Journal of the Arkansas Academy of Science

Volume 42 Article 19

1988

Autumn Foods of White-Tailed Deer in Arkansas

Thomas A. Nelson
Arkansas Tech University

Luke Eggering
International Paper Company

Danny Adams
International Paper Company

AUTUMN FOODS OF WHITE-TAILED DEER IN ARKANSAS

THOMAS A. NELSON[1], LUKE EGGERING[1], and DANNY ADAMS[2]
[1]Fish and Wildlife Biology Program
Arkansas Tech University
Russellville, AR 72801
and
[2]International Paper Company
Arkadelphia, AR

ABSTRACT

Rumen contents from 65 hunter-harvested deer were collected and analyzed during 1985-86 to estimate the principal autumn foods consumed by white-tailed deer inhabiting the Ozark Mountains, Arkansas River Valley, and Gulf Coastal Plain regions of Arkansas. Deer in the Ozarks and Coastal Plain fed heavily on woody browse species, which comprised 99% of rumina identified from these 2 regions. Acorns were the primary food of deer in these heavily forested areas. Acorns and other woody browse were less important to deer inhabiting the Arkansas River Valley. In this region of interspersed agricultural fields and bottomland forests, soybeans and corn comprised 75% of the diet, and acorns accounted for only 2%.

INTRODUCTION

The principal food consumed by white-tailed deer *(Odocoileus virginianus) have been well documented in many southern states (Korschgen, 1962; Lay, 1965; Harlow et al.,* 1975). However, little information is available on the food habits of deer in Arkansas, and no studies have been conducted to compare the diets of deer inhabiting varying ecoregions of the state. A prior study reported important fall foods of deer inhabiting the Ouachita Mountains (Fenwood *et al.,* 1985); however, no published data are available describing deer food habits in three other ecoregions: the Ozark Mountains, Arkansas River Valley, and Gulf Coastal Plain. Such information is useful for habitat improvement and for the assessment of range quality. The purpose of this report is to compare and contrast the autumn diets of deer inhabiting these three ecoregions.

MATERIALS AND METHODS

During November of 1985 and 1986, rumen samples were collected from 65 hunter-harvested deer at locations reprsentative of each ecoregion. Rumina was collected from 21 deer harvested in Carlk Co., located in the mixed pine-hardwood forests of the Gulf Coastal Plain. Assessment of the diet of deer in the Arkansas River Valley was based on samples from 32 deer collected on Holla Bend National Wildlife Refuge in Pope Co. Holla Bend supports both bottomland hardwoods and extensive agricultural fields, a mixed habitat that is characteristic of much of the Valley. Twelve deer were collected on the Sylamore Wildlife Management Area in Stone and Baxter Counties; an area of the Ozark Mountains domainted by oak-hickory forests.

Approximately 3 L of rumina were collected from each deer; samples were labelled and stored frozen for subsequent analyses. Each sample was washed through a standard 9.51-mm mesh sieve to remove materials too small for analysis. Prior research demonstrated that this size screen provides a reasonable estimate of most food items present in the rumen (Harlow and Hooper, 1971). Suspended food items were separated by species or genus; the portion of each plant consumed (leaves, stems, or fruits) and its volume (measured by water displacement) were recorded. The importance of each food item to deer was based on its relative volume and frequency of occurrence in these rumens.

RESULTS AND DISCUSSION

All of the deer collected in the Ozarks fed heavily on acorns, which comprised over 90% of the fall diet (Table 1). Fruits and vegetative parts of woody species made-up 98% of the foods identified from these individuals. Woody vines, such as greenbriers (*Smilax* spp.) and grapes (*Vitis* spp.) occurred frequently in these deer, but seldom constituted more than 5% of the total volume in any rumen. Small volumes of sumac *(Rhus glabra, R. copallina)* were also common. Although eastern redcedar *(Juniperus virginiana)* is considered to be a preferred fall food of deer in Missouri (Murphy and Crawford, 1970), and occurs in scattered glades throughout the Ozarks, the species was not found in our samples.

Deer inhabiting the mixed pine-hardwood forests of the Coastal Plain had an autumn diet similar to that of deer in the Ozarks. Acorns predominated in the rumina of these individuals (Table 1); 28 of 31 individuals sampled had fed primarily (87.1%) on acorns. Other woody plants that were commonly eaten in this region included Japanese honeysuckle *(Lonicera japonica),* greenbriers, and sumac.

Deer harvested in the Arkansas River Valley fed on a very different diet than deer inhabiting other regions (Table 1). Agricultural plants, particularly soybeans and corn, comprised the major component of the diet of these deer. Although the fruits of these species appeared to be the most preferred plant part, leaves and stems of both species were commonly consumed. Primary woody plants consumed included: honeysuckle, hackberry *(Celtis occidentalis),* sumac, greenbriers, and grapes. Although some oaks do occur on Holla Bend, they are not common. Consequently, acorns were not an important component of the diet of these deer. While woody plants comprised approximately 98% of the volume of food consumed by deer in the Ozarks and Gulf Coastal Plain areas, only 21% of the diet among Arkansas River Valley deer was from woody species.

Acorn production in Arkansas forests was high during the two years of this study. We speculate that in years of poor production, deer would rely more heavily on woody species such as greenbriers, grapes, and sumac that were present at low levels in our samples. Fenwood *et al.,* (1985) reported that acorns averaged 65% (by volume) of the food consumed by deer in the Ouachita Mountains in a good mast year, but were absent in a year of mast failure.

Our results suggest that deer managers interested in assessing deer densities relative to available food supplies could use greenbriers, sumacs, and grapes as "indicator species" for browse utilization surveys. All three of these foods were consumed in each ecoregion studied, and were used even when acorns, soybeans, or corn were abundant. It is important to note however, that the extent that deer use these "indicator species" will vary among regions and among years, depending on the availability of acorns, crops, and other preferred foods. Management practices which encourage a diversity of understory browse species should help to buffer food supplies during years of poor mast production.

Table 1. Volume (and frequency) of principal foods found in rumens of white-tailed deer harvested in the Ozark Mountain, Gulf Coastal Plain, and Arkansas River Valley regions of Arkansas, November 1985 and 1986.

Food Items and Parts Eaten	Region		
	Ozarks	Gulf Coastal Plain	Arkansas River Valley
Oak (Quercus spp.) acorns	91.0 (100)	87.3 (90)	2.1 (3)
Soybeans (Glycine max) fruits, leaves, stems	-	-	61.3 (81)
Corn (Zea mays) fruit, leaves, stems	-	-	13.8 (44)
Honeysuckle (Lonicera japonica) leaves, stems	0.2 (17)	3.9 (43)	9.6 (38)
Hackberry (Celtis occidentalis) fruits	-	-	5.0 (3)
Sumac (Rhus spp.) leaves, stems	0.9 (50)	2.2 (19)	1.3 (6)
Greenbriers (Smilax spp.) leaves, stems	1.1 (50)	0.6 (76)	0.6 (9)
Unidentified leaves and stems	3.5 (50)	1.0 (57)	0.9 (16)
Partridge pea (Cassia fasiculata) fruits, stems	-	-	2.7 (3)
Black cherry (Prunus serotina) leaves	-	1.4 (5)	-
Fungi	0.4 (8)	1.0 (71)	-
Grapes (Vitis spp.) fruits, leaves, stems	0.9 (17)	0.2 (10)	0.5 (6)
Winged elm (Ulmus alata) leaves	0.8 (8)	0.2 (6)	0.3 (14)
Grass and/or grass-like leaves	0.4 (83)	0.3 (43)	0.3 (9)
Goldenrods (Solidago spp.) leaves	0.8 (8)	-	-
Rattanvine (Berchemia scandens) fruits	-	0.4 (3)	0.1 (5)
Flowering dogwood (Cornus florida) leaves	<0.1 (17)	0.3 (10)	-
Cross-vine (Bignonia capreolata) leaves, stems	-	0.3 (14)	-
Gum bumelia (Bumelia lanuginosa) fruits	-	-	0.3 (6)
Elderberry (Sambucus canadensis) fruits	-	-	0.3 (3)
Blueberries (Vaccinium spp.) leaves, stems	<0.1 (8)	0.2 (14)	-
Poison ivy (Toxicodendron radicans) leaves	-	0.2 (10)	<0.1 (6)
Osage orange (Maclura pomifera) fruits	-	-	0.2 (3)
Ground cherry (Physalis heterophyla) fruits	-	-	0.2 (3)
Soapberry (Sapindus drummondi) fruits	-	-	0.2 (3)
Possum haw (Ilex decidua) fruits	-	0.2 (10)	-
Buckbrush (Symphoricarpos orbiculatus)	<0.1 (33)	-	-
Morning glory (Convolvulus spp.) leaves, stems	-	-	0.1 (9)
American elm (Ulmus americanum) leaves	-	0.1 (5)	-
Box elder (Acer negundo) leaves	-	0.1 (5)	-
Devil's walkingstick (Aralia spinosa) leaves	-	0.1 (5)	-
Red mulberry (Morus rubra) leaves	-	<0.1 (5)	-
Sugarberry (Celtis laevigata) leaves	-	<0.1 (5)	-
Wild plum (Prunus texana) leaves	<0.1 (17)	-	-
Ironwood (Ostrya virginiana) leaves	<0.1 (8)	-	-
Blackhaw (Viburnum spp.) leaves	-	<0.1 (5)	-
Black willow (Salix nigra) leaves	-	<0.1 (5)	-
American holly (Ilex ambigua) leaves	-	<0.1 (5)	-
Pine (Pinus spp.) leaves	-	<0.1 (5)	-
Carolina moonseed (Cocculus carolinus) leaves	-	<0.1 (5)	-
Partridgeberry (Mitchella repens) leaves	-	<0.1 (5)	-
Beggarweeds (Desmodium spp.) leaves	-	<0.1 (5)	-
Cancerweed (Salvia lyrata) leaves	-	<0.1 (5)	-

ACKNOWLEDGEMENTS

Funding for this study was provided by the National Park Service, the Ross Foundation, and Arkansas Tech University. The authors wish to thank Mike Cartwright and Donny Harris, Arkansas Game and Fish Commission; Martin Perry, U.S. Fish and Wildlife Service; and Dr. Gary Tucker, Rex Garner, and Brett Perrett, Arkansas Tech University, for technical assistance.

LITERATURE CITED

FENWOOD, J. D., D. A. SAUGEY, and C. A. RACCHINI. 1985. Fall deer food selection in the Ouachita National Forest. Proc. Ark. Acad. Sci. 39:123-124.

HARLOW, R. F. and R. G. HOOPER. 1971. Forages eaten by deer in the southeast. Proc. Ann. Conf. S. E. Game and Fish Commissioners 25:18-46.

HARLOW, R. F., J. B. WHALEN, H. S. CRAWFORD, and J. E. SKEEN. 1975. Deer foods eaten during years of oak mast abundance and scarcity. J. Wildl. Manage. 39:330-336.

KORSCHGEN, L. J. 1962. Foods of Missouri deer, with some management implications. J. Wildl. Manage. 26:164-172.

LAY, D. W. 1965. Fruit utilization by deer in southern forests. J. Wildl. Manage. 29:370-375.

MURPHY, D. A. and H.S. CRAWFORD. 1970. Wildlife foods and understory vegetation in Missouri's National Forests. Missouri Dept. of Conserv. Tech. Bull. no. 4. 47 pp.