Deer Range Appraisal for East Texas Forests

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All wildlife species need food, cover, water and space. These elements must be furnished by their habitat, the forest. In East Texas forests, food and its distribution are common elements limiting deer numbers. Evaluation of the food supply is a key to appraisal of the deer range.

The old saying, "All that glitters is not gold," is very appropriate when applied to deer food. Not all of a forest's vegetation is deer food. Deer are very selective in the plants they utilize. For optimum growth, deer must be selective in fulfilling their rather high nutritional requirements of 13 to 16 percent protein and 0.5 percent phosphorus. Hence, deer choose from the plants to which they have access. Some plant species are chosen first in most areas of East Texas; other plants are eaten only as a last choice.

The first step in appraising a deer range is recognizing plants which furnish the food supply. The second step is determining whether the food plants are of sufficient abundance and variety to allow the animals a selection to meet their nutritional needs.

Deer make some use of all categories of forage woody plants, grass, weeds and fruits. Grass, as a category, is probably least used. Fertilized, cool-season grasses such as oats, however, may receive heavy use. Weeds and fruits are very important, sometimes constituting one-half to three-fourths of a deer's diet. The availability of weeds and fruits, however, fluctuates greatly from season to season. Although not necessarily the most important forage category, woody plants are perhaps the most reliable indicators of the total forage supply. If all highly palatable browse species are overgrazed, the highly palatable weeds, fruits and grasses will also be heavily utilized. Research indicates that deer select palatable plants without regard to artificial categories. Top choices in one area might be acorns and greenbriar while in another area they would be yaupon and oats. This behavior of selecting the palatable food items first allows us to utilize a palatability listing developed for a particular plant growth form as an indicator of the total forage supply.

Browse, with its year-to-year stability, is more permanent and measurable than other forage categories. In the East Texas forest habitat, browse plants can be utilized to appraise the deer range.

Objectives

1. Identify important browse species within a given area.
2. Determine how deer browse is used by deer or livestock.
3. Demonstrate the relative palatability of browse species to deer.
4. Determine under- or over-stocking of deer range based on the degree of browse use.

Methods

The following method of appraising browse is adapted from Lay (1967).

The appraisal consists of three steps: (1) browse inventory and estimate of degree of utilization; (2) palatability classification; and (3) calculation and interpretation of utilization indices. These steps are explained in order.

(1) Within any major vegetative type, randomly select 25 to 100 circular plots of .01 acre (11.8-ft. radius). The number that can be inventoried in one day usually is sufficient for extensive surveys.

Identify browse species present within the plots, List species on a tally sheet. *Deer Browse Plants of Southern Forests,* edited by Halls and Ripley, is a useful publication in recognizing common browse species. Grass utilization is recorded as a group and forbs are ignored.

Determine the percent utilization class which best describes the extent of use on each browse species available to deer (that below 5 feet) in the plot. Record one mark in the appropriate utilization class for each species in the plot. If a given species is between the 10 or 50 percent point, it can be classified accurately by counting browsed and unbrowsed tips, using the percent of the tips browsed as the percent of browse utilized.

The time required for inspecting a plot for species and utilization depends on the number of species and the vegetation density. At times, close searching is necessary. After surveying all plots, determine the species which rate as common (species present on 20 percent or more of the plots examined). As many as 100 browse species may be present, yet few ranges

have more than 20 common species. Although the survey may be made at any time, results are more meaningful in late winter when utilization of the previous season's growth is nearly ended. Late winter is the only time to measure utilization of the least palatable species.

(2) The second step uses a grouping of the common species into first, second and third choices of palatability. A classification list was developed for 80 of the more common browse species by Lay (1967) and his coworkers (See Table 1). First-choice browse plants often are scarce as a result of heavy utilization in the past. Some may have been eliminated. Utilization of these must exceed optimum levels in order to obtain full use of the range. Second-choice species commonly supply the bulk of browse forage. Third-choice plants seldom are used under moderate stocking. When their utilization increases, important management implications are necessary.

(3) A utilization mean is calculated for each species occurring on 20 percent or more of the plots. Each utilization class is represented by a single percentage figure which is the approximate midpoint of the class – 0, 5, 30 and 70. This is a result of adding the percentage utilization readings and dividing by the number of plots in which they occurred. For example, species "X" on the tally sheet occurs on 10 of the 40 plots examined with the following percentages: 5, 0, 30, 70, 70, 70, 0, 0, 5 and 0. The total of 250 is divided by 10 to obtain a mean value of 25. The utilization mean for grass is derived in the same manner.

The utilization mean for each common first-choice species is combined into a mean index for the group. The same is done for the second- and third-choice groups. This produces a ratio of three numbers for browse utilization. The utilization of grass is recorded because it reflects cattle pressure. The mean for pine is listed separately for its indicator value, although it is a part of the third-choice group. Research indicates that ratios given in Table 2 can be expected from use of the method for ranges with deer only, or deer and cattle, and for light, moderate and heavy stocking intensities. Comparison of computed ratios with ratios in Table 2 will indicate the stocking intensity as reflected in browse use. Any ratios on the heavy side should be taken as warnings of overstocking. After sufficient experience is gained to recognize deer food plants and any obvious deficiencies in the habitat, another method of appraising over-use might be used. Using low-choice browse species as indicator plants, look for light use (5 to 15 percent of the annual growth) of four or five low-choice browse species. This degree of browsing indicates that the range has reached or exceeded its carrying capacity.

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Table 1. Palatability ratings of browse species for deer of Eastern Texas, common and scientific names.

First Choice		Second Choice		Third Choice	
Common name	**Scientific name**	**Common name**	**Scientific name**	**Common name**	**Scientific name**
St. Peterswort	*Ascyrum stans*	Red maple	*Acer rubrum*	American hornbeam	*Carpinus caroliniana*
Alabama supplejack	*Berchemia scandens*	Peppervine	*Ampelopsis arborea*	Hickory	*Carya* sp.
American cyrilla	*Cyrilla racemiflora*	Chokeberry	*Aronia arbutifolia*	Florida chinkapin	*Castanea floridana*
Brook euonymus	*Euonymus americanus*	Common pawpaw	*Asimina triloba*	Eastern redbud	*Cercis canadensis*
White ash	*Fraxinus americana*	Azalea	*Azalea* sp.	Common persimmon	*Diospyros virginiana*
Carolina jessamine	*Gelsemium sempervirens*	Crossvine	*Bignonia capreolata*	American beech	*Fagus grandifolia*
Honeylocust	*Gleditsia* sp.	American beautyberry	*Callicarpa americana*	Towing silverbell	*Halesia diptera*
St. Johnswort	*Hypericum* sp.	Buttonbush	*Cephalanthus occidentalis*	Common witchhazel	*Hamamelis virginiana*
Georgia holly	*Ilex longipes*	White fringetree	*Chionanthus virginicus*	American holly	*Ilex opace*
Yaupon	*I. vomitoria*	Flowering dogwood	*Cornus florida*	Eastern redcedar	*Juniperus virginiana*
Virginia sweetspire	*Itea virginica*	Roughleaf dogwood	*C. asperifolia*	American sweetgum	*Liquidambar styraciflua*
Japanese honeysuckle	*Lonicera japonica*	Hawthorn	*Crataegus* sp.	He-huckleberry	*Lyonia ligustrina*
Blackberry	*Rubus* sp.	Largeleaf gallberry	*Ilex coriacea*	Southern magnolia	*Magnolia grandiflora*
Sassafras	*Sassafras albidum*	Possumhaw holly	*I. decidua*	Southern waxmyrtle	*Myrica cerifera*
Greenbrier	*Smilax* sp., except pumila	Sweetbay magnolia	*Magnolia virginiana*	American hophornbeam	*Ostrya virginiana*
American snowbell	*Styrax americana*	Partridgeberry	*Mitchella repens*	Shortleaf pine	*Pinus echinata*
Kentucky viburnum	*Viburnum molle*	Red mulberry	*Morus rubra*	Loblolly pine	*P. taeda*
		Black tupelo	*Nyssa sylvatica*	Carolina laurelcherry	*Prunus caroliniana*
		Virginia creeper	*Parthenocissus quinquefolia*	Black cherry	*P. serotina*
		Redbay persea	*Persea borbonia*	Bluejack oak	*Quercus cinera*
		Flatwoods plum	*Prunus umbellata*	Southern red oak	*Q. falcata*
		White oak	*Quercus albe*	Blackjack oak	*Q. marylandica*
		Water oak	*Q. nigra*	Post oak	*Q. stellata*
		Willow oak	*Q. phellos*	Carolina buckthorn	*Rhamnus caroliniana*
		Smooth sumac	*Rhus glabra*	Flameleaf sumac	*Rhus copallina*
		Willow	*Salix* sp.	Dwarf greenbrier	*Smilax pumila*
		Common sweetleaf	*Symplocos tinctoria*	Mexican buckeye	*Ungnadia speciosa*
		Poisonoak	*Toxicodendron quercifiolium*	Blueberry	*Vaccinium* sp.
		Poisonsumac	*T. vernix*		
		Elm	*Ulmus* sp.		
		Mapleleaf viburnum	*Viburnum acerifolium*		
		Possumhaw viburnum	*V. nudum*		
		Blackhaw viburnum	*V. prunifolium*		
		Rusty blackhaw	*V. rufidulum*		
		Muscadine	*Vitis rotundifolia*		

Table 2. Browse utilization indices by palatability class for East Texas range stocked at different intensities.

Palatability class	Stocking intensity		
	Light	Moderate	Heavy
	Deer Only		
Browse:			
First choice	35	55	60
Second choice	10	30	40
Third choice	1	5	15
Grass	0	tr	tr
Pine	0	0	3
	Deer and cattle		
Browse:			
First choice	45	55	65
Second choice	20	35	45
Third choice	5	10	25
Grass	20	40	60
Pine	2	5	30

Browse Utilization Survey

Date of survey _____ Observer _____

Growth surveyed (year) _____ Browsed by ( ) Deer ( ) Cattle ( ) Both

Location _____

Number of plots _____ Total

Plant species	Percent utilization class				
	(0) 0	(5) Trace-10	(30) 10-50	(70) 50+	Occurrence (Number of plots)
Grass					
Pine					
"X,"					