

FOODS OF WHITE IBIS FROM SEVEN COLLECTION SITES IN FLORIDA¹

by

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ABSTRACT

Between 1970 and 1973, 180 white ibis (*Eudocimus albus*) 140 adult and 40 nestlings, were collected from four fresh water and three salt water sites and their stomach contents identified. Crustacean and aquatic insects were the major food items totaling 86.4% of the total food volume. Differences exist between stomach contents of ibis collected from fresh water and salt water habitats. Those collected from fresh water habitats contained more insects and snails while those from salt water sites contained more insects of certain families and crabs.

INTRODUCTION

Knowledge of food habits is fundamental to understanding wildlife ecology. Food habits studies have not been a popular avenue of wildlife investigation during the past 20 years and this has left a void in this important subject. Foods of white ibis have been described only in general terms. In a study of disgorged food from 50 nestling white ibis, Baynard (1912) listed 352 cutworms (*Lepidoptera*), 308 grasshoppers (*Orthoptera*), 602 crayfish (*Procambarus sp.*), and 42 small "moccasins" (*Agkistrodon?*) Baynard (1912) later generalized that "Glossy ibis feed like white ibis principally on crayfish, cutworms, other insects and young moccasins." Schorger (1962) cited Baynard (1913), mentioned contents from 12 additional stomachs and summarized the foods of white ibis as including largely crustaceans, fish, frogs, snakes (mainly "water moccasins"), snails, aquatic beetles, and other insects.

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METHODS

In the spring of 1970 through the summer of 1973, 180 white ibis were collected with shotguns and .22 rifles for a parasite (Bush 1973) and food habits survey from three salt water and four fresh water locations either while birds were returning to evening roosts or as they fed. Forty of these were nestlings, 21 from Biven's Arm of Paynes Prairie (fresh water) and 19 from Sea Horse Key (salt water). Stomachs were removed and the contents separated, identified and measured, with a graduated cylinder, to the nearest tenth milliliter. Figure 1 shows the seven collection sites and Table 1 gives location, date and number of specimens from each location.

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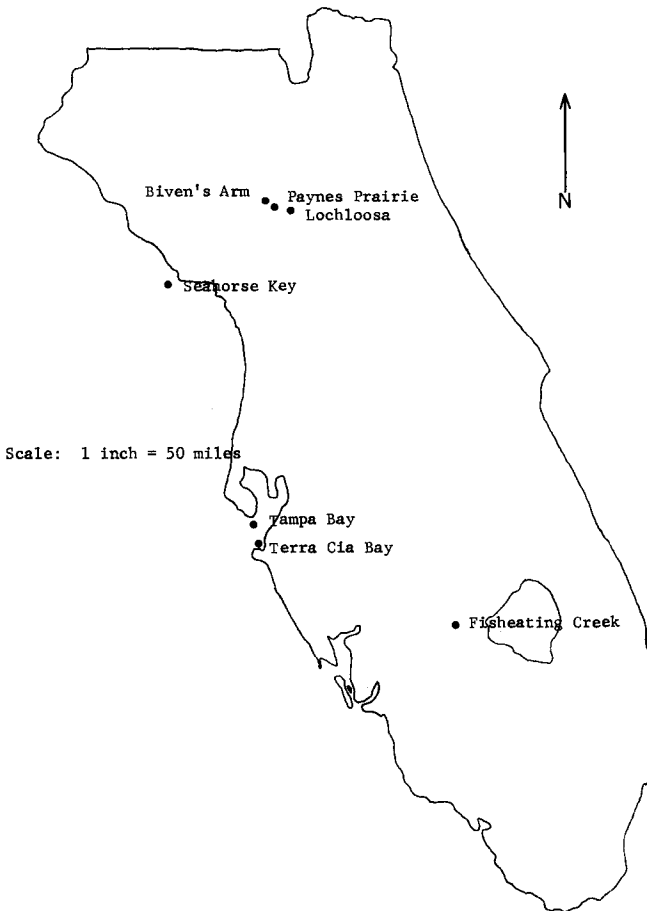


Figure 1. White Ibis Collection Sites.

RESULTS AND DISCUSSION

Table 2 presents the volume and frequency of occurrence of ibis food items found in this study. Animal matter made up virtually the entire diet with plant material, which may have been ingested incidentally, accounting for only 1.2% by volume. The two major constituents by volume were from one order (Decapoda) including two families of crustaceans accounting for 54.5% of the diet and nine orders and 42 families of insects accounting for 31.9%. Ibis were often seen feeding along the edges of the rising bodies of water where terrestrial invertebrates were concentrated and half-drowned, and birds subsequently collected, had been feeding on distressed earthworms (Oligochaeta) and mole crickets (Gryllotalpidae). A more thorough analysis of water conditions in relation to stomach contents would probably reveal that fish are taken in significant numbers by white ibis only during periods of relatively low water. The occurrence of fly maggots (Muscidae) in one stomach suggests this individual had fed on or near decom-

Table 1. White Ibis collection dates, locations and numbers.

Location	Date	Number of Specimens
<i>Fresh Water</i>		
Fisheating Creek (Glades County)	2/28/70	2
Fisheating Creek (Glades County)	10/21/70	17
Fisheating Creek (Glades County)	-/-/70	8
Fisheating Creek (Glades County)	2/17/73	14
Fisheating Creek (Glades County)	8/12/73	36
Paynes Prairie (Alachua County)	2/16/70	6
Paynes Prairie (Alachua County)	3/16/70	11
Paynes Prairie (Alachua County)	Spring/70	4
Paynes Prairie (Alachua County)	4/16/71	1
Lake Lochloosa (Alachua County)	12/2/71	5
Biven's Arm (Alachua County)	7/25/72	3 (nestlings)
Biven's Arm (Alachua County)	8/3/72	3 (nestlings)
Biven's Arm (Alachua County)	8/4/72	3 (nestlings)
Biven's Arm (Alachua County)	8/6/72	1 (nestling)
Biven's Arm (Alachua County)	8/8/72	5 (nestlings)
Biven's Arm (Alachua County)	8/11/72	6 (nestlings)
	TOTAL	125
<i>Salt Water</i>		
Sea Horse Key (Levy County)	6/9/72	16 (10 nestlings)
Sea Horse Key (Levy County)	6/23/72	14 (9 nestlings)
Terra Cia Bay (Manatee County)	7/19/72	5
Tampa Bay (Pinellas County)	7/19,20/72	11
	TOTAL	46
Unknown		9
	TOTAL	180

posing animal matter. Foods of nestlings and adults were similar except that diving water beetles (Dytiscidae) were found two and one half times more frequently in stomachs of nestlings.

Differences were noted in the diets of birds from fresh water and salt or brackish water habitats. White ibis nesting in coastal colonies fly inland to feed but our data suggest that many of them may travel no further than the nearest suitable feeding area which may still be brackish water. Insects accounted for 36.7% of the diet by volume at fresh water collection sites, whereas at salt and brackish water sites insects, by volume, were 24.3%. Snails (Gastropoda) were found in 27.2% of the stomachs from fresh water sites, but were found in only one stomach from a salt water site. Species of Decapoda made up 45.3% and 75.1% of the diet by volume from fresh and salt water sites respectively. Crayfish (*Procambarus sp.*) were consumed at an almost equal rate by both groups (45.3% for fresh water and 44.1% for salt water sites, by volume). Identification beyond the genus level was not possible, but it is likely these were two or more species of crayfish, possibly occupying different habitats. Fiddler crabs (*Uca sp.*) and unidentified crabs predictably appeared only in the diet of individuals from salt water sites. Diptera were about four times more common (by volume and frequency) in stomachs from salt water sites, but horsefly larvae (Tabanidae) were found in 34.4% of the stomachs from fresh water sites and not encountered in stomachs from salt water sites.

Table 2. Foods of 180 White Ibis

	Fresh Water Sites 125 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Plants								
<u>Polygonum</u> sp. seeds (smart weed)	trace	2 (1.6)					trace	2 (1.1)
<u>Rubus</u> sp. seeds (blackberry)	trace	2 (1.6)					trace	2 (1.1)
Unid. seeds	1.3 (0.2)	4 (3.2)	1 (0.1)	1 (2.2)			2.3 (0.2)	5 (2.8)
<u>Tillandsia usneoides</u> (Spanish moss)	trace	1 (0.8)					trace	1 (0.6)
Unid. Plant Material	14.9 (1.8)	13 (10.4)			1.5		16.4 (0.5)	15 (8.3)
Total Plants	16.3 (2.0)	22 (17.6)	1 (0.1)	1 (2.2)	1.5		18.8 (1.2)	25 (13.9)
Invertebrates								
Flat Worms								
Turbellaria								
<u>Pipilium kewense</u> (land planaria)	2.9 (0.3)	4 (3.2)			0.7		3.6 (0.2)	5 (2.8)

Table 2. (Continued)

	Fresh Water Sites 125 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Round Worms								
<i>Polychaeta</i> (marine worms)			3.4 (0.4)	2 (4.3)			3.4 (0.2)	2 (1.1)
<i>Oligochaeta</i> (earthworms)	42.3 (5.1)	28 (22.4)					42.3 (2.6)	28 (15.6)
<i>Hirudinea</i> (leeches)			2.8 (0.3)	4 (8.7)	0.1		2.9 (0.2)	5 (2.8)
<i>Placobdella</i> sp.							48.5 (3.0)	35 (19.4)
Total Round Worms	42.3 (5.1)	28 (22.4)			0.1			
Mollusks								
Gastropoda (snails)								
<i>Polyzva cereolus</i>	0.5 (0.1)	1 (0.8)					0.5 (trace)	1 (0.6)
<i>Polyzva avara</i>	0.5 (0.1)	1 (0.8)					0.5 (trace)	1 (0.6)
<i>Pomacea paludosa</i>	8.0 (1.0)	1 (0.8)					8.0 (0.5)	1 (0.6)
<i>Physa pumilio</i>	0.2 (trace)	1 (0.8)					0.2 (trace)	1 (0.6)

Table 2. (Continued)

	Fresh Water Sites 125 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
<i>Helisoma trivolvis</i> <i>intertextum</i>	0.4 (trace)	3 (2.4)			0.4 (trace)	3 (1.7)		
<i>Helisoma duryi</i> <i>inter-</i> <i>calare</i>	0.3 (trace)	1 (0.8)			0.3 (trace)	1 (0.6)		
Unid. snails	8.4 (1.0)	26 (20.8)	0.9 (0.1)	1 (2.2)	5.8	31 (17.2)	15.1 (0.9)	39 (21.9)
Total Gastropoda	18.3 (2.2)	34 (27.2)	0.9 (0.1)	1 (2.2)	5.8	39 (21.9)	25.0 (1.5)	39 (21.9)
Pulmonata (slugs)	1.1 (0.1)	1 (0.8)				1 (0.6)	1.1 (0.1)	1 (0.6)
Total Mollusks	19.4 (2.3)	35 (28.1)	0.9 (0.1)	1 (2.2)	5.8	40 (22.2)	26.1 (1.6)	40 (22.2)
Arachnids								
Arachnida	16.1 (1.9)	31 (24.8)	0.4 (0.1)	1 (2.2)	0.4	33 (18.3)	16.9 (1.0)	33 (18.3)
Crustacea								
Decapoda								
<i>Procambarus</i> sp. (cray- fish)	376 (45.3)	87 (69.6)	340.5 (45.5)	21 (45.7)	4.8	117 (65.0)	721.3 (43.8)	117 (65.0)

Table 2. (Continued)

	Fresh Water Sites 125 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Unid. Decapoda (crabs)			135.6 (18.1)	15 (32.6)			135.6 (8.4)	15 (8.3)
<u>Uca</u> sp. (fiddler crab)			40.0 (5.3)	1 (2.2)			40.0 (2.5)	1 (0.6)
Total Decapoda	376 (45.3)	87 (69.6)	516.1 (68.9)	37 (80.4)	4.8		896.9 (54.5)	133 (73.9)
Insects								
Coleoptera								
Scarabaeidae (scarab beetles)	146.2 (17.6)	154 (123.2)	4.1 (0.5)	31 (67.4)	16.5		166.8 (10.1)	193 (107.2)
Carabidae (ground beetles)	105.9 (1.27)	16 (12.8)	1.2 (0.2)	7 (15.2)	12.5		119.6 (7.3)	29 (16.1)
Curculionidae <u>Sphenophorus</u> sp. (weevils)	10.4 (1.3)	44 (35.2)	0.3 (trace)	3 (6.5)			10.7 (0.7)	47 (26.1)
Dytiscidae (predaceous diving beetles)	10.3 (1.2)	41 (32.8)	trace	1 (2.2)	0.8		11.1 (0.7)	43 (23.9)
Hydrophilidae (water scavenger beetles)	15.5 (1.7)	32 (25.6)	1.1 (0.1)	12 (26.1)	0.9		17.5 (1.0)	50 (27.8)
	1.9 (0.2)	10 (8.0)	0.4 (0.1)	2 (4.3)	0.8		3.1 (0.2)	13 (7.3)

Table 2. (Continued)

	Fresh Water Sites 125 Stomachs		Salt Water Sites 45 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Tenebrionidae (darkling beetle)	1.0 (0.1)	1 (0.8)	0.4 (0.1)	3 (6.5)	1.0		2.4 (0.1)	6 (3.3)
Staphylinidae (rove beetles)	0.4 (trace)	5 (4.0)			0.1		0.5 (trace)	6 (3.3)
Chrysomelidae (leaf beetles)	0.1 (trace)	1 (0.8)			0.2		0.3 (trace)	2 (1.1)
Cantharidae (soldier beetles)	0.2 (trace)	1 (0.8)			0.1		0.3 (trace)	2 (1.1)
Cicindelidae (tiger beetles)	0.2 (trace)	1 (0.8)					0.2 (trace)	1 (0.6)
Coccinellidae (lady bird beetle)	0.2 (trace)	1 (0.8)					0.2 (trace)	1 (0.6)
Elaeteridae (snap beetle)	0.1 (trace)	1 (0.8)			0.1		0.2 (trace)	2 (1.1)
Gyrinidae (whirligig beetle)			0.2 (trace)	1 (2.2)			0.2 (trace)	1 (0.6)
Trogidae (skin beetles)			0.5 (0.1)	2 (4.3)			0.5 (trace)	1 (0.6)
Hemiptera	20.8 (2.5)	59 (47.2)	61.1 (8.4)	23 (50.0)	0.4		82.3 (5.6)	83 (46.1)

Table 2. (Continued)

	Fresh Water Sites 125 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Belostomatidae (giant water bugs)	20.2 (2.4)	53 (42.4)	60.8 (2.9)	20 (43.5)			81.0 (4.9)	73 (40.6)
Naucoridae <i>Pelocoris</i> sp. (creeping water bugs)	0.1 (trace)	2 (1.6)	0.1 (trace)	1 (2.2)			0.6 (trace)	4 (2.2)
Corixidae (water boatmen)	0.2 (trace)	2 (1.6)	0.1 (trace)	1 (2.2)			0.3 (trace)	3 (1.7)
Nepidae (water scorpions)	0.2 (trace)	1 (0.8)	0.1 (trace)	1 (2.2)			0.3 (trace)	2 (1.1)
Reduviidae (assassin bugs)	0.1 (trace)	1 (0.8)					0.1 (trace)	1 (0.6)
Orthoptera	42.2 (5.1)	63 (50.4)	14.4 (1.9)	4 (8.7)	0.2		56.8 (3.5)	69 (38.3)
Gryllotalpidae (mole crickets)	38.6 (4.7)	28 (22.4)	1.1 (0.1)	2 (4.3)			39.7 (2.4)	30 (16.7)
Tettigidae (pygmy grasshoppers)	2.1 (0.3)	22 (17.6)					2.1 (0.1)	22 (12.2)
Blattidae (cockroaches)	0.5 (0.1)	5 (4.0)	13.0 (1.1)	1 (2.2)	0.2		13.7 (0.8)	8 (4.4)
(<i>Pycnoscelus surinamensis</i>)	0.5 (0.1)	5 (4.0)	13.0 (1.1)	1 (2.2)			13.5 (0.8)	6 (3.3)

Table 2. (Continued)

	Fresh Water Sites 126 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Gryllidae (field crickets)	0.4 (trace)	5 (4.0)	0.3 (trace)	1 (2.2)			0.7 (trace)	6 (3.3)
Tettigoniidae (long horned grasshoppers)	0.2 (trace)	2 (1.6)					0.2 (trace)	2 (1.1)
Acrididae (short horned grasshoppers)	0.4 (trace)	1 (0.8)					0.4 (trace)	1 (0.6)
Diptera	27.3 (3.3)	55 (44.0)	96.6 (12.9)	5 (10.9)	9.4		133.3 (8.1)	62 (34.4)
Tabanidae (larvae) (horse flies)	20.2 (2.4)	43 (34.4)			9.3		29.5 (1.8)	45 (25.0)
Syrphidae (maggot) (syrphid flies)	1.8 (0.2)	3 (2.4)	92.2 (12.0)	2 (4.3)	0.1		94.1 (5.8)	6 (3.3)
Stratiomyidae (soldier flies)	1.0 (0.1)	1 (0.8)	4.4 (0.6)	3 (6.5)			5.4 (0.4)	4 (2.2)
Tipulidae (crane flies)	1.1 (0.1)	2 (1.6)					1.1 (0.1)	2 (1.1)
Bibionidae (March flies)	1.0 (0.1)	2 (1.6)					1.0 (0.1)	2 (1.1)
<u>Dilophus</u> sp.	0.9 (0.1)	1 (0.8)					0.9 (0.1)	1 (0.6)

Table 2. (Continued)

	Fresh Water Sites 125 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
<u>Plecia nearctica</u>	0.1 (trace)	1 (0.8)					0.1 (trace)	1 (0.6)
Calliphoridae (maggot) (blow flies)	0.1 (trace)	1 (0.8)					0.1 (trace)	1 (0.6)
Ephydriidae (maggot) (shore flies)	0.1 (trace)	1 (0.8)					0.1 (trace)	1 (0.6)
Muscidae (maggot) <u>Musca domestica</u> (housefly)	2.0 (0.2)	1 (0.8)					2.0 (0.1)	1 (0.6)
Unknown Diptera	0.5 (0.1)	1 (0.8)					0.5 (trace)	1 (0.6)
Odonata	33.6 (4.0)	29 (23.2)	1.7 (0.2)	7 (15.2)	11.4		46.7 (2.8)	41 (22.8)
Libellulidae (nymph) (common skimmers dragonflies)	11.1 (1.3)	22 (17.6)	0.9 (0.1)	5 (10.9)	10.6		22.5 (1.4)	31 (17.2)
Aeschnidae (nymph) (damers dragonflies)	22.5 (2.7)	7 (5.6)	0.8 (0.1)	2 (4.3)	0.8		24.1 (1.5)	10 (5.6)
Lepidoptera	29.9 (3.6)	13 (10.4)	0.2 (trace)	1 (2.2)			30.3 (1.8)	15 (8.3)

Table 2. (Continued)

	Fresh Water Sites 123 Stomachs		Salt Water Sites 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Noctuidae (moths)	27.9 (3.3)	12 (9.6)	0.2 (trace)	1 (2.2)			28.1 (1.7)	13 (7.2)
<u>Mocis latipes</u> (grass worms)	0.4 (trace)	2 (1.6)					0.4 (trace)	2 (1.1)
<u>Spodoptera frugiperda</u> (larva) (fall army worms)	21.1 (2.5)	5 (4.0)					21.1 (1.3)	5 (2.8)
Sphingidae (spynx moths)	2.2 (0.3)	2 (1.6)					2.2 (0.1)	2 (1.1)
Hymenoptera	4.4 (0.5)	5 (4.0)	0.1 (trace)	2 (4.3)			4.5 (0.3)	7 (2.8)
Formicidae (ants)	0.1 (trace)	1 (0.8)	0.1 (trace)	2 (4.3)			0.2 (trace)	3 (1.7)
Ichneumonidae (Ichneumon flies)	0.2 (trace)	2 (1.6)					0.2 (trace)	2 (1.1)
Vespidae (larva) (wasps)	4.1 (0.5)	2 (1.6)					4.1 (0.2)	2 (1.1)
Dermaptera			1.3 (0.2)	4 (8.7)			1.3 (0.1)	4 (2.2)
Labiduridae (ear wigs)			1.3 (0.2)	4 (8.7)			1.3 (0.1)	4 (2.2)
Neuroptera			0.7 (0.1)	2 (4.3)			0.7 (trace)	2 (1.1)

Table 2. (Continuous)

	Fresh Water Site 125 Stomachs		Salt Water Site 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Sialidae (<i>Chauliodes</i> sp.) (larva) (aiderflies)			0.7 (0.1)	2 (4.3)			0.7 (trace)	2 (1.1)
Total Insects	304.9 (36.7)	378 (302.4)	180.2 (24.3)	79 (171.7)	37.8		522.9 (31.9)	476 (264.4)
Total Invertebrates	761.6 (91.8)	563 (405.4)	703.8 (94.3)	124 (269.6)	49.5		1,514.9 (92.0)	722 (401.1)
Vertebrates								
Fish								
Poeciliidae								
<i>Gambusia affinis</i> (mosquito fish)			2.0 (0.3)	1 (2.2)			2.0 (0.1)	1 (0.6)
Centrarchidae								
<i>Lepomis</i> sp. (sunfish)	1.5 (0.2)	1 (0.8)					1.5 (0.1)	1 (0.6)
Unid. Fish	4.4 (0.5)	7 (5.6)	2.2 (0.3)	6 (13.0)			6.6 (0.9)	13 (7.2)
Total Fish	5.9 (0.7)	8 (1.0)	4.2 (1.0)	7 (5.6)			10.1 (0.6)	15 (8.3)

Table 2. (Continued)

	Fresh Water Site 125 Stomachs		Salt Water Site 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Amphibians								
Sirenida (siren)	2.5 (0.3)	1 (0.8)					2.5 (0.2)	1 (0.6)
Hyllidae (tree frog)								
<i>Acris</i> sp.	4.0 (0.5)	1 (0.8)					4.0 (0.3)	1 (0.6)
<i>Hyla</i> sp.	0.4 (trace)	1 (0.8)					0.4 (trace)	1 (0.6)
Unid. Tadpole	3.2 (0.4)	2 (1.6)			0.8	0.8	4.0 (0.3)	3 (1.7)
Total Amphibians	10.1 (1.2)	5 (4.0)			0.8	0.8	10.9 (0.8)	6 (3.3)
Reptiles								
Colubridae (snake)	25.0 (3.0)	2 (1.6)					48.0 (3.1)	3 (1.7)
Iguanidae (lizard)	0.4 (trace)	1 (0.8)					0.4 (trace)	1 (0.6)
Unid. Reptile	2.0 (0.2)	1 (0.8)			14.0	14.0	16.0 (0.9)	3 (1.7)
Total Reptiles	27.4 (3.3)	4 (3.2)			23.0 (3.0)	1 (2.2)	64.4 (3.4)	7 (3.9)

Table 2. (Continued)

	Fresh Water Site 125 Stomachs		Salt Water Site 46 Stomachs		Unknown 9 Stomachs		Total 180 Stomachs	
	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)	Volume (ml) (%)	Frequency (%)
Total Vertebrates	51.8 (6.2)	30 (24)	29.2 (3.9)	9 (19.6)	19.6		100.6 (6.1)	46 (25.6)
Miscellaneous Materials								
Unid, Vertebrate Bones	8.4 (1.0)	13 (10.4)	2 (0.3)	1 (2.2)	4.8		15.2 (0.9)	18 (10.0)
Egg Shell			5.0 (0.7)	1 (2.2)			5.0 (0.3)	1 (0.6)
Feathers			7.0 (0.9)	1 (2.2)			7.0 (0.4)	1 (0.6)

Coleoptera were twice as frequent in the diet from fresh water sites. Orthoptera were about three times more common (by volume and frequency) in the diet at fresh water sites. These differences probably reflect varying availability of prey species in salt and fresh water.

The feeding habits of the white ibis may have some economic importance. Baynard (1912) states that the taking of crayfish by white ibis favorably affects the fishery associated with the feeding marsh by reducing predation on fry. On the other hand in areas where crayfish are used for human food, white ibis may be pests. Though crayfish and aquatic insects make up the bulk of the normal diet, white ibis are at times able to take advantage of unusually high or low water conditions to find food.

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EFFECT OF DOGS ON DEER REPRODUCTION IN VIRGINIA¹

by

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ABSTRACT

Dogs were used to chase female white-tailed deer (*Odocoileus virginianus*) in a 2,040-acre enclosure at Radford Army Ammunition Plant, Dublin, Virginia, during late pregnancy from April to June 1972 (Phase I) and throughout pregnancy from October 1972 through May 1973 (Phase II) to determine the effect on reproduction. During Phase I, trained deer hounds were used to chase approximately 40 percent of the deer in the study area; the other 60 percent were used as a control. During Phase II, hounds and other dogs were used for chasing deer on the entire study area. All healthy deer easily escaped the chase dogs, but a badly deformed piebald fawn was caught. Neighborhood dogs apparently killed one additional young fawn during the study, but the problem is not serious because of the protective behavior of the does and the secretive nature of young fawns. No significant difference in fawns per doe surviving to late summer censuses was found between deer chased by dogs and those that were not. No permanent home range changes were noted as a result of dog chasing, but temporary changes of 1 or 2 days duration occurred. Dogs were not measurably detrimental to this enclosed, densely populated herd, either by limiting its reproduction, inducing permanent home range changes, or killing individual deer.

INTRODUCTION

Free-running dogs are often thought to be a serious threat to deer, but scientific evidence is lacking to support this viewpoint. The question is filled with emotion, and many writers of popular wildlife articles appear to be caught up in the anti-dog

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