

CROCODILE and ALLIGATOR SAFETY FOR FIELD RESEARCHERS

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Dr. James Perran Ross, Associate Professor of Wildlife, University of Florida, is former Executive Officer and current treasurer of the Crocodile Specialist Group of SSC/IUCN. He has been an advisor on crocodylian conservation and management, international trade and sustainable use to the US Fish and Wildlife Service, Convention on International Trade in Endangered Species (CITES) and numerous national authorities. He has conducted crocodylian field research, surveys and captures for over 17 years including work on large Alligators, Cuban crocodiles, American crocodiles, Black caiman and Saltwater crocodiles in USA, Cuba, Nicaragua, Mexico, Costa Rica, Brazil, Argentina and Australia. He also has advised and worked with captive crocodylians and observed crocodylian behavior at St. Augustine Alligator farm, Gatorama (Florida) and Alligator Adventures(SC). He has investigated and analyzed crocodylian attacks in Florida, Costa Rica, Mexico, Belize, Ecuador and Zimbabwe as well as numerous published reports from Australia, Asia and Africa. He has published or edited over 50 publications on crocodylians in the refereed and popular literature.

Alligators can be found in any water body in Florida and American crocodiles (*Crocodylus acutus*) are increasingly common in South Florida. Other species of crocodiles and caimans are found throughout the tropics where WEC student research occurs. Here we treat them all the same. The actual risk of injury or death from crocodylians (i.e. crocodylians including alligators and caimans) is vanishingly small, far less than other more commonly encountered hazards [e.g. ants and bees, drunk drivers, motor cycles, skateboards, pet dogs, marshmallows (inhaled), bathroom heaters, jealous spouses etc.]. Nevertheless, understanding crocodylian predation strategies and capacities, and some simple precautions, can further minimize this risk.

Crocodyles are stealthy ambush predators that usually take prey smaller than themselves. Like any animal, they can and will bite if harassed, improperly handled or accidentally assaulted by people (e.g. stepped upon). They can also scratch and large specimens deliver damaging blows with their head, body and tail. However, most crocodyles will rapidly retreat if approached by people. Within their range, crocodyles may be present in almost any water body- and often in surprisingly small or isolated locations.

Crocodyles take nearly all their prey in the water. Their usual method is to remain still, or approach stealthily, and engulf or seize prey with a single swift lunge and snap. A crocodile can rapidly propel itself approximately one body length through the water or from the water up onto land with a propulsive thrust of its tail. They are agile and can strike straight ahead and about 120 degrees to either side. They do occasionally also sweep prey toward the head and mouth with their muscular tail. Smaller prey are seized

and swallowed, sometimes after manipulation in the mouth to orient the prey. Larger prey are most commonly pulled beneath the water and drowned and then dismembered by the famed "death roll". The crocodile seizes a portion of the prey and rotates rapidly around its long axis, tearing a piece from the prey. Crocodiles feed and may attack at any time of the day or night, but are more active at night.

Crocodiles are incapable of running down a person on land and very rarely capture prey away from the water, however large specimens are reported to sometimes venture many m from the water to take unsuspecting or immobile prey (such as carrion or people sleeping near water bodies). Crocodiles are often reported to be "thoughtful" or "cunning" in their attacks. In captivity they show an advanced capacity for recognizing repeated patterns of human behavior (e.g. predictable feeding times) and are reported to observe prey behavior patterns over several days and take advantage of repeated or predictable patterns. They are also opportunistic and take rapid advantage of sudden or unexpected events. They are commonly attracted to commotions in the water that may signify vulnerable prey. Having once committed to an attack, and particularly if the prey appears to be injured, crocodiles can be persistent in continuing their attacks. However, there are numerous reports of crocodiles initiating an attack and then discontinuing it when the victim puts up an active fight.

Crocodiles (both sexes) display territorial aggression to each other and females remain near and may protect nests and young. However, these activities involve stereotyped movements and posturing, splashing with the head or tail, loud vocalization (hisses, grunts) and are rarely the precursor to attacks on people. These displays are so obvious that the most unobservant or incautious person will notice and avoid them. Available data do not indicate any association, positive or negative, between attacks and breeding or nesting seasons. Crocodiles occasionally feed cooperatively, usually on schools of fish or large carcasses, but all reported attacks on people are invariably by a single crocodile. Crocodiles are reported to occasionally attack and capsize canoes, kayaks and small local craft, but these are always small, flimsy craft and may be attacked because of their resemblance to a crocodile. Most robust and stable craft of modern construction, even small jon-boats, should be safe.

The really dangerous crocs are the really big ones. Large specimens (usually males) over about 12 feet/4m may have several decades of experience, a body mass in excess of 1 tonne, no natural enemies and years of practice stalking and taking larger prey. The croc that may get you is the big one you don't see! For general purposes, the length of a crocodile's head (nostril to eye), or the length of its hind foot (track) in inches approximates its total length in feet.

Firearms are unnecessary and undesirable for repelling crocodiles. Crocodiles are difficult to fatally shoot and there is high danger of collateral injury by ricochet. The preferred equipment used by researchers, exhibitors of captive crocs, and professional collectors is a stout stick or pole that can be used to push away an advancing croc or whack it over the head, usually causing immediate withdrawal.

Injury from crocodile attack can be severe including lacerations, deep puncture wounds, broken limbs, limb removal, general trauma, shock and very often, -drowning. Virulent infections often result from crocodile bites, and advanced medical antibiotic treatment should be sought for all but the most trivial injury.

From these observations and our knowledge of actual attacks the following general precautions are recommended:

- Crocodiles larger than you are potentially dangerous (i.e. >6-8feet+) the larger the more dangerous.
- The danger zone is in the water (any depth) and within 1 crocodile body length of the water.
- Be alert, be aware:
 - Determine from local informants if crocodiles/large crocodiles are present.
 - Watch for crocodiles.
 - Watch for obvious signs of crocodiles including tracks, mudslides and shoreline basking areas.
 - Remain vigilant while conducting in-water and near water activity.
- Where crocodiles are, or may be present, don't go in the water or linger at the water's edge unless necessary.
- If aquatic field work is required, post a croc guard with sole responsibility to keep a sharp watch.
- If you are in the water and see a large crocodile, stand up, move calmly to shallow water and leave the water.
- Do not approach, touch or attempt to capture crocodiles (including juveniles or hatchlings) that you see.
- Do not swim, wade or paddle at night, dawn or dusk.
- Do not sleep or nap within 50 m of the water's edge.
- Be cautious and vigilant when washing, drinking, fishing and excreting at the water's edge.
- If crocodiles are known or suspected to be present, avoid regular aquatic activities (morning swim, midday dip etc.).
- In the event of unexpected commotions (falling in water, overturn canoe etc.) be alert to the possibility of attracting crocodiles.
- Evaluate the relative cost and risk of entering the water- is that dropped item, extra data point or hung up fish line really worth serious injury?
- Be vigilant and carry a big stick!
- If you have the rare misfortune to be attacked- fight like hell, try and maintain or regain your footing to avoid being pulled under, try to leave the water. Aid your companion who is attacked- there are many reports of crocs being driven off a victim by his or her companions.

But to reassure you: In 15 years research, we have spent many months in the field and hundreds of hours studying and attempting to catch crocodiles, caimans and alligators- of necessity in locations where large crocodiles are known to be present. We have had no attacks, incidents or crocodile caused injury. It is our experience that when we are

actively studying/hunting crocodiles, the problem is usually that they are elusive, wary, actively avoid us and are very difficult to approach. Most attacks for which data are available suggest that the victims are usually inattentive, casual, unobservant, complacent, negligent, or else completely uninformed and oblivious to the possibility of crocodile attack. Avoid this complacent, inattentive or oblivious profile and you greatly reduce your vulnerability as crocodile prey. Be alert, observant and appropriately cautious.

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Crocodilian Benevolent Association

Support your aquatic food chain—be a prey item.

How to be a crocodile attack victim.

- Be oblivious- öSay Wha? There are crocs here???
- Don't be informed- Ignore or do not seek information about crocodiles.
- Be inattentive- do not pay attention to your surroundings, ignore that swirl in the water, its probably a fish or an old log.
- Be complacent- öThere are crocs here? So what? they never hurt anyone.ö
- Be predictable- öYep. 5pm, time for cocktails again in the river pool.ö
- Be negligent- Send that undergrad assistant back into the water to recover the pen you dropped, and while she is in there, have her grab a couple of those hatchlings so we can take a photo.
- Swim at night- öWhoohoo- moonlight skinny dip- last one in is a rotten----!ö

Your aquatic top predator thanks you.