

Quality White-tailed Deer Management on an East Texas Hunting Club

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Abstract: A management plan was implemented for white-tailed deer (*Odocoileus virginianus*) on a 1,781-ha East Texas hunting club. Objectives included the improvement of the herd's age structure and antler quality by reducing the population density and by selective harvest. During the 3-year study, 145 antlerless deer and 60 antlered deer were harvested. In spite of the accelerated antlerless harvest, the population increased approximately 15% each year. These increases apparently were because of increased fawn production. The buck population increased 48% during the study and noticeable improvements in quality were observed. Results of the study were used to exhibit methods of deer management to hunters and area landowners.

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White-tailed deer herds have recently exceeded the habitat's carrying capacity in the Pineywoods Ecological Area of Southeast Texas. The Texas Parks and Wildlife Department's stocking efforts have increased deer density in areas where deer populations are protected. Many areas, which only had remnant herds in the late 1930s, were overpopulated with deer by 1960 (Spencer 1981). The recovery was so rapid that landowners and hunters began to find emaciated deer and deer carcasses, indicating that the herds were dying off. Many other areas exhibited range deterioration. Deer herds in about one-third of the Pineywoods deer range are presently in critical condition in spite of the demand for hunting and the liberal bag limits for both buck and doe deer. The protective attitudes and regulations that previously allowed the deer population to increase have become a curse to wildlife managers. The landowners and hunters who protected the deer are now reluctant to believe that harvesting spike-bucks and antlerless deer is required throughout most of East Texas.

The Hickory Creek Hunting Club is one of the first clubs in Southeast Texas where an effort has been made to reduce the deer herd to a level within the range's carrying capacity. During the summer of 1980, the club's directors

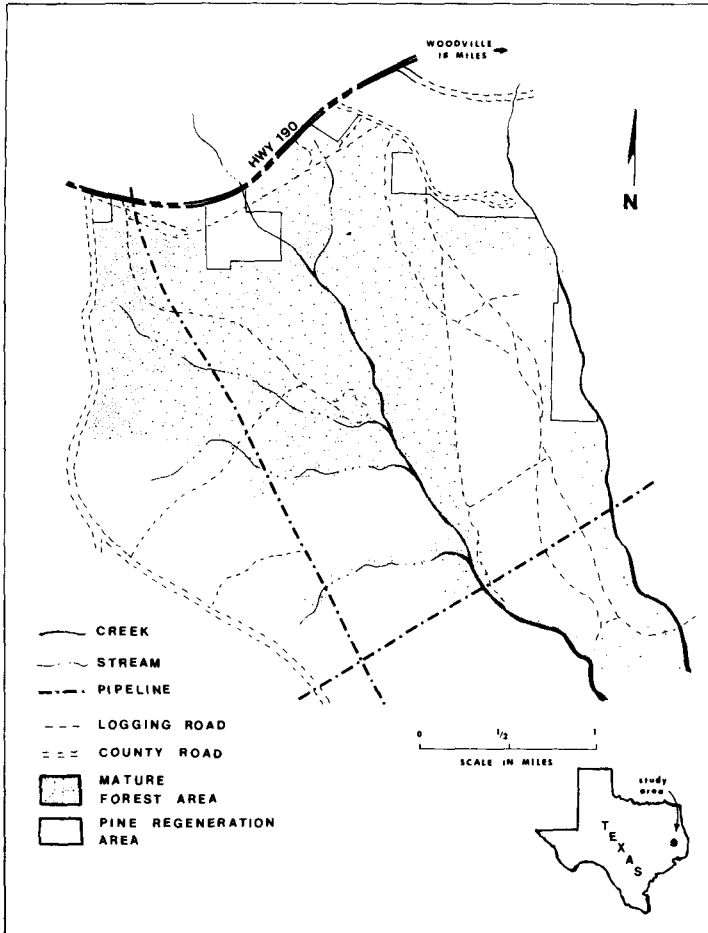


Figure 1. The Hickory Creek Hunting Club in Southeast Texas, showing mature forested areas and pine regeneration areas.

requested assistance from the Texas Parks and Wildlife Department to improve the quality of their deer herd.

Study Area

The 1,781-ha hunting club is located in the Pineywoods of Southeast Texas, between Livingston and Woodville (Fig. 1). The land is owned by major lumber companies and leased by local sportsmen and landowners exclusively for the purpose of hunting. Twenty-one families belong to the club

with many of the members either related or close friends. Club members have purchased cattle grazing rights from the owners but no livestock are allowed on the tract; rights were purchased primarily to keep the habitat from being grazed. The club property is fenced to exclude neighboring herds of cattle, but the fence does not impede deer movement. Approximately half of the club property is mature pine-hardwood forest produced through natural regeneration (Fig. 1); the remainder has been clearcut and planted with pine. The clear-cut and reforested area includes approximately 769 ha vegetated with 10-year-old pines and 162 ha vegetated with a dense growth of 4-year-old pine and understory. A creek bisects the club property and another borders it on the east.

Other hunting clubs adjoin the Hickory Creek Club on all sides, and a mixture of hunting practices is used by those clubs during the hunting season. Several adjoining clubs harvest only forked-antlered deer, but most attempt to harvest a few does.

Methods

Prior to the 1980–1981 hunting season, club members were informed of the deer management project and the assistance of the Texas Parks and Wildlife Department. Although most members seemed in favor of the project, participation was mandatory. The following objectives were included in a comprehensive management plan for the club:

1. Identify the problems associated with deer management on the club property.
2. Improve the deer herd's age structure, buck-to-doe ratio, and the quality of the antlered segment of the population.
3. Reduce the deer herd's population to a level within the habitat's carrying capacity.
4. Exhibit methods of deer management to the club members and area landowners to increase their awareness to the needs and rewards of proper deer management.

The Hickory Creek Hunting Club was censused by the track-count method (Daniel and Frels 1971). Dense vegetation throughout the club made other "direct observation" census techniques unusable. Counts were conducted on each of 2 transects during the third week of June in 1980, 1981, and 1982. The number of crossings/km of transect was used as an index to the deer population during each sample period. A deer/400 ha figure was calculated by estimating that the number of crossings/kilometer of transect approximated the deer/161 ha (Daniel and Frels 1971).

Browse utilization was examined (Lay 1967) throughout the study area

during January of 1980. One hundred randomly selected plots, 0.004 ha in size, were inventoried. Utilization of browse growth was classified as 0%, 5%, 30%, or 70%, representing approximate midpoints of utilization classes. Plant species were grouped into palatability choices as classified by Lay (1967). Browse utilization indices by palatability class were then calculated for the range.

Recommendations were discussed with the club's directors. To achieve the desired objectives, all hunters on the club were asked to adhere to the following recommendations:

1. Harvest only spike-bucks and antlerless deer during the 1980–1981 and 1981–1982 hunting seasons.
2. Harvest only mature bucks, cull bucks (spike and 3-pointers), and antlerless deer during the 1982–1983 hunting season.
3. Harvest antlerless deer in quantities equal to or exceeding the year's fawn production.
4. Harvest no more than 50% of the antlered bucks each year.
5. Plant food plots to reduce herd dispersal during the hunting season and help increase hunter success by concentrating the herd.

Each hunter who killed a deer was required to bring it to an established check station where it was weighed, aged, and an information sheet filled out. On this sheet, antler measurements were recorded along with the hunter's name, sex of deer, date and time of kill, and the weather conditions.

During the 1981–1982 and the 1982–1983 hunting seasons, club members who hunted at the club on the opening morning of the season recorded where they hunted and the sex and age of deer observed. This information substantiated previous data and added credibility to the program. The participation of club members in every aspect of the plan was encouraged to not only increase interest, but to help the program's acceptance.

Guest hunters were invited to help with the management plan but each was carefully screened; only hunters who could be trusted to harvest adult doe were selected. Those hunters were required to record their harvest data the same as regular members and to assist in data collection.

Results and Discussion

Range appraisal (Lay 1967) on the Hickory Creek Hunting Club indicated that deer browse was being heavily utilized. Browse utilization was so intense throughout the club, that there was little difference as to palatability classes. The data collected were not very discriminating since first and second choice plant species were heavily utilized in excess of 75%. Third choice species, such as pine (*Pinus* spp.) and waxmyrtle (*Myrica cerifera*), showed

Table 1. Deer track count results and population estimates on the Hickory Creek Hunting Club, 1980–1982.

Year	Deer crossings			Km in census	Crossings/km	Ha/deer	Deer/400 ha ^a
	Adults	Fawns	Total				
Line 1							
1980	268	10	278	8.1	89.5	4.7	89
1981	292	28	320	8.1	103.0	4.0	99
1982	361	10	371	8.1	119.4	3.5	115
Line 2							
1981 ^b	32	6	38	4.8	20.4	20.4	20
1982	37	5	42	4.8	22.5	18.5	22

^a Deer density was estimated assuming the crossings per kilometer equaled a deer per 161 hectares (Daniel and Frels 1971).

^b Rainfall during the 1980 census prevented a usable count on line 2.

utilization in excess of 25%. Many first choice indicator species were probably completely eliminated from the range due to over-utilization. Species such as Carolina Jessamine (*Gelsemium sempervirens*) and St. Peterswort (*Ascyrum stans*) are commonly found throughout similar habitat types but occurred in less than 5% of the vegetative plots surveyed.

Track counts conducted during the summer of 1980 indicated a deer population of approximately 300 deer on the club (Table 1). Observations of the herd indicated about 44 of the 300 deer were antlered bucks (Table 2). A harvest of 80 deer was recommended with no more than 22 to be spike bucks (50% of the antlered bucks) harvested. It was later determined that this recommendation was probably too conservative.

The 1980–1981 hunting season began with the range in very poor condition. A hot, dry summer left very little browse for the over-populated herd and mast production was observed below average. Deer moved well throughout the season allowing hunters the opportunity to harvest 74 deer, 21 of which were spikes (Table 3).

Track counts conducted during summer 1981 indicated the deer popu-

Table 2. Population estimates on the Hickory Creek Hunting Club determined from hunter observation and track count census, 1980–1982.

Year	Bucks	Does	Fawns	Totals	Deer/400 ha ^a
1980	44	176	80	300	68.01
1981	63	180	103	346	78.44
1982	65	228	105	398	90.23

^a Deer density was estimated assuming the crossings/km equaled 1 deer/161 ha (Daniel and Frels 1971).

Table 3. Age, weight, and antler development of deer from Hickory Creek Hunting Club, 1980-1982.

Year	Harvest		Age, $\bar{x} \pm SE$ (years)		Weight, $\bar{x} \pm SE$ (kg)		Antler size, $\bar{x} \pm SE$ (mm)		
	Antlerless	Bucks	Antlerless	Bucks	Antlerless	Bucks	Spread	Base	Length
1980	53	21	3.5 \pm 0.2	1.5 \pm 0.0	29.8 \pm 1.2	30.4 \pm 0.8	116.9 \pm 8.5	43.1 \pm 3.5	108.5 \pm 13.6
1981	39	23	3.0 \pm 0.2	1.7 \pm 0.0	27.1 \pm 1.0	30.7 \pm 1.0	109.4 \pm 7.3	49.1 \pm 2.1	107.5 \pm 8.6
1982	53	16	3.2 \pm 0.2	1.9 \pm 0.2	29.7 \pm 1.0	33.1 \pm 1.7	169.4 \pm 27.9	62.4 \pm 6.1	183.5 \pm 24.3
1982	Trophy bucks ^a		....	3.0 \pm 0.9	....	43.3 \pm 3.9	312.3 \pm 26.1	87.2 \pm 15.2	322.3 \pm 50.1
1982	Cull bucks ^b		....	1.7 \pm 0.1	....	29.9 \pm 1.4	112.3 \pm 16.6	53.4 \pm 3.3	137.3 \pm 13.7

^a Trophy bucks had antlers extending past the ears and 8 or more points.

^b Cull bucks had antlers with 3 points or less.

lation had not been reduced or even maintained at its previous density but had increased 15% to approximately 346 deer ($X^2 = 3.276$, $df = 1$, $P < 0.1$). Both track counts and hunter observations indicated the fawns/adult increased (Table 2). The percentage of the herd that was antlered bucks increased from approximately 14.7% in 1980 to 18.2% in 1981. A harvest of 100 deer was recommended for the 1981–1982 hunting season. No more than 25 bucks were to be harvested.

Mild temperatures and increased precipitation allowed range conditions to improve during 1981. In spite of extensive plantings of oats, rye, and clover to attract deer, hunting was difficult. Deer moved very little throughout the season and hunters only harvested 62 deer, including 23 spike bucks. Some lack of confidence in the program may have contributed to the poor harvest but even guest hunters had some difficulties in harvesting deer.

The 1982 track count on the hunting club indicated a population of 398 deer ($X^2 = 3.634$, $df = 1$, $P < 0.1$), once again indicating a 15% increase over the previous year. The accelerated harvest that had been undertaken during the 1980–1981 and the 1981–1982 hunting season apparently only increased fawn production while improving the buck-to-doe ratio. The population had increased from 300 deer in 1980 to 398 deer ($X^2 = 6.910$, $df = 2$, $P < 0.05$) in 1982. A harvest of 100 deer was once again recommended and no more than 25 bucks were to be taken. During the 1982–1983 hunting season, hunters were to harvest “trophy” or quality bucks, cull bucks, and antlerless deer. Trophy bucks were deer with 8 points or more and a spread wider than its ears. Cull bucks were spike-bucks and 3-pointers. After hunters had harvested 21 inferior bucks, only antlerless deer and quality bucks were to be hunted. It was expected that no more than 4 trophy-age bucks would be harvested since only about 5% of the deer examined by Texas Parks and Wildlife Department biologists in Southeast Texas are older than 3.5 years of age (Harwell 1982).

The 1982–1983 hunting season opened similar to the 1981–1982 season with deer activity reduced. Observations on acorn-producing trees on the club indicated a good mast crop. The mast crop probably kept many of the deer in the woods where hunting was difficult. Hunters were also somewhat reluctant to harvest doe deer and spike-bucks early in the season since most of them were looking for the big trophy buck. There were 69 deer harvested during the season; 53 antlerless deer, 12 inferior bucks and 4 quality bucks. Several young bucks were harvested erroneously as trophies but most hunters had developed the patience and knowledge to wait for the quality buck. The biggest buck harvested field dressed 53.07 kg, had an antler spread of 372 mm, a 477 mm main beam length and 120 mm basal circumference. It was 3.5 years of age and had a 10-point rack.

During the study period, fawn production changed relative to the harvest. When the study was initiated in 1980, only $0.45 \pm .01$ ($\bar{x} \pm SE$, $N = 13$)

fawns were being observed per doe deer. In 1981, the ratio had changed to $0.57 \pm .11$ ($\bar{x} \pm SE$, $N = 17$) and in 1982, it was $0.47 \pm .02$ ($\bar{x} \pm SE$, $N = 19$) fawns/doe. This difference was noticed in both the track counts and the hunter observations. Off the study area, fawn production was $0.32 \pm .08$ ($\bar{x} \pm SE$, $N = 16$) in 1980, $0.18 \pm .03$ ($\bar{x} \pm SE$, $N = 12$) in 1981 and nearly $0.32 \pm .11$ ($\bar{x} \pm SE$, $N = 14$) in 1982 (Gore and Harwell 1981). In 1981, when the area fawn production was depressed almost 50%, the study area experienced a rise in production. The increased antlerless harvest on the study area apparently prevented the reduced production experienced in adjacent areas that same year. If the increased doe harvest contributed to the increase in production, and every indication is that it did, the harvest of antlerless deer caused the population on the club to increase.

The quality of the antlered segment of the population improved primarily by allowing the bucks to mature. There was no proof that the spike-bucks affected the genetic quality of the herd. These poor quality deer were probably a product of the nutritional inadequacies characteristically found on over-populated, over-browsed range (Brothers and Ray 1982). Few spike-bucks were harvested that were more than 1.5 years of age and as the herd was managed by the hunters, the spike-bucks even showed signs of improvement. During the first 2 years of the study, cull bucks had an average main beam length of 108.10 mm whereas the 1982–1983 season produced cull bucks with main beam lengths averaging 137.25 mm. There was no significant difference ($X^2 = 0.638$, $df = 4$, $P < 0.90$) in average weight per age class for the deer harvested during 1980 and 1982.

Although no data were available, hunters indicated they were seeing more young bucks with small 4-, 6- and 8-point racks after the first year of the study; there were also a few good quality bucks with trophy class antlers sighted each year. The small bucks would have been harvested in the past but now are passed up so they can mature. Adjacent hunting clubs surely harvest a few of the bucks that the club is trying to save each year but there is no evidence that it affected the success of the management plan. Hunter observations indicated the adult buck population increased from 14.7% of the herd in 1980 to 18.2% in 1981. In 1982, the adult buck population on the club was 16.3% of the herd. The overall number of bucks on the Hickory Creek Hunting Club increased 43.1% from 1980 to 1981 and a total of 47.7% for the study period.

The controlled harvest of bucks allowed many veteran hunters the opportunity to enjoy watching the activity of deer. In the past, they would have shot the first antlered deer that presented itself. Many hunters felt that the experience they gained by being able to watch and not shoot would help their understanding of the white-tailed deer and eventually improve their hunting skills.

Conclusions

The success of the management plan, considering the objectives, was mixed. Many of the problems associated with deer management on a small hunting club in Southeast Texas were identified, the herd's age structure was improved, and the club members appeared satisfied with the improvements in buck quality. The problem of reducing an over-populated herd to a level within the habitat's carrying capacity proved to be the major failure in the study. With the number of families belonging to the club and their reluctance to bring in additional hunters, hunting pressure could not be applied with the intensity required to lower the population. The dense vegetation and the number of hunters participating made the recommended harvest impossible to achieve. Although some hunter apathy surely contributed to the problem, the logistics of putting sufficient hunting pressure on the herd was the major problem.

One of the most interesting and possibly the most productive part of the study was the extension aspect. Hunters, club managers, and sportsmen throughout the county followed the activities and progress of the Hickory Creek Club. Several clubs have expressed interest in duplicating the club's program or organizing a management plan for their group. This extension aspect will probably prove to be valuable in convincing sportsmen and club managers that harvesting antlerless deer and spike bucks is a part of sound deer management.

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