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Diet of Nile Monitors (*Varanus niloticus*) Removed from Palm Beach and Broward Counties, Florida, USA

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Abstract.—**Nile Monitors (*Varanus niloticus*) are large (up to 2.4 m in length), semiaquatic, carnivorous lizards native to Sub-Saharan Africa. Nile Monitors are reported from southeastern Florida near the Homestead Air Reserve Base in Miami-Dade County, around Southwest Ranches in Broward County, and from a reproducing population along the C-51 canal in Palm Beach County. This study characterizes the diet of Nile Monitors removed from Palm Beach and Broward counties. In 2012, Florida Fish and Wildlife Conservation Commission staff and University of Florida researchers began conducting monthly boat surveys along the C-51 canal and driving and walking surveys in Southwest Ranches. We used Nile Monitors removed with firearms or live traps from southeastern Florida from 2012 to 2016. We extracted gastrointestinal (GI) tracts and collected gut contents when present. We rinsed, sorted, dried, examined, and identified gut contents to the lowest taxonomic level possible. We examined 68 GI tracts (30 males, 37 females, 1 of undetermined sex) and identified 1,484 prey items from 65 individuals. We categorized prey items as gastropod, diplopod, malacostracan, arachnid, insect, fish, amphibian, reptile, reptile egg, bird, and mammal. Adult Nile Monitors exhibited the highest dietary diversity and evenness among size classes, and there was no observable difference in diet between males and females. Our observations confirm Nile Monitors are active foragers, and the combination of broad diet and active foraging makes it unlikely that food availability will limit distribution of these invasive lizards in Florida.**

Florida has proven vulnerable to invasion by reptiles, owing to a warm climate, disturbed natural environment, and major sources of nonnative species from the pet trade (ports of entry, captive breeders, and animal dealers). Florida has the most species of introduced and established reptiles of any state within the United States (Meshaka, 2011; Krysko et al., 2016) and more nonnative lizards reproducing in the wild than native species (Engeman et al., 2011). The four largest species of lizards breeding in Florida are from Africa (Nile Monitor, *Varanus niloticus*), South America (Argentine Black and White Tegu, *Salvator merianae*), South and Central America (Green Iguana, *Iguana iguana*), and Central and North America (Spiny Tailed Iguana, *Ctenosaura* spp.) (Engeman et al., 2011).

Nile Monitors are large (up to 2.4 m in length), semiaquatic, carnivorous lizards native to Sub-Saharan Africa (Faust and Bayless, 1996; Pianka et al., 2004). These lizards are opportunistic foragers and inhabit a variety of habitats, usually adjacent to water, including residential and agricultural areas (Bennett, 1995). They depredate crocodile nests in Africa (Cott, 1960; Mohda, 1965) and potentially threaten other aquatic species in Florida, such as waterbirds (herons, egrets, rails, gallinules, grebes, ducks, and shorebirds) (Enge et al., 2004; Engeman et al., 2011). There is evidence dating back more than 20 yr for an established population of Nile Monitors in the city of Cape Coral, Florida, in Lee County (Enge et al., 2004; Campbell, 2005). They are also reported from southeastern Florida near the Homestead Air Reserve Base in Miami-Dade County and in Southwest Ranches in Broward County (Fig. 1) and are reproducing successfully in Palm Beach County along the C-51 canal (Ketterlin Eckles et al., 2017). This study serves to characterize the diet of Nile Monitors removed from Palm Beach and Broward counties. Studies of diet are fundamental to understanding the ecology of an organism (Rosenberg and Cooper, 1990). Research on lizards has demonstrated an affect from diet on body condition, growth, behavior, and reproduction (Nagy, 1973; Griffiths and Christian, 1996).

Based on description of Nile Monitor diet from Africa (Losos and Greene, 1988; McGraw, 1992; Bennett, 1995; Pianka et al., 2004), we predicted that Nile Monitors would have a generalist carnivorous diet, that larger Nile Monitors would have a more diverse diet than smaller Nile Monitors, and that Nile Monitors would be active foragers. We also evaluated the prediction by Enge et al. (2004) and Engeman et al. (2011) that Nile Monitors could depredate waterbirds in Florida.

Materials and Methods

The C-51 canal is the primary canal in the C-51 basin in Palm Beach County, Florida, USA. The C-51 canal runs parallel to, and south of, Southern Boulevard/U.S. Highway 98 (Fig. 1). A busy road and county park border the eastern section of the canal, with businesses to the north and residences to the south. Further west, residential areas and shopping centers border the C-51 canal to the north and south. Stormwater Treatment Areas 1E&W and the Arthur R. Marshall Loxahatchee National Wildlife Refuge are south of C-51 at the western edge of the

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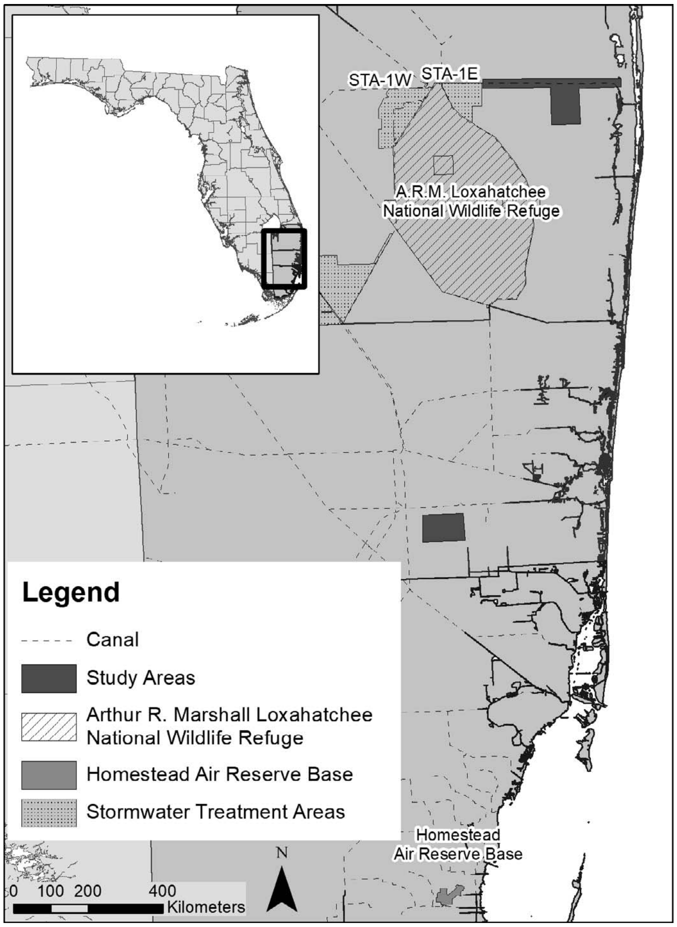

FIG. 1. Study sites for Nile Monitor (*Varanus niloticus*) diet analysis. Inset shows location of study areas within Florida, USA.

study site (Fig. 1). Numerous smaller canals and ditches, such as the E-2 canal, drain into the C-51 canal from the north and south. Southwest Ranches is a residential community in southwestern Broward County (Fig. 1). Smaller secondary canals in Southwest Ranches drain into the C-11 canal.

As a result of confirmed sightings of Nile Monitors in Palm Beach and Broward counties, the Florida Fish and Wildlife Conservation Commission (FWC) staff and University of Florida (UF) researchers began conducting monthly boat surveys of the C-51 canal in 2012. Driving and walking surveys in Southwest Ranches began in 2012 in response to sightings. FWC and UF staff removed Nile Monitors with firearms when feasible or live trapped them by using large box traps baited with chicken. We humanely euthanized trapped Nile Monitors with a captive bolt gun. Upon return to the laboratory, we immediately necropsied Nile Monitors or froze them for later analyses. Necropsies followed standard procedures (Farris et al., 2013). We categorized Nile Monitor size class based on previous studies (Bennett, 1995; Faust and Bayless, 1996; Campbell, 2005): hatchlings and young-of-the-year , <20 cm snout–vent length (SVL); juveniles, 20.1–33.9 cm SVL; and adults ≥34 cm SVL.

During necropsies, we removed gastrointestinal (GI) tracts and collected gut contents when present. We rinsed, sorted, dried, and examined gut contents by using a binocular dissecting scope. Next, we identified contents to the lowest taxonomic level possible. As a result of fragmentation and advanced digestion, we quantified prey items by using percent occurrence following Rosenberg and Cooper (1990) and Platt et al. (2013). We defined percent occurrence (proportion) as the number of GI tracts in which a particular prey item appeared divided by the total number of GI tracts in the sample. Percent occurrence is an appropriate metric when individual prey items cannot be quantified (Rosenberg and Cooper, 1990). We calculated percent occurrence for each prey category by size class, sex, and overall. We recorded prey items as having occurred in a sample regardless of their quantity and assigned each prey item to one of the following general categories: gastropod, diplopod, malacostracan, arachnid, insect, fish, amphibian, reptile, reptile egg, bird, mammal, or other (i.e., sand or plant material).

Because flesh and mollusk shells digest rapidly, whereas chitinous remains, hair, and feathers are more persistent, differential digestion of prey types is a common source of bias in diet studies (Platt et al., 2013). To reduce bias from this source, we analyzed ontogenetic trends within prey categories under the assumption that remains of different prey within any unique prey category persisted in the stomach for similar periods (Tucker et al., 1996; Platt et al., 2013).

We determined ontogenetic trends by using overlapping group analysis as described by Platt et al. (2013). We placed Nile Monitors into overlapping size classes of 15 individuals ranked by SVL. For example, the first group consisted of 15 Nile Monitors with the smallest SVL, and the next group contained the next 5 larger Nile Monitors, excluding the 5 smallest individuals.

We used the Shannon–Wiener diversity index (H′) to estimate dietary diversity in each overlapping group and size class, for each sex, and overall (Schoener, 1968). We standardized the index on a scale of 0 to 1 by using the evenness measure (J′) (Krebs, 1989; Platt et al., 2013). The lower the value of J′, the more specialized the feeding habits of a particular overlapping group, size class, or sex.

We calculated percent dietary overlap (P) by using Renkonen's index (Balmer, 2002). The P value was estimated by $\sum$ (minimum p_{ij}, p_{ik}) $\times$ 100, where p_{ij} and p_{ik} are the proportion of prey item (*i*) used by size class (*j*) and (*k*), respectively, and ranges from 0% (no overlap) to 100% (complete overlap) (Platt et al., 2013). We also used Renkonen's index to calculate dietary overlap between males and females.

RESULTS

We examined GI tract contents of 68 Nile Monitors, including (30) males, (37) females, and (1) individual of undetermined sex. Size class composition was hatchlings (2), juveniles (8), and adults (58). The smallest monitor examined for diet was 19.1 cm SVL, and the largest was 78.7 cm SVL. Body mass of sampled animals ranged from 110.0 to 12,300.0 g. The GI tracts of 65 (96%) of 68 Nile Monitors contained food items.

We identified 1,484 prey items in 65 Nile Monitor GI tracts. Thirty-six monitors contained plant fragments most likely consumed incidentally while foraging for buried items such as reptile eggs or toads. We did not identify any plant parts (e.g., berries or seeds) from deliberate or secondary consumption. We categorized prey items as follows: 115 (8%) gastropods, 4 (0.3%) diplopods, 11 (0.7%) malacostracans, 12 (0.8%) arachnids, 1,063 (72%) insects, 2 (0.1%) fish, 42 (3%) amphibians, 32 (2%) reptiles, 181 (12%) reptile eggs, 4 (0.3%) birds, and 18 (1%) mammals (Table 1). Insects were the most common prey item recovered from GI tracts from both juveniles and adults (Table 2). Reptile

TABLE 1. Prey categories, dietary diversity (H′), and evenness (J′) among size classes of Nile Monitors (*Varanus niloticus*; $n = 65$), Florida, USA. Number of Monitor Lizards containing a prey category followed by the percent occurrence within each size class in parentheses. Size classes are defined as hatchlings (SVL < 20 cm), juveniles (SVL 20.1–34.0 cm), and adults (SVL > 34.1 cm).

Prey category	Hatchling (1 male, 1 unidentified)	Juvenile (1 male, 6 females)	Adult (27 males, 29 females)	Males (29)	Females (35)
Actinopterygii	0	0	2 (4)	1 (3)	1 (3)
Amphibia	1 (50)	2 (29)	19 (34)	11 (38)	9 (26)
Arachnida	0	1 (14)	8 (14)	6 (21)	3 (9)
Aves	0	0	4 (7)	2 (7)	2 (6)
Diplopoda	0	0	3 (5)	1 (3)	2 (6)
Reptile eggs	0	5 (71)	15 (27)	7 (24)	13 (37)
Gastropoda	0	2 (29)	17 (30)	10 (34)	9 (26)
Insecta	1 (50)	7 (100)	48 (86)	25 (86)	30 (86)
Malacostraca	0	3 (43)	7 (13)	4 (14)	6 (17)
Mammalia	0	0	14 (25)	6 (21)	8 (23)
Reptilia	1 (50)	4 (57)	18 (32)	8 (28)	15 (43)
H′	1.01	1.79	2.08	2.07	2.04
J′	0.46	0.75	0.87	0.86	0.85

eggs and decapods were the next most frequently eaten prey items by juveniles, whereas amphibians, reptiles, and gastropods were the next most frequently eaten prey items by adults (Table 1). One hatchling contained a reptile, and one hatchling contained an insect and an amphibian.

We identified 10 orders of insects, including invasive red fire ants (*Solenopsis invicta*) (Table 2). Native Water Snakes (*Nerodia* spp.) were the most commonly recovered reptiles. We also recovered nonnative Brown Basilisks (*Basiliscus vittatus*), Green Iguanas (*Iguana iguana*), and Tropical House Geckos (*Hemidactylus mabouia*). All eggs recovered were reptile eggs, including what appeared to be one clutch of Green Iguana eggs in a single Nile Monitor's stomach and one clutch of turtle eggs (species unknown) also in a single stomach. We also recovered nonnative Greenhouse Frogs (*Eleutherodactylus planirostris*), Cuban Tree Frogs (*Osteopilus septentrionalis*), and Marine Toads (*Rhinella marina*) from GI tracts. Gastropods included the nonnative Asian Trampsnails (*Bradybaena similaris*) and Cuban Brown Snails (*Zachrysia provisoria*) (Table 2). All mammals recovered were rodents, including the nonnative Black Rats (*Rattus rattus*) and native Hispid Cotton Rats (*Sigmodon hispidus*).

We found all prey categories in adult Nile Monitors, which had the most diverse and even diet among the size classes (Table 1). All mammals, birds, bony fishes, and millipedes recovered were exclusively from adult Nile Monitors. Gastropods, insects, arachnids, decapods, reptile eggs, amphibians, and reptiles were recovered from juveniles, whose diets were both less diverse and less even than adults (Table 1). Male and female diets were similar in diversity and evenness. Diets of adults and juveniles had a 76% overlap (Table 3), and diets of males and females had an 87.2% overlap.

Relationships between SVL and percent occurrence of the most common prey categories and dietary evenness (J′) among Nile Monitors from southeastern Florida are shown in Figure 2. Evidence for ontogenetic changes in diet is lacking (Fig. 2). Dietary specialization is low for all SVL groups (Fig. 2).

DISCUSSION

Descriptions of the diet of Nile Monitors in Africa are similar to our results, including consumption of beetles, spiders, orthopterans, snakes, lizards, turtles, reptile eggs, small mammals (McGraw, 1992), birds and their eggs, frogs, toads, crabs, snails, termites, and carrion (Losos and Greene, 1988; Bennett, 1995; Pianka et al., 2004). Although we did not observe consumption of carrion, the presence of red fire ants suggests incidental ingestion from carrion consumption.

Our results are also similar to diet of Nile Monitors from the Cape Coral, Florida, population, which displayed a wide diet breadth with insects being the most common diet item (Campbell, 2005). Diet items from the Cape Coral population also included a large number of introduced species ranging from insects to herpetofauna. Seventeen of the 56 species identified in our sample were nonnative species. One difference is that diet items from the Cape Coral population also included marine species because of the proximity of monitor habitat in Cape Coral to the Gulf Coast.

Our observations also confirm that Nile Monitors are active foragers that opportunistically prey upon species common to the area, searching above- or underground for prey (Pianka et al., 2004) as evidenced by consumption of iguana and turtle eggs and Marine Toads. Our results suggest that although they are semiaquatic, Nile Monitors primarily forage on the canal banks and sides vs. in the canal. The combination of a broad diet and active foraging makes it unlikely that food availability will limit distribution of Nile Monitors in Florida.

Our lack of evidence of ontogenetic changes in diet is likely because of the small number of hatchlings and juveniles in our sample. In previous studies, ontogenetic changes in Nile Monitor diet were associated with changes in dentition as hatchlings grow into juveniles accompanied by a dietary shift from insects to gastropods and crustaceans (Lönnberg, 1903; Bennet, 1995). We did not observe such a shift in the present study, as insects were the most commonly recovered prey from adults. A likely explanation for the higher diversity in the diet of adults compared with juveniles (Table 2) is that our sample consisted primarily of adults and larger individuals. Only adults consumed birds and mammals, supporting the hypothesis that larger monitors consume larger prey. We agree with the observation of others that Nile Monitors are opportunistic diet generalists (Pianka et al., 2004). Prior studies have correlated dietary breadth with invasion success in Burmese Pythons (*Python bivittatus*) in Florida (Reed et al., 2012).

We recognize two major sources of bias in our diet samples. First, the animals examined in the study were mostly large Nile Monitors. This preponderance of large individuals in our sample may reflect a greater abundance of adults at our study sites, a higher detectability and capture susceptibility of adults,

TABLE 2. Prey items identified in the gastrointestinal tracts of Nile Monitors (*Varanus niloticus*) in southeastern Florida, USA, and the number of individuals in which each item occurred. Asterisks (*) indicate nonnative species.

Prey category	Class	Order	Family	Species	Common name	No. of GI tracts
Actinopterygii	Actinopterygii	Cyprinodontiformes	Cyprinodontidae	*Jordanella floridae*	Flagfish	1
Actinopterygii	Actinopterygii	Perciformes	Cichlidae			1
Amphibia	Amphibia					1
Amphibia	Amphibia	Anura				8
Amphibia	Amphibia	Anura	Bufonidae	*Anaxyrus terrestris*	Southern Toad	1
Amphibia	Amphibia	Anura	Bufonidae	*Rhinella marina*	Cane Toad*	10
Amphibia	Amphibia	Anura	Eleutherodactylidae	*Eleutherodactylus planirostris*	Greenhouse Frog*	1
Amphibia	Amphibia	Anura	Hylidae	*Osteopilus septentrionalis*	Cuban Treefrog*	1
Amphibia	Amphibia	Anura	Ranidae	*Lithobates grylio*	Pig Frog	2
Amphibia	Amphibia	Anura	Ranidae	*Lithobates sphenocephalus*	Southern Leopard Frog	3
Arachnida	Arachnida					2
Arachnida	Arachnida	Araneae				1
Arachnida	Arachnida	Araneae	Araneidae			1
Arachnida	Arachnida	Araneae	Pisauridae	*Dolomedes* sp.		5
Arachnida	Arachnida	Scorpiones				1
Arachnida	Arachnida	Scorpiones	Buthidae	*Centruroides* sp.		1
Aves	Aves					4
Diplopoda	Diplopoda					3
Egg						8
Egg	Reptilia					8
Egg	Reptilia	Squamata	Iguanidae	*Iguana iguana*	Green Iguana*	1
Egg	Reptilia	Testudines				5
Gastropoda	Gastropoda					13
Gastropoda	Gastropoda		Bradybaenidae	*Bradybaena similaris*	Asian Trampsnail*	1
Gastropoda	Gastropoda	Stylommatophora	Camaenidae	*Zachrysia provisoria*	Cuban Brown Snail*	8
Insecta	Insecta					18
Insecta	Insecta	Blattodea				2
Insecta	Insecta	Blattodea	Blaberidae	*Pycnoscelus surinamensis*	Surinam Cockroach*	5
Insecta	Insecta	Caelifera				1
Insecta	Insecta	Coleoptera				27
Insecta	Insecta	Coleoptera	Carabidae			2
Insecta	Insecta	Coleoptera	Chrysomelidae			4
Insecta	Insecta	Coleoptera	Curculionidae			1
Insecta	Insecta	Coleoptera	Curculionidae	*Myllocerus* sp.		1
Insecta	Insecta	Coleoptera	Curculionidae	*Myllocerus undatus*	Sri Lanka Weevil*	2
Insecta	Insecta	Coleoptera	Elateridae			5
Insecta	Insecta	Coleoptera	Scarabaeidae			3
Insecta	Insecta	Coleoptera	Scarabaeidae	*Cotinis nitida*	Green June Bug	2
Insecta	Insecta	Coleoptera	Tenebrionidae			1
Insecta	Insecta	Dermaptera				1
Insecta	Insecta	Diptera				1
Insecta	Insecta	Diptera	Stratiomyidae		Soldier Fly	1
Insecta	Insecta	Hemiptera				6
Insecta	Insecta	Hemiptera	Pentatomidae			1
Insecta	Insecta	Hymenoptera				7
Insecta	Insecta	Hymenoptera	Formicidae			6
Insecta	Insecta	Hymenoptera	Formicidae	*Camponotus planatus*	Compact Carpenter Ant	1
Insecta	Insecta	Hymenoptera	Formicidae	*Camponotus* sp.		18
Insecta	Insecta	Hymenoptera	Formicidae	*Odontomachus* sp.		3
Insecta	Insecta	Hymenoptera	Formicidae	*Pheidole* sp.		1
Insecta	Insecta	Hymenoptera	Formicidae	*Pseudomyrmex* sp.		1
Insecta	Insecta	Hymenoptera	Formicidae	*Solenopsis invicta*	Red Fire Ant*	5
Insecta	Insecta	Hymenoptera	Formicidae	*Solenopsis* sp.		10
Insecta	Insecta	Hymenoptera	Formicidae	*Tetramorium* sp.		2
Insecta	Insecta	Hymenoptera	Sphecidae			1
Insecta	Insecta	Lepidoptera				2
Insecta	Insecta	Lepidoptera	Noctuidae			2
Insecta	Insecta	Lepidoptera	Sphingidae	*Xylophanes tersa*	Tersa Sphinx Moth	7
Insecta	Insecta	Odonata	Libellulidae		Dragonfly naiad	1
Insecta	Insecta	Orthoptera				10
Insecta	Insecta	Orthoptera	Acrididae			2
Insecta	Insecta	Orthoptera	Gryllidae			3
Insecta	Insecta	Orthoptera	Gryllotalpidae			2
Insecta	Insecta	Orthoptera	Tettigoniidae	*Neoconocephalus triops*	Broad-Tipped Conehead Katydid	1

TABLE 2. Continued.

Prey category	Class	Order	Family	Species	Common name	No. of GI tracts
Malacostraca	Malacostraca	Decapoda				3
Malacostraca	Malacostraca	Decapoda	Cambaridae	*Procambarus* sp.		7
Mammalia	Mammalia					7
Mammalia	Mammalia	Rodentia				2
Mammalia	Mammalia	Rodentia	Cricetidae	*Oryzomys palustris*	Marsh Rice Rat	1
Mammalia	Mammalia	Rodentia	Cricetidae	*Sigmodon hispidus*	Hispid Cotton Rat	5
Mammalia	Mammalia	Rodentia	Muridae	*Rattus rattus*	Black Rat*	1
Reptilia	Reptilia					3
Reptilia	Reptilia	Squamata				6
Reptilia	Reptilia	Squamata	Anguidae	*Ophisaurus* sp.		1
Reptilia	Reptilia	Squamata	Anguidae	*Ophisaurus ventralis*	Eastern Glass Lizard	1
Reptilia	Reptilia	Squamata	Colubridae			2
Reptilia	Reptilia	Squamata	Colubridae	*Coluber constrictor*	Everglades Racer	1
Reptilia	Reptilia	Squamata	Colubridae	*Nerodia fasciata*	Banded Water Snake	2
Reptilia	Reptilia	Squamata	Colubridae	*Nerodia floridana*	Florida Green Water Snake	1
Reptilia	Reptilia	Squamata	Colubridae	*Nerodia taxispilota*	Brown Water Snake	3
Reptilia	Reptilia	Squamata	Colubridae	*Pantherophis guttatus*	Corn Snake	1
Reptilia	Reptilia	Squamata	Corytophanidae	*Basiliscus vittatus*	Brown Basilisk*	2
Reptilia	Reptilia	Squamata	Dipsadidae	*Diadophis punctatus*	Southern Ringneck	1
Reptilia	Reptilia	Squamata	Gekkonidae	*Hemidactylus mabouia*	Tropical House Gecko*	2
Reptilia	Reptilia	Squamata	Iguanidae	*Anolis* sp.		1
Reptilia	Reptilia	Squamata	Iguanidae	*Iguana iguana*	Green Iguana*	1
Reptilia	Reptilia	Squamata	Scincidae	*Plestiodon inexpectatus*	Southeastern Five-Lined Skink	1
Reptilia	Reptilia	Testudines	Kinosternidae	*Kinosternon baurii*	Striped Mud Turtle	1

or both. We did not estimate sizes of Nile Monitors observed and not collected, nor did we conduct any surveys independent of removal efforts.

Second, advanced state of digestion and differing digestion rates and gut retention times of various prey items may confound results (Platt et al., 2013). However, because we were interested in diet composition rather than quantities of a particular prey items, this bias was minimal. In addition, as mentioned in the methods, we minimized this source of bias by analyzing ontogenetic trends within prey categories so the bias was consistent within prey types and not affected by variation among prey types (Tucker et al., 1996; Platt et al., 2013).

Potential ecological impacts of invasive Nile Monitors are of concern in Florida because of their large body size, semiaquatic habits, and carnivorous diet (Gore et al., 2003; Enge et al., 2004; Campbell, 2005). One potential impact of Nile Monitors on other native wildlife in Florida could be direct predation. Burmese Pythons have reduced mammal populations in the Everglades through predation (Snow et al., 2007; Dove et al., 2011; Dorcas et al., 2012), and it is possible Nile Monitors could have a similar impact on other wildlife communities.

Another example is the potential competition between Nile Monitors and American Alligators (*Alligator mississippiensis*) in the Everglades over food resources because of their similar diet (Barr, 1997). In addition to competition for food, Nile Monitors may depredate American Alligator nests and consume hatchlings, as they do for Nile Crocodiles (*Crocodylus niloticus*) (Cott, 1960; Mohda, 1965). However, at the moment Nile Monitors are confined to urban habitats in southeastern Florida and have not been observed in habitats with nesting American Alligators.

TABLE 3. Percentage of dietary overlap among size classes of Nile Monitors (*Varanus niloticus*) in Florida, USA. We calculated dietary overlap using the Renkonen similarity index.

Size class	Hatchling	Juvenile	Adult
Hatchling	100		
Juvenile	54	100	
Adult	55	76	100

Enge et al. (2004) and Engeman et al. (2011) expressed concern that Nile Monitors could also negatively affect waterbirds in Florida. Although we found no evidence of waterbird consumption in the present study, we speculate that Nile Monitors will consume whatever prey resources are available (Pianka et al., 2004); as a result, they will prey on more waterbirds given the opportunity, particularly when other prey species are less abundant. Evidence that Nile Monitors eat eggs of reptiles and their potential to eat eggs of ground-nesting birds (Campbell 2005) should be a cause for concern. Preventing spread of Nile Monitors from and reducing current population levels within the C-51 canal basin should be immediate wildlife conservation priorities.

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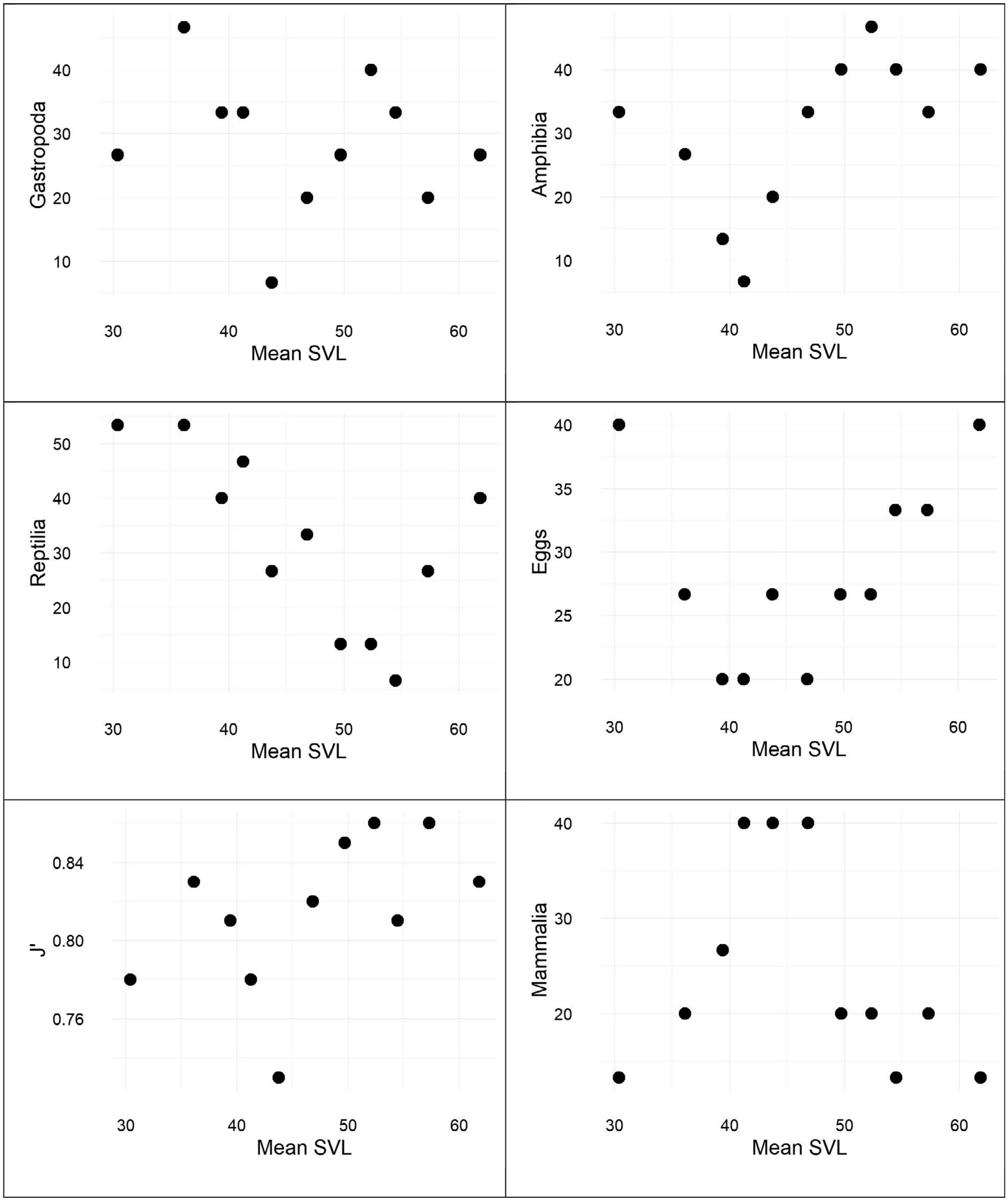

FIG. 2. Relationship between the mean SVL of each subgroup in the overlapping group analysis compared with percent occurrence of prey categories and dietary evenness (J′) of Nile Monitors (*Varanus niloticus*; $n = 65$) in Florida, USA.

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