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FLORIDA'S NUISANCE ALLIGATOR CONTROL PROGRAM

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ABSTRACT

The recovery of alligators from centuries of exploitation, coupled with a burgeoning human population in Florida has resulted in an increasing number of problem animals and alligator attacks. In response to this problem, the Florida Game and Fresh Water Fish Commission implemented a nuisance alligator control program in 1978. A mean of 2513 nuisance alligators per year was harvested during the period 1978 to 1988. The number of alligator complaints, nuisance alligators harvested, and alligator attacks increased significantly over the period ($P=0.0003$, $P=0.0001$, and $P=0.04$). The value of alligator meat remained stable at about \$5.00/pound over the same period, while the price paid for alligator hides has varied from \$8.52 to \$42.72/linear foot. The high economic value of this resource coupled with a commensurate license and tag fee structure has resulted in a program for removal of nuisance alligators that is relatively self-sufficient.

INTRODUCTION

The American alligator (Alligator mississippiensis) is the largest carnivorous reptile in North America, attaining a length of 14 feet and a weight of over 1000 pounds. Alligators are opportunistic feeders and eat a variety of prey, but usually that which is most abundant and easy to catch (Delany and Abercrombie 1986). They feed primarily on aquatic organisms, but will opportunistically take terrestrial animals (Delany and Abercrombie 1986, Delany et al. 1988). Prior to the 1970's authorities believed that alligators would rarely attack humans (McIlhenny 1935, Neill 1971). In fact, from 1958 through 1971 no attacks were reported in Florida. However, in 1972, three attacks resulting in bites were recorded and an increasing number of attacks were documented in subsequent years (Hines and Keenlyne 1976, 1977; Woodward et al. 1987). This trend corresponds to an increase in the alligator population following protection in

the early 1970's (Schemnitz 1974, Hines 1979).

The increasing incidence of alligator attacks on humans as well as depredation of livestock and pets created a public safety problem that required attention. During the early 1970's, Florida Game and Fresh Water Fish Commission (Commission) employees were dispatched to capture and relocate potentially dangerous "nuisance" alligators. By 1975, responding to nuisance alligator complaints and relocating alligators was costing the Commission an estimated \$250,000 per year (Hines and Woodward 1980). The problem steadily increased through the mid-1970's such that Commission staff and money were being diverted from other essential programs. In addition, it became evident that the live-capture and relocation of nuisance alligators would not resolve these problems since wild populations were increasing rapidly (Hines 1979) and large alligators had a tendency to move extensively following relocation. As a result, in 1976 the Commission petitioned the U. S. Fish and Wildlife Service to change the status of alligators

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from endangered to threatened and in 1977 embarked on a pilot study to determine an effective and economical method of managing nuisance alligators.

The pilot nuisance alligator control program (NACP) focused on the lethal removal of problem animals. Hines and Woodward (1980) found that contracted private trappers were more effective in taking nuisance alligators than wildlife officers and wildlife reservists. Three factors were cited for the private trappers success: 1) experience and economic motivation, 2) more attempts were made to take individual alligators, and 3) private trappers were able to respond quickly to all complaints. Furthermore, they found that using private trappers cost the Commission about 25% of the cost of using wildlife officers. Alligators taken under this program were skinned and tagged by the trapper; hides were curred for several weeks, and turned over to the Commission for sale.

Trappers received 70% of the sale proceeds, while the Commission retained 30% to offset some costs of the program. Overall, the pilot NACP resulted in an effective and economical method of handling nuisance alligators.

In 1978, approximately 55 alligator trappers were contracted to remove nuisance alligators under the conditions and guidelines established during the 1977 pilot study (Hines and Woodward 1981). NACP trappers worked under the supervision of regional biologists assigned to coordinate NACP activities. Minor changes in the NACP were made during the period 1979 through 1986, including the initiation of meat sales in 1979. As a result, 100% of the meat sale proceeds were retained by the NACP trappers.

Development of other alligator management program components during 1987 and 1988, including the harvest of alligators on public and private wetlands, necessitated implementation of new license and tag fees that were consistent across program components. Upon legislative approval, this restructuring resulted in the adoption

of a \$250 alligator trapping license, a \$30 per hide tag fee, and the elimination of hide sales by the state. The new fees replaced the 30% of hide sale revenues previously retained by the Commission. Although the average NACP trapper pays about one-half of what he would have paid under the 30% fee structure, the Commission's ability to effectively manage the program has not been jeopardized because there are no longer costs associated with handling and storing hides. Additionally, license and tag fee revenues have offset some of the program costs.

We would like to thank J. D. Ashley and P. J. Allen for providing hide sale data, the Commission' Division of Law Enforcement (DLE) for annual nuisance alligator harvest reports, and V. L. Sims for assisting in the preparation of this manuscript.

METHODS

Harvest

Nuisance alligator complaints are typically received by the duty officer at one of the Commission's five regional offices. Information regarding the subject alligator's behavior, size, and perceived threat are recorded on a nuisance alligator complaint form (Appendix 1). This information is provided to the DLE's regional NACP coordinator for review. Each complaint is evaluated with respect to the alligators potential to cause harm to humans, domestic animals or livestock, or to create dangerous situations such as by crawling across roads. The coordinator also reviews reports of wounded or dead alligators (primarily road-kills) to determine if the hide or meat can be salvaged by NACP trappers.

Complaints received on alligators less than four feet in length are generally not considered a legitimate nuisance problem and complaintants are urged to avoid

those alligators and allow them to move at will. In most cases, these alligators will move to nearby wetlands. In instances where small alligators are disabled or are not capable of escape, the regional coordinator will often dispatch a local wildlife officer to capture and relocate the animal.

Currently, 45 NACP trappers are under contract to remove nuisance alligators at the direction of the Commission. When the NACP coordinator has determined that a complaint is valid and a legitimate threat exists, a permit is issued to the trapper who resides nearest the complaint location. Details of the location and size of the alligator are provided to the appropriate trapper to ensure prompt response. In most instances, the trapper is encouraged to contact or visit the complainant within three days of the issuance of the permit. If the specific alligator is captured and processed, a harvest report form is completed by the trapper and returned to the regional coordinator to identify the final disposition of the complaint. Unused harvest permits are returned within 45 days from the date of issuance to the regional coordinator and subsequently voided.

The NACP trapper must be prepared to lethally remove alligators upon notification from a variety of habitat types. Information provided by the regional coordinator may cue the NACP trapper as to the type of habitat the alligator is in, but the trapper must often carry a small jon boat, outboard, electric trolling motor, and airboat to respond to one nuisance alligator complaint.

Trappers use a variety of weapons to take alligators. Detachable-head harpoons, baited set-hooks, snatchhooks, and snares are used most commonly. The use of firearms, other than powerheads or bangsticks, is prohibited unless the trapper is accompanied by a Commission employee.

NACP trappers often kill alligators immediately upon taking. However, if

the trapper is more than two or three hours from his alligator processing facility or if the public is present, the trapper may take the animal alive. The flexibility of NACP trappers to live-capture alligators helps ensure that the meat and hide do not spoil before processing.

Every alligator harvested from the wild must be tagged immediately upon taking with a numbered, nylon, self-locking harvest tag (Poly-Lok II door seals, E. J. Brooks Co.). This tag remains attached to the hide throughout processing and individually identifies each alligator hide that results from a wild-harvested alligator.

Processing

After harvest, the hide is removed, cleaned, and curred in salt, and the meat is deboned and packaged. Commission regulations require that any alligator meat sold be processed in an alligator processing facility approved by the Department of Agriculture and Consumer Services and meeting other specific state or county criteria that may be required locally. However, trappers may process alligators in unapproved facilities provided the meat is personally consumed and not sold. Because many of the NACP trappers rely solely on the revenues generated from the sale of alligator meat and hides for their income, most have either constructed or secured access to approved facilities. Alligators are generally processed within two to three hours of taking. If the trapper cannot process within this time-frame, alligators are refrigerated at a temperature that ensures an internal body temperature of at most 45 degrees Fahrenheit.

The processing, possession, and commerce of alligator meat, hides, and skeletal parts is governed by a number of Commission regulations.

In short, these dictate specific instructions for preparing the hide and meat for sale, identify who may possess and sell these commodities, and how transaction records of these commodities must be maintained and reported.

RESULTS AND DISCUSSION

Numbers of alligator complaints and nuisance alligators harvested have increased significantly since 1978 ($P=0.0003$, $r^2=0.71$; $P=0.0001$, $r^2=0.83$) (Table 1). Woodward et al.

likely the result of a highly publicized alligator related fatality in June, 1988, and initiation of Florida's first public alligator hunt which began September, 1988.

Public perception, therefore, is important in determining the number of complaints received by the Commission. In general, we find the public to be misinformed with respect to the actual dangers associated with alligators. Compounding this problem, is an

Year	Complaints Received	Permits Issued	Tags Issued	Alligators Harvested	Alligators Harvested/ Complaint
1977	709 ^a	-- ^b	-- ^b	535	0.75
1978	4,914	2,346	3,124	1,871	0.38
1979	4,639	2,486	3,321	1,679	0.36
1980	4,024	2,216	2,856	1,590	0.40
1981	4,931	2,622	3,318	1,871	0.38
1982	6,124	3,209	3,826	2,169	0.35
1983	5,955	3,003	3,550	1,871	0.31
1984	7,289	3,536	4,272	2,201	0.30
1985	6,432	6,187 ^c	6,187	3,023	0.47
1986	6,018	5,458 ^c	5,458	3,049	0.51
1987	7,288	6,618 ^c	6,618	3,853	0.53
1988	10,305	7,978 ^c	7,978	4,464	0.43

^a Complaints from an 11-county area.

^b Permits and tags were issued in conjunction with a pilot study and were not comparable to 1978-1988 data.

^c Beginning in 1985 only one tag was issued per permit.

Table 1. Summary of Florida's nuisance alligator harvests from 1977 to 1988.

(1987) attributed increases during the period 1977 to 1986 to an increase in human populations in close proximity to alligator habitat, a gradual increase in wild alligator densities (Wood et al. 1985, Woodward unpubl. report), and a greater awareness and acceptance of the NACP by the public. Coupled with these effects, the large increase in complaints received during 1988 is

inability of the average person to accurately determine the length of nuisance alligators. As a result, only about 50% of complaints resulted in the issuance of permits to remove alligators, and only 55% of issued permits result in the harvest of an alligator.

Woodward et al. (1987) reported 78 unprovoked alligator attacks on

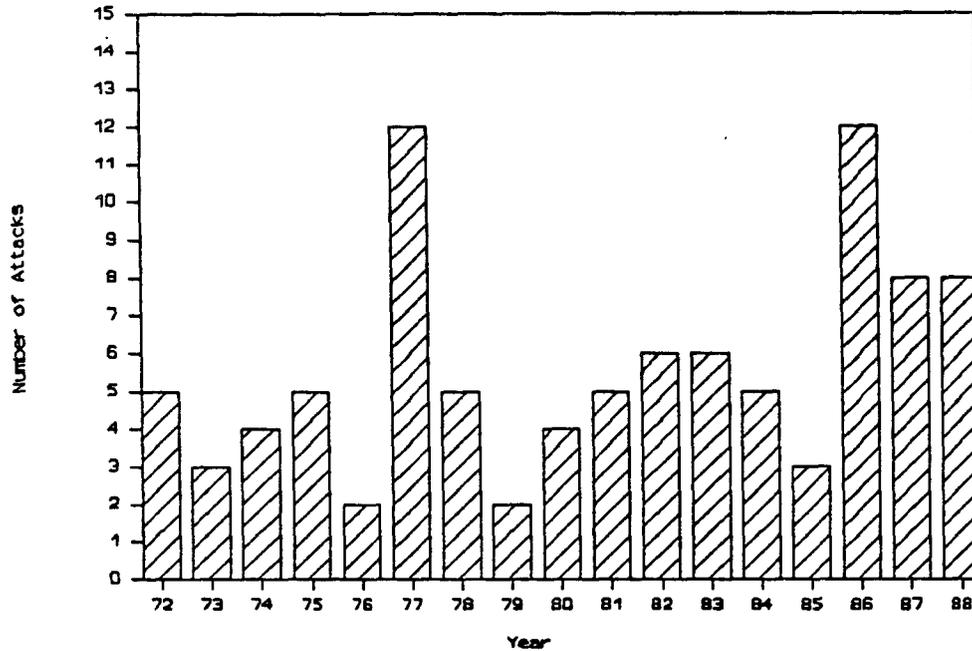


Figure 1. Alligator attacks in Florida from 1972 to 1988.

human beings from 1972 to 1986 and indicated a slight increase in the number of attacks between 1977 and 1986. Additional data for 1987 and 1988 suggest this trend continues ($P=0.04$, $r^2=0.34$) and that the annual average for alligator attacks has increased slightly, from about 5/year to 5.6/year during the period 1972 to 1988 (Fig. 1). Five fatalities occurred as a result of alligator attacks from 1973 to 1988; three of those since 1977^{2/}. During this same

period, Florida's human population has increased from 8,042,000 to 12,417,000 (Florida Dept. of Commerce), while alligator populations have nearly doubled (A. Woodward, unpublished report). We attribute the low occurrence rate and relative stability in attack frequency since 1977 to an effective system of handling complaints and expeditiously removing potentially dangerous alligators, and to an increase in public awareness.

NACP trappers removed an average of 2513 alligators annually from 1978 to 1988 (Table 1), with an annual gross value of \$837,755 (Table 2). Hide prices have fluctuated from \$8.52/linear foot in

^{2/}Fatalities are reported as observed attacks that resulted in death.

Year	Hide Value	Meat Value	Total
1977	\$ 22,128	-- ^a	\$ 22,138
1978	80,599	-- ^a	80,599
1979	-- ^b	\$ 14,468	14,468
1980	286,590	147,628	434,218
1981	279,204	234,624	513,812
1982	115,489	254,555	370,044
1983	111,096	267,640	378,736
1984	514,464	356,310	870,774
1985	390,074	450,500	840,774
1986	520,517	477,840	998,375
1987	1,038,663	553,125	1,591,788
1988	1,454,462	606,485	2,060,947
Totals	\$4,813,286	\$3,363,175	\$8,176,461

^a Alligator meat sales prohibited prior to October 1979.

^b No hide sales were held in 1979.

Table 2. Gross sale value of alligator hides and meat from Florida's nuisance alligator control program from 1977 to 1988.

1978 to a high of \$42.72/linear foot in 1988, but have steadily increased since mid-1986. Woodward et al. (1987) attributed hide price fluctuations to the value of the U.S. dollar, demand for crocodilian leather products, export and import regulations, competition, time of sale, buyers knowledge of hide sale programs, and collusion among hide buyers. More recently, however, increasing trends in hide prices are primarily due to market demand and the value of the U.S. dollar.

In contrast, alligator meat prices are principally affected by local demand. Development of wholesale and retail markets during the early years of the NACP program has resulted in relatively stable market conditions, which have resulted in a consistent price of about \$5.00/pound.

Unlike most other traditional wildlife control programs, the economic value of nuisance alligators has

allowed the development of a program that requires very little outside funding. Under the initial revenue generating mechanism of retaining 30% of the hide sale value and the current license and tag fee structure, the Commission has ensured that the majority of program costs are offset by revenues. Considering the budgetary constraints of many state and federal agencies tasked with managing wildlife related damage, we feel the NACP employs a unique strategy that will continue to ensure public safety while utilizing the economic value of the resource to offset the operational costs of the program.

Wildlife damage control encompasses a diversity of traditional crop and stock depredation and urban wildlife problems (Berryman 1983), as well as concerns regarding public safety. Although many of Florida's wildlife

damage related problems consist of these conventional topics, a small, but highly publicized percentage are related to nuisance alligators. The relatively high visibility of the NACP can be attributed to the public's general misconception and lack of information regarding the alligator's life history. As a result, many visitors, new residents, and long-term Floridians regard the alligator as a competitor for available water resources. Although efforts currently are being made by the Commission to educate the public through brochures and posters, it is likely that nuisance alligator complaints will continue to increase annually over the next several years.

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Appendix I

ALLIGATOR HARVEST COMPLAINT/PERMIT
Florida Game and Fresh Water Fish Commission
Nuisance Alligator Control Program
Florida Wildlife Code 39-25.003

Time & Date: _____ / _____ Complaint No: _____
Complainant's Name: _____ Phone No: (H) _____
Address: _____ (W) _____
City: _____ County: _____ Zip: _____
Location: _____

Details of Complaint:

1. How Many? _____ Approximate size? _____
 2. Date last seen? _____ How long there? _____
 3. Where? _____ Does complainant own property? _____
 4. Is there human activity in the water? _____
 5. Is the alligator threatening pets, livestock, etc.? _____
 6. Is the alligator coming out on land? _____ Where? _____
 7. Do your neighbors agree with the alligator's removal? _____
 8. Do you know if the alligator is or has been fed? _____
- Additional comments: _____

Received by: _____

Law Enforcement Complaint No.: _____ Officer: _____
Recommended action: _____

VERIFICATION

Contact Phone _____ Date _____ Valid? No _____ Yes _____

Additional Comments: _____

This permit authorizes Alligator Control Agent _____ to
take one alligator as specified in 39-25.003, F.A.C., by Method _____

Size: _____ Date issued _____ Expires _____

Coordinator's Signature

The Commission copy of the Alligator Harvest Report Form shall be returned
to the Regional Coordinator within 24 hours after harvest of each alligator,
as provided by the agency agreement.

Reviewed by Regional Commander _____ Date: _____

Comments: _____