

AN ANALYSIS OF LOUISIANA'S 1972 EXPERIMENTAL ALLIGATOR HARVEST PROGRAM

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ABSTRACT

In September 1972 the Louisiana Wild Life and Fisheries Commission established an experimental alligator harvest program. The primary objective of the open season was to evaluate a complex system of quotas, tags, licenses and report forms designed to rigidly control the harvest and shipment of alligator skins. Information was also obtained on the effects of the harvest on alligator populations, food habits, tag recovery rates, body condition factors, aging techniques, reproductive biology and pesticide and parasite levels. A total of 61 alligator hunters were issued 1,961 tags. One thousand three-hundred and fifty alligators averaging 6 feet 11 inches, were taken during the 13 day season. Skins were sold at public auction for \$74,773, an average of \$55.93 each for the 1,337 skins sold. Males comprised 80.29 percent of the kill. Shipments were followed through commerce with no evidence of illegal skins entering the legal traffic. Populations appeared unaffected by the experimental harvest program and there was no indication of an increase in poaching activity.

INTRODUCTION

The American alligator (*Alligator mississippiensis*) can be a significant aesthetic and economic aspect of Louisiana's renewable resources if properly managed. Populations have demonstrated dramatic increases in areas where well planned management programs have been initiated. Because of its value and vulnerability however, the alligator requires special regulations which must be designed to closely regulate the harvest of surplus animals and yet instill in land managers an incentive to develop this valuable resource. The ultimate objectives of these alligator harvest regulations are to enhance existing alligator populations and to provide for the harvest of surplus animals on a sustained yield basis.

The development of Louisiana's alligator management program is based upon a comprehensive long range research program which was initiated in 1958. Since that time, Louisiana has emerged as the leader in alligator research. Although the research projects appear diverse in scope, their primary objective was to provide input into the management of the alligator as a renewable resource.

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Complementing research was a concerted effort to reduce the illegal kill by the enactment of effective state and federal laws governing the taking, possession and transportation of alligators and their products. By late 1970, such legislation was in effect in Louisiana. With the implementation of the amendment to the Lacey Act that same year, nationwide laws regulating the interstate shipment of illegally taken animals became effective.

Seven years before these bills became law, concerned individuals and landmanagers in southwestern Louisiana took the initiative to reverse the downward trend of the alligator population. Through the cooperation of state and federal agents, the local courts and a concerned citizenry, alligator poaching was virtually eliminated in Cameron Parish. During the same period several thousand alligators were transferred from federal and state refuges to privately owned lands in an effort to increase the recovery rate of the alligator population. The primary objectives in increasing the alligator population were two fold: first, to establish the animals as a permanent part of the natural fauna of the marshes and secondly, to harvest surplus alligators as a source of continuing revenue from the land.

The plan worked almost too well. By the late 1960's populations expanded to the level where they were becoming a nuisance. Trappers complained that alligators were eating their nutria and other fur animals. They appeared in stock ponds, swimming pools, flower gardens and garages. Many were killed on highways posing hazardous obstacles to nighttime motorists. Large alligators in canals and bayous are often killed when hit by boat propellers. The problem is greatest in areas of high population densities during periods of drought.

In 1970, the first steps were taken toward harvesting the alligator surplus with the enactment of state legislation setting up the basic framework of the season. A decision was made to allow two years to develop an effective harvest program and, at the same time, test the recently enacted state and federal laws regulating the illegal killing of alligators. By 1972, a harvest plan had been developed which would control the taking of alligators and, through a system of tags and report forms, effectively prevent illegally taken skins from entering the legal traffic. Enforcement efforts had already reduced poaching in southwestern Louisiana to a negligible level.

Several large scale dealers in illegal skins sought to test the new state and federal laws and were imprisoned. Other dealers were quickly made aware of the seriousness of violating the provisions of the amended Lacey Act and . . . "would have nothing to do with illegal skins".

The time was right to test the rather complex system of applications, licenses, tags and report forms which were necessary to the implementation of a workable harvest program. The Louisiana Wild Life and Fisheries Commission, acting on the advice of researchers and professional administrators, decided to test the system by implementing an experimental harvest program in September 1972. This report is an analysis of a portion of the information gathered during that experimental season.

We wish to thank all who worked to make this project a success. Special appreciation is extended to Ted O'Neil, Chief of the Fur Division, Louisiana Wild Life and Fisheries Commission, whose years of experience in working with the fur industry enabled him to formulate a tagging and shipping plan which was both effective and manageable. Mr. Allan B. Ensminger, Chief of the Refuge Division, Louisiana Wild Life and Fisheries Commission, has worked hard coordinating the research and administrative effort which was vital to the ultimate implementation of the program. Enforcement officers, especially Mr. James Nunez, Refuge Warden, worked tirelessly to assure that the complex regulations were understood and obeyed by hunters and non-hunters alike. Field assistance was provided by Paul Jackson, Bobby Faulk, James Collins and a number of

Louisiana Polytech Institute inservice training students. Federal refuge personnel also assisted in the collection of field data. Appreciation is also extended to Diane Hewitt, secretary for the Louisiana Cooperative Wildlife Research Unit, for transforming, into a legible manuscript, a vast pile of "chicken scratch".

BACKGROUND RESEARCH

During the formulation of the harvest recommendations, Commission biologists carefully reviewed the information which had been gathered during the long term alligator research program.

Movement and Habitat Preference

The results of early mark and recapture studies and more recent telemetric investigations added valuable insight into movement and habitat requirements of alligators (Chabreck 1965, Joanen and McNease 1970a and 1972a). These studies identified significant differences in habitat requirements and habitat preferences of mature male and female alligators. The activity patterns of nesting females were especially important in the formulation of harvest regulations. The research indicated that hunting, restricted to canals, bayous and lakes shortly after the eggs have hatched, would result in a harvest composed primarily of adult males and non-breeding alligators of both sexes.

Nesting

Nesting studies identified a well defined breeding season (Joaanen 1969). The majority of nesting took place within a two week period for any given year and usually extended from early June to the first week of July. Spring temperatures appeared to significantly affect the time that the majority of nesting occurred. Hatching dates likewise extended over a two week period since the incubation period normally ranges from 63 to 65 days. By permitting hunting after the eggs have hatched, hatchlings would survive should the female be killed.

Population Surveys

Basic population data were essential to the development of recommendations for the experimental harvest program. It was apparent, from earlier studies, that aerial nest counts were a practical method of alligator inventory. Using the procedures developed by Chabreck (1966), nest counts were used to determine the female breeding population which comprised an estimated five percent of the total alligator population.

Since 1970, inventories have been conducted annually of Louisiana's coastal marsh alligator population. North-south transect lines spaced at 7.5° intervals of longitude were sampled from a helicopter at an altitude of approximately 200 feet. The transects were 350 feet wide and 39 lines were required to sample the entire coast. Alligator nests were recorded by marsh vegetative types based on the map prepared by Chabreck, Joanen and Palmisano (1968)

Population Distribution and Habitat Preference

Alligators were associated primarily with fresh, intermediate or brackish marsh habitats but occasionally ventured into saline marshes. No significant nesting was recorded in salt marshes where salinities exceed 20 parts per thousand. Joanen (1969) found alligators nesting on Rockefeller Refuge in brackish marshes where salinities reached a maximum of 8.3 parts per thousand. In establishing nesting densities, marshes with salinities in excess of 10 ppt were omitted as alligator nesting habitat.

The 1970 alligator survey indicated a total coastal population of approximately 170,000 alligators (Joanen and McNease 1970b). Comparing population densities in three areas of the Louisiana coast revealed that the marshes of southwestern Louisiana had significantly greater alligator populations when compared to those of the southeast.

The Chenier Plain in the southwest comprised 35 percent of Louisiana's marshland but 57.2 percent of the total coastal alligator population. The sub-delta marshes of southeastern Louisiana exhibited a reversal of the figures, with 57 percent of the total acreage and 34.5 percent of the alligators. The active delta, at the mouth of the Mississippi River, occupied 7.9 percent of the area and contained 8.3 percent of the alligator population. In 1970, Cameron Parish had a much higher concentration of alligators than any other coastal parish (Joanen and McNease 1972b).

Approximately 50,000 alligators or 57.5 percent of the total estimated Cameron Parish population were present on privately owned marshlands (Table 1). Federal and state wildlife refuges accounted for 36,800 alligators or 42.5 percent.

Fresh marshes exhibited the highest alligator population density when compared to intermediate and brackish marsh types. Of the total population, 55.5 percent were recorded in fresh marsh. This type occupied only 33.2 percent of Cameron Parish's marshland. Intermediate marshes, transitional between fresh and brackish, comprised 33.0 percent of the area and 34.9 percent of the alligators. Brackish marshes made up 33.8 percent of the acreage and only 9.6 percent of the alligator population. This information on distribution by habitat type was used to determine alligator harvest quotas.

Table 1. Estimated 1970 Alligator Populations in Cameron Parish, Louisiana.

Vegetative Type	Private Property		Wildlife Refuges	
	Estimated No.	Percent	Estimates No.	Percent
Brackish Marsh	4,800	9.6	13,500	36.7
Intermediate Marsh	17,400	34.9	10,700	29.1
Fresh Marsh	27,700	55.5	12,600	34.2
Total	49,900	100.0	36,800	100.0

PROVISIONS REGULATING TAKING AND SHIPMENT OF ALLIGATORS

Federal Regulations

In December 1969, Public Law 91-135, popularly termed the "Amended Lacy Act", was implemented to become effective 180 days after enactment. The provisions make it a federal crime to sell or transport, in interstate or foreign commerce, any form of wildlife or products made from wildlife which was taken in violation of the laws of any state or foreign country. Any person who purchases or receives wildlife in interstate commerce who falsifies records or labels is also liable to prosecution under this act.

Penalties for violation fall into two categories. Those who *know* or *should* know that he is violating the law are subject to a maximum fine of \$5,000 for each violation. Those who *knowingly* and *willingly* violate the provisions are subject to \$10,000 fine and/or one year imprisonment for each violation. Wildlife or products seized shall be forfeited to the government upon conviction.

State Statutes and Louisiana Wild Life and Fisheries Commission Regulations State Statutes

To best understand the function of the state statutes and regulations pertaining to alligators, it is important that the animals role, as determined by the legislature, be clearly understood. Louisiana law classifies the alligator as a non-game quadruped along with wild fur-bearing animals valuable for their skins or hides. As such, their taking, possession and shipment, are governed by a recent act of the 1970 Regular Session of the Louisiana Legislature which revised all the states trapping laws relative to fur animals and alligators. In Louisiana the alligator is, therefore, considered a commercial wildlife species and Act 550 formed the framework which permitted the implementation of a closely regulated commercial harvest of surplus alligators.

Licenses and Shipping

The law provided for the establishment of a twenty-five dollar alligator hunting license and defined an alligator hunter as a person who takes alligators in the wild state for the purpose of selling the skins or live animals. Licenses for fur buyers and dealers, who are allowed to purchase and ship alligator skins, were also established. Only licensed alligator hunters and dealers were allowed to ship alligator skins out of the state. Major emphasis was placed on provisions regulating the shipment of alligator skins in commerce. Information required on official tags for both in state and out of state shipments was described in detail. Out of state tags must give information as to the consignor, the consignee, the dealer's license number, the number of alligator skins in each size class, the individual skin tag number and the total weight of the shipment (Figure 1). Duplicate stubs bearing the above information must be surrendered to the Louisiana Wild Life and Fisheries Commission at the time of shipment. Dealers, buyers or hunters who retain raw alligator skins more than sixty days after the close of the season must obtain permits from the Commission before shipping them out of state and report, at sixty day intervals, the number and description of all skins on hand. Complete records must be maintained on forms provided by the Commission detailing the purchase and sale of all skins. At the time of shipment out of state, a severance tax of twenty-five cents per alligator skin must be paid the state by the dealer or alligator hunter.

Method of Taking

The Louisiana Wild Life and Fisheries Commission was the sole state agency authorized to establish seasons for taking alligators and the means by which they may be taken. State law forbid the taking of alligators with a gun between the hours of sunset and sunrise and those animals less than four feet in length. Other provisions regulating the taking and shipment of alligators were established by the Commission.

Penalties

First offenders are subject to a fine ranging from 250 dollars to 600 dollars or imprisonment for up to 90 days or both. For second offenders, the fine is 500 dollars to 800 dollars and imprisonment for a minimum of 60 days. Anything seized in connection with the second violation is automatically forfeited to the Commission. In the event a person is convicted of a third violation of the alligator laws, the fine shall range between 750 dollars and 1,000 dollars and a minimum of 90 days in jail plus the forfeiture of anything seized in connection with the violation.

Louisiana Wild Life and Fisheries Commission Regulations

Special regulations were established by the Commission to control the taking and shipment of alligators during the experimental harvest season.

No 83 

OFFICIAL ALLIGATOR SKIN SHIPPING TAG
Louisiana Wild Life and Fisheries Commission

Name of Shipper _____
Address _____
License No. _____ Date Shipped _____
No. Alligator Skins _____ Weight of Shipment _____

Notice to Carrier: Do Not Accept with Erasures
This Tag VOID After First Shipment

Detach Here

No 83

Name of Shipper _____
Address _____
License No. _____ Date Shipped _____
No. Alligator Skins _____ Weight of Shipment _____
@ 25¢ each. \$ _____

Number of Alligator Skins in Each Size Class				
2 Ft.	3 Ft.	4 Ft.	5 Ft.	6 Ft.
7 Ft.	8 Ft.	9 Ft.	10 Ft.	Over 10 Ft.

List Alligator Tag Numbers Below

Notice of Shipment of Alligator Skins OUT of State
NOT TRANSFERABLE

NOTICE TO CARRIER
DO NOT ACCEPT
WITH ERASURES

This Tag VOID After First Shipment

SHIP TO: _____

ADDRESS _____

OFFICIAL ALLIGATOR SKIN SHIPPING TAG
Louisiana Wild Life and Fisheries Commission
To Be Used Only for Out of State Shipment
COUPON BELOW MUST BE DETACHED, FILLED OUT COMPLETELY AND MAILED AS INSTRUCTED

Every trapper, dealer or other party is prohibited from shipping and express companies, post offices and common carriers are prohibited by law from accepting shipments of raw alligator skins without proper tag on each package.

RETURN THIS PORTION OF TAG AT TIME OF SHIPMENT

USE SEPARATE TAG FOR EACH THIRTY-TWO (32) ALLIGATOR SKINS SHIPPED.

This tag is numbered and **MUST** be accounted for. If not used, return to Louisiana Wild Life and Fisheries Commission, New Orleans, La., within fifteen days following the close of season. No further tags will be issued upon failure to return unused tags.

VIOLATIONS SUBJECT TO STATE AND FEDERAL PROSECUTION.

SHIPPED TO: _____

ADDRESS _____

Figure 1. Out-of-state shipping tag required by state law.

Season Dates and Methods of Taking

The open season was 13 days beginning at sunrise on September 5, 1972 and extending through September 17, 1972. The taking of alligators was permitted only during the daylight hours and only by licensed hunters. The use of poles to remove alligators from their holes was specifically forbidden.

Application

The hunter had to satisfactorily complete an application form provided by the Commission in order to obtain an alligator hunting license. He was required thereon to furnish proof that he either owned the land or had a notarized agreement with the land owner to hunt alligators on the specified property.

A sample application is presented in Figure 2. The area to be hunted was clearly described by section, township and range. Acreage was calculated by personnel of the Louisiana Wild Life and Fisheries Commission from ownership maps of Cameron Parish. Once the tract was located the vegetative type was determined from the map prepared by Chabreck, Joanen and Palmisano 1968. The land applied for by this particular applicant, for instance, covered 1,440 acres of fresh marsh and 1,920 acres of intermediate type. The number of alligator tags was calculated at the rate of one tag per 100 acres of fresh marsh and one per 150 acres of intermediate marsh. The total number of tags issued to this applicant was 28 and the tag numbers ranged from 442 to 469 inclusive.

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Application Form
ALLIGATOR HUNTER LICENSE
Louisiana Wild Life and Fisheries Commission
400 Royal Street
New Orleans, Louisiana 70130

Name: Nolan Savoie Lic # 9004
 Address: 271 Bay St
Creole, La. Zip: 70023
 Social Security Number: 433 - 32 - 4101

I wish to apply for a license to take alligators in the wild state for the purpose of selling the skins during the 1972 season.

Name of Landowner or Manager: Alvin Dyson (Miami Corporation)
 Address: _____
 Telephone No.: Cameron Parish La 225-2334 or 225-2347

Description of Area to be Hunted: Sec. 3, 4, 9, 10, 11- T14S, R5W;
 (Submit copy of property tax receipt 8/2 of 35- T14S, R5W;
 for land description) 1440 Acres - 15
 Parish: Cameron 1920 Acres - 13
 Nearest town: _____ 28
 Approximate acreage: _____
 I will hunt: 1440 F acres.
1920 I

Nolan Savoie
 Signature of Applicant
August 22 19 72
 Date of Application

Approved: Landowner or Manager
Alvin Dyson
 Notarized by: _____
 Date Approved: August 22, 19 72

Number of official tags issued 28 Tag Nos. 442 through 469 inclusive
not 442

Approved: T. L. Joanen Biologist
 Louisiana Wild Life and Fisheries Commission Title

\$25.00 for license
 5.00 for tags and pliers
 Amount Received \$30.00

Figure 2. Sample of a completed alligator hunter application form.

Harvest Quotas

Information obtained from night counts on Rockefeller Wildlife Refuge in 1966 and data gathered from managed hunts on Sabine National Wildlife Refuge in 1947 and 1948, were used to determine the size composition of the alligator population in Cameron Parish. These data indicate that alligators four feet in length and larger constituted 39.4 percent of the population. On privately owned lands in Cameron Parish, this would total 19,620 alligators. Brackish marsh had 1,875, intermediate marsh 6,847 and fresh marsh 10,898.

A suggested maximum harvest of 20 percent of the alligators 4 feet and longer was determined to be a rate which would provide for the continued increase in the alligator population and at the same time permit an economically feasible harvest. Based on this harvest rate, 375 tags were allotted for brackish marsh, 1,360 for the intermediate type and 2,179 tags for the fresh marsh. A total potential harvest of 3,914 alligators was allotted for privately owned lands in Cameron Parish.

Alligator tags were issued at the rate of one tag per 700 acres of brackish marsh, one per 150 acres of intermediate marsh and one per 100 acres of fresh marsh. Harvest rates on reclaimed marsh (dewatered natural marshes) were given special attention. Although these areas lie within the fresh and intermediate marsh types, the production from dewatered areas was quite low. For this reason only one tag per 700 acres was issued for this type of habitat (Joanen and McNease 1972c).

Open Area

Cameron Parish, located in extreme southwestern Louisiana, comprises approximately 825,000 acres of marshland. Of this total, 784,975 acres were considered alligator habitat. An attempt was made to establish clearly defined land features as boundaries of the area to be hunted. The area open to alligator hunting was bordered by the Gulf of Mexico on the South, Sabine River and Sabine Lake on the West, the Intracoastal Canal to the North and the Cameron-Vermilion parish line on the East. No hunting was permitted on state or federally owned lands or water bodies.

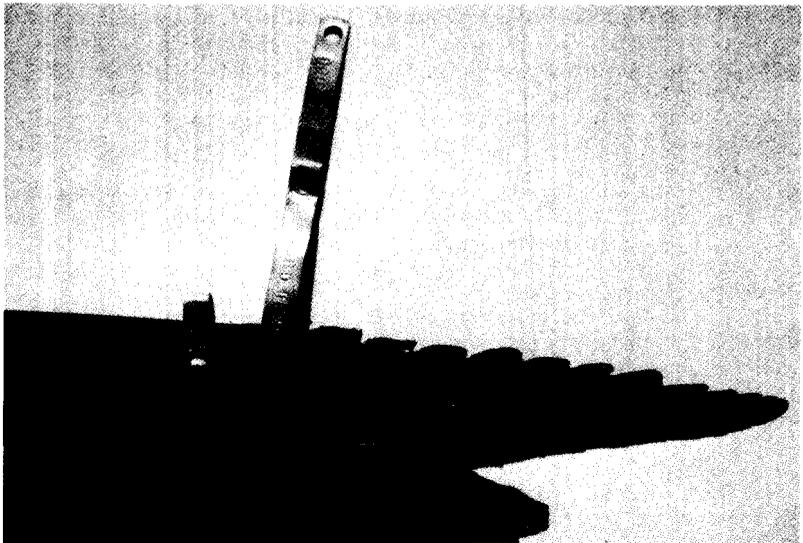


Figure 3. Metal tags properly applied to a sample alligator skin.

Tags

Alligator hide tags were of a tubular rivet design, constructed of brass, which was riveted to a slit in the hide with a special pair of pliers (Figure 3). On the body of the tag appeared the letters "La." for Louisiana, then two series of numbers, the first was "72" for the year and the second the actual number of the tag. A complete tag designation read: La. 72-138. Attached to the tag was a duplicate stub bearing the same numbers as the tag body. This stub was to remain attached to the tag until the skin was shipped from the state. At that time the dealer cut off the stub and returned it to the Louisiana Wild Life and Fisheries Commission along with the required record forms. By removing the stub the tag was destroyed since it was illegal to possess tags with stubs removed. Commission regulations required that only licensed alligator hunters could possess tags and that these tags were to be firmly attached to the skin immediately upon taking. All unused tags were to be returned to the Commission within fifteen days after the close of the season.

Alligator Farmers

Licensed alligator farmers were allowed to sell surplus animals during the season. Alligators on farms could be killed only under the supervision of Commission personnel. The same rules and regulations which pertained to hunters applied to farmers as well.

Validation Procedures

All alligator skins taken during the experimental season were to be inspected by Commission biologists during a three day period beginning on September 18. Skins were brought to Rockefeller Wildlife Refuge inspected and validated by attaching a second tag to the skin. The validation tag was a self piercing monel tag with the inscription: "LWFC, N.O., LA. - 72". Once the skin was validated it was returned to the hunter ready for sale.

Special Skinning Instructions

To avoid the possibility of skins taken illegally prior to the season from entering the legal traffic, hunters were told that special skinning instructions would be issued the day before the season opened. Any alligators skinned contrary to these instructions would be considered illegal. Hunters were contacted by registered mail and by agents of the Commission on September 4 and instructed to leave the skin of both front feet attached to the hide. All skins were inspected during validation to assure compliance with these regulations.

Shipping Regulations

Shipment of alligator skins, both within the state and out of state, was regulated by state statutes. No special regulations were adopted by the Commission for the experimental season.

Supervisory Responsibilities

Since it was the first time such an elaborate alligator harvest program was attempted by the Commission, they felt it necessary that everyone concerned with the administration of the program have their specific duties clearly defined. Overall supervision was the responsibility of the Director and Assistant Director of the Commission. The Refuge Division was responsible for the compilation of research data into recommendations pertaining to areas to be hunted, harvest rates, application reviews and the gathering of biological data from alligators taken during the experimental season. The Fur Division was to issue licenses and tags, maintain records and reports required of hunters, buyers and dealers, supervise the shipment of skins and the collection of

severance tax. Enforcement Division was charged with the duties of enforcing the regulations governing the harvest and to serve in a liaison capacity in the event unforeseen problems arose in the field. The public information section was in charge of news releases and informing the various news media which expressed an interest in covering the season.

PUBLIC RELATIONS

One of the most formidable tasks encountered in developing the harvest program was to inform the public of the Louisiana Wild Life and Fisheries Commission's background and objectives in establishing an open season on alligators. For many years National publicity was focused on the plight of the alligator. It, along with the Whooping Crane, had become the symbol of vanishing American wildlife. The immediate threat was accurately identified not as pesticides, loss of habitat or disease but over exploitation for the fabrication of luxury products from their skins.

Several persons canceled vacation trips to Louisiana in protest; little realizing the sincerity and genuine effort involved in the conservation of the alligator in Louisiana. The announcement came as a shock to those who had not closely followed the progress made in Louisiana in restoring alligator populations. It appeared as a "spur of the moment" decision, not the culmination of a long term project extending over a decade. The flood of news releases and articles prepared by the Commission prior to the season had little effect in turning the tide of controversy.

The news media, sensing the essential ingredients of a good news story, gave full coverage to every detail of the program. Although a few reporters and writers came to gather "ammunition" for a blast at the Commission, most came with an open mind and made a concerted effort to understand the complex situation. Those who participated in "show me" tours and hours of explanation and discussion with the technical personnel, generally supported the Commission's program. In reporting, they presented the facts from both points of view and allowed the reader to make up his own mind. A well coordinated program developed by the Information Section of the Administrative Division of the Commission was effective in presenting a vast amount of technical information to the news media in an effort to avoid any misunderstanding.

LAW ENFORCEMENT

The ability to control the illegal taking of alligators is the first step toward their effective management. To be effective, law enforcement must have the full co-operation of the agents, district attorneys, courts and above all the people. Cameron Parish took the initiative in developing a well co-ordinated effort to protect the alligator by closing the hunting season in 1962, one year before the remainder of the state. Several penalties were meted to alligator violators, the most severe of which was a sentence of 5 years and 165 days imposed on an alligator hunter with a previous record of similar violations. The concern exhibited by the people of Cameron Parish for the enforcement of alligator laws was the primary reason this parish was selected for the initial experimental harvest.

A well co-ordinated enforcement effort was developed during the formulation of the program. A meeting was held prior to the season to inform the agents of all of the rules and regulations regarding the hunt. Federal agents, federal refuge managers and representatives of the Texas Department of Parks and Wildlife were also in attendance. Thirty state wildlife enforcement agents were assigned

to the hunt area. They worked in pairs with at least one of the men experienced in alligator enforcement work. Experienced agents were brought from coastal parishes in southeastern Louisiana and agents from north Louisiana were moved in to assure uniform enforcement coverage. Approximately 3,000 total man hours were expended in enforcement work in the hunt area. No alligator violations occurred during the season. One case was filed after the season against a licensed dealer who had an improper in-state shipping tag. He had seven more legally taken skins in his possession than shown on the tag and claimed that they were inadvertently picked up while loading his vehicle.

Enforcement agents proved to be an important link between alligator hunters and the technical personnel administering the hunt.

RESULTS AND DISCUSSION

Area Hunted

Applications for alligator hunting licenses were accepted for review from August 7, 1972 to August 25, 1972. Licenses were issued to 59 hunters in Cameron Parish who were to hunt 278,168 acres. This represented approximately 35.3 percent of the privately owned marshland in Cameron Parish on which alligator hunting was permitted. Three additional licenses were issued to registered game breeders so that they might dispose of some of their surplus alligators.

Several large tracts did not hunt because they had adopted a "wait and see" attitude toward the season. Prices were uncertain and dealer enthusiasm appeared low, which is usually the mood of most businessmen when they are about to make a large purchase. There was a question as to federal shipping permit requirements which must accompany shipments involving the skins of endangered species. The system of applications, tags, report forms and restrictive hunting methods caused some large landowners to refrain from hunting at least the first year.

Much of Cameron Parish is divided into smaller private holdings. The maximum allowable rate of harvest was one alligator per 100 acres. Several hunters pooled smaller tracts of land into an area large enough to permit an economically feasible number of alligators to be harvested. This was difficult because these areas were often in dewatered "districts" and the allowable rate for this habitat was one alligator per 700 acres which required more than one square mile of land for a single tag!

Alligator Harvest

A total of 1,961 alligator tags were issued. The number ranged from a low of two tags issued one hunter to a high of 227 tags to another. During the 13 day season, 1,350 alligators were taken (Table 2). This represents 68.8 percent of the total number of tags issued. Only 30.3 percent of the hunters met their quota of allotted tags. Alligator farmers took 35 animals which were included in the total.

Why Wasn't the Quota Met?

The most significant factor responsible for the 68.8 percent take was the restrictive measures regarding the methods by which alligators could be taken. Every hunter interviewed stated that he could have easily killed his quota were he permitted to hunt at night. Because of the experimental nature of the season, no night hunting was permitted. "Pole" hunting was also outlawed since information obtained from supervised hunts on Sabine National Refuge in the early 1960's indicated that this method significantly increased the take of breeding females. Hunters were therefore restricted to either day time shooting or "fishing". Fishing was a method by which alligators were taken with a

Table 2. Licenses, Alligator Tags and Distribution of Harvest for 1972 Experimental Alligator Harvest, Cameron Parish, Louisiana.

	CORPORATION LAND		ANOTHER'S LAND		OWN LAND		PARISH LAND		TOTAL	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Alligator Hunter Licenses Issued	29	49.1	21	35.6	8	13.6	1	1.7	59	100.00
Alligator Tags Issued	1,341	68.4	477	24.3	141	7.2	2	0.1	1,961	100.0
Alligators Taken	817	60.5	430	31.9	101	7.5	2	0.1	1,350	100.0
Percent of Quota	60.9		90.2		71.6		100.0		68.8	
Average Number Tags Per Licensee	46.5		22.7		16.4		2.0			
Average Number Skins Taken Per Licensee	28.2		20.5		12.5		2.0			

baited hook and line much like commercial cat fishing. Both methods are relatively inefficient when compared to night hunting and both required that the hunter work during the heat of the September days. It had been over a decade since alligator hunting was allowed in Cameron Parish. Even old time hunters had to re-educate themselves to the habits of the alligator especially in view of the different hunting methods.

The short 13 day season also contributed to a reduced take. Hunters were still learning how to catch alligators up to the last day of the season. Most hunters got less than 10 days of effective hunting in during the entire period. The old method of hunting often involved a full night of shooting, a short rest period and a day of skinning. Most professional hunters had little time to rest during the short experimental season and practically all work had to be done during the daytime.

A typical day would involve running the "lines" beginning at sunrise. The animals were slowly brought to the surface and shot in the brain. During the course of checking the lines, a few free swimming alligators were shot. The catch was then brought in to be skinned, usually about noon. Skinning began immediately and, depending on the amount of assistance and the number of alligators, often continued until well after dark.

Since the mean size alligator was nearly seven feet in length, it took the average man nearly an hour to skin, scrape and salt a single animal. Five to seven such alligators per day was the maximum work load one could accomplish. Only five hunters took over 50 alligators during the open season. A number of trappers were allotted more tags than could possibly be used during the short season thus reducing the overall harvest.

During the season hunters were constantly inquiring about the price they could expect to get for their skins or indeed if any buyers would even show up to purchase their skins. There was no way of knowing what the price would be because it was many years since alligators were legally sold in Louisiana. The apparent lack of buyer interest caused many hunters to become apprehensive and unwilling to spend the money or effort necessary to meet their quota. It was easy to make excuses not to get out and fight the hot September sun. After the sale on September 20 these men regretted not having filled their quotas.

Size and Sex Composition of Harvest

Earlier studies (Joanen and McNease 1970a and 1972a) suggested that an early September hunt which incorporated the restrictive harvest regulations would result in a kill composed largely of large males and immature animals of both sexes. Breeding females would make up a very small percentage of the harvest. The results of the 1972 season showed that the kill was made up primarily of large animals. The average length of the 1,347 measured skins was 6 feet 11 inches and ranged from 4 feet to 13 feet 7 inches. The modal size class was 6 to 7 feet. Approximately 65.7 percent of the skins were between 5 and 8 feet (Table 3).

Larger males were most vulnerable during the season because they were found in canals, bayous and lakes which were readily accessible. Fishing with a baited line appeared to catch the larger size animals. In some instances the bait was intentionally placed one foot or more above the surface of the water so that only the larger animals could reach it. In tide affected marshes the trapper had to consider the tide stage when setting his lines. Trappers generally sought the larger animals because, with a limited number of tags, the larger the alligators the greater their income.

A sample of 337 alligators indicated that 74.8 percent were caught using a baited hook and line. The remaining 25.2 percent were shot and usually retrieved from the bottom with a grapple hook. A few alligators were temporarily lost but

were recovered the following day when they floated to the surface. The rate of crippling loss was not determined but interviews and field observations indicated that it was not significant.

Table 3. Size Composition of Alligator Skins Taken During the 13 Day Experimental Harvest Program, Cameron Parish, 1972.

<u>Size Class (feet)</u>	<u>Number Measured</u>	<u>Percent</u>
4-5	142	10.54
5-6	270	20.04
6-7	327	24.29
7-8	288	21.38
8-9	149	11.06
9-10	93	6.90
10-11	57	4.23
11-12	16	1.19
12-13	4	.30
13-14	1	.07
	<u>1,347*</u>	<u>100.00</u>

*Three skins not measured.

Most of the larger animals were taken by the "fishing" method. Approximately 50 percent of those taken on lines were over seven feet in length. Alligators taken by shooting were generally in the smaller size classes, 70.5 percent being less than 7 feet in length (Table 4).

No instances of undersized (less than four feet) alligators were reported caught on lines. Smaller alligators usually remain in the shallow interior marsh ponds and feed on crustacea or small fishes, (Valentine et al. 1972 and Chabreck 1971) and it is not likely that they would take blackbirds or the fish suspended well above the water on baited hooks. Chabreck (1966) found that alligators less than four feet in length comprised 60.6 percent of the population. The harvest methods permitted during the experimental season were selective for the larger size classes.

We examined 487 alligator carcasses during the season. Adult males (over 6 feet) made up 85.09 percent of the mature alligators inspected in the field for which accurate information on the size class, sex and weight were obtained. Alligator populations appear to have more males than females in the larger size classes (Chabreck 1966). Although there would appear to be a surplus of males in the population, careful consideration should be given to the long term effects of the harvest of a large segment of breeding size animals.

Table 4. Method by Which Alligators Were Taken During 1972 Experimental Hunt.

<u>Size Class</u>	<u>Hook and Line</u>		<u>Shot-Free Swimming</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
4-5	15	6.0	14	16.5
5-6	47	18.7	25	29.4
6-7	63	25.0	21	24.6
7-8	57	22.5	15	17.6
8-9	23	9.1	6	7.1
9-10	29	11.5	1	1.2
10-11	15	6.0	2	2.4
11-12	2	.8	1	1.2
12- u	<u>1</u>	<u>.4</u>	<u>0</u>	<u>0</u>
TOTAL	252	100.0	85	100.0
		(74.8%)		(25.2%)

Table 5. Size and Sex Composition of 303 Alligators Taken During the 1972 Experimental Harvest.

<u>Size Class</u>	<u>Males</u>		<u>Females</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
4-5	21	8.8	13	20.0
5-6	55	23.1	19	29.2
6-7	61	25.6	13	20.0
7-8	42	17.7	18	27.7
8-9	29	12.2	2	3.1
9-10	16	6.7	0	0.0
10-11	10	4.2	0	0.0
11-12	3	1.3	0	0.0
12-13	<u>1</u>	<u>0.4</u>	<u>0</u>	<u>0.0</u>
TOTAL	238	100.0	65	100.0

Females constituted less than 20 percent of the alligators examined in the field. An estimated 140 females over 6 feet in length were taken during the season. Earlier reproductive studies indicated that 66.7 percent of the adult size females were capable of producing young each year. Applying these figures to the harvest, 93 of the 140 females taken were capable of breeding the year of the hunt. Joanen and McNease (1970b) calculated that there was an estimated 2,500 (5% of population) breeding females in the open area of Cameron Parish. The 140 mature females represents only 5.6 percent of the breeding females assuming that 100 percent of them were capable of breeding. A sample of non-productive females taken from Rockefeller Wildlife Refuge showed that 25.9 percent were quiescent (capable of breeding but had not during the year examined) and 7.4 percent were barren (Joanen and McNease 1973a).

It is not likely that this rate of harvest will significantly affect the population of breeding female alligators in the area hunted.

Validation and Sale of Skins

At the close of the experimental season all hunters were required to bring their skins to Rockefeller Wildlife Refuge to be inspected and validated. The alligator tag numbers and hide measurements were recorded for each skin and a monel

validation tag attached. The validation process extended over a three day period and 1,337 skins were sold at public auction on September 20, 1972. Four buyers participated in the sale which consisted of sealed bids for each individual trapper's lot of skins. Variation in the care with which each hunter prepared the skins was an important factor considered by dealers in grading their quality. To get a top price the skins had to be clean of excessive amounts of fat and flesh, have no significant holes in the usable part of the skin and lastly, have their maximum width which was achieved by leaving one row of "horns" on each side of the belly skin. Although there was much talk of "buttons" (osteoderms) during the grading process, they were apparently not a major consideration in the ultimate price paid for the skins.

Bids were opened by one of the major land managers who participated in the season. The first bid opened was for a lot of 79 skins which had been pooled by two hunters. The highest bid was \$4,521 and the closest other bid was \$3,500. This was considerably more than the hunters had anticipated receiving for their skins. After all of the bids were opened, the 1,337 skins netted a total of \$74,773 with an average price of \$55.93 per skin. The average price per linear foot was \$8.10; larger skins in top condition brought considerably more. Landowners received 10 to 30 percent of the total value of each lot of skins taken from their land. Seven skins were retained by hunters "trophies" and six were sold to dealers the day after the 20 September sale.

Shipment

A major objective of the experimental season was to test the shipping procedures to assure that no illegally taken skins entered the legal traffic. Control on the shipment was accomplished through a series of shipping tags and report forms which were required of hunters, buyers and dealers. Hunter report forms were completed at the time of validation and public auction. From these forms the buyer of each skin was identified. Dealers, shipping their skins out of state, are required to complete official shipping tags (Figure 1). The next destination was recorded on the shipping tags. From this point the skins were followed by correspondence and conversations with the persons handling the skins.

A diagrammatic scheme of the movement of the alligator skins is presented in Figure 4. The primary source of skins was from corporation owned lands which accounted for 60.5 percent of the total harvest and 49.1 percent of the licensed hunters. No state or federally owned lands were hunted but two skins (0.1%) were taken from a section of parish owned land. Of the four dealers who participated in the auction, three were successful bidders (Table 6). *Mirandona Bros.* bought 1,104 skins, *Fur Trappers Associates* 166 and *Tom Mudd* 73. Following the initial sale, Mr. Mudd's skins were sold to the other two dealers. *Mirandona Bros.* ultimately bought 1,157 skins and *Fur Trappers Associates* 186. This total includes six skins sold after the auction to *Fur Trappers Associates*.

Mirandona Bros. had 86.2 percent of the skins which were all shipped to New Orleans on September 21, the day after the sale. On October 6, 1972 they were shipped to France by ship arriving on October 18. They were processed and out of the tanning plant in France by November 2, 1972, forty-four days after the auction in Cameron Parish.

Fur Trappers Associates bought 13.8 percent of the skins and shipped them to Newark, New Jersey by air freight on September 24, 1972. There the raw skins were separated into two groups. The largest lot, consisting of 165 skins, was shipped to France on October 24, 1972. The other lot of 20 "hornbacks" was shipped to Japan on November 6, 1972.

Mirandona Bros. shipment of 1,157 skins required 39 wooden barrels with a total weight of 17,503 pounds. The other shipment of 186 skins weighed 1,578 pounds.

Shipments out of Louisiana were closely supervised with no evidence of illegal skins entering the legal traffic.

Enforcement Effort

Enforcement effort was used to determine the effect of the experimental alligator harvest on the rate of violations. Information on man hours expended and cases filed was requested for federal and state agents as well as state refuge wardens for calendar years 1971 and 1972.

Federal agents expended a total of 3,948 man hours on alligator oriented enforcement in 1971 and filed 21 alligator cases. This amounts to 188 man hours per case. In 1972, the year of the experimental season, 2,645 man hours were expended and 4 cases filed; approximately 661 man hours per case. These figures indicate that 3.5 times the effort was required to file a case in 1972 than 1971 (Table 7). Man hour figures do not include out of state investigations originating in Louisiana or preparation for court and travel time to testify.

State agent enforcement effort followed a similar trend. Information provided for District 8, a vast area of coastal marsh in southeastern Louisiana, indicated that in 1971, 1,981 man hours were spent and 25 cases filed. The enforcement effort more than doubled in 1972 and 18 cases were made. It required 2.9 times as many man hours to make a case in 1972 than in 1971.

State refuge wardens accounted for much of the alligator enforcement effort in coastal Louisiana. Their time was not necessarily confined within the boundaries of the refuge. Only two cases were filed each year by refuge wardens. In 1971 it required 4,658 man hours to make a case and 6,766 man hours in 1972. Enforcement effort indicated that there was a significant reduction in the number of alligator violations in 1972 when compared to the previous year.

Another good index to the degree of alligator hunting was skinned carcasses. During the open season such carcasses were apparent to even the most casual observer yet represented only 1,350 dead alligators. It was no easy matter to dispose of an animal the size of an alligator. Other areas of the state exhibited no apparent signs of illegal hunting. It was evident that the open season did not stimulate alligator poaching anywhere in Louisiana.

Population Trends

An aerial inventory of nesting alligators in the Louisiana coastal marshes has been conducted since 1970 (Joanen and McNease 1972b). The survey was designed to determine alligator population densities by region and vegetative type and also to monitor annual population trends. The effects of the experimental harvest program on the alligator population was of primary concern since the harvest rates were designed to allow for a continued increase in the population while at the same time allowing an economically feasible harvest.

Population estimates for privately owned marshlands in Cameron and adjoining Vermilion Parishes have exhibited significant increases in both 1972 and 1973 over previous years (Table 8). Figures for 1973 showed a 33.4 percent increase over the previous three year average (Joanen and McNease 1973b).

Since 1971, an alligator night count survey has been conducted throughout the southeastern United States. The objective of the survey was to establish base line information on the alligator in an effort to determine gross changes in population trends (Chabreck 1973a).

Table 6. Results of the Sale of Alligator Skins From the 1972 Experimental Season Held in Cameron Parish, Louisiana.

DEALER	INITIAL SALE											
	CORPORATION LAND			ANOTHER'S LAND			OWN LAND			PARISH LAND		
	Number	Percent	ALLIGATOR SKINS PURCHASED	Number	Percent	Number	Percent	Number	Percent	Number	Percent	TOTAL
Mirandona Bros.	728	91.5	349	79.2	25	24.0	2	100.0	1,104	82.2		
Fur Trappers Assoc.	68	8.5	39	8.8	59	56.7	0	0	166	12.4		
Tom Mudd	0	0	53	12.0	20	19.3	0	0	73	5.4		
Ralph Sagrera	0	0	0	0	0	0	0	0	0	0		
TOTAL	79	100.0	441	100.0	104	100.0	2	100.0	1,343	100.0		
	FINAL SALE											
Mirandona Bros.	728	91.5	402	91.2	25	24.0	2	100.0	1,157	86.2		
Fur Trappers Assoc.	68	8.5	39	8.8	79	76.0	0	0	186	13.8		
TOTAL	796	100.0	441	100.0	104	100.0	2	100.0	1,343	100.0		

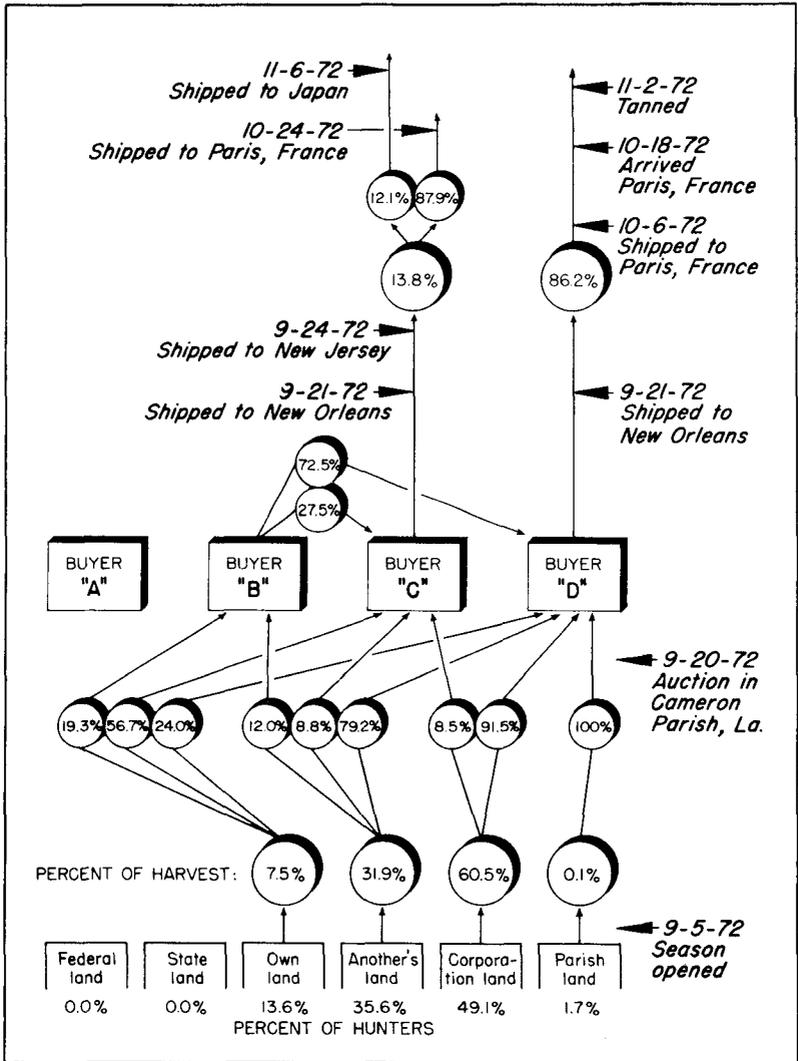


Figure 4. Diagrammatic scheme of the movement of alligator skins taken during the 1972 experimental harvest program conducted in Louisiana.

Table 7. Alligator Enforcement Effort in Louisiana for 1971 and 1972

Years	Federal Agents			State Agents*			State Refuge Wardens		
	Man Hours	Cases Filed	Man Hours Per Case	Man Hours	Cases Filed	Man Hours Per Case	Man Hours	Cases Filed	Man Hours Per Case
1971	3,948	21	188	1,981	25	79	9,316	2	4,658
1972	2,645	4	661	4,227	18	235	13,532	2	6,766

* - Only District 8 - coastal parishes of southeastern Louisiana. Does not include approximately 3,000 man hours in Cameron Parish during the period of the open alligator season.

Table 8. Alligator Population Estimates for Privately Owned Marshlands in Cameron and Vermilion Parishes.

Year	Estimated Population	Percent Increase or Decrease In Comparison To 1970
1970	51,760	--
1971*	31,340	-39.45%
1972	60,500	+16.88%
1973	71,897	+38.90%

*Extremely dry nesting conditions in 1971 resulted in a low nesting effort.

In an effort to evaluate the effect of the experimental harvest on alligator populations, routes in Louisiana conducted in 1972, prior to the season, were compared to the same routes surveyed in 1973 (Table 9). Federal and state refuges and state wildlife management areas averaged 3.53 alligators per mile of waterway in 1972. In 1973, an average of 4.03 alligators were observed per mile along the same routes, an increase of 14.2 percent. Non-refuge areas surveyed averaged 1.40 alligators per mile in 1973 an increase of 52.2 percent over the previous year.

The results of the aerial inventories and the night counts indicate that the experimental harvest did not adversely affect alligator population levels in Louisiana.

SUMMARY AND CONCLUSIONS

The Louisiana Wild Life and Fisheries Commission, acting on the recommendations made by research and administrative personnel, established a short experimental alligator harvest season in a small area of southwestern Louisiana during September 1972. The primary objectives of the program were to evaluate a complex system of quotas, tags and report forms which was felt necessary to a controlled harvest of surplus alligators and to measure the effects of this harvest on alligator populations. Secondary objectives were to gather biological information relative to food habits, tag recovery rates, body condition factors, aging techniques, reproductive biology and pesticide and parasite levels of alligators.

The system worked smoothly with 61 licensed alligator hunters being issued 1,961 tags. A total of 1,350 alligators averaging 6 feet 11 inches were taken during the 13 day season. One thousand three hundred and thirty-seven skins were sold at public auction for \$74,773, an average of \$55.93 per skin. As predicted males comprised the majority of the harvested animals (80.29%). An estimated 140 females over 6 feet were taken during the season which represented approximately 5.6 percent of the nesting population in the open area. Skins were followed through commercial channels with no evidence of illegal skins entering the legal traffic. Population levels appeared unaffected by the experimental harvest program and there was no indication of an increase in poaching activity.

It is felt that Louisiana's alligator management program is an excellent example of modern, goal oriented, wildlife research, enforcement and management. Approximately 14 years of comprehensive research, a dedicated state and federal law enforcement effort, enactment of effective state and federal laws and the cooperation of many agencies and individuals were incorporated into the program. The impetus for setting the season went beyond established

Table 9. Comparison of 1972 and 1973 Alligator Night Counts Conducted in Louisiana.

	Refuges and Wildlife Management Areas					Non-Refuge Areas						
	Total routes	Total miles	Total alligators	Alligators per mile	Total routes	Total miles	Total alligators	Alligators per mile	Total routes	Total miles	Total alligators	Alligators per mile
1972a	7	80.0	282	3.53	13	106.0	97	0.92				
1973b	7	79.2	319	4.03	13	119.2	167	1.40				
percent increase	--	--	13.1	14.2	--	--	72.2	52.2				

aChabreck 1972.

bChabreck 1973.

concepts of management often based on carrying capacity, predator-prey relationships, economic incentives and the like. In fact, the program was initiated because the alligator is a renewable resource which has exhibited a remarkable response to management and the primary function of the Louisiana Wild Life and Fisheries Commission is to manage our Wildlife resources.

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