Wild Turkey Food Habits in Pine Plantations in South Carolina

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Abstract: A total of 1,576 wild turkey (*Meleagris gallopavo*) droppings (650 male and 926 female) was collected from 1 January–31 December 1989 on Westvaco's Oswald Unit located in Jasper County, South Carolina. This Unit is made up of loblolly pine plantations (77%), natural pine stands (10%), hardwood stands (5%), and open, non-forested areas (8%). Fecal analysis was used to determine food habitats. Forty-six food stuffs were identified, and there were no significant differences ($P > 0.05$) in food items by sex. *Panicum* sp., *Ilex glabra, Myrica cerifera, Paspalum* sp., *Rubus* sp., *Vaccinium* sp., *Cyperus* sp., and insects made up the bulk of food items throughout the year. The annual diet consisted of 92% plant matter and 8% animal matter.

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Short-rotation pine plantations are not generally considered as habitat for the eastern wild turkey. However, Stoddard (1963), Bailey and Rinnell (1968), Holbrook (1973), Speake et al. (1975), Davis (1976), and Sims (1979) found that some pine plantations of the southeastern United States do support dense turkey populations. Data on turkey food habitats in short-rotation pine plantations are limited. The objective of this study was to determine eastern wild turkey food habits on areas managed intensively for pine fiber production in the South Carolina Coastal Plain.

Although fecal analysis has been used extensively in food habits studies of mammals, the technique has received little use with gallinaceous birds (Swanson 1940). Most studies of bird food habits have been based on crop and gizzard contents (Dalke 1935). Several studies suggest that fecal analysis may be as effective as gizzard and crop analysis in detecting food items in birds (Jenson and Korschgen 1947).

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Methods

Study Area

The study was conducted on Westvaco's Oswald Unit (5,169 ha) near Pineland, South Carolina. The area contained 3,965 ha of loblolly pine (*Pinus taeda*) plantations 1- to 36-years-old, with 65% of plantations being <15-years-old and 82% <20-years-old. The remainder of the area contained 501 ha of natural slash pine (*P. elliottii*) and longleaf pine (*P. palustris*) stands ranging in age from 22–60 years, 277 ha of mixed hardwoods made up of various species ranging in age from 23–58 years, and 426 ha of openings such as food plots, canals, roads, bays, and areas not planted in pine.

Terrain is flat with slopes generally <2%. Elevation ranges from 24–30 m. Soils on the area range from well-drained to poorly-drained (Stuck et al. 1980). Since most of the study area is poorly drained, canals have been dug to improve the growth and survival of planted pines. Climate is subtropical with long, hot summers and short, mild winters. Annual precipitation averages 125 cm.

The Oswald Unit has an extensive, all-weather road system which provides excellent access throughout the study area. There are a total of 91 km of Westvaco-gated roads and 22 km of public roads on the Oswald Unit.

Westvaco management practices include intensive site preparation, prescribed burning, thinning, and fertilization. Site preparation normally includes shearing, raking, and burning of slash. Prescribed burning is conducted at approximately 3-year intervals. The average rotation for pine plantations is <30 years.

Westvaco adopted a corridor system in the establishment of plantations. Corridors are 80–100 m in width and were usually older age pine stands around plantations <15 years of age. Spoil banks, roads, and openings throughout the area were planted with Bahia (*Paspalum notatum*) or rye (*Secale cereale*).

Data Collection/Analysis

Food habits were determined from analysis of droppings collected throughout the year on roads, food plots, roost sites, and other areas on the Oswald Unit. The sex of the turkey providing each dropping was determined as described by Bailey (1956). Droppings were allowed to air dry for 12 days. Droppings from the same sex collected on the same day were placed in a paper bag, sealed, and labeled as to sex and date collected, and stored until analysis. During analysis, droppings from the same sex collected in the same month were lightly crushed in a mortar and pestle and mixed to form a composite sample. The composite sample was sepa-

rated into 2.7-ml sample units, which was the average volume per dropping determined from 770 droppings by Kozicky (1942). A sub-sample of 10 sample units was randomly chosen each month to determine the major food items. From the sub-sample, the necessary sample size to detect all major foods within 90% confidence limits was calculated (Cain 1955). Fecal material from each randomly chosen sample unit was placed into a gridded petri dish and viewed under a binocular scope. A food items reference collection donated by J.A. McGlincy (International Paper Co., Bainbridge, Ga.) and seed identification manuals by Martin and Barkley (1961) and Landers and Johnson (1976) were used for food identification. Food items were identified to genus and species when possible. Percent of the total volume comprised by food items was determined by ocular estimate. Items <1% were considered trace. Data derived from this method were presented as frequency of occurrence by season: fall (Sep–Nov), winter (Dec–Feb), spring (Mar–May), summer (Jun–Aug).

Results

A total of 1,576 droppings (650 male and 926 female) were collected on the Oswald Unit from 1 January–31 December 1989. Average number of droppings collected per month was 54 for males and 77 for females. Using the cumulative-frequency curve (Cain 1955), the maximum number of sub-samples needed from composite samples to detect 90% of the species was 4.

Table 1. Food items for eastern wild turkeys detected by fecal analysis on the Oswald Unit, Jasper County, S.C. (fall, Sep.–Nov. 1989).

Item	Frequency of occurrence (%)	Percent composition (%)	Part
Grass	100	33	assorted
Forb	100	7	assorted
Digitaria sp.	100	16	seed
Panicum sp.	100	11	seed
Insect	100	12	assorted
Gaylussacia sp.	45	2	seed
Ilex glabra	50	trace	seed
Unknown plant	100	10	assorted
Pine straw	45	1	leaves
Cyperus sp.	65	1	seed
Myrica cerifera	60	2	seed
Paspalum sp.	70	2	seed
Vaccinium sp.	10	trace	seed
Nyssa aquatica	30	trace	seed
Diodia teres	10	trace	seed
Scirpus sp.	5	trace	seed
Physalis sp.	10	trace	seed
Callicarpa americana	10	trace	seed
Quercus sp.	10	trace	seed

Table 2. Food items for eastern wild turkeys detected by fecal analysis on the Oswald Unit, Jasper County, S.C. (winter, Dec. 1989–Feb. 1990).

Item	Frequency of occurrence (%)	Percent composition (%)	Part
Grass	100	42	assorted
Myrica cerifera	95	7	seed
Ilex glabra	100	16	seed
Insect	100	9	assorted
Cornus florida	0.5	trace	seed
Setaria sp.	45	4	seed
Forb	90	7	assorted
Unknown plant	60	9	assorted
Panicum sp.	75	7	seed
Cyperus sp.	10	trace	seed
Lespedeza sp.	0.5	trace	seed
Schrankia sp.	0.5	trace	seed
Gaura filipes	10	trace	seed
Nyssa aquatia	10	trace	seed
Triticum aestinum	3	trace	assorted
Quercus sp.	30	1.0	seed
Digitaria sp.	10	trace	seed
Pine straw	10	trace	leaves
Dioda teres	25	1.0	seed

Forty-six food stuffs were identified (Tables 1–4). Chi-square analysis and analysis of variance revealed no significant differences ($P > 0.05$) in foods eaten by sex. Thirty-nine food items were identified to genus and 17 of these were identified to species. Winter diets averaged 8% animal matter and 92% plant matter. In the spring, the average diet was 9% animal matter and 91% plant matter. Fall digs were made up of 13% animal matter and 87% plant matter. The trace occurrence of *Quercus* sp. in fall and winter samples can be attributed to the lack of hardwoods on the study area and the poor mast crop during fall 1988.

Discussion

Schemnitz (1956), Kirdland (1971), and Sims (1979) reported grasses comprised the bulk of wild turkey diets with *Paspalum* sp., *Panicum* sp., *Myrica cerifera, Ilex glabra, Prunus serotins*, and *Cornus florida* being major food items. Assorted insects comprised a large proportion of the remaining diet. The diet on the Oswald Unit was primarily assorted plant parts of *Panicum* sp., *Digitaria* sp., *Ilex glabra, Myrica cerifera, Paspalum* sp., *Rubus* sp., *Vaccinium* sp., *Cyberus* sp., and assorted insect parts.

Food habits analysis on the Oswald Unit suggest that wild turkey diets in intensively managed pine plantations are similar to those reported from hardwood, pine hardwood, and natural pine stands (Good and Webb 1940, Schemnitz 1956, Kirdland 1971, Exum et al. 1987). The annual diet was made up of 92% plant

Table 3. Food items for eastern wild turkeys detected by fecal analysis on the Oswald Unit, Jasper County, S.C. (spring, March–May 1990).

Item	Frequency of occurrence (%)	Percent composition (%)	Part
Grass	100	43	assorted
Forb	100	7	assorted
Ilex glabra	95	15	seed
Rubus sp.	35	1	seed
Panicum sp.	80	4.6	seed
Insect	95	9	assorted
Phalaris sp.	10	trace	seed
Secale cereale	35	4	assorted
Myrica cerifera	35	trace	seed
Gaylussacia sp.	25	1	seed
Hordeum pusillum	25	trace	seed
Vaccinium sp.	25	1	seed
Unknown plant	75	7.2	assorted
Pine straw	10	trace	leaves
Paspalum sp.	15	trace	seed
Cyperus sp.	30	2.7	seed
Muhlenbergia sp.	0.5	trace	seed
Scleria sp.	0.5	trace	seed
Hieracium sp.	10	trace	seed
Vibernum dentatum	0.5	trace	seed
Carya aquatica	0.5	trace	seed
Nysa aquatica	10	trace	seed

matter and 8% animal matter on the Oswald Unit. These percentages are comparable to those reported by Good and Webb (1940), Rivers (1940), Dalke et al. (1942), Glover and Bailey (1949), and Schemnitz (1956).

Management practices which have proven successful in other habitats should enhance habitat conditions for eastern wild turkeys in landscapes dominated by pine plantations. The 100% occurrence and high percent composition by grasses during all seasons indicate that openings, roadsides, and stand management practices such as thinning and prescribed fire provide opportunities for improving habitat conditions for wild turkeys on these areas. Other important food items such as forbs and insects also should be stimulated by these practices. Retention of hardwoods and access control by gating roads are encouraged.

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Table 4. Food items for eastern wild turkeys detected by fecal analysis on the Oswald Unit, Jasper County, S.C. (summer, Jun.–Aug. 1990)

Item	Frequency of occurrence (%)	Percent composition (%)	Part
Grass	100	21	assorted
Forb	100	7	assorted
Digitaria sp.	95	22	assorted
Insect	95	6	assorted
Panicum sp.	95	7	seed
Secale cereale	30	4	assorted
Paspalum sp.	70	5.7	seed
Nyssa aquatica	0.5	trace	seed
Quercus sp.	0.5	trace	seed
Cyperus sp.	55	4	seed
Unknown plant	80	7	assorted
Vaccinium sp.	70	13	seed
Gaylussacia sp.	85	4	seed
Rubus sp.	45	1	seed
Sagittaria sp.	0.5	trace	seed
Solanum sp.	1	trace	seed
Pine straw	10	trace	leaves
Phalaris sp.	10	trace	seed
Ilex glabra	15	1.0	seed
Diodia teres	0.5	trace	seed
Hordem pussillum	10	trace	seed
Callicarpa amrican	0.5	trace	seed
Physalis sp.	10	trace	seed

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