New study sheds light for those working to save world's endangered crocodiles

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Slender-snouted crocodile in Gabon. Credit: Matthew Shirley, UF/IFAS researcher

(Phys.org) —African crocodiles, long thought of as just three known species, are among the most iconic creatures on that continent. But recent University of Florida research now finds that there are at least seven distinct African crocodile species.

The UF team's latest discovery, led by then-doctoral candidate Matthew

H. Shirley, is that what had been believed to be a single species of slender-snouted crocodile, is actually two.

The findings, which have major implications for policy-makers and conservationists, are outlined in a paper published online last week by *Proceedings of the Royal Society B*.

The results emphasize how little is known about crocodile biogeography, or how species are distributed geographically over time, in Western and Central Africa, said Jim Austin, a co-author on the paper and Shirley's doctoral adviser at UF.

In the paper, Shirley and his team describe that West African populations of the slender-snouted crocodile do not share the same genetic or specific physical features as those populations in Central Africa – and they estimate the two populations have been separated from each other geographically for at least 7 million years.

Biologists and conservation agencies need to know the precise taxonomy of animals and plants to avoid allocating precious conservation funding and effort working to protect species that may be more plentiful than believed, or – as in this case – ensuring that those resources can be directed toward species whose numbers are lower than believed.

Now that researchers know the West African slender-snouted crocodile is not the same species as its Central African cousin, Shirley said, that changes its standing.

"The West African slender-snouted crocodile is actually among the three or four most endangered crocodiles in the world," Shirley wrote in an email last week. "By finally recognizing that it is a unique species, we are in a much better position to advance its conservation and ensure its future."

Shirley likened the plight of the West African slender-snouted croc to the American alligator, which was on the cusp of extinction in the 1960s, but because it was protected, can now be easily observed in nature, be legally harvested at times, and helps drive Florida's tourism economy.

In Africa, crocodiles are traded and consumed as bush meat, making them a significant protein source for residents. They also play a major role at the top of the food pyramid, with significant influence on fish and crustraceans, much as lions control antelope populations.

"If we remove them from the ecosystem, then there may be profound effects on fisheries resources in the future," he wrote.

Crocodile species are often difficult to identify by physical characteristics alone. Most non-scientists can barely tell the difference between an alligator and a crocodile, in fact. So to bolster their genetic sleuthing, the UF team also looked at skull characteristics of slender-snouted crocodiles from museum collections and were able to find consistent differences between the species, Austin said.

Austin is a faculty member in UF's Department of Wildlife Ecology and Conservation, part of the Institute of Food and Agricultural Sciences. The other team members were Kent Vliet, laboratories coordinator with UF's biology department, and Amanda Carr, an undergraduate in Wildlife Ecology and Conservation.

Austin said the team's work is leading to helpful information for American zoos and aquariums by decoding the correct identification and taxonomy of African crocodiles housed in these facilities. Without the correct species identification, zookeepers could interbreed these hard-to-distinguish species, rendering them ineffective as founder animals for conservation purposes. And captive breeding efforts may be wasted when individuals of different species simply won't breed.

"We're doing the work to see which species they actually have," Austin said.

More information: Rigorous approaches to species delimitation have significant implications for African crocodilian systematics and conservation, Published 11 December 2013 DOI: 10.1098/rspb.2013.2483

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