OLD HOME SITES; IMPORTANT SOURCES OF WINTER FORAGE FOR DEER

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Abstract: During the summer of 1976 and winter of 1976-77, understory production was measured in 3 old home sites and in 12 other timber strata in the Upper Coastal Plain of South Carolina. These strata differed in stand composition, condition and age. Summer production in old home sites ranged from 496-922 kg per ha,. and winter production from 128-433 kg per ha. Relatively open canopies probably contributed to high yields. Winter yields from known deer food species were substantially greater in old home sites, range 40.1-303.4 kg per ha (X=207). Japanese honeysuckle (*Lonceria japonica*) was abundant in each old home site and was the dominant understory species in the 2 sites with highest production. Potential yields of deer forages, particularly honeysuckle, were diminished by species competition from woody vines, trees, and honeysuckle growing beyond the feeding height of deer.

Proc. Ann. Conf. S.E. Assoc. Fish & Wildl. Agencies 33: 181-186

With increased emphasis on efficient utilization of our land resources, it becomes increasingly beneficial for wildlife managers to encourage the natural production of wildlife foods. Old home sites can be a source of white-tailed deer (*Odocoileus virginianus*) forages within pine forest. For years outdoorsmen have recognized the attraction these abandoned home sites offer wildlife and have sought out these sites when searching for game animals. However, the importance of old home sites as a forage producing area has not been fully investigated, probably because of their relatively small size and infrequent occurrence in managed wildlife areas.

METHODS

The study was conducted on the 81,000 ha Savannah River Plant (SRP) located 25 miles northeast of Augusta, Georgia in the Upper Coastal Plain of South Carolina. Since its closing to the public in 1952, the area has been managed for timber production by the USDA Forest Service, under contract for the Department of Energy. The SRP is comprised of 50 compartments and is evenly comprised of the Coastal Terrace Subregion and the Aiken Plateau. Previous land use was mostly rural agricultural farming (Langley and Marter 1973).

Timber stands in 3 compartments, 14, 18, and 44, were grouped into strata according to stand age, condition, and composition (Table 1). Thirteen separate strata were identified, with even-aged pine plantations, mixed hardwood and pine, and old home sites present in each compartment. No accurate estimate of the number of abandoned home sites was available, but 2-3 per compartment would be a fair approximation. Compartments 14 and 18 were located in the upland, while compartment 44 was in the lowland, bordering the Savannah River Swamp.

Current season's growth was clipped from 1 m^2 quadrats to a height of 1.5 m during the summer and early autumn (July-November) 1976 and winter (December-March) 1976-77 (Harlow 1977). Clipped vegetation was sorted and weighed by species or species groups and by plant parts (leaves and twigs). Samples of clipped vegetation were oven-dried and production expressed as kilograms per hectare. A minimum of 20 randomly selected quadrats were clipped in each stratum.

TABLE 1. Criteria for grouping forest stands into strata.

Strata	Forest Stand Composition	Stand Condition	Stand Age (yrs.)
A	Pine (loblolly, slash, longleaf)	Regeneration	0-2
B	Pine	Sparse poletimber; Sparse sawtimber	Mixed[a]
C	Pine	Seedlings and samplings adequately stocked	3-12
D	Pine	Immature poletimber; seedlings and samplings adequately stocked	13-24
E	Pine	Immature poletimber; Immature sawtimber	25+
F	Pine	Non-stocked	Mixed
G	Pine-Hardwoods	Immature sawtimber	25+
H	White Oak, Red Oak, Hickory	Low quality poletimber	Mixed
I	White Oak, Red Oak, Hickory	Immature sawtimber	25+
J	Sweetgum, Nuttal Oak, Willow Oak	Seedlings and Sampling adequately stocked	2-12
K	Sweetgum, Nuttal Oak, Willow Oak	Immature poletimber Immature sawtimber	25+
L	Red Maple, Sweet Bay, Swamp Tupelo	Immature poletimber	25+
M	Old home sites		25+

[a]No dominant age group

Density and basal area of trees were measured in each stratum for overstory characterization. All stems between 3 cm diameter at breast height (dbh) to less than 12 cm dbh were recorded from circular 0.02 ha plots. A 1 m factor prism was used to record stems 12 cm dbh or greater. Stems were recorded by species and dbh. Overstory measurements were determined from 8-15 (X=10) random plots in forest strata and from 4-8 (X=5.7) plots in old home sites. Mast production capability was estimated from overstory measurements (USFS 1971).

This research was supported by the Department of Energy's Graduate Student Participation Program in cooperation with the USFS.

RESULTS

Tree basal area and density

Tree basal area ranged from 6 to 11 m^2 per ha and density from 905 to 1110 stems per ha in the 3 old home sites (Table 2). The low basal area and density indicated a sparse and open canopy. Overstory species of chinaberry (*Melia azedarch*), pecan (*Carya*

TABLE 2. Density and basal area by dbh class in 3 old home sites on the SRP.

Overstory parameter	Compartment 14	18	44
DENSITY (stems/ha)			
Stems 3≤12 cm dbh	775	530	976
Stems >12 cm dbh	253	375	124
Total	1028	905	1100
BASAL AREA (m^2/ha)			
Stems 3 ≤12 cm dbh	3	2	2
Stems >12 cm dbh	8	9	4
Total	11	11	6

illinonsis), red mulberry (*Morus rubra*), and walnut (*Juglans nigra*) were some old home site tree species not common to pine forest.

Summer understory production

Forage production in the abandoned home sites ranged from 496 to 922 kg per ha (Table 3). Leaves of woody plants averaged 61% of the total yield, woody twigs 28%, and non-woody vegetation 11%. Japanese honeysuckle (*Lonicera japonica*) was the principal plant in the home sites sampled in compartments 18 and 44. It occurred in 96 and 67% of the quadrats and comprised 54 and 36% of the yield respectively. For the home site in compartment 14, wisteria vine (*Wisteria sinesis*) was the major understory plant, occurring in 65% of the quadrats and making up 47% of the total yield. Honeysuckle was present in this site, but it occurred in only 19% of the quadrats and made up 5% of the yield.

TABLE 3. Seasonal understory yields by plant parts for old homesites in 3 compartments on the Savannah River Plant, 1976-77.

Plant part	Compartment 14 (kg/ha) S*	W	18 (kg/ha) S	W	S	W
Fungi	1	0	5	0	0	0
Grasses & Sedges	60	15	0	0	10	36
Herbaceous plants	44	1	8	3	41	49
Woody twigs	134	84	328	78	127	54
Woody leaves	257	28	582	311	386	294
Total	496	128	923	392	564	433

*S = summer; W = winter

Winter understory production

Winter forage yield in the 3 home sites ranged from 128 to 433 kg per ha (Table 3). Winter yields were on the average 51% lower than summer yields in the old home sites. In contrast, the forest strata winter yields were 63% lower than summer yields except for

strata J, K, and L (Table 4). These strata maintained high winter yields apparently from production by evergreen species. Woody plants were the principal vegetation in each old home site in the winter. Green leaves comprised 56, woody twigs 33, and non-woody plants 11% of the total winter yield (Table 3).

TABLE 4. Seasonal yields and known deer foods production of forest strata on the Savannah River Plant during the summer and winter 1976-77.

	Compartment 14 (kg ha)			Compartment 18 (ka ha)			Compartment 44 (kg ha)		
	Total			Total			Total		
Strata	Summer	Winter	Known winter deer foods	Summer	Winter	Known winter deer foods	Summer	Winter	Known winter deer foods
A	1513	438	15	1327	328	2	633	72	42
B	1251	358	49	1226	272	72	892	252	50
C	440	31	14	275	60	27	63	19	8
D	154	84	11	178	183	150	223	87	25
E				238	33	9	150	71	4
F				132	66	31			
G				248	93	60			
H	247	97	106*						
I				127	93	71	162	78	6
J	832	544	11						
K	660	959	3	362	218	4	360	305	11
L				607	486	20			
M	496	128	40	922	392	303	564	433	278

*Acorn mast production capability was added to forage yield and resulted in known deer food production to exceed total winter understory forage yield in some instances.

As in the summer season, honeysuckle was the principal understory plants in the old home sites of compartments 18 and 44. In these sites it occurred in 95 and 52% of the quadrats and comprised 76 and 38% of the yield respectively. In compartment 14, wisteria vine was the principal species in this home site, occurring in 67% of the quadrats and making up 30% of the yield. In this site, honeysuckle occurred in only 15% of the quadrats but accounted for 19% of the yield.

A significant ($p<0.05$) difference in total forage yield was evident between the 2 old home sites of compartments 18 and 14 and the old home site in compartment 44 during the winter season. Some of this difference can be associated with whether or not the principal forage plant in each site is deciduous or evergreen. In the two abandoned sites where honeysuckle was the principal forage plant, leaves comprised a major proportion of the forage yield. However, leaves made up a smaller proportion of the winter yield where wisteria vine was dominant, resulting in a more reduced yield for this site.

Production of known deer foods

Overall, 58%, of all the winter yields in the old home sites consisted of plants species that were identified from winter food habit studies (Table 4). Japanese honeysuckle contributed 60, 99, and 60% of the known deer food production in the home sites of compartments 14, 18, and 44 respectively. Other deer forages included grasses, forbs, mushrooms, and fleshy fruits. Oak trees occurred in only 1 site, thus acorn production capability was low. Known deer foods averaged 30% of the winter yield in the forest strata and this included considerable yields of acorn mast in some strata. During the sampling survey, only 1 forest stratum, H, in compartment 14 contained appreciable amounts of honeysuckle. For this stratum, honeysuckle comprised 77% of its total winter yield.

DISCUSSION

Old home sites sampled in this study were important as deer food production areas primarily because of the high frequency and production of Japanese honeysuckle in them. Food habit studies of deer in the Southeast have shown honeysuckle to be 1 of the principal forage items for deer (Harlow and Hooper 1971, Harlow et al. 1979). The relatively open canopy associated with the old home sites seems to be a major influence in the high production of deer forages and honeysuckle in particular. Sheldon and Causey (1974) in central Alabama found highest honeysuckle production in test plots where overstory canopy closure was less than 35%. When canopy closure exceeded 65%, they reported honeysuckle production decreased rapidly.

The presence of honeysuckle in deer habitat is desirable since it retains high nutritional quality throughout the year, especially during the winter season when other available forages are low in quality. Craft and Haygood (1972) found leaves of honeysuckle to be high in protein content seasonally and to have a higher digestibility than many other forages. Segelquist et al. (1971) also reported high nutritional qualityof honeysuckle on Arkansas Ozark food plots. They found highest utilization of honeysuckle by deer in the winter and reported even when leaves were completely consumed, the establishment of honeysuckle was not hindered. The high nuturitional value of honeysuckle in mid-winter is most important since recent studies have shown many forages may be providing only basal energy requirements for deer as early as November (Short 1975).

Sheldon and Causey (1974) believed that honeysuckle availability was the primary reason for the high density and good physical condition of deer in a monoculture pine forest in central Alabama. They stated also that honeysuckle had the potential to increase greatly the carrying capacity of monoculture forests for deer. On the SRP, honeysuckle was also the predominant species contributing to higher yields of winter foods in old home sites and stratum H as compared to other forest strata.

To assure continued production in these sites current policy of nondisturbance of old home sites during normal silvical practices may require alteration. Sampling indicated species competition from less desirable forage species, particularly wisteria vine in compartment 14, and considerable amounts of honeysuckle had grown atop various woody shrubs above the feeding zone of deer. Segelquist et al. (1976) reported native woody species invaded honeysuckle food plots rapidly and, wherever dense canopies developed, greatly depressed the growth of honeysuckle. Without some type of effective vegetation control, they believed trees and shrubs would eventually restrict honeysuckle production.

Since this study involved old home sites of approximately equal successional age (27 yrs.) more studies are needed for determining production trends and species diversity in successionally different sites. Also, acceptable management treatments which could maintain old home sites at optimum forage production should be tested. Sufficient testing of proposed treatments is encouraged before implementing them on a regional basis. Sheldon and Causey (1974) found honeysuckle production decreased in fertilized and/or burned plots when compared with untreated plots. Segelquist el al. (1976) reported, mowing to be ineffective for controlling woody vegetation in test plots. They believed, however, that economic control could be achieved by selective application of herbicides.

Though relatively small in proportion to other managed wildlife lands, old home sites can provide many additional benefits to existing habitats. These natural food plots, if managed correctly may increase the overall carrying capacity of surrounding forest stands for deer by providing forages of high nutritional value. Also, some economy may be realized through the proper management of these established, natural food plots rather than trying to establish and maintain artificial food plots.

LITERATURE CITED

Craft, B.R., and J.L. Haygood. 1972. Production, nutritive quality, and rootstock survival of Japanese honeysuckle. Proc. Southeastern Assoc. Fish and Game Comm. 26:69-75.

Harlow, R.F., and R.G. Hooper. 1971. Forages eaten by deer in the Southeast. Proc. Southeastern Assoc. Game and Fish Comm. 28:562-567.

_____. 1977. Technique for surveying deer forage in the Southeast. Wildl. Soc. Bull. 5(4):185-191.

_____, D.F. Urbston, and J.G. Williams. 1979. Forages eaten by deer in two habitats at the Savannah River Plant. USDA For. Serv. Res. Note SE-275, Southeastern For. Exp. Sta., Asheville, N.C. 4 pp.

Langley, T.M., and W.L. Marter. 1973. The Savannah River Plant Site. U.S. Dep. of Energy, Savannah River Lab. DP-1323, Aiken, S.C. 175 pp.

Segelquist, C.A., M. Rogers, and F.D. Ward. 1971 Quantity and quality of Japanese honeysuckle on Arkansas Ozark food plots. Proc. Southeastern Assoc. Game and Fish Comm. 25:47-53.

_____, M. Rogers, and F.D. Ward. 1976. Response of Japanese honeysuckle to management in the Arkansas Ozarks. Proc. Southeastern Assoc. of Game and Fish Comm. 29:370-373.

Sheldon, J.J., and K. Causey. 1974. Deer habitat management: use of Japanese honeysuckle by white-tailed deer. J. For. 72(5):286-287.

Short, H.L. 1975. Nutrition of southern deer in different seasons. J. Wildl. Manage. 39(2):321-329.

USDA, For. Serv. FSH 2609.23 R Southern region. Atlanta, GA.