DEER AND CATTLE DIETS ON HEAVILY GRAZED PINE-BLUESTEM RANGE

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Abstract: We studied dietary overlap between captive white-tailed deer ($n = 3$) (*Odocoileus virginianus*) and cattle ($n = 4$) for 3 years on 2 rotationally burned, 54-ha longleaf pine (*Pinus palustris*)-bluestem (*Andropogon* spp.) pastures in central Louisiana. A third of each pasture was burned each year in late February. One pasture was grazed heavily (61–77% herbage use) yearlong; the other was grazed heavily (50–67% use) from mid-April to 1 November. Deer diets were dominated yearlong by a mixture of browse (49.3–83.2%) and forbs (11.2–47.1%). Cattle consumed mostly grasses during spring and summer and 60 and 40% browse and herbage, during fall and winter, respectively. Cattle consumed more herbage on first-year burns. Dietary overlap under heavy yearlong grazing averaged 25.8, 11.8, 26.0, and 30.7% during spring, summer, fall, and winter, respectively. Overlap under heavy seasonal grazing averaged 18.5, 7.4, and 22.6% during spring, summer, and fall, respectively. Diets of both animals were diverse and overlap generally resulted from sharing small amounts of many plant taxa. Except on recent burns during summer, dietary overlap under heavy yearlong grazing was comparable to that observed under moderate yearlong grazing at half the cattle stocking rate. Moderate grazing (40–50% herbage removal) of similar range from late spring through early fall should have little negative impact on deer forage availability. Grazing during late fall and winter reduces an already limited supply of deer forage by reducing availability of evergreen browse and herbaceous winter rosettes.

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Most woodland grazing in the southern United States has been confined to the longleaf-slash pine (*P. elliottii*) type. Bluestem grasses dominate the herbaceous understory on about 2 million ha of this forest type in southern portions of Louisiana, Mississippi, and Alabama, and in northwest Florida. Substantial knowledge on integrated forestry and cattle management has been gathered, but questions of compatibility between cattle and wildlife, especially deer, have stirred considerable debate but resulted in little research until recently (Mitchell 1980, Thill 1984, Thill and Martin 1986).

Early studies of cattle diets in the South pertain primarily to the sparsely forested bluestem and wiregrass (*Aristida stricta*) ranges that developed following extensive clearcutting earlier this century. The heavy yearlong grazing and frequent (often annual) burning common earlier this century reduced availability of woody plants, which are generally a major component of deer diets in southern states (Lay 1969). Consequently, it is not surprising that browse was generally a minor component of cattle diets in early studies (Thill 1985).

Most of this cut-over range has been replanted with pines, and woody plants are now relatively abundant as a result of less burning and grazing. Thus, early studies of cattle diets are generally not applicable to present conditions. Recent research in southern Mississippi showed that browse contributed from 2.5% of cattle diets during summer to 21.4% during winter (Mitchell 1980). Cattle diets on rotationally burned, moderately grazed pine–bluestem range in central Louisiana averaged 40.9% browse during winter, and dietary overlap between cattle and deer ranged from 8.6% during summer to 34.7% during winter (Thill and Martin 1986).

Prescribed burning is an integral component of southern range management because it increases forage quality and production and aids in distributing cattle. Deer receive similar forage benefits and prefer recent burns (Lay 1967).

Our study was conducted in 2 phases of 3 years each to evaluate dietary overlap between deer and cattle under prescribed rotational burning and several grazing treatments. In phase I, we studied deer and cattle diets in a pasture grazed moderately yearlong and deer diets only in an adjacent ungrazed pasture (Thill and Martin 1986). We also evaluated phase I treatment effects on deer nutrition (Thill et al. 1987). The objective of this study was to quantify deer and cattle dietary overlap on pine-bluestem range under heavy seasonal and heavy yearlong grazing. We also compare phase I and phase II data.

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Table 1. Overstory basal area, cattle stocking, herbaceous standing crop, and herbage use by study phase, grazing treatment, and burn age for central Louisiana study areas.

Study phase[a]	Pasture	Treatment[b]	Burn age	Basal area (m^2/ha)[c]		Cattle[d] stocking (AU/month)	Herbage[e]	
				Pine	Hardwood		Standing crop (kg/ha)	Use (%)
I	West	U		13.5	1.0	0.0		
			1				1,036	
			2				1,084	
			3				965	
	East	MY		13.4	1.3	1.8		
			1				1,098	46
			2				567	29
			3				847	26
II	West	HS		15.8	0.8	3.4		
			1				1,260	77
			2				1,025	58
			3				983	61
	East	HY		14.6	1.4	3.8		
			1				1,135	67
			2				770	52
			3				884	50

[a] Inclusive sampling dates: phase I = Oct 1980–Aug 1983; phase II = Apr 1984–Feb 1987.
[b] U = ungrazed, MY = moderate yearlong grazing, HS = heavy seasonal (15 Apr–1 Nov) grazing, and HY = heavy yearlong grazing.
[c] Mean overstory basal area of pines and hardwoods across subunits in 1981 (phase I) and 1984 (phase II).
[d] Mean cattle stocking (animal units [AU]/month) over the entire grazing season (i.e., yearlong for all but the heavy seasonal grazing treatment).
[e] Measured in Oct following procedures of Thill (1982).

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STUDY AREAS AND METHODS

Study areas and methods were described by Thill (1982) and Thill and Martin (1986). This study was conducted from April 1984 through February 1987 on 2 adjacent pastures of the Palustris Experimental Forest in central Louisiana. Both pastures were divided by firelines into 3 burning subunits (each approx 18 ha) that served as separate sampling areas. Subunits had been control burned in late February on a 3-year rotation (1 subunit/pasture/yr) since 1981. Overstory basal area, cattle stocking, the herbaceous standing crop, and herbage use for phases I and II are summarized in Table 1.

The west pasture had not been grazed by livestock since 1956 and remained ungrazed during phase I. Beginning in 1984, the west pasture was stocked with cattle from mid-April to 1 November at a mean stocking rate of 3.4 animal units (AU)/month. The east pasture had a long history of moderate to heavy yearlong grazing. Cattle stocking on the east pasture during phase I averaged 1.8 AU/month; stocking during phase II was increased to 3.8 AU/month. Herbage use was higher on 1-year-old burns than on 2- or 3-year-old burns because cattle also prefer recent burns (Table 1).

The overstory on both pastures was a thinned, natural stand of longleaf pine with scattered, mostly immature hardwoods (Table 1). Current-year growth of hardwoods, shrubs, and vines to a height of 1.5 m averaged 401 and 468 kg/ha (oven-dry wt) on the east and west subunits, respectively, during phase I and was estimated at or slightly above these levels during phase II. The herbaceous standing crop averaged about 1,000 kg/ha for both pastures during both study phases (Table 1). Graminoids comprised an average of 56% of total phase II herbage on the east pasture and 76% on the west pasture and consisted mostly of bluestems, panicum grasses (*Panicum* spp. and *Dicanthelium* spp.), and paspalums (*Paspalum* spp.). Some green forage was available throughout winter from evergreen and tardily deciduous woody species, low panicum grasses, and rosette-producing forbs.

We quantified deer and cattle diets by closely observing 4 gentle cows and 3 tame deer and counting the number of bites eaten of each plant species. Mixed-breed cows (initially 1.5–2.5 yr old) were used throughout the 6-year study. Two of the deer (a F and a castrate) were also used throughout the study and were 3.5 years old at study initiation in October 1980. The third deer was added during 1981 winter trials when she was 8 months old. Feeding trials were conducted on each subunit on 4 or 5 dates spaced at equal

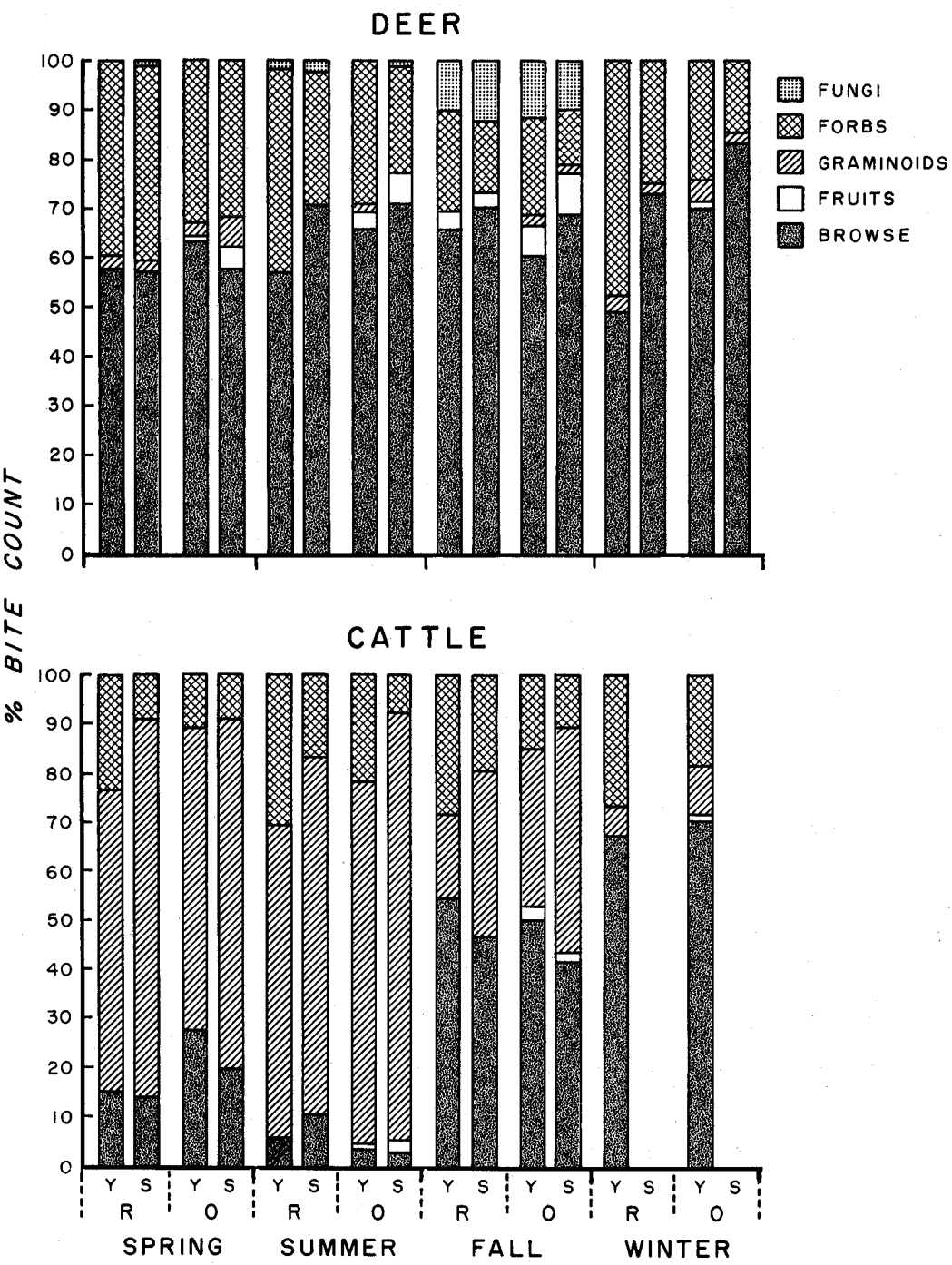

Fig. 1. Seasonal forage-class use by cattle and tame white-tailed deer under heavy yearlong (Y) and heavy seasonal (S) cattle grazing of pine-bluestem range in central Louisiana, 1984–87. Values are 3-year means for recent (R) and older (O) (2- and 3-yr-old) burns of a 3-year rotational burning system.

intervals during each of 4 seasons: spring (31 Mar–6 Jun), summer (23 Jun–13 Sep), fall (22 Sep–21 Nov), and winter (5 Jan–4 Mar). Trials lasted 30 minutes/deer and 20 minutes/cow and began at random starting points between 0730 and 1500 hours. Deer were harnessed and leashed during trials but were allowed to move at will; cattle were observed unrestrained.

Table 2. Number of plant taxa eaten and shared, and dietary overlap between cattle and tame deer by season and burn age under heavy yearlong (HY) and heavy seasonal (HS) cattle grazing of pine-bluestem range in central Louisiana, 1984–87[a].

Season	Burn age	No. taxa eaten[b]				No. taxa shared						% overlap	
		Yearlong		Seasonal		Total		≥1%[c]		≥5%[d]			
		Deer	Cattle	Deer	Cattle	HY	HS	HY	HS	HY	HS	HY	HS
Spring	1	80.3	96.3	80.3	83.7	58.3	50.7	5.7	2.7	0.7	0.3	24.2	15.8
	2	86.7	104.3	85.0	85.3	59.0	54.0	8.7	5.0	0.3	0.3	26.0	19.4
	3	84.0	103.3	91.7	83.3	62.3	51.7	7.0	6.0	0.3	0.7	27.2	20.3
Summer	1	74.7	87.0	67.7	68.3	43.7	39.3	3.0	3.7	0.7	0.3	19.7	12.4
	2	77.7	75.0	72.3	60.0	40.7	33.3	1.7	0.7	0	0	7.4	4.8
	3	73.3	81.0	77.3	61.7	43.0	35.3	2.7	1.0	0	0	8.3	5.0
Fall	1	52.7	82.3	51.3	61.0	38.3	32.7	4.0	7.0	0.3	0.3	23.3	25.2
	2	54.7	70.3	60.7	55.7	34.7	32.0	7.7	7.0	1.0	0.3	28.3	22.1
	3	54.3	65.0	56.0	61.7								
Winter	1	42.7	46.3	43.7		27.7		5.0		1.0		27.2	
	2	38.0	46.7	39.0		23.7		8.0		1.3		32.7	
	3	37.3	39.7	37.7		24.3		7.0		1.7		32.2	

[a] Values are means across subunits over 3 yr.
[b] Taxa counts include several species groups in which field separation of individual species was not possible.
[c] No. plant taxa comprising ≥1% of diet composition of both animals.
[d] No. plant taxa comprising ≥5% of diet composition of both animals.

Deer were maintained between trials on commercial horse and mule feed (13% crude protein, 0.44% phosphorus, and 0.48% calcium) and a variety of native plants. Cattle had yearlong access to salt and bonemeal and received about 225 kg of hay and 475 kg of horse and mule feed/animal during winter. Supplemental feed was removed from deer and cattle the evening before each trial to ensure sufficient foraging.

Phase II findings on deer are based on 497 hours of observation and 130,225 bite counts; cattle were observed for 378 hours, yielding 755,320 bite counts. Dietary overlap was computed using Kulcyznski's coeffieinct of similarity formula (Oosting 1956:77). For our purposes, forbs included ferns, and browse included leaves and tender twigs of trees, shrubs, and vines. Graminoids refer collectively to grasses and grasslike plants, but grasslike plants probably comprised <5% of the herbage and even less of the diets.

RESULTS

Deer Diets

Browse was generally the most important forage class used by deer throughout the year, and comprised 49.3–83.2% of their diet and averaged 65.2% across years, burn ages, and grazing treatments (Fig. 1). Forbs were second in importance, comprising 27.1% of the yearlong diet and ranging from 11.2 to 47.1%. Fungi, fruits, and graminoids comprised the remaining 7.7% of the annual diet. Fungi comprised <1% of the diet during all seasons except fall (10.9%) and on recent burns during summer (1.9%). Fruits were consumed most during summer and fall, but their availability was reduced during the first year after burning. Consequently, fruits comprised an average of 0.9% of diets on recent burns and 3.9% on older burns. Principal fruits used were flowering dogwood (*Cornus florida*), American beautyberry (*Callicarpa americana*), blackberries (*Rubus* spp.), flameleaf sumac (*Rhus copallina*), and blueberries (*Vaccinium* spp.). Graminoids, primarily low panicum grasses (*Dicanthelium* spp.), were eaten most during winter and spring but comprised only 2.1% of the annual diet. When averaged across years, burn ages, and grazing treatments, deer diets were composed of 84.7, 73.8, 55.0, and 39.7 plant taxa during spring, summer, fall, and winter, respectively (Table 2).

Cattle Diets

Cattle diets differed markedly by season (Fig. 1). Graminoids dominated summer (73.7%) and spring (67.8%) but not fall (32.6%) or winter (8.0%) diets. Browse dominated fall (48.1%) and winter (69.0%) diets, followed by graminoids (32.6%) and forbs (18.0%) in fall, and forbs (22.6%) and graminoids (8.0%) in winter. Browse comprised a mean of 19.3 and 6.2% of spring and summer diets, respectively. Forbs comprised a mean of 16.1% of spring and summer diets. Fungi were consumed only in trace (<0.1%) amounts during all seasons except fall (0.2%). Fruit consumption was highest on older burns and during summer and fall. No fruits

were eaten during spring. Highest recorded fruit use (9.2%) occurred during fall on a 3-year-old burn; but fruits averaged only 1.7% of diets on older burns from summer through winter.

Cattle diets consistently contained higher numbers of plant taxa than deer diets (Table 2). While foraging for grasses, cattle consumed larger bites that often contained a number of insignificant (relative to wt of grasses) herbaceous taxa, each of which was recorded. Deer bites seldom contained >1 species. As with deer, cattle diet diversity decreased from a high in spring to a low in winter (Table 2). Diets of cattle on the seasonally grazed west pasture consistently averaged fewer numbers of taxa than those of the yearlong-grazed east pasture. Diets from the yearlong-grazed pasture contained a mean (across burn ages) of 101.3, 81.0, 72.5, and 44.2 plant taxa during spring, summer, fall, and winter, respectively. Diets for these same animals averaged 84.1, 63.3, and 59.5 taxa on the seasonally grazed pasture for spring through fall, respectively.

Dietary Overlap

Numbers of plant taxa shared by deer and cattle decreased from spring to winter (Table 1). Averaged across burn ages and grazing treatments, 56.0, 39.2, 34.0, and 25.2 taxa were shared during spring, summer, fall, and winter, respectively. On average, ≤9 taxa (<4 during summer) comprised ≥1% of both their diets, and <2 taxa comprised ≥5% of both their diets for any given year and subunit (Table 2). Thus, diet overlap resulted from sharing relatively small amounts of many taxa rather than large amounts of a few key taxa. Except for low panicum grasses, principal shared taxa were woody plants or forbs (Table 3). Forty-two taxa comprised ≥1% of both their diets on ≥1 occasion, but a few taxa met this criteria consistently (Table 3).

Dietary overlap averaged slightly lower on recent than on older burns of the yearlong grazing treatment during all seasons except summer (Table 2). Overlap was also lower on recent (21.5%) than on older (29.2%) burns during spring under moderate yearlong grazing (Thill and Martin 1986). Overlap was negligible during summer (11.8% under heavy yearlong and 7.4% under heavy seasonal grazing) but averaged from 18.5% during spring under seasonal grazing to 30.7% during winter under heavy yearlong grazing (Table 2).

Diet overlap declined rather rapidly during spring, remained low during summer, and then gradually climbed again through fall. These seasonal patterns were observed in both phases of the study for both recent (Fig. 2) and older (Fig. 3) burns.

DISCUSSION

Recent findings (Olson-Rutz and Urness 1987) suggest that diets of experienced, tractable deer should be very similar to wild deer. All 3 deer used during phase II has >3 years during phase I to become familiar with the study areas. The 2 older deer also had 3.5 years of additional experience in other southern forest communities. In general, we found that plants that are preferred by tame deer also are preferred by wild deer.

Supplemental feeding apparently has little influence on diets selected by tame deer (Regelin et al. 1976, Bartmann et al. 1982). Consequently, we feel that our approach provides a valid, first-step assessment of potential dietary overlap between deer and cattle. Nevertheless, high overlap is not sufficient evidence for competition in the absence of supporting data showing diminished health or reproduction.

Weather directly affected dietary overlap and caused variability in fall data (Figs. 2 and 3). For example, cattle diets shifted abruptly from grasses to browse after heavy winds and rain from hurricane Juan caused an abrupt, heavy pine needle cast that covered much of the remaining herbage. As a result, fall overlap increased earlier than normal during 1985 as both types of animals concentrated on browse. Early fall freezes had similar effects, but early spring weather reduced overlap by increasing grass availability earlier and thereby reducing cattle browse consumption.

Incidences of high overlap on recent burns during summer, especially in August under the heavy yearlong treatment (Fig. 2), resulted from heavy, shared use of rough buttonweed (*Diodia teres*), which was very abundant on recent burns following heavy grazing. When it was encountered by both types of animals during the same week, overlap increased substantially, which resulted in high data variability.

Levels of dietary overlap and seasonal patterns were very similar for the east pasture under moderate and heavy yearlong grazing (Figs. 2 and 3). High plant diversity on both pastures and the highly diverse diets of deer and cattle

Table 3. Plant taxa that comprised ≥1% of the diet of deer and cattle by season under heavy yearlong and heavy seasonal (mid-Apr–Nov) grazing of pine-bluestem range of central Louisiana and the number of times out of 9 (3 yr × 3 subunits) that plants met this criterion[a].

Species	Yearlong grazing				Seasonal grazing		
	SP[b]	SU	FA	WI	SP	SU	FA
Woody plants							
Flowering dogwood	5	2	7	2	6	6	9
Blackberries	7		6	9	3		8
White sassafras (*Sassafras albidum*)	6	5	7		2	2	4
Summer grape (*Vitis aestivalis*)	9	1			7	3	3
Japanese honeysuckle (*Lonicera japonica*)			3	5			7
American sweetgum (*Liquidambar styraciflua*)	4	1	7				2
Poison-oak (*Toxicodendron toxicarium*)	7	2	2		1	1	1
Flameleaf sumac	1		3	9			
Post oak (*Quercus stellata*)	1		3		2		4
Yellow jessamine (*Gelsemium sempervirens*)			2	6			1
Muscadine grape (*V. rotundifolia*)			1		1		5
American beautyberry		1	1				4
Southern waxmyrtle (*Myrica cerifera*)				6			
Cat greenbrier (*Smilax glauca*)				5			1
Dewberries (*Rubus* spp.)	2				3		
Elliott blueberry (*Vaccinium elliottii*)			1	2	1		1
Red maple (*Acer rubrum*)			2				2
Farkleberry (*Vaccinium arboreum*)				3	1		
Deerberry (*V. stamineum*)	2				2		
Arrowwood viburnum (*Viburnum dentatum*)							4
Chinese privet (*Ligustrum sinense*)				1	1		1
Longleaf pine (*Pinus palustris*)				3			
Alabama supplejack (*Berchemia scandens*)			1				1
Water oak (*Q. nigra*)				2			
Saw greenbrier (*S. bona-nox*)			1		1		
Yaupon holly (*Ilex vomitoria*)				1			
Virginia creeper (*Parthenocissus quinquefolia*)	1						
Black cherry (*Prunus serotina*)					1		
Poison-ivy (*T. radicans*)	1						
Nonwoody plants							
Low panicum grasses[c]	6		5	4	6	1	
Swamp sunflower (*Helianthus angustifolius*)	3	5	3				
Rough buttonweed	1	4	1			2	
Grassleaf telegraphplant (*Heterotheca graminifolia*)				7			1
Rosinweed sunflower (*Helianthus silphioides*)	3		3				1
Woollywhite ragweed (*Hymenopappus artemisiifolius*)	1		2	3			
Pinehill bluestem (*Andropogon divergens*)					2		
Green silkyscale (*Anthaenantia villosa*)	1	1					
Partridgepea senna (*Cassia fasiculata*)						1	1
Violet woodsorrel (*Oxalis violacea*)	1				1		
Skeletongrasses[d] (*Gymnopogon* spp.)	1						
Common bracken fern (*Pteridium aquilinum*)	1						
Willow goldenrod (*Solidago salicina*)							1

[a] Within woody and nonwoody categories, taxa with highest seasonal totals across both grazing treatments are ranked first.
[b] SP = 31 Mar–6 Jun, SU = 23 Jun–13 Aug, FA = 22 Sep–21 Nov, WI = 5 Jan–4 Mar. No winter data for seasonal grazing treatment.
[c] Panicum grasses that produce basal rosettes during winter.
[d] Bearded skeletongrass (*G. ambiguus*) and slim skeletongrass (*G. brevifolius*).

were the primary reasons why dietary overlap did not increase markedly on the east pasture (except for summer) from phase I to II in response to a doubling of cattle stocking. Under heavy yearlong grazing, a mean of 32.8 taxa were used exclusively by deer in summer, and 38.6 taxa were used only by cattle (Table 3). These exclusively used taxa comprised 26.9 and 62.1% of deer and cattle diets, respectively. Exclusively used taxa were less common in deer diets under heavy than under moderate yearlong grazing, but their contribution was slightly higher under heavy yearlong grazing during all seasons except summer (Table 4). More exclu-

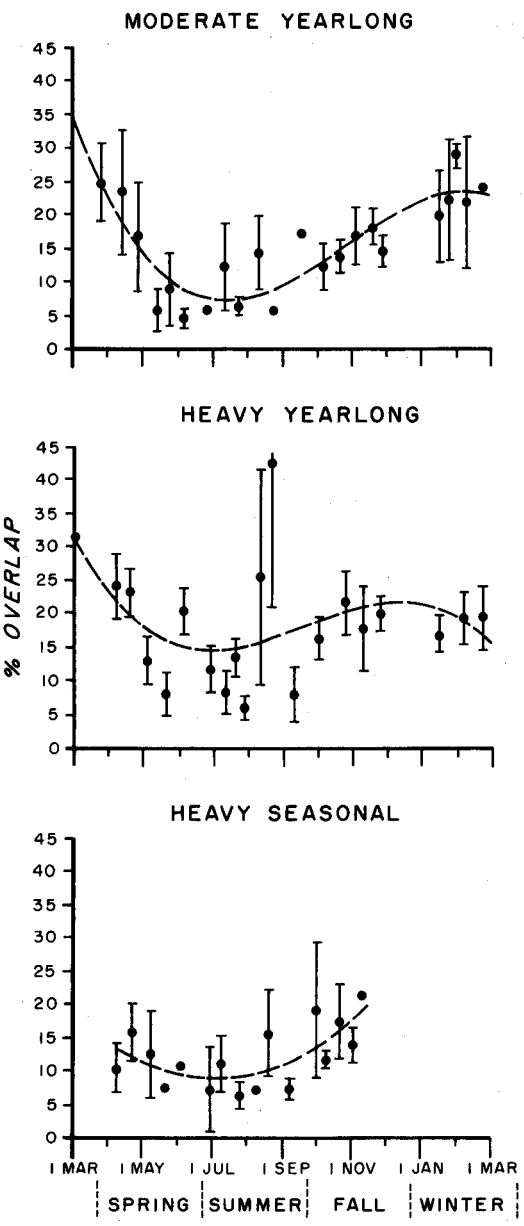

Fig. 2. Seasonal overlap ($\bar{x} \pm$ SE) in diets of cattle and tame deer on recent burns under moderate yearlong (Thill and Martin 1986), heavy yearlong, and heavy seasonal cattle grazing of pine-bluestem range in central Louisiana, 1980–87. Except for several single observations, each point is a mean of 2–5 ($\bar{x}$ = 2.6) data values that had similar Julian dates over the 3 years of data collection. Least-square curves are third-order polynomials except for the heavy seasonal (second-order) treatment.

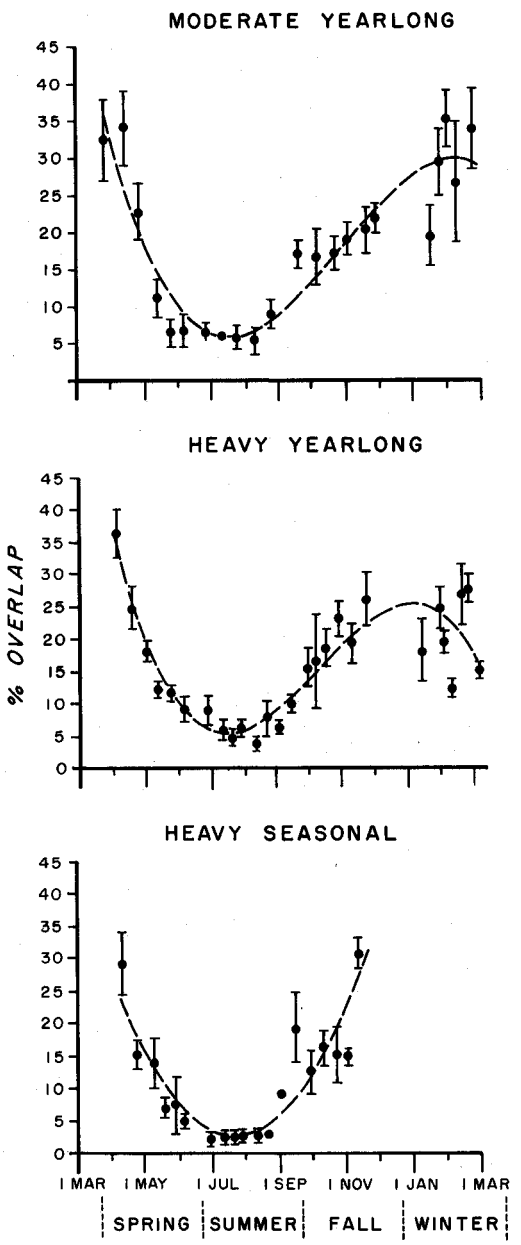

Fig. 3. Seasonal overlap ($\bar{x} \pm$ SE) in diets of cattle and tame deer on older (2- and 3-yr-old) burns under moderate yearlong (Thill and Martin 1986), heavy yearlong, and heavy seasonal cattle grazing of pine-bluestem range in central Louisiana, 1980–87. Except for several single observations, each point is a mean of 2–6 ($\bar{x}$ = 4.4) data values that had similar Julian dates over 3 years of data collection. Least-square curves are third-order polynomials except for the heavy seasonal (second-order) treatment.

sively used taxa were consumed by cattle under heavy yearlong grazing, but their dietary contribution was less most seasons under heavy than under moderate yearlong grazing.

Of 520 plant taxa monitored by Warren and Hurst (1981) in Mississippi pine plantations, 407 (78.3%) received moderate to high use by deer during ≥1 season. Foraging behavior in diverse plant communities should lessen the impact of

Table 4. Number of exclusively used plant taxa and their percent contribution to deer and cattle diets under moderate ($n = 9$) and heavy ($n = 9$) yearlong cattle grazing of pine-bluestem range in central Louisiana, 1984–87.

		No. unshared taxa				% contribution of unshared taxa			
		Moderate yearlong		Heavy yearlong		Moderate yearlong		Heavy yearlong	
Animal	Season	$\bar{x}$	SE	$\bar{x}$	SE	$\bar{x}$	SE	$\bar{x}$	SE
Deer	Spring	31.3	2.0	23.8	1.6	8.6	1.5	11.2	2.0
	Summer	51.7	3.6	32.8	2.0	39.0	4.9	26.9	3.1
	Fall	28.2	2.5	19.6	1.6	16.0	3.4	17.4	3.2
	Winter	30.7	2.1	15.3	1.9	14.3	2.0	15.6	2.4
Cattle	Spring	31.0	1.9	41.3	3.0	8.2	2.8	38.0	7.7
	Summer	31.1	2.1	38.6	2.4	73.7	8.6	62.1	5.7
	Fall	39.3	2.0	37.4	2.6	37.8	8.6	32.2	3.0
	Winter	12.3	1.9	19.0	2.0	30.2	7.4	20.1	4.0

reduced availability of some key forage species following grazing or other disturbances. However, Goodrum and Reid (1962) reported a marked decline in a fall deer population when about half of the preferred ("high choice") browse species (usually involving approx 10 key species) exhibited overbrowsing by deer within longleaf pine communities.

Forbs were an important component of tame deer diets even on the ungrazed west pasture where forbs were less abundant and physically less available under denser stands of mid- and tall-grasses (Thill and Martin 1986). Burning and grazing in combination increased forb abundance. Forbs averaged 21% of the herbaceous standing crop on recently burned ungrazed west pasture subunits but increased to 35% (44% the last yr) under heavy seasonal grazing (R. E. Thill, unpubl. data). Forb composition also increased on the east pasture, climbing from 32 on recent burns in phase I to 44% during phase II.

Our findings agree with others (Smith et al. 1958, Mitchell 1980, Pearson et al. 1982) who found that cattle diets on pine-bluestem range were mostly comprised of graminoids except when green grass was scarce. Consequently, the likelihood of competition is highest from late fall to early spring.

MANAGEMENT IMPLICATIONS

Findings reported here and for phase I (Thill and Martin 1986) suggest that late-spring through early-fall grazing of longleaf pine-bluestem range should have little negative impact on deer forage availability. During this period, cattle diets consisted primarily of grasses, while deer consumed mostly browse and forbs. Except for recent burns during summer, dietary overlap did not increase substantially following a doubling of the stocking on the east pasture. Likewise, overlap under heavy seasonal grazing followed patterns similar to that observed for corresponding months under moderate yearlong grazing. Diet overlap was highest from late fall through early spring as both types of animals sought diets from a limited supply of evergreen and tardily deciduous browse and herbaceous winter rosettes. Consequently, even moderate cattle stocking during this period could reduce available deer forage significantly.

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