AMPHIBIAN AND REPTILE TRADE IN TEXAS:

CURRENT STATUS AND TRENDS

A Thesis

by

HEATHER LEE PRESTRIDGE

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

August 2009

Major Subject: Wildlife and Fisheries Sciences

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Approved by:

Chair of Committee,	Lee A. Fitzgerald
Committee Members,	James R. Dixon
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ABSTRACT

Amphibian and Reptile Trade in Texas: Current Status and Trends.

(August 2009)

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Chair of Advisory Committee: Dr. Lee A. Fitzgerald

The non-game wildlife trade poses a risk to our natural landscape, natural heritage, economy, and security. Specifically, the trade in non-game reptiles and amphibians exploits native populations, and is likely not sustainable for many species. Exotic amphibian and reptile species pose risk of invasion and directly or indirectly alter the native landscape. The extent of non-game amphibian and reptile trade is not fully understood and is poorly documented. To quantitatively describe the trade in Texas, I solicited data from the United States Fish and Wildlife Service's (USFWS) Law Enforcement Management Information System (LEMIS) and Texas Parks and Wildlife Department's (TPWD) non-game dealer permits. I surveyed amphibian and reptile pet owners, breeders, Internet sites, pet shops, and meat and seafood establishments by visits, electronic surveys, and observations.

The trade in exotic species of amphibians and reptiles in the state of Texas was found to be popular in two ways; the importation of wildlife products and sale of live specimens for pets. Persisting in the pet trade were species known to be exotic, a problem made worse by lack of regulations governing the import, export, and keeping of

exotic species. Trade in wild collected native species was primarily for export to foreign countries. Collection of turtles from the wild in Texas was heavy until 2008, when TPWD restricted collection to private waters. Collection of other species from the wild was minimal, with the exception of the Western Diamond-backed Rattlsnake (*Crotalus atrox*) for rattlesnake roundups. Native species were found to exist in the pet trade, but primarily as genetic color variants that do not occur in the wild, an indication that captive breeding may be relieving pressures on wild caught specimens.

Minor changes in reporting requirements and permitting systems at the state and federal level would improve the management of exotic and native amphibians and reptiles that persist in the trade. Changes that include standardized taxonomic reporting requirements at state and federal level, streamlined permitting system for individuals wishing to collect from the wild in Texas, bag limits and seasons for wild collection, increased reporting requirements for owners of exotics, and enforcement of reporting errors would aid in management of exotic and native amphibians and reptiles in the trade.

DEDICATION

This project is dedicated to the responsible amphibian and reptile breeders, owners, and enthusiasts who wish to keep their rights to enjoy their hobby.

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I would like to thank my committee chair, Lee A. Fitzgerald, for the opportunity to further my academic career. My committee members, James “Doc” Dixon, Toby J. Hibbitts, and Uli Gretzel for their patience, advise, and support throughout the course of this project. My trusty, independent, student worker, Rachel Blodgett should receive thanks for all of her hard work and dedication to this project and for her help in wading through data.

Thanks also go to my friends and colleagues and the department faculty and staff for making my time at Texas A&M University a great experience. I would like to acknowledge Ms. Circee Pieters at United States Fish and Wildlife Service and Mr. Jon Purvis at Texas Parks and Wildlife Department for their collaboration in data mining. I also want to extend my gratitude to Dr. Matt Wagner at Texas Parks and Wildlife Department, who, during the course of this project was charged with regulating the trade in reptiles and amphibians in the state. Texas Parks and Wildlife Department should also be acknowledged for providing the funding for the project.

Thanks to my mom, dad, grandmother, uncle, and sisters for their encouragement and enthusiasm for my further education. Finally, thanks and love to my husband Byron for his patience and support throughout the entire process.

NOMENCLATURE

LEMIS	Law Enforcement Management Information System
TPWD	Texas Parks and Wildlife Department
USFWS	United States Fish and Wildlife Service

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CHAPTER I

INTRODUCTION

The trade in wildlife and wildlife products is valued at tens of billions of dollars per year and involves thousands of wild species (USFWS Trade Overview 2003). Unsustainable and illegal trade is considered a primary threat to many species (Klemens and Thorbjarnarson 1995, Gibbons et al. 2000). In a 2003 report, the United States Fish and Wildlife Service summarized data from their Law Enforcement Management Information System (LEMIS) – a wildlife import/export database that records all reported wildlife shipments entering or leaving the United States. Their analysis included a coarse grain view of the trade in live wildlife and wildlife products involving the United States and reported: number of annual imports and exports, volume of imports and exports, top wildlife trade partners, scope of and most frequently traded species in the live animal trade, and trends in each area during their review period of 1997 to 2003. Additionally, they examined 60 individual ports in finer detail including number of shipments per port per year, mode of transport per port, number of shipments per port, most traded commodities and species involved, and any significant trends per port. They reported that imports by number of shipments increased 41% from 1998 to 2003. Imports were reported as 90% of the total trade, indicating that the United States as a whole is more a consumer than producer of wildlife and their products. Live animal

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This thesis follows the style of the Journal of Wildlife Management.

imports exceeded 235 million animals in 2003, which represented nearly 30% of all imports reported by number. They reported that live amphibians and reptiles imported in 2003 totaled 5,752,168 and 1,594,415 respectively. Consistently the top three species codes for live specimens exported per year were tropical fish (TROP) averaging 22.75 million, Red-eared Sliders (STUR) averaging 6.85 million, and mink (MINK) averaging 4.37 million. As an exporter, Texas ports ranked high in number of export shipments for 1998-2003. Dallas, El Paso, Laredo, Houson, and Brownsville ranked 6th, 22nd, 24th, 27th, and 36th respectively and totaled 9,134 shipments for this period. For imports, Texas ports also ranked high. Dallas, Houston, El Paso, Laredo, and Brownsville ranked 8th, 21st, 28th, 39th, and 40th respectively and totaled 28,652 import shipments (USFWS Overview 2003).

A problem inherent to the USFWS reporting system is that multiple codes refer to the same species and affects the numbers of Red-eared Sliders reported in both import and export situations. Both TSCE and TSCR can refer to Red-eared Sliders, as can the code for *Pseudemys sp.*. Schlaepfer et. al. (2005) reported similar issues with the use of LEMIS data in evaluating the impact of the trade in amphibians and reptiles on their wild populations. Inconsistency in code usage coupled with synonomus taxonomy and on-the-fly entry by inspectors makes LEMIS data difficult to analyze. Many shipments reporded in the LEMIS database are of specimens only identified to genus, which impede the evaluation of impacts of trade on wild populations. Suggestions have been made to utilize the Taxonomic Serial Number (TSN) provided by the Integrated

Taxonomic Information System, but these changes have yet to be considered (Gerson et. al. 2008).

Analysis provided by USFWS did not include enough to determine which species may be in jeopardy and which species may be detrimental to native populations if escaped. They did not recognize that there is a difference in trade of wild caught animals versus captive or farm reared animals. An individual reading the report could easily draw conclusions about the pressure on native species from the wild when there may not be a realized demand for wild caught individuals. Supporters of captive propagation argue that captive breeding should be able to provide a reliable and sustainable supply of turtles and other species leading to a theoretical decrease in hunting of wild turtles (Reed and Gibbons 2002). While captive rearing may seem to be the reasonable answer to decreasing wild harvest of a species, there are issues associated with the practice. In China, turtle farms are the primary purchasers of adult animals harvested from the wild (Shi et. al. 2007). Wild stock is sought after because after years in captivity some species show marked decrease in reproductive capability. Additionally, not all species in the trade have life history traits that make them suitable for farming operations (Reed and Gibbons 2002). It is also plausible that species known to be invasive persist in the trade because of lack of regulation, but the analysis by USFWS did denote invasive species. As a whole, the USFWS Wildlife Trade Overview 1997-2003 is just that, an overview. Their report did not provide a fine enough analysis of wildlife trade to enable individual states to make management decisions.

Regulatory agencies including United States Fish and Wildlife, Food and Drug Administration, and Texas Parks and Wildlife Department manage the trade at different levels making it difficult to come up with a clear picture of the status and trends of the trade when using data from only one source. Beyond the Endangered Species Act (ESA) that provides blanket protection for many rare species, there are few federal regulations that govern the take and use of reptiles and amphibians. The Food and Drug Administration ban placed on the sale of turtles less than 4" in carapace length with the exception of specimens designated for foreign trade and educational, scientific, and display uses. That law is largely ignored by commercial vendors on the Internet and at herpetological expositions (Reed and Gibbons 2002). Texas Parks and Wildlife Department manages take in live amphibians and reptiles through their non-game collector and dealer permitting system. But few state regulations govern exotic species. Inconsistencies in inter-state regulations regarding amphibian and reptile trade make it difficult to protect the species in need of protection.

The United States in general and specifically Texas lack amphibian and reptile trade studies that use multiple sources of information to assess trade in both native and exotic species making it difficult to determine the extent of the trade, potential exploitation of native populations, and potential introduction of exotics. Involved are importers, exporters, amphibian and reptile breeders, on-line sources of live specimens, herpetological exposition promoters and vendors, collectors and dealers of native amphibians and reptiles, pet stores, meat and seafood establishments, and pet owners. Using data from multiple sources to paint a complete picture of the status and trends in

the amphibian and reptile trade in Texas, I will determine which species of native and exotic reptiles and amphibians are currently traded in Texas, describe and quantify trends in numbers of collectors and dealers, prices, quantities traded, and geographic foci where dealers and collectors operate, describe and quantify patterns of import, export of reptiles and amphibians to and from Texas, identify strengths and weaknesses of the current reporting system used by TPWD and USFWS and provide policy recommendations regarding monitoring procedures to provide for sustainable use of species existing in or entering into the trade.

Chapter II addresses the trade in exotic amphibians and reptiles in the trade specifically in Texas. Included in the analysis is a comprehensive list of species documented to be in the trade, import and export numbers for international shipments, an assessment of species that are popular in the pet trade, and identification of species that are known to be invasive but persist in the trade. Chapter III addresses the trade in native amphibians and reptiles in Texas. Included in the analysis is a comprehensive list of species documented to be in the trade, import and export numbers for international shipments, summary of aTPWD non-game dealer collections and purchases of native specimens, and an assessment of species that are popular in the pet trade. Both chapters include a review of the reporting requirements to USFWS and TPWD as they pertain to the species addressed in the chapter.

CHAPTER II

TRADE IN EXOTIC REPTILES AND AMPHIBIANS IN TEXAS

It is increasingly clear that establishment of invasive species of vertebrates, especially amphibians and reptiles, is linked to the commercial trade in these animals for pets and food (Goh and O'Riordan 2007, Westphal et al. 2008). As a result, environmental impacts resulting from pet trade are a concern in the USA and many countries. Exotic amphibian and reptile species in the pet trade pose a unique set of ecological risks to our landscape. They alter fundamental properties of communities and ecosystems through direct and indirect competition with native species (Mack et al. 2000). Populations of exotic species from the pet trade have become established in many regions of the world, including the United States. In Florida, at least 38 species of lizards, 4 snakes, 1 crocodilian, and 3 amphibians that are non-native have established breeding populations (Crother et al. 2008). Six species of exotic lizards are established in Texas. The Red-eared slider, *Trachemys scripta elegans,* is by far the most common species in the non-game wildlife trade in the United States (Salzberg 1995, Williams 1999). Meanwhile this species is currently banned for import by the European Union (Council Regulation (EC) No. 338/97 of 9 December 1996) because they were outcompeting and posing a threat to native European pond turtles. In contrast to Europe, few restrictions exist for exotics imported to the United States.

Yet, it is unknown how many additional secondary invaders are harbored within exotic amphibian and reptiles existing in the trade in Texas. Secondary invaders such as

ticks, mites, and other parasites hitchhike along with species in the live animal trade. Imported wild caught specimens often enter the trade without proper quarantine or examination for external parasites. In New Zealand, imports of *Trachemys scripta elegans* were banned because of the association of the species with *Salmonella* (Thomas and Hartnell, 2000). Burridge et al. (2000) reported finding exotic tick species in 91% of the establishments where exotic reptiles are housed in Florida. This is of great concern, as two of the tick species discovered were known vectors of heartwater disease, which is not present in North America but is lethal to deer, cattle, goats, and sheep. Chytrid fungus (*Batrachochytrium dendrobatidis*), a pathogen responsible for mass amphibian die-offs, is another example of the dangers of un-checked trade in exotic reptiles and amphibians. The fungus is thought to have originated from imported African clawed frogs (*Hymenochirus sp.)* traded for decades in the medical and pet industries (Daszak et al. 1999, Raverty and Reynolds 2001). This fungus has also been linked to Green Treefrogs (*Litoria caerulea*) and Poison Dart Frogs (*Dendrobates sp*.) which may spread the disease via the pet trade. Chytrid is now a major threat to amphibian populations globally (Raverty and Reynolds 2001, Pessier et al. 1999). Dwarf African Clawed-frogs (*Xenopus laevis*), a species known to be in the pet trade, can be a covert carrier of ranavirus (Robert et. al 2007). Ranavirus (*Iridoviridae*) is another disease associated with pet trade and is implicated in amphibian decline (Pearman and Garner 2005). Understanding the trade in amphibians and reptiles in Texas is an important first step in being aware of potential invasive species and secondary invaders.

Regulatory agencies including Food and Drug Administration (FDA), United States Fish and Wildlife (USFWS), and Texas Parks and Wildlife Department (TPWD) have taken different approaches to monitoring wildlife trade making it difficult to come up with a clear picture of the status and trends of the trade when using data from only one source. Beyond the Endangered Species Act (ESA) that provides blanket protection for listed species, there are few federal regulations that govern the use of exotic reptiles and amphibians. The FDA ban placed on the sale of all turtles less than 4" in carapace length with the exception of specimens designated for foreign trade and educational, scientific, and display uses. Therefore hatchling turtles have persisted in the trade. Restrictions due to this law have been largely ignored by vendors on the Internet and at herpetological expositions (Reed and Gibbons, 2002). In a 2004 report, the United States Fish and Wildlife Service (USFWS) summarized data from their Law Enforcement Management Information System (LEMIS) – a wildlife import/export database that records all reported wildlife shipments entering or leaving the United States (United States Fish and Wildlife Service 2004). Live amphibians and reptiles imported in 2003 totaled 5,752,168 and 1,594,415 respectively. For calendar year 2003 imports, Texas ports of Dallas, Houston, El Paso, Laredo, and Brownsville ranked 8th, 21st, 28th, 39th, and 40th respectively and totaled 28,652 import shipments (United States Fish and Wildlife Service 2004). However, analyses lack detail on trade of individual species and their uses. A piece of state legislation introduced in 2008 by TPWD, the "Controlled Exotic Snake" permit, requires owners and sellers of the 5 largest boids (*Python sebae, Python molurus, Eunectes murinus, Python reticulatus, and Python natalensis*) and/or all

exotic venomous snakes to be permitted (31 TAC §§55.651-65.656). This permitting system was set into place for the 2008 season, but no studies have documented the extent of trade in listed species.

The United States in general and specifically Texas lack studies that utilize multiple sources of information to assess trade in exotic amphibians and reptiles. Information from established reporting systems has never been coupled with data from other segments of the trade including surveys of pet owners and amphibian and reptile breeders. To gain insight into commercial trade in exotic amphibians and reptiles in Texas while considering information from multiple sources, I determined which species were traded and described and quantify trends in import, export, availability, price, use, and quantities of species traded. After synthesizing results and drawing attention to significant trade patterns, I conclude by identifying strengths and weaknesses of the current permitting and reporting systems used by TPWD and USFWS, and provide policy recommendations to improve monitoring of commercial trade in exotic amphibians and reptiles.

METHODS

I used paper surveys, Internet surveys, observations, and data requests to collect information on amphibian and reptile trade from various user groups and regulatory agencies. All surveys contained closed format questions. I attempted to keep surveys as simple as possible to minimize the proportion of non-respondents and reduce potential biases associated with misinterpretation (White et al. 2005). Exotic species were defined

as those that do not occur in Texas. Thus, exotics include species outside of the US as well as species that occur in the US but not in Texas.

Data Collection

Amphibian and reptile breeders were identified during visits to six reptile expositions. Schedules of these expositions were published on the web page: www.kingsnake.com, a primary resource for hobbyists. I recorded the following information during each visit: Organizer of the exposition, total number of vendors, species offered for sale, life stage of animals for sale (hatchling, pre-juvenile, juvenile, adult), their origin (captive bred, import, farm raised, wild caught), color morph (wild or cultivar), and price.

With the purpose of characterizing those species sought by hobbyists, a written questionnaire was presented to the public attending herpetological expositions requesting the following information: Do you keep any reptiles or amphibians? What species are your pets? Which type of amphibian is your favorite? Which type of reptile is your favorite? How many expos do you visit per year? Where do you usually purchase your reptiles and supplies? At expositions, a small table was set up outside the show. As many respondents as possible were solicited from patrons leaving the show. Respondents were handed a clip board with paper survey and allowed to complete it on their own. For each exposition, the same researcher handed out surveys to avoid bias created by different interviewers. To calculate the response rate, the number of non-respondents was recorded. As an incentive and gesture of goodwill, a summary of this information was given to the organizers of the expositions.

I created Internet-based surveys to sample pet shops operating in Texas using SurveyMonkey.com. I used IP addresses to identify respondents and avoid double submission. I obtained pet shop addresses and phone numbers through the Texas Department of Commerce. Whether the shops sold live reptiles or amphibians was determined with a phone call and I requested an e-mail address for the owner of the stores that sold amphibians and reptiles. An e-mail was then sent to the owner with a link to the on-line survey. The survey asked: In what city does your shop operate? What species do you have? What age are they? Price per animal? What is the origin of the animals? Do you ship live amphibians and reptiles to customers? If so, where (within Texas, United States, internationally)?

Meat, fish, and seafood establishment addresses and phone numbers were found through the Texas Department of Commerce. Short telephone surveys were conducted for stores that had locations in Texas counties with over 100,000 residents. Following Ceballos (2001), I asked these questions: Do you have turtle, snake, or frog meat for sale? What type of meat do you have? Where does it come from? How much is a pound of meat? I conducted all phone surveys for this group, eliminating interviewer bias (White et al. 2005).

Amphibian and reptile dealers using Internet sales were identified on the popular hobbyist website kingsnake.com. Individual websites were visited, and if it was verified that a business would ship amphibians and reptiles to Texas, the following data were recorded: location of Internet dealer home office, list of species available through

Internet trade, life stage of species for sale (hatchling, juvenile, adult), color morph (wild or cultivar), price, and species origin (wild vs. captive).

I used the United States Fish and Wildlife Service Law Enforcement Management Information System (LEMIS) database to obtain the following data: Import and export records for all amphibians and reptiles entering or exiting Texas, species, quantity, wildlife description code, country of origin or destination, shipment date, port of entry/exit, purpose of shipment (scientific, trade, personal, zoological), and US exporter/importer name. I note that some wildlife description codes may not represent one actual specimen; therefore, I termed the data in Table 3 as instances of import or export. For example, the wildlife description code for leather product (LPS) may contain multiple parts from the same animal or several individuals. Additionally animal parts may have come from a wild animal or one bred in captivity, but this is impossible to determine from LEMIS records. The LEMIS database also includes a species code that can be misleading, and in some cases there are multiple codes for the same species. Thus, I ran queries based on genus and species fields instead of relying on species codes from LEMIS. Many shipments in the LEMIS database were only identified to genus, in those cases I have included only genera not known to occur in Texas in the analysis for this chapter.

RESULTS

Data collected for this study included observations at expositions, interviews of pet owners at expositions, online surveys of pet store managers, telephone interviews of

meat and seafood establishments, observations of online dealer records and importation and exportation records from the USFWS database (Table 1).

Table 1. Sample sizes and sources for amphibian and reptile data collected during the term of this study.

	Source	Sample size	Responses
Reptile and amphibian dealers	6 expositions	1,406 animal observations	1406
Pet owners	6 expositions	587	560
Pet supply shops	Texas Department of Commerce	1,264	4
Meat and seafood establishments	Texas Department of Commerce	389	337
Internet reptile and amphibian dealers	www.kingsnake.com	118	118
Importation and exportation records	USFWS LEMIS database	70,813	70,813

I recorded 77 families and 898 species of exotic reptiles and amphibians involved in the commercial trade in Texas (Table 2, Appendix A). The most numerous taxon group was snakes followed by lizards, amphibians, turtles, and crocodilians. Both non-venomous and venomous snakes were available for trade. Common non-vemonous snake species were primarily from two families, Colubridae (colubrid snakes) and Boiidae (boas and pythons) with 157 and 70 species respectively. At least 59 Viperids (pit vipers), 26 Elapids (cobras and coral snakes), 2 Hydrophiids (sea snakes), were recorded as available for commercial trade. Lizards primarily consisted of representatives from the families Gekkonidae (geckos), Agamidae (agamas), Scincidae (skinks), and Chamaeleonidae (chameleons) with 90, 31, 23, and 23 species respectively. Hylid frogs were the most numerous amphibian family in the trade with 24 species, followed by Dendrobatid frogs with 19 species. The families Bufonidae,

Salamandaridae, and Ranidae were represented by 15 species each. Turtles were primarily represented by three families Testudinidae (tortoises) with 32 species, Geoemydidae (Asian turtles) with 23 species, and Emydidae (Pond, box, and freshwater turtles) with 19 species. Crocodilians in the trade included 8 species of Alligatoridae and 6 species of Crocodylidae. An additional 221 species were identified only to genus, and probably did not represent additional taxa. Records at the genus level were primarily due to inconsistent levels of reporting to USFWS.

Table 2. Tallies of exotic amphibian and reptile species involved in the commercial wildlife trade in Texas from January 2002 - June 2008.

	Amphibians	Lizards	Snakes	Turtles	Crocodilians	Total
Families	32	21	12	10	2	77
Species or subspecies	183	263	322	116	15	898
Identified to genus	61	90	50	18	2	221

International Trade

Roughly six times more amphibian and reptile products or specimens were imported to Texas than exported (Table 3). The import of anurans and saurians comprised 73.53% while exports accounted for 75.20% of the trade. Trade in salamanders was almost equal when comparing imports to exports. Snake imports outnumbered exports by 444,270. Imports of crocodilians numbered 1,048,571 while exports were only 85,350.

Table 3. Instances of exotic reptiles and amphibians or products made from exotic amphibians and reptiles passing through Texas ports by taxonomic category from January 2002 - June 2008. Source: LEMIS database.

	Import Year							
Group	2002	2003	2004	2005	2006	2007	2008	Total
Anura	270,760	152,871	77,114	122,996	329,012	624,268	81,326	1,658,347
Caudata	228	3,276	3,702	4,080	5,730	3,232	5	20,253
Crocodylia	159,659	178,766	184,195	220,095	213,520	61,283	31,053	1,048,571
Sauria	601,090	479,248	430,188	489,538	413,743	522,621	163,287	3,099,715
Serpentes	67,601	110,790	73,656	112,008	103,493	79,873	39,518	586,939
Testudines	3,490	5,803	34,580	4,248	2,944	3,644	2,807	57,516
Total	1,102,828	930,754	803,435	952,965	1,068,442	1,294,921	317,996	6,471,341

	Export Year							
Group	2002	2003	2004	2005	2006	2007	2008	Total
Anura	16,454	17,506	36,438	34,308	38,122	43,459	12,966	199,253
Caudata	1,562	710	2,142	2,620	4,842	8,310	371	20,557
Crocodylia	14,210	13,224	9,314	17,225	15,945	9,457	5,975	85,350
Sauria	136,818	38,519	58,888	110,030	107,598	68,999	41,405	562,257
Serpentes	16,632	27,123	26,014	30,585	21,460	12,168	8,687	142,669
Testudines	191	203	386	312	749	533	143	2,517
Total	185,867	97,285	133,182	195,080	188,716	142,926	69,547	1,012,603

Specimens entering Texas for commercial trade were summarized by wildlife description code to determine uses of animals along with relative intensity of trade across taxonomic groups (Table 4). Lizards were used in more categories (13) for commercial trade than any other group followed by crocodilians (11), and snakes (8). It was not surprising these groups were more heavily exploited for trade because of their use in manufactured products and food. The only category in common for all commercially traded amphibians and reptiles with the exception of crocodilians was that in live specimens.

Table 4. Categories and quantities[a] for commercially traded specimens imported to Texas January 2002 - June 2008. Source: LEMIS database.

Wildlife Description Code[b]	Anura	Caudata	Sauria	Serpentes	Testudines	Crocodylia
BOD	70		314	23		
CAR					2	
EGG			205			
GAR						339
JWL			256	1,144		39
LEG	1334 kg					
LIV	402,093	13,936	369,928	79,909	15,966	
LPL			850	39,258		7,958
LPS			123,367			103,841
MEA	7960 kg		99.74 kg + 61 inds.			
SHO	12		468,755	327,998		320,568
SID						1,200
SKI	2,053		601,678	15,073		231,794
SKP			1,521,613			28,180
SKU				200		2
SOU			367 kg + 2628 inds.			
SPR			46			
TAI						130,380
TRI			816	378		153

[a] Quantities listed in individual units (inds.) unless otherwise denoted. [b] This column contains the wildlife description code in the LEMIS database. BOD (dead, whole animal), CAR (carving- other than bone, horn, or ivory), EGG (egg- dead or blown), GAR (garment- excluding shoe or trim), JWL (jewelry- other than ivory), LEG (frog leg), LIV (live specimen), LPL (leather product- large manufactured), LPS (leather product- small manufactured), MEA (meat), SHO (shoe- including boot), SID (side), SKI (skin- whole raw or tanned), SKP (skin piece- raw or tanned, including scraps), SKU (skull- except when part of trophy), SOU (soup), SPR (shell product), TAI (tail), and TRI (trim- shoe, garment, or decorative).

A total of 881,832 live exotic amphibian and reptile species entered the United States through Texas ports between 2002 and June 2008 (Table 5). Anurans and saurians made up the majority of the import trade in live specimens for this period accounting for 87.54% of the total import trade. An increase in number of anurans was apparent in 2006 and 2007, and may continue, but without complete data for 2008 a trend cannot be confirmed. A general increase in the number of salamanders, lizards, and snakes was

apparent. The trade in imported exotic turtles and tortoises was relatively constant during 2002-2008. No live specimens of crocodilians were reported as being imported. Live crocodilians exist in the pet trade, but import of these species is regulated by CITES and therefore appears to be entirely domestic.

Table 5. Live exotic amphibians and reptiles imported to Texas for commercial trade from January 2002 - June 2008. Source: LEMIS database.

	Import Year							
Order	2002	2003	2004	2005	2006	2007	2008	Total
Anura	16,754	21,838	31,328	48,566	126,526	133,621	23,460	402,093
Caudata	198	736	280	3,980	5,700	3,042	0	13,936
Crocodylia	0	0	0	0	0	0	0	0
Sauria	23,208	38,988	61,793	57,452	84,706	64,777	39,004	369,928
Serpentes	7,457	5,317	6,723	13,890	14,095	25,217	7,210	79,909
Testudines	2,499	2,127	2,858	1,555	2,411	2,515	2,001	15,966
Total	50,116	69,006	102,982	125,443	233,438	229,172	71,675	881,832

A total of 523,267 live exotic specimens were shipped out of Texas. Shipments of exotics from Texas included captive bred or farm reared specimens, but also included specimens re-exported from the state (Table 6). Because of this lack of delineation of shipments in the LEMIS database, export data were confounded by import and re-export of the same individuals. Regardless, exports of all groups increased with the exception of turtles and tortoises. As in the import trade, anurans and saurians were exported in the greatest quantities and made up 87.76% of the total export of live specimens.

Table 6. Quantities of live exotic amphibian and reptile specimens exported from Texas during January 2002 - June 2008. Source: LEMIS database.

	Export Year							
Order	2002	2003	2004	2005	2006	2007	2008	Total
Anura	16,294	17,506	36,422	34,048	38,092	41,923	12,947	197,232
Caudata	1,550	710	2,108	2,620	4,822	8,298	371	20,479
Crocodylia	0	0	0	2	6	7	10	25
Sauria	19,959	21,212	47,600	50,528	47,276	49,259	26,180	262,014
Serpentes	966	1,397	6,300	8,623	10,946	8,308	4,468	41,008
Testudines	187	203	385	312	746	533	143	2,509
Total	38,956	41,028	92,815	96,133	101,888	108,328	44,119	523,267

The top 16 species imported accounted for 76.36% of the total quantity, and the top 82 made up 94.08% of all imports (Figure 1). On average, the top 10 species of exotic amphibians and reptiles imported alive per year accounted for 65.84% (SD = 8.294) of the total imports (Table 7). Included in the top 10 lists were familiar pet species such as the Western Dwarf Clawed Frog (*Hymenochirus curtipes*), Green Tree Frog (*Litoria caerula*), Ball Python (*Python regius*), and Tokay Gecko (*Gekko gecko*). Interestingly, the Asian Grass Lizard (*Takydromus sexlineatus*) made the top 10 list 6 times, but this lizard was not detected in any retail segment of trade. An average of 153 (SD = 37.13) species per year were recorded in the LEMIS database, but only 26 species were in the yearly top 10 species imported for the period of the dataset (Tables 8 and 9). These results supported the ranked data and demonstrate that few species were consistently traded in quantities, though many more were available.

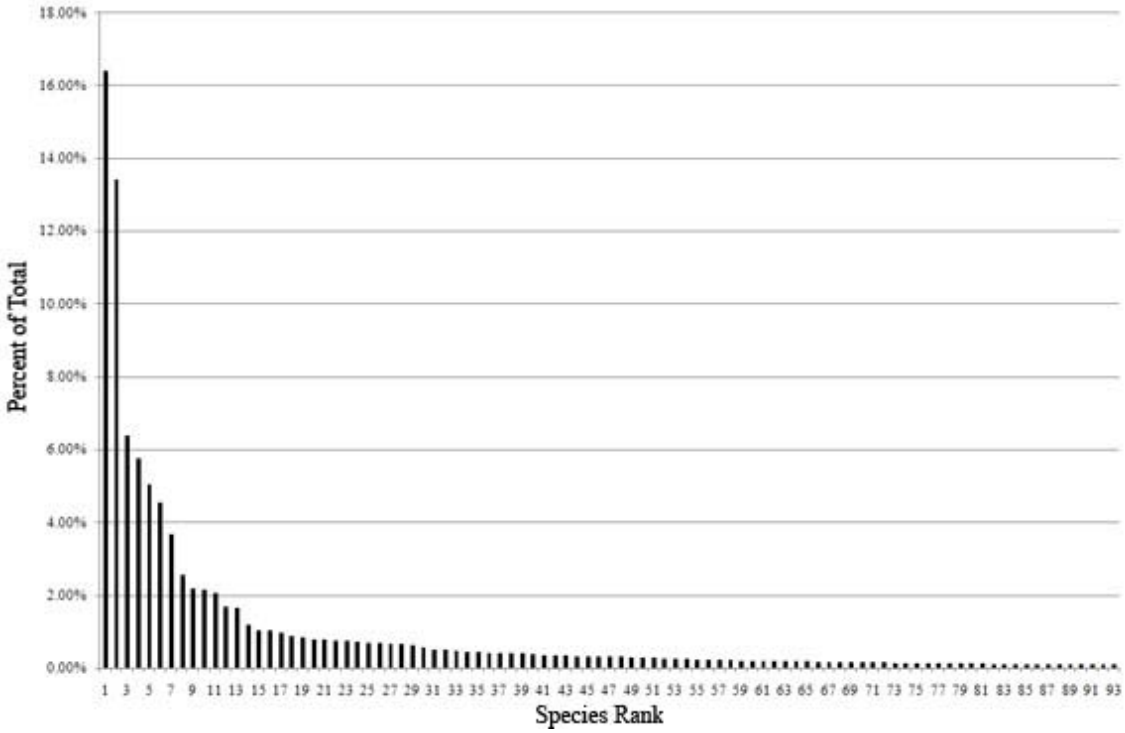

Figure 1. Ranked percentage of total imports of live exotic amphibians and reptiles, January 2002 - June 2008. The top 93 species made up 95.04% of the total imports.

Table 7. Top 10 exotic amphibian and reptile species imported live for commercial trade to Texas by year January 2002 through June 2008. Source: LEMIS database.

Year	Rank	Scientific Name	Common Name	Total Imported	Percent of Total
2002	1	*Gehyra mutilata*	Stump-tailed Gecko	7,030	14.03%
	2	*Hymenochirus sp.*	Dwarf Clawed Frog	6,500	12.97%
	3	*Litoria caerulea*	Green Tree Frog	4,792	9.56%
	4	*Python reticulatus*	Reticulated Python	3,778	7.54%
	5	*Litoria sp.*	Litoria Treefrog	2,180	4.35%
	6	*Gekko gecko*	Tokay Gecko	2,130	4.25%
	7	*Cuora amboinensis*	Amboina Box Turtle	1,775	3.54%
	8	*Ptychozoon kuhli*	Kuhl's Flying Gecko	1,748	3.49%
	9	*Agalychnis callidryas*	Red Eyed Treefrog	1,624	3.24%
	10	*Gekko vittatus*	Lined Gecko	1,425	2.84%
			Cumulative percentage accounted for by top 10 species		65.81%
2003	1	*Litoria caerulea*	Green Tree Frog	14,020	20.32%
	2	*Gehyra mutilata*	Stump-tailed Gecko	13,535	19.61%
	3	*Takydromus sexlineatus*	Asian Grass Lizard	5,765	8.35%
	4	*Gekko gecko*	Tokay Gecko	5,675	8.22%
	5	*Gekko vittatus*	Lined Gecko	2,925	4.24%
	6	*Agalychnis callidryas*	Red Eyed Treefrog	2,900	4.20%
	7	*Python curtus*	Blood Python	2,398	3.48%
	8	*Ptychozoon kuhli*	Kuhl's Flying Gecko	1,726	2.50%
	9	*Cuora amboinensis*	Amboina Box Turtle	1,300	1.88%
	10	*Varanus salvator*	Common Water Monitor	1,188	1.72%
			Cumulative percentage accounted for by top 10 species		74.52%
2004	1	*Litoria caerulea*	Green Tree Frog	18,710	18.36%
	2	*Takydromus sexlineatus*	Asian Grass Lizard	13,300	13.05%
	3	*Gekko vittatus*	Lined Gecko	3,722	3.65%
	4	*Ptychozoon kuhli*	Kuhl's Flying Gecko	3,304	3.24%
	5	*Hemidactylus platyurus*	Flat-tailed House Gecko	2,700	2.65%
	6	*Python curtus*	Blood Python	2,408	2.36%
	7	*Sceloporus malachiticus*	Green Spiny Lizard	2,218	2.18%
	8	*Cuora amboinensis*	Amboina Box Turtle	1,618	1.59%
	9	*Basiliscus plumifrons*	Green Basilisk	1,534	1.51%
	10	*Megophrys sp.*	Horned Frog	1,408	1.38%
			Cumulative percentage accounted for by top 10 species		49.97%

Table 7. Continued

Year	Rank	Scientific Name	Common Name	Total Imported	Percent of Total
2005	1	*Litoria caerulea*	Green Tree Frog	30,070	23.76%
	2	*Gehyra mutilata*	Stump-tailed Gecko	7,940	6.27%
	3	*Python regius*	Ball Python	7,710	6.09%
	4	*Takydromus sexlineatus*	Asian Grass Lizard	7,620	6.02%
	5	*Gekko gecko*	Tokay Gecko	6,335	5.01%
	6	*Hemidactylus platyurus*	Flat-tailed House Gecko	4,890	3.86%
	7	*Ptychozoon kuhli*	Kuhl's Flying Gecko	4,537	3.59%
	8	*Hemidactylus sp.*	Hemidactylus sp.	3,851	3.04%
	9	*Gekko vittatus*	Lined Gecko	3,777	2.98%
	10	*Litoria infrafrenata*	White-Lipped Treefrog	2,892	2.29%
		Cumulative	percentage accounted for by top 10 species		62.91%
2006	1	*Hymenochirus curtipes*	Western Dwarf Clawed Frog	60,600	25.96%
	2	*Litoria caerulea*	Green Tree Frog	23,286	9.98%
	3	*Hemidactylus sp.*	Hemidactylus Gecko	20,246	8.67%
	4	*Physignathus cocincinus*	Chinese Crested Dragon	10,850	4.65%
	5	*Takydromus sexlineatus*	Asian Grass Lizard	10,629	4.55%
	6	*Python regius*	Ball Python	8,187	3.51%
	7	*Polypedates leucomystax*	Asian Brown Treefrog	7,906	3.39%
	8	*Rana erythraea*	Green Paddy Frog	7,200	3.08%
	9	*Litoria infrafrenata*	White-Lipped Treefrog	5,780	2.48%
	10	*Gekko gecko*	Tokay Gecko	5,026	2.15%
		Cumulative	percentage accounted for by top 10 species		68.42%
2007	1	*Hymenochirus curtipes*	Western Dwarf Clawed Frog	76,423	33.35%
	2	*Litoria caerulea*	Green Tree Frog	20,912	9.13%
	3	*Python regius*	Ball Python	19,416	8.47%
	4	*Hemidactylus sp.*	Hemidactylus Gecko	11,627	5.07%
	5	*Takydromus sexlineatus*	Asian Grass Lizard	8,783	3.83%
	6	*Litoria infrafrenata*	White-Lipped Treefrog	8,570	3.74%
	7	*Gehyra mutilata*	Stump-tailed Gecko	7,550	3.29%
	8	*Physignathus cocincinus*	Chinese Crested Dragon	6,968	3.04%
	9	*Polypedates leucomystax*	Asian Brown Treefrog	5,640	2.46%
	10	*Hyperolius concolor*	Reed Frog	4,140	1.81%
		Cumulative	percentage accounted for by top 10 species		74.19%

Table 7. Continued

Year	Rank	Scientific Name	Common Name	Total Imported	Percent of Total
2008	1	*Hymenochirus curtipes*	Western Dwarf Clawed Frog	9,825	13.69%
	2	*Hemidactylus sp.*	Hemidactylus Gecko	7,260	10.12%
	3	*Takydromus sexlineatus*	Asian Grass Lizard	5,500	7.67%
	4	*Python regius*	Ball Python	5,384	7.50%
	5	*Litoria caerulea*	Green Tree Frog	5,050	7.04%
	6	*Physignathus cocincinus*	Chinese Crested Dragon	4,294	5.99%
	7	*Agalychnis callidryas*	Red Eyed Treefrog	3,492	4.87%
	8	*Gekko gecko*	Tokay Gecko	2,260	3.15%
	9	*Iguana iguana*	Common Green Iguana	1,810	2.52%
	10	*Gehyra mutilata*	Stump-tailed Gecko	1,800	2.51%
			Cumulative percentage accounted for by top 10 species		65.06%

Table 8. Number of species of imported live amphibian and reptile exotic species by year, January 2002 - June 2008. Source: LEMIS database.

	2002	2003	2004	2005	2006	2007	2008
Number of species	155	111	114	175	208	183	129

Table 9. Frequency of occurrence of the 26 species that comprised the 10 most imported exotic amphibian and reptiles each year from January 2002 - June 2008. Source: LEMIS database.

Scientific Name	Common Name	Frequency of Occurrence[a]
Litoria caerulea	Green Tree Frog	7
Takydromus sexlineatus	Asian Grass Lizard	6
Gehyra mutilata	Stump-tailed Gecko	5
Gekko gecko	Tokay Gecko	5
Hemidactylus sp.	Hemidactylus Gecko	4
Python regius	Ball Python	4
Gekko vittatus	Lined Gecko	4
Ptychozoon kuhli	Kuhl's Flying Gecko	4
Hymenochirus curtipes	Western Dwarf Clawed Frog	3
Physignathus cocincinus	Chinese Crested Dragon	3
Litoria infrafrenata	White-Lipped Treefrog	3
Agalychnis callidryas	Red Eyed Treefrog	3
Cuora amboinensis	Amboina Box Turtle	3
Polypedates leucomystax	Asian Brown Treefrog	2
Hemidactylus platyurus	Flat-tailed House Gecko	2
Python curtus	Blood Python	2
Rana erythraea	Green Paddy Frog	1
Hymenochirus sp.	Dwarf Clawed Frog	1
Hyperolius concolor	Reed Frog	1
Python reticulatus	Reticultated Python	1
Sceloporus malachiticus	Green Spiny Lizard	1
Litoria sp.	Litoria Treefrog	1
Iguana iguana	Common Green Iguana	1
Basiliscus plumifrons	Green Basilisk	1
Megophrys sp.	Horned Frog	1
Varanus salvator	Common Water Monitor	1

[a] This column indicates the number of times the species occurred on the top 10 list of species imported to Texas live for trade.

Retail Pet Trade

Internet dealer sites polled were physically based in the United States (101), with the top three states housing dealers being California (21), Texas (15), and Florida (10) (Figure 2). Of the species available for purchase on-line, 72% (n = 779) were exotic. Multiple dealers offered the same species for sale and each time the species was found for sale it was recorded as an instance. Of all instances, 85.08 % were exotic amphibian or reptile species. Snakes were the most common (55.89%), followed by lizards (28.32%), amphibians (10.42%), turtles (5.26%) and crocodilians (0.10%). A total of 42 species occurred more than 10 times in the dataset, demonstrating that even though many species were available for sale on-line, few occurred in high frequencies (Table 10). I reported modal price because rare color variants offered for sale demanded high prices and skewed the dataset. The top ranked species, Ball Python (*Python regius*), occurred in the dataset 481 times and ranged in price from $20 to $15,000, with a mean and modal price of $1,716.54 and $2,500.00, respectively. Numerous color variants of this species were reported - a trait that determined the price of the animal. Other species of boas and pythons were traded on-line, including 2 subspecies of the Boa Constrictor (*Boa constrictor ssp.)* with a total of 187 occurrences, Reticulated Python (*Python reticulatus*) with 76, and the Burmese Python (*Python molurus bivittatus*) with 42 instances. Exotic venomous snakes were traded on-line, but only the Monocled Cobra (*Naja kaouthia*) occurred more than 10 times. Exotic lizards traded on-line were primarily Leopard Geckos (*Eublepharus macularius*) with 198 instances and Bearded Dragons (*Pogona vitticeps*) with 49 instances. Relatively few tortoises and zero exotic turtles were sold on-

line. The Red-footed Tortoise (*Chelidonis carbonaria*) and African Spurred Tortoise (*Geochelone sulcata*) were the only species of testudinids with more than 10 instances. Only three species of amphibian were commonly sold on-line and included the Dyeing Poison Frog (*Dendrobates tinctorius*), the Strawberry Poison Dart Frog (*Dendrobates pumilio*), and Green Treefrog (*Litoria caerulea*).

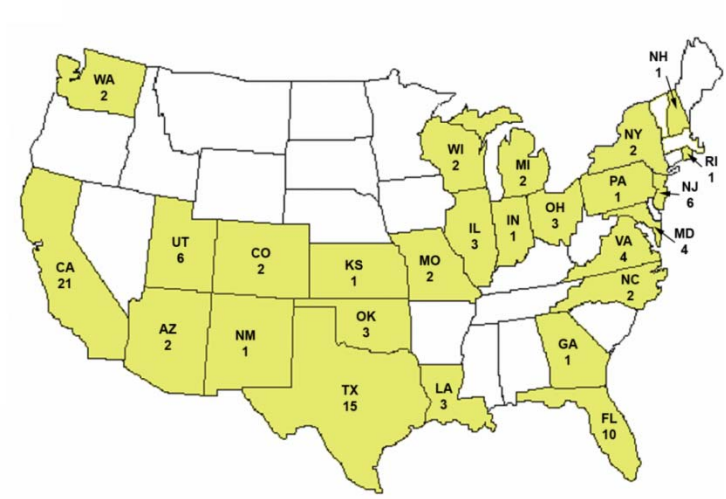

Figure 2. States in the USA where I detected dealers of amphibians and reptiles who sold amphibians and reptiles through Internet sites. Not shown are 13 international dealers that were willing to sell and ship to customers in Texas.

Table 10. Popular exotic amphibians and reptiles traded live as pets on the Internet. Source: Internet dealer website polls.

Common Name	Scientific Name	Instances[a]	Minimum	Maximum	Average Price	Mode
Ball Python	*Python regius*	481	$ 20.00	$ 15,000.00	$ 1,716.54	$ 2,500.00
Leopard Gecko	*Eublepharus macularius*	198	$ 15.00	$ 5,500.00	$ 337.07	$ 100.00
Panamanian Boa	*Boa constrictor imperator*	83	$ 30.00	$ 15,000.00	$ 1,524.57	$ 100.00
Reticulated Python	*Python reticulatus*	76	$ 45.00	$ 10,000.00	$ 1,782.69	$ 2,000.00
Honduran Milksnake	*Lampropeltis triangulum hondurensis*	67	$ 35.00	$ 950.00	$ 208.08	$ 200.00
Boa Constrictor	*Boa constrictor*	56	$ 55.00	$ 7,500.00	$ 1,061.16	$ 300.00
Central Bearded Dragon	*Pogona vitticeps*	49	$ 15.00	$ 745.00	$ 195.25	$ 250.00
Red Tailed Boa	*Boa constrictor constrictor*	48	$ 45.00	$ 8,500.00	$ 1,066.98	$ 325.00
California Kingsnake	*Lampropeltis getula californiae*	47	$ 22.00	$ 200.00	$ 62.98	$ 40.00
Burmese Python	*Python molurus bivittatus*	42	$ 22.00	$ 2,300.00	$ 438.05	$ 150.00
Crested Gecko	*Rhacodactylus ciliatus*	29	$ 40.00	$ 365.00	$ 127.62	$ 75.00
Pueblan Milksnake	*Lampropeltis triangulum campbelli*	28	$ 20.00	$ 176.00	$ 64.86	$ 60.00
Nelson's Milksnake	*Lampropeltis triangulum nelsoni*	25	$ 35.00	$ 292.00	$ 101.86	$ 75.00
Green And Black Poison Dart Frog	*Dendrobates auratus*	23	$ 26.00	$ 70.00	$ 40.09	$ 30.00
Florida Kingsnake	*Lampropeltis getula floridana*	22	$ 22.00	$ 161.00	$ 76.95	$ 45.00
Bullsnake	*Pituophis catenifer*	22	$ 25.00	$ 600.00	$ 166.91	$ 145.00
Columbian Rainbow Boa	*Epicrates cenchria cenchria*	21	$ 125.00	$ 15,000.00	$ 1,620.89	$ 135.00
Rosy Boa	*Lichurana trivirgata*	21	$ 50.00	$ 3,000.00	$ 287.29	$ 100.00
Red Blood Python	*Python brongersmai*	21	$ 65.00	$ 22,500.00	$ 1,764.76	$ 65.00
Dyeing Poison Frog	*Dendrobates tinctorius*	20	$ 35.00	$ 125.00	$ 72.75	$ 50.00
Eastern Sand Boa	*Gongylophis colubrinus loveridgii*	19	$ 45.00	$ 349.00	$ 112.89	$ 55.00
Carpet Python	*Morelia spilota*	19	$ 50.00	$ 12,500.00	$ 1,800.53	$ 200.00
Red Footed Tortoise	*Chelidonis carbonaria*	18	$ 75.00	$ 505.00	$ 204.00	$ 85.00
Sinaloan Milksnake	*Lampropeltis triangulum sinalaoe*	18	$ 25.00	$ 500.00	$ 142.65	$ 150.00
Panther Chameleon	*Pardalis pictus*	16	$ 30.00	$ 357.00	$ 251.60	$ 250.00
African Spurred Tortoise	*Geochelone sulcata*	15	$ 60.00	$ 800.00	$ 168.77	$ 65.00
Brooks' Kingsnake	*Lampropeltis getula brooksi*	15	$ 35.00	$ 700.00	$ 195.00	$ 200.00
Green Tree Python	*Morelia viridis*	15	$ 225.00	$ 1,200.00	$ 517.00	$ 325.00
Strawberry Poison Dart Frog	*Dendrobates pumilio*	14	$ 50.00	$ 325.00	$ 144.50	$ 130.00

Table 10. Continued.

Common Name	Scientific Name	Instances[a]	Minimum	Maximum	Average Price	Mode
Woma Python	*Aspidites ramasayi*	13	$ 250.00	$ 2,800.00	$ 975.55	$ 750.00
Pacman Frog	*Ceratophrys ornata*	13	$ 9.50	$ 66.00	$ 21.23	$ 15.00
Common Green Iguana	*Iguana iguana*	13	$ 7.50	$ 4,500.00	$ 367.77	$ 35.00
Savu Island Python	*Liasis mackloti*	13	$ 35.00	$ 400.00	$ 182.46	$ 250.00
Dumeril's Boa	*Acrantophis dumerili*	12	$ 115.00	$ 579.00	$ 274.45	$ 275.00
Monocled Cobra	*Naja kaouthia*	12	$ 33.00	$ 715.00	$ 344.67	$ 575.00
New Caledonia Bumpy Gecko	*Rhacodactylus auriculatus*	12	$ 60.00	$ 600.00	$ 216.58	n/a
Fat-Tailed Gecko	*Hemitheconyx caudicinctus*	11	$ 39.00	$ 700.00	$ 231.00	$ 50.00
Thayer's Kingsnake	*Lampropeltis mexicana thayeri*	11	$ 45.00	$ 850.00	$ 175.73	$ 100.00
Green Treefrog	*Litoria caerulea*	11	$ 10.00	$ 40.00	$ 21.91	$ 20.00
Amazon Tree Boa	*Corallus hortulanus*	10	$ 20.00	$ 534.00	$ 149.33	$ 30.00
Tokay Gecko	*Gekko gecko*	10	$ 6.00	$ 48.00	$ 18.30	$ 6.00
Madagascar Day Gecko	*Phelsuma madagascarensis*	10	$ 40.00	$ 116.00	$ 71.30	n/a

[a]The number of times the species was identified for sale as a unique item through polled Internet dealer sites.

Amphibian and reptile expositions are public events coordinated by private individuals, trade associations, or herpetological societies. Shows consisted of breeders and dry goods suppliers paying a fee to the show organizer in order to sell to the public in a trade show atmosphere. Admission was charged to the public for every show I attended and ranged from $8 to $15. All shows were held on weekends and lasted for two days. One show was marketed as a “hot” show and included venomous reptiles for sale. To gain entry, a waiver had to be completed for the venomous show (Appendix C). Four shows were promoted by individuals, 1 by the North American Reptile Breeders (NARBC), and one by the East Texas Herpetological Society (ETHS). I generated a table of “popular” exotic amphibians and reptiles for sale at the expositions based on the number of unique observations of each species (Table 11). Species that appeared in the dataset 10 or more times were included in this table, as there were many species represented fewer times. I reported the modal price because instances of new genetic color variants or physical abnormalities commanded abnormally high prices and skewed average price.

The top ranked species was the Ball Python (*Python reguis*) with 196 occurrences in the dataset and was marked for sale from $12 to $25,000. Rare color variants were the driving force that affected price. At expositions, other species of boas and pythons were common and included the Reticulated Python (*Python reticulatus*) with 143 instances, Boa constrictor (*Boa constrictor*) with 118 instances, and Burmese Python (*Python molurus bivittatus*) with 14 instances. Lizards common at expositions were represented by Bearded Dragons (*Pogona vitticeps*) and Leopard Geckos

(*Eublepharus macularius*) with 91 and 35 instances respectively. Species of lizards attaining larger adult size were available at expositions and included the Savannah monitor (*Varanus exanthematicus*) and the Argentine Black and White Tegu (*Tupinambis merianae*). Poison dart frogs of the genus *Dendrobates* had the greatest frequency of occurrence of all amphibians at the expositions with a total of 36 instances. All species of *Dendrobates* are protected by CITES and most dealers remarked that their specimens were produced in captivity. Two species of exotic tortoises were common at expositions and included hatchlings of Red-footed Tortoises (*Chelidonis carbonaria*) and Leopard Tortoises (*Geochelone pardalis*).

From survey respondents at herpetological expositions, 838 (76.81% of total) individual exotic amphibian or reptile pets were reported. Respondents listed the origin of their exotic pets as captive bred 71.24% (n=597), unknown 17.66% (n=148), farm reared 5.97% (n=50), and wild caught 5.13% (n=43). Of 235 respondents who listed exotic amphibians and reptiles as pets, 49.36% (n=116) listed that they purchased their live specimens at expos, while 37.45% (n=88) purchased them at brick and mortar pet stores, 11.49% (n=27) shopped on-line, and 1.70% (n=4) acquired their pets through rescue. Pet supply or dry good purchases reported by respondents fell into three categories; brick and mortar pet shops 64.22% (n=332), expos 18.18% (n=94), and on-line 17.60% (n=91).

I made 822 successful phone calls to pet stores listed by the Texas Department of Commerce. A total of 29 (3.53%) of the shops had live reptiles and/or amphibians for sale. An e-mail was sent to the owner of each store, but only 4 respondents started the

electronic survey and only 2 finished. It was difficult to get information from two large chain pet stores that operated in Texas and the United States. Employees answering phones at their locations were not able to give out e-mail addresses and managers were often not on-site. It is known that both companies sell live reptiles and amphibians, but I was unable to get a representative from either chain to complete the on-line survey. An annual report published on-line by PetSmart©, detailed that only 3% of their total net sales for 2007 were generated from the sale of live pets including fish, amphibians, reptiles, and birds (PetSmart©, Inc. 2007). Information from the pet store owner surveys did not represent a meaningful sample size and was not included in the analysis.

Trade in Established Invasive Species

I compared invasive species established in the continental United States (Crother et. al. 2008; Appendix B) to species traded alive during our study period, and discovered 36 species of exotic, invasive reptiles hprestriand amphibians (2 anurans, 30 lizards, 3 snakes, and one crocodilian) in the trade in Texas (Table 12). Three species considered invasive in Texas persisting in the trade were the Brown Anole (*Anolis sagrei*), Mediterranean Gecko (*Hemidactylus turcicus*), and Common House Gecko (*Hemidactylus frenatus*). It was possible the Mexican Spiny-tailed Iguana (*Ctenosaura pectinata*) was involved in the import trade in Texas, though records of *Ctenosaura* in the LEMIS database were only defined to genus.

Table 11. The most popular exotic amphibians and reptiles traded live as pets at herpetological expositions with instances and price. The modal price reflected better the typical market value because the mean prices were often skewed by a few very expensive specimens. Source: Observations at herpetological expositions in Texas February 2008 – February 2009.

Common Name	Scientific Name	Instances[a]	Minimum	Maximum	Average Price	Mode
Ball Python	*Python regius*	196	$ 12.00	$ 25,000.00	$ 760.11	$ 500.00
Reticulated Python	*Python reticulatus*	143	$ 80.00	$ 15,000.00	$ 2,792.83	$ 2,500.00
Boa constrictor	*Boa constrictor*	118	$ 20.00	$ 12,000.00	$ 499.21	$ 350.00
Bearded Dragon	*Pogona vitticeps*	91	$ 20.00	$ 400.00	$ 144.76	$ 175.00
Leopard Gecko	*Eublepharus macularius*	35	$ 20.00	$ 1,200.00	$ 185.51	$ 25.00
Poison Dart Frog	*Dendrobates sp.*	26	$ 40.00	$ 175.00	$ 66.54	$ 50.00
California Kingsnake	*Lampropeltis getula califoniae*	25	$ 35.00	$ 125.00	$ 64.17	$ 50.00
Honduran Milksnake	*Lampropeltis triangulum hondurensis*	24	$ 55.00	$ 500.00	$ 214.58	$ 375.00
Red Footed Tortoise	*Chelidonis carbonaria*	18	$ 15.00	$ 250.00	$ 121.39	$ 100.00
Coastal Carpet Python	*Morelia spilota*	18	$ 75.00	$ 350.00	$ 163.78	$ 125.00
Green Tree Python	*Morelia viridis*	15	$ 75.00	$ 850.00	$ 355.00	$ 375.00
Burmese Python	*Python molurus bivittatus*	14	$ 50.00	$ 1,600.00	$ 267.14	$ 85.00
Uromastyx	*Uromastyx sp.*	13	$ 35.00	$ 75.00	$ 52.31	$ 50.00
Brooks' Kingsnake	*Lampropeltis getula brooksi*	12	$ 20.00	$ 225.00	$ 90.83	$ 75.00
Savannah Monitor	*Varanus exanthematicus*	12	$ 15.00	$ 40.00	$ 24.08	$ 20.00
Argentine Black and White Tegu	*Tupinambis merianae*	11	$ 30.00	$ 125.00	$ 92.73	$ 125.00
Pacman Frog	*Ceratophrys ornata*	10	$ 10.00	$ 70.00	$ 26.00	$ 30.00
Thumbnail Poison Dart Frog	*Dendrobates quinquevittatus*	10	$ 50.00	$ 125.00	$ 92.00	$ 125.00
Leopard Tortoise	*Geochelone pardalis*	10	$ 95.00	$ 250.00	$ 129.00	$ 100.00
Arizona Mountain Kingsnake	*Lampropeltis pyromelana pyromelana*	10	$ 12.00	$ 350.00	$ 180.78	$ 95.00

[a] This column indicates the number of instances that I encountered the species for sale.

Table 12. Exotic species established in the continental United States documented in the commercial trade in Texas January 2002 - June 2008.

	Scientific Name	Common Name	State where established	Trade Categories[a]
Anurans				
	Osteopilus septentrionalis	Cuban Treefrog	FL	E, P
	Xenopus laevis	African Clawed Frog	AZ, CA	E, I, P
Lizards				
	Agama agama	African Rainbow Lizard	FL	E, I, P
	Ameiva ameiva	Giant Ameiva	FL	E, I
	Anolis (Norops) sagrei	Brown Anole	AL, FL, GA, LA, SC, TX	E, P
	Anolis chlorocyanus	Hispaniola Green Anole	FL	E
	Anolis equestris	Knight Anole	FL	E, P
	Aspidoscelis montaguae	Giant Whiptail	FL	E
	Basiliscus vittatus	Brown Basilisk	FL	E, I, P
	*Calotes versicolor**	Variable Bloodsucker	FL	
	Chamaeleo calyptratus	Veiled Chameleon	FL	E, I, P
	Chamaeleo jacksonii	Jackson's Chameleon	CA, FL	E, I, P
	Chondrodactylus bibronii	Bibron's Sand Gecko	FL	E, I, P
	Cnemidophorous lemniscatus	Rainbow Whiptail	FL	E
	*Ctenosaura pectinata**	Mexican Spiny-tailed Iguana	FL, TX	
	*Ctenosaura similis**	Gray's Spiny-tailed Iguana	FL	
	Cyrtopodion scabrum	Rough-tailed Gecko	TX	I
	Gekko gecko	Tokay Gecko	FL	E, I, P
	Hemidactylus frenatus	Common House Gecko	FL, TX	P
	Hemidactylus mabouia	Wood Slave	FL	E, I
	Hemidactylus platyurus	Asian Flat-tailed House Gecko	FL	I
	Hemidactylus turcicus	Mediterranean Gecko	AL, AZ, AL, CA, FL, GA, KS, LA, MD, MS, MO, NE, NM, OK, SC, TX, UT, VA	E, P
	Iguana iguana	Green Iguana	FL	E, F, I, P
	Leiocephalus carinatus	Northern Curly-tailed Lizard	FL	E
	Leiocephalus schreibersii	Red-sided Curly-tailed Lizard	FL	E, I
	Leiolepis belliana	Butterfly Lizard	FL	E, I, P
	*Mabuya multifasciata**	Brown Mabuya	FL	
	Phelsuma madagascariensis	Madagascar Day Gecko	FL	P

Table 12. Continued

	Scientific Name	Common Name	State Where Established	Trade Categories[a]
	Tarentola annularis	Ringed Wall Gecko	FL	E, I
	Tarentola mauritanica	Moorish Gecko	CA, FL (?)	E, I, P
	Tupinambis merianae	Argentine Giant Tegu	FL	E, I, P
	Varanus niloticus	Nile Monitor	FL	E, I, P
Snakes				
	Acrochordus javanicus	Javanese File Snake	FL	E, I
	Boa constrictor	Boa Constrictor	FL	E, I, P
	Python molurus	Indian Python	FL	I, P
Crocodilians				
	Caiman crocodilus	Spectacled Caiman	FL	E, I, P

[a] Uppercase letters denote use categories: Import (I), Export (E), Food (F), and Pet trade (P). **Calotes*, *Ctenosaura*, and *Mabuya*, are all listed in LEMIS database for import, but no specific epithet is listed.

Exotic Amphibian and Reptile Meat Trade

A total of 34 import shipments of exotic amphibians and reptiles were coded as meat or soup for commercial trade. Two of the shipments were identified as listed as "Non-CITES Reptile" (13 kg) one as Indus Valley Bullfrog (*Hoplobatrachus tigerinus*, 7,960 kg), one as Crocodile (1 kg), and 30 as Common Iguana (*Iguana iguana*, 469.74 kg plus 2,696 individuals). From January 2002 through June 2008 no exotic reptile or amphibian meat was exported from Texas.

DISCUSSION

Species in the Trade

The trade in exotic amphibians and reptiles is largely unregulated, and species could come from anywhere in the world; therefore, a lot of species are available. International trade as reported by USFWS contributes a suite of species to the trade, but more species were documented in the pet trade through expositions, on-line dealer sites, and pet owner surveys. A previous study of the turtle trade by Ceballos and Fitzgerald (2004) reported 70 species of exotic turtles in the trade, while I documented at least 115. An additional 16 species reported by Ceballos and Fitzgerald (2004) were not considered in this study because they only existed in the trade in non-commercial categories such as zoos and aquariums. The exchange of specimens for zoos and aquariums is largely internal, as institutions commonly trade with each other, breed their own, accept seized animals, gifts and exchanges (Wm. Farr, Houston Zoo, personal communication). Additionally, zoos and aquariums often display rare, threatened or endangered species that only

CITES permitted institutions are allowed to exchange. The difference may be due to the fact that I took into account the Internet trade in reptiles, which has grown in the past decade. I interpret this difference to mean the number of turtle species imported to Texas has increased. There are no prior studies that thoroughly documented other taxon groups in the trade in Texas, but the same trends of increasing species availability perhaps as a result of Internet trade is plausible within other taxon groups.

Invasive species persist in the live amphibian and reptile trade because of few and variable regulations. Imposing restrictions on species known to be invasive would be a logical step in their management (Bilger 2009). In the sense of predicting the introduction of a potential invasive species or controlling an already established invasive, all incoming shipments should be considered as a potential risk. A 2008 bill introduced to the United States House of Representatives entitled the "Nonnative Wildlife Invasion Prevention Act" called for a species by species risk assessment and creation of a list of non-native species permissible for trade (HHR 669). This bill was poorly received by the pet industry, and failed to pass the House twice. In 2007, USFWS posted a Notice of Inquiry (RIN 1018-AV68) to gather biological and economic information about the extent of trade in general of *Boa*, *Python*, and *Eunectes* in the United States to determine if it would be appropriate to include them in the list of injurious wildlife under the Lacey Act. If applied to other taxa, commercial trade including interstate commerce would be significantly restricted. Currently the only exotic amphibian or reptile species regulated by the Lacey Act is the Brown Treesnake

(*Boiga irregularis*). I documented importation of *Boiga sp*. into the United States, but it could not be determined to which species these records referred.

The primary challenge in managing for invasive species are varying federal and state regulations coupled with international regulations. An example from Lake Champlain provides a template for success. Lake Champlain is shared by two U.S. States (New York and Vermont) and the Canadian Province of Quebec. Regulation of potential invasive aquatic species was initially a challenge due to multiple ownership of the lake. As a response, a public-private partnership was formed consisting of the U.S. States, Quebec, USEPA, other federal and local agencies, and local groups. To date the Lake Champlain Basin Program has been successful in protecting the environmental integrity of the lake (Modley 2008). The partnership is able to quickly respond to invasive species introduction and spread. A similar partnership between neighboring states, Mexico, and hobbyist groups could prove beneficial in standardizing regulations, responding to invasive species across borders, and protecting the environmental integrity of our region.

Trends in Trade of Live Specimens

Imports in 2004 appeared high but may not have actually represented specimens that stayed in Texas. Hurricane season in 2004 caused closure of the port of New Orleans, and shipments during that period were re-routed to Texas. Lack of interstate reporting requirements for exotic species and/or products impeded further analysis of the final destination of shipments. I determined that regardless of final destination, quantities of

live specimens in the import trade changed over time. No live crocodiles were imported for commercial trade during the period of our dataset and levels of turtle importation remained fairly constant. Other taxonomic groups showed greater numerical increases, indicating that there is an increasing trend in imports of live exotic amphibians and reptiles. Anurans showed the greatest increase, rising from 16,754 individuals in 2002 to 133,621 in 2007 (Table 5). Increases in this group were primarily due to the increased import of the Western Dwarf Clawed Frog (*Hymenochirus curtipes*), a species that did not occur in the dataset for 2002, but 60,600 and 76,423 were imported in 2006 and 2007, respectively. Increases in this particular species should be of concern because of the dangers of Ranavirus and Chytrid, pathogens affecting native populations of amphibians (Raverty and Reynolds 2001, Robert et. al 2007).

The top 82 species in live trade accounted for 94.08% of imports. There were relatively few "popular" species in the live trade, and the list varied depending on the market and source. Species making the top 10 list (Table 7) of live imports included common amphibians and reptiles that were not expensive when encountered for sale to the public. An unexpected result was the appearance of the Asian Grass Lizard (*Takydromus sexlineatus*), which made the top 10 most imported species by number 6 times. This lizard was not detected in any retail segment of trade and I could not determine why they were imported. This species is also exported and it is possible that the same specimens were re-exported. Finer scale analysis on a species level would have been able to flesh out re-export situations, but were outside the scope of this project.

When encountered at herpetological expositions, the frequently imported species in Texas sold for $10-$20 and commercialization similar to the scenario outlined by Reed and Gibbons (2002) for hatchling turtles was implicit. Their scenario suggested that the low price pet industry is driven by the sale of inexpensive pets sold to novice keepers rather than expensive pets to more experienced hobbyists. This scenario is very plausible for other inexpensive exotic pets. However, these inexpensive species were not common at herpetological expositions, which focused more on less common species and new genetic color variants of interest to hobbyists. The species encountered the most at herpetological expositions and on-line were higher priced and primarily represented by genetic color variations produced in captivity. The Ball Python (*Python regius*) was the most common exotic species offered for sale to the public and was found to be the top species by instance on-line and at herpetological expositions. This species varied in price from $12 for a wild phase to $25,000 for an Axanthic Spider Morph (Figure 3).

Figure 3. Axanthic spider morph ball python (photo courtesy Rick Cunningham, breeder and owner, Rustys-balls.com).

Patterns of Importation and Exportation

Imports and exports recorded in the LEMIS database indicated that imports were six times greater than exports. Trade in manufactured products was inconsistent across taxonomic groups and depended on the scope and type of products that can be made from the animal. Commercial farming and wild harvest are common ways to source animals that will be processed, but it was impossible to determine where the specimen was sourced from when traded as a product. Studies exploring the sustainability of harvest of wild specimens exist for several of the exotics traded as products such as tegus (*Tupinambis sp.)* by Mieres and Fitzgerald (2006) and Reticulated Python (*Python reticulatus*) by Shine et al. (1999). However, it was beyond the scope of this project to determine whether or not harvest and manufacture of species could be sustainable for commercial trade. As a group, lizards occurred in more trade categories than any other group, followed closely by crocodilians. Lizards and crocodilians were traded as boots, shoes, handbags, watchbands, small and large leather products, and more. In contrast, amphibians and especially salamanders were not processed into manufactured products. Amphibians were more likely to be traded for meat, as in the case of the Indus Valley Bullfrog (*Hoplobatrachus tirginus*) which was imported for human consumption. The only wildlife description code common for every taxonomic category is “LIV” indicating that the specimen is imported alive either for the pet trade, as food for other animals, or to eventually end up on a humans’ dinner plate. It is not possible to tell the percentage of the trade comprised of live specimens by comparing it to the other categories because the units of trade are different by category. Import patterns of live

exotic amphibians and reptiles could represent the influx of specimens that either flow into the pet trade in the United States or are re-exported to other destinations.

The export of exotics from Texas remained difficult to analyze (Reed and Gibbons 2002, USFWS 2004, Schlaepfer et. al. 2005). It was reported that 881,832 live exotic specimens were imported to Texas and 523,267 live exotic specimens were shipped out of Texas between January 2002 and June 2008 (Table 5 & 6). Because the LEMIS data was gathered from standardized forms it is unrealistic to state the difference in import and export represented the number of specimens staying in the United States. The data reported to USFWS and stored in LEMIS does not distinguish between domestic exports and re-exports. Exports and re-exports could be international or domestic. An export could represent a "repackaging" of specimens recently imported for resale to the international market. An export could also represent specimens new to the trade originating from a captive breeding colony within the United States. Because specimens are not marked individually and cannot be inventoried as a dry good, it is impossible to tell where the specimens originate and where they end up. It is important to recognize through comparison of Table 3 and 6 the majority of the specimens included in the commercial export trade from Texas are live specimens of frogs, toads, and snakes.

Reporting System Recommendations

A problem inherent to the USFWS reporting system was that multiple codes were used to refer to the same species. These codes affected precise analysis of real numbers at the

species level. Schlaepfer et al. (2005) reported similar issues with the use of LEMIS data in evaluating the impact of the trade on wild populations. Partial codes or incomplete taxonomy could be necessary for shipments between scientific institutions, where taxonomic work was taking place, but entries such as “Non-CITES Reptile or Amphibian” or others represented only by genus (*Hemidactylus sp.)* should not have been permissible for commercial users. Schlaepfer et al. (2005) pointed out that partially or non-identified species could represent imperiled species or exotics known to be invasive. Suggestions have been made to utilize the Taxonomic Serial Number (TSN) provided by the Integrated Taxonomic Information System, but changes have yet to be implemented (Gerson et al. 2008). Data migrators could be designed to link multiple taxonomic synonymies to one numeric code, and facilitate ease in data management. In addition, records could receive an automatic flag if protected by international, federal, or state legislation. Several other benefits apparent to the standardization of synonymies and requirement of full taxonomic classification include; facilitation of summarized reports, ease in analysis of data, and prohibition of shipments lacking the correct level of taxonomic identification. Furthermore, Gerson et al. (2008) believes that through the adoption of this system, traders would be forced to become more knowledgeable about the species traded, but I am skeptical of that supposition. Part of the problem may be that dealers do not want to fully report to the species level. This could be a symptom of laziness, or an underhanded way to move regulated species. Requiring genus and species for all commercial shipments would prohibit laziness and potentially curtail illegal shipments. The problem of dubious dealers attempting to import regulated species under

unregulated names would still exist. This issue cannot be completely mended; but the system would be greatly improved if genus and species were required for trade shipments or if USFWS adopted the TSN coding system.

To address potentially dangerous large and venomous snakes, TPWD recently introduced a “Controlled Exotic Snake” permit, which requires owners of the 5 largest boids (*Python sebae, Python molurus, Eunectes murinus, Python reticulatus, and Python natalensis*) and/or all exotic venomous snakes to be permitted by the state (31 TAC §§55.651-65.656). All listed boids plus 103 exotic venomous snakes were documented in the commercial trade in Texas (Appendix A). Permit reports are to be maintained on-site by the breeder/dealer and available for inspection by the game warden, but it is not required that they be submitted to TPWD on an annual basis. The permit system should provide information about how many owners and dealers are active in the state, but without reporting requirements, it is unlikely that an estimate of the number of invasive, potentially dangerous snakes persist in the state. Continued monitoring of the status of which species are involved in the trade and what quantities are imported is crucial to protect our native species. Minor changes in federal and state regulatory systems as well as interstate and international cooperation would improve the system and facilitate consistent reproducible studies and monitoring efforts.

CHAPTER III

TRADE IN NATIVE AMPHIBIANS AND REPTILES IN TEXAS

The commercial trade in amphibians and reptiles has been of concern to conservationists and regulatory officials due to the potential that collection of live individuals for the pet trade and exploitation of wild populations for skins and meat may lead to declines in native populations (Hoover 1998, Gibbons et. al 2000, Fitzgerald et al. 2004). The worldwide decline in amphibians has garnered significant attention among scientists, popular media, and politicians (Gibbons et. al. 2000). Collection for biological supply houses and pet trade are suspected to be a factor in the decline of amphibians (Dodd 1997). For example, severe overharvest of populations of red-legged and leopard frogs in the 1800's to 1900's for meat trade led to decreased populations of frogs (Jennings and Hayes 1985, Lannoo et al. 1994). Reptile decline is also influenced by exploitation and much of the use of reptiles is clearly unsustainable (Gibbons et al. 2000). Scientists consider the global trade in turtles the major cause of declining turtle populations (Salzberg 1995, Turtle Conservation Fund 2002). The international trade in turtles for meat and pets is largely unregulated and has lead to localized extinctions in China and Vietnam (Keister and Juvik 1997, Sharma 1999). Within the United States, commercial tapping operations focused of the Alligator snapping turtle (*Macroclemys temminckii*) during the 1960's through 70's affected populations throughout the range of the species (Roman et al. 1999). Concerns about overcollection of box turtles (*Terrepene spp.)* for the pet trade led to the recent prohibition of collection in Louisiana and Texas.

Demand for live rattlesnakes and their parts led to regional declines in parts of Mexico, where herpetologists have reported it is difficult to find snakes in the wild (Fitzgerald et al. 2004). Collection of snake species from the wild such as the ocellated mountain viper (*Vipera wagneri*) for the pet trade and timber rattlesnake (*Crotalus horridus*) for rattlesnake roundups are linked to declines in populations and pose a threat to the survival of the species (Nilson et al. 1990, Shine and Fitzgerald 1996, Fitzgerald and Painter 2000). Illegal collection of unique species of lizards such as the gila monster (*Heloderma suspectum*) in New Mexico by private collectors for personal use and sale to the pet trade is suspected to be a cause for limited local population sizes (New Mexico Department of Fish and Game 1988).

Although clearly needed, studies assessing the level of trade of amphibians and reptiles native to Texas are scarce. Jester (1992) identified 2 amphibians, 5 lizards, 22 snakes, and 5 turtle species commercially traded in Texas though no levels of collection were reported because at the time Texas lacked a permitting system. Jester's analysis of trade in non-game Texas wildlife noted that people involved in the commercial trade will collect all legal species possible to satisfy universal demand and recommended that a permitting system with reporting requirements be instituted. Fitzgerald et al. (2004) accessed these collector–dealer permit reports from the 1999 season and found that 14,351 amphibian and reptile (4,861 amphibians/ 9,493 reptiles) specimens were collected in Texas during that year. This study documented at least 130 species of amphibians and reptiles native to the Chihuahuan Desert Ecoregion were involved in the commercial trade. The trade in rattlesnakes in Texas has received more attention by way

of rattlesnake commercialization studies and publications (Adams 1994, Fitzgerald and Painter 2000, Adams and Thomas 2008). Demand for the export of Texas' turtles nationally and internationally has recently increased, despite broad consensus that turtle populations cannot sustain harvest (Congdon et al. 1994, Gibbons et al. 2000, Ceballos and Fitzgerald 2004). Ceballos and Fitzgerald (2004) identified 88 species of turtles (48 exotic, 22 native to the United States excluding Texas, and 18 native to Texas) in the trade during 1999. Based on their analysis of collector–dealer reports, 16,110 turtles were collected from the wild in Texas in the 1999 season with 78% originating from 3 counties. Species of softshell turtles (*Apalone spp*.), mud and musk turtles (*Kinosernon spp. and Sternotherus spp*.), box turtles (*Terrepene spp*.) and painted turtles (*Chrysemys picta*), in pet markets, and the Red-eared Slider (*Trachemys scripta elegans*) native to Texas were documented in meat and pet markets in southern China (Cheung and Dudgeon 2006).

The trade in native, as well as exotic, species is managed at different levels by regulatory agencies. International trade is reported to United States Fish and Wildlife Service (USFWS), and records are maintained in the Law Enforcement Management Information System (LEMIS). Since 1997, Texas Parks and Wildlife Department (TPWD) has managed the collection and sale of native amphibians and reptiles using a non-game collector and dealer permitting system. Information reported by non-game dealers on an annual basis includes number of regulated species purchased or collected from the wild. Prior to the 2008 season, dealers were only required to report collection or sale of a select list species listed by TPWD, other species permissible to collect did not

require permits or reporting. In fiscal year 2008, TPWD introduced a "white list" of species that collectors and dealers may collect and sell and banned all collection on public lands (Appendix F). Species not appearing on the white list were prohibited from collection with the exception of Red-eared Sliders (*Trachemys scripta elegans*), Common Snapping Turtles (*Chelydra serpentina*) and Softshell Turtles (*Apalone spinifera* and *Apalone mutica*) could be collected from private land; all collection was prohibited in public waters (TAC Chapter 65, §65.325 - §65.332).

The goal of this study was to compile information on native species exploited for the commercial trade for pets, meat, and other uses by various user groups. I synthesize data from various sources to describe and quantify trends in import and export, and geographic foci of collection from the wild. The analysis also serves to identify strengths and weaknesses of the current permitting and reporting systems used by TPWD and USFWS as they pertain to native amphibians and reptiles.

METHODS

I used surveys, interviews, observations, and data requests as reported in Chapter II. Species native to Texas were defined as having a range that extends into the state. Many records in the LEMIS database were only reported to genus level, and if the genus was known to occur in Texas, those records have been included in this chapter.

Data Collection

In addition to the data collection and sample sizes from Chapter II, Texas Parks and Wildlife Department provided data from dealer permits 2003 to present (TAC Chapter 65, §65.325 - §65.332). Data from these reports included: list of species collected, number of individuals collected in the wild by county, number of amphibians and reptiles purchased, and contact information of permit holders.

RESULTS

Sample sizes from user groups were included from all data sources in Chapter II (Table 1). In addition TPWD non-game dealer reports provided quantities collected from the wild by dealers and quantities purchased from non-game collectors by dealers. I documented 24 families and 171 species of native amphibians and reptiles in the trade in Texas (Table 13, Appendix D). An additional 35 species were documented to genus probably do not represent different taxa. By species, snakes were the most specious group in the trade with a total of 74 species from 3 families. The family Colubridae (colubrid snakes) represented 74.66% of all species of snakes traded. A total of 16 species of Viperidae (pit vipers) and Texas Coralsnakes (*Micrurus*) were involved in the trade. Turtles were the second most numerous taxa group by species with a total of 36 species. Species from 5 families of turtles were traded, but a majority of the species came from family Emydidae (19) that includes freshwater and box turtles. The endangered Texas Tortoise (*Gopherus berlanderi*) was documented in the pet trade and is included in the dataset. One record of Green Sea Turtle (*Chelonia mydas*) was found

in the LEMIS database marked for importation to Texas, but is not included in the species count because it was seized by USFWS. For amphibians, Hylid frogs species were most numerous with 9 species followed by 7 representatives from the family Bufonidae, 5 Ranid frogs, and 4 species of Ambystomatid salamanders. Lizards from the family Phrynosomatidae comprise 9 of the 29 species documented, followed by 4 Teiids and 4 skinks.

Table 13. Native amphibian and reptile species involved in the commercial wildlife trade in Texas January 2002 – June 2008.

	Amphibians	Lizards	Snakes	Turtles	Crocodilians	Total
Families	7	7	3	5	1	24
Identified to species or subspecies	29	29	74	36	1	171
Identified to genus	7	9	12	7	0	35

International Trade

Native amphibians and reptiles were exported under 13 different wildlife description codes assigned by the LEMIS database (Table 14). Live specimens of turtles represent the largest segment of the international export trade with 1,477,367 specimens shipped from Texas ports between January 2002 and June 2008 however quantities cannot be compared across description codes. Crocodiles were used in more (11) trade categories than any other group, and are only represented by one native species, the American alligator (*Alligator mississippiensis*) in Texas. Crocodilians are the only category shipped out of Texas as processed meat product, though it is understood that many of the

live turtles are destined for Asian food markets. Snakes were shipped under 7 different wildlife description codes. Salamanders and lizards are only exported alive for international trade and appear in no other trade categories as processed products.

Table 14. Categories and quantities of commercially traded native specimens from all sources (captive, farmed, and wild) exported from Texas from January 2002 - June 2008. Source: LEMIS database.

Wildlife Description Code[b]	Anura	Caudata	Sauria	Serpentes	Testudines	Crocodylia	Total
BOD				25			25
JWL						3	3
LIV	124,135	21,746	184,480	31,603	1,238,284	30	1,600,278
LPL						33	33
LPS	6			15		30,873	30,894
MEA						6700 kg	6700 kg
SHO	64			848		2,109	3,021
SKE	2			8	1		11
SKI				1,319	10	387,592	388,921
SKP						4,850	
SKU				25	12	34	71
TAI						935	935
TRI						27	27

[a] Quantities listed in individual units (no.) unless otherwise denoted. [b] This column contains the wildlife description code as recorded by the LEMIS database. BOD (dead, whole animal), JWL (jewelry- other than ivory), LIV (live specimen), LPL (leather product- large manufactured), LPS (leather product- small manufactured), MEA (meat), SHO (shoe- including boot), SKE (skeleton- substantially whole), SKI (skin- whole raw or tanned), SKP (skin piece raw or tanned, including scraps), SKU (skull- except when part of trophy), TAI (tail), and TRI (trim- shoe, garmet, or decorative).

From the LEMIS database, I documented 609,634 live, wild caught specimens (Table 15) of native Texas amphibians and reptiles internationally exported between January 2002 and June 2008. Turtles were the most exported group, making up 42.73% of all live wild caught animals in the trade during 2002-2008. The turtle trade peaked in 2004 with 106,565 individuals exported and has since declined to <10,000 in 2007

(Table 15). Saurians and anurans were the two next largest taxon groups exported as live wild caught individuals representing 29.77% and 20.14% of the total trade respectively. Exports of snakes peaked in 2004 with 4,957 and appears to have declined. The number of salamanders exported alive peaked in 2006 with 5,690 and has since declined to below 2,000 individuals.

Table 15. Live, wild caught, native amphibian and reptile specimens exported from Texas to international destinations January 2002 - June 2008. Source: LEMIS database.

	Export Year							
Group	2002	2003	2004	2005	2006	2007	2008	Total
Anura	15,038	14,316	24,646	24,202	19,638	19,818	5,134	122,792
Caudata	4,724	1,092	3,006	4,226	5,690	1,676	652	21,066
Crocodylia	0	0	0	0	0	0	0	0
Sauria	19,630	26,250	31,976	28,023	29,023	32,264	14,293	181,459
Serpentes	3,308	3,406	4,957	4,515	2,743	3,580	1,310	23,819
Testudines	17,721	54,162	106,565	55,389	16,353	9,084	1,224	260,498
Total	62,423	101,229	173,154	118,360	75,453	68,429	24,621	609,634

Wild caught native amphibians and reptiles were exported internationally to a total of 33 countries. The top 10 countries importing live wild caught native amphibians and reptiles from Texas accounted for a yearly average of 95.618% (SD = 1.396) of the total trade (Table 16). A disproportionate share of specimens were imported by the top ranking country in each category. Germany was the largest importer for live wild caught anurans (56.07%), saurians (53.08%), and snakes (57.86%) from Texas. Japan ranked

highest for number of salamanders (43.53%) imported from Texas and Hong Kong ranked highest for number of turtles imported for this period with 59.37%.

Table 16. Foreign countries importing live Texas native amphibians and reptiles from Texas ports January 2002 - June 2008. Source: LEMIS database.

Group	Country	Percent of total	Group	Country	Percent of total
Anura	Germany	56.07%	**Caudata**	Japan	43.53%
	Netherlands	8.93%		Germany	20.64%
	France	8.49%		France	7.88%
	Japan	6.68%		Great Britain	5.27%
	Great Britain	5.03%		Netherlands	4.98%
	Sweden	3.50%		Italy	4.10%
	Italy	3.31%		Taiwan	2.98%
	Austria	1.92%		Belgium	2.25%
	Canada	1.62%		Italy	1.90%
	Belgium	0.98%		Canada	1.31%
	Cumulative percentage	96.53%		Cumulative percentage	94.84%
Sauria	Germany	53.08%	**Serpentes**	Germany	57.86%
	Netherlands	11.73%		France	7.24%
	France	7.33%		Netherlands	5.75%
	Great Britain	4.05%		Japan	5.11%
	Austria	3.70%		Sweden	4.96%
	Sweden	3.67%		Italy	3.78%
	Japan	3.60%		Great Britain	3.55%
	Belgium	2.71%		Austria	2.64%
	Canada	2.03%		Hong Kong	2.63%
	Hong Kong	1.71%		Belgium	2.62%
	Cumulative percentage	93.61%		Cumulative percentage	96.14%
Testudines	Hong Kong	59.37%			
	Netherlands	9.47%			
	Germany	7.40%			
	Republic of Korea	7.21%			
	Japan	3.37%			
	Nicaragua	3.10%			
	China	2.74%			
	France	2.37%			
	Czech Republic	1.48%			
	Great Britain	0.64%			
	Cumulative percentage	97.15%			

Specimens of captive and farm reared native amphibians and reptiles shipped from Texas numbered 987,033 for the period of January 2002 through June of 2008 (Table 17). Turtles were the top taxon group exported as captive propagates and represented 98.71% of the total trade. Exported shipments in 2005 were abnormally high and were influenced by 4 shipments of turtles from Concordia Turtle farm, a Louisiana based captive rearing facility, totaling 367,400 individuals. Shipments from Louisiana would have typically been routed through the port of New Orleans, but the port was closed for part of that year due to hurricane season. Snakes were the second most exported group for captive reared specimens, but only represented 0.008% of the trade. Exports of captive reared anurans, saurians, salamanders and crocodilians were very low for the period of the dataset and represent a cumulative 0.005%.

Table 17. Live captive or farm reared native amphibian and reptile specimens shipped out of Texas alive for commercial purposes January 2002 – June 2008. Source: LEMIS database.

	Export Year							
Group	2002	2003	2004	2005	2006	2007	2008	Total
Anura	6	124	108	64	200	759	76	1,337
Caudata	0	336	298	46	0	0	0	680
Crocodylia	11	0	0	0	0	0	0	11
Sauria	424	476	772	628	578	13	130	3,021
Serpentes	409	390	1,484	1,555	1,165	1,439	1,159	7,601
Testudines	78,815	79,818	47,948	684,621	51,283	29,314	2,584	974,383
Total	79,665	81,144	50,610	686,914	53,226	31,525	3,949	987,033

The top 15 species exported live including captive and wild caught specimens accounted for 95.01% of the total from January 2002 to June 2008 (Figure 4). The species ranked highest included 10 freshwater turtles, 2 lizards, one genus representing one or two of species of frog and one salamander. Frogs were exported as Green Treefrogs (*Hyla cinerea*) and "Treefrog" (*Hyla sp.*) in the LEMIS database. Because USFWS does not require that species be reported, these records may or may not represent a two different species. By quantity, the top-ranked species was the Red-eared Slider (*Trachemys scripta elegans*), and accounted for 48.61% of the total trade. Other freshwater turtles appeared in the ranking and included the River Cooter (*Pseudemys coccinna*), Common Snapping Turtle (*Chelydra serpentina*), Mississippi Map Turtle (*Graptemys pseudogeographica kohnii*), Mexican Plateau Slider (*Trachemys gaigeae*), and False Map Turtle (*Graptemys pseudogeographica*). Two genera as turtle were shipped out of Texas without further taxonomic delineation and included *Chrysemys sp*. and *Pseudemys sp*. The two most traded lizard species by quantity were the Green Anole (*Anolis carolinensis*) and the Collared Lizard (*Crotaphytus collaris*). The only salamander traded in relatively high numbers internationally was the Tiger Salamander (*Ambystoma tigrinum*), but only 5,820 were exported between January 2002 and June 2008.

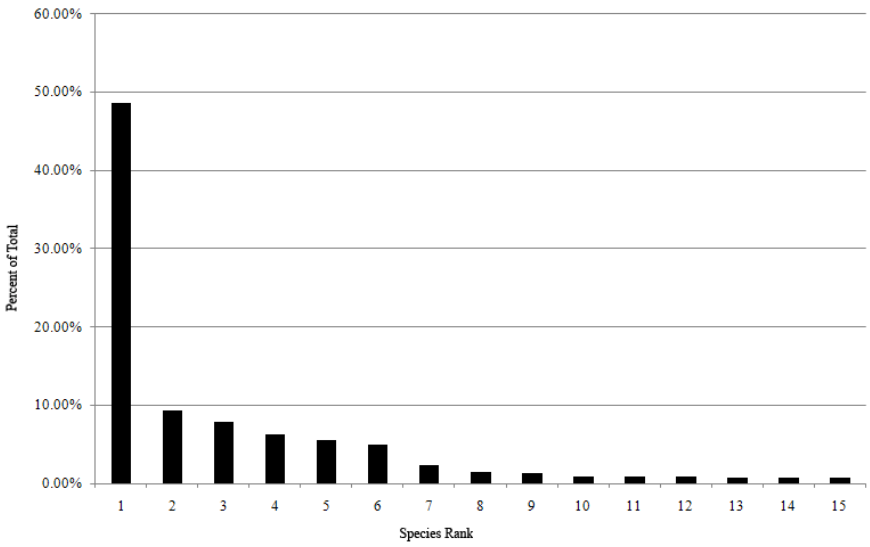

Figure 4. Ranked distribution of live native amphibians and reptiles exported from Texas January 2002 – June 2008.

The top 10 species exported internationally per year accounted for an average of 87.99% (SD = 4.532) of the total commercial trade in live native amphibians and reptiles (Table 18). Consistently, the Red-eared Slider (*T. s. elegans*) appeared as a highly exported species. Many of the same species were in the top 10 list of species traded each year throughout the study period (Table 19). The Green Anole (*Anolis carolinensis*) and Green Tree Frog (*Hyla cinerea*) were among the top 10 species traded during all years. Six species of freshwater turtles appeared in the top 10 list at least once indicating that there is an international demand. Amphibians were represented by Green Tree Frogs (*Hyla cinerea*), Tiger salamanders (*Ambystoma tigrinum*) and toads of the genus *Anaxyrus*. Lizards included the Green Anole (*Anolis carolinensis*), Collared lizard (*Crotaphytus collaris*), and Side-blotched Lizard (*Uta stansburiana*). Two species of snakes occurred in the top 10 list and included the Rough Green Snake (*Opheodrys aestivus*) and Milksnake (*Lampropeltis triangulum).* Eight species were only in the top 10 list once, indicating that either supply or demand of these species was not consistent.

Table 18. Top 10 native species exported from Texas alive by year January 2002 through June 2008 includng all sources of specimens (wild, captive, farmed). Source: LEMIS database.

Year	Rank	Scientific Name	Common Name	Total Imported	Percent of Total
2002	1	*Trachemys scripta elegans*	Red-eared Slider	75,703	54.02%
	2	*Anolis carolinensis*	Green Anole	14,766	10.54%
	3	*Pseudemys concinna*	River Cooter	7,486	5.34%
	4	*Hyla cinerea*	Green Tree Frog	6,474	4.62%
	5	*Hyla sp.*	Unidentified Treefrog	5,858	4.18%
	6	*Graptemys pseudogeographica kohni*	Mississippi Map Turtle	5,516	3.94%
	7	*Ambystoma sp.*	Unidentified Salamander	3,256	2.32%
	8	*Crotaphytus collaris*	Collared Lizard	2,114	1.51%
	9	*Bufo sp.*	Bufo Toad	1,888	1.35%
	10	*Thamnophis sirtalus*	Common Garter Snake	1,742	1.24%
			Cumulative percentage accounted for by top 10 species		89.05%
2003	1	*Trachemys scripta elegans*	Red-eared Slider	79,871	43.87%
	2	*Anolis carolinensis*	Green Anole	20,632	11.33%
	3	*Graptemys pseudogeographica kohni*	Mississippi Map Turtle	20,391	11.20%
	4	*Chelydra serpentina*	Common Snapping Turtle	12,363	6.79%
	5	*Pseudemys concinna*	River Cooter	9,118	5.01%
	6	*Hyla cinerea*	Green Tree Frog	8,830	4.85%
	7	*Sternotherus odoratus*	Common Musk Turtle	4,573	2.51%
	8	*Hyla sp.*	Unidentified Treefrog	3,682	2.02%
	9	*Crotaphytus collaris*	Collared Lizard	2,239	1.23%
	10	*Chrysmeys sp.*	Chrysemys sp.	2,058	1.13%
			Cumulative percentage accounted for by top 10 species		89.95%
2004	1	*Chelydra serpentina*	Common Snapping Turtle	42,944	17.66%
	2	*Pseudemys concinna*	River Cooter	26,844	11.04%
	3	*Anolis carolinensis*	Green Anole	25,723	10.58%
	4	*Trachemys scripta elegans*	Red-eared Slider	21,824	8.97%

Table 18. Continued.

Year	Rank	Scientific Name	Common Name	Total Imported	Percent of Total
2004	5	*Graptemys pseudogeographica kohni*	Mississippi Map Turtle	21,360	8.78%
	6	*Trachemys scripta scripta*	Yellow-Bellied Slider	20,805	8.56%
	7	*Hyla cinerea*	Green Tree Frog	18,178	7.48%
	8	*Chrysemys sp.*	Chrysemys sp.	16,095	6.62%
	9	*Graptemys pseudogeographica*	False Map Turtle	9,538	3.92%
	10	*Apalone spinifera*	Spiny Softshell	4,392	1.81%
			Cumulative percentage accounted for by top 10 species		85.42%
2005	1	*Trachemys scripta elegans*	Red-eared Slider	586,368	72.96%
		Trachemys gaigeae	Mexican Plateau Slider	36,050	4.49%
	3	*Chelydra serpentina*	Common Snapping Turtle	29,583	3.68%
	4	*Graptemys pseudogeographica kohni*	Mississippi Map Turtle	26,986	3.36%
	5	*Pseudemys concinna*	River Cooter	24,440	3.04%
	6	*Anolis carolinensis*	Green Anole	22,346	2.78%
	7	*Pseudemys sp.*	Pseudemys sp.	20,100	2.50%
	8	*Hyla cinerea*	Green Tree Frog	18,758	2.33%
	9	*Chrysemys sp.*	Chrysemys sp.	4,327	0.54%
	10	*Chrysemys picta*	Northern Painted Turtle	3,089	0.38%
			Cumulative percentage accounted for by top 10 species		96.07%
2006	1	*Pseudemys concinna*	River Cooter	43,548	34.26%
	2	*Anolis carolinensis*	Green Anole	24,686	19.42%
	3	*Hyla cinerea*	Green Tree Frog	16,112	12.68%
	4	*Chelydra serpentina*	Common Snapping Turtle	6,156	4.84%
	5	*Graptemys pseudogeographica kohni*	Mississippi Map Turtle	5,691	4.48%
	6	*Trachemys scripta elegans*	Red-eared Slider	4,562	3.59%
	7	*Ambystoma tigrinum*	Tiger Salamander	4,408	3.47%
	8	*Chrysemys picta*	Northern Painted Turtle	2,466	1.94%
	9	*Crotaphytus collaris*	Collared Lizard	2,176	1.71%

Table 18. Continued.

Year	Rank	Scientific Name	Common Name	Total Imported	Percent of Total
2006	10	*Apalone spinifera*	Spiny Softshell	1,890	1.49%
			Cumulative percentage accounted for by top 10 species		87.88%
2007	1	*Anolis carolinensis*	Green Anole	28,763	29.36%
	2	*Hyla cinerea*	Green Tree Frog	16,998	17.35%
	3	*Pseudemys concinna*	River Cooter	13,691	13.97%
	4	*Trachemys scripta elegans*	Red-eared Slider	9,591	9.79%
	5	*Chelydra serpentina*	Common Snapping Turtle	8,221	8.39%
	6	*Sternotherus odoratus*	Common Musk Turtle	1,755	1.79%
	7	*Opheodrys aestivus*	Rough Green Snake	1,516	1.55%
	8	*Ambystoma tigrinum*	Tiger Salamander	1,412	1.44%
	9	*Hyla sp.*	Unidentified Treefrog	1,298	1.32%
	10	*Thamnophis sirtalus*	Common Garter Snake	1,130	1.15%
			Cumulative percentage accounted for by top 10 species		86.11%
2008	1	*Anolis carolinensis*	Green Anole	11,581	43.60%
	2	*Hyla cinerea*	Green Tree Frog	4,207	15.84%
	3	*Trachemys gaigeae*	Mexican Plateau Slider	1,392	5.24%
	4	*Sternotherus odoratus*	Common Musk Turtle	1,092	4.11%
	5	*Crotaphytus collaris*	Collared Lizard	637	2.40%
	6	*Hyla sp.*	Unidentified Treefrog	607	2.29%
	7	*Lampropeltis triangulum*	Milksnake	566	2.13%
	8	*Opheodrys aestivus*	Rough Green Snake	542	2.04%
	9	*Uta stansburiana*	Side-Blotched Lizard	536	2.02%
	10	*Chrysemys picta*	Northern Painted Turtle	474	1.78%
			Cumulative percentage accounted for by top 10 species		81.45%

Table 19. Frequency of occurrence of the 21 species comprising the top 10 native amphibian and reptile exported live lists based on LEMIS reports January 2002 - June 2008.

Sceintific Name	Common Name	Frequency of Occurrence[a]
Anolis carolinensis	Green Anole	7
Hyla cinerea	Green Tree Frog	7
Trachemys scripta elegans	Red-eared Slider	6
Pseudemys concinna	River Cooter	6
Chelydra serpentina	Common Snapping Turtle	5
Graptemys pseudogeographica kohnii	Mississippi Map Turtle	5
Hyla sp.	Hyla Treefrog	4
Crotaphytus collaris	Collared Lizard	4
Sternotherus odoratus	Common Musk Turtle	3
Chrysemys sp.	Chrysemys sp.	3
Trachemys gaigeae	Mexican Plateau Slider	2
Ambystoma tigrinum	Tiger Salamander	2
Opheodrys aestivus	Rough Green Snake	2
Chrysemys picta	Northern Painted Turtle	2
Pseudemys sp.	Pseudemys sp.	1
Graptemys pseudogeographica	False Map Turtle	1
Apalone spinifera	Spiny Softshell	1
Ambystoma sp.	Unidentified Salamander	1
Anaxyrus sp.	Bufo Toad	1
Lampropeltis triangulum	Milksnake	1
Uta stansburiana	Side-Blotched Lizard	1

[a] Number of times the species appeared in the top 10 list for native amphibians and reptiles exported alive.

I found that amphibians and reptiles native to Texas were also imported to Texas from elsewhere. Between 2002 and June 2008, a total of 142,112 amphibians and reptiles native to Texas were imported to the state for commercial trade. Anurans represented 72.37% of the total import of live native specimens into the state. Turtles, lizards, and snakes followed with 22.65%, 4.83% and 0.14% of the trade respectively. Countries exporting native specimens to Texas differed among taxon. For anurans,

Taiwan was the largest exporter and accounted for 60.92% of the trade in that group. Japan was the largest exporter of turtles and accounted for 93.19% of the trade. Lizards imported from Nicaragua comprised 71.84% of trade in the group. Snakes were imported from 5 countries; Germany (35.64%), and Egypt (31.19%), Nicaragua (24.26%), Czech Republic (6.44%), and Mexico (2.48%). The top 10 species imported accounted for 98.86% of the total import trade for this period (Figure 5, Table 20). The Bullfrog (*Lithobates catesbeianus*), ranks number one and accounts for 45.16% of the total import trade in live native amphibians and reptiles for this period, followed by the Red-eared Slider (*Trachemys scripta elegans*), and toads of the genus *Anaxyrus*. Several species in the top 10 imported native species list were reported only to genera level and included *Anaxyrus sp*., *Hyla sp*., *Anolis sp*., and *Rana sp*.. These records could represent species that do not occur in Texas, but because there was no way to make that determination, they were included in the analysis.

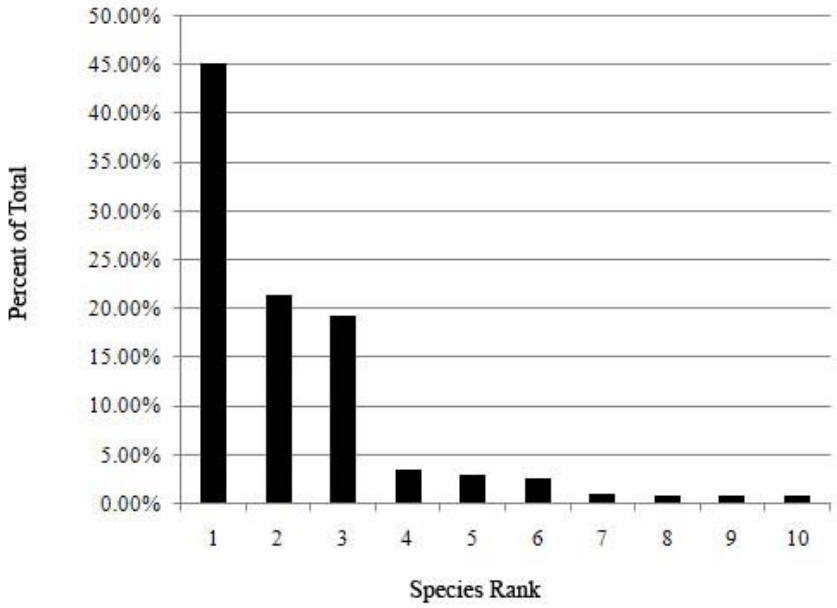

Figure 5. Ranked distribution of live native amphibians and reptiles imported to Texas 2002-2008 from foreign countries.

Table 20. The top 10 native amphibian and reptile species imported to Texas from other countries January 2002 - June 2008. Source: LEMIS database.

Scientific Name	Subspecies	Total imported
Lithobates catesbeiana	Bullfrog	64,176
Trachemys scripta elegans	Red-eared Slider	30,456
Rana berlandieri	Rio Grande Leopard Frog	27,520
Anaxyrus sp.	Bufo Toad	5,050
Hyla sp.	Hyla Treefrog	4,342
Sceloporus variabilis	Rosebelly Lizard	3,691
Anolis sp.	Anole	1,506
Chelydra serpentina	Common Snapping Turtle	1,349
Sceloporus sp.	Spiny Lizard	1,245
Lithobates sp.	Lithobates frog	1,132

Collection from the Wild

Records indicate that over the last 5 seasons, a total of 2,964 non-game dealer permits or permit renewals were issued by TPWD (mean of 466 per year). I found 7.18% of non-game dealer permits were issued to non-residents. Dealers reported the number of specimens they collect and the county of origin (Appendix E, Figures 6 - 9). From 2004 to 2008, a total of 69,182 specimens were reported as taken from the wild by permitted non-game dealers. The foci of dealer collection varied by taxonomic group and year. For amphibians, the western portion of the state had the greatest activity from year to year with collections in Hockley, Hudspeth, El Paso, Gaines counties ranking highest in seasons 2004 through 2007 respectively. The eastern county of Liberty ranked top in the 2008, the only season a western county did not claim top rank. Lizard collection by non-game dealers was also centered in the western quarter of the state for seasons 2004

through 2007. Collections in EL Paso ranked at the top for 2004 through 2006. The 2007 seaseon saw was lower levels of collection in four western counties; Presidio, Hudspeth, Brewster, and Pecos. Activity in the eastern portion of the state occurred during the 2008 season with collection of lizards reported in 9 counties that had not seen activity during 2004 through 2007. Snake collection was broad geographically but appeared to be skewed towards the western half of the state. The top year of collection by county was 2005, with a total of 10,902 snakes collected in Nolan county. An additional 2,486 snakes were collected this year by non-game dealers, but the county of collection was not reported. Lower levels of collection in the western counties of El Paso, Hudspeth, Jeff Davis and Brewster were consistent in nearly every year. The geographic foci of dealer collection of turtles could not be determined by the data provided for the 2004 season. A total of 10,489 turtles reported to be collected that year did not include county of collection. The collection of turtles by non-game dealers in the 2006 season was highest in the north central portion of the state; Palo Pinto, Parker, and Johnson accounted for 47.45% of the total. Post the 2007 season, activity was restricted to 10 counties, but continued to be centered in the north eastern quarter of the state.

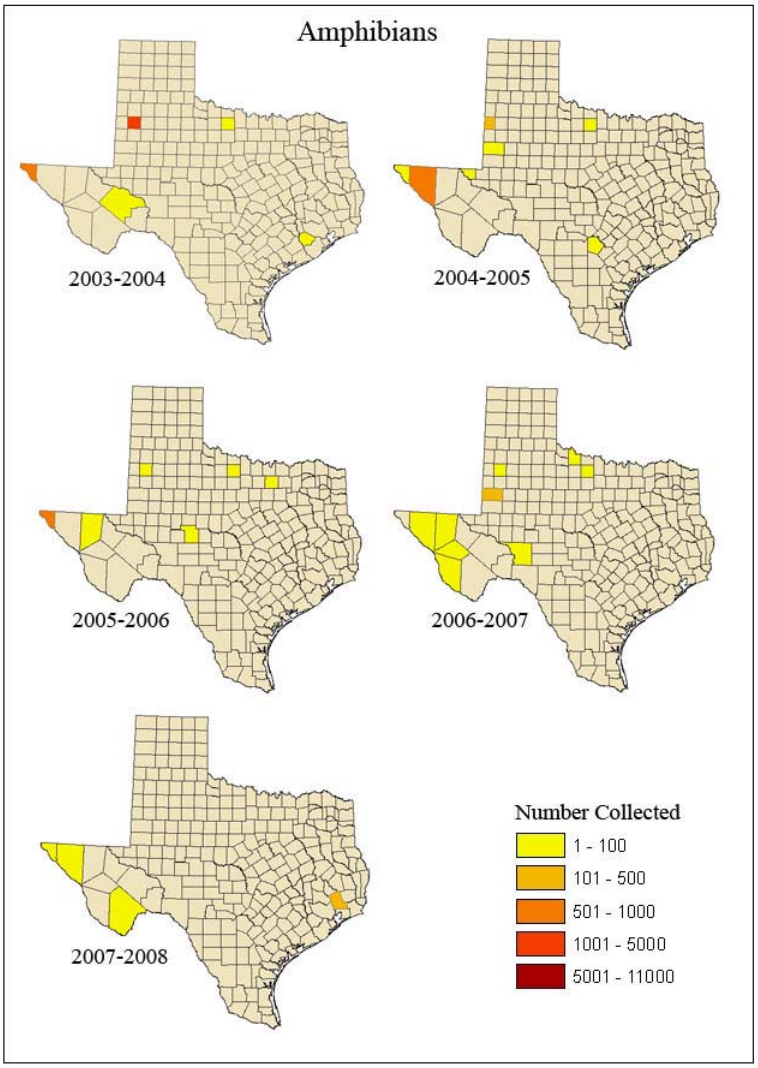

Figure 6. Amphibians collected from the wild as reported by non-game dealers to Texas Parks and Wildlife Department by season and county. In additional 65 amphibians were collected in 2004 and 12 amphibians in 2005, but no county of collection was reported.

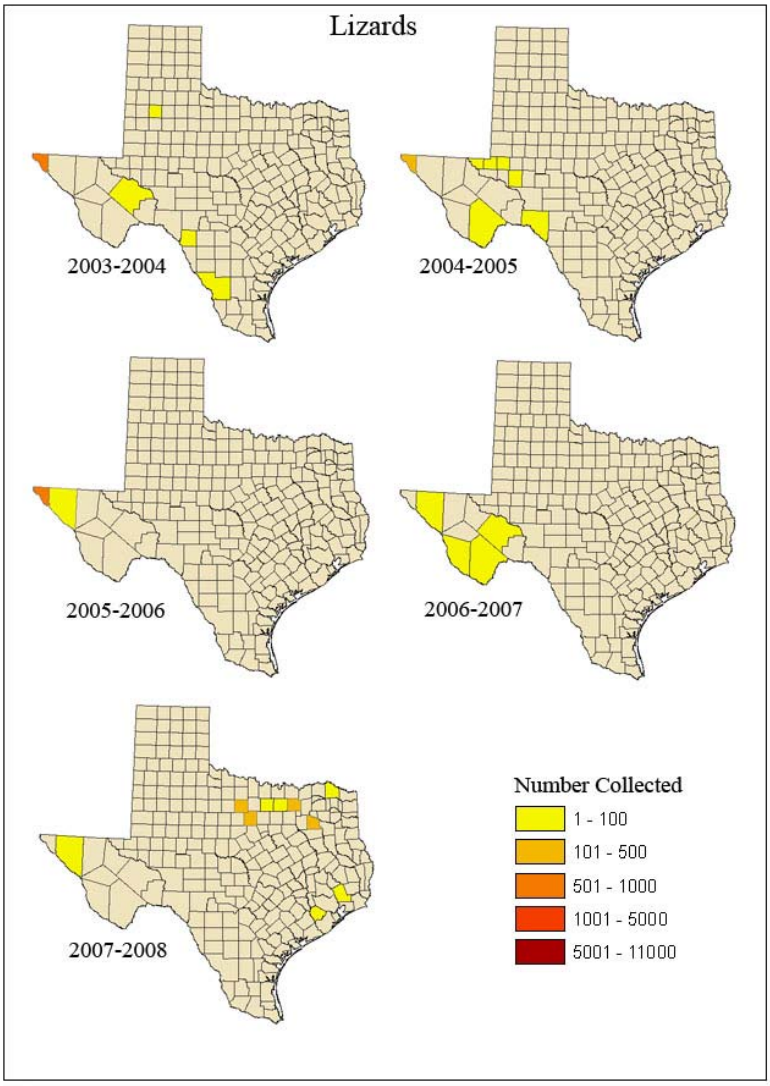

Figure 7. Lizards collected from the wild as reported by non-game dealers to Texas Parks and Wildlife Department by season and county. In additional 241 lizards were collected during the 2005 season but no county of collection was reported.

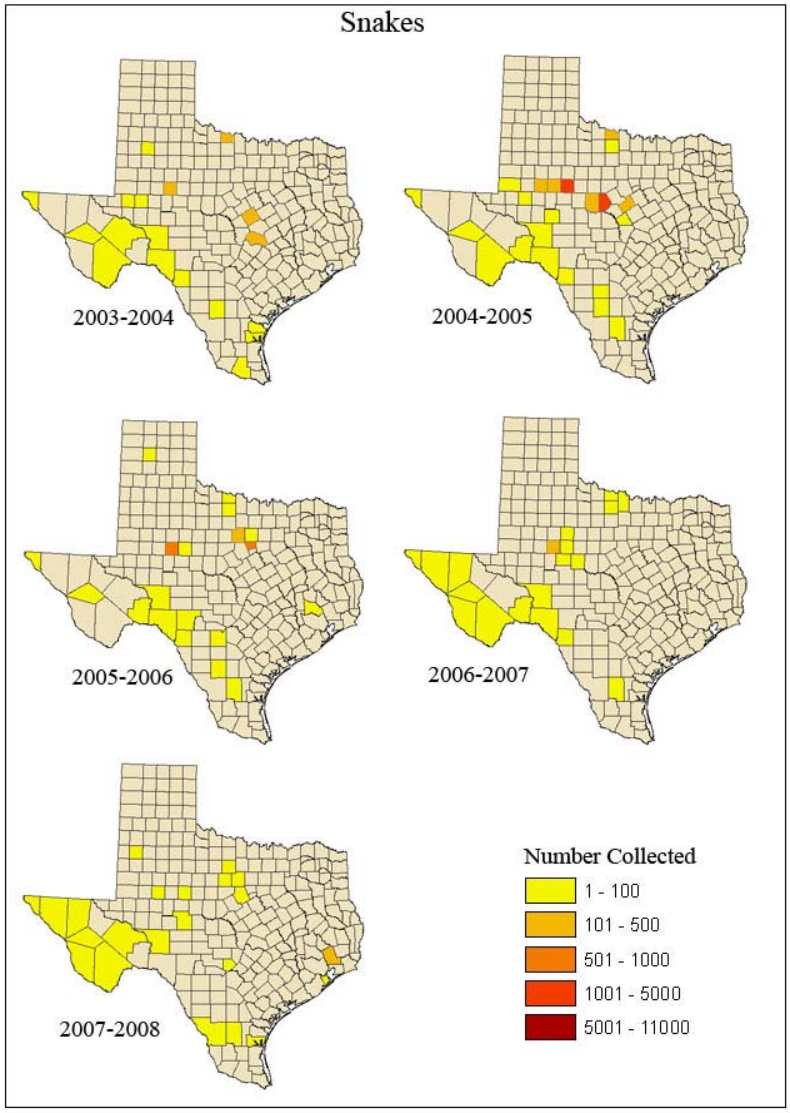

Figure 8. Snakes collected from the wild as reported by non-game dealers to Texas Parks and Wildlife Department by year and county. In additional 99 snakes were collected in 2004 and 2,486 during the 2005 season, but no county of collection was reported.

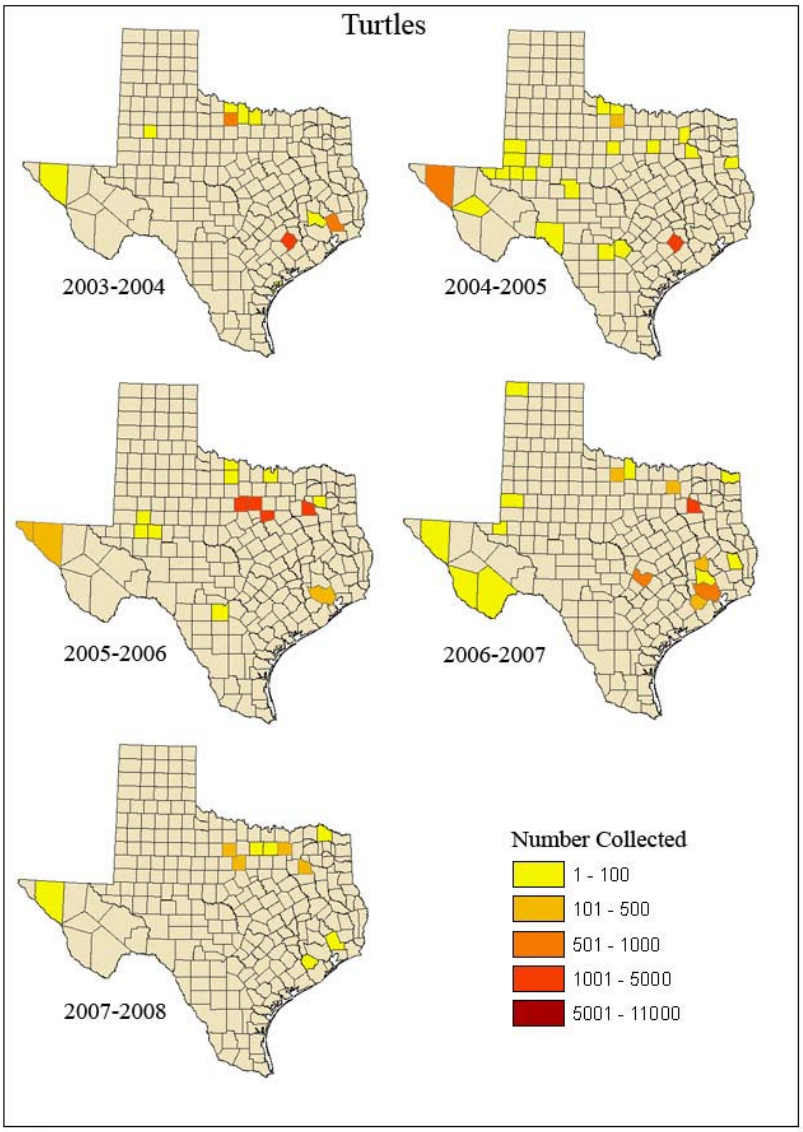

Figure 9. Turtles collected from the wild as reported by non-game dealers to Texas Parks and Wildlife Department by year and county. An additional 10,489 turtles were collected during the 2004 season, but no county of collection was reported.

Twenty species accounted for 97.88% of the total number of amphibians and reptiles collected from the wild in Texas during 2003-2008 (Figure 10). The Red-eared Slider (*Trachemys scripta elegans*) accounted for 40.24% of the collection. Also ranking high was the Western Diamond-backed Rattlesnake (*Crotalus atrox*) that represented 28.67% and was the only snake to appear in the overall rank. None of the remaining species that received a high rank accounted for more than 4% of the total. Turtles were the most common species to appear and claimed ten of the top twenty spots. Lizards were represented by the Marbled Whiptail (*Aspidoscelis marmorata*), Eastern Collared Lizard (*Crotaphytus collaris*), Southwestern Earless lizard (*Cophosaurus texanus*) and Texas Banded Gecko (*Coleonyx brevis*). Amphibians collected in quantity included the Barred Tiger Salamander (*Ambystoma mavoratium*), Couch's Spadefoot Toad (*Scaphiopus couchii*), Plains Spadefoot Toad (*Spea bombifrons*) and Texas Toad (*Anaxyrus speciosus*).

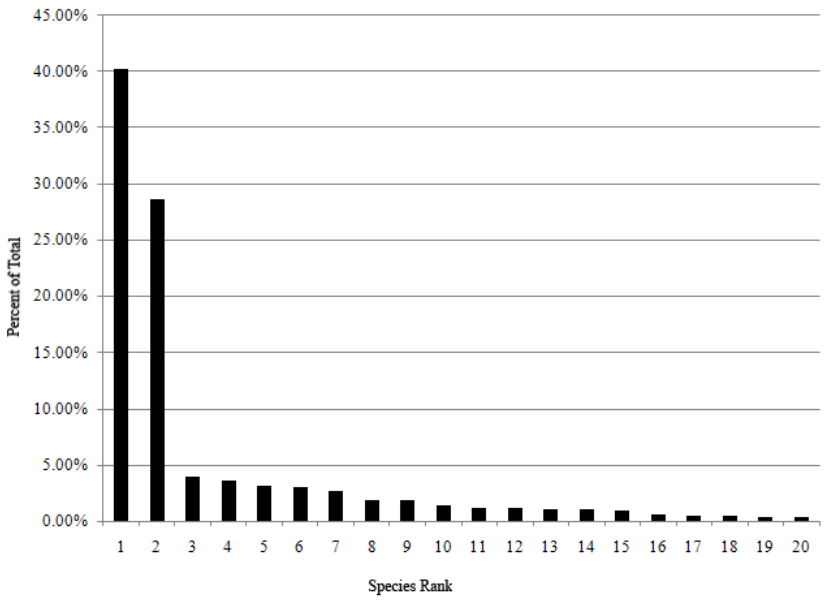

Figure 10. Species rank for wild collected native amphibians and reptiles as summarized from non-game dealer annual reports to Texas Parks and Wildlife Department for the 2004 through 2008 seasons.

By year, the top 10 species represented 95.93% (SD = 2.373) of the total number of specimens collected for seasons included (Table 21). Because of increased reporting requirements in 2008, the species ranking high accounted for less of the total percentage. The top ranked species every year was the Red-eared Slider (*T. s. elegans*). Also appearing every year was the Western Diamond-backed Rattlesnake (*C. atrox*) and the common snapping turtle (*Chelydra serpentina*). Turtles were the taxon group that represented half of the total number of species that comprised the top 10 list of collected specimens (Table 22). Lizards were represented by 6 species, Amphibians commonly collected included 3 species of toad (*S. couchii*, *S. bombifrons*, *Ollotis nebulifer*), 2 species of frog (*H. cinerea* and *L. catesbeianus*), and one salamander (*A. mavortium*) (Table 22). The only snake to make the top 10 list any year was the Western Diamond-backed Rattlesnake (*C. atrox*) The number of dealers interested in collecting the same species were low with the exception of the 2005 season collection of the Ornate Box turtle (*T. ornata*). During that season, a total of 42 dealers reported collection of the species. The target of the greatest average number of collectors per season was the Western Diamond-backed Rattlesnake with an average of 18 dealers reporting collection. With the exception of the collection of the Western Diamond-backed Rattlesnake (C. atrox), the top ranked collector accounted for over 30 % of the total of the species collected.

Table 21. Wild collected native amphibians and reptiles by rank with season total and number of active collectors by species. Source: TPWD non-game dealer reports.

Season	Rank	Scientific Name	Common Name	Season Total	Percent of Season Total	Number of collectors	Percent total accounted for by top ranked collector
2004	1	*Trachemys scripta elegans*	Red-eared Slider	10,321	51.62%	8	84.79%
	2	*Terrapene carolina*	Eastern Box Turtle	3,000	15.00%	1	100.00%
	3	*Ambystoma mavortium*	Barred Tiger Salamander	1,701	8.51%	1	100.00%
	4	*Apalone spinifera pallida*	Pallid Spiny Softshell Turtle	1,005	5.03%	4	99.50%
	5	*Chelydra serpentina*	Common Snapping Turtle	953	4.77%	6	95.70%
	6	*Crotalus atrox*	Western Diamond-backed Rattlesnake	872	4.36%	22	16.17%
	7	*Apalone spinifera hartwegi*	Western Spiny Softshell Turtle	651	3.26%	1	100.00%
	8	*Aspidoscelis marmorata*	Marbled Whiptail	438	2.19%	1	100.00%
	9	*Scaphiopus couchii*	Couch's Spadefoot Toad	271	1.36%	1	100.00%
	10	*Spea bombifrons*	Plains Spadefoot Toad	262	1.31%	2	96.18%
			Cumulative percent represented by top 10 species		97.41%		
2005	1	*Crotalus atrox*	Western Diamond-backed Rattlesnake	18,510	58.11%	31	45.92%
	2	*Trachemys scripta elegans*	Red-eared Slider	6,958	21.84%	12	55.33%
	3	*Ambystoma mavortium*	Barred Tiger Salamander	1,064	3.34%	2	53.01%
	4	*Apalone spiniferus pallida*	Pallid Spiny Softshell Turtle	1,000	3.14%	1	100.00%
	5	*Terrapene ornata luteola*	Desert (Western) Box Turtle	758	2.38%	14	37.34%
	6	*Aspidoscelis marmorata*	Marbled Whiptail	751	2.36%	3	67.51%
	7	*Terrapene ornata*	Ornate Box Turtle	638	2.00%	42	49.37%
	8	*Phrynosoma modestum*	Roundtail Horned Lizard	560	1.76%	15	31.61%
	9	*Chelydra serpentina*	Common Snapping Turtle	380	1.19%	5	81.05%
	10	*Scaphiopus couchii*	Couch's Spadefoot Toad	326	1.02%	3	76.69%
			Cumulative percent represented by top 10 species		97.14%		
2006	1	*Trachemys scripta elegans*	Red-eared Slider	8,370	58.84%	7	36.99%
	2	*Crotalus atrox*	Western Diamond-backed Rattlesnake	1,762	12.39%	14	39.73%

Table 21. Continued

Season	Rank	Scientific Name	Common Name	Season Total	Percent of Season Total	Number of collectors	Percent total accounted for by top ranked collector
2006	3	*Apalone spinifera hartwegi*	Western Spiny Softshell Turtle	1,549	10.89%	3	94.06%
	4	*Terrapene ornata*	Desert (Western) Box Turtle	517	3.63%	7	38.88%
	5	*Scaphiopus couchii*	Couch's Spadefoot Toad	440	3.09%	2	99.77%
	6	*Chelydra serpentina*	Common Snapping Turtle	276	1.94%	5	51.81%
	7	*Apalone spinifera*	Texas Spiny Softshell	237	1.67%	3	48.10%
	8	*Aspidoscelis marmorata*	Marbled Whiptail	216	1.52%	1	100.00%
	9	*Cophodsaurus texanus*	Southwestern Earless Lizard	209	1.47%	2	99.04%
	10	*Phrynosoma modestum*	Roundtail Horned Lizard	150	1.05%	3	60.67%
			Cumulative percent represented by top 10 species		96.49%		
2007	1	*Trachemys scripta elegans*	Red-eared Slider	4,413	60.66%	9	74.17%
	2	*Spea bombifrons*	Plains Spadefoot Toad	510	7.01%	2	98.04%
	3	*Crotalus atrox*	Western Diamond-backed Rattlesnake	465	6.39%	11	45.59%
	4	*Pseudemys texana*	Texas River Cooter	413	5.68%	2	95.88%
	5	*Apalone spinifera pallida*	Pallid Spiny Softshell Turtle	317	4.36%	4	51.10%
	6	*Apalone spinifera guadalupensis*	Guadalupe Spiny Softshell	248	3.41%	3	80.65%
	7	*Chelydra serpentina*	Common Snapping Turtle	227	3.12%	6	59.47%
	8	*Apalone spinifera emoryi*	Texas Spiny Softshell	225	3.09%	5	35.11%
	9	*Terrapene carolina*	Three-toed (Eastern) Box	148	2.03%	6	50.00%
	10	*Terrapene ornata*	Ornate Box Turtle	83	1.14%	8	32.53%
			Cumulative percent represented by top 10 species		96.89%		
2008	1	*Trachemys scripta elegans*	Red-eared Slider	498	23.84%	6	64.26%
	2	*Apalone spinifera emoryi*	Texas Spiny Softshell	306	14.65%	6	41.50%
	3	*Chelydra serpentina*	Common Snapping Turtle	244	11.68%	6	50.41%
	4	*Crotalus atrox*	Western Diamond-backed Rattlesnake	180	8.62%	12	30.00%

Table 21. Continued.

Season	Rank	Scientific Name	Common Name	Season Total	Percent of Season Total	Number of collectors	Percent total accounted for by top ranked collector
	5	*Uta stansburiana*	Side-Blotched Lizard	138	6.61%	1	100.00%
	6	*Crotaphytus collaris*	Collared Lizard	122	5.84%	3	83.61%
	7	*Ollotis nebulifer*	Gulf Coast toad	68	3.26%	1	100.00%
	8	*Anolis carolinensis*	Green Anole	61	2.92%	1	100.00%
	9	*Hyla cinerea*	Green Tree Frog	52	2.49%	1	100.00%
	10	*Lithobates catesbeianus*	Bullfrog	38	1.82%	1	100.00%
			Cumulative percent represented by top 10 species		81.73%		

Table 22. Frequency of occurrence of the top 26 species that comprised the 10 most collected native amphibians and reptiles each season from 2004 - 2008. Source: TPWD non-game dealer reports.

Scientific Name	Common Name	Frequency of occurrence[a]
Trachemys scripta elegans	Red-eared Slider	5
Crotalus atrox	Western Diamond-backed Rattlesnake	5
Chelydra serpentina	Common Snapping Turtle	5
Aspidoscelis marmorata	Marbled Whiptail	3
Scaphiopus couchii	Couch's Spadefoot Toad	3
Ambystoma mavortium	Barred Tiger Salamander	2
Apalone spinifera hartwegi	Western Spiny Softshell Turtle	2
Apalone spinifera pallida	Pallid Spiny Softshell Turtle	2
Terrapene ornata luteola	Desert Box Turtle	2
Terrapene ornata	Ornate Box Turtle	2
Phrynosoma modestum	Roundtail Horned Lizard	2
Apalone spinifera emoryi	Texas Spiny Softshell	2
Terrapene carolina	Eastern Box Turtle	1
Apalone spinifera pallida	Pallid Spiny Softshell Turtle	1
Spea bombifrons	Plains Spadefoot Toad	1
Pseudemys texana	Texas River Cooter	1
Apalone spinifera guadalupensis	Guadalupe Spiny Softshell	1
Apalone spinifera	Texas Spiny Softshell	1
Cophodsaurus texanus	Southwestern Earless Lizard	1
Terrapene carolina	Three-toed (Eastern) Box	1
Uta stansburiana	Side-Blotched Lizard	1
Crotaphytus collaris	Collared Lizard	1
Ollotis nebulifer	Gulf Coast toad	1
Anolis carolinensis	Green Anole	1
Hyla cinerea	Green Tree Frog	1
Lithobates catesbeianus	Bullfrog	1

[a]This column indicates the number of times the species appeared on the top 10 list of dealer collected species.

Non-game dealers are required to purchase only from permitted non-game collectors or other non-game dealers, but 76% of the reports filed did not contain a valid permit number for the seller and listed “no permit”, “out of state”, or invalid numbers instead of valid permit numbers. Because only dealers are required to report specimens collected and/or purchased for resale no data exists for non-game collectors that capture specimens to keep in their personal collections. Additionally, no locality information exists for specimens collected by non-game collectors and sold to non-game dealers. Non-game dealers purchased native amphibians and reptiles for re-sale from non-game collectors, out of state sources, and captive rearing operations totaling 733,207 specimens over the 5 seasons of data I analyzed. The top 20 species accounted for 98.50% of the total trade for this period (Figure 11). The Red-eared Slider (*Trachemys scripta elegans*), ranked first and accounted for 33.08% of the cumulative total for seasons 2004 through 2008. Turtles were the group most purchased by dealers and were represented with 8 of the top 20 species. The only snake to make the top rank was the Western Diamond-backed Rattlesnake (*C. atrox*) that accounted for 17.07 % of purchases. Also included in the top 20 were 6 amphibians (*L. berlanderi, L. catesbeianus, A. mavortium, Hyla cinerea, A. debilis, S. couchii,* and *A. speciosus*) and 4 lizards (*A. carolinensis, A. marmorata, Gambelia wislizenii, U. stansburiana,* and *C. texanus scitulus*).

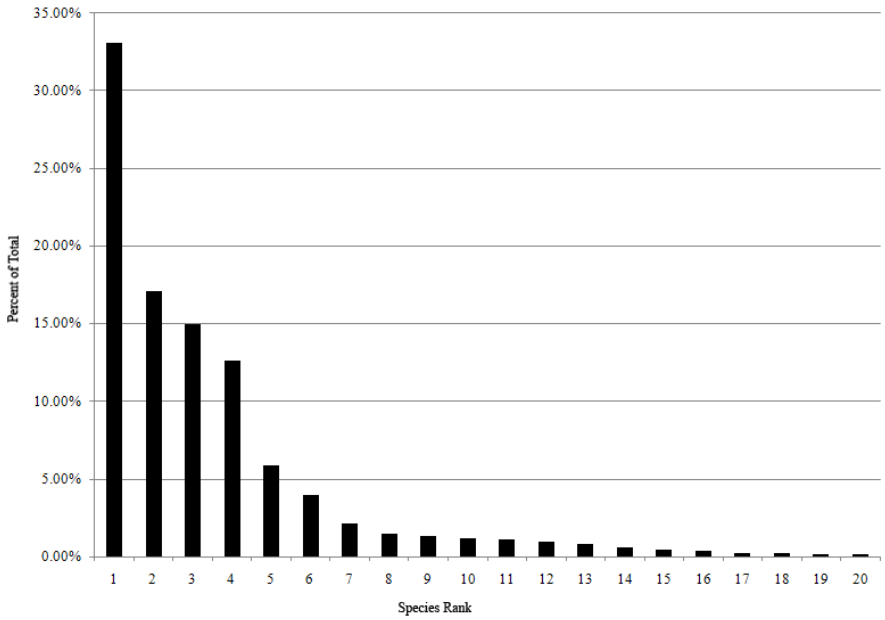

Figure 11. Ranked distribution for native amphibians and reptiles purchased by non-game dealers for resale.

The top 10 species purchased by non-game dealers each year represented an average of 96.90% (SD = 1.262) of the total number purchased (Table 23). The top ranked species for three of the five years was the Red-eared Slider (*T. s. elegans*). Across the board the number of native species purchased by non-game dealers declined. The number of Red-eared Sliders (*T. s. elegans*) purchased by non-game dealers peaked in the 2004 season at 105,733 and fell to 9,977 in the 2008 season. The number of Western Diamond-backed Rattlesnakes (*C. atrox*) peaked in 2006 at 38,694 and declined to 10,552 in 2008. The only species that did not experience a decline in the number purchased by non-game dealers was the Rio Grande Leopard Frog (*L. berlandieri*). This species only occurred on the top 10 list for the 2008 season because of the new regulations for that year. It was reported that 109,661 specimens were purchased by non-game dealers in the 2008 season.

A total of 16 species comprised the top 10 for species purchased by non-game dealers for the period of our dataset (Table 24). Four species were in the top 10 each year and included the Barred Tiger Salamander (*Ambystoma mavortium*), Common snapping turtle (*Chelydra serpentina*), Western Diamod-backed Rattlesnake (*C. atrox*), and Red-eared Slider (*T. s. elegans*). A total of seven species only occurred in the top ten once.

Table 23. Top 10 native amphibians and reptiles purchased by non-game dealers for commercial purposes with percent of species accounted for by top ranked collector, seasons 2004-2008. Source: TPWD non-game dealer reports.

Season	Rank	Scientific Name	Common Name	Season Total	Percent of Season Total	Number of Dealers	Percent of total accounted for by top ranked dealer
2004	1	*Trachemys scripta elegans*	Red-eared Slider	105,733	56.90%	15	63.23%
	2	*Crotalus atrox*	Western Diamond-backed Rattlesnake	28,433	15.30%	10	65.48%
	3	*Graptemys pseudogeographica kohnii*	Mississippi Map Turtle	26,363	14.19%	4	97.96%
	4	*Chelydra serpentina*	Common Snapping Turtle	8,508	4.58%	7	52.49%
	5	*Apalone spinifera emoryi*	Texas Spiny Softshell	4,226	2.27%	4	92.90%
	6	*Apalone spinifera hartwegi*	Western Spiny Softshell	3,539	1.90%	1	100.00%
	7	*Chrysemys picta dorsalis*	Southern Painted Turtle	2,700	1.45%	2	99.85%
	8	*Ambystoma mavortium*	Barred Tiger Salamander	1,710	0.92%	6	55.96%
	9	*Terrapene ornata*	Ornate Box Turtle	1,216	0.65%	9	40.13%
	10	*Anaxyrus debilis*	Green Toad	817	0.44%	2	83.23%
			Cumulative percentage accounted for by top 10 species		98.61%		
2005	1	*Trachemys scripta elegans*	Red-eared Slider	42,515	31.96%	40	54.34%
	2	*Lithobates catesbeianus*	Bullfrog	35,098	26.39%	2	65.70%
	3	*Crotalus atrox*	Western Diamond-backed Rattlesnake	34,977	26.30%	19	44.38%
	4	*Apalone spinifera emoryi*	Texas Spiny Softshell	5,370	4.04%	3	96.05%
	5	*Chelydra serpentina*	Common Snapping Turtle	2,979	2.24%	10	62.64%
	6	*Terrapene ornata*	Ornate Box Turtle	2,232	1.68%	21	50.76%
	7	*Ambystoma mavortium*	Barred Tiger Salamander	2,107	1.58%	10	55.96%
	8	*Apalone spinifera hartwegi*	Western Spiny Softshell	1,669	1.25%	2	99.34%
	9	*Anaxyrus debilis*	Green Toad	998	0.75%	6	53.81%
	10	*Apalone spinifera pallidus*	Pallid Spiny Softshell	918	0.69%	1	100.00%
			Cumulative percentage accounted for by top 10 species		96.88%		
2006	1	*Lithobates catesbeianus*	Bullfrog	48,849	28.00%	6	54%

Table 23. Continued.

Season	Rank	Scientific Name	Common Name	Season Total	Percent of Season Total	Number of Dealers	Percent of total accounted for by top ranked dealer
	2	*Trachemys scripta elegans*	Red-eared Slider	48,137	27.59%	40	46%
	3	*Crotalus atrox*	Western Diamond-backed Rattlesnake	38,694	22.18%	17	36%
	4	*Graptemys pseudogeographica kohnii*	Mississippi Map Turtle	15,067	8.64%	15	93%
	5	*Chelydra serpentina*	Common Snapping Turtle	6,074	3.48%	6	50%
	6	*Apalone spinifera emoryi*	Texas Spiny Softshell	4,954	2.84%	4	88%
	7	*Ambystoma mavortium*	Barred Tiger Salamander	2,746	1.57%	8	84%
	8	*Terrapene ornata*	Ornate Box Turtle	1,974	1.13%	22	44%
	9	*Scaphiopus couchii*	Couch's Spadefoot Toad	1,868	1.07%	6	41%
	10	*Apalone spinifera hartwegi*	Western Spiny Softshell	1,813	1.04%	1	100%
			Cumulative percentage accounted for by top 10 species		97.55%		
2007	1	*Trachemys scripta elegans*	Red-eared Slider	36,177	52.28%	44	35%
	2	*Crotalus atrox*	Western Diamond-backed Rattlesnake	12,537	18.12%	11	28%
	3	*Lithobates catesbeianus*	Bullfrog	4,164	6.02%	8	10%
	4	*Chelydra serpentina*	Common Snapping Turtle	4,121	5.96%	8	73%
	5	*Terrapene ornata*	Ornate Box Turtle	2,978	4.30%	17	74%
	6	*Ambystoma mavortium*	Barred Tiger Salamander	1,791	2.59%	8	74%
	7	*Anaxyrus debilis*	Green Toad	1,762	2.55%	4	75%
	8	*Scaphiopus couchii*	Couch's Spadefoot Toad	967	1.40%	6	42%
	9	*Apalone spinifera hartwegi*	Western Spiny Softshell	809	1.17%	1	100%
	10	*Aspidoscelis marmorata*	Marbled Whiptail	805	1.16%	4	45%
			Cumulative percentage accounted for by top 10 species		95.54%		
2008	1	*Lithobates berlandieri*	Rio Grande Leopard Frog	109,661	64.23%	1	100.00%
	2	*Crotalus atrox*	Western Diamond-backed Rattlesnake	10,552	6.18%	7	42.64%
	3	*Anolis carolinensis*	Green Anole	10,488	6.14%	13	34.64%

Table 23. Continued.

Season	Rank	Scientific Name	Common Name	Season Total	Percent of Season Total	Number of Dealers	Percent of total accounted for by top ranked dealer
	4	*Trachemys scripta elegans*	Red-eared Slider	9,977	5.84%	32	18.04%
	5	*Chelydra serpentina*	Common Snapping Turtle	7,189	4.21%	4	99.67%
	6	*Hyla cinerea*	Green Tree Frog	6,843	4.01%	13	47.46%
	7	*Lithobates catesbeianus*	Bullfrog	4,649	2.72%	5	43.02%
	8	*Anaxyrus debilis*	Green Toad	1,794	1.05%	2	55.52%
	9	*Gambelia wislizenii*	Longnosed Leopard Lizard	1,321	0.77%	1	100.00%
	10	*Ambystoma mavortium*	Barred Tiger Salamander	1,118	0.65%	4	50.45%
			Cumulative percentage accounted for by top 10 species		95.82%		

Table 24. The 16 native amphibian and reptile species comprising the top 10 dealer purchased list for seasons 2004-2008. Source: TPWD non-game dealer reports.

Scientific Name	Common Name	Frequency of Occurrence[a]
Ambystoma mavortium	Barred Tiger Salamander	5
Chelydra serpentina	Common Snapping Turtle	5
Crotalus atrox	Western Diamond-backed Rattlesnake	5
Trachemys scripta elegans	Red-eared Slider	5
Anaxyrus debilis	Green Toad	4
Apalone spinifera hartwegi	Western Spiny Softshell	4
Lithobates catesbeianus	Bullfrog	4
Terrapene ornata	Ornate Box Turtle	4
Apalone spinifera emoryi	Texas Spiny Softshell	3
Graptemys pseudogeographica kohnii	Mississippi Map Turtle	2
Scaphiopus couchii	Couch's Spadefoot Toad	2
Anolis carolinensis	Green Anole	1
Apalone spinifera pallidus	Pallid Spiny Softshell	1
Aspidoscelis marmorata	Marbled Whiptail	1
Chrysemys picta dorsalis	Southern Painted Turtle	1
Gambelia wislizenii	Longnosed Leopard Lizard	1
Hyla cinerea	Green Tree Frog	1
Lithobates berlandieri	Rio Grande Leopard Frog	1

[a]This column indicates the number of times the species appeared on the top 10 list of dealer purchased species.

Because non-game dealers actively collect specimens from the wild and purchase specimens for re-sale from others I considered the possibility that their behavior may change from year to year when considering number of taxa and specimens they personally collect and the number purchased (Table 25). The number of specimens purchased was always greater than the number collected by dealers. The number of specimens collected by dealers peaked in 2005 with 24,742 specimens and declined to 2,067 in 2008. Purchased quantities appeared steady with the exception of the 2007 season, when the number purchased was 105,249 less than the previous season and 101,534 less than following season.

International exportation of live, wild caught specimens was a practice of very few dealers. During the 2008 season, 3 exporters made international shipments of wild caught Texas natives designated for trade, the top dealer accounted for 692 of 695 shipments. To summarize the number and species shipped internationally, I queried the LEMIS database for specimens shipped from Texas during the TPWD 2008 season (Table 26). Twenty species were shipped internationally from Texas marked as wild caught specimens that were illegal to collect or sell per TPWD 2008 regulations.

Table 25. Total number of species and quantity involved in non-game dealer purchases and collections by season 2004-2008. Source: TPWD non-game dealer reports.

	2004	2005	2006	2007	2008
Collection quantity	19,995	24,742	14,100	7,278	2,067
Number of taxa collected	24	28	24	25	59
Purchase quantity	185,831	133,011	174,443	69,194	170,728
Number of taxa purchased	34	32	29	38	70

Table 26. Internationally exported wild caught native amphibians and reptiles September 2007 - August 2008. Source: LEMIS database.

Scientific Name	Common Name	Total exported	Permissible for trade per 2008 regs
Anolis carolinensis	Green Anole	21,297	Y
Hyla cinerea	Green Treefrog	8,949	Y
Opheodrys aestivus	Greensnake	1,252	Y
Hyla sp.	Treefrog	1,218	
Thamnophis sirtalis	Common Gartersnake	1,075	N
Sternotherus carinatus	Razor-backed Musk Turtle	994	N
Crotaphytus collaris	Eastern Collared Lizard	688	Y
Uta stansburiana	Common Side-blotched Lizard	602	Y
Ambystoma tigrinum	Eastern Tiger Salamander	586	N
Gambelia wislizenii	Long-nosed Leopard Lizard	471	N
Trachemys scripta	Slider	450	Y
Sceloporus magister	Desert Spiny Lizard	438	N
Sceloporus variabilis	Rose-bellied Lizard	391	N
Sceloporus serrifer	Rough-scaled Lizard	310	N
Anolis sp.	Anole	261	Y
Chelydra serpentina	Snapping Turtle	223	Y
Ambystoma maculatum	Spotted Salamander	208	N
Apalone spinifera	Spiny Softshell	208	Y
Sceloporus poinsettii	Crevice Spiny Lizard	194	Y
Nerodia fasciata	Southern Watersnake	167	Y
Sceloporus olivaceus	Texas Spiny Lizard	163	N
Chrysemys picta	Painted Turtle	137	N
Sonora semiannulata	Western Groundsnake	130	Y
Pseudemys concinna	River Cooter	125	N
Ambystoma sp.	Salamander	115	
Pantherophis obsoletus	Texas Ratsnake	115	Y
Kinosternon sp.	Mud Turtle	110	N
Anaxyrus debilis	Green Toad	109	Y
Scincella lateralis	Ground Skink	92	Y
Coluber constrictor	North American Racer	82	Y
Thamnophis marcianus	Checkered Gartersnake	81	N
Hyla squirella	Squirrel Treefrog	72	N
Kinosternon subrubrum	Eastern Mud Turtle	59	N
Acris crepitans	Northern Cricket Frog	50	N
Anaxyrus sp.	Toad	50	
Lithobates clamitans	Green Frog	50	N
Pseudacris crucifer	Spring Peeper	50	N
Ambystoma opacum	Marbled Salamander	37	N

Table 26. Continued.

Scientific Name	Common Name	Total exported	Permissible for trade per 2008 regs
Ollotis nebulifer	Gulf Coast Toad	36	Y
Heterodon nasicus	Western Hog-nosed Snake	31	Y
Sceloporus sp.	Fence Lizard	28	
Sceloporus undulatus	Eastern Fence Lizard	27	Y
Lithobates sp.	Frog	26	
Nerodia sp.	Watersnake	25	
Crotalus atrox	Western Diamond-backed Rattlesnake	20	Y
Lampropeltis calligaster	Yellow-bellied Kingsnake	20	Y
Lampropeltis triangulum	Milksnake	20	Y
Masticophis flagellum	Coachwhip	18	Y
Diadophis punctatus	Ring-necked Snake	17	N
Urosaurus ornatus	Tree Lizard	14	Y
Arizona elegans	Glossy Snake	8	Y
Rhinocheilus lecontei	Long-nosed Snake	8	Y
Sceloporus grammicus	Graphic Spiny Lizard	7	N
Coleonyx brevis	Texas Banded Gecko	6	Y
Pituophis sp.	Bullsnake	6	
Scaphiopus sp.	Spadefoot	6	
Trachemys gaigeae	Big Bend slider	6	N
Tantilla nigriceps	Plains Black-headed Snake	5	Y
Thamnophis sp.	Ribbonsnake	5	
Bogertophis subocularis	Trans-Pecos Ratsnake	4	Y
Hypsiglena jani	Texas Night Snake	4	Y
Aspidocelis sp.	Whiptail	3	
Kinosternon flavescens	Yellow Mud Turtle	3	N
Pseudacris sp.	Peeper	3	N
Tropidoclonion lineatum	Lined Snake	3	Y
Storeria dekayi	Dekay's Brownsnake	2	Y
Hyla chrysoscelis	Cope's Gray Treefrog	1	N

Meat Trade

Between January 2002 and June 2008, the export of native amphibians and reptiles from Texas to international markets designated as meat consisted of 3 shipments of American alligator (*Alligator mississippiensis*) shipped by one exporter for a total of 6,700 kg. All alligator meat exported was coded in the LEMIS database as being of wild origin. It was not possible to determine the number of native turtles destined for Asian meat markets using the information from the LEMIS database because there was not a distinction made between a live specimen headed for a pet shop or a live specimen headed for a meat market. Importation of native Texas amphibians and reptiles for meat trade consisted of 10 shipments of Western Diamond-backed Rattlesnake (*Crotalus atrox)* totaling 14.36 kg plus one individual. Four shipments of amphibians and reptiles coded as meat were imported for personal use between 2002 and 2008 including one shipment of *Chrysemys sp.* (1 individual), one shipment of Loggerhead Turtle (*Caretta caretta*,1 kg), two as *Crotalus* sp. (7 individuals), and one shipment of Western Diamond-backed Rattlesnake (*Crotalus atrox*, 0.45 kg). Of the 337 successful calls to meat and seafood establishments in Texas, 4% (n=12) sold frog meat, 1.48% (n=5) sold turtle meat, and 0.03% (n=1) sold snake meat. Two sellers of frog meat said that it comes from Vietnam, whereas two claimed that their frog meat comes from Louisiana. None of the snake or turtle meat vendors were able to tell us where their turtle meat comes from and none of the vendors were able to tell us what species they had available. Average price per pound of frog meat was $6.59 and the average price per pound of turtle meat was $14.33.

Retail Pet Trade

The survey of 118 Internet dealer sites from Chapter II revealed a grand total of 60 species of native amphibians and reptiles available for sale to Texas. Seventeen species were offered as wild caught specimens, but the origin of these animals was not clear (Table 27). Native species offered for sale were primarily snakes with (86.11%), followed by turtles (8.22%), lizards (2.74%), amphibians (2.74%), and crocodilians (0.20 %). I recorded a total of 3,552 instances of live amphibians and reptiles being offered for sale and shipment to Texas from 118 on-line dealer websites. Of those instances, only 14.92% (n=530) were native amphibians and reptiles. At least four species not permissible to sell under current regulations in Texas were identified as wild-caught and available for sale and shipment to Texas via Internet sites (Canyon Treefrog, *Hyla arenicolor*; Eastern Gartersnake, *Thamnophis sirtalis sirtalis*; Eastern Mud Turtle, *Kinosternon subrubrum subrubrum*; and Eastern Musk Turtle, *Sternotherus odoratus*.

Table 27. Wild caught Texas native amphibians and reptiles available from Internet dealers.

Anurans	
Ambystoma tigrinum	Eastern Tiger Salamander
Anaxyrus speciosus	Texas Toad
Hyla arenicolor	Canyon Treefrog
Hyla cinerea	Green Treefrog
Lithobates catesbeianus	American Bullfrog
Lizards	
Anolis carolinensis	Green Anole
Uta stansburiana	Common Side-blotched Lizard
Snakes	
Agkistrodon contortrix contortrix	Southern Copperhead
Nerodia erythrogaster erythrogaster	Red-bellied Watersnake
Opheodrys aestivus aestivus	Northern Rough Greensnake
Pantherophis emoryi	Great Plains Ratsnake
Pantherophis guttatus guttatus	Eastern Cornsnake
Pantherophis obsoletus	Texas Ratsnake
Rhinocheilus lecontei	Longnose snake
Thamnophis sirtalis sirtalis	Eastern Gartersnake
Turtles	
Apalone spinifera	Spiny Softshell
Kinosternon subrubrum subrubrum	Eastern Mud Turtle
Sternotherus odoratus	Eastern Musk Turtle

I ranked all native species available for sale on the Internet and ranked them by the number of instances in the dataset, reported the minimum, maximum, average and mode for their price (Table 28). It was important to include modal price in the analysis because there were several one of a kind specimens offered for sale on the Internet that demanded an extraordinarily high price and skewed the data set. Snakes offered for sale on-line comprised 13 of the 19 popularly traded amphibians and reptiles, turtles were represented by only two species, and no lizards were commonly traded. Native amphibians for sale on-line were represented by one species the Green Treefrog (*Hyla cinerea*). By far, the native species that encountered the most on-line was the Cornsnake (*Pantherophis guttatus guttatus*) with 286 instances and was marketed for sale from $15 to $500. Following in popularity on-line were the Western Hog-nosed Snake (*Heterodon nasicus*), 17 instances; Red-eared Slider (*T. s. elegans*), 15 instances; Texas Ratsnake (*Elaphe obsoletys lindheimeri*), 12 instances; and the Gray-banded Kingsnake (*Lampropeltis alterna*), 11 instances.

Table 28. Popular native amphibians and reptiles traded live as pets on the Internet.

Scientific Name	Common Name	Instances[a]	Minimum	Maximum	Average Price	Mode
Pantherophis guttatus guttatus	Cornsnake	286	$15.00	$500.00	$76.74	$50.00
Heterodon nasicus	Plains Hog-nosed Snake	17	$50.00	$1,200.00	$267.35	$50.00
Trachemys scripta elegans	Red-eared Slider	15	$3.00	$10,000.00	$819.90	$200.00
Elaphe obsoletus lindheimeri	Texas Ratsnake	12	$17.50	$168.00	$51.25	$34.00
Lampropeltis alterna	Gray-banded Kingsnake	11	$50.00	$400.00	$148.73	$50.00
Lampropeltis getula splendida	Desert Kingsnake	8	$30.00	$150.00	$60.71	$30.00
Anolis carolinensis	Green Anole	7	$2.50	$60.00	$13.79	$4.00
Lampropeltis triangulum annulata	Louisiana Milksnake	6	$25.00	$500.00	$125.83	$65.00
Thamnophis marcianus	Checkered Gartersnake	6	$9.00	$40.00	$26.50	$20.00
Hyla cinerea	Green Treefrog	5	$3.00	$15.00	$8.20	n/a
Pantherophis bairdi	Bairds Ratsnake	5	$25.00	$150.00	$69.60	n/a
Trachemys scripta scripta	Yellow-Bellied Slider	5	$5.00	$15.00	$8.70	n/a
Coluber constrictor	Common Racer	4	$5.00	$16.00	$10.50	$5.00
Pantherophis emoryi	Great Plains Rat Snake	4	$40.00	$200.00	$128.00	n/a
Sternotherus odoratus	Common Musk Turtle	4	$8.00	$10.00	$9.13	$10.00
Lampropeltis calligaster calligaster	Prairie Kingsnake	3	$40.00	$50.00	$46.67	$50.00
Opheodrys aestivus aestivus	Northern Rough Greensnake	3	$8.00	$18.00	$12.00	n/a

[a] This column indicates the number of times I encountered the species for sale on-line.

From the exposition survey respondents, 23.19% (n= 253) native amphibians and reptiles were listed as pets. Respondents listed the origin of their native pets; 51.38% (n=130) captive bred, 25.69% (n=65) wild caught, 20.95% (n=53) unknown, and 1.98% (n=5) farm reared. I generated a table of “popular” exotic amphibians and reptiles for sale at the expositions consisting of unique observations of species in the dataset (Table 29). I reported modal price in the analysis because of color variants offered for sale at shows that demanded high prices and skewed the dataset. Native species offered included 146 accounts, of those 51.70% (n=75) were offered as a color morph that does not occur in the wild. A total of 13 snakes and three lizards were recorded at expositions at least twice. The top ranked popular species for sale at expositions was the Cornsnake (*P. guttatus*) with 89 instances in the dataset. Following was the Plains Hog-nosed Snake (*Heterodon nasicus*) 15 instances; Western Diamond-backed Rattlesnake (*C. atrox*) 13 instances; and the Trans-pecos Ratsnake (*Bogertophis subocularis*) with 10 instances.

Table 29. Popular native amphibians and reptiles traded live as pets at herpetological expositions.

Genus	Common Name	Instances[a]	Minimum	Maximum	Average	Mode
Pantherophis guttatus	Cornsnake	89	$20.00	$150.00	$58.61	$50.00
Heterodon nasicus	Plains Hog-nosed Snake	15	$30.00	$600.00	$188.93	$40.00
Crotalus atrox	Western Diamond-backed Rattlesnake	13	$50.00	$800.00	$317.31	$600.00
Bogertophis subocularis	Trans-Pecos Ratsnake	10	$25.00	$150.00	$76.00	$50.00
Lampropeltis getula splendida	Desert Kingsnake	8	$35.00	$150.00	$77.50	$150.00
Lampropeltis alterna	Gray-banded Kingsnake	7	$50.00	$250.00	$153.57	$200.00
Crotalus viridis	Prairie Rattlesnake	4	$150.00	$800.00	$400.00	$150.00
Lampropeltis gutula holbrooki	Speckled King	4	$100.00	$100.00	$100.00	$100.00
Eumeces fasciatus	Five-Lined Skink	3	$5.00	$12.00	$7.33	$5.00
Pantherophis bairdi	Bairds Ratsnake	3	$75.00	$550.00	$391.67	$550.00
Thamnophis marcianus	Checkered Gartersnake	3	$8.00	$750.00	$336.00	n/a
Agkistrodon contortrix	Southern Copperhead	2	$30.00	$35.00	$32.50	n/a
Anolis carolinensis	Green Anole	2	$4.00	$4.00	$4.00	n/a
Eumeces laticeps	Broadhead Skink	2	$25.00	$25.00	$25.00	n/a
Heterodon platirhinos	Eastern Hog-nosed Snake	2	$125.00	$125.00	$125.00	n/a
Pantherophis emoryi	Great Plains Ratsnake	2	$95.00	$95.00	$95.00	n/a

[a] This column indicates the number of times I encountered the species for sale at a herpetological exposition.

Based on the results reported in Chapter II, analysis of pet store information was impeded by lack of data received. Only one respondent listed the species available for sale and no native species were documented. From the non-game dealer permit information provided by TPWD, every PetSmart© and Petco© in Texas was registered as a non-game dealer. However, only one report from a chain store (PetSmart© #1185) was filed with TPWD for the entire period of the dataset for a single purchase of 4 Red-eared Sliders (*T. s. elegans*) from an unpermitted out-of-state source

DISCUSSION

Native Species in the Trade

Theoretically the number of native species in the commercial trade should be dictated by TPWD regulations. However, varied regulations from year to year and state to state influenced the number of species detected in the trade. With a grand total of 172 species of native amphibians and reptiles commercialized from the state between January 2002 and August 2008, it appeared the adage from Jester (1992) was true and that commercialization of all permissible species possible occurred. Species illegal for sale were reported from Internet sites, appeared as pets on owner surveys, and exported internationally as wild-caught specimens. My results showed that wild-caught prohibited species were listed for sale on-line and included at least 4 species (Table 27). Although I was not able to infer intensity of illegal trade in these species it was clear that some degree of poaching and commercialization of prohibited species exists and could be monitored through routine polling of Internet websites. Another example of a species

illegal for trade appearing in the dataset was a lone record of a Desert Tortoise (*Gopherus berlanderi*) that was gleaned from a pet owner survey and not documented in the trade elsewhere. For the 2008 season, I documented 25 illegal species exported internationally from Texas (Table 26). An additional 10 genera were listed in the LEMIS database and could have represented additional species but lack of finer taxonomy prohibited conclusion. Such shipments represented two different scenarios; an interstate importation for international exportation event or a shipment that is illegal at the state level but not regulated at the federal level. Because USFWS does not monitor export of species according to state regulations these shipments were allowed to exit the state. However, at herpetological expositions no illegal species were documented, indicating that vendors were aware of TPWD regulations. Also affecting the number of species detected in the trade is a TPWD regulation that states that up to 6 specimens of each species not appearing on the White List (Appendix F) or otherwise protected may be collected by persons possessing a hunting license and kept for personal non-commercial use. Because of disparities in regulations, management appeared a challenge when attempting to supervise the native species permissible for trade.

Trends in International Exportation and Importation

Very few instances of native turtles, frogs and toads, and snakes and zero instances of salamanders were reported to be exported from Texas as manufactured products. This was largely anticipated considering the limited scope of products that can be manufactured from these animals, and results from Chapter II that showed that the

United States is primarily a consumer and not manufacturer of wildlife products. The American Alligator (*Alligator mississippiensis*) was reported in the most trade categories because of its use in manufactured leather products. Because only one exporter was responsible for the lone shipment of alligator meat, it was inferred that trade in processed meat was minimal and was the activity of few individuals. The only wildlife description code common for every taxonomic category to be traded as was "LIV" indicating that the specimen was imported alive for the pet trade, as food for other animals, or to eventually end up on someone's dinner plate. It is not possible to tell the percentage of the trade comprised of live specimens by making a direct comparison to other categories because of different units used for measurement.

The Red-eared Slider (*Trachemys scripta elegans*) was the top exported live species and appeared in nearly all top 10 lists per year. International trade in this species was believed to be primarily for meat trade in Asia but the LEMIS database does not distinguish between a live specimen destined for a meat market and one headed for the pet trade. Adult and juvenile specimens exported live to Hong Kong markets end up for sale to meat markets or farms that produce turtles for human consumption (Cheung and Dedgeon 2006). Turtle shipments peaked in 2005 with a cumulative total of 734,335 specimens shipped internationally. This result was influenced by shipments of captive propagates from Louisiana based operations shipped from Texas because of the closure of the New Orleans port due to the hurricane season that year. During that time shipments were re-routed through the Dallas Ft. Worth port, and it is plausible that wild caught specimens from Louisiana exported from Texas also increased for that time

period. Because reporting requirements for interstate shipments were not in place until 2008, it could not be inferred the number of wild caught specimens harvested from Texas versus other states within the species' range. Comparison of the number of wild caught versus captive bred specimens demonstrated that captive rearing was more common for turtles than the other taxon groups (Tables 15 and 17). The increased availability of specimens produced in captivity may be the reason for the decline in international trade of turtles from the wild. In fact, wild specimens internationally exported were outnumbered by specimens produced in captivity by almost 1 million for the period of the dataset. Groups not represented by specimens produced in captivity should be closely monitored to determine if management measures are necessary.

Germany was the top importer of Texas' native frogs, lizards, and snakes, while Japan was the top importer of salamanders. Keeping exotic pets is common in Europe, and as with trade in the United States, it is difficult to determine the precise origin of species in the trade. A recent study produced by a French-German cooperative analyzed 404 cases of bites and stings by exotic pets in Europe (Schaper et. al. 2009). The species responsible for the majority of severe envenomations were rattlesnakes in the genera *Sisturus* and *Crotalus*, both native to Texas and exported to Germany during the period of this study. It was not surprising that Hong Kong was the greatest importer of wild caught turtles at 59.37% because of other corroborating studies that document the popularity of turtles for meat and pets (Cheung and Dudgeon 2006). The only turtle sold for meat in Asian markets documented by Cheung and Dudgeon (2006) was the Red-eared Slider (*Trachemys scripta elegans*) which was the top species of turtle exported

live from Texas. Regardless of use in foreign countries, exportation of wild caught amphibians and reptiles represents a net loss to wild populations throughout the range of the species.

Collection from the Wild

Permits for collection are available at any establishment that sells hunting and fishing licenses, and no annual reports are required to be a collector. As a collector, it was only permissible to sell to a permitted non-game dealer. Because TPWD does not require annual reports from non-game collectors, the only data available for analysis was from dealer reports. Non-game dealers were allowed to collect, propagate, and sell native amphibians and reptiles to the public. Dealers were required to report personal collection and purchase of native species, but are not required to report the locality information for specimens purchased if the specimen was collected from the wild in Texas. This was a major setback from reporting requirements present for datasets previously analyzed. Ceballos and Fitzgerald (2004) were able to determine with finer scale where collectors and dealers operated using information from collector and dealer reports from the 1999 season. Their study documented that the majority of collection of turtles was occurring at the southern tip of Texas in Hidalgo and Cameron counties, but this study did not detect any collection of turtles from those counties. Because collectors are no longer required to file annual reports, it was impossible to tell if collection in these areas of Texas continued. Dealer reports were difficult to make inferences from because they included purchases from in-state and out of state sources and specimens produced in

captivity. Additionally, there was little perceived enforcement for incomplete or invalid non-game collector or dealer permit numbers on dealer reports and only 23% of the dealer reports included valid permit numbers for the seller. It is possible that the permitting and reporting system was not understood, but if permit holders are allowed to discover that the regulations are backed with little enforcement it may foster a lackadaisical attitude toward the system.

Regardless, from data available, collection, purchase and re-sale of specimens from the wild continued to be a practice of very few individuals. Most species were sought after by few dealers with the top ranked dealer harvesting an average of 71.03% of the total by species taken from the wild (Table 20). Purchases showed that few dealers were responsible for the brokering of each species and was supported by the fact that the top ranked dealer purchased an average of 64.36% of the total by species (Table 23). The Western Diamond-backed Rattlesnake (*Crotalus atrox*) was an exception presumably because it was still hunted heavily for annual rattlesnake roundups. Hunting for this species appeared to be primarily a practice of non-game collectors because the number purchased by dealers was always greater than the number collected by dealers. Season totals for Western Diamond-backed Rattlesnakes (*Crotalus atrox*) reported to be collected from the wild by dealers decreased from a 5 year high of 18,510 in 2005 to only 180 in 2008. The number purchased by dealers hit a 5 year high in 2006, with 38,694 and decreased to 10,552 in 2008. The rapid decline in number collected and purchased could be an indication that demands for wild caught rattlesnakes decreased or snakes were more difficult to locate and capture. However, the 2009 Sweetwater

Rattlesnake roundup recently reported an annual total of 13,128 pounds of rattlesnakes. Using the calculation provided in Fitzgerald and Painter (2000), it can be estimated that 7,150 rattlesnakes were involved in the 2009 Sweetwater roundup. With 10 other active roundups in the state, demand should still be considered high for this species. Turtle collection and purchase by non-game dealers comprised the majority of the total trade as reported to TPWD and two species of turtles (*T. s. elegans* and *C. serpentina*) appeared to be the most exploited for trade. Texas is also hosts unique species and subspecies of turtles with small ranges that continue to be heavily exploited. The Western Spiny Softshell Turtle (*Apalone spinifera hartwegi*) is known to occur from only 4 counties in Texas, and ranked in the top 10 dealer collected list twice and the top 10 dealer purchased list four times. Collection and purchase of lizards and amphibians appeared to be minimal with the exception of the number of Rio Grande Leopard Frogs (*L. berlandieri*) purchased in 2008. During this season, a total of 109,661 were purchased for re-sale by non-game dealers, but the lack of reporting requirements made it impossible to determine if these were collected from the wild in Texas. Several species white listed were not collected in reportable quantities for the duration of our dataset. For example, Slowinski's Cornsnake (*Pantherophis slowinskii*) was permissible to collect, but wild specimens were not collected during the 2004-2008 seasons. The species occured in the pet trade, and it was concluded that not all species permitted for collection are sought after as wild caught specimens, but are popular as captive propagates. It is also plausible that specimens collected were incorrectly identified by the dealer or collector.

In all cases, these data demonstrate that collectors and dealers were networked with few dealers acting as brokers for wild caught specimens. Dealers specialize in species or a group of species. An indicator supporting this trend was that the number of specimens collected in the wild by dealers appeared to be decreasing but the total number of specimens available did not decrease. Changes in regulations for the 2008 season restricted collection activity to private lands but also required that all specimens collected or purchased be reported to TPWD. This change may have attributed to the change in number of specimens collected personally by dealers, which decreased from 19,995 in the 2004 season to only 2,067 in the 2008 season. This could be an indicator that dealers opportunistically collected specimens for sale from public land near their hometown until the 2008 season. With the exception of the 2007 season, dealer purchases appear to be remaining constant. Dealers could be purchasing captive stock from healthy breeding operations, but afore mentioned reporting system issues precluded determination. The most concerning result of this study was the fact that over the five seasons of data available from TPWD, a total of 733,207 native amphibian and reptile specimens were purchased by dealers and no locality information exists for these specimens. Because it was impossible to determine the source it was impossible to determine if management practices should be implemented towards regionally exploited populations.

Retail Pet Trade

A small proportion of native amphibians and reptiles are kept as pets or offered for sale to the public. Popular species sold for pets and available via Internet and at herpetological expositions were similar with the Cornsnake (*Patherophis guttatus*) ranked first in each data set. Because few snakes offered for sale at expositions and on-line were wild colored morphs, it was inferred that the specimens for sale through both sources were primarily captive bred. Venomous native snakes offered for sale also included genetic color variants, and although I only visited one "hot show", the Western Diamond-backed Rattlesnake (*Crotalus atrox*) was the 3rd most popular species for all expositions. Captive production of native lizards, turtles, and frogs was inferred to be less common than that of snakes because there were fewer color morphs available. This indicated that monitoring of collection from the wild for these groups should be a priority.

Few brick and mortar pet stores could be identified as sellers of native amphibians and reptiles. The segment of retailers most difficult to get information from was the two large chain stores operating in Texas. Employees answering phones at their locations were not able to give out e-mail addresses of their managers and managers were often not on-site. Through circular advertisements (Appendix H) and opportunistic personal visits it was determined that these stores do sell live native amphibians and reptiles, but I was unable to get a representative from either chain to complete the on-line survey. It was required for each store to maintain a non-game dealer permit in order to sell native amphibians and reptiles, and while every PetSmart and Petco in Texas was

registered as a non-game dealer, only one annual report was filed for all years of the data provided by TPWD. This indicated that a problem existed with education of the permit holders, or enforcement of dealers that did not file reports. To accurately monitor the number of native amphibians and reptiles in the trade, education and enforcement are paramount.

Reporting System Recommendations

The principal problem with the current state reporting system was the lack of requirements for collectors to report counties and number of collection. Without this information, complete analysis of trade in wild caught specimens from Texas was impeded. Collector permits were available at any point of sale location where hunting and fishing licenses are sold, and data for those permits was stored separately from dealer permits. This was a fundamental problem with the permitting and reporting system, but it can be fixed. Simplification of the permitting system to one permit that allows collection, propagation, and sale of listed species would provide for consistent reporting of all data necessary to determine regional and specific pressures on wild populations. By only offering only dealer level permits, opportunistic hunting of species by collectors that do not wish to register as dealers would be reduced because of increased cost of permit and reporting requirements. It is also feasible to create a web based entry system for collection, sale, and purchase, thus eliminating the need for data entry by TPWD personnel. USFWS currently offers such a system (e-Decs) for international shipments. An additional fundamental problem with the current permitting

system was the lack of bag limits. Because there are no restrictions for the number of specimens collected, areas of collection can be consistently heavily exploited. Furthermore, with the exception of the America Alligator (*A. mississippiensis*), there were no season restrictions. The natural history of the species should be factored into the permitting system the same way that game species seasons were set. This may allow for sustainable take in species that are desirable, though more research is needed to determine if wild population can sustain harvest.

The same reporting system problems described in Chapter II also plague international trade in native species. Incomplete species codes, multiple codes for the same species, and on-the-fly entries continue to be commonplace in the LEMIS database. Both TSCE and TSCR and the code for *Pseudemys* can refer to Red-eared Sliders (*Trachemys scripta elegans*), and affects the ability to conduct precise analysis of the number of specimens traded. For species collected and reported at the state level, identification to sub-species was required, though identification only to genus was permissible for international export. This made it impossible to tell which native species were exported in many cases. For example, the genus *Apalone* is listed for import, export, and pet trade, but it could not be inferred which species or subspecies this genus refers to. A total of four subspecies of *Apalone spinifera* were collected from the wild in Texas, and species could be closely monitored if identification requirements were consistent from the state to federal level.

The symptoms of varied regulations governing native species permissible for collection and trade between regulatory state and federal agencies could be solved by a

partnership between neighboring states and Mexico. Partners in Amphibian and Reptile Conservation (PARC) is an organization that has introduced a model for state regulatory guidelines governing herpetofauna (Appendix G). If the standard regulations proposed by PARC were adopted by all states within the US, regulation and enforcement would be standardized. Regardless, for all commercial shipments of specimens, it should be required that the specimen be reported to the species level to USFWS. Specimens of native species that occur in other states and are brought in or shipped out for commercial trade should be reported to TPWD upon importation or exportation. Likewise, specimens of wild caught native species that are shipped to other states should be reported to TPWD. Collection information should be consistently collected for all specimens removed from the wild. Continued monitoring at the state level is necessary to insure that the system is working. Simply having a permit system proves useless unless data collected were meaningful and relevant to the management of the species regulated. Because native amphibians and reptiles are used both domestically and internationally, it is necessary to monitor both levels of trade. Collaboration between Texas Parks and Wildlife Department, United States Fish and Wildlife Service, special interest groups, and academia is imperative in the protection of our native species in Texas and beyond.

CHAPTER IV

CONCLUSION

Because regulatory agencies including United States Fish and Wildlife, Food and Drug Administration, and Texas Parks and Wildlife Department manage the trade at different levels it was necessary to take into account as many user groups as possible in assessing the trade in amphibians and reptiles in the state. The data mined from the LEMIS database included important species information and quantities for international export and import, but lacked information for specimens collected from the wild in Texas. The data mined from the TPWD dealer reports included information for specimens collected in the wild, but lacked locality information for specimens purchased by dealers. By visiting herpetological expositions and polling Internet dealer sites, I was able to glean insight into popularily traded species that would not have otherwise been documented. The data for species popular in the pet trade in Texas was limited by inability to determine exactly how many specimens were available and owned by citizens within the state. Through the use of all datasets, I was able to synthesize a list of species available for trade in the state, determine quantites of exotics imported and exported, identify established invasive species that persist in the trade, recognize popular exotic and native species traded as pets in the state, and identify reporting system problems.

Of greatest importance was the recognition of problems in regulation and reporting at the state and federal level that would not have been noticed if analysis only included one source of data. The LEIMS database should include standard taxonomy and

perhaps adopt the Taxonomic Serial Number to eleviate multiple species codes. This would allow for more precise analysis of species and number traded. The TPWD permitting system should require that all specimens collected from the wild be reported with locality information. Interstate shipments of native species should also be reported to provide insight into the activity between states. Because of the lack of standardization between state and federal regulations, exotic invasive species are currently permissible for trade. Without interstate reporting requirements for exotics, Texas ports may become gateways for these invasives to enter other states. Therefore, it is important for TPWD to recognize the need for management for exotic as well as native species that are traded.

My data show that analysis of one dataset would provide an incomplete picture of the status of the trade in amphibians and reptiles within the state. Because the species considered popular in the trade may change over time, continued monitoring that includes mining of data from USFWS and TPWD coupled with new collected data is necessary to protect the integrity of our native populations. Because Texas ports ranked high, but are not the top ports, similar studies in other states should be completed.

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APPENDIX A

Commercially traded exotic amphibian and reptile species in Texas 2002-2008. Trade categories were: Import (I), Export (E), Food (F), and Pet trade (P). The source of the specimens were Captive (C), Farmed (F), Unknown (U), and Wild (W).

Scientific Name	Common Name	Trade Category[a]	Source[b]	Distribution of Species[c]
Family Caeciliidae				
Caecilia sp.	Caecilian	E	W	Exotic
Dermophis mexicanus	Mexican Burrowing Caecilian	E	W	Exotic
Dermophis sp.	Dermophis Sp.	E	W	Exotic
Typhlonectes natans	Rubber Eel	I	W	Exotic
Family Ambystomatidae				
Ambystoma gracile	Northwestern Salamander	P	C	USA
Ambystoma jeffersonianum	Jefferson Salamander	E	C, W	USA
Ambystoma laterale	Blue-Spotted Salamander	E	W	USA
Ambystoma macrodactylum	Long-toed Salamander	E, P	C, W	USA
Ambystoma sp.	Mole Salamander	E	C, W	
Family Amphiumidae				
Amphiuma means	Two-toed Amphiuma	E	W	USA
Family Cryptobranchidae				
Cryptobranchus alleganiensis	Hellbender	E	W	USA
Family Plethodontidae				
Bolitoglossa dofleini	Giant Palm Salamander	E	W	Exotic
Bolitoglossa sp.	Bolitoglossa sp.	E	W	Exotic
Desmognathus fuscus	Northern Dusky Salamander	E, P	C, W	USA
Desmognathus quadramaculatus	Black-bellied Salamander	E	W	USA
Desmognathus sp.	Dusky Salamander	E	W	USA
Ensatina eschscholtzii	Ensatina	E	W	USA
Eurycea bislineata	Two-lined Salamander	W	W	USA
Eurycea longicauda	Long-tailed Salamander	E	W	USA
Eurycea sp.	Brook Salamander	E, I	W	USA

Gyrinophilus porphyriticus	Spring Salamander	E	W	USA
Hemidactylium scutatum	Four-toed Salamander	E	W	USA
Oedipina sp.	Worm Salamander	E	C	Exotic
Plethodon cinereus	Eastern Red-backed Salamander	E	W	USA
Plethodon glutinosus	Northern Slimy Salamander	E	W	USA
Plethodon sp.	Woodland Salamander	E, P	C, W	USA
Pseudotriton ruber	Red Salamander	E	W	USA
Family Proteidae				
Necturus maculosus	Mudpuppy	E	C, W	USA
Necturus sp.	Mudpuppy/Waterdog	E	W	USA
Family Salamandridae				
Cynops orientalis	Oriental Fire Bellied Newt	E	C, W	Exotic
Cynops pyrrhogaster	Japanese Newt	E, I, P	C, W	Exotic
Cynops sp.	Cynops sp.	E, I	C	Exotic
Neurergus sp.	Neurergus sp.	I	C	Exotic
Neurergus kaiseri	Emperor Newt	P	C	Exotic
Notophthalmus sp.	Notophthalmus sp.	E	C, W	USA
Notophthalmus viridescens	Eastern Newt	E, P	C, F,W	USA
Pachytriton brevipes	Black-Spotted Stout Newt	E, I	C, W	Exotic
Pachytriton sp.	Pachytriton Sp.	E	W	Exotic
Pachytriton labiatus	Spotless Stout Newt	P	C	Exotic
Paramesotriton chinensis	Chinese Warty Newt	E, P	C, W	Exotic
Paramesotriton sp.	Paramesotriton sp.	E	W	Exotic
Pleurodeles sp.	Pleurodeles Sp.	E	W	Exotic
Pleurodeles waltl	Spanish Newt	E	W	Exotic
Salamandra salamandra	Fire Salamander	E, I, P	C, W	Exotic
Salamandra sp.	Salamandra	E, I	C, W	Exotic
Taricha granulose	Rough-skinned Newt	E	C, W	USA
Taricha torosa	California Newt	E	C, W	USA
Triturus cristatus	Great Crested Newt	E, I	C, W	Exotic
Triturus sp.	Triturus sp.	E, I	C, W	Exotic
Tylototriton kweichowensis	Red-tailed Knobby Newt	E	W	Exotic
Tylototriton shanjing	Yunnan Newt	P	C	Exotic
Tylototriton sp.	Tylototriton Newt	E	C, W	Exotic
Tylototriton verrucosus	Red Knobby Newt	E,I	W	Exotic

Family Sirenidae				
Siren lacertian	Greater Siren	E, P	C, W	USA
Siren sp.	Siren	E	W	USA
Family Arthroleptidae				
Leptopelis argenteus	Silvery Tree Frog	E, I	W	Exotic
Leptopelis sp.	Leptopelis Sp.	E, I	W	Exotic
Leptopelis vermiculatus	Big-Eyed Tree Frog	E, P	C, W	Exotic
Family Bombinatoridae				
Bombina bombina	Fire-Bellied Toad	P	C, U	Exotic
Bombina maxima	Large-webbed Bell Toad	P	C	Exotic
Bombina orientalis	Oriental Fire-Bellied Toad	E, I, P	C, W	Exotic
Bombina sp.	Firebelly Toad	E	W	Exotic
Bombina variegate	Yellow-Bellied Toad	E, I	C	Exotic
Family Brevicipitidae				
Breviceps mossambiscus	Mozambique Rain Frog	E	W	Exotic
Family Bufonidae				
Anaxyrus terrestris	Southern Toad	E, P	C, W	USA
Atelopus sp.	Stubfoot Toad	I	W	Exotic
Bucephala clangula	Giant Golden Eye Toad	P	C	Exotic
Bufo regularis	African Toad	P	C	Exotic
Bufo guttatus	Spotted Toad	E	W	Exotic
Bufo ictericus	Cururu Toad	E, I	W	Exotic
Bufo marinus	Cane Toad	E, I, P	C, U, W	Exotic
Bufo melanostictus	Southeast Asian Toad	E, I	C, F, W	Exotic
Bufo pygmaeus	Rio Parahyba Toad	E	W	Exotic
Bufo regularis	Square-Marked Toad	P, E, I	C, W	Exotic
Bufo spinulosus	Warty Toad	E	W	Exotic
Bufo viridis	Green Toad	E, P	C, W	Exotic
Melanophryniscus sp.	Melanophryniscus sp.	E	W	Exotic
Melanophryniscus stelzneri	Redbelly Toad	E, I	W	Exotic
Ollotis alvaria	Sonoran Desert Toad	P	C	USA
Pedostibes hosii	Yellow Spotted Toad	E, I, P	C, W	Exotic
Family Calyptocephalellidae				
Calyptocephallela gayi	Helmeted Water Toad	E	C	Exotic

Family Centrolenidae				
Centrolene sp.	Glass Frog	E	W	Exotic
Famiy Ceratophrynidae				
Ceratophrys cranwelli	Cranwell's Horned Frog	E, I, P	C, F, W	Exotic
Ceratophrys ornate	Ornate Pacman Frog	E, I, P	C, W	Exotic
Ceratophrys sp.	Fantasy Pacman Frog	E, I, P	C, W	Exotic
Lepidobatrachus asper	Escuerzo	E	W	Exotic
Lepidobatrachus laevis	Budgett's Frog	E, I, P	C, W	Exotic
Lepidobatrachus sp.	Lepidobatrachus Sp.	E, I	C	Exotic
Family Dendrobatidae				
Dendrobates amazonicus	Poison Dart Frog	P	C	Exotic
Dendrobates auratus	Green And Black Poison Dart Frog	E, I, P	C, F, W	Exotic
Dendrobates azureus	Blue Poison Dart Frog	I, P	C	Exotic
Dendrobates castaneoticus	Brazil-Nut Poison Frog	P	C	Exotic
Dendrobates fantasticus	Red Backed Poison Dart Frog	P	C	Exotic
Dendrobates galactonotus	Splash Backed Poison Dart Frog	I, P	C	Exotic
Dendrobates imitator	Mimic Poison Frog	I, P	C	Exotic
Dendrobates leucomelas	Yellow-Banded Poison Frog	I, P	C	Exotic
Dendrobates pumilio	Strawberry Poison Dart Frog	I, E, P	C, F, W	Exotic
Dendrobates quinquevittatus	Thumbnail Species Poison Dart Frog	P	U	Exotic
Dendrobates reticulatus	Reticulated Frog	I, P	C	Exotic
Dendrobates sp.	Poison Dart Frog	I, P	C, F	Exotic
Dendrobates tinctorius	Dyeing Poison Frog	I, P	C	Exotic
Dendrobates variabilis	Zimmerman's Poison Frog	P	C	Exotic
Dendrobates ventrimaculatus	Amazonian Poison Frog	P	C	Exotic
Epipedobates femoralis	Brilliant Thighed Poison Arrow Frogs	I, P	C, W	Exotic
Epipedobates trivittatus	Three Striped Poison Dart Frog	P	W	Exotic
Phylobates aurotaenia	Kokoe Poison Dart Frog	P	C	Exotic
Phylobates vittatus	Golfo Dulce Poison Dart Frog	P	C	Exotic
Family Hemisotidae				
Hemisus marmoratus	Shovel-Nosed Frog	E, I, P	C, W	Exotic

Family Hylidae				
Agalychnis callidryas	Red Eyed Treefrog	E, I, P	C, F, W	Exotic
Agalychnis moreletii	Morelet's Treefrog	E	C, W	Exotic
Agalychnis sp.	Agalychnis	E	C	Exotic
Dendropsophus marmoratus	Marbled Treefrog	P	U	Exotic
Dendropsophus sarayacuensis	Ranita De Sarayacu	P	C	Exotic
Gastrotheca monticola	Marsupial Frog	E, I	W	Exotic
Hyla femoralis	Pine Woods Treefrog	P	C	USA
Hyla geographica	Map Treefrog	P	C	Exotic
Hyla gratiosa	Barking Treefrog	E, P	C, W	USA
Hyla leucophyllata	Clown Treefrog	P	C	Exotic
Hyla loquax	Sonorense Treefrog	E	C, W	Exotic
Hyla sp.	Unidentified Treefrog	E, I	C, W	
Litoria aurea	Green and Gold Bell Frog	E	C	Exotic
Litoria caerulea	Green Tree Frog	E, I, P	C, W	Exotic
Litoria infrafrenata	White-Lipped Treefrog	E, I, P	C, W	Exotic
Litoria sp.	Litoria	E, I	C, W	Exotic
Litoria moorei	Western Green and Golden Bell Frog	P	C	Exotic
Osteocephalus sp.	Osteocephalus	E	W	Exotic
Osteopilus septentrionalis	Cuban Treefrog	E, P	C, W	Exotic
Osteopilus sp.	West Indian Treefrog	E	C, W	Exotic
Osteopilus vasta	Hispaniola Treefrog	E, P	W	Exotic
Pachymedusa dacnicolor	Mexican Leaf Frog	E	C, W	Exotic
Phrynohyas resinifictrix	Amazon Milk Frog	E, I	C	Exotic
Phrynohyas sp.	Phrynohyas sp.	E	C	Exotic
Phrynohyas venulosa	Veined Treefrog	E, I	C, W	Exotic
Phyllomedusa bicolor	Waxy-Monkey Treefrog	E, I, P	C, W	Exotic
Phyllomedusa hypocondrialis	Tiger Leg Monkey Treefrog	E, P	C, W	Exotic
Phyllomedusa sauvagii	Painted-Belly Monkey Frog	E, I, P	C, W	Exotic
Phyllomedusa sp.	Monkey Tree Frog	E, I, P	C, W	Exotic
Phyllomedusa terribilis	Giant Monkey Treefrog	P	C	Exotic
Phyllomedusa tomopterna	Barred Monkey Treefrog	E, P	C, W	Exotic
Pseudacris sp.	Chorus Frog	E	W	
Ptychohyla sp.	Ptychohyla Sp.	I	W	Exotic
Scinax sp.	Scinax Sp.	I	W	Exotic
Smilisca sp.	Smilisca Sp.	E, I	W	

Family Hynobiidae				
Hynobius sp.	Hynobius Sp.	E	C	Exotic
Family Hyperoliidae				
Afrixalus fornasini	Fornasini's Spiny Reed Frog	E, I	W	Exotic
Afrixalus sp.	Reed Frog	E, I	W	Exotic
Heterixalus alboguttatus	White Bellied Reed Frog	P	C	Exotic
Heterixalus madagascariensis	Heterixalus Madagascariensis	I	W	Exotic
Heterixalus betsileo	Reed Frog	P	C	Exotic
Heterixalus madagascariensis	Madagascar Reed Frog	P	C	Exotic
Hyperolius concolor	Hyperolius Concolor	I	W	Exotic
Hyperolius marmoratus	Marbled Reed Frog	E, I	W	Exotic
Hyperolius sp.	Reed Frog	E, I	W	Exotic
Hyperolius tuberilinguis	Tinker Reed Frog	I	W	Exotic
Hyperolius viridiflavus	Painted Reed Frog	E, I	W	Exotic
Hyperolius argus	African Reed Frog	P	C	Exotic
Hyperolius viridiflavus	Reed Frogs	P	C	Exotic
Kassina maculata	Red-Legged Kassina	E, I, P	C, W	Exotic
Kassina senegalensis	Bubbling Kassina	E, I	W	Exotic
Kassina sp.	Kassina	E	W	Exotic
Family Leptodactylidae				
Leptodactylus pentadactylus	South American Bull Frog	E, P	C, W	Exotic
Family Leiuperidae				
Physalaemus sp.	Physalaemus sp.	E	W	Exotic
Family Lymnodynastidae				
Limnodynastes salmini	Pobblebonk Toad	P	C	Exotic
Limnodynastes sp.	Limnodynastes Sp.	E	C	Exotic
Family Megophrynidae				
Leptobrachium hasseltii	Chinese Eastern Spadefoot Toad	E, I	W	Exotic
Xenophrys aceras	Short Horned Toad	P	C	Exotic
Xenophrys longipes	Long Legged Horned Frog	E, I, P	C, W	Exotic
Megophrys montana	Asian Short Horned Frog	P	C	Exotic

Megophrys nasuta	Malayan Horned Frog	E, I, P	C, U, W	Exotic
Megophrys sp.	Horned Frog	E, I	W	Exotic
Family Mantellidae				
Boophis luteus	Greater Madagascan Tree Frog	P	C	Exotic
Boophis madagascariensis	Madagascan Bright-Eyed Frog	E, P	C, W	Exotic
Boophis sp.	Mantella Frog	I	W	Exotic
Mantella aurantiaca	Golden Mantella	P, E	C, W	Exotic
Mantella baroni	Mantella baroni	I	W	Exotic
Mantella cowanii	Harlequin Mantella	E	W	Exotic
Mantella expectata	Blue-legged Mantella	E	W	Exotic
Mantella laevigata	Climbing Mantella	P		Exotic
Mantella madagascariensis	Painted Mantella	E, I	W	Exotic
Mantella pulchra	Splendid Mantella	I	W	Exotic
Mantella sp.	Mantella	E, I	W	Exotic
Mantella viridis	Green Mantella	E, I, P	C, W	Exotic
Mantidactylus sp.	Madagascar Mantella	E	W	Exotic
Family Microhylidae				
Dermatonotus muelleri	Muller's Termite Frog	E	W	Exotic
Dyscophus antongilii	Madagascar Tomato Frog	E	W	Exotic
Dyscophus guineti	False Tomato Frog	E, P	C, W	Exotic
Dyscophus insularis	Tomato Frog	E, I, P	C, W	Exotic
Dyscophus sp.	Dyscophus sp.	E, I	C, W	Exotic
Kaloula pulchra	Chubby Frog	E, I, P	C, F, W	Exotic
Kaloula sp.	Kaloula sp.	I	W	Exotic
Melanobatrachus indicus	Kerala Hills Narrow-Mouthed Frog	E	W	Exotic
Phrynomantis bifasciatus	Red-Banded Rubber Frog	E, I, P	C, F, W	Exotic
Phrynomantis microps	Ghana Fire Frog	P	C, W	Exotic
Phrynomantis sp.	Phrynomantis sp.	E, I	F, W	Exotic
Scaphiophryne gottlebei	Gottlebe's Narrow-mouthed Frog	E, P	W	Exotic
Scaphiophryne marmorata	Green Burrowing Frog	E	W	Exotic
Scaphiophryne pustulosa	Spiny Burrowing Frog	E	W	Exotic
Scaphiophryne sp.	Burrowing Frog	E, I	W	Exotic
Family Pelobatidae				
Pelobates varaldii	Morocan Toad	P	C, W	Exotic

Family Pipidae				
Hymenochirus boettgeri	Zaire Dwarf Clawed Frog	I	C, W	Exotic
Hymenochirus boulengeri	Eastern Dwarf Clawed Frog	I	C	Exotic
Hymenochirus curtipes	Western Dwarf Clawed Frog	E, I	C, W	Exotic
Hymenochirus sp.	Dwarf Clawed Frog	I	C, W	Exotic
Pipa pipa	Surinam Toad	E, P	C, W	Exotic
Pipa parva	Sabana Surinam Toad	P	C	Exotic
Xenopus laevis	Dwarf African Clawed Frog	E, I, P	C, F, W	Exotic
Xenopus sp.	Clawed Frog	E, I, P	C, W	Exotic
Family Pseudidae				
Pseudis paradoxa	Swimming Frog	E	W	Exotic
Family Ranidae				
Amolops larutensis	Larut Torrent Frog	E, I	W	Exotic
Amolops sp.	Torrent Frog	I	W	Exotic
Ceratobatrachus guentheri	Soloman Island Eyelash Frog	E, P	C, W	Exotic
Conraua alleni	Allen's Goliath Frog	E, I	W	Exotic
Conraua crassipes	Abo Slippery Frog	I	W	Exotic
Hildebrandtia ornata	Ornate Frog	P	C	Exotic
Hoplobatrachus occipitalis	Crowned Bullfrog	P	C	Exotic
Hoplobatrachus tigerinus	Indus Valley Bullfrog	I, F	C	Exotic
Limnonectes macrodon	Malaya Wart Frog	I	C, W	Exotic
Limnonectes sp.	Limnonectes sp.	E, I	W	Exotic
Lithobates pipiens	Northern Leopard Frog	E, I, P	C, W	USA
Phrynobatrachus sp.	Phrynobatrachus sp.	E	W	Exotic
Ptychadena mascareniensis	Mascarene Grassland Frog	E, I	W	Exotic
Pyxicephalus adspersus	African Bullfrog	E, I, P	C, W	Exotic
Pyxicephalus edilus	Dwarf Pixie Frog	P	C, W	Exotic
Pyxicephalus sp.	Pyxicephalus sp.	E	C, W	Exotic
Rana aurora	Northern Red-legged Frog	E, I, P	C, U, W	USA
Rana erythraea	Green Paddy Frog	E, I, P	C, W	Exotic
Rana ridibunda	Marsh Frog	E	W	Exotic
Family Rhacophoridae				
Chiromantis petersii	Peter's Grey Treefrog	E, I	C, W	Exotic

Chiromantis xerampelina	Grey Treefrog	P	C	Exotic
Nictixalus pictus	Peter's Treefrog	P	C	Exotic
Polypedates leucomystax	Asian Brown Treefrog	E, I, P	C, F, W	Exotic
Polypedates sp.	Polypedates sp.	E, I	C, W	Exotic
Rhacophorus appendiculatus	Frilled Treefrog	P	C	Exotic
Rhacophorus bipunctatus	Twin Spotted Flying Treefrog	P	C	Exotic
Rhacophorus dennysi	Vietnamese Blue Gliding Frogs	E, P	C, W	Exotic
Rhacophorus dulitensis	Jade Tree Frog	P	C	Exotic
Rhacophorus nigropalmatus	Wallace's Flying Frog	I, P	C, F, W	Exotic
Rhacophorus reinwardtii	Green Flying Frog	E, I, P	C, W	Exotic
Rhacophorus sp.	Rhacophorus Frog	E, I	C, W	Exotic
Theloderma corticale	Tonkin Blue-Eyed Frog	E, P	C, W	Exotic
Theloderma horridum	Malayan Wart Frog	P	C	Exotic
Theloderma sp.	Thelo	E, I	C, W	Exotic
Theloderma asperum	Pied Wart Frog	P	C	Exotic
Family Scaphiopodidae				
Scaphiopus holbrookii	Eastern Spadefoot	E, P	C, W	USA
Family Agamidae				
Acanthosaura armata	Armored Pricklenape	E, I	F, W	Exotic
Acanthosaura capra	Green Pricklenape	E, I, P	W	Exotic
Acanthosaura crucigera	Boulenger's Pricklenape	E	C, W	Exotic
Acanthosaura lepidogaster	Brown Pricklenape	E	W	Exotic
Acanthosaura sp.	Pricklenape	E, P	C, W	Exotic
Agama agama	Red Headed Agama	E, I, P	F, W	Exotic
Acanthocerus atricollis	Blue Headed Agama	P	U	Exotic
Agama sp.	Agama sp.	E, I	C, W	Exotic
Bronchocela cristatella	Borneo Agama	E, I	W	Exotic
Bronchocela sp.	Bloodsucker	E, I	W	Exotic
Calotes sp.	Calotes sp.	E, I	W	Exotic
Calotes versicolor	Variable Agama	E, I	W	Exotic
Chlamydosaurus kingii	Frilled Dragon	E, I, P	C, F, W	Exotic
Draco melanopogon	Black-barbed Flying Dragon	I	W	Exotic
Draco sp.	Flying Dragon	E, I, P	C, F, W	Exotic
Draco volans	Common Flying Dragon	E, I	C, W	Exotic
Gonocephalus chamaeleontinus	Chameleon Forest Dragon	E, I	W	Exotic
Gonocephalus sp.	Dragon Agama	E, I, P	C, W	Exotic

Hydrosaurus weberi	Weber's Sailfin Lizard	E, I	W	Exotic
Hypsilurus sp.	Forest Dragon	I	W	Exotic
Japalura chapaensis	Japalure	E	W	Exotic
Japalura sp.	Japalura sp.	E, I	W	Exotic
Japalura splendida	Splendid Japalure	P	U	Exotic
Laudakia sp.	Laudakia Agama	E	W	Exotic
Laudakia stellio	Roughtail Rock Agama	E, I	W	Exotic
Leiolepis belliana	Green Butterfly Agama	E, I, P	W	Exotic
Leiolepis sp.	Leiolepis sp.	E	C, W	Exotic
Lophognathus temporalis	Swamplands Lashtail	I	W	Exotic
Phrynocephalus sp.	Phrynocephalus Agama	E	W	Exotic
Physignathus cocincinus	Chinese Crested Dragon	E, I, P	C, F, W	Exotic
Physignathus lesueurii	Eastern Water Dragon	E, P	C, W	Exotic
Physignathus sp.	Water Dragon	E, I, P	C, W	Exotic
Pogona minor	Western Bearded Dragon	E, I,P	C, F	Exotic
Pogona sp.	Bearded Dragon	E, I	C	Exotic
Pogona vitticeps	Central Bearded Dragon	E, I	C, W	Exotic
Pseudotrapelus sinaitus	Sinai Agama	I	W	Exotic
Trapelus mutabilis	Desert Agama	E, I, P	W	Exotic
Trapelus sp.	Trapelus Agama	E, I	W	Exotic
Uromastyx aegyptia	Egytian Mastigure	E	C, W	Exotic
Uromastyx dispar maliensis	Mali Uromastyx	E, I, P	C, W	Exotic
Uromastyx geyri	Sahara Mastigure	E, I	W	Exotic
Uromastyx ornata	Ornate Mastigure	E	C	Exotic
Uromastyx sp.	Uromastyx	P	C, W	Exotic
Xenagama batillifera	Xenagama	E	W	Exotic
Xenagama taylori	Taylor's Strange Agama	E, I	C, W	Exotic
Family Chamaeleonidae				
Chamaeleo bitaeniatus	Two-Lined Chameleon	E, I	W	Exotic
Chamaeleo calyptratus	Veiled Chameleon	E, I, P	C, F	Exotic
Chamaeleo cristatus	Crested Chameleon	E	W	Exotic
Chamaeleo deremensis	Wavy Chameleon	E, I	W	Exotic
Chamaeleo dilepis	Flapneck Chameleon	E, I	C, W	Exotic
Chamaeleo feae	Chameleon	E, P	C, W	Exotic
Chamaeleo fuelleborni	Ngosi Volcano Chameleon	E, I	W	Exotic
Chamaeleo gracilis	Graceful Chameleon	E, I, P	F, W	Exotic
Chamaeleo jacksonii	Jackson's Chameleon	E, I, P	C, W	Exotic
Chamaeleo melleri	Meller's Chameleon	E, I, P	W	Exotic

Chamaeleo quadricornis	Four-horned Chameleon	E, P	W	Exotic
Chamaeleo rudis	Coarse Chameleon	E, I	W	Exotic
Chamaeleo senegalensis	Senegal Chameleon	E, I, P	F, W	Exotic
Chamaeleo werneri	Wemer's Chameleon	E, I	W	Exotic
Chamaeleo wiedersheimi	Mount Lefo Chameleon	E	W	Exotic
Chamaeleo montium	Common Sailfin Chameleon	P	U	Exotic
Furcifer pardalis	Panther Chameleon	P	C, F, W	Exotic
Furcifer verrucosus	Madagascar Spiny Chameleon	P	U	Exotic
Kinyongia fischeri	Fischers' Chamaelon	E, I	W	Exotic
Kinyongia tavetanum	South African Dwarf Chameleon	E, I, P	C, W	Exotic
Rhampholeon sp.	Rhampholean	E, I	W	Exotic
Rhampholeon spectrum	Cameroon Stumptail Chameleon	E	W	Exotic
Rieppeleon brevicaudatus	Bearded Pygmy Chameleon	E, I	W	Exotic
Rieppeleon kerstenii	Kenya Stumptail Chameleon	E, I	C, W	Exotic
Family Corytophanidae				
Basiliscus basiliscus	Common Basilisk	E, I	C, W	Exotic
Basiliscus plumifrons	Green Basilisk	E, I, P	C, F, W	Exotic
Basiliscus sp.	Basilisk	E, I, P	C, W	Exotic
Basiliscus vittatus	Brown Basilisk	E, I, P	W	Exotic
Corytophanes cristatus	Smooth Helmeted Iguana	E	F, W	Exotic
Corytophanes sp.	Helmeted Iguana	E	C, W	Exotic
Laemanctus longipes	Eastern Casquehead Lizard	E	C, W	Exotic
Family Iguanidae				
Conolophus sp.	Land Iguana	I, P	W	Exotic
Ctenosaura quinquecarinatus	Spiny-Tailed Iguana	E	C, W	Exotic
Ctenosaura similis	Black Iguana	E, P	C, W	Exotic
Ctenosaura sp.	Ctenosaura Iguana	E, I	W	Exotic
Cyclura cornuta	Rhinoceros Iguana	P	U	Exotic
Cyclura sp.	Cyclura Iguana	P	C	Exotic
Dipsosaurus dorsalis	Desert Iguana	E, I, P	C, W	USA
Iguana iguana	Common Green Iguana	E, F, I, P	C, F, W	Exotic
Iguana sp.	Iguana	F, I, P	W	Exotic
Sauromalus ater	Common Chuckwalla	E, I, P	C, W	USA
Sauromalus sp.	Chuckwalla	E	C, W	

Family Opluridae				
Chalarodon madagascariensis	Madagascar Iguana	E, I	W	Exotic
Oplurus cuvieri	Cuvier's Madagascar Swift	E	W	Exotic
Oplurus sp.	Swift	E, P	W	Exotic
Family Phrynosomatidae				
Callisaurus draconoides	Zebra-tailed Lizard	E	W	USA
Petrosaurus sp.	California Rock Lizard	E	C	USA
Phrynosoma platyrhinos	Desert Horned Lizard	E, I	C, W	USA
Phrynosoma sp.	Horned Lizard	E, I	W	
Sceloporus clarkii	Clark's Spiny Lizard	E	C, W	USA
Sceloporus jarrovii	Yarrow's Spiny Lizard	E	W	USA
Sceloporus malachiticus	Green Spiny Lizard	E, I, P	C, F, W	Exotic
Sceloporus occidentalis	Western Fence Lizard	E	W	USA
Sceloporus squamosus	Mexican Spiny Lizard	I	C	Exotic
Urosaurus sp.	Urosaurus Lizard	E	W	
Uta sp.	Uta Lizard	E	W	Exotic
Family Polychrotidae				
Anolis bimaculatus	Panther Anole	E	W	Exotic
Anolis chlorocyanus	Hispaniola Green Anole	E	W	Exotic
Anolis equestris	Knight Anole	E, P	C, F, U, W	Exotic
Anolis roquet	Savannah Anole	W	W	Exotic
Anolis sagrei	Cuban Brown Anole	E, P	F, W	Exotic
Anolis solitarius	Solitaire Anole	E	W	Exotic
Anolis sp.	Anole	E, I, P	C, W	
Anolis porcus	Oriente Bearded Anole	E	W	Exotic
Polychrus acutirostris	Brazilian Bush Anole	E, I	W	Exotic
Polychrus marmoratus	Many-colored Bush Anole	E	W	Exotic
Family Tropiduridae				
Leiocephalus carinatus	Northern Curly-tailed Lizard	E	W	Exotic
Leiocephalus personatus	Haitian Curly-tailed Lizard	E, I	W	Exotic
Leiocephalus schreibersii	Red-Sided Curly-tailed Lizard	E, I	W	Exotic
Leiocephalus sp.	Curly-tailed Lizard	E	W	Exotic
Liolaemus sp.	Liolaemus Lizard	E, I	W	Exotic

Liolamus occipitalis	Skull Tree Iguana	E	W	Exotic
Microlophus occipitalis	Knobbed Pacific Iguana	E, I	W	Exotic
Microlophus peruvianus	Peru Pacific Iguana	E, I	W	Exotic
Microlophus sp.	Microlophus Iguana	E, I, P	W	Exotic
Plica plica	Tree Runner	W	W	Exotic
Plica umbra	Blue-Lipped Tree Lizard	E	W	Exotic
Stenocercus crassicaudatus	Spiny Whorltail Iguana	I	W	Exotic
Stenocercus empetrus	Rock Whorltail Iguana	I	W	Exotic
Stenocercus eunetopsis	Whorltail Iguana (euentopsis)	E	W	Exotic
Stenocercus imitator	Whorltail Iguana (imitator)	E, I	W	Exotic
Stenocercus ivitus	Ivy Whorltail Iguana	E, I	W	Exotic
Stenocercus nigromaculatus	Black-Spotted Whorltail Iguana	E, I	W	Exotic
Stenocercus sp.	Whorltail Iguana	E, I	W	Exotic
Tropidurus sp.	Lava Lizard	E, I	W	Exotic
Tropidurus torquatus	Amazon Lava Lizard	E, I	C, W	Exotic
Uracentron azureum	Green Thornytail Iguana	E	W	Exotic
Uranoscodon superciliosus	Brown Tree Climber	E	W	Exotic

Family Gekkonidae

Aeluroscalabotes felinus	Cat Gecko	E, I, P	C, W	Exotic
Agamura sp.	Agamura sp.	E, I	C, W	Exotic
Chondrodactylus angulifer	Namib Giant Ground Gecko	E, I	C	Exotic
Chondrodactylus bibronii	Bibron's Thick-toed Gecko	E, I, P	C, W	Exotic
Christinus marmoratus	Marbled Southern Gecko	E	W	Exotic
Christinus sp.	Southern Gecko	E	W	Exotic
Cnemaspis africana	African Gecko	I	W	Exotic
Coleonyx brevis	Texas Banded Gecko	E, T	W	Texas
Coleonyx elegans	Yucatan Banded Gecko	E, I	C	Exotic
Coleonyx mitratus	Central American Banded Gecko	E, I	C, F, W	Exotic
Coleonyx sp.	Banded Gecko	E, I	C, F	
Coleonyx variegatus	Western Banded Gecko	E	W	USA
Cosymbotus craspedotus	Frilled Gecko	P	U	Exotic
Cyrtodactylus consobrinus	Banded Forest Gecko	E, I	C, W	Exotic
Cyrtodactylus louisiadensis	Ring-tailed Gecko	E, I	W	Exotic
Cyrtodactylus peguensis	Pegu Forest Gecko	E	W	Exotic
Cyrtodactylus pulchellus	Malayan Forest Gecko	E, I	C, W	Exotic

Cyrtodactylus sp.	Cyrtodactylus sp.	E, I	C, W	Exotic
Cyrtopodion scabrum	Rough-tailed Gecko	I	W	Exotic
Cyrtopodion sp.	Cyrtopodion sp.	E, I	C, W	Exotic
Elasmodactylus tetensis	Zambezi Thick-Toed Gecko	W	I	Exotic
Eublepharus macularius	Common Leopard Gecko	E, P	C, W	Exotic
Eublepharus sp.	Leopard Gecko	E, P	C	Exotic
Eurydactylodes agricolae	Bauer's Chameleon Gecko	E	C	Exotic
Geckolepis anomala	Anomalous Gecko	E	C	Exotic
Geckolepis maculata	Peter's Spotted Gecko	E, I	C, W	Exotic
Geckolepis sp.	Geckolepis sp.	E	W	Exotic
Geckonia chazaliae	Helmethead Gecko	E, I	C	Exotic
Gehyra baliola	Short-tailed Dtella	I	W	Exotic
Gehyra mutilata	Stump-tailed Gecko	I	W	Exotic
Gehyra sp.	Gehydra sp.	E, I	W	Exotic
Gehyra vorax	Voracious Dtella	P	U	Exotic
Gekko gecko	Tokay Gecko	E, I, P	C, F, W	Exotic
Gekko petricolus	Thai Gecko	E, I	C, W	Exotic
Gekko sp.	Gekko sp.	E, I	F, W	Exotic
Gekko ulikovskii	Golden Gecko	P	W	Exotic
Gekko vittatus	Lined Gecko	E, I	C, W	Exotic
Goniurosaurus kuroiwae	Tokashiki Gecko	P	U	Exotic
Goniurosaurus lichtenfelderi	Lichtenfelder's Gecko	E, I	W	Exotic
Goniurosaurus luii	Chinesischer Leopard Gecko	E	C, W	Exotic
Goniurosaurus sp.	Goniurosaurus sp.	E, I	C, W	Exotic
Hemidactylus brookii	Brook's House Gecko	E, I	F, R	Exotic
Hemidactylus frenatus	Common House Gecko	P	C	Exotic
Hemidactylus mabouia	House Gecko	E, I	W	Exotic
Hemidactylus platyurus	Flat-tailed House Gecko	I	W	Exotic
Hemidactylus sp.	Hemidactylus sp.	E, I, P	C, F, W	Exotic
Hemidactylus turcicus	Mediterranean Gecko	E, P	W, C	Exotic
Hemitheconyx caudicinctus	Fat-Tailed Gecko	E, I, P	C, F, W	Exotic
Hemitheconyx sp.	Hemitheconyx sp.	E	C, W	Exotic
Holodactylus africanus	African Whole-Toed Gecko	E, I	W	Exotic
Homonota horrida	South American Marked Gecko	E, I	W	Exotic
Homopholis sp.	Homopholis sp.	E	W	Exotic
Homopholis wahlbergii	Homopholis wahlbergii	E	C	Exotic
Lygodactylus angularis	Angulate Dwarf Gecko	E, I	W	Exotic

Lygodactylus capensis	Cape Dwarf Gecko	E, I	W	Exotic
Lygodactylus luteopicturatus	Yellow-headed Dwarf Gecko	E, I	C, W	Exotic
Lygodactylus picturatus	Painted Dwarf Gecko	E	W	Exotic
Lygodactylus sp.	Lygodactylus Gecko	E	W	Exotic
Lygodactylus williamsi	William's Dwarf Blue Gecko	P	U	Exotic
Nactus sp.	Nactus Gecko	E, I	C	Exotic
Nephrurus sp.	Nephrurus Gecko	E, I	C	Exotic
Oedura sp.	Oedura Gecko	E, I	C	Exotic
Pachydactylus rangei	Web-Footed Gecko	E	C	Exotic
Pachydactylus sp.	Pachydactylus sp.	E, I	C, W	Exotic
Paroedura androyensis	Grandidier's Madagascar Ground Gecko	E	W	Exotic
Paroedura bastardi	Mocquard's Madagascar Ground Gecko	E, P	W	Exotic
Paroedura picta	Pictus Gecko	E, P	C, W	Exotic
Paroedura sp.	Paroedura Gecko	E, I	C, W	Exotic
Perochirus ateles	Dumeril Gecko	P	C	Exotic
Phelsuma abbotti	Aldabra Day Gecko	I	C	Exotic
Phelsuma astriata	Seychelles Day Gecko	I	C	Exotic
Phelsuma barbouri	Barbour's Day Gecko	I	C	Exotic
Phelsuma borbonica	Reunion Day Gecko	I	C	Exotic
Phelsuma dubia	Zanzibar Day Gecko	E, I	W	Exotic
Phelsuma flavigularis	Yellow-Throated Day Gecko	I	C	Exotic
Phelsuma laticauda	Broad-tailed Day Gecko	P	U	Exotic
Phelsuma madagascarensis	Madagascar Day Gecko	P	U	Exotic
Phelsuma nigristriata	Island Day Gecko	I	C	Exotic
Phelsuma ornata	Ornate Day Gecko	I	C	Exotic
Phelsuma quadriocellata bimaculata	Peacock Day Gecko	E	F	Exotic
Phelsuma robertmertensi	Mertens' Day Gecko	I	C	Exotic
Phelsuma serraticauda	Serrated Day Gecko	I	C	Exotic
Phelsuma sp.	Day Gecko	P	C	Exotic
Phelsuma standingi	Standing's Day Gecko	P	U	Exotic
Phelsuma sundbergi	Seychelles Giant Day Gecko	I	C	Exotic
Phyllodactylus reissii	Peters' Leaf-Toed Gecko	E, I	W	Exotic
Ptychozoon kuhli	Kuhl's Flying Gecko	E, I	W	Exotic
Ptychozoon sp.	Ptychozoon Gecko	E, I	W	Exotic
Ptyodactylus hasselquistii	Yellow Fan-Fingered Gecko	E, I	W	Exotic

Ptyodactylus sp.	Ptyodactylus Gecko	E, I	C, W	Exotic
Rhacodactylus auriculatus	New Caledonia Bumpy Gecko	E, P	C, U	Exotic
Rhacodactylus chahoua	Bavay's Giant Gecko	E	C	Exotic
Rhacodactylus ciliatus	Crested Gecko	E, P	C, W	Exotic
Rhacodactylus leachianus	New Caledonia Giant Gecko	E, I, P	C	Exotic
Rhacodactylus sarasinorum	Roux's Giant Gecko	E	C	Exotic
Rhacodactylus sp.	Rhacodactylus Gecko	E	C	Exotic
Stenodactylus petrii	Anderson's Short-Fingered Gecko	E, I	W	Exotic
Stenodactylus sp.	Stenodactylus Gecko	E, I	W	Exotic
Stenodactylus sthenodactylus	Lichtenstein's Short-fingered Gecko	P	U	Exotic
Tarentola annularis	Ringed Wall Gecko	E, I	W	Exotic
Tarentola mauritanica	Common Wall Gecko	E, I, P	W	Exotic
Tarentola sp.	Tarentola Gecko	E, I	C	Exotic
Teratolepis fasciata	Carrot-tailed Viper Gecko	E, I, P	C, W	Exotic
Teratoscincus przewalskii	Przewalski's Wonder Gecko	E	W	Exotic
Teratoscincus roborowskii	Roborowski's Wonder Gecko	E	C, W	Exotic
Teratoscincus scincus	Common Wonder Gecko	E	W	Exotic
Teratoscincus sp.	Teratoscincus Gecko	E, I	C, W	Exotic
Thecadactylus rapicauda	Turniptail Gecko	E	C, W	Exotic
Tropiocolotes sp.	Tropiocolotes Gecko	I, E	C, W	Exotic
Underwoodisaurus milli	Thick-Tailed Gecko	E, I	C	Exotic
Uroplatus ebenaui	Nosy Be Flat-tail Gecko	E, I	W	Exotic
Uroplatus fimbriatus	Common Flat-tail Gecko	E	W	Exotic
Uroplatus guentheri	Gunthers Leaf-tail Gecko	P	U	Exotic
Uroplatus henkeli	Leaf-tailed Gecko	E, P	W	Exotic
Uroplatus lineatus	Lined Flat-tail Gecko	E	W	Exotic
Uroplatus piechmanni	Leaftail gecko	P	W	Exotic
Uroplatus sp.	Uroplatus Gecko	E, P	W	Exotic
Uroplatus sikorae	Southern Flat-tail Gecko	P	U	Exotic
Family Pygopodidae				
Lialis burtonis	Burton's Snake-Lizard	E, I	C, W	Exotic
Lialis jicari	Papua Snake Lizard	I	W	Exotic
Family Cordylidae				

Cordylus cataphractus	Armadillo Girdled Lizard	P	W	Exotic
Cordylus rhodesianus	Zimbabwean Girdled Lizard	E	W	Exotic
Cordylus sp.	Girdled Lizard	E	W	Exotic
Cordylus tropidosternum	Tropical Girdled Lizard	E, I	W	Exotic
Platysaurus intermedius	Common Flat Lizard	E, I	C, W	Exotic
Platysaurus sp.	Flat Lizard	E	W	Exotic
Family Gerrhosauridae				
Gerrhosaurus flavigularis	Yellow-Throated Plated Lizard	E, I, P	U, W	Exotic
Gerrhosaurus major	Rough-scaled Plated Lizard	E, I, P	W	Exotic
Gerrhosaurus sp.	Plated Lizard	E, I	C, W	Exotic
Gerrhosaurus validus	Giant Plated Lizard	E, P	C	Exotic
Tetradactylus sp.	Whip Lizard	E	C	Exotic
Tracheloptychus sp.	Cordylid	E	W	Exotic
Zonosaurus ornatus	Ornate Girdled Lizard	E	W	Exotic
Zonosaurus quadrilineatus	Four-Lined Girdled Lizard	E	W	Exotic
Family Teiidae				
Ameiva ameiva	Giant Ameiva	E, I	C, W	Exotic
Ameiva chaitzami	Chaitzam's Ameiva	E	C, W	Exotic
Ameiva festiva	Middle American Ameiva	E	C, W	Exotic
Ameiva sp.	Ameiva	E, I	C, F, W	Exotic
Aspidoscelis deppei	Blackbelly Racerunner	E, I	W	Exotic
Aspidoscelis montaguae	Giant Whiptail	E	W	Exotic
Callopistes flavipunctatus	False Monitor	E, I	W	Exotic
Callopistes maculatus	Chilean Spotted Lizard	E	W	Exotic
Callopistes sp.	Callopistes False Monitor	I	C	
Cnemidophorus lemniscatus	Rainbow Lizard	E	W	Exotic
Cnemidophorus sp.	Whiptail	E	W	
Dicrodon heterolepis	Ecuador Desert Tegu	E, I	W	Exotic
Dracaena guianensis	Northern Caiman Lizard	I	F	Exotic
Teius teyou	Four-Toed Tegu	E	W	Exotic
Tupinambis merianae	Argentine Black and White Tegu	E, I, P	C, F, W	Exotic
Tupinambis rufescens	Red Tegu	E, I	C, F, W	Exotic
Tupinambis sp.	Tegu	E, I, P	C, F, W	Exotic
Tupinambis teguixin	Golden Tegu	E, I, P	C, W	Exotic

Family Lacertidae				
Acanthodactylus pardalis	Egyptian Fringe-fingered Lizard	E	W	Exotic
Acanthodactylus sp.	Fringe-fingered Lizard	E, I	C, W	Exotic
Adolfus jacksoni	Jackson's Forest Lizard	E, I	W	Exotic
Eremias sp.	Eremias Racerunner	I	W	Exotic
Gallotia sp.	Gallotia Lizard	E, I	C, W	Exotic
Holaspis guentheri	Sawtail Lizard	E, I	W	Exotic
Lacerta agilis	Sand Lizard	E, I	F, W	Exotic
Lacerta sp.	Lacerta Lizard	E, I	C, W	Exotic
Lacerta viridis	European Green Lizard	E	C	Exotic
Latastia longicaudata	Southern Long-tailed Lizard	E, I	W	Exotic
Podarcis sp.	Wall Lizard	E, I	C	Exotic
Takydromus septentrionalis	China Grass Lizard	I	W	Exotic
Takydromus sexlineatus	Asian Grass Lizard	E, I	W	Exotic
Takydromus sp.	Grass Lizard	E, I	W	Exotic
Family Scincidae				
Acontias percivali	Percival's Lance Skink	E, I	W	Exotic
Chalcides chalcides	Algerian Cylindrical Skink	E	W	Exotic
Chalcides ocellatus	Ocellated Skink	E, I	C, W	Exotic
Chalcides sp.	Chalcides Skink	E, I	C, W	Exotic
Corucia zebrata	Solomon Island Skink	P	U	Exotic
Cryptoblepharus sp.	Cryptoblenpharus Skink	E	W	
Dasia sp.	Dasia Skink	E, I	W	Exotic
Egernia frerei	Major Skink	E, I	C, W	Exotic
Egernia sp.	Egernia Skink	I	C	Exotic
Emoia sp.	Emoia Skink	E, I	W	Exotic
Eugongylus albofasciolatus	White-Striped Cape Skink	E	W	Exotic
Eugongylus sp.	Cape Skink	E	W	Exotic
Eumeces schneideri	Schneider's Skink	E, I	W	Exotic
Eumeces sp.	Eumeces Skink	E	C, W	Exotic
Hemisphaeriodon gerrardi	Pink-tongued Skink	E	C	Exotic
Lamprolepis smaragdina	Emerald Skink	E, I	W	Exotic
Lygosoma sp.	Lygosoma Skink	E, I	W	Exotic
Eutropis macularia	Bronze Mabuya	E, I	W	Exotic
Eutropis multifasciata	East Indian Brown Mabuya	E, I	C, W	Exotic
Trachylepis perrotetii	Teita Mabuya	E,I	C, W	Exotic

Eutropis quinquetaeniata	Beautiful Mabuya	E, I	W, F	Exotic
Mabuya sp.	Mabuya	E, I	F, W	Exotic
Trachylepis varia	Variable	E, I	W	Exotic
Mochlus fernandi	Fire Skink	E, I, P	C, F, W	Exotic
Scincus scincus	Sandfish Lizard	E, I	C, W	Exotic
Tiliqua gigas	Bluetounged Skink	E, I, P	C, F, W	Exotic
Tiliqua nigrolutea	Blotched Bluetongue Skink	I	C	Exotic
Tiliqua rugosa	Shingleback Lizard	P	U	Exotic
Tiliqua scincoides	Common BlueTongue	E, I	C, F, W	Exotic
Tiliqua sp.	Tiliqua Skink	E, I	C, W	Exotic
Tribolonotus gracilis	Red Eyed Crocodile Skink	P	C	Exotic
Tribolonotus novaeguinea	Spiny Skink	I	W	Exotic
Tribolonotus sp.	Tribolonotus Skink	E, I	C, W	Exotic
Tropidophorus apulus	Keeled Skink	E, I	W	Exotic
Family Xantusiidae				
Lepidophyma flavimaculatum	Yellow-Spotted Night Lizard	E	C, W	Exotic
Family Anguidae				
Abronia sp.	Alligator Lizard	P	W	Exotic
Diploglossus sp.	Galliwasp	E	C	Exotic
Gerrhonotus sp.	Gerrhonotus sp.	E	C, W	
Mesaspis moreletii	Morelet's Alligator Lizard	E	W	Exotic
Ophisaurus sp.	Glass Lizard	E	W	
Ophisaurus ventralis	Eastern Glass Lizard	E	W	USA
Pseudopus apodus	Eurpean Legless Lizard	E	C, W	Exotic
Family Xenosauridae				
Shinisaurus crocodilurus	Chinese Crocodile Lizard	I	C	Exotic
Family Helodermatidae				
Heloderma horridum	Beaded Lizard	E, P	C, F	Exotic
Heloderma suspectum	Gila Monster	E, P	F	USA
Family Varanidae				
Varanus acanthurus	Ridgetail Monitor	P	C	Exotic
Varanus albigularis	White-Throated Monitor	P	C, F, W	Exotic

Varanus doreanus	Bluetail Monitor	E, I	F, W	Exotic
Varanus dumerilii	Dumeril Monitor	E, I	F, W	Exotic
Varanus exanthematicus	Savannah Monitor	E, I, P	C, F, W	Exotic
Varanus indicus	Mangrove Monitor	E	C, W	Exotic
Varanus jobiensis	Peach-Throated Monitor	E, I	F, W	Exotic
Varanus macraei	Varanus macraei	I	F	Exotic
Varanus melinus	Banggai Island Monitor	I	C, F	Exotic
Varanus niloticus	Nile Monitor	E, I, P	C, F, W	Exotic
Varanus panoptes	Yellow-Spotted Monitor	I, P	C, F	Exotic
Varanus prasinus	Emerald Monitor	I	C, W	Exotic
Varanus rudicollis	Roughneck Monitor	E, I	F, W	Exotic
Varanus salvadorii	Crocodile Monitor	E, I	W	Exotic
Varanus salvator	Common Water Monitor	E, I, P	C, F, W	Exotic
Varanus sp.	Monitor	E, I, P	C, U, W	Exotic
Varanus storri	Storr's Monitor	P	U	Exotic
Varanus timorensis	Spotted Tree Monitor	E, I, P	C, W	Exotic
Family Amphisbaenidae				
Amphisbaena sp.	Worm Lizard	E, I	W	Exotic
Family Acrochordidae				
Acrochordus granilatus	Little Filesnake	I	W	Exotic
Acrochordus javanicus	Java File Snake	E, I	C, F, W	Exotic
Acrochordus sp.	Filesnake	I	W	Exotic
Family Cylindrophiidae				
Cylindrophis ruffus	Red-tailed Pipe Snake	E, I	W	Exotic
Family Loxocemidae				
Loxocemus bicolor	Mexican Burrowing Python	E, I	C, W	Exotic
Family Xenopeltidae				
Xenopeltis unicolor	Sunbeam Snake	E, I, P	C, W	Exotic
Famiy Boidae				
Acrantophis dumerili	Dumeril's Boa	P	C	Exotic
Acrantophis dumerili dumerili	Dumeril's Boa	P	C	Exotic
Acrantophis madagascarensis	Madagascar Ground Boa	P	C	Exotic
Antaresia childreni	Childrens Python	E, P	C, W	Exotic

Antaresia maculosa	Spotted Python	E, P	C	Exotic
Antaresia stimsoni	Stimson's Python	P	C	Exotic
Apodora papuana	Papuan Olive Python	I, P	C, W	Exotic
Aspedites ramsayi	Woma	P	C	Exotic
Aspidites melanocephalus	Black headed Python	P	C	Exotic
Boa constrictor	Boa constrictor	E, I, P	C, F, W	Exotic
Boa constrictor amarali	Bolivian Short Tailed Boa	P	C	Exotic
Boa constrictor constrictor	Red Tailed Boa	P	C	Exotic
Boa constrictor imperator	Panamanian Boa	P	C	Exotic
Boa constrictor longicauda	Peruvian Long Tailed Boa	P	C	Exotic
Boa constrictor occidentalis	Boa constrictor	P	C	Exotic
Boa constrictor sabogae	Sabogae Island Boa	P	C	Exotic
Boa madagascariensis	Madagascan Ground Boa			Exotic
Bothrochilus boa	Ringed Python	P	C	Exotic
Calabaria rheinhardtii	African Burrowing Python	I, P	C, W	Exotic
Candoia aspera	Viper Boa	E, I, P	C, F, W	Exotic
Candoia aspera aspera	Viper Boa	P	C	Exotic
Candoia carinata	Pacific Boa	E, I, P	F, W	Exotic
Candoia sp.	Halmahera Ground Boa	I, P	C	Exotic
Candoia carinata carinata	Indonesian Tree Boa	P	W	Exotic
Charina bottae	Northern Rubber Boa	E, P	C	USA
Corallus annulatus	Northern Annulated Boa	P	C	Exotic
Corallus caninus	Emerald Tree Boa	E, P	C, F, W	Exotic
Corallus hortulanus	Amazon Tree Boa	E, P	C, W	Exotic
Epicrates angulifer	Cuban Boa	I, P	C	Exotic
Epicrates cenchria	Rainbow Boa	E, P	C, W	Exotic
Epicrates cenchria cenchria	Columbian Rainbow Boa	E, I, P	C, F, W	Exotic
Epicrates cenchria crassus	Paraguayan Rainbow Boa	P	C	Exotic
Epicrates cenchria maurus	Guyannan Rainbow Boa	P	C, W	Exotic
Eryx jaculus	Javelin Sand Boa	P	C	Exotic
Eryx johnii	Indian Smooth Scaled Sand Boa	E, P	C	Exotic
Eryx johnii persicus	Persian Sand Boa	P	C	Exotic
Eryx sp.	Sand Boa	P	C	Exotic
Eunectes murinus	Green Anaconda	E, P	C, W	Exotic
Eunectes notaeus	Yellow Anaconda	E, I, P	C, W	Exotic
Gongylophis colubrinus	Eastern Sand Boa	E, P	C	Exotic
Gongylophis muelleri	Müller’s Sand Boa	E, I, P	C, F, W	Exotic

Gongylophis conicus	Rough Scaled Sand Boa	P	C	Exotic
Leiopython albertisii	White Lipped Python	I, P	C, F, W	Exotic
Liasis fuscus	Australian Water Python	I, P	C, W	Exotic
Liasis mackloti	Macklott's Python	I, P	C, F, W	Exotic
Liasis mackloti mackloti	Macklott's Python	P	C	Exotic
Liasis mackloti savuensis	Savu Island Python	P	C	Exotic
Liasis olivaceus	Olive Python	P	C	Exotic
Liasis olivaceus olivaceus	Australian Olive Python	P	C	Exotic
Morelia amethistina	Southern Scrub Python	I, P	C, F, W	Exotic
Morelia boeleni	Boelen's Python	I	F	Exotic
Morelia bredii	Bredli Carpet Python	P	C	Exotic
Morelia sp.	Carpondro's Python	P	C	Exotic
Morelia spilota	Carpet Python	E, I, P	C, F, U, W	Exotic
Morelia spilota cheynei	Jungle Carpet Python	P	C	Exotic
Morelia spilota imbricata	South-western Carpet Python	P	C	Exotic
Morelia spilota mcdowelli	Coastal Carpet Python	P	C	Exotic
Morelia spilota variegata	Northwestern Carpet Python	E, I, P	C, F, W	Exotic
Morelia viridis	Green Tree Python	E, I, P	C, F, W	Exotic
Python anchietae	Angolan Python	E, P	C, F	Exotic
Python breitensteini	Borneo Blood Python	E, I, P	C, W	Exotic
Python brongersmai	Red Blood Python	E, I, P	C, F, W	Exotic
Python curtus	Blood Python	E, I, P	C, F, W	Exotic
Python molurus	Indian Python	I, P	C, W	Exotic
Python molurus bivittatus	Burmese Python	E, I, P	C, F, W	Exotic
Python molurus molurus	Indian Python	P	C	Exotic
Python molurus pimbura	Cyelonese Python	P	C	Exotic
Python regius	Spider Ball Python	E, I, P	C, F, U, W	Exotic
Python reticulatus	Reticultated Python	E, I, P	C, F, W	Exotic
Python reticulatus jampeanus	Jampea Dwarf Reticulated Python	P	C	Exotic
Python natalensis	Southern African Rock Python	P	C	Exotic
Python sebae sebae	African Rock Python	P	C	Exotic
Python sp.	Python	E, I, P	C, U, W	Exotic
Sanzinia madagascariensis	Madagascar Tree Boa	P	C	Exotic
Family Tropidophiidae				
Ungaliophis panamensis	Panamanian Dwarf Boa	I	C	Exotic

Family Colubridae				
Ahaetulla nasuta	Long-Nosed Treesnake	E, I, P	C, W	Exotic
Ahaetulla prasina	Asian Whip Snake	E, I, P	C, W	Exotic
Ahaetulla sp.	Treesnake	I	W	Exotic
Arizona elegans occidentalis	California Glossy Snake	P	C	USA
Asthenodipsas vertebralis	Vertebral Slug Snake	P	C	Exotic
Boiga cyanea	Green Cat Snake	P	C	Exotic
Boiga cynodon	Dog Tooth Cat Snake	P	C	Exotic
Boiga dendrophila	Mangrove Snake	E, I, P	C, W	Exotic
Boiga nigriceps	Black Headed Cat Snake	I, P	C, W	Exotic
Boiga sp.	Cat Snake	I	W	Exotic
Cerberus rhynchops	New Guinea Bockadam	E, I	F, W	Exotic
Chionactis occipitalis	Western Shovel-nosed Snake	E	W	USA
Chironius sp.	Chironius	E	W	Exotic
Chrysopelea ornata	Golden Flying Tree Snake	P	C	Exotic
Chrysopelea ornata	Golden Flying Snake	E, I	C, W	Exotic
Chrysopelea paradisi	Paradise Flying Tree Snake	P	C	Exotic
Chrysopelea sp.	Flying Snake	I	W	Exotic
Clelia clelia	Mussurana	P	C	Exotic
Coelognathus flavolineatus	Black Copper Rat Snake	E, I	W	Exotic
Coelognathus helena	Trinket Rat Snake	E, P	C, W	Exotic
Coelognathus radiata	Radiated Rat Snake	E, I, P	C, W	Exotic
Coluber bilineatus	Sonoran Whipsnake	P	W	USA
Coluber sp.	Coluber sp.	I	W	
Dasypeltis medici	East African Egg Eating Snake	P	C	Exotic
Dasypeltis scabra	African Egg-Eating Snake	I, P	C, W	Exotic
Dendrelaphis caudolineatus	Blue Bronzeback	P	C	Exotic
Dendrelaphis formosus	Elegant Bronzeback	P	C	Exotic
Dendrelaphis kopsteini	Kopstein's Bronzeback	P	C	Exotic
Dendrelaphis pictus	Common Bronzeback	P	C	Exotic
Dendrelaphis sp.	Bronzeback	I	W	Exotic
Dinodon rufozonatum	Rose Big-Toothed Snake	E	C	Exotic
Drymarchon corais	Indigo Snake	I, E	W	Exotic
Drymarchon corais corais	Western Indigo Snake	P	C	Exotic
Drymarchon couperi	Eastern Indigo Snake	P	C	USA
Elaphe carinata	Taiwan Stink Snake	E, I	C, W	Exotic
Elaphe climacophora	Japanese Rat Snake	E, P	C	Exotic

Elaphe quatuorlineata	Four-Lined Ratsnake	E	C	Exotic
Elaphe rufodorsata	Frog-Eating Ratsnake	E	W	Exotic
Elaphe schrenckii	Siberian Ratsnake	E, I, P	C, W	Exotic
Enhydris bocourti	Bocourt's Water Snake	E, I	W	Exotic
Enhydris sp.	Water Snake	I	W	Exotic
Erpeton tentaculatum	Tentacled Snake	E, I	W	Exotic
Euprepiophis mandarina	Mandarin Ratsnake	E, P	C, W	Exotic
Farancia abacura abacura	Eastern Mudsnake	P	C	USA
Gonyosoma oxycephelum	Green Tailed Ratsnake	P	C, W	Exotic
Gonyosoma jansenii	Indo Yellow Ratsnake	E, I, P	C, W	Exotic
Gonyosoma oxycephalum	Red-Taileded Green Ratsnake	E, I	C, W	Exotic
Gonyosoma sp.	Gonysoma sp.	E	C, W	Exotic
Grayia smithii	Smith's African Water Snake	I	W	Exotic
Heterodon simus	Southern Hog-nosed Snake	P	C	USA
Heterodon sp.	Hog-nosed Snake	E, P	C, W	USA
Hydrodynastes gigas	False Water Cobra	P	C	Exotic
Hypsiglena sp.	Hypsiglena sp.	E	W	
Lampropeltis getula	Common Kingsnake	P	C, W	USA
Lampropeltis getula californiae	California Kingsnake	E, P	C, W	USA
Lampropeltis getula floridana	Florida Kingsnake	P	C	USA
Lampropeltis getula getula	Eastern Kingsnake	P	C, W	USA
Lampropeltis getula meansi	Apalachicola Kingsnake	P	C	USA
Lampropeltis getula nigra	Eastern Black Kingsnake	P	C	USA
Lampropeltis getula nigrita	Western Black Kingsnake	P	C	USA
Lampropeltis mexicana	Mexican Kingsnake	E, P	C, U, W	Exotic
Lampropeltis mexicana greeri	Durango Mountain Kingsnake	P	C	Exotic
Lampropeltis mexicana mexicana	San Luis Potosi Kingsnake	P	C	Exotic
Lampropeltis mexicana thayeri	Thayer's Kingsnake	P	C	Exotic
Lampropeltis mexicana thayeri	Thayer's Kingsnake	P	C	Exotic
Lampropeltis pyromelana	Sonoran Mountain Kingsnake	W, P	C, W	USA
Lampropeltis pyromelana pyromelana	Arizona Mountain Kingsnake	P	C	USA
Lampropeltis ruthveni	Ruthvens Kingsnake	E, P	C, W	Exotic
Lampropeltis triangulum arcifera	Jalisco Milksnake	P	C	Exotic
Lampropeltis triangulum gaigae	Black Milksnake	P	C	Exotic
Lampropeltis triangulum	Columbian Milksnake	P	C	Exotic

micropholis				
Lampropeltis triangulum polyzona	Atlantic Central American Milksnake	P	C	Exotic
Lampropeltis triangulum andesiana	Andean Milksnake	P	C	Exotic
Lampropeltis triangulum arcifera	Jalisco Milksnake	P	C	Exotic
Lampropeltis triangulum campbelli	Pueblan Milksnake	P	C	Exotic
Lampropeltis triangulum hondurensis	Honduran Milksnake	P	C	Exotic
Lampropeltis triangulum multistriata	Pale Milksnake	P	W	USA
Lampropeltis triangulum nelsoni	Nelson's Milksnake	P	C	Exotic
Lampropeltis triangulum sinalaoe	Sinaloan Milksnake	P	C	Exotic
Lampropeltis triangulum stuarti	Costa Rican Milksnake	P	C	Exotic
Lampropeltis triangulum syspila	Red Milksnake	P	C	USA
Lampropeltis zonata	California Mountain Kingsnake	E, P	C	USA
Lamprophis fuliginosus	Brown House Snake	E, P	C, U, W	Exotic
Lamprophis lineatus	Striped House Snake	P	C	Exotic
Lamprophis maculatus	Dotted House Snake	E	C	Exotic
Lamprophis sp.	House Snake	I	W	Exotic
Langaha madagascariensis	Madagascan Hognosed Snake	E, P	C, W	Exotic
Langaha sp.	Langaha sp.	E	W	Exotic
Leioheterodon madagascariensis	Madagascar Sharp Nosed Snake	P	C	Exotic
Leioheterodon modestus	Malagasy Hognose Snake	E	W	Exotic
Leioheterodon sp.	Hognosed Snake	E	W	Exotic
Leptophis ahaetulla	Parrot Snake	I	W	Exotic
Lichurana trivirgata	Rosy Boa	P	C	USA
Liophis poecylogirus	Water Snake	P	C	Exotic
Liophis sp.	Liophis sp.	I	W	Exotic
Lycodon sp.	Lycodon sp.	I	W	Exotic
Lystrophis semicinctus	Ringed Hognose Snake	E, I	C, W	Exotic
Lystrophis sp.	Tricolor Hognose	E, P	C	Exotic
Macrocalamus schultzi	Shulz's Reed Snake	P	C	Exotic
Macrocalamus tweediei	Tweedie's Reed Snake	P	C	Exotic
Macropisthodon flaviceps	Orange Neck Keelback	P	C	Exotic
Madagascarophis sp.	Madagascan Cat Eyed Snake	P	U	Exotic
Natriciteres olivacea	Olive Marsh Snake	I	W	Exotic
Natrix maura	Viperine Water Snake	P	C	Exotic

Natrix natrix	Ringed Snake	E, I	C, W	Exotic
Natrix sp.	Water Snake	E, I	C, W	Exotic
Natrix tessellata	Dice Snake	E	W	Exotic
Nerodia sp.	Water Snake	E, P	C, W	
Oligodon cyclurus	Cantor's kukri snake	P	C	Exotic
Oligodon purpurascens	Brown Kukri Snake	P	C	Exotic
Opheodrys aestivus carinatus	Florida Rough Green Snake	P	W	USA
Oreocryptophis porphyracea	Red Bamboo Snake	I, P	C	Exotic
Oreocryptophis porphyracea coxi	Red Bamboo Snake (coxi)	P	C	Exotic
Oreocryptophis porphyracea latacincta	Red Bamboo Snake (latacincta)	P	C	Exotic
Oreocryptophis porphyracea pulchra	Yunnan Mountain Ratsnake	P	C	Exotic
Oreocryptophis porphyracea vaillanti	Red Bamboo Snake (vaillanti)	P	C	Exotic
Orthriophis moellendorffi	Moellendorf's Ratsnake	E, P	C, W	Exotic
Orthriophis taeniurus	Beauty Snake	E, I	C, W	Exotic
Orthriophis taeniurus friesi	Taiwan Beauty Rat Snake	P	C	Exotic
Orthriophis taeniurus ridleyi	Cave Racer	P	C	Exotic
Orthriophis taeniurus ssp.	Vietnamese Blue Beauty Snake	P	C	Exotic
Orthriophis taeniurus taeniura	Chinese Beauty Snake	P	C	Exotic
Orthriophis taeniurus yunnanensis	Yunnan Beauty Snake	P	C	Exotic
Oxybelis fulgidus	Green Vine Snake	P	U	Exotic
Oxyrhopus sp.	Oxyrhopus sp.	I	W	Exotic
Pantherophis flavirufus	Yellow-red Ratsnake	E, P	C	Exotic
Pantherophis flavirufus flavirufus	Yellow-red Ratsnake	P	C	Exotic
Pantherophis obsoletus obsoletus	Black Ratsnake	P	C	USA
Pantherophis obsoletus quadrivittata	Yellow Ratsnake	P	C, W	USA
Pantherophis obsoletus rossalleni	Everglades Ratsnake	P	C	USA
Pantherophis sp.	Ratsnake	E, I, P	C, W	
Pantherophis spiloides	Gray Ratsnake	P	C	USA
Pantherophis vulpinus	Western Foxsnake	E, P	C	USA
Pareas carinatus	Snail Eating Snake	P	C	Exotic
Philodryas baroni	Baron's Green Racer	P	C	Exotic
Philodryas sp.	Philodryas sp.	I	W	Exotic
Philothamnus sp.	Philothamnus sp.	I	W	Exotic
Phyllorhynchus sp.	Leaf-nosed Snake	E	W	USA
Pituophis catenifer annectans	San Diego Gopher	P	C	USA

	Snake			
Pituophis catenifer catenifer	Pacific Gopher Snake	P	C	USA
Pituophis catenifer deserticola	Great Basin Gopher Snake	P	C, W	USA
Pituophis catenifer vertebralis	Cape Gopher Snake	P	C	Exotic
Pituophis deppei	Mexican Bull Snake	P	U	Exotic
Pituophis deppei deppei	Mexican Bull Snake	P	C	Exotic
Pituophis deppei jani	Mexican Pine Snake	P	C	Exotic
Pituophis melanoleucus	Pinesnake	E, P	C, W	USA
Pituophis melanoleucus lodingi	Black Pinesnake	P	C	USA
Pituophis melanoleucus melanoleucus	Northern Pinesnake	P	C	USA
Pituophis melanoleucus mugitus	Florida Pinesnake	p	C	USA
Pituophis sp.	Bull/Gopher Snake	E	C, W	
Psammodynastes pulverulentus	Mock Viper	P	C	Exotic
Psammophis sibilans	Striped Sand Snake	I	W	Exotic
Pseudoxenodon macrops	Big-eyed Bamboo Keelback	P	C	Exotic
Ptyas korros	Chinese Ratsnake	I	W	Exotic
Ptyas mucosus	Oriental Ratsnake	E, I	U, W	Exotic
Regina sp.	Crayfish Snake	E	W	
Rhadinaea flavilata	Pine Woods Littersnake	E	W	USA
Rhadinophis prasina	Green Bush Ratsnake	P	C	Exotic
Rhamphiophis oxyrhynchus	Rufous Beaked Snake	P	W	Exotic
Rhinechis scalaris	Ladder Snake	I	C	Exotic
Rhynchophis boulengeri	Rhinocerous Snake	P	C	Exotic
Salvadora hexalepis	Western Patch-nosed Snake	E	W	USA
Senticolis triaspis	Green Ratsnake	P	C	USA
Senticolis triaspis intermedia	Northern Green Ratsnake	P	C	USA
Sinonatrix sp.	Sinonatrix	I	W	Exotic
Sonora sp.	Groundsnake	E, I	W	
Spalerosophis diadema	Diadem Snake	E, P	C, W	Exotic
Spalerosophis diadema atriceps	Pakistan Ratsnake	P	C	Exotic
Spilotes pullatus	Tiger Ratsnake	E, P	W	Exotic
Storeria victa	Florida Brownsnake	P	C	USA
Tantilla sp.	Black-headed Snake	E	W	USA
Thamnophis atratus	Aquatic Gartersnake	P	C	USA
Thamnophis elegans	Terrestrial Gartersnake	E, P	C, W	USA
Thamnophis elegans vagrans	Wandering Gartersnake	P	C	USA
Thamnophis ordinoides	Northwestern Gartersnake	E, P	C, W	USA

Thamnophis sauritus	Eastern Ribbonsnake	E, I, P	C, U, W	USA
Thamnophis sauritus sauritus	Common Ribbonsnake	P	C	USA
Thamnophis sirtalis parietalis	Red-sided Gartersnake	P	C	USA
Thamnophis sirtalis tetrataenia	San Francisco Gartersnake	P	C	USA
Thamnophis sp.	Gartersnake	E, P	C, W	
Xenochrophis trianguligerus	Triangle Keelback	P	C	Exotic
Xenochrophis piscator	Asiatic Water Snake	I	W	Exotic
Xenochrophis sp.	Xenochrophis sp.	I	W	Exotic
Xenochrophis vittata	Banded Keelback	E, I	W	Exotic
Zamenis longissima	Aesculapean Snake	E	C	Exotic
Zamenis persica	Persian Ratsnake	P	C	Exotic
Zamenis situla	Leopard Ratsnake	I, P	C	Exotic
Famiy Elapidae				
Aspidelaps lubricus	Coral Cobra	P	C	Exotic
Aspidelaps sp.	Coral Cobra	P	F	Exotic
Bungarus fasciatus	Banded Krait	I	W	Exotic
Bungarus sp.	Krait	I	W	Exotic
Bungarus candidus	Blue Krait	P	C	Exotic
Bungarus fasciata	Banded Kraits	P	C	Exotic
Bungarus flaviceps	Red-headed Krait	P	C	Exotic
Calliophis bivirgatus	Blue Malaysian Coral Snake	I, P	C, W	Exotic
Calliophis intestinalis	Banded Coral Snake	P	C	Exotic
Dendroaspis angusticeps	Eastern Green Mamba	P	C, W	Exotic
Dendroaspis polylepis	Many-Scaled Mamba	I	C	Exotic
Dendroaspis sp.	Mamba	E, I	W	Exotic
Hemachatus haemachatus	Ringnecked Spitting Cobra	I	C	Exotic
Micrurus sp.	Coral Snake	P	C	
Naja annulifera	Banded Cobra	P	C, U	Exotic
Naja annulifera annuifera	Snouted Cobra	P	C	Exotic
Naja atra	Chinese Cobra	I	W	Exotic
Naja haje	Egyptian Cobra	P	U	Exotic
Naja haje legionis	Moroccan Black Cobra	P	C	Exotic
Naja kaouthia	Monocled Cobra	I, P	C, F, W	Exotic
Naja melanoleuca	Black and White Cobra	E, I, P	W, F	Exotic
Naja mossambica	Mozambique Spitting Cobra	P	C, W	Exotic
Naja naja	Indian Cobra	I, P	C, U, W	Exotic
Naja naja karachiensis	Pakistan Black Cobra	P	C	Exotic

Naja nubiae	Nubian Spitting Cobra	P	C, W	Exotic
Naja pallida	African Cobra	I, P	C, W	Exotic
Naja samarensis	Peters' Cobra	I, P	C, W	Exotic
Naja siamensis	Indo-Chinese Spitting Cobra	P	C	Exotic
Naja sp.	Cobra	I	C, U, W	Exotic
Naja sputatrix	Indonesian Cobra	E, I, P	C, W	Exotic
Ophiophagus hannah	King Cobra	I, P	C, W	Exotic
Family Hydrophiidae				
Hydrophis sp.	Seasnake (Hydrophis)	E	F	Exotic
Lapemis hardwickii	Hardwicke's Spine-Bellied Seasnake	I	W	Exotic
Lapemis sp.	Seasnake (Lapemis)	I	W	Exotic
Pseudolaticauda semifasciata	Chinese Sea Snake	I	W	Exotic
Family Homalopsinidae				
Homalopsis buccata	Puff-faced Water Snake	E, I, P	C, F, W	Exotic
Family Typhlopidae				
Typhlops sp.	Blind Snake	P	C	
Family Viperidae				
Agkistrodon bilineatus	Ornate Cantil	P	C, W	Exotic
Atheris ceratophora	Usambura Bush Viper	P	C	Exotic
Atheris chloroechis	West African Bush Viper	E, I	C, W	Exotic
Atheris sp.	Bush Viper	I, P	C, W	Exotic
Atheris squamigera	African Bush Viper	E, I, P	C, W	Exotic
Bitis arietans	Puff Adder	I, P	C, F, W	Exotic
Bitis gabonica	Gabon Viper	E, I, P	C, W	Exotic
Bitis gabonica rhinoceros	Western Gaboon Viper	P	C	Exotic
Bitis nasicornis	Rhinoceros Viper	E, I, P	C, F, W	Exotic
Bitis sp.	Viper	I	W	Exotic
Bothriechis aurifer	Yellow-blotched Palm Pit Viper	I	F	Exotic
Bothriechis sp.	Bothriechis	I	W	Exotic
Bothriopsis bilineatus	Green Jararaca	P	C	Exotic
Bothrops alternatus	Urutu	P	U	Exotic
Bothrops asper	Terciopelo	P	U	Exotic
Bothrops atrox	Common Lancehead	P	C	Exotic
Bothrops brazili	Brazilian Lancehead	P	U	Exotic

Bothrops colombianas	Columbian Lancehead	P	U	Exotic
Bothrops diporus	Argentine Lancehead	P	U	Exotic
Bothrops leucurus	Whitetail Lancehead	P	U	Exotic
Bothrops sp.	Lancehead	P	C	Exotic
Callaselasma rhodostoma	Malayian Pit Viper	P	C	Exotic
Cerastes cerastes	Desert Horned Viper	I	W	Exotic
Cerastes sp.	Horned Viper	I	W	Exotic
Cerastes vipera	Sahara Sand Viper	I	W	Exotic
Crotalus basiliscus	Basilisk Rattlesnake	P	U	Exotic
Crotalus adamanteus	Eastern Diamond-backed Rattlesnake	E, P	C, F, W	USA
Crotalus cerastes	Sidewinder	E	W	USA
Crotalus durissus dryinus	Cascabel Rattlesnake	P	C	Exotic
Crotalus durissus pifanorum	Venezuelan Guarico Rattlesnake	P	C	Exotic
Crotalus enyo	Lower California Rattlesnake	P	C	Exotic
Crotalus enyo furvus	Rosario Rattlesnake	I	C	Exotic
Crotalus mitchellii	Speckled Rattlesnake	P	U	USA
Crotalus mitchellii pyrrhus	Southwestern Speckled Rattlesnake	E, P	C	USA
Crotalus oreganus	Western Rattlesnake	E, P	C, U	USA
Crotalus oreganus helleri	Southern Pacific Rattlesnake	P	C	USA
Crotalus polystictus	Mexican Lancehead Rattlesnake	I, P	C	Exotic
Crotalus simus	Costa Rican Rattlesnake	P	C	Exotic
Crotalus sp.	Rattlesnake	I, P	C, U, W	
Crotalus tigris	Tiger Rattlesnake	E	W	USA
Crotalus vegrandis	Uracoan Rattlesnake	I, P	F	Exotic
Daboia russellii	Russel's Viper	I	W	Exotic
Deinagkistrodon acutus	Chinese Moccasin	E, P	C	Exotic
Echis carinatus	Saw-Scaled Viper	I	W	Exotic
Echis coloratus	Palestine Saw-Scaled Viper	I	W	Exotic
Echis pyramidum	Egyptian Saw Scaled Viper	P	C	Exotic
Echis pyramidum leakeyi	Leaky Carpet Viper	P	C	Exotic
Macrovipera mauritanica	Moorish Viper	P	C	Exotic
Ovophis monticola	Chinese Mountain Pit Viper	P	C	Exotic
Porthidium lansbergii lansbergii	Hognose Pit Viper	P	C	Exotic
Porthidium ophryomegas	Slender Hognosed Viper	P	U	Exotic
Prothidium lansbergii rozei	Lansberg's Hognose Viper	P	C	Exotic

Sistrurus miliarius barbouri	Dusky Pygmy Rattlesnake	P	C	USA
Sistrurus miliarius milarius	Carolina Pygmy Rattlesnake	I	C	USA
Trimeresurus albolabris	Wetar Pit Viper	P	C	Exotic
Trimeresurus gramineus	Bamboo Pit Viper	P	U	Exotic
Trimeresurus purpureomaculatus	Shore Pit Viper	P	C	Exotic
Trimeresurus sp.	Asian Pitviper	E, I, P	C, W	Exotic
Trimeresurus trigonocephalus	Sri Lankan Green Pitviper	P	C	Exotic
Trimeresurus borneensis	Borneon Pit Viper	P	C	Exotic
Trimeresurus kanburiensis	Kanburi Pit Viper	P	C	Exotic
Trimeresurus popeiorum popeiorum	Pope Pit Viper	P	C	Exotic
Trimeresurus sumatranus	Sumatran Pit Viper	P	C	Exotic
Tropidolaemus sp.	Tropidolaemus sp.	P	U	Exotic
Tropidolaemus wagleri	Wagler's Palm Viper	I, P	C, W	Exotic
Vipera ammodytes	Nose-horned Viper	I, P	C	Exotic
Vipera sp.	Vipera sp.	I	C, W	Exotic
Vipera xanthina	Ottoman Viper	P	U	Exotic
Family Chelydridae				
Chelydra serpentina osceola	Florida Snapping Turtle	P	C	USA
Family Emydidae				
Chrysemys picta picta	Eastern Painted Turtle	P	C	USA
Clemmys guttata	Spotted Turtle	E, P	C, W	Exotic
Clemmys marmorata	Pacific Pond Turtle	E	C, W	Exotic
Deirochelys reticularia chrysea	Florida Chicken Turtle	P	C	USA
Emydoidea blandingii	Blanding's Turtle	E, P	C	USA
Emys orbicularis	European Pond Terrapin	I, P	W	Exotic
Glyptemys insculpta	Wood Turtle	P	C	USA
Graptemys barbouri	Barbour's Map Turtle	E	C	USA
Graptemys gibbonsi	Pascagoula Map Turtle	E	W	USA
Graptemys nigranoda	Black-knobbed Map Turtle	E	C	USA
Graptemys sp.	Map Turtle	E, P	C, W	
Malaclemys terrapin centrata	Carolina Diamond-backed Terrapin	P	C	USA
Malaclemys terrapin terrapin	Northern Diamond-backed Terrapin	P	C	USA
Pseudemys cocinna floridana	Coastal Plain Cooter	E, I, P	C, W	USA
Pseudemys nelsoni	Florida Red-bellied Cooter	E, I, P	C, W	USA

Pseudemys peninsularis	Peninsula Cooter	E, P	C, W	USA
Pseudemys rubriventris	Northern Red Bellied Turtle	E, P	C, W	USA
Pseudemys sp.	Pseudemys sp.	E	C, W	
Terrapene carolina carolina	Eastern Box Turtle	P	C	USA
Terrapene sp.	American Box Turtle	P	C, W	
Trachemys scripta	Pond Slider	E, I, P	C, W	USA
Trachemys scripta scripta	Yellow-bellied Slider	E, I, P	C, W	USA
Trachemys scripta troostii	Cumberland Slider	E, P	C	USA
Trachemys sp.	Slider	E	C, W	
Family Testudinidae				
Astrochelys radiata	Radiated Tortoise	P	C	Exotic
Chelidonis carbonaria	Red Footed Tortoise	E, I, P	C, F, U, W	Exotic
Chelidonis denticulata	Yellow Footed Tortoise	E, I, P	C, U, W	Exotic
Dipsochelys dussumieri	Aldabra Tortoise	I, P	C, U	Exotic
Geochelone elegans	Star Tortoise	P	C	Exotic
Geochelone sulcata	African Spurred Tortoise	E, P	C, F, U	Exotic
Gopherus agassizii	Desert Tortoise	P	W	USA
Gopherus berlanderi	Texas Tortoise	P	W	Texas
Indotestudo elongata	Elongated Tortoise	E, I, P	C, W	Exotic
Indotestudo forstenii	Forsten's Tortoise	E, I	W	Exotic
Kinixys belliana belliana	Bell's Hingeback Tortoise	P	C	Exotic
Kinixys belliana nogueyi	Western Bell's Hingeback Tortoise	P	C	Exotic
Kinixys erosa	Serrated Tortoise	I	W	Exotic
Kinixys homeana	Forest Hingeback Tortoise	I, P	C, U, W	Exotic
Malacochersus tornieri	Pancake Tortoise	P	C	Exotic
Manouria emys	Asian Brown Tortoise	E, I, P	C, W	Exotic
Manouria emys emys	Asian Forest Tortoise	P	C	Exotic
Manouria emys phayrei	Black Mountain Tortoise	P	C	Exotic
Manouria sp.	Manouria Sp.	P	C	Exotic
Manouria impressa	Impressed Tortose	P	C	Exotic
Psammobates pardalis	Leopard Tortoise	E, I, P	C, F, W	Exotic
Psammobates pardalis babcocki	Leopard Tortoise	P	C	Exotic
Pyxis arachnoides arachnoides	Spider Tortoise	P	C	Exotic
Testudo gracea	Mediterranean Spur-Thighed Tortoise	E, P	C, F, U, W	Exotic
Testudo gracea gracea	Greek Tortoise	P	C	Exotic

Testudo graeca ibera	Greek Tortoise	P	C	Exotic
Testudo hermanni	Hermann's Tortoise/Russian Tortoise	E, P	C, U, W	Exotic
Testudo horsfieldii	Russian Tortoise	P	C, U, W	Exotic
Testudo kleinmanni	Egyptian Tortoise / Kleinman's Tortoise	P	C	Exotic
Testudo marginata	Marginated Tortoise	P	C	Exotic
Testudo marginata marginata	Marginated Tortoise	P	C	Exotic
Testudo marginata sarda	Marginated Tortoise	P	C	Exotic
Testudo marginata weissinger	Weissinger's Tortoise	P	C	Exotic
Testudo sp.	Testudo Sp.	I	W	Exotic
Family Geoemydidae				
Batagur borneoensis	Painted Terrapin	I	W	Exotic
Chinemys reevesii	Reeve's Turtle	E, P	C, F, W	Exotic
Chinemys sp.	Pond Turtle	E	C	Exotic
Cuora amboinensis	Amboina Box Turtle	I, P	C, W	Exotic
Cuora flavomarginata	Snake Eating Turtle	P	C, U	Exotic
Cuora sp.	Asian Box Turtle	P	U	Exotic
Cuora trifasiata	Three Lined Box Turtle	P	C	Exotic
Cyclemys dentata	Asian Leaf Turtle	E, I, P	C, W	Exotic
Cyclemys sp.	Leaf Turtle	I	W	Exotic
Geoclemys hamiltoni	Spotted Pond Turtle	P	C	Exotic
Geoemyda sp.	Geoemyda sp.	I	W	Exotic
Geoemyda spengleri	Vietnamese Leaf Turtle	E, P	W	Exotic
Heosemys grandis	Giant Asian Pond Turtle	P	C, W	Exotic
Heosemys spinosa	Spiny Turtle	I, P	W	Exotic
Leucocephalon yuwonoi	Sulawesi Forest Turtle	I	W	Exotic
Malayemys subtrijuga	Malayan Snail-Eating Turtle	I	W	Exotic
Mauremys japonica	Japanese Turtle	E, I	C, W	Exotic
Mauremys mutica	Chinese Yellow Pond Turtle	P	C	Exotic
Notochelys platynota	Malayan Flat-Shelled Turtle	I	W	Exotic
Ocadia sinensis	Chinese Thread Head Turtle	E, P	C	Exotic
Rhinoclemmys aerolata	Belizian Wood Turtle	P	C	Exotic
Rhinoclemmys funerea	Black Wood Turtle	E, I P	C, W	Exotic
Rhinoclemmys pulcherrima	Ornate Wood Turtle	P	C, W	Exotic
Rhinoclemmys pulcherrima incisa	Central America Wood Turtle	P	C	Exotic
Rhinoclemmys pulcherrima	Central American	P	C	Exotic

manni	Ornate Turtle			
Rhinoclemmys punctularia	South American Wood Turtle	E, I, P	C, W	Exotic
Rhinoclemmys sp.	Rhinoclemmus Sp.	E, I	C, W	Exotic
Siebenrockiella crassicollis	Black Marsh Turtle	I, P	W	Exotic
Family Carettochelyidae				
Carettochelys insculpta	Fly River Turtle	I, P	C, W	Exotic
Family Trionychidae				
Amyda cartilaginea	Asiatic Softshell	I, P	C, W	Exotic
Apalone ferox	Florida Softshell	E, I, P	C, W	USA
Apalone sp.	Softshell	E, I, P	C, W	
Chitra chitra	Striped Softshell	P	C	Exotic
Dogania subplana	Malayan Softshell	I	W	Exotic
Pelochelys bibroni	Asian Giant Softshell	I	W	Exotic
Pelochelys cantorii	Asian Giant Softshell	I	W	Exotic
Family Kinosternidae				
Claudius angustatus	Narrowbridge Musk Turtle	E	C, W	Exotic
Kinosternon baurii	Striped Mud Turtle	E, P	C, W	USA
Kinosternon cruentatum	Red-cheeked Mud Turtle	P	C	Exotic
Kinosternon leucostomum	White-lipped Mud Turtle	P	C	Exotic
Kinosternon scorpioides	Scorpion Mud Turtle	E, P	C, W	Exotic
Kinosternon sp.	Mud Turtle	E, I, P	C, F, W	
Staurotypus salvinii	Pacific Giant Mud Turtle	E	C, W	Exotic
Staurotypus triporcatus	Mexican Giant Mud Turtle	E, P	C, W	Exotic
Sternotherus minor	Loggerhead Musk Turtle	E	C, W	USA
Sternotherus sp.	Sternotherus Sp.	E	C, W	
Family Chelidae				
Chelodina longicollis	Snake Neck Turtle	P	C	Exotic
Chelodina mccordi	Roti Island Snake Neck Turtle	P	C	Exotic
Chelodina novaeguineae	New Guinea Sideneck Turtle	P	U	Exotic
Chelodina parkeri	Parker’s Snake-Necked Turtle	E, I	W	Exotic
Chelodina reimanni	Reimann's Snakeneck	I	W	Exotic

	Turtle			
Chelodina siebenrocki	Australian Snake Neck Turtle	E, I, P	C, W	Exotic
Chelus fimbriata	Mata Mata Turtle	E, I, P	C, W	Exotic
Elseya sp.	Elseya sp.	E, I	W	Exotic
Emydura albertisii	Pink Belly Sideneck Turtle	E, I, P	C, W	Exotic
Emydura macquarii	Macquari Short Necked Turtle	P	C	Exotic
Emydura subglobosa	Pink Bellied Sideneck Turtle	E, I, P	C, W	Exotic
Hydromedusa tectifera	Argentine Snake Necked Turtle	P	C	Exotic
Phrynops gibbus	Gibba Turtle	E	C, W	Exotic
Phrynops rufipes	Red Spotted Sideneck Turtle	P	C	Exotic
Phrynops sp.	Phrynops sp.	W	W	Exotic
Phrynops gibbus	Gibba Sideneck Turtle	P	C	Exotic
Platemys platycephala	South American Flat-Headed Turtle	E, P	W	Exotic
Platemys sp.	Flat-Headed Turtle	W	C, W	Exotic
Family Pelomedusidae				
Pelomedusa subrufa	African Helmeted Turtle	E, I, P	C, W	Exotic
Pelusios castaneus	West African Mud Turtle	P, E, I	W	Exotic
Pelusios castanoides	African Yellow Bellied Sideneck Turtle	P	C	Exotic
Pelusios niger	African Side Neck Turtle	P	C	Exotic
Pelusios sinuatus	Serrated African Sideneck Turtle	P	C	Exotic
Pelusios sp.	Pelusios Sp.	E, P	C, W	Exotic
Family Podocnemididae				
Erymnochelys madagascariensis	Madagascan Big-Headed Side-Necked Turtle	I	W	Exotic
Podocnemis unifilis	Yellow-Spotted Amazonian River Turtle	I	F	Exotic
Family Alligatoridae				
Alligator sinensis	Chinese Alligator	P	C	Exotic
Caiman crocodilus crocodilus	Spectacled Caiman	I, E	C, U, W	Exotic
Caiman crocodilus fuscus	Common Caiman	I, E, P	C, F, U, W	Exotic
Caiman sp.	Caiman	I, E	C, U, W	Exotic

Caiman yacare	Yacare Caiman	I, E	C, W	Exotic
Pakeisycgys trigonatus	Smooth-Fronted Caiman	P	C	Exotic
Paleosuchus palpebrosus	Dwarf Caiman	P	C	Exotic
Paleosuchus palpebrosus	Dwarf Caiman	E, P	C, U, W	Exotic
Paleosuchus trigonatus	Smooth-Fronted Caiman	E, P	C, F, U, W	Exotic
Family Crocodylidae				
Crocodylus niloticus	Nile Crocodile	E, I, P	C, F, U, W	Exotic
Crocodylus moreletii	Morelet's Crocodile	P	F	Exotic
Crocodylus novaeguineae	New Guinea Crocodile	E, I	C, U, W	Exotic
Crocodylus porosus	Saltwater Crocodile	E, I	C, W	Exotic
Crocodylus sp.	Crocodile	I, P	C, U, W	
Osteolaemus tetraspis tetraspis	Dwarf Crocodile	I	W	Exotic

[a] Uppercase letters denote use categories: Import (I), Export (E), Food (F), and Pet trade (P). [b] This column indicates the reported source of the specimen: Captive (C), Farmed (F), Unknown (U), and Wild (W). [C] This column indicates native range of species: Continental United States excluding Texas (USA) or exotic (Exotic).

APPENDIX B

Exotic species of amphibians and reptiles known to be established in the continental United States (Crother et al. 2008).

Genus	Common Name	Established in
Anurans		
Eleutherodactylus coqui	Coqui	CA, FL
Eleutherodactylus planirostris	Greenhouse Frog	AL, FL, GA, LA, MS
Osteopilus septentrionalis	Cuban Treefrog	FL
Xenopus laevis	African Clawed Frog	AZ, CA
Lizards		
Agama agama	African Rainbow Lizard	FL
Ameiva ameiva	Giant Ameiva	FL
Anolis (Norops) sagrei	Brown Anole	AL, FL, GA, LA, SC, TX
Anolis chlorocyanus	Hispaniola Green Anole	FL
Anolis cybotes	Large-headed Anole	FL
Anolis equestris	Knight Anole	FL
Anolis porcatus	Cuban Green Anole	FL
Aspidoscelis montaguae	Giant Whiptail	FL
Basiliscus vittatus	Brown Basilisk	FL
Calotes versicolor	Variable Bloodsucker	FL
Chamaeleo calyptratus	Veiled Chameleon	FL
Chamaeleo jacksonii	Jackson's Chameleon	CA, FL
Chondrodactylus bibronii	Bibron's Sand Gecko	FL
Cnemidophorous lemniscatus	Rainbow Whiptail	FL
Ctenonotus cristatellus	Crested Anole	FL
Ctenonotus distichus	Bark Anole	FL
Ctenosaura pectinata	Mexican Spiny-tailed Iguana	FL, TX
Ctenosaura similis	Gray's Spiny-tailed Iguana	FL
Cyrtopodion scabrum	Rough-tailed Gecko	TX
Gekko gecko	Tokay Gecko	FL
Gonatodes albogularis	Yellow-headed Gecko	FL
Hemidactylus frenatus	Common House Gecko	FL, TX
Hemidactylus garnotii	Indo-Pacific House Gecko	FL, TX
Hemidactylus mabouia	Wood Slave	FL
Hemidactylus platyurus	Asian Flat-tailed House Gecko	FL
Hemidactylus turcicus	Mediterranean Gecko	AL, AZ, AL, CA, FL, GA, KS, LA, MD, MS, MO, NE, NM, OK, SC, TX, UT, VA
Iguana iguana	Green Iguana	FL
Lacerta bilineata	Western Green Lacerta	KS
Leiocephalus carinatus	Northern Curly-tailed Lizard	FL
Leiocephalus schreibersii	Red-sided Curly-tailed Lizard	FL
Leiolepis belliana	Butterfly Lizard	FL
Mabuya multifasciata	Brown Mabuya	FL

Norops garmani	Jamaican Giant Anole	FL
Phelsuma madagascariensis	Madagascar Day Gecko	FL
Podacris muralis	Common Wall Lizard	IN, KY, OH
Podacris sicula	Italian Wall Lizard	KS, NY
Spaerodactylus argus	Occellated Gecko	FL
Spaerodactylus elegans	Ashy Gecko	FL
Tarentola annularis	Ringed Wall Gecko	FL
Tarentola mauritanica	Moorish Gecko	CA, FL (?)
Tupinambis merianae	Argentine Giant Tegu	FL
Varanus niloticus	Nile Monitor	FL
Snakes		
Acrochordus javanicus	Javanese File Snake	FL
Boa constrictor	Boa Constrictor	FL
Python molurus	Indian Python	FL
Ramphotyphlops braminus	Brahminy Blindsnake	FL, LA, MA, TX, VA
Crocodilians		
Caiman crocodilus	Spectacled Caiman	FL

APPENDIX C

LIABILITY WAIVER FOR TEXAS REPTILE EXPOS
SAN ANTONIO, TEXAS

SATURDAY _____ SUNDAY _____

EVERYONE OVER THE AGE OF 18 MUST READ AND SIGN THIS WAIVER BEFORE ENTRANCET O THE TEXAS REPTILE EXPO – SAN ANTONIO. YOU MUST PRESENT THIS WAIVER TO THE CASHIER BEFORE ENTERING. REFUSING TO DO SO WILL CAUSE REFUSAL TO YOUR ENTRANCE INTO THE EXPO.

I HEREBY ACKNOWLEDGE AND UNDERSTAND THAT VENOMOUS REPTILES WILL BE FOR SALE AND ON DISPLAY AT THIS EXPO, WHICH I UNDERSTAND ARE INHERENTLY AND POTENTIALLY DANGEROUS. BY SIGNING THIS WAIVER, I ACKNOWLEDGE AND UNDERSTAND THAT I AM AWARE OF THIS AND HOLD HARMLESS THE LIVE OAK CIVIC CENTER CENTER, THE CITY OF LIVE OAK, TEXAS, TEXAS REPTILE EXPOS, SAN ANTONIO REPTILE EXPOS, RANDAL & BONNIE BERRY, ALL STAFF MEMBERS AND SELLERS, IN THE EVENT OF ANY ACCIDENTS, INJURIES OR BITES THAT MAY OCCUR AT THIS EXPO. I UNDERSTAND THIS ALSO APPLIES TO ANYONE WITH ME AND TO ANY CHILDREN WITH ME UNDER THE AGE OF 18. I UNDERSTAND AND ACKNOWLEDGE THAT I ENTER THIS EXPO AT MY OWN RISK. ADULTS MUST WATCH THEIR CHILDREN AT ALL TIMES AND WILL BE HELD RESPONSIBLE FOR ANY DAMAGE OR INJURY THEY MAY CAUSE. I CERTIFY THAT I HAVE READ THE ABOVE INFORMATION, AND AM OVER THE AGE OF 18 (EIGHTEEN) YEARS.

SIGNATURE: _____Date: _____

PLEASE PRINT CLEARLY:

NAME:_____

EMAIL:_____

ADDRESS:_____ #_____

CITY:_____

STATE:_____ ZIP:_____ PHONE: (_____) _____

HOW DID YOU HEAR ABOUT THIS SHOW?

Newspaper:_____ Internet: _____ Postcard:_____ e-Mail from TexasReptiles.com _____

San Antonio Herp Assoc. _____

KONO 101.1 FM_____ KONO 860AM _____ KXTN 107.5_____ KISS 99.5 FM _____

Other :_____

APPENDIX D

Commercially traded native amphibian and reptile species in Texas 2002-2008.

Scientific Name	Common Name	Trade Category[a]	Source[b]
Family Ambystomatidae			
Ambystoma maculatum	Spotted Salamander	E, P	C, F, W
Ambystoma mavortium	Barred Tiger Salamander	T	W
Ambystoma opacum	Marbled Salamander	E, I	C, W
Ambystoma sp.	Unidentified Salamander	E	C, W
Ambystoma tigrinum	Eastern Tiger Salamander	E, P	C, W
Family Proteidae			
Necturus beyeri	Gulf Coast Waterdog	P	C
Family Bufonidae			
Anaxyrus americanus	American Toad	E	W
Anaxyrus cognatus	Great Plains Toad	E, T	W
Anaxyrus debilis	Green Toad	E, I, P, T	C, W
Anaxyrus punctatus	Red-Spotted Toad	E, T	W
Anaxyrus sp.	Bufo Toad	E, I, P	C, F, W
Anaxyrus speciosus	Texas Toad	E, T, P	C, W
Anaxyrus woodhousii	Woodhouse's Toad	E, P, T	C, W
Ollotis nebulifer	Gulf Coast Toad	E, T	W
Family Hylidae			
Acris crepitans	Northern Cricket Frog	E	W
Acris gryllus	Southern Cricket Frog	E	W
Hyla arenicolor	Canyon Treefrog	P	C, W
Hyla chrysoscelis	Cope's Gray Treefrog	E	W
Hyla cinerea	Green Treefrog	E, I, P, T	C, F, W
Hyla sp.	Unidentified Treefrog	E, I	C, W
Hyla squirella	Squirrel Treefrog	E	W
Hyla versicolor	Gray Treefrog	E, P	C, W
Pseudacris crucifer	Spring Peeper	E	F, W
Pseudacris sp.	Chorus Frog	E	W
Smilisca baudinii	Mexican Treefrog	E, I	C, W
Smilisca sp.	Smilisca sp.	E, I	W

Family Microhylidae			
Gastrophryne carolinensis	Eastern Narrow-mouthed Toad	E	C, W
Family Ranidae			
Lithobates berlandieri	Rio Grande Leopard Frog	I	C, W
Lithobates catesbeianus	American Bullfrog	E, F, I, P, T	C, F, W
Lithobates palustris	Pickerel Frog	E	F
Lithobates sp.	Frog	E, F, I, P	C, F, W
Lithobates sphenocephalus	Southern Leopard Frog	P	C
Lithobates clamitans	Green Frog	E	W
Family Scaphiopodidae			
Scaphiopus couchii	Couch's Spadefoot	E, T	W
Scaphiopus sp.	Spadefoot	E, T	W
Spea bombifrons	Plains Spadefoot	T	W
Family Crotaphytidae			
Crotaphytus collaris	Eastern Collared Lizard	E, I, T, P	C, W
Crotaphytus sp.	Collared Lizard	E	W
Gambelia wislizenii	Long-nosed Leopard Lizard	E	C, W
Family Phrynosomatidae			
Cophodsaurus texanus scitulus	Chihuahuan Greater Earless Lizard	T	W
Cophosaurus texanus	Greater Earless Lizard	E	W
Holbrookia maculata	Common Lesser Earless Lizard	E, T	W
Holbrookia sp.	Lesser Earless Lizard	E	W
Phrynosoma modestum	Round-tailed Horned Lizard	E, T	C, W
Phrynosoma sp.	Horned Lizard	E, I	W
Sceloporus cyanogenys	Blue Spiny Lizard	E	W
Sceloporus grammicus	Graphic Spiny Lizard	E	W
Sceloporus magister	Desert Spiny Lizard	E	W
Sceloporus olivaceus	Texas Spiny Lizard	E, I	W
Sceloporus poinsettii	Crevice Spiny Lizard	E, I, T, P	W
Sceloporus serrifer	Rough-scaled Lizard	E	W
Sceloporus sp.	Spiny Lizard	E, I, P	C, W
Sceloporus undulatus	Eastern Fence Lizard	E	W
Sceloporus variabilis	Rose-bellied Lizard	E, I	C, F, W

Urosaurus ornatus	Ornate Tree Lizard	E	W
Urosaurus sp.	Tree Lizard	E	W
Uta stansburiana	Common Side-blotched Lizard	E, T	W
Family Polychrotidae			
Anolis carolinensis	Green Anole	E, I, P, T	C, W
Anolis sp.	Anole	E, I, P	C, W
Family Gekkonidae			
Coleonyx brevis	Texas Banded Gecko	E, T	W
Coleonyx reticulatus	Reticulate Banded Gecko	P	U
Coleonyx sp.	Banded Gecko	E, I	C, F
Family Teiidae			
Aspidoscelis exanguis	ChihuahuanSpotted Whiptail	T	W
Aspidoscelis gularis	Common Spotted Whiptail	E	W
Aspidoscelis marmorata	Marbled Whiptail	T	W
Aspidoscelis sexlineata	Six-lined Racerunner	T	W
Aspidoscelis tesselata	Common Checkered Whiptail	E	W
Family Scincidae			
Plestiodon fasciatus	Common Five-lined skink	E, P, T	W
Plestiodon laticeps	Broad-headed Skink	E, P	W
Plestiodon obsoletus	Great Plains Skink	E, T	W
Scincella lateralis	Little Brown Skink	E, P, T	W
Family Anguidae			
Gerrhonotus infernalis	Texas Alligator Lizard	E, T	C, W
Ophisaurus attenuatus	Slender Glass Lizard	E	W
Ophisaurus sp.	Glass Lizard	E	W
Family Colubridae			
Arizona elegans	Glossy Snake	E, P, T	C, W
Bogertophis subocularis	Trans-Pecos Ratsnake	E, P, T	C, W
Carphophis amoenus	Eastern Wormsnake	E	W
Cemophora coccinea	Scarletsnake	E	W
Coluber constrictor	North American Racer	E, P, T	C, W
Coluber flagellum	Coachwhip	E, P, T	C, W
Coluber sp.	Coluber sp.	I	W

Coluber taeniatus	Striped Whipsnake	E	W
Diadophis punctatus	Ring-necked Snake	E, I	W
Diadophis punctatus arnyi	Prairie Ring-necked Snake	T	W
Drymarchon melanurus	Central American Indigo Snake	P	C
Farancia abacura	Red-bellied Mudsnake	E, T	W
Gyalopion canum	Chihuahuan Hook-nosed Snake	E	W
Heterodon kennerlyi	Mexican Hog-nosed Snake	P, T	C, W
Heterodon nasicus	Plains Hog-nosed Snake	E, P, T	C, W
Heterodon platirhinos	Eastern Hog-nosed Snake	E, P	C, W
Hypsiglena jani texana	Texas Nightsnake	E, P, T	W
Hypsiglena sp.	Nightsnake	E	W
Hypsiglena torquata	Texas Night Snake	E	W
Lampropeltis alterna	Gray-banded Kingsnake	E, P	C, W
Lampropeltis calligaster	Yellow-bellied Kingsnake	E, P, T	C, W
Lampropeltis calligaster calligaster	Prairie Kingsnake	P	C
Lampropeltis getula holbrooki	Speckled Kingsnake	P	C
Lampropeltis getula splendida	Desert Kingsnake	P, T	C, W
Lampropeltis sp.	Kingsnake	E, T, P	C, W
Lampropeltis triangulum	Milksnake	E, I, P	C, W
Lampropeltis triangulum annulata	Mexican Milksnake	P	C, W
Lampropeltis triangulum celaenops	New Mexico Milksnake	P	C
Lampropeltis triangulum gentilis	Central Plains Milksnake	P	C
Nerodia clarkii clarkii	Gulf Saltmarsh Watersnake	T	W
Nerodia erythrogaster	Plain-bellied Watersnake	E, T, P	C, W
Nerodia erythrogaster erythrogaster	Red-bellied Watersnake	P	W
Nerodia fasciata	Southern Watersnake	E, T	W
Nerodia rhombifer	Diamond-backed Watersnake	E	W
Nerodia sp.	Watersnake	E, P	C, W
Opheodrys aestivus	Rough Greensnake	E, P	C, U, W
Opheodrys aestivus aestivus	Northern Rough Greensnake	P	C, W
Pantherophis bairdi	Baird's Ratsnake	E, P, T	C, W
Pantherophis emoryi	Great Plains Ratsnake	T, P	C, W
Pantherophis guttatus	Eastern Cornsnake	E, I, T, P	C, F, U, W
Pantherophis obsoletus	Texas Ratsnake	E, I, T, P	C, W
Pantherophis slowinskii	Slowinski's Cornsnake	P	C

Pantherophis sp.	Ratsnake	E, I, P	C, W
Pituophis catenifer	Gophersnake	E, P, T	C, U, W
Pituophis catenifer affinis	Sonoran Gopher Snake	P	C
Pituophis catenifer sayi	Bullsnake	P	C, W
Pituophis sp.	Bull/Gopher Snake	E	C, W
Regina sp.	Crayfish Snake	E	W
Rhinocheilus lecontei	Longnose Snake	E, P, T	W
Salvadora hexalepis desserticola	Big Bend Patchnose Snake	T	W
Sonora semiannulata	Western Groundsnake	E	W
Sonora sp.	Groundsnake	E, I	W
Storeria dekayi	Dekay's Brownsnake	E, T	W
Tantilla nigriceps	Plains Black-headed Snake	E	W
Tantilla sp.	Black-headed Snake	E	W
Thamnophis cyrtopsis	Black-necked Gartersnake	E, P	C, W
Thamnophis cyrtopsis cyrtopsis	Western Black-necked Gartersnake	T	W
Thamnophis cyrtopsis ocellatus	Eastern Black-necked Gartersnake	P	C
Thamnophis marcianus	Checkered Gartersnake	E, I, P, T	C, W
Thamnophis marcianus marcianus	Marcy's Checkered Gartersnake	P	C
Thamnophis proximus	Western Ribbonsnake	T	W
Thamnophis radix	Plains Gartersnake	P	C
Thamnophis sirtalis	Common Gartersnake	E, I	C, W
Thamnophis sirtalis sirtalis	Eastern Gartersnake	P	W
Thamnophis sp.	Gartersnake	E, I	C, W
Tropidoclonion lineatum	Lined Snake	E	W
Virginia striatula	Rough Earthsnake	T	W
Famiy Elapidae			
Micrurus tener	Texas Coralsnake	P, T	C, W
Family Viperidae			
Agkistrodon contortrix	Copperhead	T, P	C, F, W
Agkistrodon contortrix contortrix	Southern Copperhead	P	C, W
Agkistrodon contortrix pictigaster	Trans-Pecos Copperhead	T, P	W
Agkistrodon picivorus	Cottonmouth	P, T	W
Agkistrodon sp.	Agkistrodon sp.	E	C
Crotalus atrox	Western Diamond-backed Rattlesnake	E, I, P, T	C, F, W
Crotalus horridus	Timber Rattlesnake	E, P	C, F, W

Crotalus lepidus	Rock Rattlesnake	E, P, T	C, W
Crotalus lepidus lepidus	Mottled Rock Rattlesnake	T, P	W
Crotalus molossus	Black-tailed Rattlesnake	E, T	W
Crotalus molossus molossus	Northern Blacktailed Rattlesnake	P	C
Crotalus scutulatus	Mojave Rattlesnake	E, T	C, W
Crotalus sp.	Rattlesnake	I, P	C, U, W
Crotalus viridis	Prairie Rattlesnake	E, P, T	C, W
Sistrurus catenatus	Massasauga	E	C
Sisturus catenatus edwardsii	Desert Massasauga	T	W
Sisturus catenatus tergeminus	Western Massasauga	T	W
Sisturus miliarius	Pygmy Rattlesnake	E. P, T	C, W
Family Chelydridae			
Chelydra serpentina	Snapping Turtle	E, I, P, T	C, F, W
Macrochelys temminckii	Alligator Snapping Turtle	P, E	C, U
Family Emydidae			
Chrysemys dorsalis	Southern Painted Turtle	P	C
Chrysemys picta	Painted Turtle	E, P	C, U, W
Chrysemys picta bellii	Western Painted Turtle	P, T	C, W
Chrysemys sp.	Painted Turtle	I, E, P	C, W
Deirochelys reticularia miaria	Western Chicken Turtle	P, T	C, W
Deirochelys reticularia	Chicken Turtle	E	C, W
Graptemys ouachitensis	Oachita Map Turtle	P, T	C, W
Graptemys ouachitensis sabinensis	Sabine Map Turtle	T	W
Graptemys pseudogeographica	False Map Turtle	E	C, W
Graptemys pseudogeographica kohnii	Mississippi Map Turtle	I, E, P	C, W
Graptemys sp.	Map Turtle	E, P	C, W
Graptemys versa	Texas Map Turtle	E, P, T	C, W
Malaclemys terrapin	Diamondback Terrapin	E, I, P	C, W
Pseudemys concinna	River Cooter	E, I, P	C, W
Pseudemys gorzugi	Rio Grande River Cooter	E, P	C, W
Pseudemys sp.	Cooter	E	C, W
Pseudemys texana	Texas Cooter	T	W
Terrapene carolina	Eastern Box Turtle	P, T	C, U, W
Terrapene carolina triungus	Three-Toed Box Turtle	T	W
Terrapene ornata	Ornate Box Turtle	P, T	C, U, W
Terrapene ornata luteola	Desert Box Turtle	T	W
Terrapene sp.	American Box Turtle	P	C, W

Trachemys gaigeae	Big Bend Slider	E	C, W
Trachemys scripta elegans	Red-eared Slider	I, E, P, T	C, F, W
Trachemys sp.	Slider	E	C, W
Family Testudinidae			
Gopherus berlanderi	Texas Tortoise	P	W
Family Trionychidae			
Apalone mutica	Smooth Softshell	E, P	C, W
Apalone mutica mutica	Midland Smooth Softshell	T	W
Apalone sp.	Softshell Turtle	E, I, P	C, W
Apalone spinifera	Spiny Softshell	E, I, P	C, W
Apalone spinifera emoryi	Texas Spiny Softshell	T	W
Apalone spinifera guadalupensis	Guadalupe Spiny Softshell	T	W
Apalone spinifera hartwegi	Western Spiny Softshell	T	W
Apalone spinifera pallida	Pallid Spiny Softshell	T	W
Family Kinosternidae			
Kinosternon flavescens	Yellow Mud Turtle	E, I	C, W
Kinosternon hirtipes murrayi	Mexican Plateau Mud Turtle	P	C
Kinosternon sp.	Mud Turtle	E, I, P	C, F, W
Kinosternon subrubrum	Eastern Mud Turtle	E, I, P	C, W
Kinosternon subrubrum subrubrum	Eastern Mud Turtle	P	W
Sternotherus carinatus	Razor-backed Musk Turtle	E, P	C, W
Sternotherus minor	Loggerhead Musk Turtle	E	C, W
Sternotherus odoratus	Eastern Musk Turtle	E, I, P	C, F, U, W
Sternotherus sp.	Musk Turtle	E	C, W
Family Alligatoridae			
Alligator mississippiensis	American Alligator	E, I, P	C, F, U, W

[a] Uppercase letters denote use categories: Import (I), Export (E), Food (F), and Pet trade (P). [b] This column indicates the reported source of the specimen: Captive (C), Farmed (F), Unknown (U), and Wild (W).

APPENDIX E

Numbers of amphibians and reptiles collected in the wild by county for seasons 2004-2008.

Season	County	Amphibians	Lizards	Snakes	Turtles	Total for year by county	Percentage of Total
2004	Unknown	65		99	10,489	10,653	53.28%
	Colorado				4,000	4,000	20.01%
	Hockley	1,701				1,701	8.51%
	El Paso	523	648	33		1,204	6.02%
	Archer	6			743	749	3.75%
	Liberty				731	731	3.66%
	Williamson			201		201	1.01%
	Wichita			153	24	177	0.89%
	Mitchell			123		123	0.62%
	Coryell			109		109	0.55%
	Kinney		25	57		82	0.41%
	Brewster			63		63	0.32%
	Hudspeth				53	53	0.27%
	La Salle			27		27	0.14%
	Clay				26	26	0.13%
	Montague				25	25	0.13%
	Lubbock		1	18		19	0.10%
	Val Verde			15		15	0.08%
	Pecos	12	1	1		14	0.07%
	Lynn				4	4	0.02%
	Aranasas				3	3	0.02%
	Jeff Davis			3		3	0.02%
	Fort Bend	2				2	0.01%
	Kleberg			2		2	0.01%
	Midland			2		2	0.01%
	Webb		2			2	0.01%
	Crockett			1		1	0.01%
	Ector			1		1	0.01%
	Hidalgo			1		1	0.01%
	Montgomery				1	1	0.01%
	Nueces			1		1	0.01%
			Season Total- all groups			19,995	
2005	Nolan			10,902		10,902	42.35%
	Colorado				4,000	4,000	15.54%
	Brown			3,878		3,878	15.06%
	Unknown	12	241	2,486	2	2,741	10.65%
	Hudspeth	564			848	1,412	5.49%
	El Paso	445	127	21		593	2.30%
	Cochran	500				500	1.94%
	Mitchell			400		400	1.55%
	Hamilton			241		241	0.94%
	Archer	1		50	155	206	0.80%
	Wichita			107	50	157	0.61%
	Coleman			125		125	0.49%
	Loving	86	11		14	111	0.43%
	Howard			107	3	110	0.43%

	Kinney			63		63	0.24%
	Van Zandt				49	49	0.19%
	Val Verde		6	34	1	41	0.16%
	Ector		1		33	34	0.13%
	Jeff Davis			2	24	26	0.10%
	Tarrant				26	26	0.10%
	Andrews			2	13	15	0.06%
	Gaines	12			3	15	0.06%
	Panola				12	12	0.05%
	Bexar	7			2	9	0.03%
	La Salle			8		8	0.03%
	Lampasas			8		8	0.03%
	Winkler		1		7	8	0.03%
	Wilbarger				7	7	0.03%
	Brewster		2	4		6	0.02%
	Midland			1	5	6	0.02%
	Stephens				6	6	0.02%
	Frio			5		5	0.02%
	Hunt				5	5	0.02%
	Terrell			5		5	0.02%
	Medina				4	4	0.02%
	Upton		3			3	0.01%
	Duval			2		2	0.01%
	Crockett			1		1	0.00%
	Irion			1		1	0.00%
	Tom Green				1	1	0.00%
			Season Total - all groups			25,742	
2006	Val Verde			4	3,398	3,402	24.13%
	Johnson				2,691	2,691	19.09%
	Parker			62	2,387	2,449	17.37%
	Palo Pinto			116	1,434	1,550	10.99%
	El Paso	575	623	39	211	1,448	10.27%
	Mitchell			700		700	4.96%
	Hood			634		634	4.50%
	Harris				376	376	2.67%
	Hudspeth		3		231	234	1.66%
	Archer	26		60	10	96	0.68%
	Nolan			88		88	0.62%
	Midland				86	86	0.61%
	Denton	65				65	0.46%
	Wichita			24	35	59	0.42%
	Glasscock				56	56	0.40%
	Kinney			34		34	0.24%
	Hockley	28				28	0.20%
	Martin				19	19	0.13%
	Cooke				14	14	0.10%
	Wood				14	14	0.10%
	Terrell			13		13	0.09%
	Potter			9		9	0.06%
	La Salle			8		8	0.06%
	Medina			7	1	8	0.06%
	Duval			6		6	0.04%

	Jeff Davis			5		5	0.04%
	Culberson	2				2	0.01%
	Montgomery			2		2	0.01%
	Tom Green	2				2	0.01%
	Crockett			1		1	0.01%
	Edwards			1		1	0.01%
			Season Total - all groups			14,100	
2007	Van Zandt				4,089	4,089	56.11%
	Travis				625	625	8.58%
	Harris				574	574	7.88%
	Gaines	500			10	510	7.00%
	Fort Bend				317	317	4.35%
	Mitchell			257		257	3.53%
	Archer	67		28	121	216	2.96%
	Collin				149	149	2.04%
	Walker				112	112	1.54%
	Bowie				54	54	0.74%
	Hudspeth	38	1	4	6	49	0.67%
	Nolan			45		45	0.62%
	Wichita			44		44	0.60%
	Kinney			39		39	0.54%
	Dallam				26	26	0.36%
	Runnels			24		24	0.33%
	Hockley	19				19	0.26%
	Presidio	1	6	8	1	16	0.22%
	Culberson	13		2		15	0.21%
	Jeff Davis	1		11		12	0.16%
	Crockett	9		2		11	0.15%
	Wilbarger	10				10	0.14%
	Duval			9		9	0.12%
	El Paso			9		9	0.12%
	Clay			5	3	8	0.11%
	Fisher			8		8	0.11%
	Montgomery				8	8	0.11%
	Tyler				8	8	0.11%
	Coke			5		5	0.07%
	Brewster		1	1	2	4	0.05%
	Terrell			2		2	0.03%
	Val Verde			2		2	0.03%
	Pecos		1			1	0.01%
	Winkler				1	1	0.01%
			Season Total - all groups			7,278	
2008	Liberty	163	101	173	13	450	21.77%
	Hudspeth	13	244	41	91	389	18.82%
	Palo Pinto			23	342	365	17.66%
	Collin				250	250	12.09%
	Van Zandt				171	171	8.27%
	Young			14	134	148	7.16%
	Nolan			54		54	2.61%
	Denton				40	40	1.94%
	Wise				27	27	1.31%

Howard			26		26	1.26%
Hockley		17	2		19	0.92%
Stephens			17		17	0.82%
Presidio		6	9		15	0.73%
Brewster	1	2	10		13	0.63%
Duval			12		12	0.58%
El Paso	2		10		12	0.58%
Jeff Davis			11		11	0.53%
Reagan		9			9	0.44%
Erath			7		7	0.34%
Culberson			6		6	0.29%
Fort Bend				6	6	0.29%
Pecos			5		5	0.24%
Kleberg			3		3	0.15%
McMullen			2		2	0.10%
Red River				2	2	0.10%
Tom Green			2		2	0.10%
Crockett			1		1	0.05%
Edwards		1			1	0.05%
Galveston			1		1	0.05%
Kendall			1		1	0.05%
Real		1			1	0.05%
Webb			1		1	0.05%
			Season Total - all groups		2,067	

APPENDIX F

Texas Parks and Wildilfe White List

Frogs and Toads
Great Plains toad (*Bufo cognatus*)
Green toad (*Bufo debilis*)
Red-spotted toad (*Bufo punctatus*)
Texas toad (*Bufo speciosus*)
Gulf Coast toad (*Bufo valliceps*)
Woodhouse's toad (*Bufo woodhousei*)
Green treefrog (*Hyla cinerea*)
Bull frog (*Rana catesbeiana*)
Couch's spadefoot (*Scaphiopus couchii*)
Plains spadefoot (*Spea bombifrons*)
New Mexico spadefoot (*Spea multiplicata*)

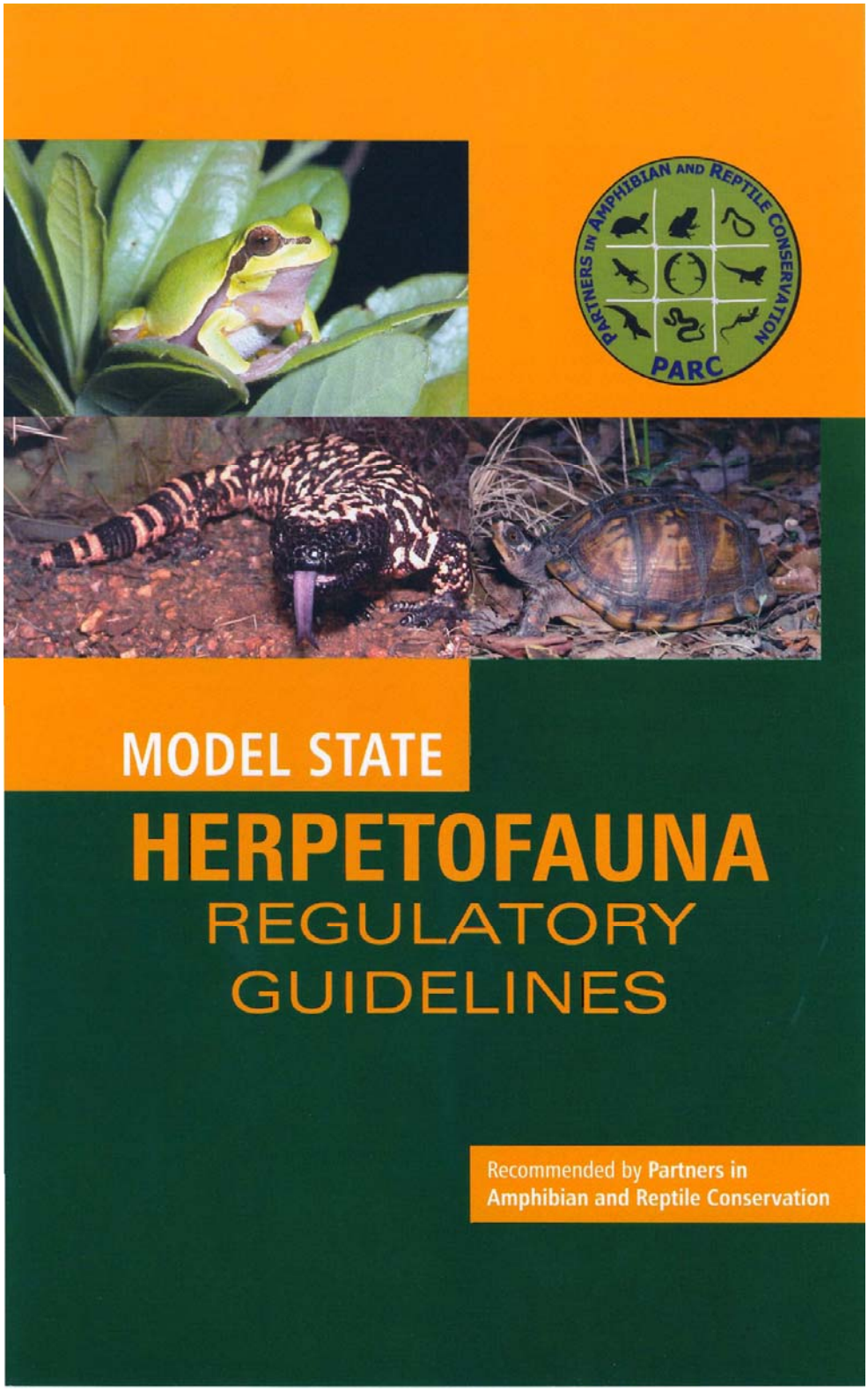
Salamanders
Tiger salamander (*Ambystoma tigrinum*)

Lizards
Green anole (*Anolis carolinensis*)
Chihuahuan spotted whiptail (*Aspidoscelis exsanguis*)
Texas spotted whiptail (*Aspidoscelis gularis*)
Marbled whiptail (*Aspidoscelis marmoratus*)
Six-lined racerunner (*Aspidoscelis sexlineatus*)
Checkered whiptail (*Aspidoscelis tesselatus*)
Texas banded gecko (*Coleonyx brevis*)
Greater earless lizard (*Cophosaurus texanus*)
Collared lizard (*Crotaphytus collaris*)
Five-lined skink (*Eumeces fasciatus*)
Great plains skink (*Eumeces obsoletus*)
Texas alligator lizard (*Gerrhonotus infernalis*)
Lesser earless lizard (*Holbrookia maculata*)
Crevice spiny lizard (*Sceloporus poinsettii*)
Prairie lizard (*Sceloporus undulatus*)
Ground skink (*Scincella lateralis*)
Tree lizard (*Urosaurus ornatus*)
Side-blotched lizard (*Uta stansburiana*)

Snakes
Copperhead (*Agkistrodon contortrix*)
Cottonmouth (*Agkistrodon piscivorus*)
Glossy snake (*Arizona elegans*)

Trans-Pecos rat snake (*Bogertophis subocularis*)
Racer (*Coluber constrictor*)
Western diamondback rattlesnake (*Crotalus atrox*)
Rock rattlesnake (*Crotalus lepidus*)
Blacktail rattlesnake (*Crotalus molossus*)
Mojave rattlesnake (*Crotalus scutulatus*)
Prairie rattlesnake (*Crotalus viridis*)
Baird's rat snake (*Elaphe bairdi*)
Great Plains rat snake (*Elaphe emoryi*)
Texas rat snake (*Elaphe obsoleta*)
Slowinski's cornsnake (*Elaphe slowinskii*)
Western hognose snake (*Heterodon nasicus*)
Eastern hognose snake (*Heterodon platirhinos*)
Texas night snake (*Hypsiglena torquata*)
Gray-banded kingsnake (*Lampropeltis alterna*)
Prairie kingsnake (*Lampropeltis calligaster*)
Speckled or desert kingsnake (*Lampropeltis getula*)
Milk snake (*Lampropeltis triangulum*)
Texas blind snake (*Leptotyphlops dulcis*)
Coachwhip (*Masticophis flagellum*)
Schott's whipsnake (*Masticophis schotti*)
Striped whipsnake (*Masticophis taeniatus*)
Texas coral snake (*Micrurus tener*)
Blotched or yellowbelly water snake (*Nerodia erythrogaster*)
Broad-banded water snake (*Nerodia fasciata*)
Diamondback water snake (*Nerodia rhombifer*)
Rough green snake (*Opheodrys aestivus*)
Bullsnake or gopher snake (*Pituophis catenifer*)
Texas longnose snake (*Rhinocheilus lecontei*)
Western blackneck garter snake (*Thamnophis cyrtopsis*)
Checkered garter snake (*Thamnophis marcianus*)
Western ribbon snake (*Thamnophis proximus*)
Big Bend patchnose snake (*Salvadora deserticola*)
Texas or mountain patchnose snake (*Salvadora grahamiae*)
Massasauga (*Sistrurus catenatus*)
Pygmy rattlesnake (*Sistrurus miliarius*)
Ground snake (*Sonora semiannulata*)
Brown snake (*Storeria dekayi*)
Flathead snake (*Tantilla gracilis*)
Southwestern blackhead snake (*Tantilla hobartsmithi*)
Plains blackhead snake (*Tantilla nigriceps*)
Lined snake (*Tropidoclonion lineatum*)
Rough earth snake (*Virginia striatula*)

APPENDIX G


PARTNERS IN AMPHIBIAN AND REPTILE CONSERVATION
PARC
MODEL STATE
HERPETOFAUNA
REGULATORY
GUIDELINES
Recommended by Partners in
Amphibian and Reptile Conservation

Model State Herpetofauna Regulations

Recommended by Partners in Amphibian and Reptile Conservation (PARC)

The objective of this model is to assist wildlife management agencies in creating or modifying their regulations regarding the collection, manipulation, possession and sale of native and non-native herpetofauna; and to promote consistency, when reasonable and feasible, between adjacent states. An agency's decision to selectively adopt parts of, or the entire model, will depend upon its statutory authority, available resources and relevance of the recommendations and stakeholder input.

The conservation of wild native herpetofauna populations, sustainable use of those populations and public safety can be reasonably assured if an agency incorporates the following baseline recommendations:

- Establish the legal presumption that all herpetofauna, and their body parts, are protected from collection unless specifically allowed;
- Promote enforcement of regulations;
- Establish appropriate penalties for violators;
- Establish a licensing or permitting system to manage the personal, commercial and scientific use of herpetofauna;
- Regulate the collection, possession, and sale of native taxa, and venomous, invasive and potentially dangerous non-native taxa (those taxa potentially threatening native species, ecosystems, or human health); and
- Centralize the management and regulatory authority for all aspects of native and non-native herpetofauna into one work unit.

This document elaborates on the recommendations that PARC believes are the most critical to successful herpetofauna management and regulation.

Recommendations for regulating the collection of herpetofauna intended for personal use:

a. Require the purchase of a standard fishing or small game hunting license for the collection of herpetofauna for personal use (e.g. pets, food, fishing bait, or cultural needs). As an alternative to a fishing or hunting license, consider creating a special herpetofauna license or stamp. This special license or stamp could also assist an agency in managing and monitoring the number of collectors, collection trends, creating a stakeholder contact-list and establish base funding for herpetofauna management.

b. Identify a list of native and non-native taxa that may be collected from the wild, or for species rich states, a list of taxa that may not be collected (i.e. prohibited or restricted taxa). Taxa placed on such a list should be considered on a case-by-case basis and supported by sound scientific data or the best available information. The natural history, rarity, vulnerability and range-wide distribution of each taxa should be evaluated in developing a list.

c. Establish seasons, daily or yearly collection and possession limits, size limits, safe and humane capture methods and geographical areas open or closed to collection.

d. Consider allowing juveniles (typically those under the age of 14 or 16 years) to collect some of the most common (open season) taxa for personal use without a permit or license.

e. Wild collected native taxa should not be sold or bartered, unless regulated by the wildlife management agency.

f. Specimens held in captivity for any length of time should not be released into the wild. The exception would be specimens temporarily held in the field for photographs or identification.

g. Live aquatic herpetofauna collected for fishing bait should be used at the body of water where captured, and not transported alive to another body of water. Unused live bait should be humanely euthanized or given to another angler fishing at that site.

Recommendations for regulating the collection of herpetofauna intended for commercial sale or use (e.g. biological supply companies, pet dealers, and specialty meat or skin suppliers):

a. Develop a special permit and review process to allow for the limited and closely regulated commercial collection of identified taxa. The fee for this permit or license should be proportionally higher than fees

assessed for personal or scientific use and should cover the administrative oversight and regulation compliance of commercial collectors. The permit or license should be required for even the most common native taxa and established populations of non-native taxa. In some cases, the collection and commercialization of non-native taxa may be prohibited to prevent further deliberate human dispersal.

b. Identify a list of native and established non-native taxa that may be collected from the wild, or for species rich states, a list of taxa that may not be collected (i.e. prohibited or restricted taxa). Each taxa listed should be considered on a case-by-case basis and supported by scientific data or the best available information. The natural history, rarity, vulnerability, range-wide distribution and local traditional uses of each taxa should be evaluated in developing a list. In the absence of such information, the agency should err conservatively when establishing collection limits and seasons.

c. Establish seasons, daily or yearly collection and possession limits, sex and size limits, safe and humane capture methods and geographical areas open or closed to collection.

d. Specimens held in captivity for any length of time should not be released into the wild.

e. Develop guidelines for, and require the use of, aseptic field techniques (aquatic and terrestrial) to prevent the spread of pathogens between wild populations (e.g. Declining Amphibians Population Task Force field techniques).

f. Disperse collection activities for all taxa to avoid negatively impacting local populations.

g. Require the submission of an annual or seasonal report that includes accurate information on the numbers of specimens of each taxa collected, date of collection, an identifiable geographical location/region where collected and the buyer. These records should be kept current and made available for impromptu agency inspections.

Recommendations for regulating the sale of captive-bred native taxa:

a. Identify a list of native taxa (e.g. species, subspecies, genera, families, etc.) that may be possessed, bred, exported, exchanged or sold without permit or authorization. In some circumstances, it may be easier to identify prohibited or restricted native taxa.

b. Develop an annual permit fee and special permit process regulating the sale of captive-bred native taxa. Permit fees should be used for administrative oversight and regulation compliance, required for even the most common native taxa.

c. Provide significant penalties for illegal collections or other prohibited activities.

d. Require breeders and dealers to provide their customers with the taxon's common and scientific name, basic and humane husbandry information, average adult size, human health risks and the proper disposal of unwanted pets.

e. For venomous or potentially dangerous native taxa, require the permittee to develop an emergency bite protocol.

f. If the illegal trade of some wild taxa is a concern, set a maximum size limit for specimens (e.g. hatchlings, juveniles) that may be exported, exchanged or sold.

g. The seller must possess and maintain documentation supporting the taxon's legal origin (e.g. license or permit).

h. Develop basic captivity standards for breeders and dealers to ensure that specimens are held safely and humanely.

i. Require the submission of an annual report that includes information on: the number of individuals of each taxa currently being held, the physical location of the collection, number of young born in captivity, number of individuals that died in captivity and a list of buyers. For rare, valuable, or taxa with the potential for illegal trade, breeders and/or juveniles should be marked with a PIT tag or similar life long, unique and permanent mark. Identification marks should be readily recognizable, non-reusable and ideally traceable to the breeder. Distribution of identification tags should remain in control with the wildlife agency and tags distributed in conjunction with the licensing process.

Recommendations for regulating the possession and sale of non-native taxa, including venomous, invasive, or potentially dangerous taxa:

a. Identify a list of non-native taxa (e.g. species, subspecies, genera, families, etc.) that may be possessed, bred, exported, exchanged or sold without permit or authorization. In some circumstances, it may be easier to identify prohibited or restricted native taxa.

- For all taxa, to the greatest extent possible, assure their accidental escape or intentional release is not likely to result in the

establishment of new populations, harm or have an adverse affect on native taxa or ecosystems, or pose a significant threat to humans or domestic animals either by injury or disease.

b. Develop a process by which individuals can apply to possess prohibited or restricted taxa. Ideally, the possession of prohibited or restricted taxa will be limited to use in valid scientific research projects, public education programs, or displays in recognized museums, aquaria or zoos.

c. Require breeders and dealers to provide their customers with the taxon's common and scientific name, basic and humane husbandry information, average adult size, human health risks and information on the proper disposal of unwanted pets.

- Require the seller to possess and maintain documentation supporting the specimen's legal origin (e.g. copies of a license, permit, or letter of authorization).
- Develop basic captivity standards for breeders and dealers to ensure that specimens are held safely and humanely.

In addition, for venomous, invasive or potentially dangerous taxa:

a. Develop a special permit or license process with an annual fee. The fee should be used to cover administrative oversight and regulation compliance. Ideally, the possession of prohibited or restricted taxa will be limited to use in valid scientific research projects, public education programs, or displays in recognized museums, aquaria or zoos.

b. Ensure applicants possess or obtain minimum experience in the husbandry of the taxa for which they intend to keep before issuance of a permit or license.

c. Surplus research specimens or their progeny should be disposed of to an accredited zoo or aquarium, research institution or as directed by the wildlife management agency.

d. Require submission of an annual report that includes information on the number of individuals of each taxa currently being held, physical location of the collection, number of births and deaths and a comprehensive list of buyers. Breeders and juveniles should be marked with a PIT tag or other life-long, unique and permanent mark. Identification marks must be readily recognizable,

non-reusable and ideally identify the original source. Identification tags should be distributed in conjunction with the licensing process.

e. For venomous and potentially dangerous taxa require development of an effective emergency (e.g. bite, escape) protocol specific to the taxa held.

Recommendations for regulating the scientific collection or manipulation of native herpetofauna for research, education, display, or salvage activities

All the aforementioned uses could be accommodated in one permit or separate permits. The permit would also allow recognized environmental consultants to conduct inventory work for proposed development projects and to relocate individuals out of harm's way when necessary. Work with Federally listed taxa, or on Federal or Tribal lands, will require an additional and separate permit. The permit process should be as quick and efficient as possible so not to impede or discourage scientific research.

a. The permit should be issued at no charge, or for a nominal administrative fee.

b. Establish a special application and review process (with qualified reviewers) to evaluate the conservation, scientific or educational benefits of the proposal. In other words, is the proposed activity in the best interest of the population or taxa?

c. Identify a list of native and non-native taxa that may be collected from the wild, or for species rich states, a list of taxa that may not be collected (i.e. prohibited or restricted taxa). Each taxa listed should be considered on a case-by-case basis, and supported by sound scientific data or the best available information. The natural history, rarity, vulnerability, range-wide distribution and local traditional uses of each taxa should be evaluated in developing this list. In the absence of such information, the agency should err conservatively.

d. Each permit should specify the number of specimens that can be collected or manipulated, acceptable methods of collection, disposition of dead salvaged or voucher specimens and approved handling, marking, or tissue sampling techniques.

e. Specimens held in captivity for any length of time should not be released into the wild. Exceptions could be made for specimens temporarily held at the field site (e.g. for data processing, photographs) or licensed wildlife rehabilitators that practice aseptic husbandry standards.

f. Require the submission of an annual or otherwise regular report that includes accurate information on the numbers of individuals of each taxa collected, observed or handled, identifiable geographical location and the eventual disposition of those specimens collected. These records should be keep current and made available for agency inspection.

g. Specimens collected must be deposited in a recognized or accredited public museum or educational institution.

h. All agents assisting the applicant should be identified in the permit and a copy of the permit should be in the possession of the applicant and agents at all times. When possible, background reviews of all applicants and their agents should be conducted to search for wildlife violations within and outside the state.

i. Research projects that require the collection of significant numbers of specimens should be geographically dispersed to minimize the impact on wild population.

j. Develop guidelines and require the use of aseptic techniques (aquatic and terrestrial) to prevent the spread of pathogens in wild populations (e.g. DAPTF field techniques).

k. Whenever possible, specimens confiscated by law enforcement, salvaged from future development sites, or captured on nuisance wildlife calls should be substituted for wild collection. Likewise, captive bred specimens should be recommended if available.

Establish a comprehensive list noting the biological and legal status of native herpetofauna (e.g. state or federal endangered, threatened, rare, sensitive, or special concern). In addition, consider the following recommendations:

a. Develop a process map or decision tree to add, remove or modify taxa on the State's comprehensive list.

b. Prohibit the collection of taxa on the comprehensive list without permit or license.

c. Provide significant penalties for prohibited activities involving listed taxa that are proportionally greater than violations for non-listed taxa.

d. Develop an evaluation process (preferably through the existing scientific collecting permit process) for requests for the collection, manipulation, or handling of taxa on the comprehensive list.

e. Integrate the State's comprehensive list of taxa, with those of adjacent states or countries.

Partners in Amphibian and Reptile Conservation (PARC) Mission:
To conserve amphibians and reptiles and
their habitat through proactive and coordinated
public/private partnerships.
PARC includes both state and federal wildlife agencies,
the private sector, conservation societies
and the academic community.

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Trade Committee.

Photos furnished by Bruce D. Taubert and Randall D. Babb

APPENDIX H


Make a Splash With P.A.L.S. Savings on Big Br
PETCO P.A.L.S.
P.A.L.S. PRICE
14.99
Red-Eared Slider Turtles
PETCO feeds and recommends Zoo Med
P.A.L.S. OFFER
10% off
Tank-Raised Clownfish
OCEAN NUTRITION
PETCO feeds and recommends Ocean Nutrition
2.69 - 14.
Bettas
Includes Crowntails, De
Halfmoons and King Be
PETCO uses and recommends Ward
P.A.L.S. OFFER
20.00 off
Zilla Aquatic Turtle Kit
Includes 20-Long size terrarium, two dome light fixtures with bulbs, power filter, basking platform, food and more.
REPTILES
P.A.L.S. PRICE
199.99
COMBO OFFER
PETCO Hampton Stand and Marineland Aquarium
Buy the stand and 28 Euro Aquarium kit together and save.
Must purchase both to receive savings. Limited to quantity on hand.
P.A.L.S. OFFER
30% off
on 3 or more
Aquatic Decor
Choose from a variety of artificial plants, aquatic ornaments, gravel, marbles and accents.
P.A.L.S. OFFER
Turtle Bone
FREE
with purchase
BONUS OFFER
Zoo Med Turtle Dock
Buy a dock and get a 2-pack of Turtle Bone FREE!
FREE
P.A.L.S. PRICE
19.99
COMBO OFFER
Tetra Fish Food
Buy a 1.72 lb. bucket of Koi Sticks and 2.42 lb. bucket of Floating Pond Sticks together and save. Plus receive a 100 ml. bottle of algae control FREE!
Must purchase both to receive savings.
P.A.L.S. OFFER
10% off
Hagen AquaClear Power Filters and Power Heads
All sizes.
AquaClear
P.A.L.S. OFFER
10% off
ENTIRE STOCK
Zilla Heaters and Lights
Create the perfect habitat.
P.A.L.S. OFFER
15% off
Hikari Bio-Gold Betta Food
2 and 20 gram packs. Helps enhance natural colors.
Hikari
Betta Bio-Gold
P.A.L.S. OFFER
15% off
ENTIRE STOCK
Python Products
Gravel vacuums, vacuum tubes and accessories.
NO SPILL!!
For the PETCO location nearest you, please visit www.petco.com/locator or call 1-
NEW
New! PETCO P.A.L.S. Rewards
Join P.A.L.S. Rewards now and earn P.A.L.S. Points every time you shop, on everything you buy at PETCO. Your Points add up each quarter towards P.A.L.S. Quarterly Rewards. Earn at least 1000 Points in a quarter and receive a Rewards Certificate. Learn more at petcopals.com
zootoo.com & PETCO.
Connecting pet lovers.
Learn more at www.petco.com/zootoo
Prices Valid March 29 – April 18, 2009*
*For Grand Opening Stores, sale starts Wednesday, April 1, 2009. PETCO accepts all manufacturers' coupons. Customer is responsible for applicable taxes and fees on all advertised prices, coupons and discounts. Selection, regular prices and vary by store. Quantities limited to stock on hand. PETCO reserves the right to limit quantities of merchandise sold. While all items may not be available in all stores, all can be special ordered. BOGO offers are not 1/2 sales; if only a single item is purch applies. Sale prices are valid only for regularly priced items, excluding clearance items and special markdowns. Selection, regular prices and advertised offers on PETCO.com may differ. Items may not be exactly as illustrated. PETCO reserves the right to c
8: B Base

APPENDIX I

Pet Owner Survey

Howdy!

I am a graduate student at Texas A&M University currently studying the trade in non-game reptiles and amphibians. I am interested in the species that are involved in the trade or kept as pets. Information from this study will be used as part of my masters' thesis. To assist in this study, we are asking that you voluntarily take some time today to complete this form.

Your personal information will not be collected; this information will not be shared with solicitors or otherwise used for financial gain.

What is your county and state of residence?

_____, _____

Sex: M F **Age:** <18 18-24 25-34 35-44 45-54 55+

What type of amphibians do you like the most (circle one)?

Caecilians Salamanders Frogs Toads No preference

What type of reptiles do you like the most (circle one)?

Lizards Snakes Turtles Crocodilians No preference

What would you like to see in the next expo?

_____

Is this your first time at a reptile expo? Yes No

How many expos do you visit per year (circle one)? 1 2 3 4 5+

Where do you usually purchase your reptile supplies?

Pet supply store (chain) Pet supply store (independent) Reptile and Amphibian Expo

On-line (chain) On-line (independent)

Where do you usually purchase your live reptiles and/or amphibians?

Pet supply store (chain) Pet supply store (independent) Reptile and Amphibian Expo

Private Breeder On-line (chain) On-line (independent)

Tell us more about your reptile and amphibian pets!

Species Common or scientific name	**Age at purchase** Hatchling, juvenile, adult	**Origin** Wild, captive, farmed, unknown	**Number owned**	**Years owned**

*use back for additional space

VITA

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