

Reptile **CARE**

Volume 3 Issue 6

UK £3.25 US \$6.95 CAN \$8.95

Mother's pride

Discover this tortoise's secret

Defensive tactics

Seeing off predators



Steve Irwin

The way we should remember him



Plus: rare crocs, snake psychology and the strangest stories



Photo: Colin Stevenson

Losing its habitat: a juvenile tomistoma at Crocodile Conservation Services, Florida

Crocodiles in need of friends

Colin Stevenson makes a plea on behalf of the least-known, least-loved and least-protected crocodilians

AS A CHILD, I was obsessed with crocodilians. I grew up knowing that all species were considered endangered, with most peering over into the extinction void. During my lifetime (and I'm not really that old) it is pleasing to note that most species have improved their situation and are holding steady, with some able to support hunting seasons.

Sadly, though, not all species are in this comfortable position – and, to be fair, even the most secure species rely on continued law enforcement and protection of habitat. As reptile keepers, if you have a look at your favourite reptile and then consider that there may be as few as 150 to 200 of those animals in

total in the wild, then you can get an idea of the situation of some croc species.

Crocodiles 1, dinosaurs 0

There are 23 species of crocodilian floating about the tropical waterways of this planet. They have been around for a long time – the ancestors of these guys kicked off about 250 million years ago. Although they are not really “living dinosaurs”, crocs are distant relatives of the big guys that were wiped out 65 million years ago. Branching out from one part of the reptilian tree of life were different lines that ended with dinosaurs, crocs and birds. So crocs were developing alongside dinosaurs.

Often it is assumed by people that these are ancient creatures: small brain,

kinda prehistoric. So it is a nice slap in the face for these people to learn that the crocodilian heart is arguably the most advanced heart on the planet. Yes – better than a mere human heart. Unlike those of other reptiles, croc hearts are four-chambered, like ours. However, for long dives, crocs have a valve in the heart that opens, shunting blood along different pathways. Essentially (and in simplified words), oxygenated blood is sent to vital organs such as the brain, while the limbs receive deoxygenated blood.

That's pretty clever. To top it all off, the oxygen-carrying capacity of crocodilian blood is better than that of any other animal – including the deep-diving marine mammals such as seals.



Crocodiles have the nasty habit of ripping limbs off other crocodiles (and you thought your brother was mean to you...). But the victims have some tricks up their sleeve. First, the blood clots quickly, stopping the croc from bleeding to death. But the animal is still lying in dirty water with a huge wound. To stop infection, the croc's immune system includes a nifty factor that acts like an antibiotic. This factor is in the croc's blood, so it can get to any part of the body. In fact, research is ongoing to isolate this factor for human use, as it has been shown to be effective on bugs that we do not have current antibiotics for. Crocs to the rescue!

Given this fairly impressive list of abilities and history, you would think that crocodiles should be adored and admired, and protected by us all. Well, as usual the ancients were on the right track, while nowadays we've generally lost the plot! Every ancient civilisation that arose within areas inhabited by crocodiles eventually worshipped them: the Mayans; aboriginals of Australia and New Guinea; and most famously the ancient Egyptians, with their crocodile god Sobek and the ancient city of Crocodilopolis. In modern times, we are driving most species toward extinction, and of course reshaping the earth unsustainably and in negative ways that are being felt across the globe.

This kind of "progress" is the biggest threat the planet faces.

Crocodile conservation

Crocodiles have the reputation for being large, aggressive predators basking under the tropical sun, protected from the hunters that nearly destroyed them early last century. They laze about without a care in the world, except for the threat of TV presenters from any of the cable stations.

Crocodiles, it might seem, all grab unsuspecting wildebeest or people as easily as we grab a Big Mac. Well, the day a Chinese alligator or dwarf caiman grabs a wildebeest is the day that many croc owners will suddenly be very worried about the cute little caiman in the fish tank in the lounge room! The point is that the media portrays the same species doing the same things all the time. The

smaller species are ignored because it is much more dramatic to have wildebeest plucked from the bank of the Mara river.

Similarly, focusing on the success stories from a conservation point of view distorts the reality of the species that are continuing to decline in the wild. Most programs show the Australian crocs, both species of which are doing fine and dandy due to legal protection, strong enforcement, and plenty of habitat. The American alligator is the next popular croc on TV – and again, it is doing OK, with over a million gators estimated to be

Given the history and abilities of crocodiles, you would think they should be adored, admired and protected by us all

soaking up the Floridian sun. The Nile croc is the one that dines on wildebeest, and this population is going well, but in many countries in Africa, even the mighty Nile croc is suffering badly.

The sad and sorry list

Humans are a funny bunch! We have the power both to destroy and to save. We drive species right down to near-extinction levels, and then start shouting that something needs to be done to stop this madness. Well, we're shouting now about several croc species. The sad and sorry list of species that are in real trouble is as follows:

- Gharial
- Tomistoma
- Philippine crocodile
- Chinese alligator
- Siamese crocodile

These are the most endangered croc species right now. All are on CITES App 1. For most of these, if you were to go out into the wild and count each

animal of that species, you would end up with a three-digit figure. These guys number in the hundreds in the wild, in the world. Even worse, with some, the number is less than 200 animals left floating about their rivers and lakes.

Gharial

The gharial, *Gavialis gangeticus*, ranges throughout the Indian subcontinent. Its former range was throughout India, Nepal, Pakistan, Bangladesh, Bhutan and Myanmar – covering around 20,000 sq km. Population estimates from the 1940s list around 10,000 gharials. Now, the species is found only in a 250 sq km range, with about 200 animals. That's right, just 200 gharials in the wild. The Crocodile Specialist Group (CSG) of the IUCN is preparing to have the gharial moved from "Endangered" to "Critically Endangered" on the official Red List of endangered species.

The gharial itself is an incredible animal. These guys are relatively tolerant of the cold (compared with other crocs), and can be seen basking on sand banks » » with snow-capped mountains in the far distance. The gharial is that croc you may have seen on TV that has the really long and thin jaw, specialising in grabbing fish with rapid sideways swipes.

During the past 30 years, there was a significant conservation program that resulted in over 10,000 gharial eggs being collected, incubated, hatchlings raised, and more than 5,000 released into the wild in India. It was a success story itself. However, it is all too clear that it failed.

Before the programme started, estimates were that only 200 gharial survived world-wide – that is, in captivity and in the wild. After thousands of gharial have been released, we are seeing figures from the wild that are nearing their lowest numbers ever.

The problem was that no effort was put into having local people respect the gharial. Fisherman continue to kill them on sight. Gharials are found with jaws broken, jaws cut off, heads cut off – or the animals simply drown after becoming caught in the fishing nets. Those long jaws are snagged easily. The fact is that »



» conservation is won at the local level. Without the support of the locals, there is no chance of success.

So, the way forward is to establish a clear picture of the gharial's status throughout its range. An education program needs to be designed for people within the gharial's habitat, and ideas for gaining their support.

There is a task force established by CSG members that aims to drive gharial conservation. These guys volunteer their time in order to ensure the continued survival of the gharial in the wild. A website is being developed at this moment.

Tomistoma

Tomistoma schlegelii. Funny name, that (and so that you can impress your friends, I'll tell you that Tomistoma means "sharp mouth")! Another common name is the false gharial, owing to a very superficial resemblance to the gharial. It has slender jaws, but certainly not as slender as the gharial's. Often described as a fish-eater, the tomistoma is happy and more than capable of crunching through mammalian prey. These guys grow quite large – 15ft to 18ft being a good size.

Tomistoma is found in the swamp forests of Malaysia and Indonesia. Throughout this range, the numbers are small, and it is considered extinct in Thailand. It is threatened by destruction and exploitation of its habitat and, like the gharial, it gets caught in fishing nets and other traps meant for fish, and it drowns.

Through the CSG's Tomistoma Task Force, renewed activity for this species has already resulted in surveys and workshops. Further programmes include research projects such as genetic work, further surveys, establishing a conservation programme for the world's zoos, education programmes and studies of the biology of the tomistoma.

Chinese alligator

About seven years ago, the croc world was shocked to hear that estimates for the Chinese alligator were roughly 130-150 animals in the wild. This was beyond belief, and had it been a more "popular" animal, the entire planet would have heard about it. But most people have never heard of Chinese alligators, let alone how endangered it is.

One thing this guy had going for it was a huge captive population within China. There has been an enormous amount

of research done on this species, but a massive human population had shrunk the alligator habitat to a fraction of its former size. The Chinese alligator is reduced to living in only half a dozen ponds or so within the Anhui Province along the Yangtze river.

The CSG held a regional meeting in China in 2001, and was relieved at the work begun by Chinese colleagues and the Chinese authorities. Habitat is being assessed, reserved and developed for the species, and several animals have been released into the wild with full monitoring via radio-tracking. Local people are involved in the programmes, and while the species will never have its former range or pristine habitat, there is reason to be confident that wild numbers will slowly increase to a functional population.

The Chinese alligator is the original Chinese dragon of mythology. The sight of these creatures on a cool morning breathing plumes of steam, with water dancing off their backs during breeding season, gave rise to tales of powerful fire-breathing animals that were enhanced by story-tellers over the generations to the myth we know of today.

Photo: Colin Stevenson. St Augustines Alligator Farm

Short on the ground: there could be fewer than 200 gharials in the wild



Photo: Colin Stevenson. St Augustines Alligator Farm



Home from home: Siamese crocodiles are more welcome in Cambodia than Thailand

Siamese crocodile

These guys had quite a large historic range. It included Thailand, Cambodia, Vietnam, Malaysia and Indonesia. The Siamese crocodile is now extinct over most of this range, and decent populations are found only in Cambodia, with remnant populations in Thailand. So again, a pretty bad situation.

Siamese crocs are mid-sized – maybe 13 feet or so. They have a solid appearance, with a very strongly formed skull. Unfortunately, many captive groups of these guys have been hybridised with other species, rendering them useless for conservation initiatives.

DNA work has been done on these to assess the level of purity in captive groups for possible reintroductions in the wild. In areas within Cambodia, the local people can be very tolerant, and in fact quite proud to have these crocs around.

The situation for this species is precarious. Again, though, there are captive animals that may be suitable for future reintroductions but, first of all, habitat needs to be secured, local support guaranteed, and true protection established. It will be a slow battle for the Siamese crocodile.

Philippine crocodile

The good ol' Philippine crocodile, *Crocodylus mindorensis*, is again not in great shape. It had been estimated at around 150 animals at one stage, but further populations have since been found.

Unfortunately for this species, crocodiles are simply not cherished in the Philippines. In fact, the word for crocodile is also used to describe unpopular people over there.

Current estimates place the population of this species at no more than 1,000 individuals. An action plan has been developed for this species, and is supported mainly by zoos interested in obtaining these crocodiles for display purposes.

Summary

Conservation of crocodylians will only be won at a local level. It is always easy for people to sit in comfort in the UK or America and say that certain species should be saved, and berate the locals for killing these animals. But it is another to live directly with species that can and will kill you, especially when some local peoples rely on rivers for their daily life: water, bathing, washing clothes, fishing, travelling. If there are large predators in these waters, it is hard to live with this every day, and have people thousands of miles away telling you to leave the animals alone.

Crocodylian conservation relies heavily on getting the locals involved. Once they support the species, saving it is much easier. This is where we are at with the above crocodylians. And we can always use your help! These web sites will tell you more about how to get involved in croc conservation, and with crocs in general.

Tomistoma Task Force: www.tomistoma.org

Crocodile Specialist Group: www.flmnh.ufl.edu/natsci/herpetology/crocs.htm

One of the best places to start on anything crocodylian is www.crocodylian.com which is Dr Adam Britton's site. This has information on all aspects of crocodylian biology, including videos, sound recordings of croc calls, captive care, conservation – it is the best croc site on the web.

If you want to contact me about croc conservation, you can do so at: coleosuchus@hotmail.com

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