

*Wildlife Damage Management, Internet Center for
The Handbook: Prevention and Control of
Wildlife Damage*

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ALLIGATORS (*Alligator
mississippiensis*)

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ALLIGATORS

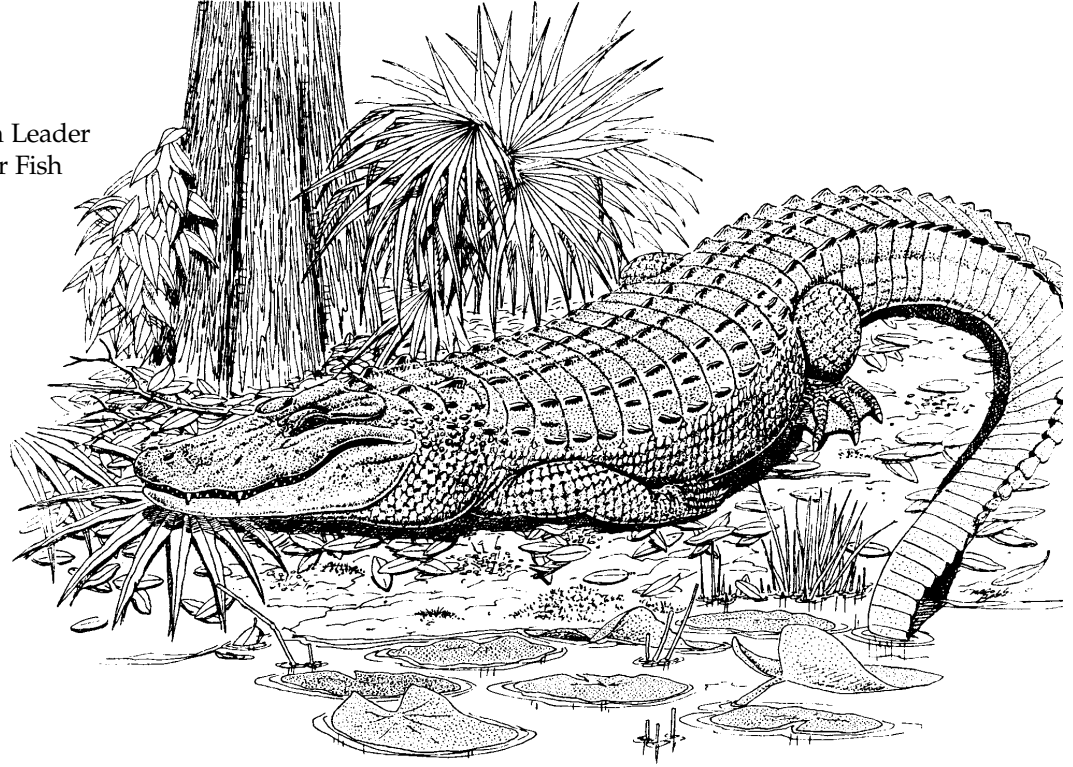


Fig. 1. American alligator,
Alligator mississippiensis

Damage Prevention and Control Methods

Exclusion

Bulkheads along edges of lakes and waterways.

Wire mesh fences.

Habitat Modification

Minimize emergent vegetation.

Drain ponds and borrow pits where appropriate and permitted.

Frightening

Prodding or other harassment can increase wariness.

Hunting pressure increases wariness and avoidance of people.

Repellents

None are registered.

Toxicants

None are registered.

Fumigants

None are registered.

Trapping

Baited hooks and trip-snare traps are most effective.

Shooting

Hunt during the day or night with rifles or crossbows.

Other Methods

Hunt with detachable-head harpoons or handheld, breakaway pole snares.

Capture with snatch hooks or tongs.

Identification

The American alligator (*Alligator mississippiensis*, Fig. 1) is the most common of two crocodylians native to the United States and is one of 22 crocodylian species worldwide. The other native crocodylian is the American crocodile (*Crocodylus acutus*). Caimans (*Caiman* spp.), imported from Central and South America, are occasionally released in the United States and can survive and reproduce in Florida. The American alligator is distinguished from the American crocodile and caiman by its more rounded snout and black and yellow-white coloration. American crocodiles and caimans are olive-brown in color and have more pointed snouts. American alligators and crocodiles are similar in physical size, whereas caimans are 40% smaller.



PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

Cooperative Extension Division
Institute of Agriculture and Natural Resources
University of Nebraska - Lincoln

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control

Great Plains Agricultural Council
Wildlife Committee

Range

The American alligator is found in wetlands throughout the coastal plain of the southeastern United States. Viable alligator populations are found in Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, and North Carolina. The northern range is limited by low winter temperatures. Alligators are rarely found south of the Rio Grande drainage. Alligators prefer fresh water but also inhabit brackish water and occasionally venture into salt water. American crocodiles are scarce and, in the United States, are only found in the warmer coastal waters of Florida, south of Tampa and Miami. Caimans rarely survive winters north of central Florida and reproduce only in southernmost Florida.

Habitat

Alligators can be found in almost any type of fresh water, but population densities are greatest in wetlands with an abundant food supply and adjacent marsh habitat for nesting. In Texas, Louisiana, and South Carolina, the highest densities are found in highly productive coastal impoundments. In Florida, highest densities occur in nutrient-enriched lakes and marshes. Coastal and inland marshes maintain the highest alligator densities in Georgia, Alabama, and Mississippi. Alligators commonly inhabit urban wetlands (canals, lagoons, ponds, impoundments, and streams) throughout their range.

Food Habits

Alligators are exclusively carnivorous and prey upon whatever creatures are most available. Juvenile alligators (less than 4 feet [1.2 m]) eat crustaceans, snails, and small fish; subadults (4 to 6 feet [1.2 to 1.8 m]) eat mostly fish, crustaceans, small mammals, and birds; and adults (greater than 6 feet [1.8 m]) eat fish, mammals, turtles, birds, and other alligators. Diets are range-dependent; in Louisiana coastal marshes, adult alligators feed primarily on nutria (*Myocastor coypus*), whereas in Florida and northern Louisiana, rough

fish and turtles comprise most of the diet. Recent studies in Florida and Louisiana indicate that cannibalism is common among alligators. Alligators readily take domestic dogs and cats. In rural areas, larger alligators take calves, foals, goats, hogs, domestic waterfowl, and occasionally, full-grown cattle and horses.

General Biology, Reproduction, and Behavior

Alligators are ectothermic — they rely on external sources of heat to maintain body temperature. They are most active at warmer temperatures and prefer 82° to 92° F (28° to 33° C). They stop feeding when ambient temperature drops below 70° F (21° C) and become dormant below 55° F (13° C).

Alligators are among the largest animals in North America. Males can attain a size of more than 14 feet (4.3 m) and 1,000 pounds (473 kg). Females can exceed 10 feet (3.1 m) and 250 pounds (116 kg). Alligators of both sexes become sexually mature when they attain a length of 6 to 7 feet (1.8 to 2.1 m), but their full reproductive capacity is not realized until females and males are at least 7 feet (2.1 m) and 8 feet (2.4 m) long, respectively.

Alligators begin courtship in April throughout most of their range and breed in late May and early June. Females lay a single clutch of 30 to 50 eggs in a mound of vegetation from early June to mid-July. Nests average about 2 feet (0.6 m) in height and 5 feet (1.5 m) in diameter. Nests are constructed of the predominant surrounding vegetation, which is commonly cordgrass (*Spartina* spp.), sawgrass (*Cladium jamaicense*), cattail (*Typha* spp.), giant reed (*Phragmites* spp.), other marsh grasses, peat, pine needles, and/or soil. Females tend their nests and sometimes defend them against intruders, including humans. Eggs normally take 65 days to complete incubation. In late August to early September, 9 to 10-inch (23 to 25-cm) hatchlings are liberated from the nest by the female. She may defend

her hatchlings against intruders and stay with them for up to 1 year, but gradually loses her affinity for them as the next breeding season approaches.

Growth rates of alligators are variable and dependent on diet, temperature, and sex. Alligators take 7 to 10 years to reach 6 feet (1.8 m) in Louisiana, 9 to 14 years in Florida, and up to 16 years in North Carolina. When maintained on farms under ideal temperature and nutrition, alligators can reach a length of 6 feet (1.8 m) in 3 years.

Alligators are not normally aggressive toward humans, but aberrant behavior occasionally occurs. Alligators can and will attack humans and cause serious injury or death. Most attacks are characterized by a single bite and release with resulting puncture wounds. Single bites are usually made by smaller alligators (less than 8 feet [2.4 m]) and result in an immediate release, possibly because they were unsure of their intended prey. One-third of the attacks, however, involve repeated bites, major injury, and sometimes death. Serious and repeated attacks are normally made by alligators greater than 8 feet in length and are most likely the result of chase and feeding behavior. Unprovoked attacks by alligators smaller than 5 feet (1.5 m) in length are rare.

Contrary to popular belief, few attacks can be attributed to wounded or territorial alligators or females defending their nests or young. Necropsies of alligators that have attacked humans have shown that most are healthy and well-nourished. It is unlikely that alligator attacks are related to territorial defense. When defending a territory, alligators display, vocalize, and normally approach on the surface of the water where they can be more intimidating. In most serious alligator attacks, victims were unaware of the alligator prior to the attack. Female alligators frequently defend their nest and young, but there have been no confirmed reports of humans being bitten by protective females. Brooding females typically try to intimidate intruders by displaying and hissing before attacking.

Alligators quickly become conditioned to humans, especially when food is involved. Feeding-habituated alligators lose their fear of humans and can be dangerous to unsuspecting humans, especially children. Many aggressive or “fearless” alligators have to be removed each year following feeding by humans. Ponds and waterways at golf courses and high-density housing create a similar problem when alligators become accustomed to living near people.

Damage and Damage Identification

Damage by alligators is usually limited to injuries or death to humans or domestic animals. Most alligator bites occur in Florida, which has documented approximately 140 unprovoked attacks from 1972 to 1991, or about 7 per year. Since 1972, 5 deaths have been positively attributed to alligators. Historically, nonfatal attacks have also been documented in South Carolina (8), Louisiana (2), Texas (1), Georgia (1), and Alabama (1).

Alligators inflict damage with their sharp, cone-shaped teeth and powerful jaws. Bites are characterized by puncture wounds and/or torn flesh. Alligators, like other crocodylians that take large prey, prefer to seize an appendage and twist it off by spinning. Many serious injuries have involved badly damaged and broken arms on humans and legs on animals. Sometimes alligators bite or eat previously drowned persons. Coroners can usually determine whether a person drowned before or after being bitten. Stories of alligators breaking the legs of full-grown men with their tails are unfounded.

Alligators sometimes excavate extensive burrows or dens for refuges from cold temperatures, drought, and predators (other alligators and humans). Burrowing by alligators can damage dikes in impoundments.

Legal Status

The American alligator is federally classified as “threatened due to simi-

larity of appearance” to other endangered and threatened crocodylians. This provides federal protection for alligators but allows state-approved management and control programs. Alligators can be legally taken only by individuals with proper licenses or permits. Florida, Louisiana, Georgia, South Carolina, and Texas have problem or nuisance alligator control programs that allow permitted hunters to kill or facilitate the removal of nuisance alligators. Other states use state wildlife officials to remove problem animals.

Damage Prevention and Control Methods

Exclusion

Alligators are most dangerous in water or at the water’s edge. They occasionally make overland forays in search of new habitat, mates, or prey. Concrete or wooden bulkheads that are a minimum of 3 feet (1 m) above the high water mark will repel alligators along waterways and lakes. Alligators have been documented to climb 5-foot (1.5-m) chain-link fences to get at dogs. Fences at least 5 feet high with 4-inch (10-cm) mesh will effectively exclude larger alligators if the top of the fence is angled outward.

Habitat Modification

Elimination of wetlands will eradicate alligators because they depend on water for cover, food, and temperature regulation. Most modifications of wetlands, however, are unlawful and would adversely affect other wildlife. Elimination of emergent vegetation can reduce alligator densities by reducing cover. Check with appropriate conservation authorities before modifying any wetlands.

Frightening

Aversive conditioning using sticks to prod “tame” alligators and rough handling of captured alligators have been attempted in several areas with limited success. Hunting pressure appears to be the most effective means of increasing alligator wariness and may be responsible for limiting the incidence of

alligator attacks in Florida, despite increasing human and alligator populations. The historically low attack rate in Louisiana is attributed to a history of intense hunting.

Repellents

None are registered.

Toxicants

None are registered.

Trapping

Alligators can be readily trapped because they are attracted to baits. A baited hook is the simplest method and is used in Louisiana as a general harvest method and in Florida to remove nuisance alligators. Hooks are rigged by embedding a large fish hook (12/0 forged) in bait (nutria, fish, beef lungs, and chicken are popular) and suspended from a tree limb or pole about 2 feet (0.6 m) above the surface of the water. The bait should be set closer to the water to catch smaller alligators. To increase success, baited hooks should be set in the evening and left overnight during the primary feeding time of alligators. Once swallowed, the hook lodges in the alligator’s stomach and the alligator is retrieved with the attached rope. This method can kill or otherwise injure alligators and is not suitable for alligators that are to be translocated. Hooked alligators are most effectively killed by a shot to the brain with a small caliber (.22) rifle. Powerheads (“bangsticks”) can also be used to kill alligators, but should only be used with the barrel under water and according to manufacturer recommendations.

Trip-snare traps (Fig. 2) are more complicated and somewhat less effective than are set hooks but do not injure or kill alligators. An alligator is attracted to the bait and, because of the placement of the guide boards, is forced to enter from the end of the trap with the snare. The alligator puts its head through the self-locking snare (No. 3, 72-inch [1.84-m]; see **Supplies and Materials**), seizes the bait, and releases the trigger mechanism as it pulls the bait. The surgical tubing contracts and locks the snare on the alligator. These

traps can be modified as floating sets. A variation of the trip-snare trap can be set on alligator trails and rigged to trip by the weight of the alligator (see Mazzotti and Brandt 1988).

Wire box traps have been used effectively to trap alligators. Heavy nets have been used with limited success to capture alligators and crocodiles at basking sites.

Translocation

Translocation of problem alligators was practiced extensively during the 1970s with limited success. Alligators, especially larger ones, tended to return to their original capture sites after being moved. These alligators not only caused problems during their return trip but frequently required subsequent capture and translocation. Translocation is not recommended unless areas with depleted alligator populations are available for release of problem animals.

Shooting

Next to baited hooks, shooting is probably the most effective means of removing alligators. Alligators can be shot during the day or at night, and should be shot in the brain case with a sufficiently powerful rifle (.243 caliber and larger) for an efficient and humane kill. Firearms, however, present public safety problems in most nuisance alligator settings. Furthermore, alligators sink almost immediately after dying and may be difficult to recover (by gaffs or snatch hooks) in areas with currents or dense submergent plants. This method may make confirmation of a kill difficult and may compromise the commercial value of the alligator. Crossbows with lines attached to barbed bolts work fairly well at short distances but should only be used to kill alligators.

Other Methods

Detachable-head harpoons (Fig. 3a, b) with attached lines have been used effectively to harvest nuisance alligators. A harpoon assembly (Fig. 3a) is attached to a 10- to 12-foot (3- to 3.5-m) wooden pole. The harpoon is thrust at

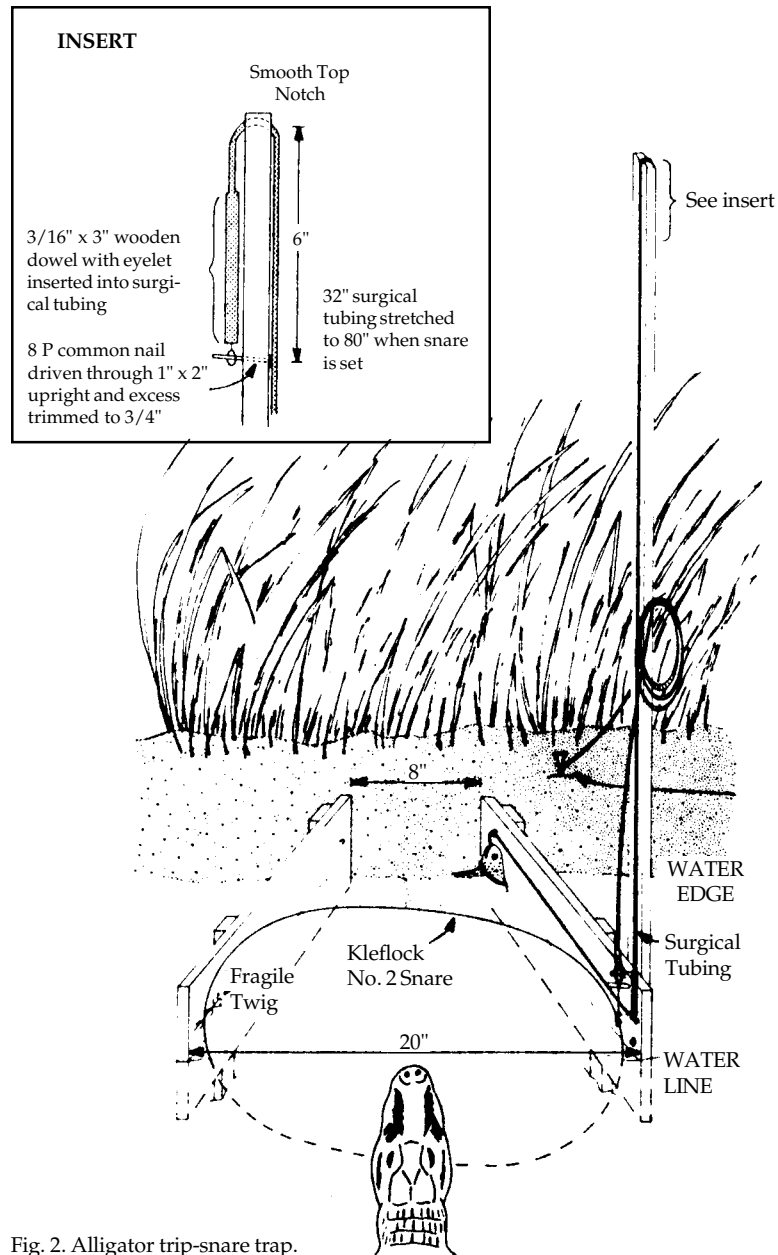


Fig. 2. Alligator trip-snare trap.

the alligator and, after the tip penetrates the skin, withdrawn, leaving the tip embedded under the alligator's skin (Fig. 3b). As tension is placed on the retrieval line, the off-center attachment location of the cable causes the tip to rotate into a position parallel to the skin of the alligator, providing a secure attachment to the alligator. Harpoons are less effective than firearms, but the attached line helps to ensure the recovery of the alligator.

Snatch hooks are weighted multitine hooks on fishing line that can be cast over an alligator's back and embedded in its skin. The size of hooks and the line strength should be suited to the

size of the alligator; small alligators can be caught with standard light fishing gear while large alligators require 10/0 hooks, a 100-pound test line, and a heavy-duty fishing rod. Heavy hooks with nylon line can be hand-cast for larger alligators. After the hook penetrates the alligator's skin, the line must be kept tight to prevent the hook from falling out. Alligators frequently roll after being snagged and become entangled in the line. This entanglement permits a more effective recovery. Snatch hooks work well during the day and at night, provided that vegetation is minimal.

Handheld poles with self-locking

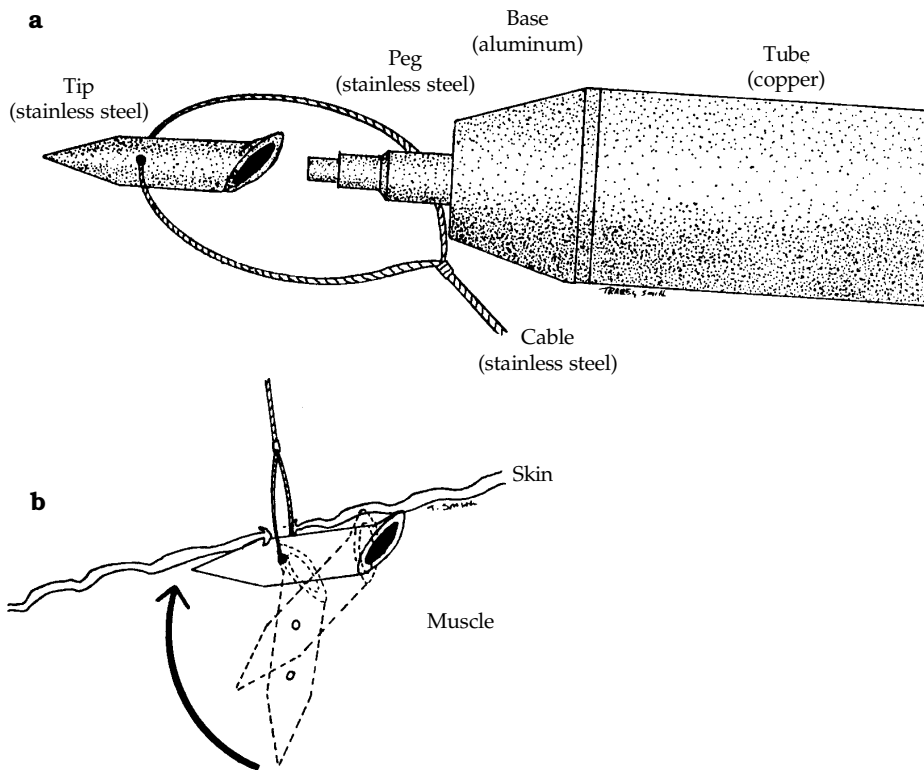


Fig. 3. (a) Detachable-head harpoon; (b) Rotation of harpoon tip after penetration.

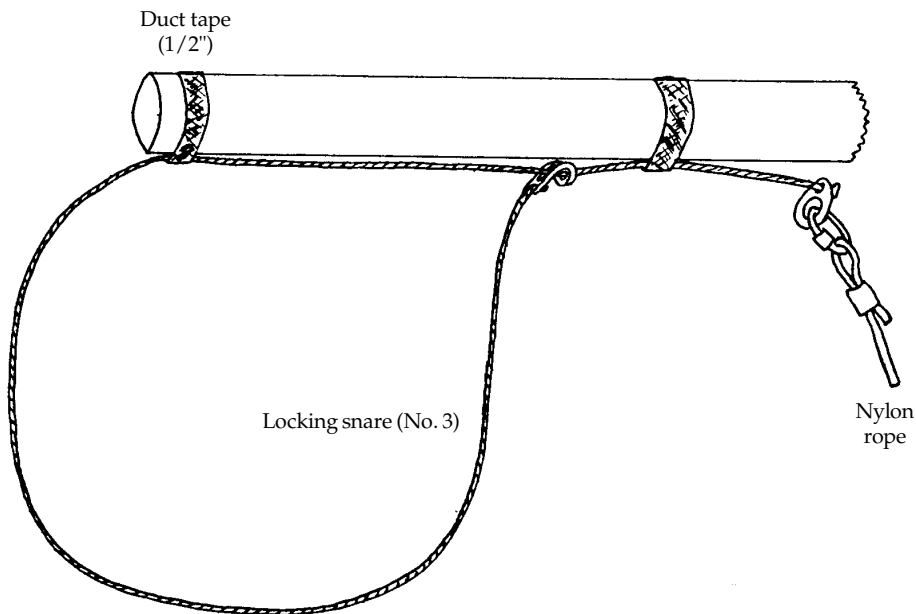


Fig. 4. Break-away snare.

snares (sizes No. 2 and 3; Fig. 4) can be used effectively to capture unwary alligators at night. For smaller (less than 6 feet [1.8 m]) alligators, snares can be affixed to a pole with a hose clamp. For adult alligators, snares should be rigged to “break away” from the pole by attaching the snare to the pole with thin (1/2-inch [1-cm] wide) duct tape (Fig. 4). The tape or clamps allow the snare to be maneuvered and are designed to release after the snare is locked. Carefully place the snare around the alligator’s neck, then jerk the pole and/or retrieval line to set the locking snare. A nylon retrieval rope should always be fastened to the snare and the rope secured to a boat or other heavy object.

For alligators less than 6 feet (1.8 m) long, commercially available catch poles (Fig. 5; see **Supplies and Materials**) can be used. Snake tongs (Fig. 6, see **Supplies and Materials**) are effective for catching alligators less than 2 feet (0.6 m) long.

Avoidance

Measures can be taken to avoid confrontations with alligators and substantially reduce the probability of attacks. Avoid swimming or participating in water activities in areas with large alligators. Avoid water activities at dusk and at night during the warmer months when alligators are most active. Alligators can quickly surge at least 5 feet (1.5 m) onto the shore to seize prey, so care should be taken when at the water’s edge. Do not feed alligators. Avoid approaching nests and capturing young (<2 feet [0.6 m]) alligators.

Economics of Damage and Control

Alligators can cause injuries and death to humans, livestock, and pets. All alligator bites require medical treatment and serious bites may require hospitalization. Infections can result from alligator bites, particularly from the *Aeromonas* spp. bacteria.

Lawsuits that arise from findings of negligence on the part of a private

Fig. 5. Commercial catch pole.

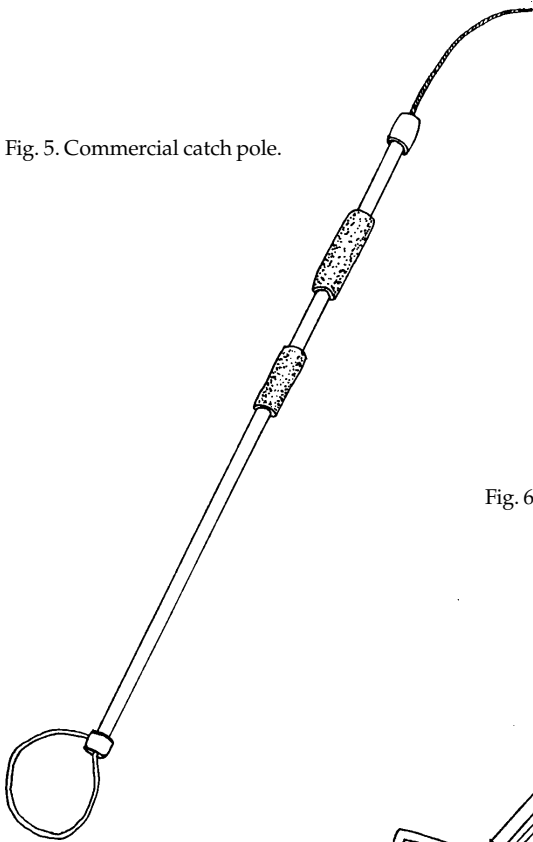
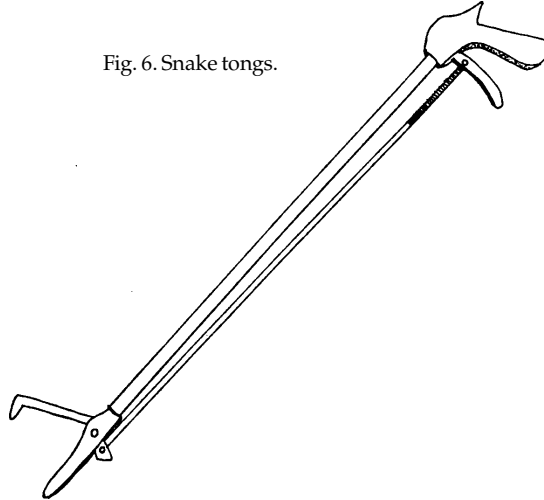


Fig. 6. Snake tongs.



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owner or governmental agency responsible for an attack site can lead to significant economic liability.

In Florida, approximately 15% of the alligator complaints are due to fear of pet losses and, to a lesser extent, livestock losses. Losses of livestock other than domestic waterfowl, however, are uncommon and difficult to verify. Levees damaged by alligator burrows or dens may require repair.

Alligators are valuable for their skin and meat. An average-sized nuisance alligator typically yields 8 feet (2.4 m) of skin and 30 pounds (13.5 kg) of boneless meat with a wholesale value

of \$390 (at \$30 per foot for skins and \$5 per pound for meat). Other products such as skulls, teeth, fat, and organs can be sold, but account for less than 10% of the value of an alligator. Nuisance alligator control programs in several states use the sale of alligator skins to offset costs of removal and administration.

Florida has the most pressing nuisance alligator problem and currently harvests about 4,000 alligators per year. Nuisance alligator harvests also occur in Louisiana (600), Georgia (400), South Carolina (250), and Texas (50).