

# FOODS OF YOUNG FLORIDA WILD TURKEYS<sup>1</sup>

Larry H. Barwick

Game and Fresh Water Fish Commission  
Gainesville, Florida 32601

Willa Mae Hetrick

Game and Fresh Water Fish Commission  
Gainesville, Florida 32601

Lovett E. Williams, Jr.

Game and Fresh Water Fish Commission  
Gainesville, Florida 32601

## ABSTRACT

Stomach and crop contents of 75 turkeys (*Meleagris gallopavo osceola*) poults from 1 to 164 days old and 8 adults, collected from April through October in Glades and Alachua Counties, Florida, were identified and measured by volume displacement. Vegetable material accounted for 75.0 percent and animal material for 25.0 percent of the diet by volume of poults 1 to 14 days old. Poults 15 to 164 days old ate 72.8 percent vegetable and 27.2 percent animal foods. The most important single item in the diet of the 1 to 14 day old group was "stargrass" (*Hypoxis leptocarpa*) — this was replaced in importance by the seed of a true grass (*Paspalum conjugatum*) in the older poults. Eight summer crops of adult turkeys permit a brief comparison between foods of adults and poults.

## INTRODUCTION

With few exceptions, food studies of wild turkeys have dealt with grown young and adult turkeys during fall and spring when crops and stomachs were available from hunting. These studies have given a fairly adequate picture of the foods of turkeys in fall through late winter, but knowledge is lacking about the foods of young poults or adults during summer.

For this paper we have taken advantage of an unusual opportunity to obtain crops from a sizeable number of young poults and a few summer adults that were collected for studies of parasites and diseases, molt and plumage development, and growth and development. While we do not consider this to be a definitive study of poult food habits, it is evidently only the second paper to be written on the subject, the first being a recent one by Hamrick and Davis (1972) in Alabama, based on a much smaller sampling of poults.

We thank Lykes Brothers, Inc. and Owens-Illinois, Inc. for making their properties available for this study, and Wildlife Biologist David H. Austin, Game Managers Tommie E. Peoples, William B. Frankenberger and Robert W. Phillips and Student Assistant Larry T. Hon for their assistance with the field collections and laboratory work. D. J. Forrester and his laboratory assistants were helpful in saving and preserving most of the crops and stomachs as they necropsied the specimens.

## STUDY AREAS

Fisheating Creek Wildlife Management Area is located in southcentral Florida near Lake Okeechobee. The plant associations on the area are: 1) cypress woods 2) bay heads, 3) low oak scrub, 4) saw palmetto flats, 5) glades and the associated ecotones. The vegetation of the area has been described in

<sup>1</sup>This is in part a contribution of the Federal Aid to Wildlife Restoration Program, Florida Pittman-Robertson Project W-41.

detail in an earlier paper (Williams et al. 1973). Lochloosa Wildlife Management Area is located in northcentral Florida. The major plant community is planted slash pine (*Pinus elliottii*). The area also contains a few live oak (*Quercus virginiana*) hammocks, bay heads, flatwoods bogs, prairies, cypress ponds, and natural slash and long-leaf (*P. palustris*) pine flatwoods. Cattle graze both areas.

## METHODS

Eighty-three wild turkeys (75 poults, 8 adults) were hand caught when too young to fly, or cannon netted, or shot between 22 April and 1 November, 1969 through 1972. Crop and gizzard contents were preserved in buffered 10 percent formalin and later air dried, sorted, identified, occurrence noted, and their volumes measured to 0.05 ml. Items measuring less than 0.05 ml were recorded as traces. Some birds were collected near baited areas and contained varying amounts of corn bait. Occurrence and volume of corn were recorded and included in the tables, but not used in assessing food preference.

Of the 75 poults collected, 14 were of known age because they had been toe-clipped soon after hatching in connection with another study. The others were aged by comparing their plumage development with the known-age birds collected during the same period. The oldest poult, collected 29 October 1970, closely resembled in plumage development and primary replacement a 164 day old marked poult of known age and was therefore considered to be the same age. The ages of the poults were well distributed between 1 and 164 days.

Grit occurred in all samples but is not included in the tables.

Scientific names for the grasses were taken from Hitchcock (1950). Other plant names are from Fernald (1950) or Small (1933).

## RESULTS AND DISCUSSION

Table 1 lists food items of 1 to 14 day old poults. Plant foods were found in 85.7 percent of the poults and accounted for 75.0 percent of the total food volume. Stargrass, the most important plant food for this age group, occurred in 61.9 percent of the samples and accounted for 21.8 percent of the total food volume. It was closely followed by mixed vegetation (volume percent 17.5) and a small-fruited huckleberry (*Gaylussacia* sp.) (volume percent 14.1).

Animal foods occurred in 61.9 percent of the samples and made up 25.0 percent of the total food volume. Insects accounted for all of the animal foods for which volume could be measured. Spider parts were found in one poult but only in trace amounts. Beetles were the single most important insect order accounting for 19.6 percent of the 25.0 percent total insect volume. The percent volume of animal foods (25.0 percent) found in the 1 to 14 day age group was similar to the findings of Hamrick and Davis (1972), but considerably lower than reported for some other gallinaceous birds. In a study of the bobwhite (*Colinus virginianus*) small insects were the most important food eaten by chicks 2 to 20 days old (Hurst, 1972). Handley (1950) reported that bobwhite chicks under two weeks of age ate 83.7 percent animal material. Insects were reported to make up 70 percent of the diet of ruffed grouse (*Bonasa umbellus*) during the first two weeks of life (Bump et al. 1947). Wheeler (1948) and Ligon (1946) both believed that insects and green vegetation are of highest importance as foods of young turkey poults. Additional study of the foods of 1 to 14 day old turkeys will be necessary to learn definitely whether very young turkeys eat less animal matter than do other young game birds.

Table 2 lists the plant foods of 54 poults 15 to 164 days old. Seeds of the grass *Paspalum conjugatum* occurred in 16.7 percent of the samples and amounted to 17.4 percent by volume, the highest volume for any one food item. Three grasses

comprised 25.1 percent (Table 6) of the total food volume. Live oak accounted for 8.8 percent, stargrass 6.1 percent, arrowhead (*Sagittaria* sp.) 5.0 percent and laurel oak (*Quercus laurifolia*) 4.2 percent of the plant food by volume. Swamp cabbage (*Sabal palmetto*) berries and seeds occurred in more samples (19) than any other plant food, but it accounted for only 2.2 percent of the plant food volume.

Table 3 lists the animal foods of 54 turkey poults 15 to 164 days old. Lepidopterous insects were the most important animal food of this age group. Two families accounted for most of the animal foods volume: Geometridae made up 49.5 percent and Noctuidae 19.8 percent.

The data from Tables 2 and 3 were combined and the percent volume of vegetable and animal foods were recalculated for Table 6 to give a more graphic comparison between the three age groups discussed.

Table 4 lists the plant foods of 8 adult wild turkeys collected from the same areas and during the same months as the poults. A grape (*Vitis rotundifolia*) made up 44.9 percent of the plant food volume, but occurred in only two of the samples. Seed of *Paspalum conjugatum* was next in percent volume and accounted for 25.8 percent of the food volume. Blackgum seed occurred in more samples (3 of the 8 samples) than any other plant food, but comprised only 0.8 percent of the volume.

Table 5 lists the animal foods of the 8 adult wild turkeys. Lepidopterous insects were the most important animal food items of this age group. Larvae of Geometridae accounted for 66.8 percent of the total animal food volume.

Table 6 compares the total percent occurrence and volume of food types. Percent volume of food types was roughly similar for the three age groups.

When the percent volume of the different types of vegetable foods are compared, there is a suggestion that different habitat types may be used for feeding by the different age classes, but our sample size is too small to say more.

Table 1. Plant and animal foods of 21 wild turkey poults 1 to 14 days old, Glades County, Florida.

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
PLANT FOODS (Total)	18	85.7	3.45	75.0
<i>Hypoxis leptocarpa</i> , stargrass seeds	13	61.9	1.00	21.8
Misc. mixed vegetation, leaves stems, (partly spanish moss)	2	9.5	0.80	17.5
<i>Gaylussacia</i> sp., huckleberry fruit	3	14.3	0.65	14.1
<i>Polygonum sagittatum</i> , tear thumb seeds	6	28.6	0.20	4.4
<i>Sagittaria</i> sp., arrowhead tuber	2	9.5	0.20	4.4
<i>Paspalum conjugatum</i> , seeds	3	14.3	0.15	3.3
<i>Myrica cerifera</i> , wax myrtle fruit	3	14.3	0.15	3.3
<i>Vaccinium</i> sp., blueberry fruit	1	4.8	0.10	2.2
<i>Paspalum notatum</i> , bahia grass seeds	3	14.3	0.10	1.6
<i>Commelina elegans</i> , dayflower seeds	2	9.5	0.05	1.1
Unidentified, seeds	1	4.8	0.05	1.1
Unidentified grass, leaves	1	4.8	trace	
<i>Viburnum</i> , black haw seeds	1	4.8	trace	

ANIMAL FOODS (Total)	13	61.9	1.15	25.0
Insects (Insecta) (Total)	13	61.9	1.15	25.0
Coleoptera, beetles	12	57.1	0.90	19.6
Hemiptera, bugs	1	4.7	0.05	1.1
Orthoptera, grasshoppers	2	9.5	0.05	1.1
Lepidoptera, moths, butterflies	2	9.5	0.05	1.1
Diptera, flies	1	4.7	0.05	1.1
Hymenoptera, ants, wasps, bees	1	4.7	0.05	1.1
Dermaptera, earwigs	1	4.7	trace	
Arachnida, spiders	1	4.7	trace	

Table 2. Plant foods of 54 wild turkey poults 15 to 164 days old, Alachua and Glades Counties, Florida.

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
<i>Zea mays</i> , corn seeds	15	27.8	187.30	37.0
<i>Paspalum conjugatum</i> , seeds	9	16.7	88.00	17.4
<i>Quercus virginiana</i> , live oak acorns	6	11.1	44.50	8.8
<i>Hypoxis leptocarpa</i> , stargrass seeds, pods	15	27.8	30.70	6.1
<i>Sagittaria</i> sp., arrowhead tubers	13	24.1	25.15	5.0
<i>Quercus laurifolia</i> , laurel oak acorns	4	7.4	21.30	4.2
<i>Panicum</i> sp., panic grass leaves	2	3.7	20.00	4.0
<i>Panicum</i> sp., panic grass seeds	11	20.4	15.40	3.0
<i>Nyssa sylvatica</i> , blackgum seeds	12	22.2	13.45	2.7
Unidentified, leaves	2	3.7	13.00	2.6
<i>Sabal palmetto</i> , swamp cabbage berries, seeds	19	35.2	11.35	2.2
<i>Rhus radicans</i> , poison ivy seeds	8	14.8	6.20	1.2
<i>Commelina elegans</i> , dayflower seeds, pods, stems	10	18.5	6.00	1.2
<i>Parthenocissus quinquefolia</i> , Virginia creeper seeds	4	7.4	4.40	0.9
<i>Paspalum notatum</i> , bahia grass seeds	7	13.0	3.60	0.7
<i>Ampelopsis arborea</i> , pepper vine seeds	2	3.7	3.20	0.6
<i>Myrica cerifera</i> , wax myrtle seeds	12	22.2	3.00	0.6
<i>Muscadinia munsonaria</i> , grape seeds, fruit	4	7.4	2.45	0.5
<i>Hydrocotyle</i> sp., penny worts leaves	1	1.9	2.00	0.4
<i>Taxodium</i> sp., cypress twigs	1	1.9	2.00	0.4
<i>Smilax</i> sp., greenbriar seeds	7	13.0	0.85	0.2

<i>Callicarpa americana</i> , beauty berry seeds	1	1.9	0.40	0.1
<i>Celtis laevigata</i> , hackberry seeds	3	5.6	0.30	0.1
<i>Diodia teres</i> , button weed seeds	2	3.7	0.30	0.1
<i>Ipomoea</i> sp., morning glory seeds	1	1.9	0.20	trace
<i>Desmodium tortuosum</i> , seeds	1	1.9	0.20	trace
<i>Triticum aestivum</i> , wheat seeds	2	3.7	0.15	trace
<i>Aneilema nudiflorum</i> , seeds, pods	2	3.7	0.15	trace
<i>Polygonum sagittatum</i> , tear thumb seeds	7	13.0	0.15	trace
<i>Viola</i> sp., violet seeds, pods	1	1.9	0.10	trace
Unidentified, seeds	1	1.9	0.10	trace
<i>Zanthoxylum</i> sp., prickly ash seeds	1	1.9	0.10	trace
<i>Rubus</i> sp., black berry seeds	1	1.9	0.05	trace

Table 3. Animal foods of 54 wild turkey poults 15 to 164 days old, Alachua and Glades Counties, Florida.

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
<b>INSECTS</b>				
Lepidoptera, butterflies & moths				
Geometridae - larvae	9	16.7	93.30	49.5
pupae	1	1.9	0.30	0.2
adults	1	1.9	0.20	0.1
Noctuidae - larvae	18	33.3	37.25	19.8
adults	5	9.3	0.80	0.4
Citheroniidae - adults	1	1.9	1.50	0.8
Pyralidae - adults	5	9.3	0.80	0.4
Hesperiidae - larvae	3	5.6	0.25	0.1
Arctiidae - larvae	2	3.7	0.10	trace
Nymphalidae - adults	2	3.7	0.10	trace
Pieridae - larvae	2	3.7	0.10	trace
pupae	1	1.9	0.05	trace
Orthoptera, crickets, short-horned, long-horned & pygmy grasshoppers				
Tetrigidae - adults	13	24.1	8.80	4.7
Acrididae - adults	8	14.8	6.20	3.3
nymphs	2	3.7	0.40	0.2
Tettigoniidae - adults	7	13.0	1.10	0.6
nymphs	2	3.7	0.40	0.2

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
Gryllidae - adults	5	9.3	0.55	0.3
nymphs	3	5.6	0.30	0.2
Coleoptera, beetles				
Chrysomelidae - adults	12	22.2	4.50	2.4
Curculionidae - adults	14	25.9	3.85	2.0
Carabidae - adults	4	7.4	1.10	0.6
Cantharidae - adults	2	3.7	1.10	0.6
Elateridae - adults	4	7.4	0.50	0.3
Tenebrionidae - adults	4	7.4	0.50	0.3
Histeridae - adults	3	5.6	0.65	0.3
Scarabaeidae - adults	3	5.6	0.50	0.3
Hydrophilidae - adults	1	1.9	0.20	0.1
Anthribidae - adults	1	1.9	0.10	trace
Hemiptera, bugs				
Pentatomidae - adults	12	22.2	2.60	1.4
Belostomatidae - adults	1	1.9	2.00	1.1
Cydnidae - adults	7	13.0	1.10	0.6
Coreimelaenidae - adults	3	5.6	0.90	0.5
Lygaeidae - nymphs	5	9.3	0.80	0.4
adults	6	11.1	0.70	0.4
Reduviidae - adults	4	7.4	0.55	0.3
Coreidae - adults	4	7.4	0.50	0.3
Saldidae - adults	1	1.9	0.10	trace
Odonata, dragon flies & damsel flies				
Libellulidae - nymphs	1	1.9	2.00	1.1
adults	2	3.7	0.40	0.2
Coenagrionidae - adults	2	3.7	0.40	0.2
Diptera, flies				
Tabanidae - adults	1	1.9	2.00	1.1
Tipulidae - adults	3	5.6	0.30	0.2
Caliphoridae - adults	1	1.9	0.10	trace
Syrphidae - adults	1	1.9	0.05	trace
Homoptera, leafhoppers & spittle bugs				
Cicadellidae - adults	9	16.7	1.05	0.6
Cercopidae - adults	3	5.6	0.40	0.2
Dermaptera, earwigs				
Labiduridae	2	3.7	0.20	0.1
Hymenoptera, braconids, ichneumons, sawflies				
Ichneumonidae - adults	3	5.6	0.10	trace
Tenthredinidae - cocoons	1	1.9	0.05	trace

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
Braconidae - adults	1	1.9	0.05	trace
Neuroptera, antlions				
Myrmeleonidae - adults	1	1.9	0.20	0.1
Arachnida, spiders	14	25.9	3.90	2.1
Oligochaeta, earthworms	2	3.7	1.40	0.7
Gastropoda, mollusk, snails	1	1.9	0.40	0.2
Reptilian, bone fragments	1	1.9	0.20	0.1
Myriapoda, millipedes	1	1.9	0.10	trace

Table 4. Plant foods of 8 adult wild turkeys, between 22 August and 1 November, Alachua and Glades Counties, Florida.

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
<i>Vitis rotundifolia</i> , fruits, seeds	2	25.0	149.70	44.9
<i>Paspalum conjugatum</i> , seeds	3	37.5	86.10	25.8
<i>Zea mays</i> , corn seeds	3	37.5	86.10	25.8
<i>Centrosema</i> sp., butterfly peas, leaves, flowers	1	12.5	15.00	4.5
<i>Serenoa repens</i> , saw palmetto seeds	1	12.5	9.00	2.7
<i>Myrica cerifera</i> , wax myrtle seeds	2	25.5	8.00	2.4
Gramineae, grass leaves	2	25.0	8.00	2.4
<i>Rhus radicans</i> , poison ivy seeds	2	25.0	3.65	1.1
<i>Desmodium tortuosum</i> , beggarweed seeds	1	12.5	3.00	0.9
<i>Nyssa sylvatica</i> , blackgum seeds	3	37.5	2.75	0.8
<i>Callicarpa americana</i> , beauty berry seeds	1	12.5	2.00	0.6
<i>Paspalum notatum</i> , bahia grass seeds	1	12.5	1.50	0.5
<i>Quercus laurifolia</i> , laurel oak acorns	2	25.0	1.20	0.4
<i>Ampelopsis arborea</i> , pepper vine seeds	1	12.5	1.00	0.3
<i>Panicum</i> sp., panic grass seeds	2	25.5	0.70	0.2
<i>Rhus copallina</i> , seeds	1	12.5	0.30	0.1
<i>Zanthoxylum</i> sp., prickly ash seeds	1	12.5	0.30	0.1
<i>Hydrocotyle</i> sp., penny wort leaves	1	12.5	0.20	0.1
<i>Celtis laevigata</i> , hackberry seeds	2	25.5	0.20	0.1
<i>Sabal palmetto</i> , swamp cabbage berries, seeds	1	12.5	0.20	0.1
<i>Parthenocissus quinquefolia</i> , Virginia creeper seeds	1	12.5	0.20	0.1

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
<i>Commelina elegans</i> , dayflower seeds	1	12.5	0.10	trace
<i>Serinea oppositifolia</i> , seeds	1	12.5	0.10	trace
<i>Carex</i> sp., sedges seeds	1	12.5	0.05	trace

Table 5. Animal foods of 8 adult wild turkeys between 22 August and 1 November, Alachua and Glades Counties, Florida.

Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
<b>INSECTS</b>				
Lepidoptera, butterflies & moths				
Geometridae - larvae	2	25.0	73.00	66.8
adults	1	12.5	1.00	0.9
Citheroniidae - adults	2	25.0	1.30	1.2
Noctuidae - larvae	3	37.5	1.00	0.9
pupae	2	25.0	0.80	0.7
Nymphalidae - adults	1	12.5	0.50	0.5
Hesperiidae - larvae	1	12.5	0.20	0.2
Orthoptera, crickets, mantids, short-horned, long-horned & pygmy grasshoppers				
Acrididae - adults	2	25.0	6.10	5.6
nymphs	1	12.5	0.20	0.2
Tetrigidae - adults	12.5	2.00	1.8	
Tettigoniidae - adults	1	12.5	2.00	1.8
Blattidae - adults	1	12.5	0.40	0.4
Mantidae - adults	1	12.5	0.20	0.2
Homoptera, leafhoppers & spittle bugs				
Cicadidae - adults	1	12.5	5.00	4.6
Cercopidae - adults	1	12.5	0.50	0.5
Fulgoridae - adults	1	12.5	0.10	0.1
Cicadellidae - adults	1	12.5	0.10	0.1
Coleoptera, beetles				
Scarabaeidae - adults	3	37.5	1.40	1.3
Chrysomelidae - adults	2	25.0	1.10	1.0
Curculionidae - adults	1	12.5	1.00	0.9
Carabidae - adults	1	12.5	1.00	0.9
Cerambycidae - adults	2	25.0	0.50	0.5
Buprestidae - adults	1	12.5	0.20	0.2
Hemiptera, bugs				



Food Item	Occurrence		Volume	
	Times	Percent	(ml)	Percent
Pentatomidae - adults	2	25.0	2.20	2.0
nymphs	1	12.5	0.15	0.1
Coreidae - adults	2	25.0	1.20	1.1
Lygaeidae - adults	1	12.5	0.20	0.2
Scutelleridae - adults	1	12.5	0.10	0.1
Reduviidae - adults	1	12.5	0.10	0.1
Diptera, flies				
Tabanidae	1	12.5	0.20	0.2
Stratiomyidae	1	12.5	0.20	0.2
Amblyomma americanum - adults	1	12.5	0.10	0.1
Odonata, skimmers				
Libellulidae - adults	1	12.5	0.40	0.4
Hymenoptera, vespid wasp, ants & brachonids				
Braconidae - adults	1	12.5	0.20	0.2
Vespidae - adults	1	12.5	0.10	0.1
Formicidae - adults	1	12.5	trace	trace
Dermaptera, earwigs				
Labiduridae - adults	1	12.5	0.10	0.1
Pulmonata, slug - adults	1	12.5	2.00	1.8
Gastropoda, snail - adults	1	12.5	1.00	0.9
Arachnida, spiders	3	37.5	1.00	0.9
Nematomorpha worms	1	12.5	0.20	0.2

Table 6. Comparison of food types by age groups.

Food Item	Age Group					
	1-14 Days (n=21)		15-164 Days (n=54)		Adult (n=8)	
	Percent Occurrence	Percent Volume	Percent Occurrence	Percent Volume	Percent Occurrence	Percent Volume
VEGETABLE <sup>a</sup>	85.7	75.0	93.9	72.8	100.0	75.3
Grass (leaves and seeds)	33.3	7.2	61.1	25.1	75.0	29.0
Herbs (leaves and seeds)	66.6	42.0	46.3	12.7	37.5	5.5
Trees, shrubs, vines (fruit and seeds)	28.6	26.1	77.8	22.6	100.0	53.6
ANIMAL	61.9	25.0	63.6	27.2	62.5	24.7

<sup>a</sup>All vegetable material including unidentified particles and bait corn and wheat is tabulated for total vegetable matters to reveal the true proportion of vegetation  
<sup>b</sup> animal matter in the diet; however, unidentified material and bait grain is not tabulated in the data for the vegetable subdivisions listed as grass, herbs, or trees.

## LITERATURE CITED

- Bump, G., R. W. Darrow, F. G. Edminister and W. F. Crissey. 1947. The ruffed grouse: life history, propagation and management. New York Conserv. Dept. 915 pp.
- Fernald, M. L. 1950. Gray's manual of Botany. 8th Ed. American Book Co., New York. 1632 pp.
- Hamrick, W. J. and J. R. Davis. 1972 (1971). Summer food items of juvenile wild turkeys. Proc. Annu. Conf. Southeastern Assoc. Game and Fish Commissioners. 25:85-89.
- Handley, C. O. 1950. Foods of the young. Pages 159-164 *in* H. L. Stoddard. The bobwhite quail its habits, preservation and increase. Charles Scribner's Sons, New York. 559 pp.
- Hitchcock, A. S. 1950. Manual of grasses of the United States. 2nd Ed., United States Government Printing Office, Washington, D. C. 1051 pp.
- Hurst, G. A. 1973 (1972). Insects and bobwhite quail brood habitat management. Proc. Natl. Bobwhite Quail Symp. 1:65-82.
- Ligon, J. S. 1946. History and management of Merriam's wild turkey. New Mexico Game and Fish Comm., Albuquerque. 84 pp.
- Small, J. K. 1933. Manual of the southeastern flora. University North Carolina Press, Chapel Hill. 1554 pp.
- Wheeler, R. J., Jr. 1948. The wild turkey in Alabama. Ala. Dept. Conserv., Montgomery. 92 pp.
- Williams, L. E., Jr., D. H. Austin, T. E. Peoples, and R. W. Phillips. 1973(1970) Observations on movement, behavior, and development of turkey broods. Pages 79-99. *In* G. C. Sanderson and Helen C. Schultz [Editors], Wild turkey management. Proc. Natl. Wild turkey Symp. 2. 355 pp.