Monograph

ZOOTAXA

3028

Verified non-indigenous amphibians and reptiles in Florida from 1863 through 2010: Outlining the invasion process and identifying invasion pathways and stages

KENNETH L. KRYSKO¹, JOSEPH P. BURGESS°, MICHAEL R. ROCHFORD³, CHRISTOPHER R. GILLETTE⁴, DANIEL CUEVA⁵, KEVIN M. ENGE⁶, LOUIS A. SOMMA⁷, JENNIFER L. STABILE⁸, DUSTIN C. SMITH⁹, JOSEPH A. WASILEWSKI¹⁰, GUY N. KIECKHEFER III¹¹, MICHAEL C. GRANATOSKY¹, ¹¹ & STUART V. NIELSEN¹²

¹Florida Museum of Natural History, Division of Herpetology, University of Florida, Gainesville, Florida 32611, USA (e-mail: KLK: kenneyk@flmnh.ufl.edu)
²Florida Department of Environmental Protection, GTM NERR, Ponte Vedra, Florida 32082, USA (e-mail: Joseph.Burgess@dep.state.fl.us)
³University of Florida, Fort Lauderdale Research and Education Center, 3205 College Avenue, Fort Lauderdale, Florida 33314-7719, USA (e-mail: MRR: mikerochford@hotmail.com, GNK: gnkieck@gmail.com)
⁴Florida International University, Department of Environmental Studies, Modesto Maidique Campus, 11200 SW 8th Street, Miami, Florida 33199, USA (e-mail: cgill002@fia.edu)
⁵Florida International University, Department of Biological Sciences, Modesto Maidique Campus, 11200 SW 8th Street, Miami, Florida 33199, USA (e-mail: dvede001@fia.edu)
⁶Florida Fish and Wildlife Conservation Commission, 1105 SW Williston Road, Gainesville, Florida 32601, USA (e-mail: kevin.enge@myfwc.com)
⁷Volunteer in Herpetology, Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA (e-mail: somma@ufl.edu)
⁸Central Florida Zoological Park, 3755 NW Highway 17-92, Sanford, Florida 32747, USA (e-mail: jensr@centralfloridazoo.org)
⁹Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA (e-mail: somma@ufl.edu)
¹⁰Natural Selections, 24305 SW 142th Avenue, Homestead, Florida 33032, USA (jawnaise@bellsouth.net)
¹¹Present address: Department of Evolutionary Anthropology, P.O. Box 90383, Duke University, Durham, North Carolina 27708, USA (e-mail: michael.granatosky@duke.edu)
¹²University of Mississippi, Department of Biology, 214 Shoemaker Hall, University, Mississippi 38677, USA (e-mail: svnielse@olemiss.edu)

Magnolia Press
Auckland, New Zealand

Accepted by S. Carranza: 02 Aug. 2011; published: 15 Sep. 2011
KENNETH L. KRYSKO, JOSEPH P. BURGESS, MICHAEL R. ROCHFORD, CHRISTOPHER R. GILLETTE, DANIEL CUEVA, KEVIN M. ENGE, LOUIS A. SOMMA, JENNIFER L. STABLE, DUSTIN C. SMITH, JOSEPH A. WASILEWSKI, GUY N. KIECKHEFER III, MICHAEL C. GRANATOSKY & STUART V. NIELSEN

Verified non-indigenous amphibians and reptiles in Florida from 1863 through 2010: Outlining the invasion process and identifying invasion pathways and stages

(Zootaxa 3028)

64 pp.; 30 cm.

15 Sep. 2011

ISBN 978-1-86977-783-8 (paperback)

Abstract

We follow a biological invasion model that consists of a series of five consecutive obligatory stages, concluding with stages 4a and 5 (i.e., widespread = invasive species). The State of Florida is infamous for having the most introduced (stages 2–5) amphibians and reptiles in the United States. However, there is disagreement regarding their numbers as well as identification in some cases. Unverified claims of species being introduced (stage 2), or established (stages 3–5) without evidence (i.e., a voucher specimen or photograph) are prevalent in the literature. It is crucial to provide data on all known non-indigenous herpetofaunal species via vouchers to help keep numbers of species consistent, accurately identify species, document when and where a particular species is found, and identify the invasion pathway and current invasion stage of each species. In this study, we use vouchers to confirm interceptions and introductions of all known non-indigenous amphibians and reptiles in Florida from 1863 through 2010, provide a list of these species along with their invasion pathways and current ecological status (i.e., invasion stage), and provide a species account for each newly confirmed species. We include species that were previously reported in the literature but lacking an associated voucher.
and provide greater details on previously reported species and those species whose invasion stage has been upgraded to established (stages 3–5). Based on nearly two decades of field work along with examination of museum records and literature, we confirm three intercepted and 137 introduced amphibian and reptile taxa in Florida. Of these, 56 are established (i.e., reproducing; stages 3–5), including three frogs, four turtles, one crocodilian, 43 lizards, and five snakes. Of 149 total independent introduction pathways (i.e., including a different pathway one time only for each taxon) for the 140 total non-indigenous taxa above, two (1.34%) are related to the biological control pathway, four (2.68%) to the zoo pathway, 18 (12.08%) to the cargo pathway, and 125 (83.89%) to the pet trade pathway. Florida now ranks as having the largest number of established non-indigenous herpetofaunal species in the entire world. Despite current state laws that make it illegal to release any non-indigenous animal in Florida without first obtaining a permit from the Florida Fish and Wildlife Conservation Commission, enforcement is difficult, and no person has ever been prosecuted for the establishment of a non-indigenous animal species in Florida. Because current state and federal laws have not been effective in curtailing the ever-increasing number of illegal introductions, laws need to be modified and made enforceable. At the very least, those responsible for introductions should be held accountable for compensation to clean up (= extermination) of those species for which they are responsible. Lastly, we strongly support the creation of an Early Detection and Rapid Response program to quickly identify newly found introduced species for eradication attempts. This paper will also serve as a baseline to document future introductions.

**Key words:** alien, checklist, crocodilian, exotic, frog, herpetology, lizard, non-native, salamander, snake, turtle

“That which is lost is the beauty inherent in the biological systems and relationships evolved under unique historical regimes of migration, competition, and evolutionary accommodation. These unique histories have led to the evolutionary development of unique floras and faunas in different parts of the world. These evolved biotas include species, each with a unique combination of adaptive features allowing it to survive in its own particular slice of the world; communities of coevolved and co-accommodating species creating geographically unique assemblages of life forms; and the ecosystems whose mix of unique communities, climatic regimes, and topography impart to landscapes their specific distinctiveness and appeal. I suggest that the distinctive co-evolved, unique beauty of each of these systems is besmirched by the introduction of alien species – much as a beautiful beach or coastline may be impaired by an oil spill. Or perhaps more aptly, the facile pollution of these self-generated biotas by human introductions is equivalent to splattering the canvases in the Louvre with day-glo paint: the structural integrity of the canvases may not be marred, the added colors may be beautiful, but the aesthetic integrity of the artworks is thoroughly violated. The difference, of course, is that the impact of an oil spill lasts for mere years, vandalism of a painting may be rectified by careful restoration, but alien invasions are most usually irreversible and irreparable.”

Fred Kraus (2009: 13)

**Introduction**

Introduced species are second in negative effects only to human-mediated effects on native species, habitats, and whole ecosystems (Simberloff *et al.* 1997; Wilcove *et al.* 1998; Parker *et al.* 1999; Pimentel *et al.* 2000, 2005; Kraus 2009). Many introduced species not only cause harm to the environment, but also to the economy and human health (Executive Order 13112, Invasive Species Advisory Committee 2006; Kraus 2009). Invasion ecologists study the processes by which organisms are transported and become introduced to new areas where they are not native. Below we illustrate one model of the invasion process as a reference guide, although other similar frameworks exist (e.g., Williamson & Fitter 1996; Kolar & Lodge 2002; Fletcher 2005; Hill 2008). Colautti and Maclsaac (2004) break down the invasion process into a series of five consecutive obligatory stages, concluding with stages 4a and 5 (i.e., *widespread = invasive species*; although these authors deter using the term *invasive species* [R. Colautti personal communication]).

- Stage 0 = Potential invader begins as a resident in its native or a donor region.
- Stage 1 = Potential invader is transported to a new area.
- Stage 2 = Potential invader survives transport, escapes or is released (i.e., becomes introduced), and is thus non-indigenous to the new area.
- Stage 3 = Non-indigenous species survives and establishes (reproduces) in the new suitable environment but remains uncommon and localized.
Stage 4 = Non-indigenous species becomes either (a) widespread but remains uncommon, or (b) dominant in abundance or density but remains localized.

Stage 5 = Non-indigenous species becomes both widespread and dominant.

The State of Florida is infamous for having the largest number of introduced (stages 2–5) amphibians and reptiles in the United States, but there is disagreement regarding the number of species and even their identification. Unverified claims of species being introduced (stage 2), or established (stages 3–5) without evidence (i.e., a voucher specimen or photograph) are prevalent in the literature, and erroneous and unverifiable information is often perpetuated in the literature (also see Kraus 2008). For example, two anoles (Anolis extremus Garman 1887 and A. ferreus [Cope 1864]) were claimed to be introduced (stage 2) during the 1990s in Fort Myers, Lee County (Bartlett 1994; Bartlett & Bartlett 1999), and both species continue to be reported (see Meshaka et al. 2004; Kraus 2008). However, species identification cannot be verified because no known voucher specimen or photograph exists for either species from Florida. Photographs of these non-indigenous species in the field guide by Bartlett and Bartlett (1999) are of imported captive individuals (R.D. Bartlett and William B. Love personal communication), and subsequent searches by many people of the purported introduction sites have failed to find either anole species, suggesting that 1) if these species were introduced they failed to become established or 2) they were never introduced at all. Many other examples of unverified introductions exist as well, which unfortunately lead to the purported invasion of these species in the literature (for some other taxa see Bartlett & Bartlett 1999; Engeman et al. 2005; Meshaka et al. 2004; Kraus 2008, 2009; Anonymous 2009; Campbell & Olmeda 2009). No one should be exempt from this examination; even the senior author of this paper has reported introduced taxa without providing an associated voucher (e.g., see Trachemys scripta scripta [Thunberg in Schoepff 1792] and Mecistops cataphractus [Cuvier 1825] in Krysko et al. 2010a).

Because of these examples and the potential ecological effects caused by introduced species, we believe it is crucial to provide data on all known non-indigenous herpetofaunal species via vouchers to help keep numbers of species consistent, accurately identify species, document when and where a particular species is found, and identify the invasion pathway and stages of species. In this study, we use vouchers to confirm interceptions and introductions of all known non-indigenous amphibians and reptiles in Florida from 1863 through 2010, provide a list of these species along with their invasion pathways and ecological status (i.e., invasion stage), and provide a species account for each newly confirmed species. We include species that were previously reported in the literature but lacking an associated voucher and provide more details on previously reported species whose invasion stage has been upgraded to established (stages 3–5). Providing a list of unverified taxa in Florida is well beyond the scope of this paper, as the examples are innumerable. However, this paper will also serve as a baseline to document future introductions.

Materials and methods

We confirm interceptions (i.e., discovery in transit before introduction) and introductions of all known non-indigenous herpetofaunal species in Florida from 1863 through 2010 from our field surveys, examination of specimens in systematic collections throughout the United States, photographs sent to us for identification purposes, and the literature. Beginning in 1992, one of us (KLK) started a project documenting non-indigenous herpetofaunal species in Florida. The long-term continuation of this project is now a large collaborative effort involving biologists from the Florida Fish and Wildlife Conservation Commission (FWC), South Florida Water Management District, National Park Service, United States Geological Survey, Florida State Collection of Arthropods of the Florida Department of Agriculture and Consumer Services (FDACS), universities, zoological parks, as well as concerned citizens. During our field surveys, specimens were collected opportunistically by hand, with nooses (Camposano et al. 2008), blowguns shooting tapered corks (Krysko et al. 2009), fishing rods using invertebrates (mainly dead insects found on the radiators of vehicles and live domestic crickets) for bait (Krysko 2000), and as salvaged dead-on-road (DOR) animals. We also took in situ photographs at times to provide evidence in case non-indigenous animals escaped capture. Both specimens and photographs are deposited as vouchers in the Florida Museum of Natural History (FLMNH), University of Florida (UF collection), which is mandated by law as Florida’s official natural history museum and serves as the state repository for our voucher specimens (Florida
Statute § 1004.56). Appropriate permits were obtained to collect on protected public lands, and permission was requested to collect on private properties. Voucher specimens in collections other than UF were either borrowed and examined by us to verify species identification, or verified by curatorial staff within their respective institutions. We also sent voucher photographs for taxon confirmation or identification purposes to authorities who have experience with certain taxonomic groups.

Although several authors (e.g., Williamson & Fitter 1996; Kolar & Lodge 2002; Fletcher 2005; Hill 2008) have proposed similar invasion models and definitions regarding establishment, we follow the definition of establishment to mean evidence of reproduction (see Introduction; stage 3 following Colautti & MacIsaac 2004) in the wild with the presence of different size classes (juveniles and adults). We do not impose an arbitrary time limit on how long a species must be present. We provide a comprehensive summary table for all confirmed intercepted and introduced non-indigenous amphibians and reptiles in Florida from 1863 through 2010, listing family, scientific and common names, year introduced, year established, source, first voucher, current invasion stage, and introduction pathways. Clarifications on certain headings are provided.

### Year Introduced.—The known or estimated year of first invasion pathway (additional years are provided for different invasion pathways).

### Year Established.—The known or estimated year of first established population for each invasion pathway.

### Source.—The first known reference for a particular interception or introduction (additional sources are provided for different invasion pathways, or as This Study if we provide the first known voucher, provide greater details to a species we previously documented, or upgrade a species invasion stage to being established [stages 3–5]).

### First Voucher.—The first known voucher for a particular interception or introduction (additional vouchers are provided for different invasion pathways). Acronyms for collections follow Leviton et al. (1985), with the addition of Everglades National Park (EVER), from which the entire fluid-preserved collection is now accessioned and curated within the UF collection.

### Stage.—Current invasion stage determined by examining the known geographic distribution of each taxon based on our field work, examination of vouchers, and literature.

### Pathway.—Invasion pathways are categorized as cargo (i.e., cargo/plants), biological control, zoo, or pet trade, and determined via documented cases in the literature, personal correspondences, and most logical explanations. We made one invasion pathway change from its original documentation in the literature. Meshaka (1999) suggested that the Brown Mabuya, *Eutropis multifasciata* (Kuhl 1820), was introduced via the pet trade. However, we removed this species from the pet trade pathway and placed it into the cargo pathway because it is known to be established only in the vicinity of The Kampong, Miami-Dade County, a botanical garden specializing in importing plants from the indigenous region of *E. multifasciata* (Larry Schokman personal communication).

Three graphs were created to illustrate 1) the number of independent invasion pathways (n = 146) of introduced amphibian and reptile taxa (n = 137) in Florida for each decade from 1860–2010 (note that intercepted taxa [n = 3] are not included), 2) an accumulation curve for the total number of invasion pathways (n = 146) and established taxa (n = 56) for each decade from 1860–2010 (establishment is calculated only once for each taxon using the first year it became established), and 3) the numbers of indigenous species and established non-indigenous taxa among taxonomic groups (salamanders, frogs, turtles, crocodilians, amphibiaenids, lizards, and snakes). Because some sample sizes were small and the data were not normally distributed, we conducted Pearson chi-square tests of goodness of fit (Sokal & Rohlf 1995) to determine differences 1) between numbers of indigenous species and established non-indigenous taxa among taxonomic groups, and 2) in the distribution of non-indigenous taxa among their independent invasion pathways (each different pathway is counted only once for each taxon, even if that taxon has been introduced multiple times via the same pathway). Statistical analyses were conducted using JMP (ver. 8. SAS Institute Inc., Cary, NC) with α = 0.05.

For each species account, we provide a common name, currently accepted scientific name with authority, indigenous and introduced geographic distributions, all associated data documenting its interception or introduction in Florida, and a representative voucher photograph. A single higher resolution digital image for each of these species is also available from MorphoBank (www.morphobank.org; project number p536) with the following codes: M88020, M88441–M88450, M88496–M88500, M88544–M88546, M88559, M88568–M88576, M88624–M88676, M88677. Updated taxonomy and taxa below are arranged in systematic order by family following Maddison and Schulz (2007), Gamble *et al.* (2008), Frost (2010), and Uetz *et al.* (2011).
Results

We confirmed three intercepted and 137 introduced amphibian and reptile taxa (n = 140) in Florida from 1863 through 2010 (Table 1; Fig. 1). Of 149 total independent invasion pathways for the 140 non-indigenous taxa (Table 1), two (1.34%) are related to the biological control pathway, four (2.68%) to the zoo pathway, 18 (12.08%) to the cargo pathway, and 125 (83.89%) to the pet trade pathway (Fig. 1). There was a significant difference in the distribution of these non-indigenous taxa among invasion pathways ($\chi^2 = 279.69$, d.f. = 3, p < 0.0001), with the pet trade being the largest contributing pathway by far.

<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALAMANDRIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypselotriton orientalis (David 1873)</td>
<td>Oriental Fire-bellied Newt</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157033</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Pachytriton labiatus (Unterstein 1930)</td>
<td>Spotless Stout Newt</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157219</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>AMPHIUMIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphiuma tridactylum Cuvier 1827</td>
<td>Three-toed AmphiAmphiuma</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157220, 157286</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>BOMBINATORIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bombina orientalis (Boulenger 1890)</td>
<td>Oriental Fire-bellied Toad</td>
<td>2007</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 152327</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>PIPIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xenopus laevis (Daudin 1802b)</td>
<td>African Clawed Frog</td>
<td>1964</td>
<td>N/A</td>
<td>King &amp; Krakauer 1966; This Study</td>
<td>UF 158477</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>MICROHYLIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaloula pulchra Gray 1831b</td>
<td>Malaysian Painted Frog</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 153704</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>HYPEROLIIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afrixalus fornasini (Bianconi 1849)</td>
<td>Fornasini's Spiny Reed Frog</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 163085</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>BUFONIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duttaphrynus melanostictus (Schneider 1799)</td>
<td>Asian Black-spotted Toad</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 159699</td>
<td>1</td>
<td>Cargo</td>
</tr>
<tr>
<td>Rhinella marina (Linnaeus 1758)</td>
<td>Cane Toad</td>
<td>1936</td>
<td>N/A</td>
<td>Lobdell 1936</td>
<td>UMMZ 113000</td>
<td>2</td>
<td>Biological Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

...continued on the next page
<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEUHEROGRACILYDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eleutherodactylus coqui</td>
<td>Coqui</td>
<td>1973</td>
<td>N/A</td>
<td>Austin &amp; Schwartz 1975</td>
<td>MPM 24418</td>
<td>2</td>
<td>Cargo</td>
</tr>
<tr>
<td>Eleutherodactylus planirostris</td>
<td>Greenhouse Frog</td>
<td>1863</td>
<td>1860s</td>
<td>Cope 1863</td>
<td>USNM 30955</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>HYLIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Litoria caerulea (White 1790)</td>
<td>Great Green Treefrog</td>
<td>2003</td>
<td>N/A</td>
<td>Bartlett 1994; This Study</td>
<td>UF 146573</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Osteopilus septentrionalis</td>
<td>Cuban Treefrog</td>
<td>1920s</td>
<td>1920s</td>
<td>Barbour 1931</td>
<td>USNM 85392-97</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Pseudacris sierra (Jameson et al. 1966)</td>
<td>Sierra Chorus Frog</td>
<td>1983</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 116750-51</td>
<td>1</td>
<td>Cargo</td>
</tr>
<tr>
<td>EMYDIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrysemys dorsalis (Agassiz 1857)</td>
<td>Southern Painted Turtle</td>
<td>2008</td>
<td>2000s</td>
<td>Johnston et al. In Press; This Study</td>
<td>UF 153957</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Chrysemys picta bellii (Gray 1831a)</td>
<td>Western Painted Turtle</td>
<td>1933</td>
<td>N/A</td>
<td>Carr 1940; This Study</td>
<td>UF 1898</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Chrysemys picta picta (Schneider 1783)</td>
<td>Eastern Painted Turtle</td>
<td>2007</td>
<td>N/A</td>
<td>Deckert 1918; This Study</td>
<td>UF 153764</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Glyptemys insculpta (Le Conte 1830)</td>
<td>Wood Turtle</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 159391</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Graptemys ouachitensis Cagle 1953</td>
<td>Ouachita Map Turtle</td>
<td>2006</td>
<td>N/A</td>
<td>Enge et al. 2007</td>
<td>UF 150157</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Graptemys pseudogeographica kohni (Baur 1890)</td>
<td>Mississippi Map Turtle</td>
<td>2010</td>
<td>N/A</td>
<td>Kail et al. In Press</td>
<td>UF 159338</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Graptemys pseudogeographica pseudogeographica (Gray 1831c)</td>
<td>False Map Turtle</td>
<td>2000</td>
<td>2000s</td>
<td>Lau &amp; Johnston 2008; This Study</td>
<td>UF 121459</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Trachemys callirostris (Gray 1855)</td>
<td>Colombian Slider</td>
<td>1972</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 154026, 155125</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Trachemys scripta elegans (Wied-Neuwied 1839)</td>
<td>Red-eared Slider</td>
<td>1958</td>
<td>1960s</td>
<td>King &amp; Krakauer 1966</td>
<td>CU 13034</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Trachemys scripta scripta (Thunberg in Schoepff 1792)</td>
<td>Yellow-bellied Slider</td>
<td>2002</td>
<td>2000s</td>
<td>Johnston &amp; Johnston 2003; This Study</td>
<td>UF 134595</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Trachemys venusta (Gray 1855)</td>
<td>Huastecan Slider</td>
<td>2009</td>
<td>N/A</td>
<td>Kail et al. 2010</td>
<td>UF 157304</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>TESTUDINIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chelonoidis carbonaria (Spix 1824)</td>
<td>Red-footed Tortoise</td>
<td>2007</td>
<td>N/A</td>
<td>Meshaka et al. 2004; This Study</td>
<td>UF 153958</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Geochele sulcata (Miller 1779)</td>
<td>African Spurred Tortoise</td>
<td>2002</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 151752</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Stigmochelys pardalis (Bell 1828)</td>
<td>Leopard Tortoise</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 155440</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Testudo horsfieldii (Gray 1844)</td>
<td>Horsfield’s Tortoise</td>
<td>2008</td>
<td>N/A</td>
<td>Krysko et al. 2010a; This Study</td>
<td>UF 152758, 159551</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>GEOMYDIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhinoclemmys pulcherrima (Linnaeus 1758)</td>
<td>Tropical Wood Turtle</td>
<td>2006</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 121604</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Rhinoclemmys punctularia (Daudin 1801)</td>
<td>Spotted-legged Wood Turtle</td>
<td>2008</td>
<td>N/A</td>
<td>Bartlett &amp; Bartlett 2006b; This Study</td>
<td>UF 153697</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
</tbody>
</table>

... continued on the next page
<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRIONYCHIDAE</strong></td>
<td>Apalone spinifera (Le Sueur 1827)</td>
<td>Spiny Softshell</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 153765</td>
<td>2</td>
</tr>
<tr>
<td><strong>KINOSTERNIDAE</strong></td>
<td>Staurotypus salvinii Gray 1864</td>
<td>Pacific Coast Giant Musk Turtle</td>
<td>2010</td>
<td>N/A</td>
<td>Smith et al. 2011</td>
<td>UF 160342</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Sternotherus carinatus (Gray 1855)</td>
<td>Razorback Mask Turtle</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 154191</td>
<td>2</td>
</tr>
<tr>
<td><strong>CHELIDAE</strong></td>
<td>Platemys platycephala (Schneider 1792)</td>
<td>Twist-neck Turtle</td>
<td>1985</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 154589</td>
<td>2</td>
</tr>
<tr>
<td><strong>CROCODYLIDAE</strong></td>
<td>Mecistops cataphractus (Cuvier 1825)</td>
<td>African Slender-snouted Crocodile</td>
<td>1983</td>
<td>N/A</td>
<td>Anonymous 1983; This Study</td>
<td>UF 163093</td>
<td>2</td>
</tr>
<tr>
<td><strong>ALLIGATORIDAE</strong></td>
<td>Caiman crocodilus (Linnaeus 1758)</td>
<td>Spectacled Caiman</td>
<td>1950s</td>
<td>1950s</td>
<td>King &amp; Krakauer 1966</td>
<td>UF 75207</td>
<td>4b</td>
</tr>
<tr>
<td></td>
<td>Paleosuchus palpebrosus (Cuvier 1807)</td>
<td>Cuvier’s Dwarf Caiman</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>EVER 40566</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Paleosuchus trigonatus (Schneider 1801)</td>
<td>Schneider’s Smooth-fronted Caiman</td>
<td>1999</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 165484</td>
<td>2</td>
</tr>
<tr>
<td><strong>CORYTOPHANIDAE</strong></td>
<td>Basiliscus vittatus Wiegmann 1828</td>
<td>Brown Basilisk</td>
<td>1963</td>
<td>1960s</td>
<td>King &amp; Krakauer 1966</td>
<td>UF 124584</td>
<td>5</td>
</tr>
<tr>
<td><strong>IGUANIDAE</strong></td>
<td>Ctenosaura pectinata (Wiegmann 1834b)</td>
<td>Mexican Black Spiny-tailed Iguana</td>
<td>1960s</td>
<td>1960s</td>
<td>Eggert 1978</td>
<td>KU 206675</td>
<td>4b</td>
</tr>
<tr>
<td></td>
<td>Ctenosaura similis (Gray 1831a)</td>
<td>Black Spiny-tailed Iguana</td>
<td>1970s</td>
<td>1970s</td>
<td>Butterfield et al. 1997</td>
<td>UF 91662</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Cyclura cornuta (Bonnaterre 1789)</td>
<td>Rhinoceros Iguana</td>
<td>1960s</td>
<td>N/A</td>
<td>King &amp; Krakauer 1966</td>
<td>UF 155189</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Cyclura nubila nubila (Gray 1831a)</td>
<td>Cuban Rock Iguana</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 164356</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Iguana iguana (Linnaeus 1758)</td>
<td>Green Iguana</td>
<td>1964</td>
<td>1960s</td>
<td>King &amp; Krakauer 1966</td>
<td>UF 22910</td>
<td>5</td>
</tr>
<tr>
<td><strong>PHRYNOSOMATIDAE</strong></td>
<td>Phrynosoma cornutum (Harlan 1825)</td>
<td>Texas Horned Lizard</td>
<td>1928</td>
<td>1930s</td>
<td>De Sola 1934</td>
<td>FMNH 11037</td>
<td>4a</td>
</tr>
<tr>
<td><strong>POLYCHROTIDAE</strong></td>
<td>Anolis chlorocyanus Duméril &amp; Bibron 1837</td>
<td>Hispaniolan Green Anole</td>
<td>1987</td>
<td>1980s</td>
<td>Moler 1988</td>
<td>KU 210033</td>
<td>4b</td>
</tr>
<tr>
<td></td>
<td>Anolis coelestinus Cope 1862b</td>
<td>Jeremie Anole</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157133</td>
<td>2</td>
</tr>
</tbody>
</table>

...continued on the next page
TABLE 1 (continued)

<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anolis cristatellus Duméril &amp; Bibron 1837</td>
<td>Puerto Rican Crested Anole</td>
<td>1975</td>
<td>1970s</td>
<td>Schwartz &amp; Thomas 1975</td>
<td>MCZ R-146223-26</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Anolis cybotes Cope 1862b</td>
<td>Large-headed Anole</td>
<td>1964</td>
<td>1967</td>
<td>King &amp; Krakauer 1966</td>
<td>UF 91063</td>
<td>4b</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Anolis distichus Cope 1861</td>
<td>Bark Anole</td>
<td>1946</td>
<td>1940s</td>
<td>Smith &amp; McCauley 1948</td>
<td>MCZ R-50001</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Anolis equestris Merrem 1820</td>
<td>Knight Anole</td>
<td>1952</td>
<td>1950s</td>
<td>Neill 1957</td>
<td>LACM 61680</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Anolis porcatus Gray 1840</td>
<td>Cuban Green Anole</td>
<td>1904</td>
<td>1900s</td>
<td>Barbour 1904</td>
<td>UF 91293</td>
<td>4 or 5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Anolis sagrei Duméril &amp; Bibron 1837</td>
<td>Brown Anole</td>
<td>1887</td>
<td>1880s</td>
<td>Garman 1887</td>
<td>USNM 85175-99</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Anolis trinitatis Reinhardt &amp; Lütken 1862</td>
<td>St. Vincent Bush Anole</td>
<td>2004</td>
<td>2004</td>
<td>This Study</td>
<td>UF 144299, 151034</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>TROPIDURIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tropidurus hispidus (Spix 1825)</td>
<td>Peter’s Lava Lizard</td>
<td>2003</td>
<td>N/A</td>
<td>Enge et al. 2004; This Study</td>
<td>UF 137411-13</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Leiocephalus carinatus Gray 1827</td>
<td>Curlytailed Lizard</td>
<td>1935</td>
<td>1930s</td>
<td>Barbour 1936</td>
<td>UF 7893</td>
<td>5</td>
<td>Zoo</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1940s</td>
<td>1940s</td>
<td>Weigl et al. 1969</td>
<td></td>
<td>5</td>
<td>Biological Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1950s</td>
<td>1950s</td>
<td>Duellman &amp; Schwartz 1958; King 1960</td>
<td></td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Leiocephalus personatus Cope 1862b</td>
<td>Haitian Curlytail Lizard</td>
<td>1970s</td>
<td>N/A</td>
<td>Bartlett 1994; Krysko et al. 2010a; This Study</td>
<td>UF 145733</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Uranoscodon superciliosus (Linnaeus 1758)</td>
<td>Mophead Iguana</td>
<td>2004</td>
<td>N/A</td>
<td>Krysko et al. 2010a; This Study</td>
<td>UF 145734</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>AGAMIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calotes cf. versicolor (Daudin 1802c)</td>
<td>Bloodsucker Lizard</td>
<td>1978</td>
<td>1970s</td>
<td>Enge &amp; Krysko 2004</td>
<td>UF 137448</td>
<td>4b</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Laudakia stellio (Linnaeus 1758)</td>
<td>Roughtail Rock Agama</td>
<td>1996</td>
<td>N/A</td>
<td>Meshaka et al. 2004</td>
<td>EVER 304176</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Leiolepis belliana (Gray 1827)</td>
<td>Butterfly Lizard</td>
<td>1992</td>
<td>1990s</td>
<td>Krysko &amp; Enge 2005</td>
<td>UF 141589-91</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Physignathus cocincinus Cuvier 1829</td>
<td>Chinese Water Dragon</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 158809</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Pogona vitticeps (Ahl 1826)</td>
<td>Inland Bearded Dragon</td>
<td>2005</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 152677</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Uromastyx dispar malensis Joger &amp; Lambert 1996</td>
<td>Southern Saharan Spiny-tailed Lizard</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 159616</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
</tbody>
</table>

...... continued on the next page
TABLE 1 (continued)

<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAMAELEONIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chamaeleo calyptratus</td>
<td>Veiled Chameleon</td>
<td>2000</td>
<td>2000s</td>
<td>Krysko et al. 2004</td>
<td>UF 133251, 133255-57, 133259-63</td>
<td>4a</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Chamaeleo senegalensis (Daudin 1802a)</td>
<td>Senegal Chameleon</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157301</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Furcifer oustaleti (Mocquard 1894)</td>
<td>Oustalet’s Chameleon</td>
<td>2000</td>
<td>2000s</td>
<td>Gillette et al. 2010</td>
<td>UF 163066-084</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Furcifer pardalis (Cuvier 1829)</td>
<td>Panther Chameleon</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 153489</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Trioceros melleri (Gray 1865)</td>
<td>Meller’s Chameleon</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 153465</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>SPHAERODACTYLIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sphaerodactylus argus Gosse 1850</td>
<td>Ocellated Gecko</td>
<td>1944</td>
<td>1940s</td>
<td>Savage 1954</td>
<td>CAS-SU 10439-40, 10442</td>
<td>3</td>
<td>Cargo</td>
</tr>
<tr>
<td>Sphaerodactylus elegans MacLeay 1834</td>
<td>Ashy Gecko</td>
<td>1921</td>
<td>1920s</td>
<td>Stejneger 1922</td>
<td>MCZ 31636-43</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Gonatodes albogularis (Duméril &amp; Bibron 1836)</td>
<td>Yellow-headed Gecko</td>
<td>1933</td>
<td>1930s</td>
<td>Carr 1939</td>
<td>YPM 01308</td>
<td>4a</td>
<td>Cargo</td>
</tr>
<tr>
<td>GEKKONIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chondrodactylus turneri (Gray 1864)</td>
<td>Turner’s Thick-tailed Gecko</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157971</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Gehyra mutilata (Wiegmann 1834a)</td>
<td>Mutilating Gecko</td>
<td>1996</td>
<td>N/A</td>
<td>Meshaka et al. 2004</td>
<td>EVER 303436</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Gehyra badeni Szczerski &amp; Nekrasova 1994</td>
<td>Golden Gecko</td>
<td>2008</td>
<td>2000s</td>
<td>This Study</td>
<td>UF 153894</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Gehyra gecko (Linnaeus 1758)</td>
<td>Tokay Gecko</td>
<td>1964</td>
<td>1960s</td>
<td>King &amp; Krakauer 1966</td>
<td>UF 99183</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Gehyra grossmanni Günther 1994</td>
<td>Marbled Gecko</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 152730</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Gehyra vittata (Houttuyn 1782)</td>
<td>Lined Gecko</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157035, 157327</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Hemidactylus frenatus Schlegel 1836</td>
<td>House Gecko</td>
<td>1993</td>
<td>1990s</td>
<td>Meshaka et al. 1994</td>
<td>USNM 504381-83, 504379-80</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Hemidactylus garnotii Duméril &amp; Bibron 1836</td>
<td>Indo-Pacific Gecko</td>
<td>1963</td>
<td>1960s</td>
<td>King &amp; Krakauer 1966</td>
<td>MCZ 77585</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Hemidactylus platyurus (Schneider 1792)</td>
<td>Asian Flat-tailed House Gecko</td>
<td>1984</td>
<td>1980s</td>
<td>Meshaka &amp; Lewis 1994</td>
<td>KU 222278-80, 223403</td>
<td>4b</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Hemidactylus turcicus (Linnaeus 1758)</td>
<td>Mediterranean Gecko</td>
<td>1910</td>
<td>1910s</td>
<td>Fowler 1915</td>
<td>ANSP 18035</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Lepidodactylus lugubris (Duméril &amp; Bibron 1836)</td>
<td>Mourning Gecko</td>
<td>2005</td>
<td>2000s</td>
<td>Meshaka et al. 2004; This Study</td>
<td>UF 151603</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Lygodactylus williamsi Loveridge 1952</td>
<td>Turquoise Dwarf Gecko</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 161359</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Phelsuma dubia (Boettiger 1881)</td>
<td>Dull Day Gecko</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157201</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
</tbody>
</table>

...... continued on the next page
<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phelsuma grandis</td>
<td>Madagascar Giant Day Gecko</td>
<td>1990s</td>
<td>1990s</td>
<td>Bartlett &amp; Bartlett 1999</td>
<td>UF 130725-37, 131553-54</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Phelsuma laticauda (Boettger 1880)</td>
<td>Gold Dust Day Gecko</td>
<td>2003</td>
<td>N/A</td>
<td>Bartlett &amp; Bartlett 2006b; This Study</td>
<td>UF 137087</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Phelsuma standingi Methuen &amp; Hewitt 1913</td>
<td>Standing’s Day Gecko</td>
<td>1995</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 163090</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Ptychozoon liomotum</td>
<td>Smooth-backed Gliding Gecko</td>
<td>2003</td>
<td>N/A</td>
<td>Enge et al. 2004; This Study</td>
<td>UF 137764</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>PHYLLODACTYLIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tarentola annularis (Geoffroy Saint-Hilaire 1827)</td>
<td>White-spotted Wall Gecko</td>
<td>1990</td>
<td>1990s</td>
<td>Bartlett 1997</td>
<td>EVER 302922, 304348-43</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Tarentola mauritanica (Linnaeus 1758)</td>
<td>Moorish Gecko</td>
<td>1996</td>
<td>1990s</td>
<td>Bartlett &amp; Bartlett 1999; This Study</td>
<td>UF 157268</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>TEIIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ameiva ameiva (Linnaeus 1758)</td>
<td>Giant Ameiva</td>
<td>1953</td>
<td>1950s</td>
<td>Neill 1957</td>
<td>UMMZ 111408</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Aspidoscelis motaguae (Sacket 1941)</td>
<td>Giant Whiptail</td>
<td>1994</td>
<td>1990s</td>
<td>Bartlett 1995</td>
<td>KU 222210-11</td>
<td>4b</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Conesurus phymaegatus (Linnaeus 1758)</td>
<td>Rainbow Whiptail</td>
<td>1964</td>
<td>1960s</td>
<td>King &amp; Krakauer 1966</td>
<td>KU 209859</td>
<td>4b</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Tropinambis merianae (Duméril &amp; Bibron 1839)</td>
<td>Argentine Black &amp; White Tegu</td>
<td>2002</td>
<td>2000s</td>
<td>Enge et al. 2006</td>
<td>UF 135044</td>
<td>4b</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Tropinambis rufescens (Günther 1871)</td>
<td>Red Tegu</td>
<td>2007</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 151510</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Tropinambis teguixin (Linnaeus 1758)</td>
<td>Gold Tegu</td>
<td>1990</td>
<td>N/A</td>
<td>Anonymous 1990; This Study</td>
<td>UF 153696</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>LACERTIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takydromus tachydromoides (Schlegel 1838)</td>
<td>Japanese Grass Lizard</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157202</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>SCINCIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalcides ocellatus (Forskål 1775)</td>
<td>Ocellated Skink</td>
<td>1999</td>
<td>2000s</td>
<td>This Study</td>
<td>UF 135284</td>
<td>3</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Egermania cunninghami (Gray 1832)</td>
<td>Cunningham’s Skink</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 153760</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Eutropis multifasciata (Kuhl 1820)</td>
<td>Brown Mabuya</td>
<td>1990</td>
<td>1990s</td>
<td>Meshaka 1999</td>
<td>USNM 523790</td>
<td>4b</td>
<td>Cargo</td>
</tr>
<tr>
<td>Lepidothryis fernandi (Burton 1836)</td>
<td>Fire Skink</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 153513</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Tiliqua scincoides (White 1790)</td>
<td>Eastern Blue Tongue Skink</td>
<td>2007</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 152392</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>CORDYLIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cordylus mossambicus FitzSimons 1958</td>
<td>Gorongosa Girled Lizard</td>
<td>2006</td>
<td>N/A</td>
<td>Krysko et al. 2010a; This Study</td>
<td>UF 153698</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>VARANIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varanus albigularis microstictus Boettger 1893</td>
<td>Black-throated Monitor</td>
<td>2007</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 152520</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
</tbody>
</table>

...... continued on the next page
TABLE 1  (continued)

<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varanus exanthematicus (Bosc 1792)</td>
<td>Savannah Monitor</td>
<td>1992</td>
<td>N/A</td>
<td>Prusak 1992</td>
<td>UF 135537</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Varanus indicus (Daudin 1802c)</td>
<td>Pacific Mangrove Monitor</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 160345</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Varanus jobiensis Ahl 1932</td>
<td>Peach-throated Monitor</td>
<td>2008</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 154404</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Varanus niloticus (Linnaeus 1766)</td>
<td>Nile Monitor</td>
<td>1990</td>
<td>1990s</td>
<td>Campbell 2003</td>
<td>UF 137057</td>
<td>5</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Varanus salvadorii (Peters &amp; Doria 1878)</td>
<td>Crocodile Monitor</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 159511</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Varanus salvator Laurenti 1768</td>
<td>Water Monitor</td>
<td>1978</td>
<td>N/A</td>
<td>Beltz 1992; This Study</td>
<td>UF 65461</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
</tbody>
</table>

ACROCHORDIDAE

Acrochordus javanicus Hornstedt 1787 | Javan File Snake | 1970s           | 1970s            | This Study               | UF 151593-94  | 3     | Pet Trade |

BOIDAE

Boa constrictor constrictor Linnaeus 1758 | Common Boa | 1960s           | 1970s            | King & Krakauer 1966     | UF 137070     | 3     | Pet Trade |
| Boa constrictor occidentalis Philippi 1873 | Argentine Boa | 2009            | N/A              | This Study               | UF 157190     | 2     | Pet Trade |
| Epicrates cenchria (Linnaeus 1758) | Rainbow Boa | 1997            | N/A              | This Study               | UF 123128     | 2     | Pet Trade |
| Eunectes marinus (Linnaeus 1758) | Green Anaconda | 2004            | N/A              | Snow et al. 2007b; This Study | UF 143935     | 2     | Pet Trade |
| Eunectes notaeus Cope 1862c | Yellow Anaconda | 2007            | N/A              | Reed & Rodda 2009; This Study | UF 152688     | 2     | Pet Trade |
| Gongylophis colubrina (Linnaeus 1758) | Egyptian Sand Boa | 2007            | N/A              | This Study               | UF 151512     | 2     | Pet Trade |
| Gongylophis muelleri Boulenger 1892 | West African Sand Boa | 2009            | N/A              | This Study               | UF 155335     | 2     | Pet Trade |

PYTHONIDAE

Broghammerus reticulatus (Schneider 1801) | Reticulated Python | 1989            | N/A              | Neil & Dampier 1989; This Study | UF 163091     | 2     | Pet Trade |
| Leio-pythonfredparkeri Schleip 2008 | Parker’s Python | 2006            | N/A              | This Study               | UF 159916     | 2     | Pet Trade |
| Morelia spilota (Lacépède 1804) | Carpet Python | 2009            | N/A              | This Study               | UF 157128     | 2     | Pet Trade |
| Python regius (Shaw 1802) | Ball Python | 1995            | N/A              | Beltz 1995; This Study    | UF 152563     | 2     | Pet Trade |

COLUMBIDAE

Lampropeltis alternata (Brown 1901) | Gray Banded Kingsnake | 2010            | N/A              | This Study               | UF 158776     | 2     | Pet Trade |
| Lampropeltis californiae (Blainville 1835) | California Kingsnake | 1992            | N/A              | Bartlett & Bartlett 2003; This Study | UF 135053     | 2     | Pet Trade |
| Lampropeltis triangulum hondurensis Williams 1978 | Honduran Milksnake | 2009            | N/A              | This Study               | UF 157203     | 2     | Pet Trade |

...... continued on the next page
Table 1 (continued)

<table>
<thead>
<tr>
<th>Family/Species</th>
<th>Common Name</th>
<th>Year Introduced</th>
<th>Year Established</th>
<th>Source</th>
<th>First Voucher</th>
<th>Stage</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lampropeltis triangulum sinaloae Williams 1978</td>
<td>Sinaloan Milksnake</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 155625</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Pantherophis obsoletus (Say 1823)</td>
<td>Texas Ratsnake</td>
<td>2009</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 155624</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>Pituophis ruthveni Stull 1929</td>
<td>Louisiana Pinesnake</td>
<td>2010</td>
<td>N/A</td>
<td>This Study</td>
<td>UF 157954</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>HOMALOPSIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erpeton tentaculatum Lacépède 1800</td>
<td>Tentacle Snake</td>
<td>2010</td>
<td>N/A</td>
<td>Holbrook &amp; Krysko 2011</td>
<td>UF 163086</td>
<td>2</td>
<td>Pet Trade</td>
</tr>
<tr>
<td>TYPHLOPIDAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramphotyphlops braminus (Daudin 1803)</td>
<td>Brahminy Blind Snake</td>
<td>1979</td>
<td>1970s</td>
<td>Wilson &amp; Porras 1983</td>
<td>AUM 32681</td>
<td>5</td>
<td>Cargo</td>
</tr>
<tr>
<td>Typhlops lumbricalis (Linnaeus 1758)</td>
<td>Earthworm Snake</td>
<td>1930</td>
<td>N/A</td>
<td>Myers 1958</td>
<td>UF 8995</td>
<td>2</td>
<td>Cargo</td>
</tr>
</tbody>
</table>

Figure 1. Number of different invasion pathways (n = 146) of introduced amphibian and reptile taxa (n = 137) in Florida for each decade from 1860–2010. Note that intercepted taxa (n = 3) are not included.
The earliest (Cope 1863) known herpetofaunal introduction to Florida is an amphibian, the Greenhouse Frog, *Eleutherodactylus planirostris* (Cope 1862a) (currently stage 5). The earliest (2009; *This Study*) known salamander introduction is the Oriental Fire-bellied Newt, *Hypsiboas orientalis* (David 1873) (currently stage 2), although no non-indigenous salamanders are currently known to be established. The earliest (1933; Carr 1940) known turtle introduction is the Western Painted Turtle, *Chrysemys picta bellii* (Gray 1831a) (currently stage 2; taxon corrected in *This Study*). The earliest (1950s; King & Krakauer 1966) known crocodilian introduction is the Spectacled Caiman, *Caiman crocodilus* (Linnaeus 1758) (currently stage 4b). The earliest (Garman 1887) known lizard introduction is the Brown Anole, *Anolis sagrei* Duméril and Bibron 1837 (currently stage 5). The earliest (1930; Myers 1958) known snake introduction is the Earthworm Snake, *Typhlops lumbricalis* (Linnaeus 1758) (currently stage 2). Fifty-six taxa have evidence of establishment (i.e., reproducing; stages 3–5), including three frogs, four turtles, one crocodilian, 43 lizards, and five snakes (Figs. 2–3). From the 1960s (n = 23) to the 2000s (n = 56), the number of established taxa more than doubled (Fig. 2). We found a significant difference between indigenous and established non-indigenous taxa among taxonomic groups (Fig. 3; \( \chi^2 = 86.543, \text{d.f.} = 6, p < 0.0001 \)). We provide accounts for 83 newly confirmed intercepted or introduced non-indigenous amphibians and reptiles in Florida through 2010, including those previously reported in the literature but lacking an associated voucher and those whose invasion stage has been upgraded to established (stages 3–5).

**FIGURE 2.** Accumulation curves for the total number of invasion pathways of introduced taxa (n = 146) and established taxa (n = 56) for each decade from 1860–2010. Note that establishment is calculated only once for each taxon using the first year it became established, and intercepted taxa (n = 3) are not included.
FIGURE 3. Numbers of indigenous and established non-indigenous taxa among taxonomic groups.

Discussion

Florida now ranks as having the largest number (n = 56) of established non-indigenous herpetofaunal species in the entire world, with Hawaii coming in a distant second (n = 31; Kraus 2009). The indigenous origins of these species in Florida are nearly global, spanning Australia, Oceania and Indonesia, Asia, the Mediterranean, Africa, Madagascar, South America, the Caribbean, and western, central and eastern regions of the United States.

The “tens rule” states that only about 10% of non-indigenous species that are transported to a new area (stage 1) become introduced (stage 2), 10% of introduced species become established (stage 3), and 10% of established species become pests (i.e., have a negative effect) (see Holdgate 1986; Williamson & Brown 1986; Williamson & Fitter 1996). This model was developed for British plants and animals, but there are exceptions such as birds in Hawaii, where >50% of introduced species became established (Williamson & Fitter 1996). We do not have sufficient data from Florida to determine if this modeling rule applies to the transition from being transported to a new area to becoming introduced or from being established to becoming a pest. However, the tens rule clearly does not apply to the transition from being introduced to becoming established, as 56 (40.87%) of 137 of Florida’s introduced herpetofaunal species are now established (Table 1). Kraus (2009) reported 50 species of established non-indigenous herpetofauna in Florida, 55 that did not successfully establish, and 17 of uncertain status, strictly through using peer-reviewed literature. Our data represent a considerable expansion and clarification from his massive compilation of data; however, our verified, voucher-based data cannot be compared to Kraus (2009) because of the differing methodologies and the fact that he used the year 2006 as his cut-off point for data collection. The large number of established non-indigenous lizards (n = 43) in Florida is overwhelming considering...
that there are only 16 native lizard species in Florida. The prevalence of non-indigenous lizards might be because of their popularity in the pet trade, the similarity of their native climate and habitats to those in Florida, and/or edificarian habits. It is noteworthy that, to date, there has never been a verified, established, non-indigenous amphibian or reptile species in Florida that has been subsequently extirpated.

We documented three intercepted species (Table 1), including *Duttaphrynus melanostictus* (Schneider 1799), *Pseudacris sierra* (Jameison et al. 1966), and *Cyclura nubila nubila* (Gray 1831a). One of these, *P. sierra*, is noteworthy because it has been intercepted four different times over a near 30-year period originating from the same horticultural business in Santa Rosa, Sonoma County, California.

We documented 137 introduced taxa, including 149 total independent invasion pathways. The least frequent (n = 2) invasion pathway is for biological control, increasing slightly to four for the zoo pathway and 18 for the cargo pathway (Table 1; Figs. 1–2). Beginning in the 1960s, the pet trade pathway began to increase, whereas other pathways remained the same or declined each decade thereafter. The pet trade pathway contributed mostly during the 2000s to the overall number of independent invasions (Figs. 1–2). The most frequent (n = 125) invasion pathway is the pet trade, and animal dealers are the source of many established populations of introduced reptile species in Florida (also see Bartlett & Bartlett 1999; Meshaka et al. 2004). From 1995–2010, one animal importer in particular in Hollywood, Broward County, was the most likely source for the introduction of at least 32 (23.35%) of the 137 confirmed introduced taxa (Table 1) that have not been found elsewhere, lack established populations in extensive areas leading to the facility, and have been listed in their inventory: *Hypselotriton orientalis*, *Pachytriton labiatus* (Unterstein 1930), *Amphiuma tridactylum* Cuvier 1827, *Bombina orientalis* (Boulenger 1890), *Kaloula pulchra* Gray 1831b, *Afrixalus fornasini* (Bianconi 1849), *Litoria caerulea* (White 1790), *Anolis coelestinus* Cope 1862b, *Calotes* cf. versicolor (Daudin 1802c), *Physignathus cocincinus* Cuvier 1829, *Chamaeleo senegalensis* (Daudin 1802a), *Chondrodactylus turneri* (Gray 1864), *Gekko badenii* Szczerbak and Nekrasova 1994, *Gekko gecko* (Linnaeus 1758), *Gekko grossmanni* Günther 1994, *Gekko vittatus* (Houttuyn 1782), *Hemidactylus platyurus* (Schneider 1792), *Lycodactylus williamsi* Loveridge 1952, *Phelsuma dubia* (Boettger 1881), *Pychozoon lioniottum* Annandale 1905, *Tarentola annularis* (Geoffroy Saint-Hilaire 1827), *Tarentola mauritanica* (Linnaeus 1758), *Tupinambis teguixin* (Linnaeus 1758), *Takydromus tachydromoides* (Schlegel 1838), *Lepidothyris certhia* (Linnaeus 1758), *Python regius* (Shaw 1802), *Lampropeltis triangulum* honorensis Williams 1978, *Lampropeltis triangulum* sinaloa Williams 1978, *Pantherophis obsoletus* (Say 1823), and *Erpeton tentaculatum* Lacépède 1800 (for most of these, see species accounts below). This locality is well known for unusual non-indigenous species, and neighborhood children, hobbyists, and even professional herpetologists frequently search the area for released or escaped animals (also see Christy 2008, 2009, 2010; Smith 2011). A second animal importer in Florida City, Miami-Dade County, was the most likely source for the introduction of at least 5 (3.64%) of the 137 confirmed introduced taxa (Table 1), including *Litoria caerulea*, *Furcifer oustaleti* (Mocquard 1894) (see Gillette et al. 2010), *Phelsuma laticauda* (Boettger 1880), *Tarentola annularis*, and *Tupinambis* spp. Other animal dealers and individual pet owners are responsible for the majority of the remaining introduced taxa.

To assist management agencies with developing effective programs to reduce introduced species, herein we offer suggestions regarding 1) how to properly document newly discovered introduced herpetofaunal species in Florida in order to keep numbers of species consistent, accurately identify species, and document when and where a particular species is found and its invasion pathway and stage; 2) the definition of an established species; and 3) management strategies to possibly prevent or slow the introduction of more species in Florida.

To properly document an introduced species, we urge publishing observed introduction events in a scientific journal. The numerous examples of unverified claims already present in other types of literature suggest the need to have tighter editorial accountability when publishing as well (Kraus 2008). However, scientific journals require vouchers only when they have been deposited in a systematic research collection and a catalogue number has been provided. An easy way for the public to report and assist in documenting non-indigenous amphibians and reptiles is to send voucher specimens and/or digital images along with all associated data (i.e., locality, latitude/longitude [if possible], date, and collector or photographer) to Florida’s official natural history museum, the Florida Museum of Natural History (http://www.flmnh.ufl.edu/herpetology/herpetology.htm). In turn, FLMNH researchers will attempt to verify submitted data, prepare specimens for the scientific research collection, and provide a catalogue number for documenting in a peer-reviewed journal.
We consider a species to be established when there is evidence of reproduction (stage 3) in the wild, and we do not impose an arbitrary time limit on how long a species must be present. In contrast, FWC defines a species as established when it has “reproduced for five or more years” and is “unlikely to be extirpated without human intervention” (Hardin 2007:44). This definition is quite counterintuitive. We recommend that FWC reconsider these criteria and that extirpation efforts begin as soon as non-indigenous species are detected, because once populations have time to disperse from their points of introduction, they are usually very difficult (if not impossible) and expensive to eradicate. The FWC claims that they would like to attempt to exterminate non-indigenous species, but this depends upon practicality, availability of resources, and potential consequences (Scott Hardin personal communication). At this time, it is apparent that public and governmental support for responding to non-indigenous species is divided because of economic pressures and private interests. Instead of responsibility falling on any single agency (such as FWC), we feel it is time to consider constructing Invasive Species Committees (ISCs), as has been done in Hawaii (Kraus & Duffy 2010). The model of ISCs was developed to avoid such limitations by forming cooperative partnerships among agencies and the public to identify and eradicate non-indigenous species (Kraus & Duffy 2010). By combining efforts and not allowing one agency to have full authority and responsibility, a broad range of interested partners can work around political jurisdictions and/or barriers, obtain resources, and achieve a true Early Detection and Rapid Response program in a fairly cost-effective manner (Kraus & Duffy 2010; also see Perry & Farmer 2011). We also strongly urge state and federal authorities, researchers, and residents to immediately target and remove all newly found introduced species, before they spread and become out of control.

The FWC’s “approach to managing non-native wildlife is based on (1) encouraging responsible pet ownership; (2) a regulated industry is preferable to underground traffic; and (3) most introduced species have negligible environmental impacts” (Hardin 2007:43). Although we agree that responsible dealers and pet ownership should first be encouraged over prohibition, we found that 83.78% of all introduced herpetofaunal species through 2010 are directly related to the pet trade pathway, and this approach is simply not working but getting worse each decade (Figs. 1–2). As for claiming that most introduced species having negligible environmental impacts (Hardin 2007), none of the 56 established herpetofaunal species in Florida has been thoroughly studied (or not been studied at all) to determine its economic or environmental impacts. However, preliminary diet studies of at least one species, *Python bivittatus* Kuhl 1820, illustrate that it consumes birds, alligators, and mammals (Greene et al. 2007; Snow et al. 2007a; Rochford et al. 2010; Holbrook & Chesnes 2011; Reed et al. 2011), many of which are protected or managed species. Although the stance is sometimes taken that introduced species do not pose any threats to the environment, economy, nor human health (e.g., *Python bivittatus; see* Barker & Barker 2009, 2010a, 2010b; Jordan 2009), this denial or mere lack of understanding potential consequences and range expansion of introduced species are common misconceptions. “Effects of invasions are frequently impossible to predict, although ecological mechanisms of impact can often be identified and explained retrospectively” (Kraus 2009:15). Additionally, Kraus (2009) suggested that impacts are indeed apparent for nearly all introduced amphibians and reptiles that have received research attention, and the reason that impacts are assumed to be minimal or absent for most species is that research has not been conducted to determine impacts. As a principle of logic in Florida, we suggest considering the Precautionary Principle: where effects are uncertain but potentially both costly and irreversible, and society should limit those effects before uncertainty is resolved (Perrings et al. 2005; Kraus 2009). Taking such a passive stance as currently done towards non-indigenous species in Florida is unacceptable, especially knowing the severe negative effects introduced species have had around the world (Pimentel et al. 2005; Pimentel 2007). Nonetheless, with such a high diversity of herpetofaunal species now in Florida, it appears that the stage is now set for a species (either one that is already introduced or a future non-indigenous species) to have devastating impacts. For example, the Brown Treesnake, *Boiga irregularis* (Bechstein 1802), on Guam has caused harm to human health, the economy, and the environment, including the loss of 11 of 13 of Guam’s land birds (Rodda & Fritz 1992; Fritts & Leasman-Tanner 2001), but it took approximately 40 years lag time to determine such effects. *Boiga irregularis* consumed much of the naïve native fauna before shifting its diet to mostly lizards, many of which were also introduced (Rodda & Fritz 1992; Fritts & Leasman-Tanner 2001 and references therein). The scenario in Florida is quite similar; the southern peninsula (where most non-indigenous species occur) has an island-like geography (surrounded by water on three sides and a freeze line to the north; Myers & Ewel 1990; Simberloff 1997), there are many bird species (both indigenous and non-indigenous), and the majority (~77%) of Florida’s established non-indigenous herpetofauna is now comprised of lizards. Additionally, despite peninsular Florida not...
being a true island, “every sort of havoc wrought by non-indigenous species on islands can be found on the mainland as well” (Simberloff 1997:4). In Florida, we do not know what cumulative or synergistic impacts the large number of non-indigenous herpetofaunal species are having nor what the future holds. Nonetheless, if current trends continue as they appear now, additional species will become introduced or established with unknown consequences.

Despite Florida Statute § 379.231 that makes it illegal to release any non-indigenous animal in Florida without first having a permit from the FWC, no person has ever been prosecuted for intentionally releasing a non-indigenous animal (Linda Harrison personal communication) because such an act would have to be witnessed by FWC law enforcement in order for a possible conviction. Because current state and federal laws have not been effective at curtailing the ever-increasing number of illegal introductions, laws need to be modified and made enforceable. Craighead and Dasmann (1966:19) suggested that those responsible for illegal introductions should be held accountable by compensating for the cleaning up (= eradication) of those species for which they are responsible, and King (2010:17) points out an existing legal precedent for sea snakes in Florida and advocates that a “letter of credit” be required of pet dealers that could pay for eradication if any of their non-indigenous animals were released or had escaped. FWC staff has discussed options for recovering the cost of cleaning up of released or escaped animals from facility or pet owners (Scott Hardin personal communication), and it is working with the Florida Reptile & Amphibian Association to develop best management practices for the reptile industry that include security, containment, and recovery procedures that might reduce escapes from complying members. We agree with Campbell (2007) and King (2010) that an Early Detection and Rapid Response program (e.g., Stanford & Rodda 2007) needs to be implemented in Florida to quickly identify newly found introduced herpetofaunal species for eradication efforts, like ISCs do in Hawaii and FDACS and USDA do to eradicate or prevent the spread of agricultural pests. Although we are sensitive about unjustifiably diminishing the rights of pet owners (also see Perry & Farmer 2011), we believe that the current approach to managing non-indigenous wildlife, existing laws, and denial and uncaring attitudes regarding introduced species need to be changed immediately, and preventative measures must be considered at this time.

Species Accounts

Species accounts are listed below for each of the 83 newly confirmed taxa, including those previously reported in the literature but lacking an associated voucher and those whose invasion stage has been upgraded to established (stages 3–5). Greater details are also provided for some previously reported species.

CAUDATA

SALAMANDRIDAE

The Oriental Fire-bellied Newt, *Hypselotriton orientalis* (David 1873), is indigenous to southern central China (Zhao & Adler 1993; Zhao 1999). On 4 June 2009, CRG and DC collected an adult *H. orientalis* (photographic voucher UF 157033) at 2338 h alongside an Oriental Fire-bellied Toad, *Bombina orientalis* (see account below) in a puddle of water ca. 1.5 m in diameter and 7.5 cm deep just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 22 August 2009, CRG and DC collected, but did not voucher, another adult *H. orientalis* at night time at the same site. On both 21 June and 3 July 2010 at night time, MRR collected additional adults (UF 158927: 34.1 mm snout-vent length [SVL], 61.2 mm total length [TL] and UF 157946: 35.9 mm SVL, 63.6 mm TL; MorphoBank M88020; Fig. 4), respectively) just outside the property under a board near the same puddle of water as above. This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species and the earliest known salamander introduction in Florida.

The Spotless Stout Newt, *Pachytriton labiatus* (Unterstein 1930), is indigenous to southern and central China (Zhao & Adler 1993; Zhao 1999). On 2 February 2010 at 2230 h, CRG and DC collected a *P. labiatus* (UF 157219,
64.6 mm SVL, 128 mm TL; MorphoBank M88441; Fig 5.) in the same puddle of water (see Hypselotriton orientalis account above) just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

AMPHIUMIDAE

The Three-toed Amphiuma, *Amphiuma tridactylum* Cuvier 1827, is indigenous to southeastern Texas, east to Alabama and north to southern Illinois and southwestern Kentucky (Conant & Collins 1998), Carr (1940), Bishop (1943), and Carr and Goin (1955) suggested that *A. tridactylum* might occur as an indigenous species in several Florida panhandle counties, but this was based on a misunderstanding of amphiumid taxonomy, and no voucher of this species exists for this region. On 3 December 2009 at 2245 h, CRG and DC found seven and collected five adult *A. tridactylum* (UF 157220; MorphoBank M88442; Fig. 6; photographic voucher UF 157286 of four different individuals) in the same puddle of water as above (*see Hypselotriton orientalis* species account) just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On various other nights at this same site, CRG observed additional adult *A. tridactylum*, but these salamanders escaped back into the pipe before they could be photographed or captured. On 8 October 2010 at 2230 h, DC, Jake Edwards and Suzanne Hurley collected another adult *A. tridactylum* (photographic voucher UF 163094) at this same site. This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

ANURA

BOMBINATORIDAE

The Oriental Fire-bellied Toad, *Bombina orientalis* (Boulenger 1890), is indigenous to Japan, Korea, and far-eastern Russia and China; it adapts to urban and suburban habitat (Zhao & Adler 1993; Zhao 1999; Ishchenko & Mitchell 2008) and has been introduced to Spain, the Netherlands, and perhaps Germany (Kraus 2009). On 27 September 2007 at night time, SVN collected an adult *B. orientalis* (photographic voucher UF 152327) in leaf litter at the base of a tree just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). At this same locality, on 22 August 2009, CRG and DC found two and collected one adult *B. orientalis* (UF 155692; MorphoBank M88443; Fig. 7 at night time alongside a *Hypselotriton orientalis* species account). In September 2009, CRG and DC collected, but did not voucher, two additional adult *B. orientalis* found just east of the facility’s property. On 30 January 2010 at 2130 h, GNK, Ari Triest, Jakob Pammer, and Keiley Huerff collected two additional adult *B. orientalis* (photographic voucher UF 157280) in this same area. Although *B. orientalis* has now been found multiple times for three years, there is no current evidence of reproduction (stage 3). This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this family and species in Florida.

PIPIDAE

The African Clawed Frog, *Xenopus laevis* (Daudin 1802b), is indigenous to sub-Saharan Africa, including the countries of Namibia, South Africa, Lesotho, Swaziland, Botswana, Mozambique, Zimbabwe, Congo, southwestern Kenya, eastern Nigeria, Zambia, Angola, Malawi, Tanzania, Sudan, Burundi, Rwanda, Uganda, Cameroon, and Gabon (Tinsley et al. 1996; Poynton 1999; Channing 2001). This species has been introduced, often with established populations, to non-indigenous regions throughout the world, including Japan, Ascension Island, and a wide variety of localities on the continents of Europe, South America, and North America (Tinsley & McCoid 1996; Kraus 2009). In 1964, ca. 200 *X. laevis* were intentionally released into Hialeah (Red Road) Canal, Hialeah, Miami-Dade County, Florida, by an animal importer (King & Krakauer 1966), but no voucher was deposited. An additional Florida report includes a single *X. laevis* found near Tampa, Hillsborough County, but no date of collection or voucher was mentioned (Tinsley & McCoid 1996). On 27 June 2010 at 1430 h, MCG collected an adult (63.6 mm SVL) *X. laevis* (UF 158477; MorphoBank M88444; Fig. 8) while dip-netting in a retention pond on Knox McRae Drive, 0.08 km east of Sussana Lane, Titusville, Brevard County (28.57232°N, -80.83237°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this family and species in Florida.

**MICROHYLIDAE**

The Malaysian Painted Frog, *Kaloula pulchra* Gray 1831b, is indigenous to India, Bangladesh, Myanmar, Thailand, China, Sumatra, and Sulawesi (Inger 1999). This species is known to have been transported into Australia and New Zealand via cargo and has established non-indigenous populations in Borneo, Brunei, Celebes, Guam, Malaysia, the Philippines, and Singapore (Christy *et al.* 2007; Tyler & Chapman 2007; Charles 2008; Das...
2009; Fidenci 2009; Kraus 2009). On 29 December 2006 at 2100 h, Michael Cravens collected an adult *K. pulchra* (photographic voucher UF 152654) in the parking lot of a strip mall at 5450 Stirling Road, Hollywood, Broward County (26.046123°N, -80.218873°W), ca. 100 m east of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 2 April 2008, Nathan H. Nazdrowicz collected an adult (51 mm SVL) *K. pulchra* (UF 153704) under a railroad tie just outside the property of the animal importer’s facility. On 22 August 2009 at 2315 h, CRG and DC collected an adult *K. pulchra* (photographic voucher UF 155691; MorphoBank M88445; Fig. 9) inside a cinder block wall along the same strip mall at 5450 Stirling Road. Although multiple *K. pulchra* have now been found in a 3.5-year period, there is no current evidence of reproduction (stage 3). This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

**HYPEROLIIDAE**

Fornasini’s Spiny Reed Frog, *Afrixalus fornasini* (Bianconi 1849), is indigenous to savannas of coastal southern Kenya southward to South Africa (Channing & Howell 2006). On 5 November 2010 at 1822 h, MRR collected an adult (26 mm SVL) *A. fornasini* (UF 163085; MorphoBank M88446; Fig. 10) perched on a PVC pipe just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this family and species in Florida.

**BUFONIDAE**

The Asian Black-spotted Toad, *Duttaphrynus melanostictus* (Schneider 1799), is indigenous to southern Asia including central, southern and southwestern China, Taiwan, southward into India, Sri Lanka, and southeast through to Borneo and sections of Indonesia (Zhao & Adler 1993; Inger 1999; Zhao 1999). This species has become established in Sulawesi, western Papua and the Maldives, and it has been introduced to Australia and New Zealand (Kraus 2009). On 26 August 2010, a *D. melanostictus* was intercepted (stage 1) by USDA from inside a shipping container of Money Trees (*Pachira aquatica*) at 6302 NW 36th Street, Miami, Miami-Dade County (25.80762°N, -80.29922°W). This cargo originated from a port at Zhanjiang, Guangdong, China, on 25 July 2010; however, the location of the tree farm is not known. This *D. melanostictus* (UF 159699; 65 mm SVL, 32.4 g, MorphoBank M88447; Fig. 11) was subsequently transferred to Zoo Miami before being deposited in the FLMNH. This is the first known voucher for this species in Florida.

**HYLIDAE**

The Great Green Treefrog, *Litoria caerulea* (White 1790), is indigenous to eastern and northern Australia and southern Papua New Guinea, and it has been introduced to New Zealand (Tyler 1999; Cogger 2000; Kraus 2009). *Litoria caerulea* reportedly has been found in Florida along canals in Lee, Collier, Sarasota, Broward, and Miami-Dade counties (Bartlett 1994; Butterfield *et al.* 1997; Powell *et al.* 1998; Bartlett & Bartlett 1999, 2006a; Meshaka *et al.* 2004); however no specific locality nor known vouchers exist. On 29 May 2003, KLK and KME collected an adult *L. caerulea* (UF 146573) on a wooden fence at a reptile importer’s facility at 36490 SW 192nd Avenue, Florida City, Miami-Dade County (25.432283°N, -80.50195°W). This specimen likely escaped (stage 2) from an outdoor screened enclosure that contained dozens of *L. caerulea*. On 6 December 2006 at 1900 h, MRR collected an adult *L. caerulea* (photographic voucher UF 152655; MorphoBank M88448; Fig. 12) on the underside of a piece of fallen metal gutter about 0.75 m above ground just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 11 September 2007, MRR collected another adult (72.6 mm SVL) *L. caerulea* (UF 151734) and observed another adult inside a PVC pipe on the ground at this site. On 27 September 2007, SVN collected an adult *L. caerulea* (photographic voucher UF 152330) on an aluminum fence just outside the property of the animal importer’s facility. On 8 March 2010 at 2200 h, DC
and Ana M. Martinez collected another adult (71.2 mm SVL) *L. caerulea* (UF 158810) perched on a non-indigenous pothos plant at this site. Although *L. caerulea* has now been found multiple times over a period of 6.5 years, there is no current evidence of reproduction (stage 3). This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

The Sierra Chorus Frog, *Pseudacris sierra* (Jameson et al. 1966) is a western North American chorus frog that has undergone a recent taxonomic split from the *Pseudacris regilla* complex of Pacific Chorus Frogs (Recuero et al. 2006a, 2006b). The indigenous range of *P. sierra* extends from the Pacific coast of central California, northeast to eastern Oregon, Idaho, and Montana (Recuero et al. 2006a, 2006b). On 24 August 1983, J. Frankel and M. Thurmond intercepted (stage 1) two *P. sierra* (UF 116750–51) on bird’s nest fern (*Asplenium nidus*) seedlings at a cargo dock at the Miami International Airport, Miami, Miami-Dade County (25.80648°N, -80.289164°W). The shipment originated from a horticultural business in Santa Rosa, Sonoma County, California. On 3 November 1986, a gravid female *P. sierra* was intercepted (stage 1) in a shipment of climbing bird’s nest ferns (*Microsorium punctatum* “Grandiceps”) that reached a plant nursery at 2005 Jaudon Road in Dover, Hillsborough County (27.97246°N, -82.24021°W), and was subsequently transferred to FDACS, Division of Plant Industry (DPI), Gainesville, and then the FLMNH (UF 65748). The origin of the ferns and frog was the same horticultural business above in Santa Rosa, California. On 20 June 2007, Rick Stokes intercepted (stage 1) an adult *P. sierra* in a shipment of starter ferns (plant species not specified) in a different nursery located at 4630 Reola Road, Dover, Hillsborough County (28.0251°N, -82.218919°W). This specimen was originally transferred to DPI (Entomology number E2007–4456), before being deposited in the FLMNH (UF 152457; MorphoBank M88449; Fig. 13). This plant shipment also originated from the same horticultural business in Santa Rosa, California. Members of the *P. regilla* complex are highly adaptable and not particularly ecosystem limited (Stebbins 2003; Somma 2008). Although there is no current evidence that this species is established (stage 3), its persistent entry into Florida for nearly 25 years through the same horticultural commerce from California is cause for concern. These are the first known vouchers for this species in Florida.

TESTUDINES

EMYDIDAE

The Southern Painted Turtle, *Chrysemys dorsalis* (Agassiz 1857), is indigenous to North America from southern Illinois to the Gulf, and from western Alabama to extreme southeastern Oklahoma, with a disjunct population in central Texas (Starkey et al. 2003; Ernst & Lovich 2009). King and Krakauer (1966) reported the release (stage 2) in 1964 of 25 *C. dorsalis* into a canal in Hialeah, Miami-Dade County; however, no known voucher exists. On 10 November 2008, CRG photographed a *C. dorsalis* (photographic voucher UF 153957) in a pond at 11200 SW 8th Street, Florida International University, Modesto Maidique Campus, 0.03 km northwest of the Owa Ehan Building (25.75858°N, -80.37338°W). In March 2008, CRG collected, but did not voucher, a neonate *C. dorsalis* from the same pond. On 20 June 2010, KLK et al. collected two adult (112 and 128 mm CL) female *C. dorsalis* (UF 157930 [MorphoBank M88450; Fig. 14] and photographic voucher UF 157931, respectively) from the same pond. On 25 June 2009, Matthew H. Kail collected an adult (112 mm CL) female *C. dorsalis* (UF 159928) in a pond on the Santa Fe College campus, Gainesville, Alachua County (29.68265°N, -82.43532°W) (Johnston et al. In Press). This species likely was released or had escaped (stage 2) from enclosures (released at FIU), and a neonate found at FIU suggests reproduction and establishment (stage 3) of this species there. These are the first known vouchers for this species in Florida.

The Western Painted Turtle, *Chrysemys picta bellii* (Gray 1831a), is indigenous to a broad region of North America from western Ontario across southern Canada west to British Columbia, southward to Missouri, eastern Colorado, Wyoming, Idaho, northern Oklahoma and northern Oregon, with scattered populations in several southwestern states and Chihuahua, Mexico (Starkey et al. 2003; Ernst & Lovich 2009). In April 1933, O. C. Van Hyning collected a *C. p. bellii* (107.0 mm CL; UF 1898; MorphoBank M88496; Fig. 15) from the Chipola River, south of Marianna, Jackson County (30.74894°N, -85.21627°W). This specimen was erroneously identified by Carr (1940)
as “Chrysemys picta dorsalis” (= C. dorsalis). This species likely was released or had escaped (stage 2) from an enclosure. This represents both the first known voucher for this species/subspecies and earliest known turtle introduction in Florida.

The Eastern Painted Turtle, *Chrysemys picta picta* (Schneider 1783), is indigenous to North America from northern Georgia north to Nova Scotia, and west to the Appalachians (Starkey *et al.* 2003; Bonin *et al.* 2006; Ernst & Lovich 2009). This and other members of the *C. picta* complex have been widely introduced to Europe and non-indigenous regions of western North America (Spinks *et al.* 2003; Kraus 2009). Deckert (1918) claimed that *C. p. picta* existed in Jacksonville, Duval County, but no known voucher exists (Carr 1940; Carr & Goin 1955; Bartlett & Bartlett 1999). On 5 June 1939, T. Carr collected a *C. p. picta* (UF 1920) at the Chemistry Building on the University of Florida campus, Gainesville, Alachua County (29.65059°N, -82.34384°W), but identification cannot be verified because this specimen is missing. On 26 August 2007, CRG photographed a *C. p. picta* (photographic voucher UF 153764; MorphoBank M88497; Fig. 16) in a pond at 11200 SW 8th Street, Florida International University, Modesto Maidique Campus, 0.08 km southeast of the Ryder Business Building, Miami, Miami-Dade County (25.757°N, -80.3754°W). This species likely was released (stage 2). These represent the first known vouchers for this species/subspecies in Florida.

The Wood Turtle, *Glyptemys insculpta* (Le Conte 1830), is indigenous to southern Quebec and Ontario, south to Virginia and west to Minnesota and Iowa (Ernst & Lovich 2009). On 23 August 2009, John D. Brueggen collected a *G. insculpta* (photographic voucher UF 159391; MorphoBank M88498; Fig. 17) on State Road 207, 1.6 km east of I-95, St. Augustine, St. Johns County (29.83752°N, -81.36921°W). The specimen was donated to the St. Augustine Alligator Farm. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The False Map Turtle, *Graptemys pseudogeographica* (Gray 1831c), is indigenous to the Missouri River system and upper Mississippi River drainages as far north as Minnesota and North Dakota, and as far northeast as Indiana (Ernst & Lovich 2009), and it has been introduced to various non-indigenous localities in the United States and France (Haffner 1997; Spinks *et al.* 2003; Ernst & Lovich 2009; Kraus 2009). On 19 December 2000 at 1500 h, KLK, Anthony T. Reppas and Amir Soleymani collected an adult (134.8 mm CL) *G. pseudogeographica* (UF 121459) basking on oolitic limestone along Snapper Creek and SW 99th Court, Miami, Miami-Dade County (25.696183°N, -80.355317°W). On 26 August 2007, CRG collected a *G. pseudogeographica* (photographic voucher UF 153763) in a pond at 11200 SW 8th Street, Florida International University (FIU), Modesto Maidique Campus, 0.08 km southeast of the Ryder Business Building, Miami, Miami-Dade County (25.757°N, -80.3754°W). At a nearby pond 0.03 km northwest of the Owa Ehan Building, FIU (25.75975°N, -80.37739°W), CRG collected two neonates (1.5 cm CL) *G. pseudogeographica* on 1 October 2009 (photographic vouchers UF 154572 and 155179) on 30 January and 29 March 2009, respectively. At this same pond, CRG and DC collected three additional neonate *G. pseudogeographica* on 1 October 2009 (photographic vouchers UF 162631 and 23 February 2010, and observed another neonate on 20 September 2010 at 1300 h. On 20–21 June 2010, KLK *et al.* collected four adult *G. pseudogeographica* on the FIU campus: two (148.0 mm CL [UF 157935] and 185.0 mm [UF 159345]) were 0.08 km southeast of the Ryder Business Building, one (286.0 mm) was 0.01 km west of the Owa Ehan Building (25.75786°N, -80.3733°W), and one (190.0 mm) was 0.18 km southwest of the main campus entrance on US 41 (25.75975°N, -80.37739°W). On 1 October 2007, Lau and Johnston (2008) collected an adult (13.1 cm CL) *G. pseudogeographica* (photographic voucher UF 150678) 1.21 km upstream from the river sink of the Santa Fe River, O’Leno State Park, Columbia County (29.917°N, -82.5478479°W). On 5 May 2009, CRG observed three adults and collected one *G. pseudogeographica* (photographic voucher UF 155445; MorphoBank M88499; Fig. 18) at the Turkey Creek Sanctuary, Palm Bay, Brevard County (28.01413°N, -80.601132°W). This species likely was released or had escaped (stage 2) from enclosures (released at FIU and Turkey Creek Sanctuary), and numerous adults and neonates in different ponds on the FIU campus suggests reproduction and establishment (stage 3) of this species there. This species is currently being used as a substitute for *T. scripta elegans* in the pet trade (Lee 2010). These represent the first known vouchers for this species in Florida.

The Colombian Slider, *Trachemys callirostris* (Gray 1855), is indigenous to the northwestern Maracaibo Basin in Venezuela and a portion of Caribbean Colombia (Pritchard & Trebbau 1984; Bonin *et al.* 2006). In 1972, Bernard Martof collected two juvenile *T. callirostris* (UF 154026 [MorphoBank M88499; Fig. 19], 127 mm CL; and UF 155125) in an unspecified locality on Key West, Monroe County (24.55607°N, -81.77767°W). Joseph Ward
(personal communication) did not observe this species during a follow-up survey in 1977. This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

The Yellow-bellied Slider, *Trachemys scripta scripta* (Thunberg in Schoepff 1792) (for authority see Rhodin and Carr 2009), is indigenous to southeastern Virginia south to southeastern Alabama and northern Florida (as far south as Levy County), and it has been broadly introduced to numerous non-indigenous localities worldwide via the pet trade (Thomas 2006; Ernst & Lovich 2009; Kraus 2009). Unvouched observations for *T. s. scripta* have been reported on Key Biscayne, Miami-Dade County, Florida, by Bader (1976) at Crandon Park, and by Krysko et al. (2010a) from a *T. s. scripta* collected at Bill Baggs Cape Florida State Park on 8 January 2005. On 1 April 2009, a park visitor collected an adult *T. s. scripta* (photographic voucher UF 159494) at Bill Baggs Cape Florida State Park, Miami-Dade County (25.673667°N, -80.1575°W), but this turtle was re-released back into a pond within the park by staff. On 22 September 2002, Johnston and Johnston (2003) collected an adult (21.8 cm CL) female *T. s. scripta* (UF 13595) in a canal on SW 76th Avenue, 0.61 km north of Orange Drive, Davie, Broward County (26.06888°N, -80.24833°W). On 26 August 2007, CRG collected a *T. s. scripta* (140 mm CL; photographic voucher UF 155178) in a pond at 11200 SW 8th Street, Florida International University (FIU), Modesto Maidique Campus, 0.03 km northwest of the Owa Ehan Building, Miami (25.75843°N, -80.37346°W). On 20–21 June 2010, KLK et al. collected five juvenile and adult *T. s. scripta* (along with juveniles and adults of 97 *T. s. elegans* and 10 *T. s. scripta x T. s. elegans* intergrades) on the FIU campus: one (98.0 mm CL [UF 157934; MorphoBank M88544; Fig. 20]) was 0.04 km southeast of the Ryder Business Building (25.75706°N, -80.3753°W), three (112 cm, 115 mm, and 171 mm) were 0.08 km southeast of the Ryder Business Building (25.757°N, -80.3754°W), and one (128 mm) was 0.04 km west of the Owa Ehan Building (25.75838°N, -80.3739°W). This species likely was released (stage 2), and juveniles and adults found at FIU suggest reproduction and establishment (stage 3) of this species there. These represent the first known vouchers for this subspecies in southern Florida.

**TESTUDINIDAE**

The Red-footed Tortoise, *Chelonoidis carbonaria* (Spix 1824), is indigenous to southern Central America, and South America east of the Andes Mountains, south to northern Argentina, with non-indigenous populations in Trinidad and a variety of Caribbean Islands, and it has been introduced to California (Pritchard & Trebbau 1984; Bonin et al. 2006; Kraus 2009). Meshaka et al. (2004) claimed that *C. carbonaria* has been found in a tropical hardwood hammock near Cutler Bay, Miami-Dade County, since the 1980s, but they did not provide a specific locality or voucher. On 15 July 2007 at 1600 h, CRG collected a *C. carbonaria* (photographic voucher UF 153958; MorphoBank M88545; Fig. 21) on Jones Road, 0.13 km north of State Road 518, Melbourne, Brevard County (28.12171°N, -80.70868°W). On 10 April 2008, Kristina Serbesoff-King photographed (photographic voucher UF 152773), but did not remove, a *C. carbonaria* at the Seacrest Scrub Natural Area, West Palm Beach, Palm Beach County (26.49625°N, -80.06911°W). On 25 October 2009, William Johnson collected a *C. carbonaria* (photographic voucher UF 156970) at 415 Forest Road, Mount Dora, Lake County (28.81471°N, -81.6484°W). On 27 July 2010, Jake Edwards collected a male *C. carbonaria* (21.5 cm CL; photographic voucher UF 158808) on SW 42nd Court, 0.09 km west of SW 62nd Avenue, Davie, Broward County (26.06909°N, -80.22929°W). This species likely was released or had escaped (stage 2) from enclosures (released at Seacrest Scrub Natural Area). These represent the first known vouchers for this species in Florida.

The African Spurred Tortoise, *Geochelone sulcata* (Miller 1779), is indigenous to isolated, relictual colonies scattered across sub-Saharan western, central, and eastern Africa (Bonin et al. 2006), and it has been introduced to United Arab Emirates (Soorae et al. 2010) and California (Lemm 2006). This species has been found in Hillsborough and Sarasota counties (George L. Heinrich personal communication), but no vouchers exist for these areas. Numerous *G. sulcata* have been removed from the Boyd Hill Nature Preserve in St. Petersburg, Pinellas County. In 2002, G.L. Heinrich (personal communication) collected and kept in captivity, but did not voucher, an adult female *G. sulcata* from Lake Seminole Park, Seminole, Pinellas County (30.791867°N, -85.679609°W),
which was estimated to have a mass of 27 kg in 2006. In February 2007, an adult male *G. sulcata* (photographic voucher UF 164360; MorphoBank M88546; Fig. 22) was observed in a natural area during a prescribed fire and on 23 April 2007 it was photographed by JPB and collected near Dunny Lane and Fulford Road, Pumpkin Hill State Park, Duval County (30.47405°N, -81.5019°W). On 18 September 2007, Monty Kowtiz collected a *G. sulcata* (photographic voucher UF 151752) in Bonifay, Holmes County (30.79186°N, -85.6796°W). On 21 July 2008, Arnold Brunell collected an adult (41.2 kg) male *G. sulcata* (photographic voucher UF 153511) at 1329 Webster Street, Orlando, Orange County (28.58692°N, -81.39898°W). On 28 August 2008, Fred Robinette and Kelly Bunting collected an adult (18.1 kg) male *G. sulcata* (photographic voucher UF 153514) near Panama City at 9124 Kingswood Road, Southport, Bay County (30.31536°N, -85.61382°W). There have been at least three other *G. sulcata* captured, but not vouched, in the Panama City area (John G. Himes personal communication). On 3 November 2008, Julian Proctor collected *G. sulcata* (photographic voucher UF 153890) on Emporia Road, 0.8 km west of US 17, Pierson, Volusia County (29.20475°N, -81.45464°W). On 1 December 2008 at 1700 h, Steve Brinkley collected an adult *G. sulcata* (photographic voucher UF 154195) at County Road 74 and Bronco Road, Charlotte County (26.94663°N, -81.88685°W). On 20 January 2009, Kevin Jackson collected a *G. sulcata* (photographic voucher UF 154409) at 1988 Raymond Lane, Sneads, Jackson County (30.70779°N, -84.9409°W). On 23 June 2009, Amanda Sigman provided us with photographs of a juvenile *G. sulcata* (photographic voucher UF 155687) found at 3602 Shore Drive, St. Augustine, St. Johns County (29.83348°N, -81.30728°W). On 4 November 2009, Clifton Morris collected an adult (53.3 cm CL) *G. sulcata* (photographic voucher UF 156972) at 5852 South Rovan Point, Lecanto, Citrus County (28.778°N, -82.469°W). On 12 December 2009 at 1709 h, MRR and CRG found a dead *G. sulcata* (photographic voucher UF 157355), likely killed on the nearby service road, just inside the fence of Kissimmee Prairie State Park, NW 322nd Street, 0.84 km east of 192nd Avenue, Okeechobee County (27.53884°N, -81.01422°W). On 18 February 2010, Nicole Ranalli provided us with photographs of an adult (40 cm CL) *G. sulcata* (photographic voucher UF 157312) collected by forestry personnel 0.66 km south of Lake Andrea Road and Sultermfuss Road, Walk-in-the-Water Wildlife Management Area, Lake Wales Ridge State Forest, Polk County (27.79716°N, -81.47461°W). Although there is currently no evidence of reproduction (stage 3), the high propagule pressure (i.e., number of individual tortoises being found in the wild), and the superficial resemblance to the indigenous Gopher Tortoise, *Gopherus polyphemus* (making identification of species difficult for the average observer), should be a major concern. This species likely was released or had escaped (stage 2) from enclosures (release at Kissimmee Prairie State Park and Lake Wales Ridge State Forest). These represent the first known vouchers for this species in Florida.

The Leopard Tortoise, *Stigmochelys pardalis* (Bell 1828), is indigenous to eastern and southern Africa, from central Sudan southward through South Africa and Namibia (Spawls et al. 2002; Bonin et al. 2006; Alexander & Marais 2007), and it has been introduced to California, USA, and non-indigenous portions of South Africa (Lemm 2006; Kraus 2009). On 27 May 2009, Kenneth N. Johnson collected a *S. pardalis* (photographic voucher UF 155440; MorphoBank M88549; Fig. 23) at 11822 152nd Street North, Jupiter, Palm Beach County (26.9001°N, -80.2224°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

Horsfield’s Tortoise, *Testudo horsfieldii* (Gray 1844), is indigenous to Asia from extreme western China and the Caspian Sea in southern Russia, south through Afghanistan, Iran, and Pakistan to the northern and western Baluchistan region (Bonin et al. 2006; Lee & Smith 2010), and it has been introduced to Maryland and North Carolina, USA, and Austria (Kraus 2009; Lee & Smith 2010). On 26 July 2005, a *T. horsfieldii* (photographic voucher UF 159551) was collected at Bill Baggs Cape Florida State Park, Key Biscayne, Miami-Dade County (25.673667°N, -80.1575°W) (see Krysko et al. 2010a for original record without voucher), and donated to the Miami Museum of Science. On 4 April 2008, Jason R. Bourque collected a (144.8 mm CL) female *T. horsfieldii* (UF 152758; MorphoBank M88568; Fig. 24) along railroad tracks 0.5 km west of County Road 491, Brooksville, Hernando County (28.628 oN, -82.45204°W). On 27 May 2009, Ryan Roehm collected a *T. horsfieldii* (photographic voucher UF 155439) at 1105 SW Williston Road, Gainesville, Alachua County (29.61618°N, -82.33632°W). This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

GEOMYDIDAE

The Tropical Wood Turtle, *Rhinoclemmys pulcherrima* (Linnaeus 1758) (for authority see Rhodin & Carr 2009), is indigenous to Central America, northward to portions of the western coast of Mexico (Bonin et al. 2006), and it has
been introduced to Massachusetts, USA (Kraus 2009). On 16 August 2006 at 900 h, Travis K. Blunden collected a subadult (140 mm CL) *R. pulcherrima* (UF 121604; MorphoBank M88569; Fig. 25) on Duette Road, 0.4 km north of Duette Ranch Preserve, Manatee County (27.5902°N, -82.1228°W). This species likely was released (stage 2). This represents the first known voucher for this family and species in Florida.

The Spotted-legged Wood Turtle, *Rhinochelys punctularia* (Daudin 1801), is indigenous to the Guianas, the Orinoco drainage of Venezuela, Suriname, northeastern Brazil, and Trinidad (Pritchard & Trebbau 1984; Bonin *et al.* 2006). Bartlett and Bartlett (2006b) claim that *R. punctularia* has been established in Miami-Dade County for about 10 years, and state that “most Florida specimens have been found at the edges of parking lots and roads on the Miccosukee Indian Reservation” (2006b:111), but no known voucher has ever been deposited in a systematic collection. However, this species was not found during a survey by David Serrano (personal communication) in 2009 within the Miccosukee Indian Reservation. On 2 March 2008, a *R. punctularia* was found (photographic voucher UF 153697; MorphoBank M88570; Fig. 26) near Jungle Island, 1111 Parrot Jungle Trail, Miami, Miami-Dade County (25.78534°N, -80.17341°W). This species had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

**TRIONYCHIDAE**

The Spiny Softshell, *Apalone spinifera* (Le Sueur 1827), is indigenous to a broad section of eastern and central North America, from portions of Ontario and New York, west through the plains states, south to the Gulf of Mexico and the southern states through limited sections of northern Florida, with disjunct populations in Montana, Wyoming, and various western states (Ernst & Lovich 2009). Various non-indigenous introductions of *A. spinifera* have occurred in France, Mexico, Hawaii and various eastern and western states in the USA (Haffner 1997; Ernst & Lovich 2009; Kraus 2009). On 13 October 2008, CRG photographed an adult *A. spinifera* (photographic voucher UF 153765; MorphoBank M88571; Fig. 27) in a pond at 11200 SW 8th Street, Florida International University, Modesto Maidique Campus, 0.08 km southeast of the Ryder Business Building, Miami (25.757°N, -80.3754°W). On 20 June 2010, KLK *et al.* observed, but did not voucher, an adult *A. spinifera* (possibly the same individual) at this same pond. On 7 October 2010, DC observed an adult male and female *A. spinifera* at this same pond, illustrating the potential for future reproduction and establishment. This species likely was released (stage 2). This represents the first known voucher for this species in southern Florida.

**KINOSTERNIDAE**

The Razorback Musk Turtle, *Sternotherus carinatus* (Gray 1855), is indigenous to a section of the United States from southern Oklahoma, central Arkansas, and Mississippi, south to the Gulf of Mexico through the Gulf Coastal Plain, with a disjunct population in Alabama (Ernst & Lovich 2009). On 17 December 2008, CRG photographed an *S. carinatus* (photographic voucher UF 154191) in a pond at 11200 SW 8th Street, Florida International University, Modesto Maidique Campus, 0.03 km northwest of the Owa Ehan Building, Miami, Miami-Dade County (25.75843611°N, -80.37346944°W). At a nearby pond 0.08 km southeast of the Ryder Business Building (25.757°N, -80.3754°W), CRG collected two adult *S. carinatus* (photographic vouchers UF 155180; and UF 157278 [MorphoBank M88572; Fig. 28]) on 30 March 2009 and 4 February 2010, respectively. At this same pond on 24 February 2010, CRG and DC observed, but did not voucher, another adult *S. carinatus*. Although *S. carinatus* has now been found multiple times, there is no current evidence of reproduction (stage 3). This species likely was released (stage 2). These represent the first known vouchers for this species in Florida.

**CHELIDAE**

The Twist-neck Turtle, *Platemys platycephala* (Schneider 1792), is indigenous to the Amazon and Orinoco River drainages in Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, and Venezuela (Pritchard &
Trebbau 1984; Bonin et al. 2006). Circa 1985, Gary Patterson collected a *P. platycepha*la in a pond at 101 Clubhouse Drive, Wilderness Country Club, Naples, Collier County (26.1405°N, -81.8001°W). This animal was kept in captivity and still alive as of 15 February 2009 (photographic voucher UF 154589; MorphoBank M88573; Fig. 29). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this family and species in Florida.

CROCODYLIA

CROCODYLIDAE

The African Slender-snouted Crocodile, *Mecistops cataphractus* (Cuvier 1825), is indigenous to a broad region of central Africa from Senegal east to Tanzania (Waitkuwait 1989). On 25 March 1983, three juvenile (ca. 1220 mm TL) crocodilians, including one *M. cataphractus*, were reported stolen from the old Crandon Park Zoo, Key Biscayne, Miami-Dade County (25.704317°N, -80.157883°W), after the lock on a chain-link fence that surrounded a small concrete pool had been cut (Ron Magill personal communication; Anonymous 1983). On 24 June 1986, Jeff Grigg recaptured the *M. cataphractus* (photographic voucher UF 163093; MorphoBank M88574; Fig. 30) near the old Crandon Park Zoo (the date and collector erroneously reported in Krysko et al. 2010a), after it was likely re-released by those responsible for originally taking the three crocodilians (Ron Magill personal communication; Tomb 1986). This represents the first known voucher for this species in Florida.

ALLIGATORIDAE

Cuvier’s Dwarf Caiman, *Paleosuchus palpebrosus* (Cuvier 1807), is indigenous to the Amazon and Orinoco basins of South America, across the Brazilian Shield, south to the Rio Paraguay drainage basin of northern Paraguay (Magnusson 1992). On 13 August 2008, DC observed an adult (619 mm SVL, 1067 mm TL) female *P. palpebrosus* on Long Pine Key, Old Ingraham Highway, Everglades National Park, Miami-Dade County (25.38798044°N, -80.6226°W), and on 15 August 2008, DC and CRG collected this animal (EVER 40566, UF 153469; MorphoBank M88575; Fig. 31). This species likely was released (stage 2). This represents the first known voucher for this species in Florida.

Schneider’s Smooth-fronted Caiman, *Paleosuchus trigonatus* (Schneider 1801), is indigenous to Guyana, Suriname, French Guiana, Venezuela, northern and western Brazil, Colombia, eastern Ecuador, eastern Peru, and extreme northern Bolivia (Magnusson & Campos 2010). In April 1999, Todd Hardwick captured an adult *P. trigonatus* (photographic voucher UF 165576; MorphoBank M88576; Fig. 32) in a canal near Black Point, Homestead, Miami-Dade County (25.54032°N, -80.33149°W). This animal was subsequently brought to and identified by JAW based on three pelvic scale rows of dorsal scutes above the cloaca. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

SQUAMATA

IGUANIDAE

The Rhinoceros Iguana, *Cyclura cornuta* (Bonnaterre 1789), is indigenous to Hispaniola and its satellite islands (Schwartz & Henderson 1991). King and Krakauer (1966) first reported the introduction (stage 2) of *C. cornuta* on Virginia Key and Key Biscayne, Miami-Dade County. Several lizards had escaped from an exhibit on Virginia Key and were frequently observed at the Miami Seaquarium, but no known voucher exists. On 7 April 2009, Kathleen Windsor found an adult *C. cornuta* (photographic voucher UF 155189; MorphoBank M88624; Fig. 33) on Wildwood Lane, 0.46 km east of Key Deer Boulevard, Big Pine Key, Monroe County (24.65162°N, -81.43658°W). On 26 May 2010 at 1100 hr, CRG found a *C. cornuta* (UF 162586) DOR on State Road 823, 0.14 km south of State Road 818, Hollywood, Broward County (26.062°N, -80.31366°W). This species likely was released or had escaped (stage 2) from enclosures (released on Big Pine Key by a hobbyist who allows it to roam freely throughout the neighborhood). This represents the first known voucher for this species in Florida.

The Cuban Rock Iguana, *Cyclura nubila nubila* (Gray 1831a), is indigenous to Cuba and its surrounding islands, and it has been successfully introduced to Isla Magueyes, Puerto Rico (Schwartz & Henderson 1991; Kraus 2009).
On 5 April 2004, three adult *C. n. nubila* (photographic voucher UF 164356; MorphoBank M88625; Fig. 34) were intercepted (stage 1) at the shipping terminal of the Jacksonville Port Authority, 8998 Blount Island Boulevard, Jacksonville, Duval County (30.39912°N, -81.52777°W). These *C. n. nubila* were found in a shipping container originating from Guantanamo Bay, Cuba, and were subsequently housed in the Jacksonville Zoo and Gardens hospital, before being taken back by USFWS. This represents the first known voucher for this species in Florida.

POLYCHROTIDAE

The Jeremie Anole, *Anolis coelestinus* Cope 1862, is indigenous to southwestern Hispaniola (Schwartz & Henderson, 1991). On 2 December 2009 at 2305 h, CRG, DC, and Edward F. Metzger III collected an adult female *A. coelestinus* (UF 157133) sleeping on a drainage pipe just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 9 December 2009, this female laid a single egg in captivity. On 16 December 2010 at 1100 h, George Kolaz collected an adult male *A. coelestinus* (UF 164359; MorphoBank M88626; Fig. 35) on a palm tree at this same site. Although *A. coelestinus* has now been found at different times for more than a year, including a gravid female, there is no current evidence of reproduction (stage 3) taking place in the wild. This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

The St. Vincent Bush Anole, *Anolis trinitatis* Reinhardt and Lütken 1862, is indigenous to St. Vincent, Young Island, and Chateaubelair Island in the Lesser Antilles, and it apparently has been introduced on Trinidad (Lazell 1972; Schwartz & Henderson 1991; Lever 2003; Kraus 2009). In September 2004, JPB was informed that *A. trinitatis* had been deliberately released (stage 2) in the garden area of the Fountainbleau Hotel at 4441 Collins Avenue, Miami Beach, Miami-Dade County (25.817497°N, -80.121571°W) in the summer of 2004. In October 2004, JPB visited this site and observed seven adult *A. trinitatis* on large ficus trees (*Ficus* sp.) and other tropical plants, and one juvenile on an adjacent rock wall; three adult males and two females were collected. In February 2005, JPB collected one adult male, two females, and one juvenile. In April 2005, JPB collected an adult male and female from a single ficus tree, and photographs of these individuals (photographic voucher UF 151034) along with the male specimen (UF 144299; MorphoBank M88627; Fig. 36) were deposited as vouchers in the FLMNH. In total, 11 individuals have been removed from this site, and the presence of juveniles suggests that reproduction (stage 3) has occurred there. These represent the first known vouchers for this species in Florida.

TROPIDURIDAE

Peter’s Lava Lizard, *Tropidurus hispidus* (Spix 1825), is widespread within, and indigenous to, a large region of tropical South America, east of the Andes Mountains (Frost 1992). On 22 August 2003 at 1815 h, KLK and KME collected three *T. hispidus* (UF 137411–13; MorphoBank M88628; Fig. 37) from the driveway and porches of a private residence at 6362 SW Citrus Boulevard, Palm City, Martin County (27.064°N, -80.321333°W) (Enge et al. 2004). This species was released (stage 2) the previous day in large numbers, and those we collected were lethargic. We are uncertain if other *T. hispidus* survived at this introduction site. These represent the first known vouchers for this species in Florida.

The Haitian Curlytail Lizard, *Leiocephalus personatus* Cope 1862, is indigenous to Hispaniola (Haiti and Dominican Republic) (Schwartz & Henderson 1991). *Leiocephalus personatus* was reported to have been found near the Miami International Airport (MIA), Miami-Dade County (Bartlett 1994; Butterfield et al. 1997; Bartlett & Bartlett 1999, 2006b), but they did not provide a specific locality or voucher, and Meshaka et al. (2004) did not find this species during their survey of MIA. On 11 October 2004, JPB photographed four *L. personatus* (photographic voucher UF 145733; MorphoBank M88629; Fig. 38; Krysko et al. 2010a) in Crandon Gardens, Crandon Park, Key Biscayne, Miami-Dade County (25.704317°N, -80.157883°W). We did not find this species at any other times during our ongoing surveys of this area from 1992–present (Krysko et al. 2010a), suggesting it is a recent introduction. This species likely was released (stage 2). This represents the first known voucher for this species in Florida.

The Mophead Iguana, *Uranoscodon superciliosus* (Linnaeus 1758), is indigenous to Amazonian South America and nearby Guianan regions (Frost 1992). On 11 October 2004, JPB photographed a *U. superciliosus* (photographic voucher UF 145734; MorphoBank M88630; Fig. 39) on a tree in Crandon Gardens, Crandon Park, Key Biscayne, Miami-Dade County (25.704317°N, -80.157883°W) (Krysko et al. 2010a). We did not find this species in our ongoing surveys of this area from 1992–present (Krysko et al. 2010a), suggesting it is a recent introduction. This species likely was released (stage 2). This represents the first known voucher for this species in Florida.
AGAMIDAE

County (26.04591°N, -80.21976°W); we observed an adult *P. cocincinus* along the back of the building, but could not capture it (see Krysko et al. 2006). On 7 March 2010 at 2200 h, DC and Suzanne Hurley collected a juvenile (71.4 mm SVL, 270.4 mm TL) *P. cocincinus* (UF 158809; MorphoBank M88631; Fig. 40) sleeping on a chain-link fence just outside the property of the animal importer's facility. Although we have observed an adult and juvenile at this site, we believe that these represent independent introductions, and not an established (stage 3) population, because no other *P. cocincinus* are known to have been found there. This species likely was released or had escaped (stage 2) from enclosures. This represents the first known voucher for this species in Florida.

The Inland Bearded Dragon, *Pogona vitticeps* (Ahl 1926), is indigenous to a large region of eastern central and inland southeastern Australia (Cogger 2000), and it has been unsuccessfully introduced to California, USA (Lemm 2006). Gibbons *et al.* (2009) hypothesized that *P. vitticeps* could be introduced to Florida through the pet trade. On 19 May 2005, Greg Klimock collected an adult *P. vitticeps* (photographic voucher UF 152677; MorphoBank M88632; Fig. 41) floating alive in a canal at 25340 4th Street, Summerland Key, Monroe County (24.65162°N, -81.43658°W). On 29 July 2010, Lori Oberhofer photographed, but did not capture, a *P. vitticeps* (photographic voucher UF 158991) at 485 SE 21st Lane, Homestead, Miami-Dade County (25.46588°N, -80.44665°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Southern Saharan Spiny-tailed Lizard, *Uromastyx dispar maliensis* Joger and Lambert 1996, is indigenous to northwestern Mali, on the edge of the Adrar des Iforas and southwestern Algeria (Wilms *et al.* 2007). On 2 November 2009, Kraig R. Hankins collected an adult (215 mm SVL) *U. d. maliensis* (photographic voucher UF 159616; MorphoBank M88633; Fig. 42) at SW 44th Street and SW 1st Place, Cape Coral, Lee County (26.57015°N, -81.97702°W), which was donated to the Cape Coral Environmental Park. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

**CHAMAEOLEONIDAE**

The Senegal Chameleon, *Chamaeleo senegalensis* (Daudin 1802a), is indigenous to a broad section of sub-Saharan and southern-central Africa from Sudan, Ethiopia, and Zambia, west through Togo and Senegal, and south to Angola (Martin 1992). On 5 June 2009 at 2300 h, CRG and DC collected an adult female and male *C. senegalensis* (photographic vouchers UF 157301 [MorphoBank M88634; Fig. 43] and UF 157302, respectively) that were found just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). The female (UF 157301) was found sleeping on a fence, whereas the male (UF 157302) was found approximately 1.5 m away sleeping on an oak tree. This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

The Panther Chameleon, *Furcifer pardalis* (Cuvier 1829), is indigenous to Madagascar and Reunion, and it has been introduced to Mauritius (Raxworthy *et al.* 2002; Glaw & Vences 2007; Kraus 2009). On 8 August 2008, an adult male *F. pardalis* was found crossing State Road 31 south of Arcadia, De Soto County (27.12466°N, -81.795977°W). This animal was photographed by William B. Love (photographic voucher UF 153489; MorphoBank M88635; Fig. 44) before being donated to the Calusa Herpetological Society. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

Meller’s Chameleon, *Trioceros melleri* (Gray 1865), is indigenous to Malawi, Mozambique, and Tanzania (Martin 1992; Spawls *et al.* 2002). In July 2007, an adult female *T. melleri* was found crossing Orange Avenue and Washington Street in Orlando, Orange County (28.54354°N, -81.379047°W), and donated to JLS at the Central Florida Zoo, but no voucher was deposited. On 16 July 2008, an adult male *T. melleri* was found crossing Orange Avenue in Orlando, Orange County, and donated to JLS at the Central Florida Zoo before being transferred to the FLMNH (photographic voucher UF 153465; MorphoBank M88636; Fig. 45). Although two adult (one male and
one female) *T. melleri* have been found in the same vicinity over a 1-year period, there is no current evidence that these individuals represent an established (stage 3) population. This species likely was released or had escaped (stage 2) from enclosures. This represents the first known voucher for this species in Florida.

GEKKONIDAE

Turner’s Thick-toed Gecko, *Chondrodactylus turneri* (Gray 1864), is indigenous to somewhat unclearly defined northern sections of southern Africa including northern sections of South Africa, southern and northwestern Namibia, Botswana, northern KwaZulu-Natal, and southern portions of Mozambique and Tanzania (Branch 1998; Alexander & Marais 2007; Aaron M. Bauer personal communication). Bartlett and Bartlett (1999) and Meshaka et al. (2004) claimed that *Chondrodactylus bibronii* (Smith 1846), a closely related congener indigenous to southern Africa (Alexander & Marais 2007), was established (stage 3) in Bradenton, Manatee County, Florida, since the 1970s, but these authors do not provide a specific locality, voucher, or any other evidence demonstrating its introduction (stage 2) or identity. On 8 April 2010, CRG and DC collected a juvenile (60.5 mm SVL) *C. turneri* (UF 157971; MorphoBank M88637; Fig. 46; identity confirmed by Aaron M. Bauer personal communication) on a wall just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Golden Gecko, *Gekko badenii* Szczesnab and Nekrasova 1994, is indigenous to Vietnam (Darevsky & Orlov 1994; Szczesnak & Nekrasova 1994; Nguyen et al. 2010; Rösl er et al. 2011). On 5 November 2008 at 1553 h, CRG and DC found an adult *G. badenii* (photographic voucher UF 153894; MorphoBank M88638; Fig. 47) under the hood of a broken-down vehicle at Stirling Road and NW 65th Avenue, Hollywood, Broward County (26.046267°N, -80.220513°W), adjacent to the animal importer’s facility at 6450 Stirling Road (26.04591°N, -80.21976°W). On 16 May 2009, CRG and DC collected a neonate *G. badenii* (photographic voucher UF 157034) at night at this same site. On 16 August 2009, MRR photographed an adult *G. badenii* (photographic voucher UF 155689) at night at this same site. On 16 May 2009 at 2335 h, CRG and DC collected a juvenile (59 mm SVL) *G. badenii* (UF 155839) at night at this same site. On 18 November 2010 at 2105 h, CRG and Edward F. Metzger III observed two adult *G. badenii* at this same site. This species likely was released or had escaped (stage 2) from an enclosure, and the presence of adults and juveniles for nearly two years suggests reproduction (stage 3) has occurred in the area. These represent the first known vouchers for this species in Florida.

The Marbled Gecko, *Gekko grossmanni* Günther 1994, is indigenous to southern Vietnam (Günther 1994; Rösl er et al. 2011). On 17 February 2008 at 1930 h, MRR photographed an adult *G. grossmanni* (photographic voucher UF 152730) on a wall just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 26 October 2008, GNK and Ari Triest photographed an adult *G. grossmanni* (photographic voucher UF 154193) at night at this same site. On 10 May 2009, CRG and DC collected an adult *G. grossmanni* (photographic voucher UF 157282; MorphoBank M88639; Fig. 48) at night at this same site. On 16 August 2009, MRR photographed an adult *G. grossmanni* (photographic voucher UF 155688) at night at this same site. On 10 May 2009 at night, CRG and DC collected an adult (94 mm SVL) *G. grossmanni* (UF 155834) at this same site. On 20 August 2010 at 2215 h, GNK, CRG, and Stuart F. Willcombe observed an adult *G. grossmanni* at this same site, but it escaped capture. On 3 September 2010 at 2100 h, CRG, GNK, Edward F. Metzger III, and Jakob Pammer collected two adults (95 mm SVL, 103 mm SVL) *G. grossmanni* (UF 164371 and 164372, respectively) on the wall at this same site. Although *G. grossmanni* has now been found multiple times for nearly two years, there is no current evidence of reproduction (stage 3). This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

The Lined Gecko, *Gekko vittatus* (Houttuyn 1782), is indigenous to the Indo-Australian Archipelago from Java to Oceana (Henkel & Schmidt 1995; Rösl er et al. 2011). On 6 June 2009 at 2244 h, CRG and DC observed an adult *G. vittatus* (photographic voucher UF 157035; MorphoBank M88640; Fig. 49) on a coconut palm tree (*Cocos nucifera*) and collected an adult (photographic voucher UF 157327) just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 25 March 2010 at 2100 h, CRG and DC collected, but did not voucher, a gravid female *G. vittatus* at this same site. On various other nights at this same site, CRG and DC observed additional adult *G. vittatus*, but these geckos escaped capture. Although *G. vittatus* has now been found multiple times for more than a year, including a gravid female,
there is no current evidence of reproduction (stage 3) taking place in the wild. This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

The Mourning Gecko, *Lepidodactylus lugubris* (Duméril & Bibron 1836), is indigenous to southeastern Asia and many islands in the western and central Pacific Ocean, and it has established introductions in Japan, Taiwan, South and Central America, Mexico, Australia, and some islands in the Indian and Pacific oceans, including Hawaii (McKeown 1996; Lever 2003; Kraus 2009). It has been introduced to California and Wisconsin, USA, and New Zealand (Kraus 2008, 2009). *Lepidodactylus lugubris* is a unisexual complex of diploid and triploid populations of apparently independent origins (Moritz et al. 1993; Volobouev et al. 1993). Meshaka et al. (2004) reported this species on buildings of pet dealerships in Lee and Miami-Dade counties but provided no specific locality or voucher, and the Lee County (Ft. Myers) individuals were reported to have been extirpated. On 5 April 2005 at 2030 h, JPB observed one adult and collected another adult *L. lugubris* (photographic voucher UF 151603; MorphoBank M88641; Fig. 50) on the exterior wall of a former reptile importer’s building on SW Biltmore Street, 0.16 km north of Sea Holly Terrace, Port Saint Lucie, St. Lucie County (27.29082°N, -80.366304°W). This gecko was gravid at the time of collection and laid three eggs (two in the first clutch and one in a second clutch) in captivity from which two neonates hatched successfully. In August 2005, JPB observed (but did not collect) one juvenile and two adult *L. lugubris* >3.1 m high above ground in the same building complex. On 2 November 2007 at 2015 h, JPB observed another adult *L. lugubris* on a wall at the original introduction site above, and at 2100 h, collected a neonate *L. lugubris* (UF 152416) on a building wall at SW Bayshore Boulevard and SW Sea Holly Terrace (27.28916°N, -80.36475°W), 0.23 km south of the original introduction site. This species likely was released or had escaped (stage 2) from an enclosure, and the presence of numerous individuals, including a gravid female and juveniles suggests that reproduction (stage 3) has occurred there. These represent the first known vouchers for this species in Florida.

The Turquoise Dwarf Gecko, *Lygodactylus williamsi* Loveridge 1952, is endemic to the Kimboza Forest of Tanzania (Spawls et al. 2002). On 11 December 2009 at 2030 h, CRG, DC, MRR and GNK collected an adult male *L. williamsi* (photographic voucher UF 161359; MorphoBank M88642; Fig. 51) on a metal fence pole behind a strip mall at 5450 Stirling Road, Hollywood, Broward County (26.046123°N, -80.218873°W), ca. 100 m east of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Dull Day Gecko, *Phelsuma dubia* (Boettger 1881), is indigenous to Madagascar, the Comoros, and coastal eastern Africa (Spawls et al. 2002; Glaw & Vences 2007). On 29 August 2009 at 2200 h, DC collected an adult *P. dubia* (UF 157201; MorphoBank M88643; Fig. 52) sleeping on a coconut palm just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Gold Dust Day Gecko, *Phelsuma laticauda* (Boettger 1880), is indigenous to northern Madagascar and several Indian Ocean islands (Glaw & Vences 2007; Lever 2003), and it has been introduced in the Hawaiian Islands, French Polynesia, and the Comoros (McKeown 1996; Kraus 2008, 2009). Bartlett and Bartlett (2006b) report that *P. laticauda* has been introduced to Broward, Collier, Miami-Dade, Monroe (including Key Largo), and Lee counties, but provide no specific locality or voucher. On 29 May 2003 at 1800 h, KLK and KME collected a single neonate (17.9 mm SVL) *P. laticauda* (UF 137087; MorphoBank M88644; Fig. 53) at a reptile importer’s facility (see above *Litoria caerulea* species account) at 36490 SW 192nd Avenue, Florida City, Miami-Dade County (25.432283°N, -80.50195°W). This species likely was released or had escaped (stage 2) from an enclosure, but it is uncertain if this neonate escaped because of its small size or was offspring from adults that had previously been introduced. This represents the first known voucher for this species in Florida.

Standing’s Day Gecko, *Phelsuma standingi* Methuen and Huwitt 1913, is indigenous to Madagascar (Henkel & Schmidt 2000). In 1996, William B. Love (personal communication) observed, but did not collect, two neonate *P.

*standingi* on the side of a house, 0.61 km southwest of State Road 80 and the Hendry County line, Alva, Lee County (26.70404°N, -81.56775°W). These two *P. standingi* must have hatched from eggs deposited by an adult female held within an outside greenhouse; after the first year, one of these *P. standingi* disappeared, but the other survived outside on the house until 2006. On 17 April 2008 at 1040 h, David Strasser photographed an adult *P. standingi* (photographic voucher UF 163090; MorphoBank M88645; Fig. 54) on the side of a house near Coral Way and Gayton Place, Key Largo, Monroe County (25.07189°N, -80.46373°W). *Phelsuma standingi* has been
seen in this vicinity since ca. 1995 (David Strasser personal communication); although this is a long-lived species (can live more than 20 years in captivity) there is no current evidence of reproduction. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Smooth-backed Gliding Gecko, *Ptychozoon lionotum* Annandale 1905, is indigenous to southeastern Asia and morphologically distinguishable from other congeners (Brown et al. 1997). On 22 August 2003, KLK and KME were given permission to look around the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). At 1430 h, we observed >20 *P. lionotum* scattered around the outside of the building, mostly on walls > 3 m above ground. We collected one adult (69.3 mm SVL) *P. lionotum* (UF 137764; MorphoBank M88646; Fig. 55) on an outdoor metal railing leading into the facility (also see Enge et al. 2004 for mentioning this species as introduced without providing details). Although we have not observed this species on subsequent visits, like many other species reported herein, *P. lionotum* could have dispersed into adjacent areas. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

**PHYLLODACTYLIDAE**

The Moorish Gecko, *Tarentola mauritanica* (Linnaeus 1758), is indigenous to the Mediterranean and North Africa (Schleich et al. 1996). Bartlett and Bartlett (1999, 2006b) and Meshaka et al. (2004) report *T. mauritanica* from Broward, Miami-Dade, and Lee counties; however, they did not provide a specific locality nor voucher. On 7 June 2009 at 2236 h, CRG and DC collected an adult *T. mauritanica* (photographic voucher UF 157285; MorphoBank M88647; Fig. 56) on a wall just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 20 May 2010 at 2000 h, DC and Ana M. Martinez collected a neonate (5 mm SVL) *T. mauritanica* (UF 157795) on a wooden curb at this same site. On 2 June 2010 at 2100 h, CRG observed an adult and collected a juvenile (53 mm SVL; UF 164378) *T. mauritanica* on a wall at this same site. On 20 August 2010 at 2215 h, GNK, CRG, and Stuart F. Willicombe observed an adult *T. mauritanica* at this same site, but it escaped capture. This species likely was released or had escaped (stage 2) from enclosures, and the presence of a juvenile along with multiple adults suggests reproduction (stage 3) in the wild. This represents the first known vouchers for this species in Florida.

**TEIIDAE**

The Red Tegu, *Tupinambis rufescens* (Günther 1871), is indigenous to somewhat xeric regions of southeastern Brazil, Bolivia, southward to Paraguay, Argentina and Uruguay (Fitzgerald et al. 1991; Ávila-Pires 1995). On 14 August 2007, Doug Jones photographed an adult *T. rufescens* (photographic voucher UF 151510; MorphoBank M88648; Fig. 57) at 3 Mandershaw Lane, Punta Gorda, Charlotte County (26.99959°N, -81.89523°W). On 20 September 2007, John Galvez photographed an adult *T. rufescens* (photographic voucher UF 151743) on SW 232nd Avenue, 6.8 km south of State Road 9336, Miami-Dade County (25.3365°N, -80.56572°W). This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

The Gold Tegu, *Tupinambis teguixin* (Linnaeus 1758), is broadly indigenous to tropical regions of eastern and central South America (Ávila-Pires 1995), and was intentionally introduced to the island of San Andrés, Columbia, by the release of juveniles from a pet trade shipment in 1984 (Fitzgerald et al. 2005). In 1990, an adult (ca. 1066 mm TL) *T. teguixin* was found after it escaped from its enclosure in Casselberry, Seminole County (Anonymous 1990), but no voucher was taken. Meshaka et al. (2004) stated that *T. teguixin* was observed in Everglades National Park (also see Butterfield et al. 1997), North Miami, and near Key Biscayne, Miami-Dade County, but they did not provide a specific locality nor voucher. In 1995, Brian E. Worthington captured an adult *T. teguixin* (UF 153696) inside a chicken coop at 3820 NW 65th Avenue, Hollywood, Broward County (26.04296°N, -80.22056°W). This
specimen likely was released or had escaped (stage 2) from the nearby animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 21 July 2006, Valerie Cassidy photographed an adult *T. teguixin* (photographic voucher UF 149983; MorphoBank M88649; Fig. 58) in Crandon Gardens, Crandon Park, Key Biscayne, Miami-Dade County (25.70431°N, -80.15788°W) (Krysko et al. 2010a). We did not find this species in our ongoing surveys of this area from 1992–present (Krysko et al. 2010a), suggesting that it was a recent release (stage 2) at this site. Tegus (*Tupinambis* sp.) were supposedly observed at the old Crandon Park Zoo before it closed in 1979 (Ernie Lynk and Steve Conners personal communication); however, we suspect that these might have been the commonly observed *Ameiva ameiva* (Smith & Krysko 2007; Krysko et al. 2010a). On 11 June 2008, Jennifer Eells collected an adult (355 mm SVL, 970 mm TL) male *T. teguixin* (UF 152989, EVER 44945) at the Everglades National Park Headquarters, Parachute Key, Miami-Dade County (25.39614°N, -80.58433°W). On 20 August 2009, Dallas Hazelton and Tony Pernas captured an adult (301 mm SVL) male *T. teguixin* (UF 155723) in a live trap baited with egg oil and marshmallow on SW 187th Avenue, 0.5 km south of SW 360th Street, Florida City, Miami-Dade County (25.42853°N, -80.49338°W). On 7 November 2007, Tatiana Staats found an adult *T. teguixin* (photographic voucher UF 155487) at 8500 Midnight Pass Road, Siesta Key, Sarasota County (27.22651°N, -82.51865°W). On 11 March 2008, Harry Phillips found an adult *T. teguixin* (photographic voucher UF 152526) dead in a swimming pool at 4328 SW 7th Avenue, Cape Coral, Lee County (26.57102°N, -81.98876°W). This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

**LACERTIDAE**

The Japanese Grass Lizard, *Takydromus tachydromoides* (Schlegel 1838), is indigenous to Japan (Mathui 1985). On 29 August 2009 at 2258 h, CRG and DC collected an adult (54.1 mm SVL) *T. tachydromoides* (UF 157202; MorphoBank M88650; Fig. 59) in an open grassy field just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 5 December 2009, CRG and DC collected, but did not voucher, another adult *T. tachydromoides* at this same site. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this family and species in Florida.

**SCINCIDAE**

The Ocellated Skink, *Chalcides ocellatus* (Forskål 1775), is indigenous to sub-Saharan Africa, the Mediterranean, and Middle East (Schleich et al. 1996), and it has been introduced to France and Great Britain, and established in Italy (Kraus 2009). In 1999, John Decker collected a juvenile *C. ocellatus* (photographic voucher UF 135284) in Miramar, Broward County (25.987306°N, -80.232268°W). We are uncertain of the introduction pathway of this species there, but for years Glades Herp Farm, Inc. has purchased wild collected *C. ocellatus* from Miramar for resale in the pet trade (Rob Roy MacInnes personal communication), suggesting that it is or was established (stage 3) there. However, we do not have any evidence of establishment at this time. Between August and September 2004, Jay P. Marino, Jr., collected >4 adult *C. ocellatus* (three vouchers deposited UF 142588–90, 97.9 mm, 102.3 mm, and 83.4 mm SVL, respectively) in a grassy yard with anthropogenic debris at 7335 Gulf Highlands Drive, New Port Richey, Pasco County (28.326616°N, -82.692759°W). On 22 November 2004 at 1310 h, KLK and KME visited this site and collected a juvenile (67.7 mm SVL) *C. ocellatus* (UF 142587; MorphoBank M88651; Fig. 60) under a rock on sandy soil alongside a neighbour’s house. We were unable to determine the source of these animals, but the presence of numerous adults and juveniles suggests that reproduction has occurred (stage 3) in this neighborhood, which consists of many similar houses with small yards. The adjacent neighbor had also observed this semi-fossorial species in his yard (Anonymous personal communication). This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

Cunningham’s Skink, *Egernia cunninghami* (Gray 1832), is indigenous to southeastern Australia (Cogger 2000), and it has been unsuccessfully introduced to New Zealand (Kraus 2009). On 10 October 2008, Kurt W. Larson
collected an *E. cunninghami* (92 mm SVL, 163 mm TL; photographic voucher UF 153760; MorphoBank M88652; Fig. 61) in the kitchen of a residence at 2649 Andros Lane, Kissimmee, Osceola County. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.


The Fire Skink, *Lepidothyris fernandi* (Burton 1836), is indigenous to a widespread region of sub-Saharan Africa, from Guinea and Liberia, east to Kenya and Uganda, and as far south as Angola (Spawls et al. 2002). On 13 June 2008 at 2330 h, MRR *et al.* collected an adult *L. fernandi* (photographic voucher UF 153513; MorphoBank M88653; Fig. 62) in grass along a wall just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.
The Eastern Bluetongue Skink, *Tiliqua scincoides* (White 1790), is indigenous to a widespread region of northern, eastern and southeastern Australia, and portions of New Guinea, including urban and suburban habitat (Cogger 2000; Koenig et al. 2001), and it has been introduced to New Zealand (Kraus 2009). Gibbons et al. (2009) hypothesized that *T. scincoides* could be introduced to Florida through the pet trade. On 15 November 2007, Robert Mondgock collected an adult *T. scincoides* (photographic voucher UF 152392; MorphoBank M88654; Fig. 63) at 623 SW 28th Terrace, Cape Coral, Lee County (26.599023°N, -81.987423°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

**CORDYLIDAE**

The Gorongosa Girdled Lizard, *Cordylus mossambicus* FitzSimons 1958, is indigenous to the Gorongosa Mountains of Mozambique and a limited region of the Chimanimani Mountains in Zimbabwe (Branch 1998). In September 2006, JPB photographed a *C. mossambicus* (photographic voucher UF 153698; MorphoBank M88655; Fig. 64) in Crandon Gardens, Crandon Park, Key Biscayne, Miami-Dade County (25.704317°N, -80.157883°W) (Krysko et al. 2010a). Donald Broadley tentatively identified this species as the Cape Crag lizard, *Pseudocordylus microlepidotus* (Cuvier 1829) (see Krysko et al. 2010a), a species not legally imported and native to the Republic of South Africa (Alexander & Marais 2007). However, we now recognize this as *C. mossambicus* after further consideration because it is a commonly imported species and was re-identified by Philipp Wagner. This further demonstrates the superiority of voucher specimens over photographs. We did not find this species at any other times during our ongoing surveys of Crandon Park from 1992–present (Krysko et al. 2010a), suggesting it is a recent introduction. This species likely was released (stage 2). This represents the first known voucher for this family and species in Florida.

**VARANIDAE**

The East African White-throated Monitor, *Varanus albigularis microstictus* Boettger 1893, is indigenous to a broad region of eastern Africa (Phillips 2004). On 30 November 2007, Guy Gilbert photographed a *V. a. microstictus* (photographic voucher UF 152520) at a nursery on SW 168th Street, between State Road 997 and L-31 Canal, Miami, Miami-Dade County (25.60876°N, -80.495011°W). On 11 July 2008, Reif Smith and Phillip Hughes found a *V. a. microstictus* resting on a wooden porch attached to an abandoned house on Ocean Drive, 0.45 km south of Overseas Hwy, Summerland Key, Monroe County (24.65709722°N, -81.43875277°W). This adult (685 mm SVL) specimen was captured, euthanized, photographed (photographic voucher UF 153409; MorphoBank M88656; Fig. 65), and discarded. During dissection, this specimen was found to be gravid with at least 24 oviducal eggs. This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

The Pacific Mangrove Monitor, *Varanus indicus* (Daudin 1802c), is indigenous to sections of northern Australia and New Guinea, and numerous surrounding Pacific islands from the Marshall Islands westward to the Moluccas and Timor, as far north as the Japanese Bonin Islands (Dryden & Ziegler 2004). Kraus (2009) lists populations in the Marshall Islands, and portions of Micronesia and the Marianas as successful non-indigenous introductions. On 14 September 2010, Bruce Dangerfield collected an adult (107 cm TL) *V. indicus* (photographic voucher UF 160345; MorphoBank M88657; Fig. 66) in a tree at the Dogs For Life Dog Park, 1230 16 Avenue, Vero Beach, Indian River County (27.62445°N, -80.40104°W). This species likely was released or had escaped (stage 2) from an enclosure. This is the first known voucher for this species in Florida.

The Peach-throated Monitor, *Varanus jobiensis* Ahl 1932, is indigenous to New Guinea and its offshore islands (Philipp et al. 2004). In October 2008, James Mendenhall collected a *V. jobiensis* (photographic voucher UF 154404; MorphoBank M88658; Fig. 67) in a tree at the Cypress Lakes Golf Course, Lakeland, Polk County (28.176°N, -82.0043°W). This species likely was released or had escaped (stage 2) from an enclosure. This is the first known voucher for this species in Florida.
The Crocodile Monitor, *Varanus salvadorii* (Peters & Doria 1878 in Peters *et al.* 1878), is indigenous to the island of New Guinea (Horn 2004). On 16 September 2009, an adult (2.43 kg, 565 mm SVL, 1760 mm TL) male *V. salvadorii* (photographic voucher UF 159511; MorphoBank M88659; Fig. 68) was collected at the American Airlines Cargo warehouse building 714, Miami International Airport, Miami, Miami-Dade County (25.79021°N, -80.29582°W), and subsequently donated to Zoo Miami. This species likely had escaped (stage 2) from an enclosure. This is the first known voucher for this species in Florida.

The Water Monitor, *Varanus salvator* (Laurenti 1768), is indigenous throughout most of southeastern Asia, including Malaysia, Indonesia and its surrounding islands, eastern India, Sri Lanka, the Nicobar Islands, the Philippines, and southernmost China, and it adapts well to urban and agricultural habitats (Gaulke & Horn 2004; Horn & Gaulke 2004). It has been introduced to California, USA, and Taiwan (Lemm 2006; Kraus 2009). *Varanus salvator* has been reported from Miami (Beltz 1992) and the Homestead area, Miami-Dade County (Belleville 1994; Frank & McCoy 1995), and DeLand, Volusia County (Anonymous 1999), but no known voucher exists. On 14 June 1978, Roscoe Croley collected a DOR *V. salvator* (UF 65461; MorphoBank M88660; Fig. 69) at 7920 NW 71st Street, Gainesville, Alachua County (29.72085°N, -82.41804°W). On 29 May 2007, Anthony Flanagan photographed a *V. salvator* (photographic voucher UF 153959) along a canal at State Road 817 and Taft Street, Hollywood, Broward County (26.0236°N, -80.24869°W). On 29 October 2009, Dennis Volin photographed a *V. salvator* (photographic voucher UF 156969) at a retention pond on the Florida Turnpike at the Lake Worth Service Plaza, Lake Worth, Palm Beach County (26.63689°N, -80.17516°W). Additionally, a *V. salvator* was observed on Key Biscayne, Miami-Dade County, up until 1998, but has since disappeared (Ron St. Pierre personal communication; Krysko *et al.* 2010a) and no voucher exists. This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

**ACROCHORDIDAE**

The Javan File Snake, *Acrochordus javanicus* Hornstedt 1787, is indigenous to coastal areas from Thailand, Vietnam, Cambodia, and through Malaysia and the Greater Sunda Islands of Indonesia (Lillywhite & Ellis 1994; McDiarmid *et al.* 1999), although Trutnau (1986) claimed it occurs as far west as India. Loope *et al.* (2001:292) first mentioned *A. javanicus* in southern Florida (citing Paul E. Moler [FWC] personal communication), and this locality was erroneously referred to as University Lakes Trailer Park, Miami, Miami-Dade County, by Bartlett and Bartlett (2003) and Meshaka *et al.* (2004) based on intentional misinformation to these authors regarding the actual introduction site (JAW personal observation). In the early 1970s, an exotic animal importer, Bill Chase, released several adult *A. javanicus* into a former rock-mining pit in the center of Jones Trailer Park, on State Road 997, 1.2 km southwest of U.S. 27, Miami-Dade County (25.94137°N, -80.43777°W). Since then, on numerous occasions JAW has observed or captured *A. javanicus* in the rock pit both during the day and at night. In June or July of 1979 or 1980, JAW and Tamir Ellis captured five *A. javanicus* by hand in the rock pit: one ca. 120 mm TL, two ca. 900 mm TL, and two ca. 300 mm TL. One of these *A. javanicus* was maintained in a laboratory at the University of Florida and later given to FWC as a voucher, but this specimen had gone missing (Tamir Ellis personal communication). Circa 1990, at least two adult *A. javanicus* were caught on fishing gear using live fish as bait; one of these *A. javanicus* was caught by Bill Vath (personal communication) and subsequently observed by many people, including JAW and two FWC wildlife officers (David Roudebush personal communication), but the photograph could not be located. In 1998, an adult (ca. 2100 mm TL) *A. javanicus* was observed floating dead in the rock pit. Since then, at least two other *A. javanicus* have been observed alive, one in 2002 and one 2010, but no vouchers for this population have been deposited in a collection. During cold weather in December 2002, an unidentified person claimed to have collected five juvenile *A. javanicus* that were cold-stunned and floating in shallow water in the Tamiami Canal just west of Krome Avenue, Miami-Dade County (estimated at 25.76121°N, -80.49684°W) (R.D. Bartlett personal communication); however, this introduction is not credible and could not be verified. Nonetheless, three of these purported *A. javanicus* died within a couple of weeks; two of these were deposited as vouchers: UF 151593 (31.5 cm SVL; 38.4 cm TL) and UF 151594 (58.5 cm SVL; 71.2 cm TL). On 6 June 2011 at 2200 h, DC collected a juvenile (ca. 320 mm SVL) *A. javanicus* (photographic voucher UF 164361; MorphoBank M88677; Fig. 70) laying on a metal rod ca. 150 mm above the same puddle of water (see...
Hypselotriton orientalis account above) just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). Although this date is outside of the cutoff (2010) of this paper, we believe it is crucial and included herein because this is the first verifiable voucher specimen known from Florida. Additionally, in ca. May 2011, a neighborhood resident collected three other juvenile A. javanicus in this same puddle of water (DC personal observation). This species has now been found multiple times for nearly 40 years at Jones Trailer Park, and the presence of adults and juveniles suggests reproduction and establishment (stage 3) of this species there. This represents the first known voucher for this species in Florida.

The Argentine Boa Constrictor, *Boa constrictor occidentalis* Philippi 1873, is indigenous to Argentina, Paraguay, and southern Bolivia (McDiarmid et al. 1999; Savage 2002). On 7 December 2009, Christopher A. Vandello collected an adult (2480 mm SVL, 2696 mm TL, 9.83 kg) female *B. c. occidentalis* (UF 157190; MorphoBank M88661; Fig. 71) along rail road tracks, 0.43 km north of SE Walton Road, adjacent to Savannas Preserve State Park, Jensen Beach, St. Lucie County (27.3022°N, -80.25858°W). During necropsy, R.N. Reed (personal communication) observed corpora lutea and thickened oviducts, suggesting that this individual had reproduced recently, either in the wild or captivity. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this subspecies in Florida.

The Rainbow Boa, *Epicrates cenchria* (Linnaeus 1758), is indigenous to a widespread region of the Amazon Basin of South America, with a disjunct population in the Atlantic Forest of Brazil (Passos & Fernandes 2009), and it has been introduced to non-indigenous regions of Brazil and Chile (Eterovic & Duarte 2002; Kraus 2009). During the summer of 1997, KLK collected an adult (1045 mm SVL) *E. cenchria* (UF 123128; MorphoBank M88662; Fig. 72) at 2000 SW 16th Street, Gainesville, Alachua County (29.63401°N, -82.34339°W), which was kept in captivity by Matt Burgess until it died ca. two months later. On 2 April 2008, Brian Bahder collected a juvenile (ca. 450 mm TL) *E. cenchria* just outside the property of the animal importer's facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 12 July 2008, Marlyn Stone killed and photographed an adult (1370 mm TL) *E. cenchria* (photographic voucher UF 153464) after it was found coiled around a 10 month old domestic kitten at 7166 County Road 647, Bushnell, Sumter County (28.65193°N, -82.25576°W). This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

The Green Anaconda, *Eunectes murinus* (Linnaeus 1758), is widely distributed in South America, including most tropical, lowland habitats east of the Andes mountain range (Rivas et al. 2007). On 8 December 2004, Lisa Andrews collected a juvenile (2110 mm SVL, 2420 mm TL) male *E. murinus* (UF 143935; MorphoBank M88663; Fig. 73) DOR on US Highway 41, 14.48 km west of State Road 29, Fakahatchee Strand Preserve State Park, Collier County (25.93532°N, -81.45312°W). On 13 January 2010, the Osceola County Sheriff’s Office collected an adult (3650 mm TL) *E. murinus* (photographic vouchers UF 157189) at East Lake Fish Camp, 3705 Big Bass Road, Kissimmee, Osceola County (28.32844°N, -81.29282°W). This snake sought refuge inside a culvert leading to a pond, and it was believed to be the perpetrator in the disappearance of many non-indigenous Muscovy Ducks (*Cairina moschata*) in the area. Anecdotes exist for more *E. murinus* sighted in the Everglades region, but these are not supported by vouchers (see Reed & Rodda 2009). As with *E. notaeus* below, we are concerned that the Fakahatchee Strand individual might represent the first sign of an established, cryptic, aquatic species, especially in the remote and vast Everglades. This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

The Yellow Anaconda, *Eunectes notaeus* Cope 1862c, is indigenous to Brazil, Bolivia, Paraguay, and northern Argentina (McDiarmid et al. 1999; Waller et al. 2007). On 30 January 2007, a Florida Division of Forestry employee collected an adult male (2060 mm SVL, 5.06 kg mass) *E. notaeus* (BICY 530, UF 152688; MorphoBank M88664; Fig. 74) basking on the road shoulder on State Road 94, 8.05 km south of US Highway 41, Sweetwater Slough, Big Cypress National Preserve, Monroe County (25.78849°N, -81.09992°W). On 23 January 2008, Michael W. Swann photographed an *E. notaeus* (photographic voucher UF 151160) basking on a canal bank on State Road 29, 0.55 km north of I-75, Big Cypress National Preserve, Collier County (26.15999°N, -81.34499°W). There are anecdotes of other *E. notaeus* being collected close to the Palm Beach County line and sold to a pet dealer/breeder, but no voucher exists (see Snow [personal communication] in Reed and Rodda 2009). As with *E. murinus* above, we are concerned that these Big Cypress individuals might represent the first signs of an established, cryptic, aquatic species, especially in the remote and vast Everglades. This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

BOIDAE
The Egyptian Sand Boa, *Gongylophis colubrinus* (Linnaeus 1758), is indigenous to xeric regions of sub-Saharan central and eastern Africa (McDiarmid et al. 1999; Spawls et al. 2002). On 14 August 2007, Midge Jolly collected a *G. colubrinus* (photographic voucher UF 151512; MorphoBank M88665; Fig. 75) from inside a washing machine at a private residence on the western end of Watson Boulevard, Big Pine Key, Monroe County (24.69077°N, -81.37385°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.
The West African Sand Boa, *Gonglyphis muelleri* Boulenger 1892, is indigenous to Saharan and sub-Saharan Africa, from Sierra Leon, Mauritania and Senegal, eastward through Chad and western Sudan (McDiarmid et al. 1999). On 23 February 2009, an unknown resident found an adult (560 mm TL) female *G. muelleri* (photographic voucher UF 155335; MorphoBank M88666; Fig. 76) that was killed by a domestic cat on Poinciana Road, 0.04 km west of Avenue B, Big Pine Key, Monroe County (24.68746°N, -81.35849°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

**PYTHONIDAE**

The Reticulated Python, *Broghammerus reticulatus* (Schneider 1801), is widely distributed in a broad region throughout tropical southeastern Asia (Pope 1961; Shine et al. 1999; Reed & Rodda 2009), and it has been introduced to California, Colorado, Massachusetts, and Hawaii, USA, and Germany, and the Canary Islands (Kraus 2009). Meshaka et al. (2004) reported that *B. reticulatus* has been sighted several times in mangrove forests just north of Flamingo, Everglades National Park, Monroe County, but did not provide a voucher. On 18 August 1989, JAW, Todd Hardwick, Tom McClellan and Felix Valde collected an adult (6100 mm TL) female *B. reticulatus* (photographic voucher UF 163091) under a house on NE 19th Street, Fort Lauderdale, Broward County (26.15308°N, -80.103578°W), which received widespread publicity in the media and popular books (see Neil & Dampier 1989; Carmichael & Williams 1991). On 14 May 2007, Steven Bierman found a *B. reticulatus* (photographic voucher UF 151206) dead in a swimming pool filter at 5055 Gulf of Mexico Drive, Longboat Key, Manatee County (27.405556°N, -82.652375°W). On 22 September 2009, John Rivard collected an adult (3050 mm TL) *B. reticulatus* (photographic voucher UF 155856) at 150 Highland Avenue SE, Largo Central Park Nature Preserve, Pinellas County (27.91216°N, -82.77243°W). On 18 August 2010 at 930 h, Dallas Hazelton et al. collected an adult (5296 mm SVL, 5540 mm TL, 59.4 kg) female *B. reticulatus* (UF 159335; MorphoBank M88667; Fig. 77) in one of the few remaining undeveloped tracts of pine rockland habitat, 0.45 km northeast of SW 176th Street and 137th Avenue, Miami, Miami-Dade County (25.607502°N, -80.410902°W). This *B. reticulatus* was donated to Zoo Miami. These species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

Parker’s Python, *Leiopython fredparkeri* Schleip 2008, is indigenous to central Papua New Guinea (Schleip 2008). On 20 December 2006, David Roudebush was given an adult (1610 mm SVL, 1588 g) male *L. fredparkeri* (UF 159916; MorphoBank M88668; Fig. 78) collected DOR at the entrance of Founders Park Watersports, 87000 Overseas Highway, Islamorada, Monroe County (24.96024°N, -80.56841°W). This species likely was released or had escaped (stage 2) from an enclosure. These represent the first known vouchers for this species in Florida.

The Carpet Python, *Morelia spilota* (Lacépède 1804), is indigenous to much of continental Australia, except southern Victoria and arid central and western regions (Shine & Fitzgerald 1996; Cogger 2000). On 30 December 2009, Amanda Burke found an adult (1830 mm SVL) *M. spilota* (photographic voucher UF 157128) DOR at 91 Place North, 0.5 km west of Banyan Boulevard, Loxahatchee, Palm Beach County (26.81206°N, -80.30834°W). On 24 July 2010, Skip Snow recovered an adult (1372 mm SVL, 1584 mm TL) *M. spilota* (UF 159553; MorphoBank M88669; Fig. 79) from inside a residential clothes dryer vent 11360 SW 60th Avenue, Miami, Miami-Dade County (25.66571°N, -80.29053°W). This species likely was released or had escaped (stage 2) from enclosures. These are the first vouchers for this species in Florida.

The Ball Python, *Python regius* (Shaw 1802), is indigenous to much of central and western-central Africa (Barker & Barker 2006), and it has been introduced to California, Colorado, and Hawaii, USA, the Canary Islands, St. Maarten, Brazil, and Germany (Eterovic & Duarte 2002; Lemm 2006; Kraus 2009). Beltz (1995) first reported the introduction of *P. regius* in Florida from Mount Dora, Lake County, and Bartlett and Bartlett (2003, 2006c) listed this species from Santa Rosa, Leon, Duval, Alachua, Pinellas, Orange, Glades, Brevard, Lee, Collier and Miami-Dade counties, but these authors did not provide specific localities and/or vouchers. On 17 July 2009 at 0430 h, Donna Durham found an adult (ca. 1220 mm TL) *P. regius* (photographic voucher UF 155527) on the floor inside a house at 2204 Clover Ridge Court, Eagle Lake, Polk County (27.98309°N, -81.74835°W). On 24 May 2010, Binion...
Waters collected an adult (1097 mm SVL, 1177 mm TL) *P. regius* (UF 159625) DOR on SE 27th Street, 0.09 km south of State Road 20, Gainesville, Alachua County (29.6418°N, -82.2892°W). On 6 June 2010, Shaye Winter collected a gravid adult (1097 mm SVL, 1177 mm TL; six oviducal eggs) *P. regius* (UF 157835) DOR on Harbor Shores Road, 0.12 km north of Lake Bradley Drive, Grand Island, Lake County (28.86599°N, -81.75308°W). On 7 January 2008, Jean-Paul Metz collected an adult (755 mm SVL, 810 mm TL) female *P. regius* (photographic voucher UF 152563) at 120 Madeira Road, Islamorada, Monroe County (24.92240°N, -80.632082°W). On 1 October 2009, Joy Doumis collected an adult (1167 mm SVL, 106 mm tail length) male *P. regius* (UF 158959) at 63 Sombrero Beach Road, Marathon, Vaca Key, Monroe County (24.69296°N, 81.08107°W). On 24 July 2010, Donna Allen collected a *P. regius* (photographic voucher UF 158775) DOR on NE Boca Bay Colony Drive, Palm Beach County (26.41523°N, -80.07282°W). On 11 January 2008, Daniel Walsh photographed an adult (92.5 cm TL) *P. regius* (photographic voucher UF 152562) that was killed by a fisherman at the water-control structure G-123, US Highway 27, 0.5 km north of I-75, Broward County (26.149825°N, -80.44218611°W). On 19 January 2008 at 1627 h, MRR collected an adult *P. regius* (photographic voucher UF 152572; MorphoBank M88670; Fig. 80) under plastic sheeting on College Avenue, along a canal between the Broward Fire Academy and the University of Florida, Fort Lauderdale Research and Education Center, Davie, Broward County (26.086176°N, -80.24082°W). On 2 April 2008, Brian Bahder, Nigel Watson and Nathan H. Nazdrowicz found five *P. regius*, at least one of which was collected but not vouchered, at night just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). On 3 April 2008, these three people returned to this same site and collected, but did not voucher, two additional *P. regius*. On 8 April 2008 at 1030 h, MRR and Brian Bahder returned to this same site and collected, but did not voucher, four *P. regius*. On 8 April 2009, MRR returned to this same site and collected an adult *P. regius* (photographic voucher UF 152809). On 11 December 2009 at 2030 h, CRG, DC, MRR and GNK visited this same site and collected, but did not voucher, two adult *P. regius*. On 5 November 2010 at 1818 h, MRR visited this same site and found three *P. regius*; two were dead (photographic vouchers UF 163087–88) and one collected alive (UF 163089; male, 610 mm SVL, 660 mm TL). All of these snakes were found just outside the property of the facility in the grass, hanging from wall vents, or inside PVC pipes. Although there is currently no evidence of reproduction (stage 3), we believe that there should be a concern given the propagule pressure (i.e., number of snakes being found in the wild), and especially those coming from a single invasion pathway and locality. This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

**COLUBRIDAE**

The Gray Banded Kingsnake, *Lampropeltis alterna* (Brown 1901), is indigenous to an extremely limited region of southeastern New Mexico, southwestern Texas, and southward into Mexico including the states of Coahuila, eastern Chihuahua, western Nuevo León, Zacatecas, and eastern Durango (Ernst & Ernst 2003). This species has been introduced to Hawaii and Florida (Kraus 2009); however, no known voucher exists for Florida. On 25 May 2010, an adult (390 mm SVL) female *L. alterna* (photographic voucher UF 158776; MorphoBank M88671; Fig. 81) was found in a parking lot at 851 North Maitland Avenue, Maitland, Orange County (28.63561°N, -81.36607°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The California Kingsnake, *Lampropeltis californiae* (Blainville 1835), is indigenous to western and southwestern North America, from southern Oregon to Baja California, and eastward to Utah, Arizona, and southwestern Colorado (Stebbins 2003; Krysko & Judd 2006; Pyron & Burbrink 2009), and it has been introduced to Brazil (Eterovic & Duarte 2002), Grand Canary (Pether & Mateo 2007), and possibly (i.e., we could not determine because of the recent taxonomic split from *L. getula*) Great Britain, and California, Hawaii, Massachusetts and Virginia (Kraus 2009). Bartlett and Bartlett (2003, 2006c) claimed that this species has been found in Leon, Duval, Alachua, Hillsborough, Pinellas, Lee, Collier, Monroe, Hendry, Broward and Miami-Dade counties, but provided no specific locality nor voucher. In September 1992, KLK collected an adult *L. californiae* after Hurricane Andrew in Homestead, Miami-Dade County, but no voucher was deposited. In 2002, Lindsay Pike collected a juvenile
L. californiae (UF 135053; MorphoBank M88672; Fig. 82) DOR on County Road 672, Hillsborough County (27.7926°N, -82.3798°W). On 4 January 2010, Ari Triest collected an adult (ca. 914 mm TL) L. californiae (photographic voucher UF 157279) at 10015 Park Boulevard, Lake Seminole Park, 0.06 km northwest of the park entrance, Seminole, Pinellas County (27.83997°N, -82.77453°W). On 20 June 2010 at 1145 h, Michael Bozich collected an adult L. californiae (photographic voucher UF 157945) at 16730 79th Court North, Loxahatchee, Palm Beach County (26.79295°N, -80.30677°W). This species likely was released or had escaped (stage 2) from enclosures. These represent the first known vouchers for this species in Florida.

The Honduran Milksnake, *Lampropeltis triangulum hondurensis* Williams 1978, is indigenous to the Caribbean versant of Honduras south to Costa Rica (Williams 1988). Various *L. triangulum* subspecies have been introduced to California, Indiana and Massachusetts, USA, and Brazil (Eterovic & Duarte 2002; Kraus 2009). On 10 February 2009 at 2300 h, CRG and DC collected a neonate hypomelanistic *L. t. hondurensis* (556 mm SVL, 633 mm TL; UF 157203; MorphoBank M88673; Fig. 83) on a stump of Brazilian Pepper (*Schinus terebinthifolius*) just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Sinaloan Milksnake, *Lampropeltis triangulum sinaloae* Williams 1978, is indigenous to Mexico from southwestern Sonora, southwest through Sinaloa to near the southern border of Nayarit, and into southwestern Chihuahua (Williams 1988). On 10 February 2009 at 2100 h, CRG and DC collected a juvenile (325 mm SVL) *L. t. sinaloae* (UF 155625; MorphoBank M88674; Fig. 84) just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This live *L. t. sinaloae* was located and captured after observing a feral cat (*Felis domesticus*) trying to consume it. This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Texas Ratsnake, *Pantherophis obsoletus* (Say 1823), is indigenous to North America from Texas and Louisiana, north to Minnesota (Burbink 2001). Various *P. obsoletus* subspecies (*sensu lato*) have been introduced to Massachusetts, Maryland and North Carolina, USA, the Bahamas, Brazil, and Great Britain (Eterovic & Duarte 2002; Kraus 2009). On 2 March 2009 at 2300 h, CRG and DC collected a juvenile (280 mm SVL) amelanistic *P. obsoletus* (UF 155624; MorphoBank M88675; Fig. 85) coiled approximately 0.3 m above ground on a chain-link fence just outside the property of the animal importer’s facility at 6450 Stirling Road, Hollywood, Broward County (26.04591°N, -80.21976°W). This species likely was released or had escaped (stage 2) from an enclosure. This represents the first known voucher for this species in Florida.

The Louisiana Pinesnake, *Pituophis ruthveni* Stull 1929, is indigenous to a small region of western Louisiana and adjacent eastern Texas (Rodríguez-Robles & De Jesús-Escobar 2000; Ernst & Ernst 2003). On 16 May 2010 at 1645 h, an adult (1302 mm SVL, 1486 mm TL) gravid female *P. ruthveni* (UF 157954; MorphoBank M88676; Fig. 86) was collected near exhibits at Zoo Miami, Miami, Miami-Dade County (25.60395°N, -80.4006°W). On 22 June 2010, this female oviposited three eggs; one egg went full-term and was opened on 14 September 2010 to reveal a dead, fully-developed embryo (UF 164295). On 25 December 2010 at 1215 h, another adult (male, 1425 mm SVL, 1635 mm TL) *P. ruthveni* (UF 163092) was collected by Oscar Rodriguez in an undeveloped area at Zoo Miami (25.60304°N, -80.40295°W), 0.26 km southwest of the first *P. ruthveni*. This species likely was released (stage 2) by a zoo visitor. This represents the first known voucher for this species in Florida.

Acknowledgments

We truly thank Ray and Mike Van Nostrand (Strictly Reptiles) for allowing us to survey their property; Javier Borroto (Aycock Veterinary Clinic) for permission to collect specimens on their property adjacent to Strictly Reptiles. For field work, vouchers, identification verifications and specific species information we thank Mark M. Lucas (*Pachytriton labiatus*), Keiley Huerff, Ethan R. Nielsen, and Ari Triest (*Bombina orientalis*), Michael Cravens and Nathan H. Nazdrowicz (*Kaloula pulchra*), David Begley (*Duttaphrynus melanostictus*), Arne Schiotz and Johan Marais (*Afrixalus fornasini*), Ana M. Martinez (*Litoria caerulea*), J. Frankel, Rick Stokes, and M. Thurmond (*Pseudacris sierra*), Jake Edwards, Suzanne Hurley and Brain Machovina (*Amphiuma tridactylum*), Christopher Boykin, Frank Ridgely, Catherine A. Smith, John B. Iverson and Peter A. Meylan (*Chrysemys dorsalis*), O. C. Van Hyning, John B. Iverson and Peter A. Meylan (*Chrysemys picta bellii*), T. Carr, John B. Iverson and Peter A. Meylan (*Chrysemys picta picta*), Christopher Boykin, Frank Ridgely, Anthony T. Reppas, Catherine A. Smith, Amir Soleymani, Anthony Lau, Chris Lecowicz and Jerry Johnston (*Graptemys pseudogeographica*), Christopher Boykin, Elizabeth A. Golden, Frank Ridgely, Catherine A. Smith, Jennifer Johnston and Jerry Johnston (*Trachemys scripta scripta*), Jake Edwards, William Johnson, and Kristina Serbesoff-

**References**


Island, Florida, USA, 399 pp.


5, 1–547.


Pimentel, D., Zuniga, R. & Morrison, D. (2005) Update on the environmental and economic costs associated with alien-inva-


