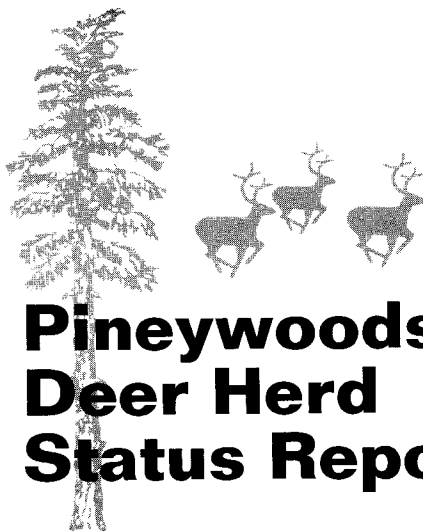


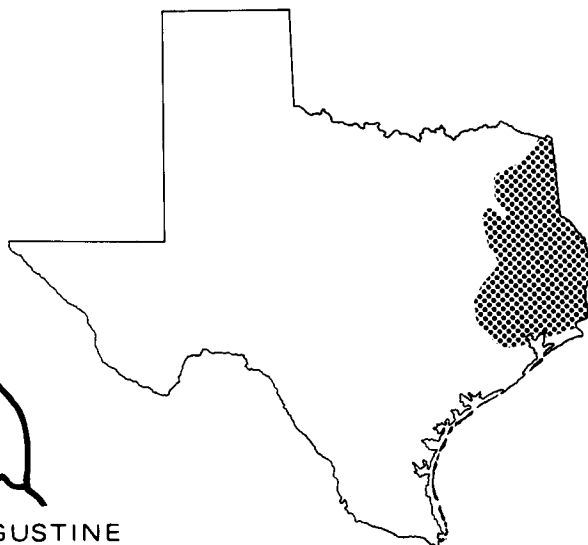
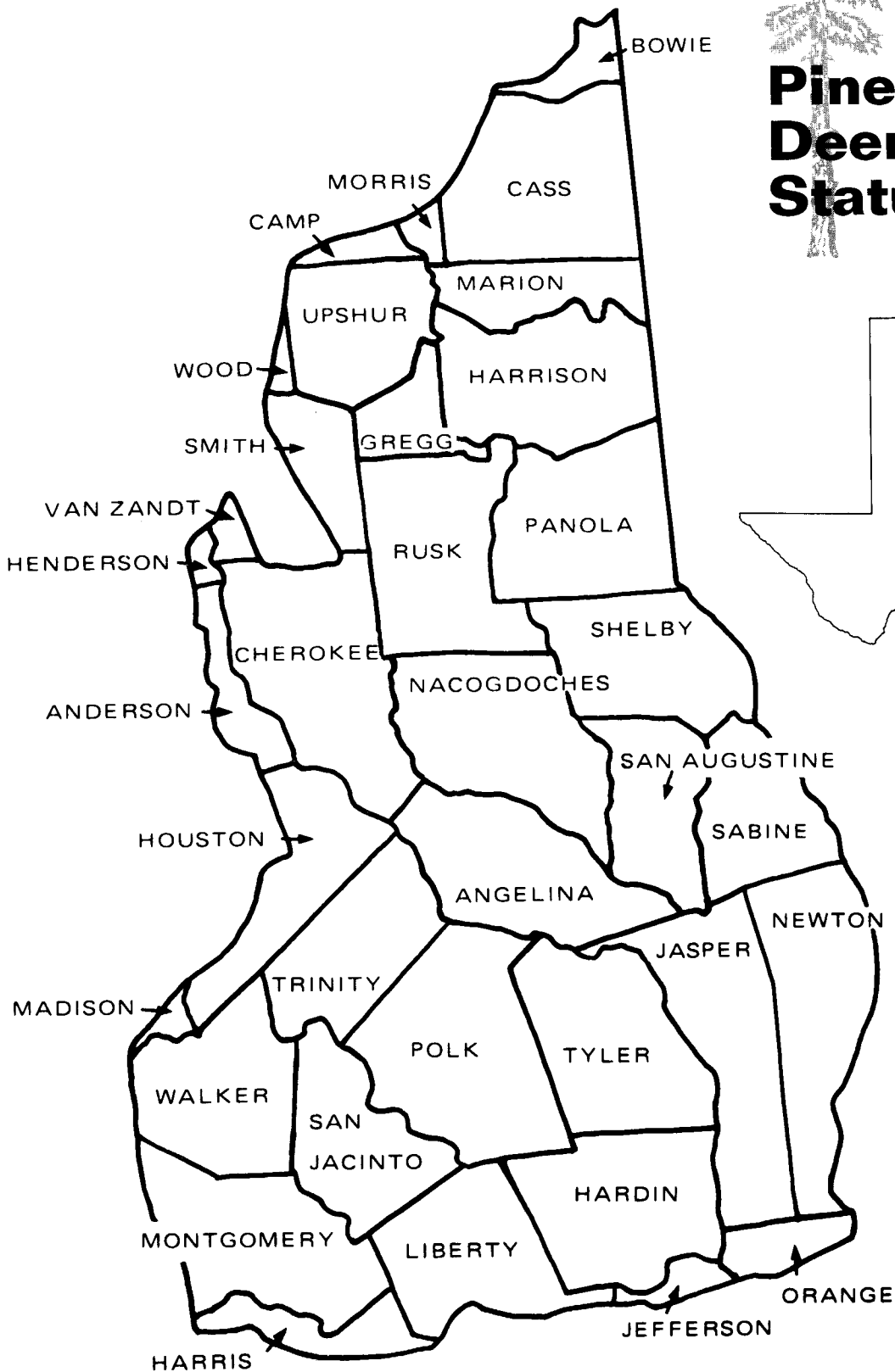
Pineywoods Deer Herd Status Report

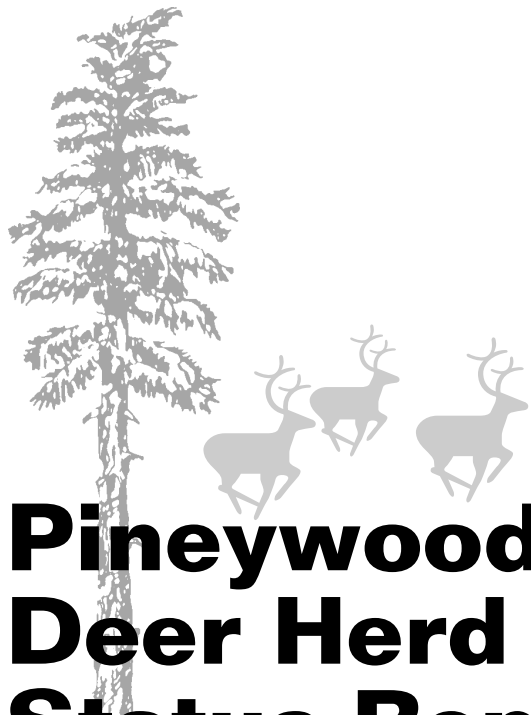
by Gary E. Spencer, Wildlife Biologist

Spencer



Pineywoods Deer Herd Status Report





Pineywoods Deer Herd Status Report

by Gary E. Spencer, Wildlife Biologist

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Introduction

The white-tailed deer is the most common big game species in Texas. It is important to Texas both for its aesthetic beauty and sporting qualities. The quality of human life is enhanced wherever deer are found. To hunters, the elusive "Whitetail" provides a challenge to test the very best outdoor skills. Over one-half million white-tailed deer hunters go to the field each year in Texas generating over 5 million hunter-days of recreation annually. Deer hunting is big business in Texas. Money spent by hunters on hunting leases, equipment, supplies, lodging, transportation, and a variety of other items adds greatly to our economy. Because of this broad interest, the white-tailed deer generates more questions, comments, and concerns among the public than any other wildlife species. In response to these concerns, the Texas Parks and Wildlife Department (TPWD) annually surveys the status of the white-tailed deer in Texas. Ongoing research and survey efforts are established to investigate population trends, productivity, habitat conditions, and the effects of harvest. The purpose of this report is to provide a summary of research and survey results relative to the status of white-tailed deer in the Pineywoods Ecological Region of East Texas (map inside cover).

Background

The Pineywoods

The Pineywoods is located in East Texas and borders three states: Arkansas, Louisiana and Oklahoma. It contains approximately 15 million acres of gently rolling terrain. The Pineywoods is a high rainfall area with averages of 35-50 inches annually. Approximately 10.6 million acres or 71 percent of the total acreage is considered deer range. Vegetation is dominated by pine and mixed pine/hardwood forest on upland sites, and by hardwood forests found in stream floodplains. The major land uses are commercial timber production and cattle ranching. Large tracts of industrial forest land are concentrated in the southern and eastern counties while smaller tracts of privately owned forest and pasturelands are common in northern and western counties.

The History of White-tailed Deer in the Pineywoods

Exploitation: Early Settlement - 1940

When the first anglo settlers arrived in the Pineywoods during the early 1800's, they found an abundance of wildlife. White-tailed deer, bear, mountain lions and wild turkeys were common. As human populations increased, however, these species began to disappear. By the turn of the century, deer and turkey numbers were significantly diminished and only a few bears and mountain lions remained. The bears and mountain lions soon disappeared and, by 1940, wild turkey populations were decimated. Only a few deer populations remained in the dense woods of the Big Thicket in deep southeast Texas. Unregulated subsistence hunting and habitat destruction were responsible for the demise of the species.

Restoration 1940-1990

The next 50 years was marked by an increased public awareness regarding the need to conserve wildlife. Deer habitat conditions were also improving as abandoned farmland grew up in brush and young forest. The Texas Parks and Wildlife Department's deer restoration effort began in 1938 and continued into the 1990's. Deer were trapped in central and south Texas and transported to the Pineywoods for release. A total of 12,149 deer was released in the Pineywoods during the period (Table 1). By 1980, only a few isolated areas remained to be stocked. Many herds in restocked areas grew rapidly and expanded their range. After 50 years of restoration efforts by sportsmen, landowners, game wardens, and biologists, the Pineywoods now supports a large, well established deer herd.

Table 1: Pineywoods Deer Stocking History

County	Year	Number of Deer Stocked	County	Year	Number of Deer Stocked	County	Year	Number of Deer Stocked	
Angelina	1938-39	11	Liberty	1956-57	5	Sabine	1949-50	116	
	1941-42	18		1958-59	1		1950-51	29	
	1950-51	36		1966-67	16		1951-52	37	
	1952-53	36		1969-70	24		1964-65	359	
	TOTAL	101		1988	49		1965-66	209	
Bowie	1945-56	40		1989	49		1966-67	623	
	1947-48	19		1990	23		1969-70	178	
	1948-49	84		TOTAL	167		1970-71	298	
	1949-50	178		Marion	1949-50		25	1971-72	148
	1950-51	52			1950-51		93	1972-73	81
	1957-58	33	1957-58		44	1973-74	157		
TOTAL	406	1958-59	8		1983-84	243			
Camp	1957-58	58	1959-60		29	1988	128		
	1958-59	42	TOTAL	209	1991	99			
	TOTAL	100	Montgomery	1968-69	14	TOTAL	2,705		
Cass	1957-58	44		Morris	1953-54	230	San Augustine	1957-58	3
	1958-59	18	1954-55		33	1958-59		82	
	1958-59	76	1955-56		19	1981-82		24	
	1959-60	49	1957-58		58	1982-83		100	
	1960-61	129	1958-59		42	1983-84		222	
	1973-74	45	TOTAL	382	1984-85	50			
TOTAL	361	Nacogdoches	1963-64	2	TOTAL	481			
Cherokee	1956-57		20	1964-65	4	San Jacinto	1991	95	
	1968-69		9	1972-73	102		Shelby	1966-67	7
	1970-71		15	1975-76	100	1972-73		102	
	1972-73		24	1976-77	102	1973-74		30	
	1987-88		68	1977-78	104	1974-75		45	
TOTAL	136		1988	54	1977-78	101			
Hardin	1943-44		31	1989	52	1978-79		100	
	1944-45		81	1990	35	1979-80		78	
	1945-46		90	TOTAL	555	TOTAL	463		
	1946-47	43	Newton	1942-43	180	Trinity	1974-75	1	
	1957-58	17		1943-44	91		1978-79	11	
	1959-60	224		1944-45	197		1982-83	91	
	1963-64	49		1945-46	264		1983-84	100	
	1969-70	24		1946-47	44		TOTAL	203	
	1972-73	10		1953-54	2	Tyler	1942-43	21	
	1988	165		1954-55	4		1943-44	86	
1989	177	1955-56		1	1944-45		193		
1990	51	1956-57		1	1945-46		120		
TOTAL	962	1957-58		2	1946-47		129		
Harrison	1966-67	85	1971-72	80	1949-50		27		
	1967-68	6	1972-73	69	1959-60		25		
	TOTAL	91	1973-74	5	1963-64	25			
	Houston	1951-52	14	1974-75	45	1964-65	114		
1952-53		104	1978-79	12	1988	49			
1953-54		89	1988	247	1989	50			
TOTAL		207	1989	323	TOTAL	839			
Jasper		1954-55	130	1990	701	Walker	1969-70	22	
		1963-64	24	TOTAL	2,268		Pineywoods Grand Total	12,149	
	1964-65	114	Panola	1938-39	7				
	1965-66	36		Polk	1944-45	102			
	1970-71	28			1945-46	156			
	1972-73	11			1946-47	70			
	1973-74	26			1947-48	71			
	1974-75	50			1950-51	35			
	1975-76	4			1951-52	68			
	1980-81	6			TOTAL	502			
1989	275	Rusk			1957-58	92			
1990	77								
TOTAL	781								

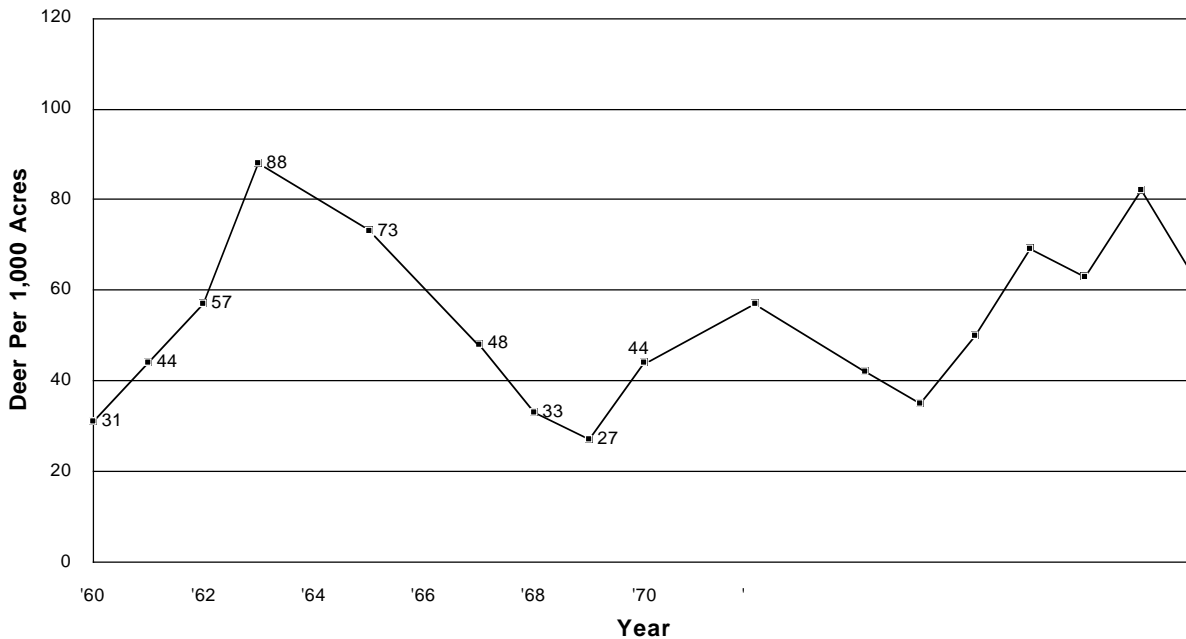
Lessons From History

Some of the introduced deer herds increased in numbers faster than others. Protection from poaching and habitat quality seemed to be the key factors in early successes. Areas that had both ingredients experienced rapid deer population increases. Some of the early restoration successes were studied by TPWD biologists. The results of these investigations provided essential information that aided future management efforts and are relative to the current situation in the Pineywoods. Each study provided the unique opportunity to observe how a deer population responded to habitat conditions and harvest systems.

Northwest Tyler County (NWTC)

The NWTC study area is located near the city of Chester in extreme northwest Tyler County. During the 20 year study period, land use practices including commercial timber harvest and cattle grazing remained relatively stable. Timber was commercially harvested, primarily under an uneven aged system, and most woodlands were grazed by cattle. Most land in the study area was privately owned and either leased for deer hunting or restricted to guest hunting only. Deer populations were monitored during the study period by TPWD biologists and population trends were documented. (Figure 1).

Figure 1: Deer Population Trends
Northwest Tyler County, Texas



The deer population in NWTC increased dramatically from 1960 to 1963. TPWD wildlife biologists monitoring the population during the period recognized that the deer herd was at a dangerously high level and damaging the range through overbrowsing. Deer numbers had exceeded what biologists call “carrying capacity.” The term “carrying capacity” refers to the maximum number of healthy deer a range will support on a year-round basis. Attempts were made to allow the harvest of antlerless deer by providing antlerless deer permits to landowners in 1964 and 1965. However, few landowners participated in the program and very few antlerless deer were harvested. Strong opposition to hunting antlerless deer in this area resulted in discontinuing the antlerless hunting program from 1965 to 1975. Antlerless permits were once again made available to landowners in this area from 1976 to 1980, but few antlerless deer were harvested.

By 1965, TPWD biologists realized that the area’s deer herd was in serious trouble. Die-offs were reported by landowners and many malnourished and weak deer were observed. Teams of veterinarians from Texas A&M University investi-

gated the die-off at TPWD's request. These studies indicated that deer in the area were carrying a heavy infestation of internal and external parasites as a result of overpopulation and overgrazing. Deer numbers continued to decline through 1969, recovered and increased until 1972, then crashed again in August of 1973. When the 20 year study terminated in 1980, the population appeared to be going through a third cycle of what is called "boom and crash." These cycles are typical of deer herds out of control.

The NWTC deer herd was indeed a herd out of control. With the deer harvest limited to bucks, the herd rapidly expanded in the early 1960's, exceeded range carrying capacity, depleted the food supply, and experienced extensive die-offs. This cycle was repeated three times. Range conditions temporarily improved after these die-offs, but without a way to control deer numbers, the food supply again diminished when the herd increased beyond range carrying capacity. Thus, the term "boom and crash" is applied to this deer herd. Only a sustained yearly harvest of antlerless deer could have stabilized herd growth and prevented an unnecessary waste of this wonderful resource and long term habitat degradation.

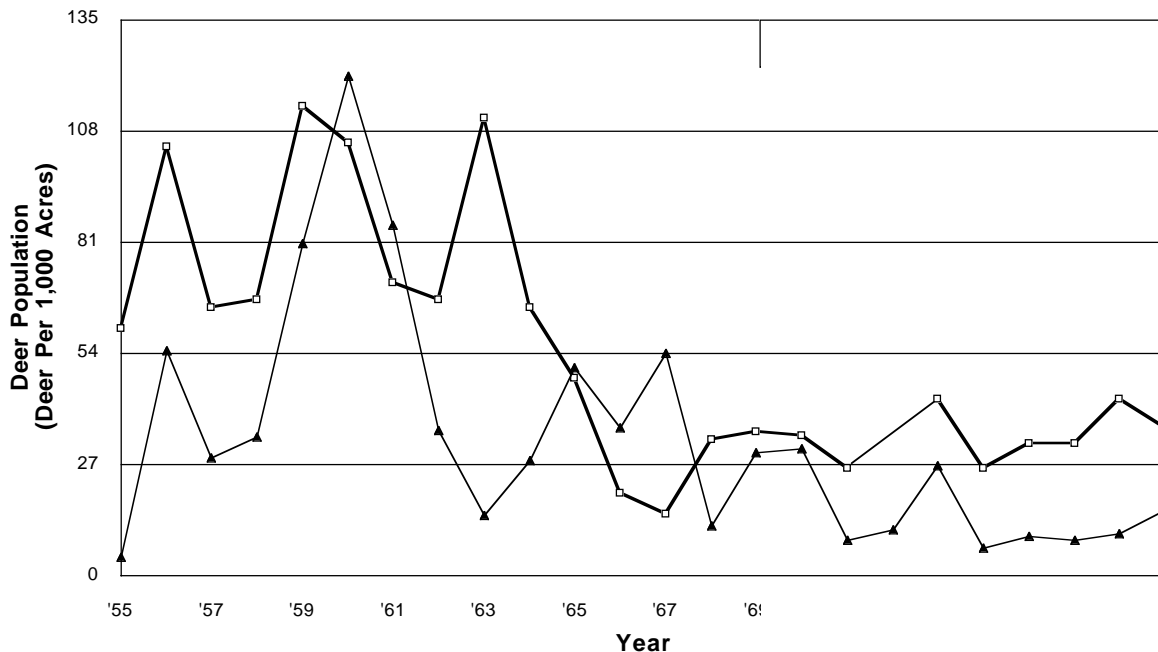
Red River Arsenal (RRA), Bowie County

The RRA and the associated Lone Star Ordinance Plant was established in 1941 through the purchase of 36,000 acres of land by the United States Government. The facility was established for the purpose of producing and storing munitions for the U.S. Army.

A large portion of the lands purchased in 1941 were previously farmed. As farming ceased, the area reverted to brush and young forest providing excellent habitat for deer. Forty-nine adult deer were stocked on the RRA in 1949. Six years later in 1954, the first deer hunt was held and 25 buck deer were harvested. TPWD began assisting RRA personnel in monitoring the deer population in 1955. Results of TPWD surveys indicated that the deer population had reached 60 deer per 1,000 acres and had severely overbrowsed the range (Figure 2). As a result, the first of several consecutive years of heavy antlerless harvest was initiated in 1956 to stabilize the population and reduce overbrowsing. In 1958, the RRA embarked on a vigorous pine tree reforestation program. From 1958 to 1962 approximately 10,000 acres of old agriculture fields were reforested with pine trees. At the same time that deer populations were rapidly increasing, food sup-

Figure 2: Deer Population and Harvest Trends

Red River Arsenal, Bowie County, Texas



plies were gradually being diminished by the shading effect of maturing pine stands as well as by overbrowsing by deer.

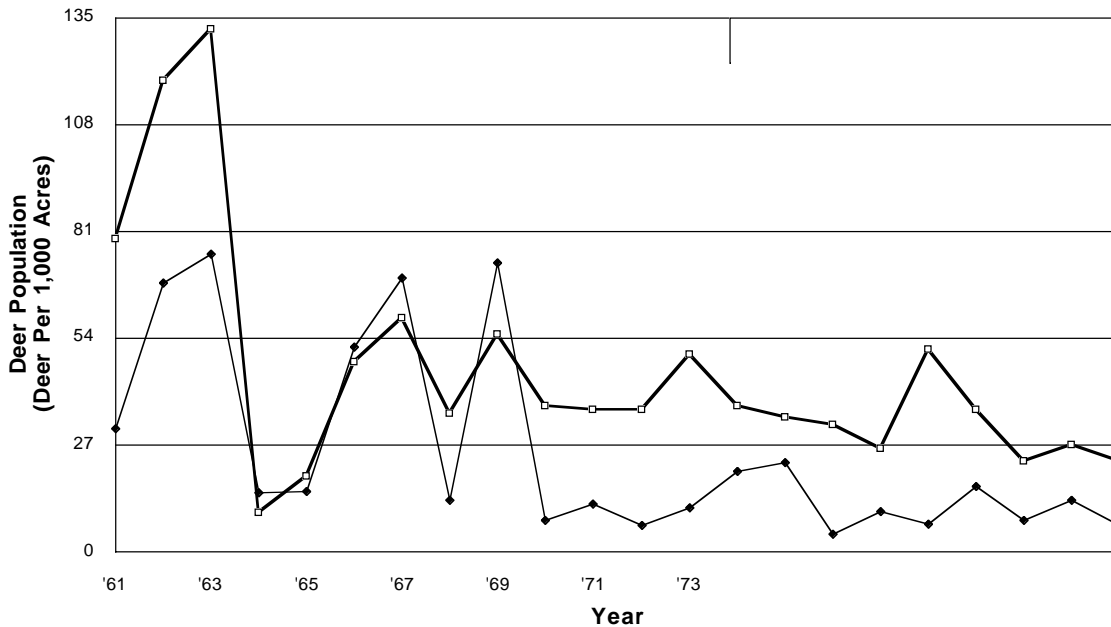
Deer populations began to level off in 1959, but high deer densities were sustained through 1965. The ongoing antlerless harvest program initiated in 1956 was insufficient to keep deer populations within the carrying capacity of the land. The combination of too many deer on the range and deteriorating habitat caused by maturing pine forest precipitated a die-off that began in 1965. The die-off went unrecognized by RRA personnel even though a large work force was present on the area at the time. Deer die-offs usually go undetected throughout the Pineywoods since deer carcasses disappear quickly through scavenging by predators. After four consecutive years of declines, the RRA deer population reached a low of 15 deer per 1,000 acres in 1967 and remained relatively stable until the study ended in 1978.

The RRA deer herd is a classic example of a deer herd responding to declining habitat conditions. When the food supply was plentiful in the early years, the deer herd "boomed" and increased beyond carrying capacity. An insufficient number of antlerless permits were utilized to reduce populations to a level the habitat could support. Eventually, a combination of range damage from deer overbrowsing and a long term habitat decline from maturing pine stands resulted in a population crash. Recent deer harvest records from the RRA indicate that the deer population may now be recovering, however, as food supplies increase following heavy thinning and controlled burning programs in pine stands.

Longhorn Army Ammunition Plant (LAAP), Harrison County

The LAAP is a military ordinance plant located along the shores of Caddo Lake in Harrison County. The facility was purchased by the United States Government in 1942 and contains 8,491 acres. Much of the land was previously farmed and contained about 3,000 acres of old agriculture fields. During the early years after purchase, the "old fields" were invaded by brush and trees, creating excellent deer habitat. Deer were stocked on the area in 1949-51. By 1961, when LAAP deer populations were first surveyed by the Department, densities were estimated at 79 deer per 1,000 acres; considerably above carrying capacity (Figure 3). The same policy regarding pine tree management on the Red River Arsenal was also initiated on LAAP. An extensive pine tree reforestation program was implemented in 1956.

Figure 3: Deer Population and Harvest Trends
Longhorn Army Ammunition Plant, Harrison County, Texas



Over the next several years approximately 3,000 acres of old agriculture fields were reforested with pine trees.

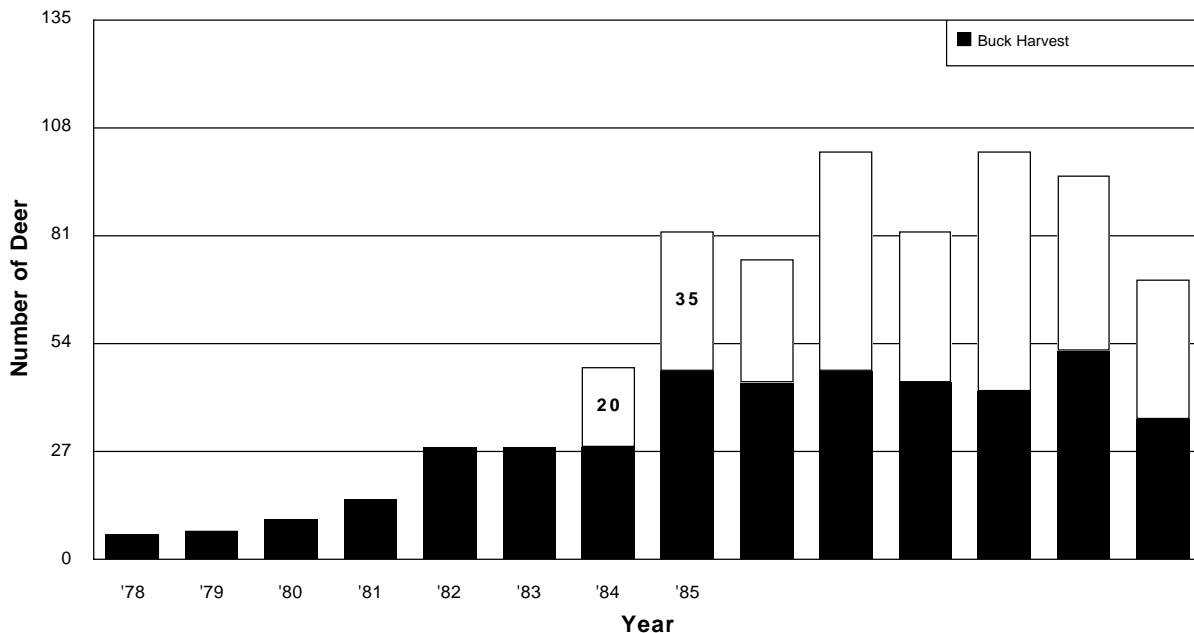
In many regards, the history of land use and deer population on LAAP and RRA were very similar. Both areas were purchased during World War II, managed by the Department of Defense for ordinance production and storage, stocked with deer by TPWD, and managed intensively for pine tree production. Deer populations and harvest trends followed similar patterns. Deer numbers on LAAP peaked in 1963, crashed in 1964, and remained at low levels through the end of the study period.

In 1961, Harrison County came under the regulatory authority of the Texas Parks and Wildlife Department and Department wildlife biologists began studies of the deer herd on LAAP. Harvest recommendations were provided to LAAP through 1982. The first antlerless harvest was conducted in 1961 and continued for three consecutive years. Antlerless harvest, however, was insufficient to prevent a die-off in 1964. When TPWD began working on the area in 1961, the deer population was out-of-control and considerable damage to deer forage plants had already occurred through overbrowsing. In 1967-1968, a team of United States Forest Service biologists studied the herd intensively and found that deer were underweight and being forced to eat undesirable and indigestible plant material. The historically high deer populations had eliminated most better quality deer food plants and the total quantity of browse was reduced as the pine trees matured. When the study period ended in 1982, deer numbers and harvest were extremely low. A maturing pine forest and many years of overbrowsing by deer had dramatically reduced the quality and quantity of habitat. Although the size of LAAP is much smaller than RRA, deer populations followed similar trends and provide another example of how deer respond to a deteriorating environment.

Bear Creek Hunting Club (BCHC), Sabine County

The BCHC is comprised of 11,000 acres of commercial forest located adjacent to Sam Rayburn Reservoir in Sabine County. The property is owned by Temple Inland, Inc. and was initially leased for hunting to the club membership in 1974. Prior to 1974, the area was decimated by unregulated hunting. Illegal hunting and poaching was a major problem. The club had problems controlling poaching initially since the property was partially surrounded by public lands, private inholdings of

Figure 4: Deer Harvest Trends
Bear Creek Hunting Club, Sabine County, Texas



small acreage, subdivisions, and state highway and county road rights-of-ways. Habitat conditions during the study period were good to excellent. A major stream containing mature bottomland hardwoods bisected the area.

Good deer habitat and decreased poaching allowed deer populations to gradually increase to near optimum levels by 1984, ten years after the property was leased (Figure 4). Deer densities have stabilized near 40-50 deer per 1,000 acres since 1985. An antlerless harvest was initiated in 1984 and has been sustained to-date with antlerless deer comprising approximately 50 percent of the total harvest for the past 5 years. Deer are healthy, buck quality is above average, and fawn production is high. With heavy hunting pressure on does, the female herd is young. Good habitat and good deer condition allow enough fawns to survive each year to more than replace the annual harvest. With a buck:doe ratio of 1:1.6, more bucks are present in this herd than are found on the average Pineywoods hunting lease. As long as habitat conditions remain stable, the BCHC herd should sustain the current annual harvest indefinitely. The BCHC is a good example of how a sustained annual yield of healthy, quality deer can be maintained through a proper harvest of both sexes of deer. The “boom and crash” cycle seen in the NWTC, RRA, and LAAP deer herds has not occurred on BCHC.

Summary

These four “case study” deer herds demonstrate how deer populations respond to harvest strategies and habitat conditions. In the NWTC example, an inadequate harvest allowed deer numbers to increase above carrying capacity, damage the range and crash, despite favorable land use practices. In the RRA and LAAP examples, deer herds “boomed” and “crashed” despite attempts to control deer numbers through an antlerless harvest. Declining habitat conditions brought about by overbrowsing and maturing pine forests reduced carrying capacity on these two sites. In contrast to the first three examples, the BCHC prevented the “boom and crash” cycle through a heavy, sustained antlerless harvest.

Recent Trends of the Pineywoods Deer Herd

Deer Population Characteristics

Population Trends

During the first 30 years of restoration, the Pineywoods deer population grew at a slow rate. However, the areas that had good control over illegal hunting and contained suitable habitat, experienced a rapid build-up in deer numbers. By 1960, the Pineywoods had a “spotty” deer population with pockets of high deer density interspersed among areas of low density.

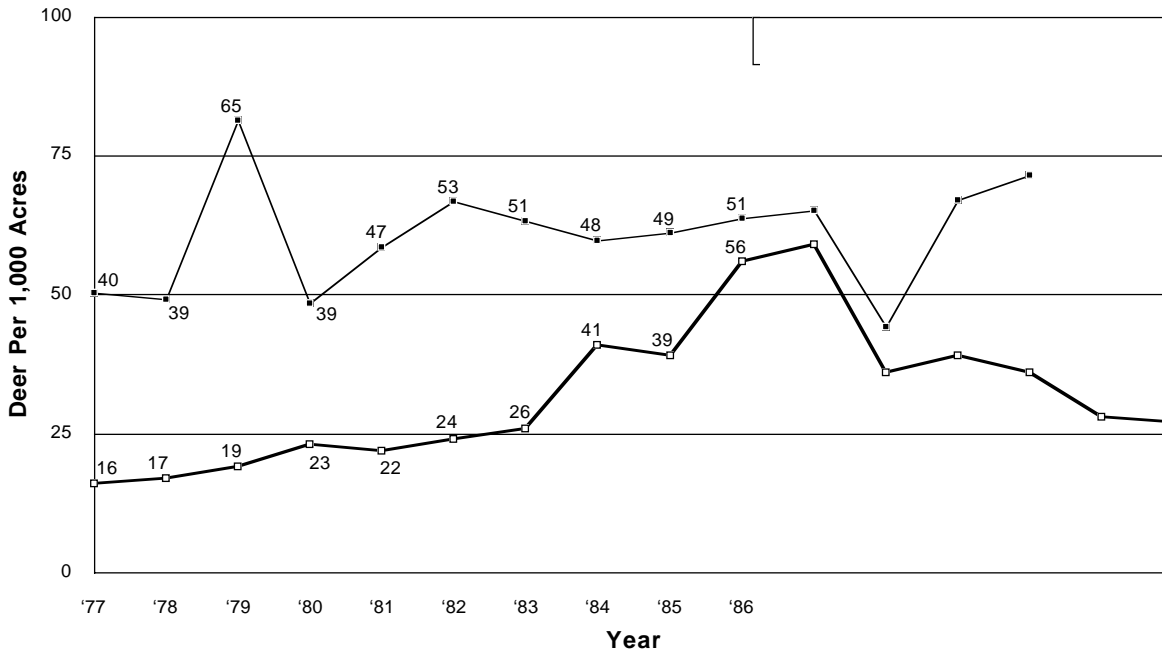
During the 1970’s however, the situation began to change. Deer leasing became important, and landowners exercised more control over their properties than they had in the past. As better protection was afforded by landowners, in cooperation with TPWD game wardens, the deer herd responded and increased over most of the range. From the mid 1970’s into the early 1980’s a steady increase was observed (Figure 5).

Between 1983 and 1987, the deer population exploded. Biologists monitoring the area’s deer herd warned that a catastrophe was in the making unless harvest was increased to slow the growth. Attempts were made to increase the issuance of antlerless permits. In 1987 a record of 88,887 antlerless permits was issued to landowners. However, only 20,221 antlerless deer were harvested, not enough to control the runaway deer herd.

By 1987, deer numbers were at an all time high, and were about 50 percent higher than biologists considered to be safe. The inevitable occurred. Drought conditions coupled with poor fruit and acorn production caused a significant deer die-off (Figure 5). The deer density has remained at moderate levels between 28 and 39 deer per 1,000 acres since 1987.

Figure 5: Deer Population & Rainfall Trends

Pineywoods, 1977-1992



Herd Composition

In order to understand the dynamics of a deer herd, it is essential to know what percentage of the herd is comprised of bucks, does, and fawns. The ratio of bucks to does provides information on the relative survival of both sexes; and the percentage of fawns in the population is a measure of productivity. Coupled with other information, biologists can estimate the percentage of the buck and doe population that die each year and how many replacement animals (fawns) are coming into the herd to replenish the annual loss.

Volunteer hunter observation surveys conducted in 1991 showed that the population was comprised of approximately 21 percent bucks, 56 percent does, and 23 percent fawns. The ratio of bucks to does was 1:2.7 and .40 fawns per doe was observed.

Age Structure

Each year, TPWD biologists age a sample of harvested deer to determine the age structure of deer harvested. The term "age structure" refers to the percentage harvest in each age class. The age structure of the buck and doe harvest and the relative percentage of deer that survive to older age classes are important information in evaluating the impact of harvest and hunting pressure on the Pineywoods deer herd. From this evaluation, biologists know that the Pineywoods' harvest age structure reflects population age structure. In heavily hunted deer herds, the age structure is very young. In herds with low hunting pressure, more deer survive to the older age classes.

In 1991, TPWD personnel aged 662 bucks and 495 does harvested by hunters in the Pineywoods. The age structure of bucks observed in the survey indicated that the buck population has high mortality, most likely due to high hunting pressure. Only 26 percent of bucks sampled were older than 2.5 years old. By contrast, the age structure of the harvested doe deer probably indicated light to moderate hunting pressure. Approximately 48 percent of all does checked were older than 2.5 years.

Hunter Trends

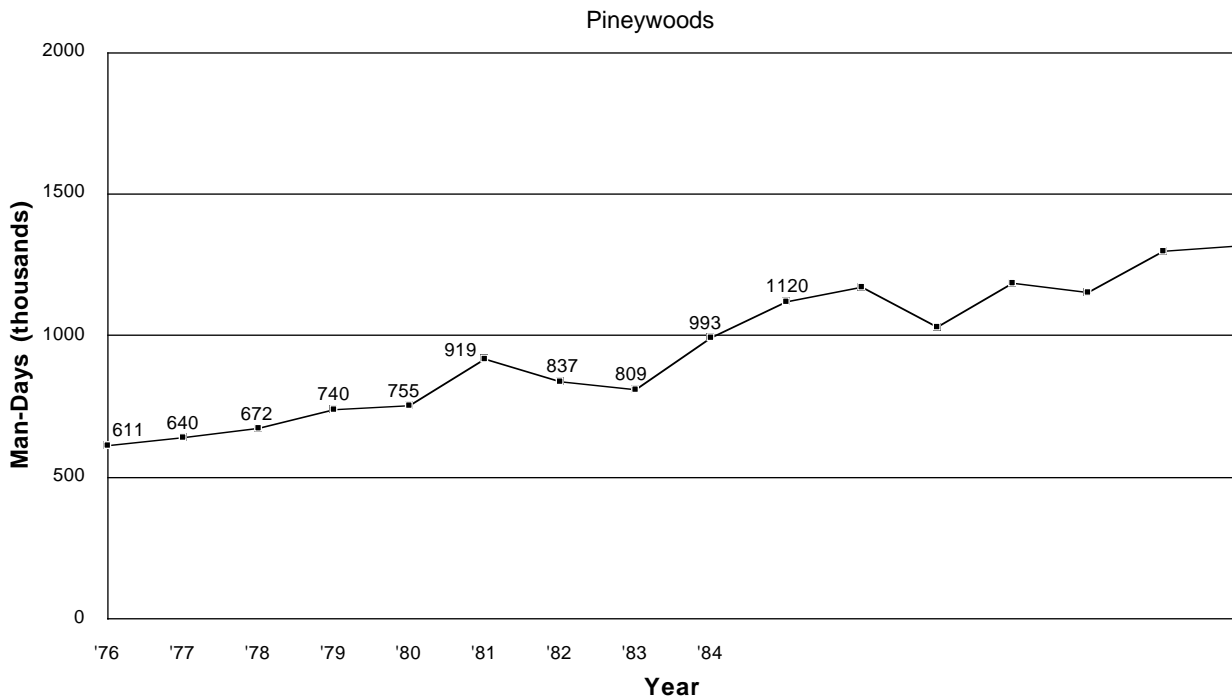
Hunter Numbers

As deer numbers increased over the last 15 years, an increasing number of people hunted deer in the Pineywoods. Local residents, who previously hunted in other parts of the State, remained at home to hunt. Between 1976 and 1991, hunter numbers increased from an estimated 82,000 hunters to 124,000 hunters, a 51 percent increase.

Hunter Effort

The total number of hunters multiplied by the average number of days hunted provides a measure of total hunter effort expressed as "hunter-days." The average Pineywoods deer hunter hunted 7.4 days in 1976. This figure increased over the next 15 years to 10.6 days per hunter in 1991. Therefore, hunter effort also increased from 611,000 hunter-days to 1,317,000 hunter-days during the same period, a 116 percent increase (Figure 6). The Pineywoods now ranks second among all regions in Texas in the total days of deer hunting recreation provided. The Edwards Plateau leads with 1.5 million hunter-days followed by the Pineywoods with 1.3 million and South Texas with .9 million hunter-days.

Figure 6: Man-days of Deer Hunting

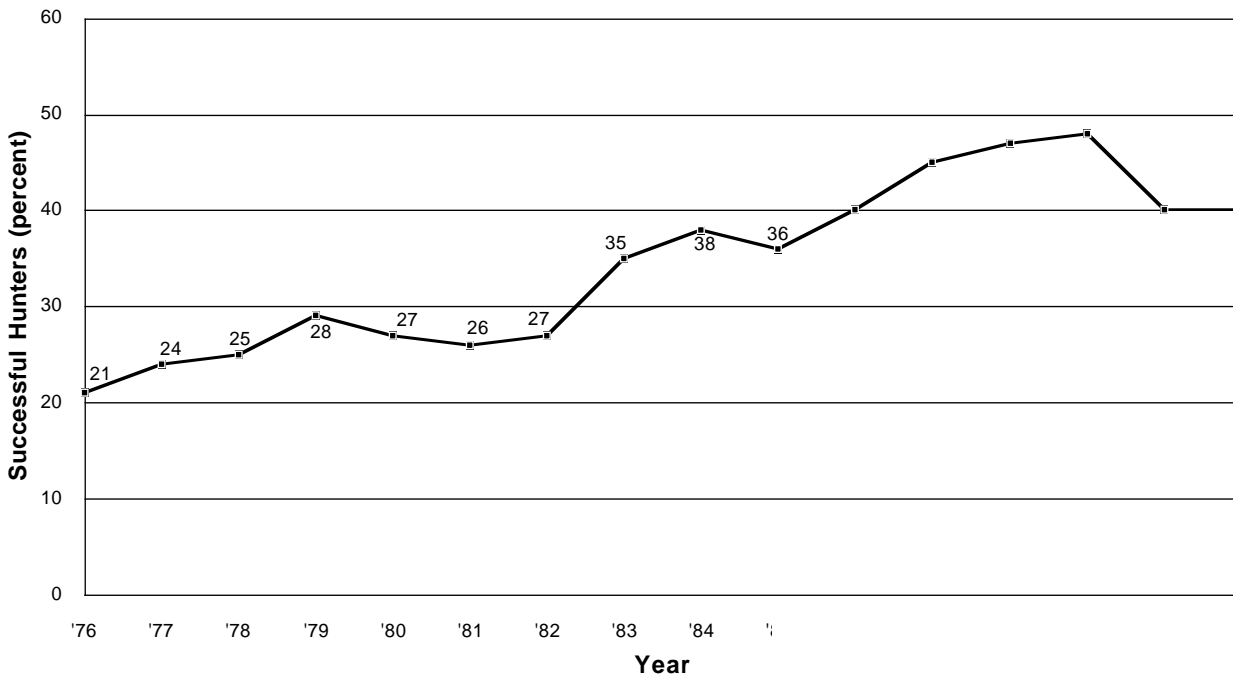


Hunter Success

One reliable indicator of deer numbers is the percent of hunters that successfully harvest a deer. As deer numbers increase and deer become more available, hunter success increases. Conversely, as deer numbers decline, hunter success declines. Deer hunter success in the Pineywoods steadily increased from 21 percent in 1976 to 48 percent in 1989 indicating a growing deer population (Figure 7). Hunter success declined in 1990 and 1991 to 40 percent, equal to the 1986 figure, but still significantly higher than during the mid 1970's. The trend in hunter success closely follows the trend in deer numbers (Figure 5).

Figure 7: Deer Hunter Success

Pineywoods



Harvest Trends

Total Harvest

In 1976, an estimated 16,324 deer were harvested in the Pineywoods. The deer harvest continued to increase as deer populations increased and more liberalized either-sex regulations were implemented (Figure 8). The total deer harvest in the Pineywoods peaked at 72,207 deer in 1988, followed by three successive years of declines as deer numbers declined. Harvest estimates in 1991 were similar to the harvest figures of 1985 and 1986.

Buck Harvest

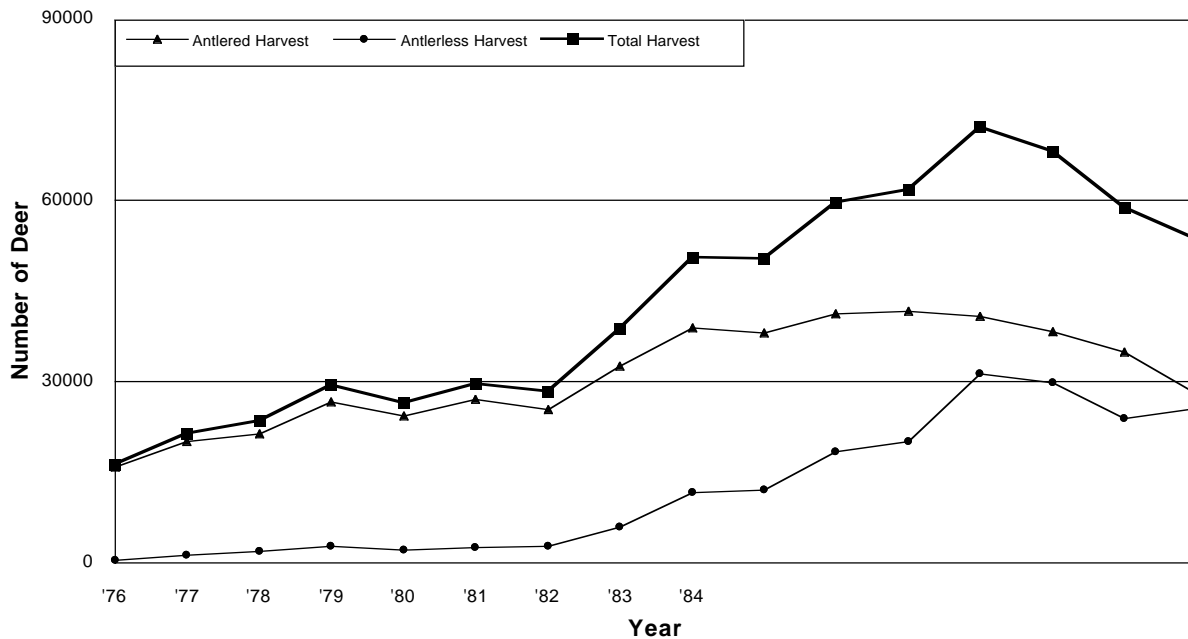
The trend in total buck harvest provides a good indicator of which way the total deer population is going (up, down, or stable). The buck harvest peaked in 1987 at 41,609 bucks and gradually declined through 1991 (Figure 8). Prior to 1991, a two buck limit was in place in all Pineywoods counties. New regulations implemented in 1991 reduced the buck bag limit to one buck, resulting in a 23 percent decrease in the buck harvest compared to 1990. The estimated buck harvest declined as total deer numbers declined from 1988 to 1991. However, with improved fawn survival and the implementation of the one buck bag limit, more bucks may be available for harvest in the future.

Antlerless Harvest

The current antlerless deer harvest program was implemented in 1973 on a limited basis. From 1973 through 1987, regulations required that antlerless permits be issued by the TPWD to landowners or their agents. The landowner then had the option of reissuing the permits to hunters on their property. Under this system, the antlerless deer harvest dramatically increased from an estimated 466 antlerless deer in 1973 to 20,221 antlerless deer in 1987 (Figure 8). However, biologists recognized that an inadequate number of antlerless deer were being harvested under the permit system to stabilize deer herd growth. In 1988, a new system allowing the harvest of antlerless deer without special permits was implemented, resulting in a 54 percent increase in the antlerless deer harvest. The total

antlerless deer harvest declined to approximately 25,719 deer by 1991. Declines since 1988 can be primarily attributed to an overall decrease in deer numbers, as a result of reduced range carrying capacity, brought on by successive years of overpopulation in the mid 1980's.

Figure 8: Deer Harvest Trends
Pineywoods



Habitat Trends

The quantity and quality of deer habitat in the Pineywoods has declined over the past three decades, primarily because of intensive land use to favor living space, water, minerals, food and fiber for mankind at the expense of wildlife. The white-tailed deer, one of the most adaptable wildlife species in the world, can tolerate a variety of habitat changes. However, the versatile "White-tail" is adversely affected when land uses and abuses are extreme. Where land use practices remain favorable, an equally ominous threat comes from the deer themselves as a result of overpopulation.

Deer Overpopulation

If deer numbers are allowed to increase beyond carrying capacity, they overbrowse and destroy the limited supply of desirable native plants they depend upon for food. The end results are malnutrition, poor fawn survival, low body weights, below average antler development, and high losses from parasites and diseases. This phenomenon has occurred historically in the Pineywoods. Similar conditions were widespread in the Pineywoods during the mid 1980's. Overpopulation and drought conditions lead to a population crash in 1988.

Cattle Grazing

The Pineywoods under natural conditions is a mixed pine-hardwood forest. The land is better suited for growing trees than for growing grasses for cattle, since it is not a natural grassland. However, thousands of acres of timberland has been converted to pastureland that can only be maintained in a productive state for cattle through the control of competing woody vegetation and weeds, the planting of exotic grasses such as coastal bermudagrass, and fertilization. The so called "improved" cow pasture is poor deer habitat since deer prefer to eat weeds, fruits and woody plants instead of grasses. As more timberland is gradually converted to

improved pasture, the quality and quantity of deer range is diminished. Equally detrimental is the common practice of permitting cattle to graze woodlands, thereby competing directly with deer for fruit and browse.

Pine Monoculture

Deer do well in a diverse forest that is periodically disturbed through timber harvest and fire. The trend since the late 1960's has been to convert much of the natural pine-hardwood forest, to pine plantations. Depending on how plantations are managed, deer populations can be favored or harmed. Pine plantations can be productive deer range during the first 5-7 years, but a period of declining conditions usually follows for the next 10 years, until the first commercial harvest begins. However, plantations may be managed more intensively through time to favor pine trees over competing woody vegetation (deer foods) leading to a lowered capacity to support deer. As fiber demands increase, it is likely that more intensive methods such as broadcast herbicides will be more commonly used to eliminate plants that are valuable to deer. Areas that are now large plantations in the sapling stage have experienced declining deer habitat quality.

Mining

Some areas of the Pineywoods are rich in lignite coal deposits. In recent years, these coal beds have been developed, stripping the land of forest and woody cover valuable to deer. After lignite is extracted, the land is recontoured and primarily revegetated with grasses, leaving the site with little to offer for deer and other wildlife. As more of these lignite deposits are mined over time and the land converted from native habitat to pasture grasses, the quality of the deer range will be diminished.

Reservoirs

The best deer range in the Pineywoods is associated with river and stream floodplains. These bottomlands offer a rich diversity of plant life, an abundant mast supply and fertile soils that produce quality forage. Studies completed in 1980 indicated that 63 percent of the original bottomland forests have been lost in Texas. Over 600,000 acres of hardwood bottomlands have been lost due to the construction of reservoirs in the past and an additional 900,000 acres of new reservoirs are being planned. In addition to the direct losses in wildlife habitat from the reservoir itself, human activity and development associated with the reservoir site takes an additional toll on habitat. Additional losses of our most valuable wildlife habitat can be expected.

Urbanization

As human populations increase, space is needed for people to live. Much of this space is taken from lands previously productive for deer and other wildlife species. Rural populations are growing and urban sprawl is consuming more habitat each year. This trend can be expected to continue in the Pineywoods.

Analysis

The history of the Pineywoods deer herd is a classic example of a herd that was decimated, restored, "boomed," and "crashed". The "boom and crash" phase seen during the past fifteen years was not unexpected. Professional deer managers have seen this happen over and over again on a smaller scale within study areas in Texas and across the United States. Three examples of the "boom and crash" phenomenon occurring in the Pineywoods are described in this report. Numerous other case histories from across Texas and other states are well documented. All deer herds that behave in this fashion are driven by the same basic biological principles. First, deer need a nutritious year round food supply to survive. However, the food supply for deer is limited on all deer range. This limited food supply sets limits on the number of deer a range will carry in a healthy condition. Thus the term range "carrying capacity." This term is often misunderstood because carrying capacity varies from year to year and

season to season. It is a "moving target." But even though carrying capacity is continually changing, sooner or later deer numbers "hit the target" and reach or exceed carrying capacity unless population growth is controlled. Deer numbers are usually limited by the year or season with the lowest carrying capacity.

A deer herd goes through phases after deer are introduced into unoccupied range. During Phase I, foods are plentiful and deer are healthy and productive. As the herd approaches carrying capacity (Phase II) productivity declines and some diseases or parasites may be present, but basically, to the untrained eye the herd may appear to be in relatively good shape. During the second phase, deer begin to consume more of the available food supply than can be replaced by the annual growth and, in a sense, deer begin to "mine" the range. Whole groups of plant species either die or fail to reproduce. Finally, when the herd reaches Phase III and numbers surpass carrying capacity, so much damage is done to the range that carrying capacity is lowered and deer numbers begin to decline. Most of the losses during Phase III come from fawn mortality and, as adult losses from disease and parasites increase, the total population declines. In many cases, this downward trend continues until the population is reduced to a much lower level that the range can support. After a period of decline, range conditions may improve and deer numbers once again begin increasing.

All of the evidence indicates that the Pineywoods deer herd followed this basic cycle of "boom" in the early years followed by a "crash" after deer numbers surpassed carrying capacity. Quite often deer populations may stay in Phase II of herd growth for several years if environmental conditions are mild. Given enough time, however, a stress period such as a drought, a severe winter, or a mast failure will move the population into Phase III and a crash occurs. That is what happened in the Pineywoods. During the early to mid 1980's weather and range conditions were favorable, rainfall was normal or above normal, mast crops were good, and winters were not severe (Figure 5). However, in 1987, as the deer population peaked, the Pineywoods entered into a period of harsh weather conditions. A hard spring freeze in late March and early April caused severe damage to fruit and mast producing trees and shrubs and, for the following two years, mast crops were very poor. As deer came through the winter of 1987-88, they entered an unusually dry spring, summer and fall period that severely reduced the quantity and quality of forage in many areas. The deer population then crashed throughout much of the Pineywoods. It was during this period of harsh conditions in 1987-1988 that the range was severely damaged in many areas. After about three years, the habitat and deer herd began to recover.

However, all Pineywoods areas did not experience deer declines in the late 1980's. Populations that were below carrying capacity, although affected, survived the period in good shape and maintained stability. But, because so much of the range was overstocked, the overall Pineywoods deer population was sharply reduced. A good example of a herd that maintained stability during the 1988-91 period is the Bear Creek Hunting Club herd discussed earlier.

While the overall Pineywoods deer population was fluctuating in response to range conditions related to deer numbers, a more subtle change was taking place that had far reaching consequences. An overbrowsed range can recover if deer numbers are reduced, but habitat that is destroyed or damaged by man's activities may never be replaced. Wildlife habitat is being lost each year. It is likely that the Pineywoods will have less white-tailed deer in the future as a result.

The Role of Hunting Regulations

The purpose of hunting regulations is to protect and provide for the equitable public use of wildlife resources. As it relates to deer, the term "protect" means to protect the resource from exploitation by man and to protect the herd from self destruction (depletion) associated with overpopulation. Regulations need to be liberal enough to prevent overpopulation and self destruction, while at the same time preventing an overharvest by man. Another ingredient in the equation is "equitable public use." This means that regulations should insure, as much as possible, that the limited wildlife resources are fairly distributed among the users of the resource. To insure that regulations accomplish these goals, the Texas Parks and Wildlife Department's professional wildlife biologists closely monitor wildlife resources. These professionals serve as consultants to the public, through the Texas Parks and Wildlife Commission, in making regulations recommendations that are based on scientific fact.

Setting hunting regulations that accomplish their intended purpose is very difficult in a private lands state like Texas. In the Pineywoods, approximately 93 percent of the land is owned by private landowners. Landowners, with the support of strong trespass laws and a highly professional and well-trained force of State Game Wardens have the opportunity to control public use of wildlife resources on their property. At the same time, landowners have total control of habitat quality. Quality habitat can be preserved and enhanced or destroyed without interference, except in the case of endangered species. Hunting regulations do not address habitat and habitat is the "key" to wildlife abundance. Therefore, on private lands in the Pineywoods, what can regulations accomplish? Basically, hunting regulations simply offer a framework within which landowners can allow and control hunting on their own lands. Within this framework, landowners may be more restrictive, but no more liberal than state regula-

tions permit. Regulations should be flexible enough to allow landowners to set harvest quotas based on the available supply of deer on individual tracts of land. At the same time, biologists need sufficient biological data to insure that the majority of landowners, within the regulations framework, are exercising good judgment and are not overharvesting the deer herd. More restrictive regulations must be implemented if an overharvest is detected.

THE FUTURE

The TPWD has limited capability through hunting regulations to control the destiny of a deer herd on private lands. Basically, the future of the Pineywoods deer herd is in the hands of private landowners. Regardless of what form hunting regulations take, private landowners continue to control what happens within their property boundaries. Good deer range can be degraded or destroyed through detrimental land use practices permitted by landowners. Deer can be replaced by pastureland, subdivisions, cropland, reservoirs, mineral development, or intensive pine monoculture at the landowner's option. Landowners may forfeit the responsibility of controlling public access to their lands and thereby allow the exploitation of a localized deer herd through overhunting. On the other hand, landowners may improve deer habitat through good land management and exercise wise harvest controls to improve the quality, health, and productivity of a deer herd.

About two-thirds of the Pineywoods deer range is relatively small tracts of land owned by private, nonindustrial landowners. Most of the remainder of the acreage consists of larger tracts of forest industry properties. Regardless of the size of a tract of land, habitat management and proper harvest are essential in insuring that a healthy, productive deer herd is present. Landowners of small tracts of land, however, often feel that they have no control over the deer population.

Deer are mobile animals with relatively large home ranges. Therefore, some landowners believe that any efforts to manage deer are futile without the cooperation of their neighbors. Landowners are often reluctant to talk to their neighbors about working together for the common purpose of improving a deer herd. However, this cooperation is essential. Landowners, both small and large, need to work together for the common good of all wildlife resources and the enjoyment that they provide to everyone. That is not easy, but it can be done. It takes a common concern among neighbors and a commitment to make something happen. The future of deer and other wildlife resources are at stake.

Who are the players in a cooperative wildlife management initiative? Basically, the landowners themselves are the players. It starts with just a few neighbors and then expands over time until a large number of landowners, collectively controlling thousands of acres, are involved. Landowners can cooperate in improving law enforcement, setting harvest quotas, collecting data, and improving habitat. During this process, TPWD biologists and game wardens are available to assist in providing the technical expertise needed to guide a cooperative program. Landowners who have successfully initiated a "cooperative" find that trust among neighbors increases and people begin taking pride in their joint successes.

Wildlife management truly is a cooperative effort. The TPWD, through the regulations process cannot insure the future of wildlife resources on private lands. On the other hand, landowners who want to do something to improve conditions for wildlife often do not know what to do and in the absence of good information, may unknowingly damage habitat. Recent land use trends in the Pineywoods are not encouraging. Unless these trends are reversed, the long-term outlook for deer is not good. As habitat is degraded or lost over time, deer numbers will decline. Landowners, hunters, agencies, and others must become partners in cooperative efforts to insure the future of the deer resource for the next generation. The future of the deer resource is in our hands.

For more information and assistance in establishing a landowner cooperative write:

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