

## LETTER FROM THE CONSERVATION FRONT LINE

# Rendering a once common turtle species endangered in China

R. Bu<sup>1</sup>, T. M. Lee<sup>2</sup> & H. Shi<sup>1</sup><sup>1</sup> Ministry of Education Key Laboratory for Ecology of Tropical Islands, College of Life Sciences, Hainan Normal University, Haikou, China<sup>2</sup> School of Life Sciences, Sun Yat-sen University, Guangzhou, China**Correspondence**

Haitao Shi, Ministry of Education Key Laboratory for Ecology of Tropical Islands, College of Life Sciences, Hainan Normal University, Haikou 571158, China.

Email: haitao-shi@263.net

doi: 10.1111/acv.12762

In the 20th Century, Reeves' turtle *Mauremys reevesii* was the most widely distributed and had the largest population of hard-shell turtles in China (Sowerby, 1925; Liu & Hu, 1940). They were often seen to flock together, perching on a tree stump or basking on the beach. Because it is omnipresent, its Chinese name 'Wugui' is used by most Chinese speakers to refer to all species of hard-shelled turtles, including those from the other parts of the world. However, by 2000, this most common of turtle species was listed as endangered by IUCN (Rhodin *et al.* 2017), and on 5th February 2021, it was placed on the list of wildlife of China with special state protection (NFGA & MARA, 2021).

In a matter of two decades (1990–2010), this species has disappeared from at least half of its original area of occurrence (Lovich, Yasukawa & Ota, 2011). Our research team has been studying the ecology and conservation of turtles for more than 30 years, covering most areas of China, and consulted with many people, but we have never seen this species in the wild.

Because there is a stereotype that Reeves' turtle is a common species, neither many government officials nor some conservationists regard it as requiring protection. In addition, due to prevalent turtle farming in China, most people do not know that a farmed individual is not a substitute for a wild one. Many who hold this erroneous view do not believe that there is a need for the conservation of the species since there are so many farmed turtles. Therefore, despite our call to strengthen the conservation of this species for the last decade, it has received little attention from policy makers and enforcers. Although this species was listed as a key protected wildlife of China in 2021 on our strong recommendation, the trade in this species is almost unregulated.

The main reasons why Reeves' turtle is threatened is due to habitat destruction as well as poaching as they are used as traditional Chinese medicine, pets and food (Lovich *et al.* 2011), and this species is widely sold in food markets (Ades *et al.* 2000; Bhupathy *et al.* 2000). Due to the high price of individual wild turtles (Sung & Fong, 2018), illegal hunting persists, even in nature reserves (Gong *et al.* 2017) where it has become a major threat to wild populations (Wang, Parham & Shi, 2021).

Although Reeves' turtle was recently listed as a second-class special state protection wildlife in China, this listing is restricted to 'wild population only' (NFGA & MARA, 2021). As a result, this has created a major obstacle to the effective conservation of this species. Whether by government law enforcement bodies or professional researchers, it remains difficult to distinguish between wild and farm-bred individuals. Worse still, turtle farms can be used as a cover for the illegal wild turtle trade (Shi *et al.* 2007). Therefore, all chelonian species would urgently need strict protection.

In addition to Reeves' turtle, 57% (16/28) of other turtle species in China have been listed as protected in 'wild population only' (NFGA & MARA, 2021). If we exclude sea turtles and tortoises, the proportion of protected freshwater turtles in China is 80% (16/20). These turtle species all face the same threat as Reeves' turtle in China. Therefore, there is an urgent need to strictly protect the species that cannot be successfully bred in captivity, such as the big-headed turtle *Platysternon megacephalum*. For those species that can be bred to maturity in farms, management of breeding programs should be strengthened, where breeding certificates must be tightly regulated. Only thereby will it be possible to effectively stop farmed turtles from being used as a cover for the illegal wild turtle trade. Therefore, stopping poaching as well as increasing captive breeding can effectively halt the further destruction of wild populations.

With 33 species, China has the third-richest turtle diversity in the world, and it is also one of the countries with the highest proportion of endangered species in this taxon (Rhodin *et al.* 2018). Seventy-six percent of turtle species are listed as Endangered or Critically Endangered by IUCN, and 88% (29/33) are given Chinese second-class protection status, where they face the threat of extinction and wild populations need immediate and urgent conservation (Wang *et al.* 2021). Take for example, the Swinhoe's softshell turtle *Rafetus swinhoei*, which was widely distributed in large numbers, has only one surviving wild caught individual in a zoo in China. The evidence suggests that even the most common species can rapidly become endangered or near-extinct, and we fear this may be the tip of the iceberg where the entire

group of Chinese turtle species may be on the brink of extinction.

## Acknowledgements

This research was funded by the National Natural Science Foundation of China (32170532).

## References

- Ades, G., Banks, C.B., Buhlmann, K.A., Chan, B., Chang, H., Chen, T., Crow, P., Haupt, H., Kan, R., Lai, J., Lau, M., Lin, H. & Shi, H. (2000). Turtle trade in Northeast Asia: regional summary (China, Hong Kong, and Taiwan). In *Asian turtle trade: proceedings of a workshop on conservation and trade of freshwater turtles and tortoises in Asia*. van Dijk, P.P., Stuart, B.L. & Rhodin, A.G.J. (Eds). *Chelonian Research Monographs*. **2**, 52–54.
- Bhupathy, S., Choudhury, B.C., Hanfee, F., Kalyar Khan, S.M.M.H., Platt, S.G. & Rashid, S.M.A. (2000). Turtle trade in south Asia: regional summary (Bangladesh, India, and Myanmar). In van Dijk, P.P., Stuart, B.L. & Rhodin, A.G.J. (Eds). *Asian turtle trade: proceedings of a workshop on conservation and trade of freshwater turtles and tortoises in Asia*. *Chelonian Research Monographs*. **2**, 101–105.
- Gong, S., Shi, H., Jiang, A., Fong, J.J., Gaillard, D. & Wang, J. (2017). Disappearance of endangered turtles within China's nature reserves. *Curr. Biol.* **27**, R170–R171.
- Liu, C. & Hu, S. (1940). Notes on growth of *Geoclemys grangeri*. *Peking Nat. Hist. Bull.* **14**, 253–266.
- Lovich, J.E., Yasukawa, Y. & Ota, H. (2011). *Mauremys reevesii* (Gray 1831)-Reeves' Turtle, Chinese three-keeled pond turtle. In Rhodin, A.G.J., Pritchard, P.C.H., van Dijk, P.P., Saumure, R.A., Buhlmann, K.A., Iverson, J.B. & 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**, 050.1–050.10.
- NFGA (National Forestry and Grassland Administration of the People's Republic of China), MARA (Ministry of Agriculture and Rural Affairs of the People's Republic of China). (2021). *China's list of wildlife under special state protection*. National Forestry and Grassland Administration and the Ministry of Agriculture and Rural Affairs of the People's Republic of China. Available from: [http://www.forestry.gov.cn/html/main/main\\_5461/20210205122418860831352/file/20210205151950336764982.pdf](http://www.forestry.gov.cn/html/main/main_5461/20210205122418860831352/file/20210205151950336764982.pdf).
- Rhodin, A.G.J., Iverson, J.B., Bour, R., Fritz, U., Georges, A., Shaffer, H.B. & van Dijk, P.P. (2017). *Turtles of the World: Annotated Checklist and Atlas of Taxonomy, Synonymy, Distribution, and Conservation Status*, 8th edn. *Chelonian Research Monographs*. **7**, 1–292.
- Rhodin, A.G.J., Stanford, C.B., van Dijk, P.P., Eisemberg, C., Luiselli, L., Mittermeier, R.A., Hudson, R., et al. (2018). Global conservation status of turtles and tortoises (Order Testudines). *Chelonian Conserv. Biol.* **17**, 135–161.
- Shi, H., Parham, J.F., Lau, M. & Tien-Hsi, C. (2007). Farming endangered turtles to extinction in China. *Conserv. Biol.* **21**, 5–6.
- Sowerby, A.C. (1925). The Chinese terrapins. *Chin. J. Sci. Arts* **3**, 496–498.
- Sung, Y.H. & Fong, J.J. (2018). Assessing consumer trends and illegal activity by monitoring the online wildlife trade. *Biol. Conserv.* **227**, 219–225.
- Wang, J., Parham, J.F. & Shi, H. (2021). China's turtles need protection in the wild. *Science* **371**, 473.