Potential Impact of Liberalized Regulations to Promote Spike Buck Harvest

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Abstract: Spike-antlered white-tailed deer (*Odocoileus virginianus*) are common in Texas. Research has shown these animals to be inferior to their herd cohorts. Attempts to upgrade buck quality have focused attention on the removal of spikes from the herd to a point of annihilation. An evaluation of harvest data collected annually in Texas shows that spike bucks are essentially a product of deteriorated range conditions. Harvest regulations aimed at the systematic removal of spike-antlered bucks have been proposed as a solution for improving deer quality. Such regulations on a statewide scale have the potential of creating distorted buck-to-doe ratios and shortages in available bucks for future harvest.

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The objective of this paper is to show that a liberalized bag limit aimed at the systematic removal of spike bucks will not enhance deer quality unless the herd is brought into balance with the habitat. The physical removal of spikes has been touted as a cure-all for antler development. However, it is reasonably safe to predict that even the most genetically superior buck cannot develop trophy antlers under nutritionally deprived conditions.

Current estimates place the Texas white-tailed deer herd at 3 million animals situated in a variety of habitats which exceed 28 million ha (Fig. 1). While Texas has an abundance of deer, most deer herds lack quality. Spike-antlered bucks are common in most areas and prevalent in others (Table 1).

History of Spike Buck Harvest

In 1925, a statewide 2-buck bag limit was enacted into law which specifically protected spikes and antlerless deer (Gore 1981). Periodic dieoffs in deer prompted legislation in 1953 which permitted the legal harvest of antlerless deer, but spikes remained on the protected list. It soon became apparent that many illegal spikes were being killed by hunters who mistook them for

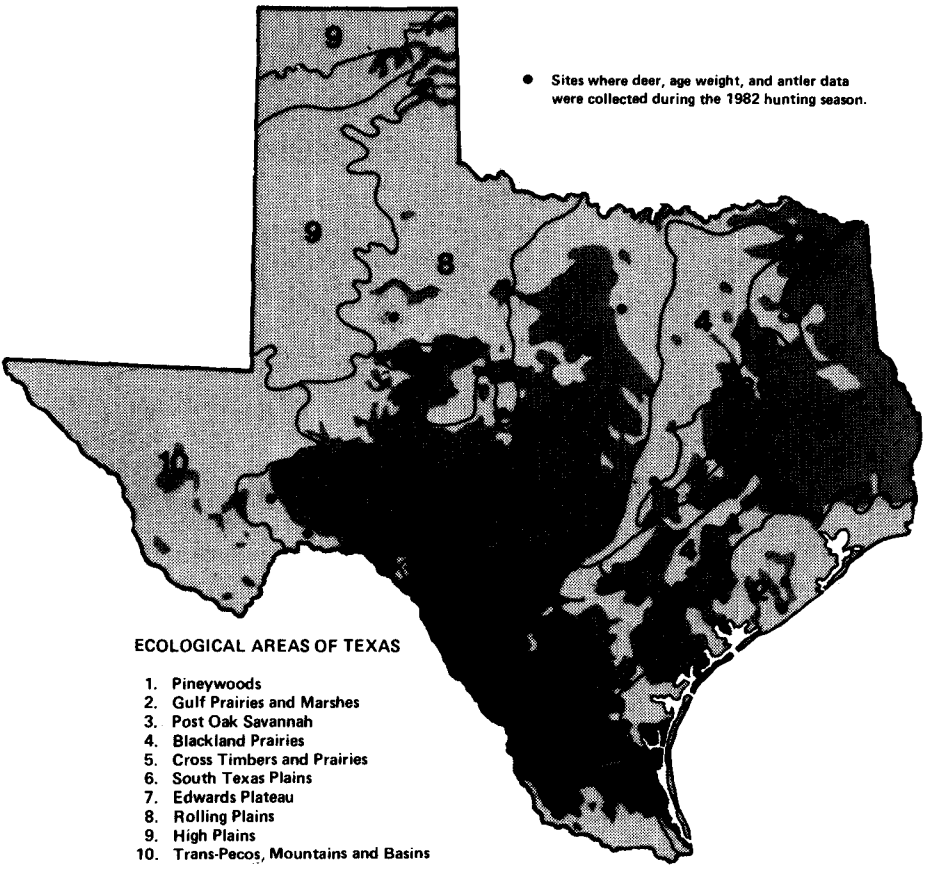

Figure 1. Distribution of white-tailed deer within the ecological areas of Texas and collection sites for deer age, weight, and antler data during the 1982 hunting season.

does. Since there was no biological reason to protect spikes, the Game and Fish Commission eventually legalized the harvest of all buck deer with hardened antlers. Current regulations of the Texas Parks and Wildlife Department do not give differential protection to spikes. However, regulations do not promote the taking of spikes by offering bonus tags, etc.

Fitting Spikes into the Harvest

Since the early 1960s, many data have been accumulated concerning spike bucks. Results of ongoing studies on the Kerr Wildlife Management Area in the Edwards Plateau of Texas have revealed that spike antlers can result from malnutrition as well as genetic inferiority (Butts and Harmel 1978). These

Table 1. Incidence of spike-antlered bucks in Texas by age class, 1982.

Ecological area	Age class (years)	Sample size	Spike-antlered bucks *N*	Spike-antlered bucks %
Pineywoods	1.5	313	91	29.1
	2.5	130	10	7.7
	3.5	59	2	3.4
	⩾4.5	27	0	0.0
	Combined	529	103	19.5
Gulf Prairies and Marshes	1.5	103	42	40.8
	2.5	44	2	4.5
	3.5	55	0	0.0
	⩾4.5	28	0	0.0
	Combined	230	44	19.1
Post Oak Savannah	1.5	280	77	27.5
	2.5	98	1	1.0
	3.5	64	1	1.6
	⩾4.5	16	0	0.0
	Combined	458	79	17.2
Cross Timbers and Prairies	1.5	180	35	19.4
	2.5	53	2	3.8
	3.5	34	0	0.0
	⩾4.5	13	0	0.0
	Combined	280	37	13.2
Edwards Plateau	1.5	457	179	39.2
	2.5	313	38	12.1
	3.5	244	5	2.0
	⩾4.5	251	2	0.8
	Combined	1,265	224	17.7
South Texas Plains	1.5	150	66	44.0
	2.5	91	0	0.0
	3.5	116	0	0.0
	⩾4.5	190	0	0.0
	Combined	547	66	12.1
Rolling Plains	1.5	139	36	25.9
	2.5	37	1	2.7
	3.5	20	1	5.0
	⩾4.5	44	0	0.0
	Combined	240	38	15.8
Trans Pecos	1.5	14	10	71.4
	2.5	5	0	0.0
	3.5	10	0	0.0
	⩾4.5	30	0	0.0
	Combined	59	10	16.9
Texas	1.5	1,636	536	32.8
	2.5	771	54	7.0
	3.5	602	9	1.5
	⩾4.5	599	2	0.3
	Combined	3,608	601	16.7

studies have also shown that spikes remain inferior in weight and antler development to fork-antlered deer of the same age class. Public acceptance of the findings that spikes are inferior has been tremendous. Although publicity of the study has included those findings dealing with malnutrition, the general public reaction has centered on controlling spikes for genetic reasons. Thus, the question arises, "Should regulations be liberalized to promote the removal of spikes from the deer herd?"

On individual ranches where deer management programs are aimed at producing trophy class bucks—all other factors being secondary—efforts have been made to remove as many spike bucks as possible. However, some managers have found that spikes removed as culls must be considered as part of the total buck harvest. If all facets of a trophy deer management program are in place, few spikes should be produced except during years of inordinately poor range conditions.

In general, trophy deer management programs are not a policy of the Texas Parks and Wildlife Department and are not the rule in Texas. However, most landowners and hunters want as many big, wide-antlered, multi-tined bucks as the land will produce. Herein lies the problem.

Malnutrition a Dominant Factor

Poor range conditions produce a high incidence of spike antlers (Harwell 1982). Two areas in Texas which consistently have chronic malnutrition problems are the Edwards Plateau and the Gulf Prairies (Fig. 1). Although the Gulf Prairie deer herd is not vast in terms of total number, the "pockets" of deer habitat often have deer numbers as dense as the heaviest concentration of the Edwards Plateau (Table 2). In both ecological areas, spike bucks are common and hunting pressure is heavy. The Gulf Prairie ranks second only to the Post Oak Savannah in hunter density (Table 3).

Drought conditions in Texas produce abnormally high numbers of spikes (Table 4). In 1982, 41% of the yearling (18-month-old) bucks in a harvest survey from the Gulf Prairies were spikes. This compared to 28% in the Post Oak Savannah and 39% in the Edwards Plateau (Harwell 1982).

Even under the best conditions for game and livestock management, such as at the Kerr Wildlife Management Area in the Edwards Plateau, extended periods of below normal precipitation, coupled with high deer populations, result in excessive numbers of yearling spikes. Conversely, high rainfall and good range conditions produce very few spikes (Table 5). The Kerr area was fenced deer-proof in 1968, enabling control of deer. Consequently, the herd had been reduced by 58% by 1972. While deer were at a controlled level (21 per 100 ha), only 7% of yearling bucks were spikes in 1973, and no yearling spikes were taken in 1975. The 43% yearling spikes taken in 1974 resulted from deteriorated range conditions caused by below normal rainfall during the winter and spring of 1973–74 (W. E. Armstrong, pers. commun.). Since 1975,

Table 2. White-tailed deer density and herd composition presented by ecological areas in Texas, 1982.

Ecological area	Deer range (ha)	Estimated deer population	Deer/100 ha	Herd composition			Does/ buck	Fawns/ doe
				% bucks	% does	% fawns		
Pineywoods	4,535,864	249,155	5.5	21.5	69.9	8.6	3.25	.12
Gulf Prairies	656,381	115,977	17.6	20.4	54.8	24.9	2.69	.45
Post Oak Savannah	3,235,676	279,020	8.6	15.6	63.7	20.7	4.09	.33
Blackland Prairies	230,515	5,820	2.5	21.5	44.6	33.8	2.07	.76
Cross Timbers	2,738,206	222,177	8.1	15.1	51.9	33.4	3.40	.65
South Texas Plains	6,734,274	475,286	7.1	16.2	53.5	30.3	3.30	.57
Edwards Plateau	8,812,303	1,550,358	17.6	17.1	46.0	36.8	2.69	.80
Rolling Plains	1,261,030	75,900	6.0	15.2	49.5	35.3	3.26	.71
High Plains	139,623	1,075	0.8					
Trans-Pecos	709,437	23,587	3.3	18.6	46.0	35.4	2.48	.77
Texas	29,053,309	2,998,355	10.3	16.7	52.1	31.2	3.13	.60

Table 3. Texas white-tailed deer harvest data by ecological area, 1982–83.

Ecological area	Hunters	Antlered kill	Antlerless kill	Total kill	Composition of the kill		Hunters/ 100 ha
					antlered %	antlerless %	
Pineywoods	102,954	25,499	2,895	28,394	90	10	2.3
Gulf Prairies & Marshes	19,306	6,765	1,889	8,654	78	22	2.9
Post Oak Savannah	102,564	29,669	3,097	32,767	91	9	3.2
Blackland Prairies	3,714	455	0	455	100	0	1.6
Cross Timbers & Prairies	64,677	23,939	6,944	30,884	78	22	2.4
South Texas Plains	97,185	50,608	18,236	68,843	74	26	1.4
Edwards Plateau	178,495	106,123	53,581	159,704	66	34	2.0
Rolling Plains	14,472	5,230	1,846	7,075	74	26	1.1
High Plains	752	212	0	212	100	0	0.5
Trans-Pecos	2,311	624	499	1,123	56	44	0.3
Statewide	525,690	248,632	88,989	337,621	74	26	1.8

Table 4. Trend of spike-antlered bucks in the harvest from selected ecological areas in Texas.

Ecological area	Age class (years)	1980 Sample size	1980 % spike bucks	1981 Sample size	1981 % spike bucks	1982 Sample size	1982 % spike bucks
Pineywoods	1.5	146	33.6	208	25.5	313	29.1
	2.5	61	6.6	76	15.8	130	7.7
	⩾3.5	68	0.0	93	1.1	86	2.3
Gulf Prairies & Marshes	1.5	52	38.5	101	50.5	103	40.8
	2.5	33	0.0	42	4.8	44	4.5
	⩾3.5	29	0.0	78	0.0	83	0.0
Post Oak Savannah	1.5	218	19.7	402	19.2	280	27.5
	2.5	63	1.6	90	5.6	98	1.0
	⩾3.5	41	0.0	54	1.9	80	1.2
South Texas Plains	1.5	125	58.4[a]	110	34.5	150	44.0
	2.5	105	14.3	93	4.3	91	0.0
	⩾3.5	353	2.8	344	0.3	306	0.0
Edwards Plateau	1.5	196	59.7[a]	356	26.7	457	39.2
	2.5	321	18.1	335	4.5	313	12.1
	⩾3.5	405	9.4	628	1.0	495	1.4
Cross Timbers & Prairies	1.5	123	33.3	225	19.6	180	19.4
	2.5	36	19.4	85	0.0	53	3.8
	⩾3.5	39	0.0	93	1.1	47	0.0
Rolling Plains	1.5	32	21.9	31	19.4	139	25.9
	2.5	5	0.0	26	3.8	37	2.7
	⩾3.5	17	0.0	60	0.0	64	1.6

[a] Severe drought.

the area deer herd has fluctuated between 17 and 27 animals per 100 ha. The result is a high percentage of yearling spikes each year the area experiences drought conditions prior to or during the antler-growing period (Harmel and Litton 1981).

Penned deer studies on the Kerr Wildlife Management Area showed that poorly-nourished spikes responded with good antler growth when nutrition was improved. Likewise, when food quality dropped, antler quality also decreased. To achieve maximum antler and body weights, a high level of nutrition is needed throughout a deer's life (Harmel and Wardroup 1982).

Based on recent research which has concluded that spikes are both genetically and nutritionally inferior (Harmel 1982, Harmel and Litton 1981), many deer managers and hunters are proposing that regulations be liberalized to place emphasis on harvesting spikes. Examples of such proposals are:

1. Allow hunters to take spikes in any number during the open season, excluding the use of license tags.
2. Allow hunters to take one spike as a bonus deer.
3. Add a special spike buck tag to the hunting licenses.

In the absence of a clear knowledge of the female contribution to the genetic code, the purposeful removal of spikes to upgrade genetic quality seems

Table 5. Percent spike bucks by age class in buck harvest—Kerr Wildlife Management Area, Hunt, Texas.

Year	Age class (%)			
	1.5	2.5	3.5	≥4.5
1962[a]	88.5	3.03		20.00
1963	69.2	7.14		
1964[a]	88.9	23.08		4.00
1965	65.9	3.33		
1966	53.7	4.41		
1967[a]	88.0	32.50		7.69
1968[b]	62.5	4.84		
1969	83.3	4.35		
1970	37.0			
1971	45.0			
1972	31.8			
1973[c]	7.1			
1974[a]	42.9			
1975[c]	0			
1976[a]	82.4	4.55		
1977	45.5			
1978	34.8			
1979	38.2	16.67		
1980[a]	88.9	15.8		
1981	54.5	7.7		
1982[d]	19.2			

[a] Result of drought.
[b] Deer-proof fence erected to control deer herd.
[c] Low deer population; excellent range conditions.
[d] Excellent range conditions.

presumptuous. Research at Mississippi State University has suggested that does contribute equally, or perhaps even more to the heredity of antler characteristics and body weight than do bucks (Jacobson 1983).

Impact of Liberalizing Spike Harvest

To evaluate spike bucks as a component of the Texas deer herd, and to effectively prescribe their harvest, 3 questions are appropriate:

1. Are spikes the problem, or are they a symptom of the problem? The answer, in light of research and field surveys, is that spike bucks are not the problem, but are a symptom of malnutrition. Further, those areas of the state having malnutrition problems also have the highest deer densities and a preponderance of spikes. Add to this the highest concentration of hunters, and the result is a compound problem of poor quality deer and heavy hunting pressure on fork-antlered bucks. The end result is a continuation of malnutrition sustained by the overabundant antlerless segment of the herd, a continual pre-

ponderance of spikes brought about by the sustained malnutrition, and a shortage of fork-antlered bucks resulting from heavy hunting pressure.

2. What would be the impact of liberalizing the bag to promote the reduction of spike bucks? Considering the problem of malnutrition, the answer would be that liberalization of the bag aimed at depleting the number of spikes in the herd would be fruitless. If the percentage of bucks with spike antlers is to be lowered, some factor must be introduced to promote better antler growth (which is secondary to body growth in yearling deer). This factor is natural food, and the most practical and economical way to introduce it is to control the animal units utilizing the finite food supply. Since hunters normally remove a substantial (and adequate) number of bucks, the chronic deer problem in Texas is an inadequate harvest of antlerless deer. Winkler (1981) sums up the state of the art of antlerless deer harvest:

"Antlerless deer hunting has been the most controversial deer management program implemented in Texas. While the concept of harvesting female deer has generally been accepted by landowners and hunters, there is reluctance to harvest antlerless deer in sufficient numbers to achieve adequate population reduction."

In 1982, 339,314 antlerless permits were issued but only 89,000 (26%) were used. There is no quick, simple alternative to the removal of antlerless deer that will suffice for proper herd management.

3. Would the elimination or depletion of spikes, as a result of liberalized bag, solve the spike buck problem? The answer is an unqualified, "No." Regulation changes to promote culling on a statewide scale would be questionable because the indiscriminate culling of bucks from many intensely-hunted deer herds would result in an excessive harvest of bucks. If "war" is declared on spike bucks in areas of chronic malnutrition and heavy buck hunting pressure, 1 of 2 situations could result. The most probable would be a drastic shortage of bucks, both spike and fork-antlered. Bucks currently comprise 75% of the state's deer harvest. The addition of a liberal bag keyed on spikes without curtailment of the harvest of fork-antlered bucks, would further reduce the number of bucks carried over to the next hunting season. This could lead to a lopsided buck-to-doe ratio of undesirable proportions.

Even though bucks are the first choice of most Texas hunters, a slow trend is developing toward achieving an adequate antlerless harvest. Deer harvest surveys also indicate that hunters seem to have a built-in limit as to the number of deer they desire to kill, regardless of the bag limit. If spike bucks were given harvest liberalization in Texas, hunting pressure would be diverted from antlerless deer, thereby further reducing the number of antlerless deer harvested and increasing the ratio of does to bucks. Such a ratio would promote greater fawn production from the higher percentage of does, thereby fueling the malnutrition problem with the result being more spike bucks.

Conclusions

A positive approach to improve the quality of deer will require a change in deer management philosophy on the part of landowners and hunters. Deer managers cannot maintain high deer numbers on low quality habitat, and at the same time produce quality bucks. If the goal is to maintain deer at levels exceeding the optimum carrying capacity, the result will be low quality deer including a preponderance of spikes. If the goal is quality deer, then deer numbers must be reduced to balance the quantity of available food. There is no middle ground and no shortcut. Present Texas deer harvest regulations are adequate to achieve the desired results provided landowners change their philosophy from protectionism to management, and hunters exert an effort to significantly increase the harvest of antlerless deer.

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