

CROCODILES IN COSTA RICA: WHY ARE THERE SO MANY? OVERPOPULATION, BAD MANAGEMENT OR LACK OF ENVIRONMENTAL EDUCATION?

by **César L. Barrio-Amorós**, Scientific director, CRWild
(www.crwild.com), Costa Rica.

All photos by the author

Recently, several cases of crocodiles preying on pets such as dogs have been reported. This has caused great consternation among the population of Costa Rica. I believe it is appropriate to make a series of clarifications about the species and its relationship with the environment and human beings. These cases have always occurred, but they are becoming more and more frequent for various reasons that we will comment on, and I will try to explain how to come to a coexistence with this great predator, which we must care for and preserve, not annihilate.

Figure 1. Orinocroc or Orinoco crocodile (*C. intermedius*) from the Venezuelan Llanos.



Species of crocodiles in the Americas

There are four species of crocodiles in the Americas; the Orinoco Croc, *Crocodylus intermedius* (Graves, 1819) in the Orinoco basin (Fig. 1), the Mesoamerican or Morelet's crocodile, *Crocodylus moreletii* (Duméril & Bibron, 1851) in the east of Mexico, especially in

the Yucatan peninsula and surrounding areas of Guatemala, Belize and Mexico (Fig. 2); the Cuban crocodile, *Crocodylus rhombifer* (Cuvier, 1807), in clear danger of extinction and hybridization in Cuba, and the most common in the continent, the American Crocodile, *Crocodylus acutus* (Cuvier, 1807) (Fig. 3).



Figure 2. Mesoamerican crocodile (*C. moreletii*) from Palenque, Chiapas, Mexico.



Figure 3. American crocodile (*C. acutus*) from Costa Rica.



Figure 4. A bunch of American crocodiles under the Tarcoles bridge, Costa Rica. This species is not as gregarious as others, but in some places many individuals can converge because they are fed by unscrupulous tourists.

Situation of the species globally and in Costa Rica

All crocodile species are under some category of threat, from the Cuban and the Orinocroc, which are Critically Endangered, to the Morelet's and American Crocodiles, which are Vulnerable under the IUCN criteria. Of course, the situation of the American crocodile is very different depending on the country. For example, in Peru, Ecuador and Venezuela they are on the verge of extinction, but in Mexico and Costa Rica they still have buoyant populations.

The threats they currently face are habitat loss and/or degradation/pollution, fishing nets, hunting and hybridization with other species.

In Costa Rica, the American croc is a species that was once in danger of disappearing. But, it was protected in 1981. Since then, its populations have recovered naturally. Costa Rica currently has the largest population of American crocodiles in the world, but can it be said that there is overpopulation (Fig. 4)? We will look at that later.

Figure 5. American crocodiles are commonly seen along rivers; Tarcoles river, Costa Rica.



Where do crocodiles live?

There is a permanent association in the Costa Rican people's minds that crocodiles live only in freshwater rivers and lakes (Fig. 5). It should be noted that the American crocodile that exists in the country is the second most marine species that exists, after the Indo-Pacific Saltwater crocodile, *Crocodylus porosus* Schneider, 1801. That is to say, it can be found in lakes, riparian (river), estuarine environments open to the sea (with brackish water) and mangrove swamps, as well as on the coast (Fig. 6) and even swimming through the sea to remote islands.

What do crocodiles feed on?

Long snouted crocodiles, like the American crocodile, have evolved to catch fish (as opposed to wide-snouted crocodiles, such as the Nile crocodile, which are better adapted to hunt large mammals). However, for an adult croc, over 3 meters, any small animal, whether terrestrial, flying or aquatic, happens to be in its possible lunch, from sea turtles, iguanas, snakes, birds that perch very close, to mammals such as raccoons, coatis, rodents, etc., to of course domestic animals such as poultry and dogs, cats or anyone

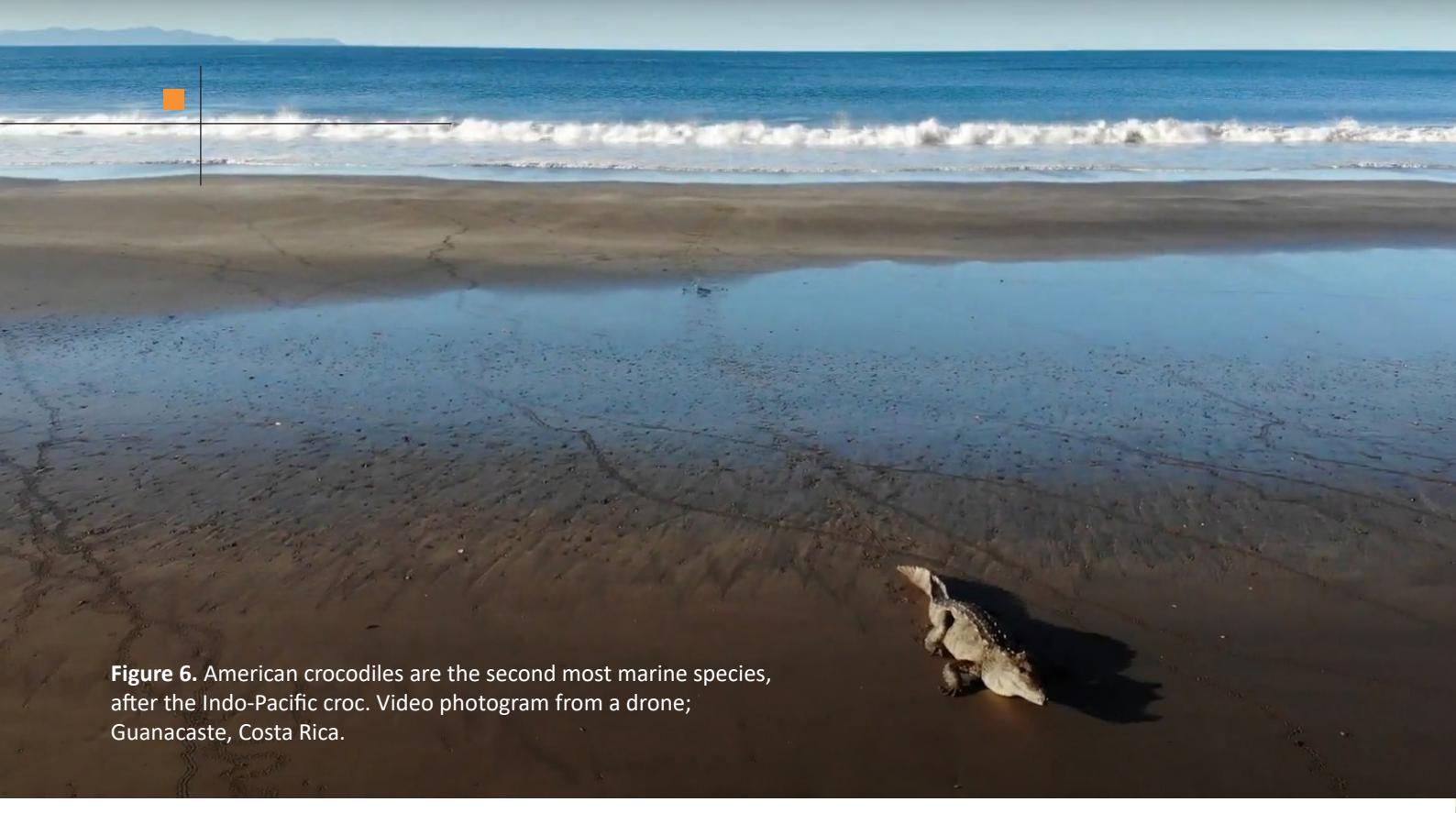


Figure 6. American crocodiles are the second most marine species, after the Indo-Pacific croc. Video photograph from a drone; Guanacaste, Costa Rica.

that comes near water. Crocodiles are generalist hunters, waiting for their prey in the water in hiding; they are hunters on the prowl. When the animal gets too close, it is chased and hunted in a moment, after a burst of activity.

What is the difference between a crocodile and a caiman?

In Costa Rica there are two species of crocodilians (in the taxonomic Order Crocodylia), each belonging to a different family. There is the



Figure 7. *C. fuscus*, the spectacled dark caiman, in a river in Costa Rica.

dark-spectacled caiman, *Caiman fuscus* (Cope, 1868), which belongs to the family Alligatoridae (Fig. 7), and the American crocodile, which belongs to the family Crocodylidae.

Are caimans dangerous?

Caimans grow to a maximum of 2 meters, but are generally much smaller, and do not pose a danger to humans unless handled carelessly. They are not hunters of large prey, so we have nothing to fear from them (Fig. 8).

How do you distinguish caimans from crocodiles?

Basically, when you see a crocodilian over 2 meters, it will always be a crocodile, never a caiman. When they are 2 m or less, caimans have a shorter snout, no lower teeth protruding into the upper jaw (Fig. 9; crocodiles have one or two that protrude clearly; Fig. 10), and a bony arch between the eyes (the famous caiman spectacles), which crocodiles do not have.

Figure 8. *C. fuscus* lurking his prey in shallow waters; Uvita, Costa Rica.





Figure 9. One of the easiest ways to differentiate between caimans and crocodiles are the exposed teeth. Caimans, like this *C. fuscus*, do not show inferior teeth when the snout is shut.



Figure 10. But in crocodiles, like in this example, an inferior tooth is seen, matching a groove on the upper mandible.



Figure 11. These animals must not be feed on, to avoid association of humans with food.

Are crocodiles dangerous?

Crocodiles are no more dangerous than other dangers we face every day. We just need to be aware that they exist (and have every right to do so). They were here long before us. Nobody thinks of going for a run or sends their children to play on the highway because there are trailers. It is a known fact, and it is respected. Nobody goes to play or do recreational activities on the highway, because there is a high probability of being run over. But nobody sees trucks as dangerous. I do, I see trailers as much more dangerous than crocodiles. Every year an average of 120 people die on Costa Rican roads. But nobody claims to be against trucks! There are certain rules, but many of them are often broken, and that's why accidents happen. Let's apply the same concept to crocodiles. It must be understood that they have their habitat and that it is potentially dangerous to wander carelessly in it, to swim and splash around, and to leave pets and children in it.

Do American crocs have natural enemies or predators?

Crocodiles have numerous natural enemies during their life. Their struggle to live begins before birth, when the mother must defend the clutch of eggs from opportunistic predators such as raccoons, coatimundis, armadillos, lizards such as *Tupinambis*, *Ctenosaura*, and possibly burrowing pythons (*Loxocemus*). Once they have hatched, the mother lovingly cares for the offspring, but with their small size they are desirable prey for a multitude of predators, both snakes (Boas, colubrids) and birds (raptors, herons), carnivorous mammals (canids, felines, mustelids, etc). Up to a size of about two meters, crocodiles are still careful not to be captured by large felids such as jaguars. But the most lethal enemies are those of their own species, whether through consumption (large animals preying on smaller ones) or competition (alpha males killing smaller ones to eliminate competition).

Are there now more crocs than before? Are they out of their own natural areas?

In Costa Rica crocodile population declined to the edge of extinction in the 70s, but after its protection in 1981, the population has grown and recovered their original numbers. However, the perception is that there are now more crocs than ever, and that they are everywhere (especially where they should not be). This notion is due to a series of factors that have come together. Of course, there is a growing population. But that does not mean that there is overpopulation. Now there are many more people expanding everywhere, and living close to the habitats of wildlife. It's not just a perception only about crocodiles, but other large predators such as pumas, jaguars, coyotes and snakes. Nowadays everyone carries a mobile phone, and all kinds of interactions can be recorded by anyone nearby and go viral quite easily.

So, is there an overpopulation of crocodiles in Costa Rica?

No, there are adequate numbers for the habitats where they exist. The limitations of the species are naturally shaped by the number of resources available to them but also artificially by human activity. If they can profit from human activity (more prey like domestic pets and livestock) then probably the population can grow more than expected. But if they rely on the natural prey (fish and small mammals) and those are rarer, then crocs limit their own population. In any case we must remember that crocs have been on the planet for more than 200 million years, with an absolute evolutionary success without changing too much; and they feed on anything that moves around them. Obviously, if there are few fish in an area because of overfishing, they will have to look for other prey.



Figure 12. Some tours show daring guides playing with huge crocs, which is totally forbidden by law in Costa Rica.



Are crocodiles a plague?

It is necessary to explain here what a plague is. A plague is an animal population that gets out of natural control. In terms of nature, sometimes some species become a plague (locusts) because periodically there is a population explosion due to some extraordinary facts that provide a lot of resources. This population explosion affects the habitat, destroying resources that are also for other beings. But after a while, everything goes back to normal... There are locust plagues every few years in Africa and Arabia. But the plagues we are talking about are usually made unconsciously by man. Ecologically speaking, humans can be considered pests, since they have gone outside their natural environment and have modified and domesticated it to suit themselves, increasing their population to non-

natural and intolerable levels. And with humans come animals, whether we want them to accompany us, consciously or unconsciously. Feral cats and dogs have now become pests because they are introduced all over the world, they have regained freedom, but not in their original habitat, so as predators they directly affect local species, which cannot recover as quickly from such a danger. Rodents are not carnivores, but omnivores, they eat everything. Yet, they have adapted very well to feed on human crops, of which they can eat 40% or even more, as well as contaminate them with bacteria, viruses and pathogenic fungi. Rabbits are not a plague in Europe, but they are in Australia, where they do not have natural enemies. This causes enormous disasters to nature and humans.

Pigeons and stilts are also out of control, as they have adapted very well to an urban environment that provides them with food (they are omnivores), shelter, and do not have many predators. The main ally of these species is the human being himself, since when campaigns to control these animals are announced, as they are considered nice and pleasant (perhaps the exception is rats and cockroaches), animal lovers rarely allow the extermination of their populations,

which do not contribute anything to the natural environment.

However, they are very different cases. These pests are created by human activity, and therefore completely artificial, and contribute nothing to the environment. Crocodiles, on the other hand, are in their environment and are a fundamental part of the fauna.

The case of crocodiles is only seen from the point of view of humans, who, I repeat, have increased their population immeasurably and are occupying the habitat of the reptile. Of course, as there are more humans everywhere, there will be more interactions. But crocs have reached their natural percentage, only now there are more means to show them up.

No, there is no overpopulation of crocodiles; there is overpopulation of humans and their pests, no matter who it hurts. And this is not even an opinion of mine, it is a scientific fact based on demography, economics and ecology, which are the sciences that prove that human overpopulation is the cause of so many conflicts with nature, and that eventually, it will lead to a collapse in a short time.

Is it true that they are more dangerous during the breeding season?

Yes of course, especially the females when they are defending their nests will harass any animal that approaches it, chasing it away vigorously. Males also become more dominant and defend their territory, but this should not affect us if we respect their habitat.

What can you do to live with these animals?

We must always try to do so; we cannot get up in our heads thinking that only we have the right to life.

Whether people like certain species of animal more or less is irrelevant for anyone who wants to eliminate them without good reasons.

Everything has its rules, you have to learn them and respect them. Just as there are safety rules to reduce traffic accidents (note that I say reduce, not eradicate, which is

impossible), industrial or laboratory accidents, there should also be rules for living with nature, which should be taught at school. Crocodiles are not the only animals to offer a potential danger, especially if you don't know about them. Snakes, wasps and bees, felids, too. In other countries, lions, bears or elephants pose major risks. It is vital to understand that we all must live together on the same planet.

What we should not do is accustom crocodiles to human presence and associate us as a food source (Fig. 11). That can make them much more daring and dangerous. It is completely prohibited in Costa Rica to feed wildlife. There are shows for tourists where crocodiles are lured with food or played with (Fig. 12), which are also totally prohibited.

What to do if you see a large animal in an area where it could be potentially dangerous to people and/or domestic animals?

If the animal is in its habitat (national parks, rivers where crocodiles are known to be present, coastlines where they have always been, even if they are not often seen, etc.), the animal should be left alone (Fig. 13). Do not go near it, do not swim, do not bring loose pets and even less so, children.

Figure 13. Two crocs just being themselves. If we do not bother them and respect the rules, they will not be a danger.

If the animal is seen in a place where you do not expect it, such as a small lake where you have never seen one, or a place where you do not expect it to be, you should always call 911 (or the emergency number of your own country) and report its presence; the authorities should determine what to do in that case, whether to call the fire service, police, environment ministry, etc. to proceed with a capture and relocation, or to determine if the animal is at a natural occurrence.

Conclusion

In conclusion, let us understand that crocodiles are reptiles that have existed on Earth for more than 200 million years. We are only 200,000 years old as a species (*Homo sapiens*), and about 3.5 million years old as bipedal hominids. Of this time, almost all of it (a 99%) we humans have been prey of large predators, including crocodiles. Obviously, the balance of power has shifted in our favor in the last 250 years (no more), but that doesn't mean we don't need to be watching around. Tigers in India, Bears in North America and now in Europe, etc., are escaping their reserves and losing their fear to humans, causing more and more incidents.

People tend to think we are the sum of creation (those many, who still believe in such

things), but we are not. We are just another animal, with the very big difference that we can modify things such as habitats and replace some species that we consider useful for others that are not (for us). We think we can do and undo without consequences. We have destroyed most of the Earth, and we are still at it, we don't want to understand that we are the real plague, that there is no terrestrial vertebrates with natural populations larger than 10-15 million individuals on the planet... that we humans have overextended ourselves on Earth, bringing chaos and destruction wherever we go. There are now 8 billion of us, we have far exceeded the natural numbers, and yet we think we can decide on the future of nature. And we are doing so, privatizing and polluting everyone's water, killing off wildlife, which is already a tiny proportion of what it was, changing natural processes for others we have created ourselves without thinking of the consequences. We are affecting the climate, drying it out due to deforestation and burning, causing the sea water level to rise day by day, and making droughts longer and rainfall heavier, causing terrible floods everywhere. We are at a point of no return, and yet people still want to think that the whole planet is theirs. I am certainly concerned, for the planet, for the wildlife, for the crocodiles, but definitely for us.



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