THE TENSAS DEER HERD

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INTRODUCTION

The incomplete story of the Tensas deer herd is one of natural and man-made tragedy. Early records indicate that the undisturbed hardwood forests of the Mississippi River Delta supported few deer. Periodic flooding is believed to have often reduced the deer herd to well below the level imposed by the scarcity of browse which is associated with extensive stands of mature timber.

White man with his land clearing, logging, land abandonment, and flood control created excellent deer habitat. The record 1927 flood almost wiped the deer herd out. From this extreme low they rapidly increased to their present status of overpopulation, deterioration of native range and a high degree of dependence on agriculture.

Management has been by emotion rather than by sound game management principles. The need to "protect the does" has been so instilled into people of this area that it is natural that many are reluctant to change. The Sheriff of Tensas Parish, a well respected gentleman who has been a leader in this parish for many years, has long used the influence of his office to build the deer herd up.

Crop damage began to occur in the early 1940's and continued to increase, becoming severe in the early 1950's.

Many plans have been advanced for herd reduction. All have been objectionable to some people.

This paper was written to try to emphasize some of the misfortunes of mismanagement of a deer herd. Although it is about the deer herd in Tensas Parish, Louisiana, its neighboring parish, Madison, is experiencing some of the same troubles and it is often referred to in this paper.

DISCUSSION

Tensas Parish, in Northeastern Louisiana, lies entirely within the Mississippi River delta; its eastern boundary is the Mississippi River and its western boundary, except for a small area in the extreme northwest corner, is the Tensas River, which separates Tensas from Franklin and Catahoula Parishes. Immediately north of Tensas Parish is Madison Parish, while Concordia Parish borders it on the south.

The topography of the land is flat to gently undulating throughout the parish. The wooded area of the parish is gently undulating and is a series of low ridges, flats, and sloughs. The average elevation is 78 feet above mean Gulf level.

Alluvial soils prevail throughout Tensas Parish (Soil Survey Division, U.S.D.A., 1956). Commerce silt loam soils border the banks, or former banks, of the Mississippi River. These soils are moderately well drained, with pH value varying from neutral to alkaline. These are the best soils for agricultural use. Further from the immediate deposits of the Mississippi River there are Mhoon soils, which are composed of finer particles. They are less permeable than the Commerce soils and have a pH range from neutral to alkaline. These soils are somewhat less desirable for agricultural production. Sharkey, a third soil series, occurs in the Mississippi River flood plain in Tensas Parish. Sharkey soils are dark, poorly drained, clay-type soils, very adhesive when wet and very hard when dry. These soils are slightly acid to alkaline and are the least suited to local agriculture and have been for the most part, left in forest growth.

Tensas Parish, primarily an agricultural area, has a land area of approximately 398,720 acres. In 1958 there were approximately 17,000 acres in cotton, 25,000 acres in soybeans, 40,000 acres in pasture of which 10,000 acres have

been cleared since 1952, and 65,000 acres in other row crops. In 1958 there are 3,000 acres in the soil bank (acreage reserve). The remaining approximately 250,000 acres is in woodland. The principal cash crops are soybeans and cotton. After most of the soybeans and some of the cotton is harvested that land is planted to wheat and oats.

According to the Agricultural Stabilization Committee office in Tensas Parish there are between 650 and 675 farms in the parish. The average size of the farm is approximately 250 acres. The common farming practice is by one large ownership broken down into three or four operators that farm independently.

As to the size of the deer herd in Tensas Parish, many estimates or guesses have been made. It has been estimated that there are between 25,000 and 27,000 animals. Some think that the deer herd is not as large now as it was in the early 1950's.

The Tensas deer herd was exposed to disasterous floods in 1912, 1913, 1916, 1922 and 1927, especially was this true of the flood in 1927; this flood almost wiped out the deer herd. Many of the officials and people of Tensas Parish fed and cared for the few remaining deer and the season was closed for a few years thereafter, exactly how long is not known. This was the beginning of the herd that grew to its present status.

The deer herd built up because of the following reasons: (1) strict law enforcement, (2) state law—bucks only and (3) ideal conditions.

Strict law enforcement was one of the main reasons for the herd build-up. Perkins (1958) stated that the excellent protection afforded by land owners and parish officials, combined with the fact that many areas were inaccessible, thereby limiting hunting pressure, allowed the deer herd to maintain the maximum rate of reproduction. Most of the enforcement problems were handled by the Parish Sheriff and high fines and jail sentences were not uncommon.

A state law of bucks only being legal during the hunting season was another reason for the build-up. When the season was opened in this area, following its closure after the 1927 flood, it was for bucks only, and there has been a season on bucks only to this date. However, the State Legislature in 1958 authorized the Louisiana Wildlife and Fisheries Commission to set any deer seasons provided local Parish Police Juries approve such actions.

Ideal conditions for deer developed following the cutting of virgin hardwood forests in this area. According to Perkins (1958) after the timber was harvested high quality food was abundant as the shrubs and hardwood seedlings came in after the trees were removed (this flood plain type of soil is very rich and supports a tremendous amount of vegetation).

The deer herd in Tensas Parish began to increase very rapidly through the late 1940's and early 1950's. During the early 40's the bucks successfully taken were extremely large, very healthy and carried heavy sets of antlers. Since no does have been taken the annual herd increment was probably about 40% or more and the sex ratio has of course become more and more out of balance. The herd continued to increase in an eruptive form during the 1940's and by 1947 the annual buck crop began to show severe depletion under heavy hunting pressure. In spite of this fact the deer herd continued to multiply rapidly during the late 1940's and early 50's. Crop damage problems began to occur as heavy browsing by deer greatly depleted available food supplies in the forested areas and the deer were forced out upon winter cover crops for food. During this time each annual crop of doe deer was being carried over while each annual buck crop suffered heavy losses as a result of heavy hunting pressure. At the present time the general herd condition is very poor in certain areas of the parish, and crop damage continues to increase each year.

The problem of a large deer herd versus crop damage is not a new one. Other states have been experiencing this problem for many years and have tried many different methods in an effort to cope with the problem. Many methods, including repellents, firecrackers, dogs, etc., have been used in an effort to keep deer out of crops in this area; not one has been successful.

Trapping and removal of the deer was tried without success. Deer herds are capable of increasing as much as 30 percent to 40 percent annually. With good trapping success not more than ten percent can be removed from a trapping area. In this area it would be safe to say that less than one percent of the herd was trapped during any one season.

There are periodic die-offs occurring but so far the number of animals lost is not significant. It is believed that there is a high mortality rate especially among the fawn class, either at birth or a few days after birth. Death of this nature, of course, goes unnoticed and is almost impossible to measure. Other mortality factors include crippling loss during hunting season, illegal kill during the closed season, minor losses through disease and parasites, and minor losses through accidents. There are an undetermined number of deer lost by being shot in the abdominal cavity with 22 caliber and other rifles while feeding in the fields. These drag out of the fields to the woods and die.

A screw worm epidemic occurred in this area in the summer of 1954. The loss of cattle directly to the screw worm was low, but according to the County Agents of Tensas and Madison Parishes the indirect loss was considered high. There were some deer lost due to the screw worm but the number was undetermined.

During the summer, particularly in the months of July, August and September of 1957 a deer die-off occurred in Tensas, Madison and Concordia Parishes. An investigation which consisted of searching the wooded area and fields in Tensas and Madison Parishes for sick or freshly dead deer was conducted.

A die-off during this period of the year has been an annual occurrence, but the Refuge Wardens and Supervisors reported that in 1957 there were more mortalities than usual. However, there seemed to be a higher deer population in Tensas and Madison Parishes in 1957. The mortalities were not due to starvation as examinations of the internal organs and bone marrow revealed that the animals were in good physical condition.

Through the Cooperative Deer Disease Study a Veterinarian and Parasitologist from the School of Veterinary Medicine, University of Georgia, Athens, Georgia, were called in to determine the cause of the die-off. Blood samples were taken and tissue cultures were prepared and analyzed.

A report was submitted by Research Associate William E. Greer, D.V.M. of the Cooperative Deer Disease Study, on the deer die-off. One two-year-old doe showing obvious signs of illness was captured, but she died shortly thereafter. This animal was suffering from chronic arsenical poisoning. Due to the lack of sufficient animals for conclusive results an assumption was all that could be given. It was the opinion of Dr. Greer that the die-off was due to chronic poisoning by arsenic. At the time of the die-off there was extensive crop dusting in Tensas and Madison Parishes with high concentrations of arsenical poisons.

During the summer of 1958 an anthrax outbreak occurred in Madison, Tensas and their neighboring parishes. At one time there were 11 parishes under quarantine due to this disease. The number of cattle lost to anthrax is not known. On the Somerset Planation in Tensas Parish 35 cows, two hogs, and eight deer were found dead. An ear from one deer was secured and sent to the W. E. Anderson Diagnostic Laboratory at Baton Rouge, Louisiana. The report on it was positive to anthrax. During this time reports of a deer die-off in Tensas and Madison Parishes began to come in. An investigation by Commission Biologists and Refuge Supervisors was conducted that included checking 97 miles of the Tensas River, a check of jeep roads, logging roads, old dummy lines, checks of small canals and bayous by walking, checks with farmers, foresters, logging crews, construction crews, and survey parties. There were no dead deer found nor had anyone contacted found any. Somerset Plantation was the only place in Tensas Parish where any dead deer were found.

In 1953 Dr. Bryant Bateman, Professor of Game Management, Louisiana State University, went to Sheriff Elliott Coleman wanting to conduct a survey in Tensas Parish to determine the extent of deer damage on agricultural

crops. He was told by the Sheriff that there were not too many does in Tensas Parish and also he (Dr. Bateman) might recommend to the Louisiana Wildlife and Fisheries Commission that some of the does should be killed. Dr. Bateman did not conduct his survey in Tensas Parish. The next year Dr. Bateman did inspect some crop damage by deer in Tensas Parish near the Sheriff's farm and was accompanied by the Sheriff.

Crop damage surveys have been made by technicians of the Louisiana Wildlife and Fisheries Commission since 1954. Since this date damage to crops in Tensas Parish has become more severe each year. It would be hard to estimate the total damage in dollars and cents; however, in 1957 approximately 25 farms in this area ranging from 100 acres to 6,000 acres in size were surveyed by biologists of the Commission. Of the 25 farms surveyed crop damage estimates were received from 15 farms. The estimated annual deer damage on these 15 farms was approximately $60,000.00. In a number of cases, especially on smaller farms, farmers have been forced to switch from soybeans to some other type of farming in order to survive. The small farmer in Tensas Parish is almost a thing of the past.

There are no lands in Tensas Parish open to public hunting. All lands are posted against public shooting and a large percent of the land is controlled by hunting clubs. The hunting clubs for the most part prefer that the deer population be maintained at the highest possible level and have voiced strong opposition to a number of the proposed special antlerless deer seasons. A few of these clubs would go along with limited herd reduction in order to give relief to landowners provided that this effort is executed in a highly controlled manner. The Commission has a 30,000 acre game management area in this parish and have plans (hopes) to open this area to the public this fall.

For a number of years, from about 1947 to 1950, the Sheriff's Department of the parish regulated the hunting season. On one week there were certain days when it was legal to hunt and the next week there would be different days when it was legal to hunt. This was done in an effort to keep people from outside of the parish from knowing what days it was legal to hunt. The local people have a strong resentment of people outside the parish coming in to hunt.

It was rumored that the hunting clubs would have a doe Tuesday or Thursday. On this day everyone that went hunting was to shoot does.

During the winter of 1956-57 immediate relief was desired and pressure was put on parish officials by farmers for immediate action. It was believed by the parish authorities that a thousand deer should be removed. It was planned to conform with Act 273 of 1926 in the removal of these deer.

Act 273 of 1926 provides that: In the event that any species of wild bird or wild quadruped herein protected shall at any time in any locality become so destructive of private property as to be a nuisance the Commissioner is authorized in his discretion, to direct any officer authorized to enforce the provisions of this Act, or any reputable citizen of this State, to take and dispose of such species of birds or quadrupeds in the manner and under the conditions specified by the Commissioner in a written permit signed by him.

The Commission wishing to conform to the wishes of the parish officials suggested the issuing of 1,000 permits which would deputize 1,000 individuals on a first come, first served or lottery basis at the Court House in St. Joseph. The Commission would designate a two day period during which these permits would be effective. The permits would be prepared in two parts—one part would be removed and attached to the deer as soon as the deer was killed. Once the permit was separated it would be void or cancelled and this would reduce the possibility of one man taking more than one deer. It was pointed out clearly that anyone found with a deer in possession without a tag would be in violation of the law and charged accordingly. Each hunter would be required to return the other half of the permit and/or the unused portion upon completion of the hunt so that a proper check could be made of the kill. It was planned to designate the locality where the hunter would hunt and also was planned to allow the hunter to use the meat in any manner desired.

After much debate over these suggestions the only agreement that the Commission and parish authorities could agree on was that Tensas had too many deer, the deer herd had to be reduced, and the only method by which to reduce a deer herd was to shoot both sexes, *but* as to *WHO* would shoot the deer could never be established. Another year passed without any relief being given to the deer or farmers.

During the summer of 1957 deer damage to agricultural crops was so severe that a large number of farmers demanded that the Commission take some type of action to reduce this damage. Crop damage was reported on almost all crops grown and so much pressure was being applied to the Commission for some type of action that as a last resort the Commission decided to issue permits to kill deer causing crop damage. The chairman of the Louisiana Wildlife & Fisheries Commission (E. R. McDonald) and Biologists of the Commission met with the Sheriff of Tensas Parish to discuss the issuing of these permits. The Sheriff's Department was very much in opposition to this plan and opposed it in its entirety.

After much debate over the issuing of kill permits the final agreement as offered by the Sheriff's Department was that the Sheriff's Department and Police Jury furnish fine shot to farmers experiencing crop damage. They in turn would attempt to protect themselves against crop damage on their farms by shooting deer with this ammunition. This proved to be a costly operation and failed to accomplish the intended purpose resulting only in a high crippling loss.

Due to the increase in the deer herd and the range deterioration the Commission again tried to take steps to alleviate, in 1957, through herd reduction, the critical situation that exists in Madison and Tensas.

Consequently, acting in accordance with R.S. 112 (Act 273 of 1926, Sec. 12), it was planned that permits be issued to any valid hunting license that would allow the holder to take one antlerless deer during the last five days of the regular hunting season in Tensas Parish or in Madison Parish. The regular hunting season in these parishes is from December 1 through January 1, inclusive. This one antlerless deer would be in addition to the regular season limit of two bucks per person.

The Commission set up a system by which the applications would be handled and issued several thousand permits. Checking stations were established in several locations where hunters with permits must have their deer checked.

It was also pointed out that regardless of the number of applicants for special permits for this antlerless season, no hunter would be permitted to hunt without permission of the landowners. In other words, securing a permit for this special season would mean nothing if the hunter did not have a place to hunt and the entire Commission as well as the Director urged that every person seeking a hunting permit first get permission from the landowner so that hunters would not "run wild" over the entire parish.

Both District Attorney and Chairman of the Commission pointed out that regardless of the number of special permits issued, only hunters who had permission from landowners or lessees to hunt on their property would be able to avail themselves of this special season and thus the landowners would be able to control the number of hunters each desired on his property.

When the annuncement of this antlerless deer season was made in November a part of Madison Parish was included as a great many landowners in Madison had complained of crop destruction and other depredations caused by an overpopulation of deer in Madison as well as Tensas, but at the November, 1957 meeting of the Wildlife and Fisheries Commission a resolution from the Madison Parish Police Jury was presented to the Commission urging the Commission not to authorize an antlerless deer season. The Commission decided to exclude Madison Parish and permit the taking of antlerless deer only in Tensas Parish during the last five days of the regular deer season.

Because of the increasing opposition to an antlerless deer season in Tensas Parish, December 28, 1957 through January 1, 1958, this special "permit hunt" was cancelled by the Commission.

In cancelling the antlerless deer season it was further pointed out by the Director that in as much as many of the landowners and land lessees had originally favored this "permit hunt" and voiced opposition to it later, there would be virtually no hunting area available for holders of special permits and thereby the benefits expected to be derived through this method of relieving the overpopulation of deer in Tensas would not materialize.

Following is a quote from E. R. McDonald, Sr., Chairman, Louisiana Wildlife and Fisheries Commission with reference to canceling the antlerless season.

"The instructions I have given above are based upon two premises:

1. That it has always been my personal wish and the wish of the Commission that home rule should always prevail.
2. That Thompson L. Clarke, District Attorney (Tensas Parish), has made a thorough investigation throughout the parish as to the feasibility of continuing with the antlerless deer program and as a consequence of this investigation he has recommended to me that the program be called off immediately for the reason that ill feelings have been engendered among the people and public officials; that he personally does not consider a special deer hunting season worth disturbing the close friendships which have always existed among the people of Tensas Parish. In this recommendation I concur."

Therefore, the antlerless season was cancelled.

During October and November, 1957, five deer herd composition checks were made from platform blinds in a pasture on the Osceola Plantation in Tensas Parish. The pasture was checked at 15 minute intervals, recording the number of bucks, antlerless deer (considered does; although we knew that some were baldheaded bucks), and fawns. The sex and fawn to doe ratios were computed by using the greatest number of each observed each day. Out of 421 sights the overall average was 64.2 (76.1 percent) antlerless, considered doe, deer, 10 (13.2 percent) fawns, and 9.2 (10.7 percent) bucks. This indicated a fawn to doe ratio of 1 to 6.4 and a buck to doe ratio of 1 to 6.9.

During the course of our trapping operation and kill surveys it was found that the 1½-year-old bucks (Appendix I) average only about 100 lbs. and are nearly always spikes and many of these deer have spikes less than three inches in length. A number of 1½-year-old deer have spikes that barely penetrated the skin. In a healthy well balanced herd the majority of the 1½-year-old bucks have four to six points and the weight would be much heavier. In several cases bucks were trapped that were as old as 3½ years and had spikes less than three inches. This type of deer was protected by the hunting regulations and was carried over on the already depleted range. In August 1958 the Louisiana Wildlife and Fisheries Commission legalized the taking of buck deer with visible antlers. The protection of the old short antlered deer in the past left these to be the breeders of the herd.

It was also found that 2½-year-old bucks ranged between 110-135 lbs. and have 4 to 6 points. However a number of 2½-year-old bucks are spikes (Appendix I). The 3½-year-old bucks usually have 6 to 8 points and weigh from 135-150 lbs. This type of condition occurs practically over the entire parish; however, certain portions have produced deer in the 200 lb. class.

The deer killed by hunters in Tensas and Madison Parishes fall mostly in the 1½ and 2½ year age groups (Appendix II). This indicates a very close cropping of the bucks. Many of the bucks that are taken in these age classes are spikes. In all probability if more bucks with legal antlers existed the take in these age classes would be even higher. This further indicates heavy hunting pressure on bucks.

Kinds of crops grown in Tensas Parish have previously been discussed but it has not been mentioned as to what crops are receiving damage from deer. Practically all crops grown have received some damage; however, some are damaged more than others.

Cotton began to receive severe damage in 1957. Up until that time the damage was confined primarily to bolls which were bitten by the deer and shattered from the plants as they walked among them. In 1957 deer began

to eat young cotton plants when they first come up. This was on a limited scale but it increased in 1958. In young plants the stems are eaten and many are pulled from the soil. This browsing continues on the plants until they reach maturity and then the squares and bolls are eaten and shattered from the plants.

When soybeans first emerge deer walk the rows eating the young tender plants. The plants are continually browsed until the fruit is mature; then the mature fruit (beans) is consumed.

In the past, corn received damage from the roasting ear stage until maturity. In 1957 some plants received minor damage before the roasting ear stage. In 1958 corn plants were severely damaged.

In the winter deer will graze on wheat and oats but as long as the soil is dry this grazing seems to benefit these crops, because it causes them to sucker out. But if the soil is wet the plants are trampled into the soil. Damage to other grain crops is insignificant.

The pastures and cover crops are grazed but the amount of damage caused is insignificant.

Family gardens and even shrubs around home sites have received terrific damage from browsing deer.

Farmers of the area are not the only ones receiving damage from deer. Forest reproduction has been heavily browsed and in places it has been severely hedged back. Most forest reproduction is less than two feet high and the next largest size class is three to four inches D.B.H. From a browse survey (Appendix III) (Aldous Method) conducted in 1958 those species being browsed heaviest are: hackberry (browse index 115.60), water oak (browse index 88.15) willow oak (browse index 57.91), black locust (browse index 91.67), green ash (56.95), and nuttall oak (browse index 70.83).

Sweetgum, a species that is not usually utilized is being browsed heavily. When other desirable species were being heavily browsed sweetgum occupied the site and in places occurs in dense stands. According to Harry Clark, Forester for Fisher Lumber Co., sweetgum is not desired by his company. When sweetgum attains a DBH of eight to ten inches, on some sites, it undergoes a heavy mortality that is usually associated with drought conditions. Some foresters are concerned about sweetgum because they do not want to manage hardwood forests for this species.

After the antlerless deer hunt planned for the last five days of the 1957-58 deer season was cancelled, the crop damage complaints continued to increase.

On February 8, 1958 the Louisiana Wildlife & Fisheries Commission inaugurated a program of selective kills by the Game Law Enforcement Agents. The program was set up for the Enforcement Agents to shoot deer in Tensas Parish that were in the act of destroying farm crops. In addition the Commission issued a total of 285 permits to landowners, or their employees, to kill deer. This program led to widespread criticism and accusations as to the method of kill and carcass disposal, a very distasteful and expensive task to the Commission and was not successful in reducing the herd. This program ended on March 12, 1958.

Biologists of the Commission checked the deer, for the first five days of the hunt and again on February 25, for biological information. The information desired from the animals was sex, age, live weight, physical measurements, general physical condition, percent of does pregnant, parasites and blood samples. All of the desired information was not obtained from a number of the animals.

A total of 134 deer (Appendix IV) of all ages were checked of which 105 were females, 28 were males, and one fawn not sexed. Of the 105 females, 44 were fawns, 16 were yearlings, and 45 were adults. Of the 28 males, 15 were fawns, three were yearlings, six were adults and four were not aged.

An examination of the data collected leaves no room for doubt that the farmers in this area are not the only losers as a result of continued over-population of the deer herd. In fact the damages to the deer herd have been relatively greater than the damage to agriculture.

While a distorted sex ratio in that portion of the herd comprised of older animals was expected we can not be sure that our sample in these age classes

is representative of the true sex ratio of mature animals since it was announced that antlered males would not be killed. It is not known what percent of the mature males had shed antlers prior to the control program.

The startling evidence that females out number males nearly three to one in the fawn class (Appendix V) is without paralled anywhere in the history of game management. Some instances of female fawns slightly outnumbering male fawns have been recorded and associated with badly unbalanced doe : buck ratios. Dahlberg and Guettinger (1956) states "Thus an even sex ratio in adults would produce an excess of male fawns, a moderately unbalanced ratio in adults would produce an even sex ratio in fawns, and a great excess of females in the adult segment would produce an excess of female fawns." The reasoning for this statement was given as a suggestion by Leopold (1933) as 'in the case of the (domestic) rabbit it has been shown that the sex ratio is related to the chronological order of the service of the buck; in the first service group there is a preponderence of males, and then an increasing preponderence of females."

It is not the purpose of the above paragraphs to attribute the great unbalance in fawn sex ratio to the present adult sex ratio. It is however one of several avenues of thought on the subject. The situation does have a reasonable explanation that may prove to be of great importance in future deer management. Since this is the first data of this magnitude ever collected in Louisiana we do not know how long the situation has existed.

It should be pointed out that a great excess of deer must be allowed to compete for food on depleted forest ranges, and in this case on agricultural areas, to provide a relatively small harvest of legal bucks. This is true when replacement deer grow into maturity at the rate of 50 males to 50 females. Af course it is even more serious when doe fawns make up such a large percent of the fawn crop.

Sex ratio of embryos "in utero" might shed some light on the situation. Since the bred does killed were carrying embryos too small to sex this would entail a late spring or early summer collection of material. When permission was asked from the Sheriff of Tensas Parish for biologists of the Commission to collect pregnant does in the early summer for an embryo *in utero* examination it was denied. It is very important to know the cause of this phenomenon since it obviously has a tremendous impact on management of this herd.

One consideration given to the treatment of this data was an inspection of the method of sampling to determine if the ratio distortion in the sex of fawns was partially or entirely due to the method of taking deer. There is no indication that there was any selection involved. In fact an effort to kill old does or big does might possibly lean towards a selection of male fawns since they averaged being heavier than the females. As for the possibility of male fawns possessing a greater degree of wariness this seems improbable, since in Wisconsin (Dahlberg and Guettinger, 1956) 341 illegal fawns seized by agents over a period of years (presumably taken by a number of methods including night hunting) were sexed as 170 males to 171 females, for a sex ratio of 50:50.

During four seasons in Michigan (Dahlberg and Guettinger, 1956) 5615 fawns were checked by biologists, male fawns outnumbered females 2,955 to 2,660 for a ratio of 53:47.

During the fawning season of 1958 Renford Williams, a Refuge Warden in Madison Parish obtained the sex of 11 fawns, three of these were bucks and eight were does. This again is close to a sex ratio of three does to one buck.

Through correspondence with other states no reasons could be uncovered which might account for an unbalanced sex ratio among fawns. Several suggestions were offered on handling the data and also on other data that should be collected that may help answer this question. Some wanted to question the method of sampling and the sample on the basis of selectivity. It is reasonably safe to assume that among the fawn age group no selectivity was involved. During the special hunt high powered rifles and lights were used; and all deer in range of the light were subject to being shot.

A statistician for the United States Forest Service was consulted on statistical value of the sample of 44 does and 15 bucks. It was determined that if there is no difference in the degree of wariness between the two sexes that the sample is statistically sound.

The peak fawning period in this area is considered to be between July 15 and August 15, but fawns are dropped in September and October. Foresters for various lumber companies and farmers think that the peak of the fawning period is in late July and early August. Many fawns are killed by farm machinery in the harvest of hay and grain crops. Data available to this investigator indicates that fawn production reaches a high in late July or early August and maintains this level until late September. This thought was gathered from the number of fawns killed during the program in February and March of 1958; in this sample there were 33 five months old and 26 six months old. Those that were five months old would have been born in September and the six month old ones would have been born in August. During deer trapping operations on the Chicago Mills Refuge in January, 1958 two spotted fawns were caught.

As was previously stated the Commission issued a total of 285 permits to landowners, or their employees. Periodic reports to the Commission as to the number of deer killed was a condition of all permits; also the lower jawbone from each deer was to be turned over to the Commission. A total of 124 persons receiving permits reported a total of 260 deer killed at the end of the program. Very few lower jaws were received. Personnel of the Commission, who were authorized to assist in this program, killed a total of 314 deer. Considering the number of permittees that failed to report and the crippling loss an estimated 1,000 deer were taken under this program.

Blood samples were taken from some of the deer and shipped to the Southeastern Cooperative Deer Disease Study, School of Veterinary Medicine, University of Georgia, Athens, Georgia. Out of 69 usable samples one (1.4 percent) had Brucellosis organisms and three (4.3 percent) had Leptospirosis organisms.

A corpora lutea examination was made of the ovaries of the reproductive tracts collected during the special hunt in February and March, 1958. The ovaries of 51 adults were usable. The examination revealed that 20 (39.2 percent) of the adults were pregnant and that none of the five or six month old age group were pregnant.

At first some of the farmers, that had deer killed on their farms, drew a sigh of relief. The deer herd had been reduced, crop damage from deer had been eliminated! But they had forgotten that in March and April the forest begins to green up and there is enough vegetation to keep deer out of the fields for a short while. But as soon as the soybeans and cotton started coming up deer started to come into the fields as bad as ever. Crop damage complaints began to flow in. The amount of crop damage didn't seem to increase but the number of complainants did.

An effort was made to capture and tag fawns during the fawning season, in an effort to obtain some information on sex ratio after the fawns were born. Apparently, the efforts were made too late, a lot of fawns were flushed, but could not be caught. Only two fawns were captured and tagged.

At the present time there are plans for a 10-day any deer season in Tensas Parish from December 23, 1958 through January 1, 1959. There are also plans for a five day antlerless deer hunt on the Chicago Mills Game Management Area in Tensas Parish from December 28, 1958 through January 1, 1959. The big question remains: Will the hunt be carried out? When and how will this deer herd come under proper management?

SUMMARY

The Tensas deer herd was exposed to many disasterous floods, especially the one of 1927, that almost wiped out the deer herd. The few deer remaining was the beginning of the herd that grew to its present status.

The deer herd built up because of: strict law enforcement; state law—bucks only are legal during the hunting season; and, ideal conditions that developed following the cutting of the virgin hardwood forests. The deer herd increased very rapidly through the late 1940's and early 1950's.

With the increase in the deer herd crop damage began to occur as the heavy browsing greatly depleted available food supplies in the forested areas and the deer were forced out upon the crops for food. The crop damage increased

steadily and in 1958 it became more severe than ever. Forest reproduction is also browsed heavily.

Several plans for antlerless deer hunts were made but no agreement was ever reached between the personnel of the Louisiana Wildlife & Fisheries Commission and the parish officials and the plans were never carried out.

In February, 1958 the Louisiana Wildlife and Fisheries Commission inaugurated a program to take deer by the Game Law Enforcement Agents. The Enforcement Agents were to shoot the deer in Tensas Parish that were in the act of destroying crops. In addition the Commission issued a total of 285 permits to landowners, or their employees, to kill deer. It was estimated that 1,000 deer were taken under this program. This program was not successful in reducing the deer herd.

A total of 134 deer of all ages were checked, by Biologists, of which 105 were females, 28 were males and one not sexed. Of the females, 44 were fawns, 16 were yearlings and 45 were adults. Of the 28 males, 15 were fawns, three were yearlings, six were adults and four were not aged. Among the fawns there was the startling evidence that females outnumbered the males nearly three to one.

Blood samples collected and an analysis by the Southeastern Cooperative Deer Disease Study revealed that out of 69 usable samples one (1.4 percent) had brucellosis organisms and three (4.3 percent) had leptospirosis organisms.

A corpora lutea examination was made from ovaries of 51 adults. The examination revealed that 20 (39.2 percent) of the adults were pregnant.

Appendix I

Antler Formation of Bucks Trapped in Trapping Operation Tensas and Madison Parishes

Age	*Number Deer*	*Antler Formation*
	1956–1957	
1½	2	Spikes—Less than 3 inches long
2½	3	Spikes
2½	1	8 Points
	1957–1958	
1½	2	Spikes
2½	1	Spikes
2½	3	4 Points (Average)
3½	2	6.5 Points (Average)

Other bucks were caught but had shed their antlers.

Appendix II

Age Class of Deer Killed by Hunters in Tensas and Madison Parishes

Age Class	*1954–55*	*1955–56*	*1956–57*	*1957–58*
1½	31	44	19	26
2½	20	17	32	36
3½	11	4	7	27
4½	1	..	..	3
6½	1	..	..	..

Percent of animals in 1½- and 2½-year age class each year:
1954-55—79.6%; 1955-56—93.8%; 1956-57—87.9%; 1957-58—67.4%.

Appendix III

Results of Deer Browse Survey in Tensas Parish—1954-1958

Species	1954 % Browse Avail.	1954 Browse Index	1955 % Browse Avail.	1955 Browse Index	1956 % Browse Avail.	1956 Browse Index	1957 % Browse Avail.	1957 Browse Index	1958 % Browse Avail.	1958 Browse Index
Blackberry	4.16	47.20	8.54	59.81	2.13	53.57	9.18	135.98	5.14	81.98
Black Locust	...	...	...	...	...	...	...	...	.03	91.67
Cross Vine	...	...	...	...	...	...	...	...	.20	9.82
Deciduous Holly	...	...	...	...	...	...	...	...	4.57	82.17
Dogwood	1.60	42.90	5.48	105.99	.13	62.50	4.31	114.14	4.37	144.61
Elderberry	...	...	...	...	...	...	...	...	.03	75.00
Elm	.85	3.84	.17	4.17	13.21	33.62	4.32	91.79	8.76	69.70
Greenbriar	28.27	107.04	5.46	89.54	14.46	64.96	13.16	151.07	15.43	110.01
Grape	...	...	...	...	...	...	1.91	2.3	3.20	3.05
Green Ash	1.07	10.40	1.46	4.89	.88	25.00	2.15	43.54	4.04	56.95
Hackberry	1.92	15.16	.49	6.94	18.82	81.55	6.03	133.03	7.48	115.60
Hawthorn	6.83	12.60	2.83	12.5	15.65	13.66	7.08	62.91	3.96	29.20
Honey Locust	...	...	...	...	.79	17.97	.75	29.37	1.47	17.44
Maple	.16	25.00	.17	.00	...	...	...	...	.05	29.17
Mulberry	...	...	...	...	...	...	...	...	.03	162.5
Nuttall Oak	...	...	...	...	...	...	...	...	.24	70.83
Overcup Oak	...	...	...	...	...	...	.08	20.83	.38	7.5
Palmetto	42.95	.0	67.32	.0	2.63	.0	9.83	5.9	7.55	11.97
Pecan (Bitter)	...	...	...	...	...	...	.12	18.57	4.34	5.78
Persimon	...	...	...	...	...	...	.50	11.5	.81	.15
Pepper Vine	...	...	...	...	...	...	...	...	.05	4.17
Poison Ivy	...	...	...	...	...	...	...	...	8.82	2.48
Rattan	3.15	19.02	2.46	52.89	9.29	26.17	8.36	112.77	5.32	59.81
St. Andrew's Cross	.51	35.25	.20	25.00	.04	62.5	.01	237.5	.08	108.93
Swamp Privet	...	...	.11	.0	4.93	17.78	2.86	48.50	.10	81.11
Sweet Gum	5.02	14.77	3.54	29.17	...	...	4.08	61.08	2.91	8.99
Switch Cane	...	...	...	...	...	...	.50	82.03	.90	58.41
Trumpet Vine	...	...	...	...	...	...	...	...	3.66	77.35
Water Locust	.83	26.71	1.14	.0	...	...	...	...	.08	.0
Water Oak	...	...	.63	104.04	...	...	.75	100.00	3.42	88.15
Wax Myrtle	...	...	...	...	...	...	...	...	.01	62.5
Willow Oak	...	...	...	...	.07	37.50	4.30	95.78	1.56	57.91
Winter Huckleberry	...	...	...	...	...	...	...	...	.01	175.00

Appendix IV

Number of Deer by Sex and Age Class in the Fawns and Older Age Classes Taken in the Controlled Hunt of Crop Damage Deer

	5 Mos.	6 Mos.	1½ Yrs.	2½ Yrs.	3½ Yrs.	4½ Yrs.	5½ Yrs.	6½ Yrs.	7½ Yrs.	8½ Yrs.
Females	25	19	16	15	14	7	4	2	1	2
Males	8	7	3	2	3	1	–	–	–	–

Appendix V

Number and Sex of Fawns Taken in Trapping Operation 1954 through 1958

Year	Total Number	Male Number	Male Percent	Female Number	Female Percent
1954-55	12	9	75	3	25
1955-56	58	37	63.8	21	36.2
1956-57	55	26	47.3	29	52.7
1957-58	29	13	44.8	16	55.2
Taken by Crop Damage Kills					
1958	59	15	25.5	44	74.5

BIBLIOGRAPHY

1. Bateman, Bryant A., Dr. 1958. Personal Communication.
2. Clark, Harry. 1958. Personal Communication.
3. Dahlberg, Burton L. and Ralph C. Guettinger. 1956. The White-Tailed Deer in Wisconsin. Wisconsin Conservation Department. Pp. 88-89.
4. Greer, William E., D.V.M., Emmett B. Shotts and Frank A. Hayes, D.V.M. 1957. A Preliminary Report from the Southeastern Cooperative Deer Disease Study. Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners. Pp. 45-49.
5. James, C. D. 1958. County Agent, Tensas Parish. Personal Communication.
6. Leopold, Aldo. 1947. Game Management. Charles Scribner's Sons, New York, N. Y. P. 106.
7. McDonald, Mac. 1958. County Agent. Madison Parish. Personal Communication.
8. McDonald, E. R. 1957. Chairman Louisiana Wildlife and Fisheries Commission. Report on Calling off Antlerless Deer Season in Tensas Parish.
9. Perkins, Carroll J. 1958. Outsider.

LIVER FLUKES IN THE SOUTHEASTERN WHITE-TAILED DEER

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Within the past decade, the importance of wild animals as reservoirs and vectors of disease has received considerable emphasis. Although many infectious conditions of man and domestic animals maintain reservoirs in wild animals, a thorough understanding of the various factors responsibile for many of these relationships has not been attained. Additional knowledge of the epidemiology of such diseases will offer newer concepts in the development of public health principles, livestock disease control procedures and game management programs. Since so many wildlife conservation efforts are now dependent on the cooperation of livestock producers, it is becoming increasingly essential that game management specialists take every precaution to prevent the spread of disease from wild animals to domestic livestock.

This discussion involves a group of parasites which are of considerable economic importance to the livestock industry. The subject matter has been derived primarily from a review of the literature and has been compiled to possibly assist southeastern game management officials in the development of a program to control the spread of liver flukes.

The liver flukes which reportedly infect deer in the United States are the lancet fluke (*Dicrocoelium dentriticum*), the common liver fluke (*Fasciola hepatica*) and the large American liver fluke (*Fascioloides magna*).[8] Although *D. dentriticum* is relatively common in European deer, the present incidence of infection in this country is confined to the northeastern section and is of little significance in deer.[8] *F. hepatica* is a serious problem among domestic livestock in the Southeast, however, it is apparently rare in deer.[8] *F. magna,* the most important trematode of deer in the southeastern United States, is the helminth considered in this discussion.

F. magna was first described in 1875 by Bassi from deer in Italy. Presence of the parasite in Italy was attributed to the importation of infected American

From the Southeastern Cooperative Deer Disease Study, Department of Pathology and Parasitology, School of Veterinary Medicine, University of Georgia, Athens. This cooperative organization is the first regional diagnostic and research service established in the United States, which is maintained for the specific purpose of investigating diseases of wild deer. The joint state project is supported by the Southeastern Association of Game and Fish Commissioners and the U. S. Fish and Wildlife Service (Region 4). The participating states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, South Carolina, Tennessee, and Virginia.