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# A review of nuisance alligator management in the southeastern United States

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## Abstract

A nuisance alligator is an American alligator (*Alligator mississippiensis*) found on public or private lands that is considered a threat to the general public. The ability of *A. mississippiensis* to thrive in urban environments relates to its ability to adapt quickly to variable nutritional resources. Also, as compared to most crocodylians, *A. mississippiensis* can thrive in areas of extreme temperature variability. State wildlife and fisheries commissions are charged with investigating complaints of the presence of a nuisance alligator. If the commission does not consider the animal a threat, then no legal removal of the animal will occur. If the animal is considered a threat, a licensed nuisance alligator hunter will be called to relocate or kill the animal. Size and temperament of the animal will determine the hunter's ability to relocate it. Relocation may not be an effective solution as *A. mississippiensis* may travel many miles to return to the area from which they were removed. After protection afforded by the Endangered Species Act in 1973, *A. mississippiensis* populations increased rapidly. Concurrently, urbanization of the range of the species has increased. The presence of *A. mississippiensis* near urban centers is beneficial for the preservation of local biodiversity. Wading bird nesting colonies can survive because *A. mississippiensis* preys on small mammals that would otherwise consume them. Alligator nests provide nesting spots for several other reptile species. Also, the increasing population of *A. mississippiensis* provides financial opportunities in the form of ranching for the sale of skins and meat. Alligator attacks on humans are becoming more common as urbanization continues. The author suggests that the nuisance alligator removal initiative be supplemented with public service education about how to maintain safe families, pets, and livestock in the vicinity of alligators. Education is a more reasonable alternative to eradicating *A. mississippiensis* on public and private lands. He further suggests that ranching operations increase productivity to take advantage of this easily accessible resource. Ranching efforts should be regulated by the United States Fish and Wildlife Service and the Convention for the International Trade of Endangered Species in order to avoid the population crash that occurred for *A. mississippiensis* during the first half of this century due to overexploitation. Whether in the form of attack or of careful management and exploitation, interactions between *A. mississippiensis* and humans are expected to be more common in the future.

## INTRODUCTION

The interaction of the American alligator and humans is becoming more common as expansion of urban centers in the Southeastern United States increases. The ability of the alligator to inhabit a wide geographic range and its prolific reproductive capacity relates to its unique physiology and behavior. This may cause unrest as their habitat becomes further encroached by urbanization. In this review, we will outline how alligators have been able to

thrive in areas of urban development and the methods by which humans tolerate the presence of this generalist predator.

In the history of the area, recollections are written of periods when wild alligators were the defining characteristic of the landscape (McIlhenny 1935). As a member of the subfamily Alligatorinae of the family Crocodylidae, they are among the last living representatives of the Mesozoic archosaurs (Alderton 1998). Their ability to sustain themselves

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throughout the past 265 million years is due to their fortitude. Most crocodylians exist in areas of thermal constancy. The American alligator is noteworthy in its tolerance to temperature variability (Brandt and Mazzotti 1990). Alligators can survive temperatures as low as 4 C, with an optimal range of 32-35 C. This is an unusually wide range for a poikilotherm (Ross 1989). Their behavioral methods of thermoregulation allow them to survive at extreme temperatures. In extreme low temperatures, alligators remain in their dens in a state of decreased activity. They will move from their dens only to bask in periods of warmth. In the den, they demonstrate an "icing" behavior in which the tip of the snout is extended from the surface of the water while the rest of the body is submerged at a 30° angle (Hagan et al. 1983). In this way, the alligator can position its body in deeper, warmer water (Brandt and Mazzotti 1990). In extreme high temperatures, an individual will move between a warmer basking area and a cooler shaded or submerged position (Ricciuti 1972). The amount of blood flowing through the systemic blood circuit is increased by a characteristic shunt from the right aortic arch into the left. This causes an increase in the systemic blood pressure, allowing the alligator to rapidly increase its body temperature (Pough 1998). During periods of high temperature, energy expenditure can triple its value at a lower temperature. However, there is a ceiling on the potential increase in mobility which may serve to stabilize the level of activity throughout the seasons (Emshwiller and Gleeson 1997).

The alligator's reproductive success is also dependent on its diet (Delany and Abercrombie 1986). Food items are selected in relation to habitat occupied, prey species encountered, prey vulnerability, prey size suitability, and alligator size (Delany and Abercrombie 1986). In addition, alligators can survive for several months between meals in times of low temperatures and general inactivity (McIlhenny 1935). When suitable prey items are not available, alligators may fast or take advantage of a more abundant prey item. The list of prey items, which an alligator will consume, includes insects, crustaceans, snails, fish, and other vertebrates (Delany 1990). The list of potential prey items also includes medium- to large-sized mammals. It has been suggested that alligators have been a significant predator of white-tailed deer throughout their evolution in the Florida Keys (Shoop and Ruckdeschel 1990). Cannibalism has also been reported (Chabreck et al. 1996). It is this dietary plasticity that allows them to persist in variable environments. The American alligator apparently has little trouble adjusting to the available resources of urban environments.

Prior to the Ice Age, the American alligator enjoyed a range that covered the majority of North America (Ross 1989). Presently, the range of the alligator is restricted to the Southeastern United States, ranging from the southern tip of Florida to the lower section of Oklahoma. Their northernmost perimeter is defined by temperature. Alligators are only found south of the -9.4 C isotherm (Alderton 1998). In Florida, they share territory with at least 2 other crocodylian species. The American crocodile (*Crocodylus acutus*) occurs in the estuarine swamps of South Florida (Gaby et al. 1985). The common caiman (*Caiman crocodilus*) has been sighted as far north as Lake Jessup, Seminole County, Florida (Ellis 1979). In 1973, the federal Endangered Species Act provided protection to all crocodiles and alligators in the United States. At present, *C. acutus* remains on Appendix I of the Endangered Species Act, giving it a status of extreme concern. *Alligator mississippiensis* and *C. crocodilus* are listed on Appendix II, meaning they are of lesser concern but still merit protection due to human exploitation and their resemblance to *C. acutus* (Ross 1989).

The wildlife and fisheries commissions of several states have established a policy for handling alligators that may endanger the citizens of the area. The presence of these nuisance alligators is brought to the attention of the state's wildlife, fisheries, and parks agency, through complaints by citizens. These complaints are verified by state personnel before the removal of an alligator is approved. In Mississippi, an alligator under 1.8-2.1m is not generally considered a threat unless it has demonstrated aggressive behaviors. Aggressive behaviors include preying on pets or livestock and demonstrating feeding behaviors in the presence of humans. If a conservation officer declares an alligator to be a nuisance because of its size or behavior, the alligator will be relocated or killed. If the conservation officer decides that the complaint does not warrant removal of the creature, a hunter will not be called. The alligator is considered the property of the state. No legal removal of the animal will occur if the request is denied by the conservation officer. The Mississippi alligator program will not relocate an alligator over 2.1m. These animals will be killed. Mississippi policy adds that alligators above 2.75m should be killed on-site (MWFP 1999).

The selection of hunters by the Louisiana Fur and Refuge Division is determined by the experience and past record of the applicant. Prior convictions involving illegal harvest of fish and wildlife within the last 3 years can result in rejection of an application for a nuisance hunter's license. In Louisiana, these licenses are not distributed to persons already in possession of a fur dealer's license, fur buyer's

license, non-game quadruped breeder's license, or alligator parts dealer's license. A minimum of 3 years documented experience in alligator hunting is required for the nuisance hunter's license application. Nuisance hunters are not representatives of the Department of Wildlife and Fisheries. The department is not liable for personal injury or lawsuit incurred by the service of the nuisance hunter (LDWF 1998).

Upon verification of a complaint, the Louisiana Fur and Refuge Division will call the licensed nuisance hunter with fastest access to the located nuisance alligator. If the hunter is not able to respond within 24 hours, the call is transferred to another hunter. A verified complaint will be assigned a Nuisance Alligator Complaint Identification Number and a nuisance alligator tag. Each nuisance alligator must be tagged before relocation or dispatch. Without the correct number and tag, the hunter may not remove the animal (LDWF 1998). The hunter may not respond to complaints that have not been verified by the Fur and Refuge Division. In Mississippi, relocation of the nuisance animal must be followed by notification to the state alligator program of the precise location of release (MWFP 1999).

If relocation proves impractical, the alligator may be killed. Relocation is a questionable solution, as many alligators will travel long distances to return to the area from which they were removed (Revkin 1988). A nuisance alligator hunter may not sell or donate a live, captured alligator to an alligator farm. However, an alligator removed by a nuisance hunter under the rules and regulations of the state may be sold for skin or meat.

During the first half of the twentieth century, *A. mississippiensis* was hunted almost to the point of extinction. After the passage of the Endangered Species Act in 1973, the depleted population of *A. mississippiensis* recovered rapidly. Concurrently, urbanization of much of their range increased rapidly. As these 2 factors continue to increase, alligator attacks on humans are becoming more common. Between 1948 and 1995, 218 people were attacked by alligators in Florida. Seven of these attacks ended in human fatality. One hundred and ten of these attacks occurred between 1990 and 1995; from 1940 to 1959, only one alligator attack was recorded (Conover and Dubow 1997). The recorded attacks occurred while the victims were swimming, snorkeling, wading, or walking near a body of water.

As urbanization and nuisance alligator complaints continue to increase, it becomes obvious that every complaint cannot be addressed. It is not possible or desirable to remove the alligator from the territory which it held before the urban encroachment. The

presence of alligators provides some benefits for the biodiversity of the area. Alligators exercise predation pressure on other nuisance species. By preying on raccoons and other mammals, large alligators give wading bird nesting colonies a respite from predators (Shoop and Ruckdeschel 1990). Other reptiles, utilize alligator nests, as spots to lay their eggs. Three turtle species, one snake species, and one lizard species are known to lay their eggs within alligator nests (Ross 1989). The increasing population of *A. mississippiensis* also provides avenues for financial gain through ranching and sale of skins and meat.

The nature of alligator attacks and how to avoid them have been studied (Conover and Dubow 1997). Public service education about maintaining safe families, pets, and livestock in the vicinity of alligators is a more feasible option than the permanent removal of all alligators from public and private lands. Ranching of *A. mississippiensis*, under the rules and regulations of the United States Fish and Wildlife Service and the Convention for the International Trade of Endangered Species, would benefit from the increasing populations of *A. mississippiensis*. Unfortunately, as urbanization increases within the range of the alligator, attacks on humans can be expected to occur more frequently. It is hoped that decisions will be made regarding these issues that will permit the coexistence of humans and alligators with minimal detriment to either species.

## REFERENCES

- Alderton, D. 1998. Crocodiles & alligators of the world. Sterling Publishing Co. New York. 190pp.
- Brandt, L. A., and F. J. Mazzotti. 1990. The behavior of juvenile *Alligator mississippiensis* and *Caiman crocodilus* exposed to low temperatures. *Copeia* 3:867-871.
- Chabreck, R. H., V. L. Wright, B. G. Addison, and D. C. Bossert. 1996. Retention rates of metal tags in stomachs of American alligators. pp. 437-440. *In: Crocodiles. Proceedings of the 13<sup>th</sup> Working Meeting of the Crocodile Specialist Group, IUCN-The World Conservation Union, Gland, Switzerland.* ISBN 2-8317-0327-1. 516p.
- Conover, M. R., and T. J. Dubow. 1997. Alligator attacks on humans in the United States. *Herpetological Review* 28(3):120-124.
- Delany, M. F. 1990. Late summer diet of juvenile American alligators. *J. Herpetol.* 24(4):418-421.
- Delany, M. F., and C. L. Abercrombie. 1986. American alligator food habits in northcentral Florida. *J. Wildl. Manage.* 50(2):348-353.
- Ellis, T. M. 1980. *Caiman crocodilus*: an established exotic in South Florida. *Copeia*. 1:152-154.

- Emshwiller, M. G., and T. T. Gleeson. 1997. Temperature effects on aerobic metabolism and terrestrial locomotion in American alligators. *J. Herpetol.* 31(1):142-147.
- Gaby, R., M. P. McMahon, F. J. Mazzotti, W. N. Gillies, and J. R. Wilcox. 1985. Ecology of a population of *Crocodylus acutus* at a power plant site in Florida. *J. Herpetol.* 19(2):189-198.
- Hagan, J. M., P. C. Smithson, and P. D. Doerr. 1983. Behavioral responses of the American alligator to freezing weather. *J. Herpetol.* 17(4):402-404.
- Louisiana Department of Wildlife and Fisheries. 1998. Louisiana Alligator Regulations. Baton Rouge, Louisiana.
- Louisiana Department of Wildlife and Fisheries. Baton Rouge, Louisiana.
- McIlhenny, E. A. 1935. The alligator's life history. Christopher Publ. House, Boston, Massachusetts. 117 pp.
- Mississippi Wildlife, Fisheries, and Parks. 1999. Nuisance alligator procedures. Mississippi Wildlife, Fisheries, and Parks. Jackson, Mississippi.
- Pough, F. H., R. M. Andrews, J. E. Cadle, M. L. Crump, A. H. Savitzky, and K. D. Wells. 1998. *Herpetology*. Simon & Schuster. New Jersey. 577 pp.
- Revkin, A. C. 1988. Water hazard. *Discover* 9:72-76.
- Ricciuti, E. R. 1972. *The American alligator; its life in the wild*. Harper & Row. New York. 70 pp.
- Ross, C. A. 1989. *Crocodiles and alligators*. Facts On File. New York. 240 pp.
- Shoop, C. R., and C. A. Ruckdeschel. 1990. Alligators as predators of terrestrial mammals. *Am. Midl. Nat.* 124:407-412.