Northeast Gulf Science

Volume 9
Number 1 *Number 1*

Article 1

4-1987

Alligator Feeding Habits: New Data and a Review

James L. Wolfe
Mississippi State University

Dwight K. Bradshaw
Mississippi State University

Robert H. Chabreck
Louisiana State University

DOI: 10.18785/negs.0901.01

Northeast Gulf Science Vol. 9. No. 1, April 1987 p. 1-8

ALLIGATOR FEEDING HABITS: NEW DATA AND A REVIEW

James L. Wolfe[1] and Dwight K. Bradshaw,
Mississippi State University Research Center, NSTL, MS 39529

Robert H. Chabreck,
School of Forestry, Wildlife, and Fisheries,
Louisiana State University Agricultural Center, Baton Rouge, LA 70803

ABSTRACT: Nutria (*Myocastor coypus*) and muskrats (*Ondatra zibethicus*) are the predominant food items of alligators over 1.5 m in length in southeastern Louisiana. Our data and a review of the literature on alligator diets indicate that the mammals are apparently major components of the diet of large alligators over much of their range, with fishes and crustaceans being more important to smaller alligators.

In areas where alligators (*Alligator mississippiensis*) coexist with furbearing animals, commercial trappers perceive serious competition between themselves and these reptiles (personal communication; McNease and Joanen, 1977). Managers are aware that such problems may exist, but available data provide a limited basis for informed decisions. Management options are also limited by legal protection afforded alligators over much of their range. Alligators are legally harvested in significant numbers only in Louisiana, and on a more limited basis in Florida and Texas.

Previous studies have stated that alligators are largely opportunistic feeders (McIlhenny, 1935). Neill (1971) lists as prey, with little corroborating evidence, virtually every vertebrate animal sharing the range and habitat of the alligator.

McIlhenny (1935), LeBuff (1957) and others have reported dietary shifts with age. In general, studies directed toward alligators of less than 1.5 m in length (Chabreck, 1971; Fogarty and Albury, 1968) have found mammals to be absent or unimportant in the diet. Studies which include larger alligators (Giles and Childs, 1949; Valentine *et al.*, 1972; McNease and Joanen, 1977) indicate that mammals are eaten in significant numbers. Giles and Childs (1949) state that mammals are an important food item for alligators over 5 feet (1.5 m), but not for smaller individuals.

In this paper we present new data on the diet of large alligators from an area of Louisiana adjacent to its border with Mississippi, which has been studied much less intensively than the southwestern part of the state. We also present additional documentation of the important role of nutria and muskrats in the diet of alligators. A summary of previous work on alligator food habits is included.

METHODS

Stomachs were obtained from 100 alligators killed during the 1984 season (September) in Louisiana. The animals were taken from coastal marshes, ranging from fresh to brackish, between the Mississippi state line (Pearl River) and eastern New Orleans. Length was recorded to the nearest 0.3 m, and ranged from 1.5 to 3.0 m, averaging 2.1 m.

Stomach contents were washed, sorted, and identified. Procedures for analyzing and expressing data on food items has varied considerably between studies. Chabreck (1971) argued convincingly that measures based on weight

[1]Present address: Archbold Biological Station, P.O. Box 2057, Lake Placid, FL 33852.

of prey were more meangingful than frequency of occurrence of prey species and that analyses based on estimates or measurements of prey live weights were better than those based on weight or volume of undigested remnants in the stomach.

Weight estimates were obtained by weighing intact specimens when they occurred in the stomach, weighing live or preserved representatives of the species, or in a few instances, using weights reported in the literature. A representative series of known weight muskrats (*Ondatra zibethicus*) and nutria (*Myocastor coypus*) skins and skeletons were available for comparison. When only hair or other items with no size information were found, we used the average for that species based on the total sample. While these estimates were at times inexact, they are far more representative of the relative importance of food items than other methods. We also express food items as percent frequency (the percentage of alligators examined that had that particular item in the stomach.)

RESULTS

Our results are summarized in Table 1. Muskrats and nutria, based on weight, accounted for over 83 percent of the diet. Together, they were found in 77 percent of the stomachs examined. Muskrats had a higher frequency of occurrence but, by weight, accounted for less than a third of the mammalian flesh consumed.

Fishes were second in importance to mammals, comprising almost 11 percent of the sample, and occurring at a frequency of 26 percent. Gars (Lepisosteidae) and drums (Sciaenidae) were the most common fishes in the diet.

Reptiles comprised 3 percent of the diet, with snakes being more than twice as important as turtles both in number and by weight. The cottonmouth (*Agkistrodon piscivorous*) was the most frequently eaten reptile.

Birds were less important in our sample accounting for only 1.4 percent of the diet. Clapper rails (*Rallus longirostris*) were found in four stomachs.

While invertebrates had a high frequency of occurrence, they accounted for only about 1 percent of the diet by weight. Blue crabs (*Callinectes sapidus*) and crayfish (*Procambarus* spp.) were the most important invertebrates in the diet.

Muskrats and nutria were well-represented in our sample among alligators of all size classes (Table 2). Muskrats greatly outnumbered nutria in the diet of the smallest alligators, but nutria predominated in the larger size classes.

Other vertebrates showed no consistent trends as related to alligator size. Invertebrates exhibited a slight trend toward decreasing in the diet of larger individuals (Table 2).

Non-food items found in the stomach were wood and other plant materials, two plastic shotgun shell cases, and parts of four plastic worm fishing lures.

DISCUSSION

We found the highest level of alligator predation on mammals ever reported, although Valentine *et al.* (1972) and McNease and Joanen (1977) also found mammals taken in substantial numbers. This may in part be due to the method of calculating weights, but our frequency of occurrence is also the highest on record.

The results shown in Table 2 along with other studies using similar methods

DOI: 10.18785/negs.0901.01

Table 1. Foods of 100 large (1.5-3.0 m) alligators from coastal marshes of southeastern Louisiana.

Food Item	% Frequency	% by Weight
Crustacea	73	1.0
Callinectes sapidus (Blue crab)	47	0.8
Procambarus sp. (Crayfish)	36	0.2
Uca sp. (Fiddler crab)	2	Tr
Insects	13	Tr
Mantidae (Praying mantis)	1	Tr
Belostomatidae (Water bug)	7	Tr
Dytiscidae (Water beetle)	3	Tr
Unidentified Coleoptera	2	Tr
Other Invertebrates (spiders, shrimp)	5	Tr
Fishes	26	10.9
Lepisosteus sp. or *Atractosteus spatula* (Gar)	8	5.7
Ictalurus sp. (Catfish)	3	0.7
Unidentified Cypriniformes	7	0.5
Sciaenidae (Drums)	7	3.8
Centrarchidae (Sunfish)	4	0.2
Other fishes (*Brevoortia,* Cyprinodontidae)	2	0.1
Reptiles	20	3.0
Chrysemys scripta (Pond slider)	1	0.2
Graptemys sp. (Sawback turtle)	1	0.1
Kinosternon subrubrum (Mud turtle)	1	0.1
Unidentified turtles	2	0.5
Storeria dekayi (Dekay's snake)	1	Tr
Nerodia fasciata clarki (Gulf salt marsh snake)	1	0.1
N. cyclopion (Green water snake)	2	0.5
Agkistrodon piscivorus (Cottonmouth)	6	1.4
Unidentified snakes	5	0.2
Unidentified reptile eggs	1	Tr
Birds	10	1.4
Rallus longirostris (Clapper rail)	4	0.6
Fulica americana (Coot)	1	0.3
Unidentified duck	1	0.5
Agelaius phoeniceus (Red-winged blackbird)	3	0.1
Unidentified bird	1	Tr
Mammals	77	83.6
Ondatra zibethicus (Muskrat)	46	24.0
Myocastor coypus (Nutria)	37	59.6

(Table 3) show consistent trends in diet related to size. Invertebrates in the diet tend to decrease with increasing alligator length. Mammals become important to alligators of about 1.5 m in length, and there is a general shift from muskrats to nutria as alligator length increases.

The prevalence of these mammals in the diet of larger alligators probably reflects prey availability. Nutria and muskrats are abundant in coastal marshes along the northern Gulf of Mexico between Mobile Bay and eastern Texas (Perry, 1982, Willner, 1982). In parts of the alligator's range where these semi-aquatic rodents are less common, mammals may be less important in the diet. While neither is common in Florida (no record of muskrats), Kinsella (1982)

Table 2. Alligator size in relation to diet in southeastern Louisiana. Food categories are listed as percent by weight, followed by number of prey individuals in parentheses.

	Alligator Size Class					
Food Item	1.5 m N = 6	1.8 m N = 31	2.1 m N = 33	2.4 m N = 19	2.7 m N = 6	3.0 m N = 5
Invertebrates	1.5(10)	1.8(45)	0.9(33)	0.8(19)	0.5(5)	0.5(3)
Fishes	12.0(6)	10.1(8)	10.5(7)	7.0(7)	21.7(4)	15.1(2)
Reptiles	6.0(2)	3.8(1)	3.2(9)	1.2(6)	3.7(2)	3.0(1)
Birds	0(0)	2.3(2)	2.4(4)	0.6(2)	0(0)	0(0)
Muskrats	59.6(7)	28.4(13)	22.3(17)	19.2(10)	18.5(3)	18.1(3)
Nutria	19.9(1)	53.5(11)	60.7(14)	71.2(11)	55.6(3)	63.3(5)

reports that the round-tailed muskrat (*Neofiber alleni*), which can be locally abundant, is sometimes preyed upon. Hopefully new studies on large alligators from other parts of the species' range will be forthcoming.

McNease and Joanen (1977) noted that alligators took more mammals in freshwater marshes than in intermediate and brackish marshes. Valentine *et al.* (1972) found no difference in mammal consumption between brackish canals and freshwater habitats. McIlhenny (1935) found muskrat remains in all alligators (N = 50) taken from "marshy pools in muskrat territory" but none in alligators (number not reported) from open bays and canals. We were unable to determine the exact habitats of alligators in our study, but they ranged from fresh to brackish.

A listing of wild mammals reported as alligator prey from studies using stomach content analyses or direct (first hand-observation) is given in Table 4. Of these, all appear to be taken infrequently except for muskrats and nutria.

Nutria were introduced into Louisiana in 1938, and populations comparable to those present today were reached in the late 1950's (Lowery, 1974). In the 1962-63 season, nutria surpassed muskrats in numbers taken by Louisiana trappers, and have been equally abundant in the harvest since that time (Ensminger and Linscombe, 1980). This trend is reflected by the data available on alligator diets. McIlhenny (1935) reported

Table 3. Relative importance of alligator foods, based on mass or volume, in relation to average length of alligators in sample.

Reference[a]	1	2	2	3	1	1	4	5
Length (m)	1.0	1.1	1.2	1.2	1.7	2.0	2.1	2.2
Number	79	10	10	36	25	309	100	314
Locality[b]	SW LA	SW LA	SW LA	S FL	SW LA	SW LA	SE LA	SW LA
Rank								
1	Fishes	Crustaceans	Crustaceans	Snails	Mammals	Mammals	Mammals	Mammals
2	Crustaceans	Birds	Fishes	Crustaceans	Crustaceans	Birds	Fishes	Fishes
3	Reptiles	Insects	Insects	Fishes	Birds	Crustaceans	Reptiles	Crustaceans
4	Mammals	Fishes		Insects	Fishes	Fishes	Crustaceans	Birds
5	Birds	Reptiles			Reptiles	Reptiles	Birds	Reptiles
6	Insects				Insects		Insects	Insects

[a]References:
(1) Valentine, *et al.*, 1972
(2) Chabreck, 1971
(3) Fogarty & Albury, 1968
(4) Present Study
(5) McNease & Joanen, 1977

[b]Localities:
SW LA — Southwestern Louisiana
S FL — Southern Florida
SE LA — Southeastern Louisiana

DOI: 10.18785/negs.0901.01

Table 4. Food items excluding domesticated animals and humans identified from alligator stomach contents or by direct observation of feeding. A reference, generally the most recent one, is indicated by the letter following the item. A key to these is given at the end of the table. Scientific names have been updated wherever applicable.

CRUSTACEA
- *Penaeus* sp. (Penaeid shrimp)a
- *P. setiferus* (White shrimp)a
- *Palaemonetes* sp. (Freshwater shrimp)a
- *P. intermedius* (Grass shrimp)e
- *Cambarus* sp. (Crayfish)d
- *Procambarus* sp. (Crayfish)ps
- *P. clarki* (Red crayfish)a
- *Callinectes sapidus* (Blue crab)a
- *Sesarma* sp. (Wood crab)g
- *S. reticulatum* (Wood crab)g
- *Uca* sp. (Fiddler crab)a
- *U. pugnax* (Fiddler crab)c
- *U. minax* (Fiddler crab)g

INSECTA
- Unidentified Odonata (larvae, nymphs, and adults)g
- Unidentified Mantidae (Praying mantis)d
- Unidentified Blattidae (Cockroach)g
- Unidentified Acrididae (Grasshopper)f
- *Bucrates malivolans* (Bucrates katydid)g
- *Dyscinetus trachypygus* (Scarab beetle)g
- *Phyllophaga* sp. (Scarab beetle)f
- *Bothynus gibbosus* (Carrot beetle)g
- *Halticus* sp. (Fleahopper)g
- *Cybister* sp. (Predaceous diving beetle)g
- *C. fimbriolatus* (Predaceous diving beetle)g
- *Dytiscus* sp. (Predaceous diving beetle)f
- *Hydaticus* sp. (Predaceous diving beetle)g
- *H. bimarginatus* (Predaceous diving bettle)g
- *Rhantus* sp. (Predaceous diving beetle)g
- *Thermonectus* sp. (Predaceous diving beetle)g
- *Listronotus obliquus* (Weevil)g
- *Sphenophorus* sp. (Billbug)g
- *S. aequalis* (Billbug)g
- *S. callosus* (Billbug)g
- *S. cariosus* (Billbug)g
- *S. pertinax* (Billbug)g
- *S. venatus* (Billbug)g
- *Berosus* sp. (Water scavenger beetle)g
- *B. striatus* (Water scavenger beetle)g
- *Dibolocelus ovatus* (Water scavenger beetle)g
- *Enochrus* sp. (Water scavenger beetle)g
- *Neohydrophilus castus* (Water scavenger beetle)g
- *Hydrophilus triangularis* (Water scavenger beetle)g

OSTEICHTHYES
- *Atracosteus spatula* (Alligator gar)g
- *Lepisosteus* sp. (Gar)a
- *Amia calva* (Bowfin)a
- *Brevoortia* sp. (Menhaden)a
- *Dorosoma* sp. (Shad)a
- *Anchoa* sp. (Anchovy)a
- Unidentified Cyrpiniformes ps
- *Ictiobus bubalis* (Buffalofish)c
- *Ictalurus* sp. (Catfish)a
- *Cyprinodon variegatus* (Sheepshead minnow)a
- *Fundulus* sp. (Killifish)c
- *Fundulus seminolus* (Florida killifish)d
- *Jordanella floridae* (Flagfish)d
- Unidentified Cyprinodontidae (Killifish)ps
- *Gambusia affinis* (Mosquitofish)d
- *Poecilia latipinna* (Sailfin molly)a
- *Menidia* sp. (Silversides)c
- *Lepomis* sp. (Sunfish)a
- *Micropterus salmoides* (Largemouth bass)d
- *Aplodinotus grunniens* (Freshwater drum)a
- *Pogonias cromis* (Black drum)a
- Unidentified Scaenidae (Drums)ps
- *Mugil* sp. (Mullet)a

AVES
- *Podilymbus podiceps* (Pied-billed grebe)g
- *P. auritus* (Horned grebe)g
- *Ixobrychus exilus* (Least bittern)a
- *Egretta thula* (Snowy egret)c
- *Egretta caerulea* (Little blue heron)c
- *Casmerodus albus* (Common egret)c
- *Butorides striatus* (Green-backed heron)a
- *Nycticorax nycticorax* (Black-crowned night heron)c
- *Egretta tricolor* (Tricolored heron)h
- *Plegadis chihi* (White-faced ibis)c
- *Anas fulvigula* (Mottled duck)a
- *Anas platyrhynchos* (Mallard)g
- *Rallus longirostris* (Clapper rail)c
- *R. elegans* (King rail)g
- *Porzana carolina* (Sora)c
- *Porphyrula martinica* (Purple gallinule)a
- *Gallinula chloropus* (Common moorhen)a
- *Fulica americana* (Coot)c
- *Calidris melanotis* (Pectoral sandpiper)g
- *Himantopus mexicanus* (Black-necked stilt)c
- *Asio flammeus* (Short-eared owl)g
- *Progne subis* (Purple martin)a
- *Cyanocitta cristata* (Blue jay)a
- *Agelaius phoeniceus* (Red-winged blackbird)a
- *Quiscalus* sp. (Grackle)a
- *Quiscalus* major (Boat-tailed grackle)c
- *Conocephalus* sp. (Meadow katydid)g
- *Gryllus* sp. (Field cricket)g
- Unidentified Nepidae (Water scorpion)d
- *Ranatra* sp. (Water scorpion)f
- *Notonecta undulata* (Backswimmer)g
- *Belostoma* sp. (Giant water bug)f
- *Lethocerus* sp. (Giant water bug)f
- *L. griseus* (Giant water bug)e
- Unidentified Lepidoptera (Butterflies and Moths)g

Amara sp. (Ground beetle)g
Bembidion sp. (Ground beetle)g
Chlaenius sp. (Ground beetle)g
C. erythropus (Ground beetle)g
Harpalus sp. (Ground beetle)g
Pasimachus marginatus (Ground beetle)f
Pterostichus sp. (Ground beetle)g
Scarites substriatus (Ground beetle)g
S. subterraneus (Ground beetle)g
Ataenius sp. (Scarab beetle)g

Tropisternus sp. (Water scavenger beetle)g
T. lateralis (Water scavenger beetle)g
T. striolatus (Water scavenger beetle)g
Languria sp. (lizard beetle)g
Naemia seriata (Lady beetle)g
Blapstinus fortis (Darkling beetle)g
Crematogaster sp. (Umbrella ant)g
Pheidole sp. (Big headed ant)g
Ponera sp. (Ponerine ant)g
Solenopsis sp. (Fire ant)g
Bombus sp. (Bumblebee)g
Tiphia sp. (Tiphiid wasp)g
Dasymutilla sp. (Velvet ant)g
Odontomyia sp. (Soldier fly)g
Tabanidae (Horse fly)f

ARACHNIDA
Dolomedes sp. (Water spider)ps
Tetragnatha sp. (Tetragnathid spider)g
Lycosa sp. (Wolf spider)g
L. carolinensis (Wolf spider)g

GASTRODODA
Pomacea paludosa (Apple snail)e
Physa sp. (Snail)g

PELECYPODA
Rangia sp. (Clam)a
Modiolus sp. (Clam)g

AMPHIBIA
Rana catesbeiana (Bullfrog)a
Gastrophryne carolinensis (Narrow-mouthed toad)g

REPTILIA
Alligator mississippiensis (Gators and eggs)a
Scincella laterale (Ground skink)g
Nerodia sp. (Water snake)a
Nerodia cyclopion (Green water snake)ps
Nerodia fasciata (Banded water snake)g
Nerodia fasciata clarki (Gulf salt marsh snake)g
Regina sp. (Crayfish snake)c
Farancia abacura (Mud snake)a
Storeria dekayi (DeKay's snake)a
Thamnophis sauritus (Ribbon snake)a
Agkistrodon piscivorous (Cottonmouth)a
Graptemys sp. (Sawback turtle)ps
Chrysemys floridana (Coastal plain turtle)g
Chrysemys scripta (Pond slider)a
Kinosternon subrubrum (Mud turtle)c
Sternotherus minor (Musk turtle)g
Malaclemys terrapin (Diamondback terrapin)g
Trionyx ferox (Soft shelled turtle)g

MAMMALIA
Didelphis virginiana (Opossum)a
Dasypus novemcinctus (Armadillo)a
Sylvilagus aquaticus (Swamp rabbit)a
Oryzomys palustris (Rice rat)a
Peromyscus gossypinus (Cotton mouse)g
Ondatra zibethicus (Muskrat)a
Neofiber alleni (Round-tailed muskrat)b
Myocastor coypus (Nutria)a
Procyon lotor (Raccoon)a
Mustela vison (Mink)a
Lutra canadensis (River otter)c
Odocoileus virginiana (White-tailed deer)a

a. McNease and Joanen, 1977
b. Kinsella, 1982
c. Valentine, *et al.*, 1972
d. Chabreck, 1971
e. Fogarty and Albury, 1968
f. Giles and Childs, 1949
g. Kellog, 1929
h. Chamberlain, 1930
ps. Present study

that alligators taken in 1916 from "muskrat habitat" fed predominantly on muskrats. Studies by Kellog (1929) and O'Neil (1943, 1949) documented the presence of muskrats in the diet of alligators, but neither reported nutria. Giles and Childs (1949) reported muskrats and no nutria in 318 stomachs collected in 1946, but Valentine *et al.* (1972) found nutria and no muskrats in 413 stomachs collected in the same area from 1961 to 1964. McNease and Joanen (1977) found a ratio of about 5 nutria to one muskrat in a sample of 314 stomachs taken in 1972 and 1973.

Invertebrates, especially crustaceans, usually rank first in the diet of smaller alligators (Table 3). Blue crabs and crayfish rank relatively high in importance, even in alligators of larger size.

DOI: 10.18785/negs.0901.01

Insects are frequently taken (Table 4), but rarely rank high in terms of weight (Table 1-3). Although there is some active predation on insects by young alligators (McIlhenny, 1935) many are undoubtedly ingested accidentally or secondarily (Jackson and Campbell, 1974). In some geographic areas, other invertebrates are major dietary items. Fogarty and Albury (1968) found a large ampullarid snail (*Pomacea paludosa* Say) to be the most important species in the diet of young alligators in a canal in the Florida Everglades.

Fishes are consumed in significant numbers by all alligators over 1 m in length (Table 3). Gars are probably the most frequent fish taken by larger individuals (McIlhenny, 1934; McNease and Joanen, 1977; present study); however, some authors report that gars, while abundant in their study areas, were not taken (Giles and Childs, 1949; Fogarty and Albury, 1968). Although some gamefish are eaten, alligator predation on these seems to be infrequent (Table 1; McNease and Joanen, 1977).

Amphibians are rarely reported as alligator foods, but reptiles, especially snakes and turtles, are frequently eaten (Tables 1, 3, 4). Among the snakes, the cottonmouth is often reported. McIlhenny (1935) describes differences in feeding behavior between alligators taking cottonmouths and non-venomous snakes.

Birds are often included in the diet (Table 4), but are rarely major items (Table 3), except under exceptional circumstances (McIlhenny, 1934). Winter dormany of alligators seems to account for their infrequent predation on waterfowl (Giles and Childs, 1949).

Wood and other plant materials are often ingested. This is almost certainly incidental to prey-catching behavior (McNease and Joanen, 1977) or burrowing (Giles and Childs, 1949). Stones and pebbles are commonly found in stomachs. It has been suggested that these are concretions which form from pieces of wood in stomachs of overwintering alligators (McIlhenny, 1935). While such objects may form, alligators do seem to intentionally swallow stones, possibly to facilitate the processing of food by the gizzard (Kennedy and Brockman, 1965; Brazaitis, 1969; Sokol, 1971). The list of non-food items found in alligator stomachs is a long one and includes such items as fishing lures (present study) and aluminum bird bands (Chamberlain, 1930; Valentine *et al.*, 1972) which were likely ingested in the process of capturing prey to which they were attached. Shotgun shell cases are often reported (Valentine *et al.*, 1972) and were found in the present study.

The diet of alligators seems to be determined largely by the availability and vulnerability of prey (McNease and Joanen, 1977). If these are equal for prey species in an area, selecting the largest should maximize feeding efficiency. Semi-aquatic mammals, especially nutria and muskrats, fulfill these criteria for larger alligators over much of their range. While the high reproductive rate of nutria and muskrats (Perry, 1982; Willner, 1982) makes it unlikely that alligator predation has a long-term effect on their populations, there is little doubt that substantial numbers are taken in areas where they coexist.

ACKNOWLEDGMENTS

We thank J.R. Love of the Louisiana Department of Wildlife and Fisheries, and commercial hunters Lloyd Garcia, Joe Billiot, David Singletary, Butch Joffrion, and Fran Joffrion for their assistance.

Financial support was provided by

the Federal Aid to Wildlife Restoration Program, Project W-48-28 to 33, administered by the Mississippi Department of Wildlife Conservation.

LITERATURE CITED

Brazaitis, P. 1969. The occurrence and ingestion of gastroliths in two captive crocodilians. Herpetologica 25:63-64.

Chabreck, R.H. 1971. The foods and feeding habits of alligators from fresh and saline environments in Louisiana. Proc. Ann. Conf. S.E. Assoc. Game and Fish Comm. 25:117-124.

Chamberlain, E.B. 1930. Notes on stomach contents of an alligator. Copeia (3):83-84.

Ensminger, A. and G. Linscombe. 1980. The fur animals, the alligator, and the fur industry in Louisiana. Louisiana Dept. of Wildl. and Fisheries, Baton Rouge, 69 p.

Fogarty, M.J. and J.D. Albury. 1968. Late summer foods of young alligators in Florida. Proc. Ann. Conf. S.E. Assoc. Game and Fish Comm. 21:220-222.

Giles, L.W. and V.L. Childs. 1949. Alligator management on the Sabine National Wildlife Refuge. J. Wildl. Manage. 13:16-28.

Jackson, J.F. and H.W. Campbell. 1974. The feeding habits of crocodilians: validity of the evidence from stomach contents. J. Herpetol. 8:377-378.

Kellog, R. 1929. The habits and economic importance of alligators. U.S. Dept. Agr. Tech. Bull. 147, 36 p.

Kennedy, J.P. and H.L. Brockman. 1965. Stomach stone in the American alligator, *Alligator mississippiensis* Daudin. British J. Herpetol. 4:103-104.

Kinsella, J.M. 1982. Alligator predation on round-tailed muskrats. Florida Field Nat. 10:79.

LeBuff, C.R., Jr. 1957. Observations on captive and wild North American crocodilians. Herpetologica 13:25-28.

Lowery, G.H., Jr. 1974. The mammals of Louisiana and its adjacent waters. Louisiana St. Univ. Press, Baton Rouge, 565 p.

McIlhenny, E.A. 1934. Notes on incubation and growth of alligators. Copeia 80-88.

_____. 1935. The alligator's life history. The Christopher Publishing House, Boston, 117 p.

McNease, L. and T. Joanen. 1977. Alligator diets in relation to marsh salinity. Proc. Ann. Conf. S.E. Game and Fish and Wildl. Agencies 31:36-40.

Neill, W.T. 1971. The last of the ruling reptiles — alligators, crocodiles, and their kin. Columbia Univ. Press, New York, 486 p.

O'Neil, T. 1943. Louisiana: Fur research and management investigation. Pittman-Robertson Quarterly 3:125.

_____. 1949. The muskrat in Louisiana coastal marshes. Louisiana Dept. Wildlife and Fisheries, New Orleans, 152 p.

Perry, H.R., Jr. 1982. Muskrats, p. 282-325 *in* J.A. Chapman and G.A. Feldhamer, eds., Wild Mammals of North America. Johns Hopkins, Baltimore and London, 1147 p.

Sokol, O. 1971. Lithophagy and geophagy in reptiles. J. Herpetol. 5:69-71.

Valentine, J.M., Jr., J.R. Walther, K.M. McCartney, and L.M. Ivy. 1972. Alligator diets on the Sabine National Wildlife Refuge, Louisiana. J. Wildl. Manage. 36:809-815.

Willner, G.R. 1982. Nutria, p. 1059-1076 *in* J.A. Chapman and G.A. Feldhamer, eds., Wild Mammals of North America. Johns Hopkins, Baltimore and London, 1147 p.

DOI: 10.18785/negs.0901.01