estimation (Martins and Souza 2008; Reinke et al. 2022), population viability analysis (Famelli et al. 2012), reproduction and allometry (Famelli et al. 2014); and movement pattern and home range estimation (Adriano et al. 2009; Famelli et al. 2016, 2025). Nevertheless, data from other localities are crucial to determine whether observed traits reflect site-specific patterns or vary across its geographic range, particularly given that its conservation status differs across its range. Further studies are needed to investigate the species' nesting habitat and nesting behavior.

Conservation Measures Proposed. — Further conservation efforts for *H. maximiliani* should focus on implementing protective measures for its habitat and populations outside protected areas. This may include establishing new protected areas, implementing sustainable land-use practices, raising awareness about the species' ecological importance, and promoting responsible tourism and recreation activities that minimize disturbance to its habitats (see also Pereira et al. 2020). Consequently, determining the nesting habitat of these turtles is of paramount importance. It is still unknown whether nesting occurs near streams, within riparian areas, or in upland habitats. This knowledge is essential for effective conservation, habitat protection, and management.

Captive Husbandry. — No known information specific to *H. maximiliani* is available.

Currently Research. — Current research by T.S. Marques and collaborators is focused in understanding the species population structure, presence of hemoparasites, diet, genetics, and general ecology in the state of Minas Gerais, especially the region of the Quadrilatéro Ferrífero, Rio Doce Basin.

Acknowledgments. — Famelli is a Daphne Jackson Fellow at the School of Geographical Science, University of Bristol, United Kingdom, funded by the Natural Environment Research Council (NERC). Souza has continuous support with a productivity grant from CNPq (number 301306/2018-4). We thank Leonardo Ramos Adriano for the use of his photo, and André de Paula Reis for the radiographs. We also thank Anders Rhodin, Craig Stanford, John Iverson, Kurt Buhlmann, and Peter Paul van Dijk for their reviews and editing, which helped improve the manuscript.

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Citation Format for this Account:

Famelli, S. and Souza, F.L. 2026. *Hydromedusa maximiliani* (Mikan 1825) – Brazilian Snake-necked Turtle, Maximilian's Snake-necked Turtle, Cágado-da-Serra, Cágado-Pescoço-de-Cobra. In: Rhodin, A.G.J., Iverson, J.B., van Dijk, P.P., Stanford, C.B., Goode, E.V., Buhlmann, K.A., and Mittermeier, R.A. (Eds.). Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs 5(20):136.1–12. doi: 10.3854/crm.5.136.maximiliani.v2.2026; www.iucn-tftsg.org/cbftt/.