

The Modern U.S. Reptile Industry

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EXECUTIVE SUMMARY

This report provides an overview of the modern U.S. reptile industry. The United States Association of Reptile Keepers (“USARK”) commissioned this report to shed light on a largely unstudied sector of the United States economy. The report details the size, scope, and flow of trade of the reptile industry within the United States. It concludes that the U.S. reptile industry is vibrant and has grown rapidly, but that the industry has been and continues to be impeded by federal legislation and regulations restricting the import, export, and domestic sale of reptiles.

Overview of the U.S. Reptile Industry

- The U.S. reptile industry encompasses a vast number of participants including pet owners, hobbyists, breeders, importers, exporters, wholesalers, pet store proprietors, pet show promoters, entertainers, veterinarians, and manufacturers of pet food and ancillary pet products.
- In 2009 businesses that sell, provide services, and manufacture products for reptiles earned revenues of \$1.0 billion to \$1.4 billion.
- In 2009 4.7 million U.S. households owned 13.6 million pet reptiles. Reptile owners are spread throughout the United States without a concentration in any one area of the country.
- Reptile businesses can be found throughout the United States although reptile importers are more densely concentrated in Florida and California than in other states.
- The vast majority of reptile businesses are small, family-run businesses.

History

- The U.S. reptile industry has experienced a significant shift toward domestic captive breeding over the past twenty years.
- Breeders transformed snake husbandry from a hobby to a viable profession by their successful cultivation of uniquely colored snakes, called morphs.

- US turtle farmers were pioneers in the global pet turtle market. U.S. turtle farmers continue to lead the world in pet turtle production and sales.

Reptile Laws, Regulations and Proposed New Regulations

- Federal and state regulations and laws concerning reptiles have negatively impacted the reptile trade within the United States. These laws and regulations have made selling and shipping reptiles more difficult and more costly.
- A new regulatory proposal by the U.S. Fish and Wildlife Service to list nine constrictor snakes as injurious wildlife life under the Lacey Act, however, goes beyond simple increasing the costs of participants in the retail industry. The proposal will limit the nearly all sales of the nine constrictors. If enacted, the proposal has the potential to cause deep and lasting damage to the snake market--the very sector of the reptile industry that has helped to drive its growth.
- If the proposal is enacted:
 - In the short-term, the industry, and snake breeders and sellers in particular, will experience significant economic losses. We estimate that revenues lost will be between \$76 million to \$104 million in the first year, a loss of 5 to 7 percent of total industry revenues.
 - The long-term impact of the proposal on the reptile industry will also be severe.
 - The economic loss to the industry over the first ten years after the proposal's enactment will be between \$505 million to \$1.2 billion in lost revenues, assuming historical industry sales growth.
 - Even assuming no growth, the economic loss over the first ten years after the proposal's enactment will be between \$372 million to \$900 million in lost revenues.

I. INTRODUCTION

The modern U.S. reptile industry is young and has grown rapidly since it came of age in the 1990s. In less than two decades, it grew from a marginal side business for a few pet stores to a complex industry with annual revenues approaching \$1.4 billion. The prime movers fueling this growth are small, predominately American businesses.

Many of these businesses began as captive breeding operations run by reptile enthusiasts and hobbyists. Over the years, these businesses have expanded their customer base to include foreign pet owners. In 2009, 11.3 million live reptiles were exported from the United States, while only 900,000 live reptiles were imported into the United States.¹ In short, U.S. small businesses dominate the global reptile industry.²

As the reptile businesses have grown, so too has reptile ownership. The American Pet Products Association (“APPA”) reports that from 1994 to 2008, the number of U.S. households that own a reptile rose from 2.8 million to 4.7 million, an increase of 68%. In contrast, the number of households that own any kind of pet increased only 35% over that same period.

The individuals and businesses that comprise the industry have as a common feature their wonder and appreciation of all living creatures, especially reptiles. In researching this report, we

¹ United States Fish and Wildlife Agency Law Enforcement Management Information System (“LEMIS”) data.

² The report was commissioned by The United States Association of Reptile Keepers.

have interviewed many owners of reptile businesses.³ We have found that their lives followed a common narrative.⁴ We have summarized this common narrative by creating the John Till story.

The Reptile Narrative: John Till's Story⁵

John Till cannot remember a time when his room was not filled with animals. He would spend most of his spare time as a kid trolling the fields and streams that bordered his neighborhood catching mice, frogs, garter snakes, and turtles. He hung around Selligman's Aquarium with his friends listening to Mr. Selligman hold court, trying to pick up tips on feeding and reptile and amphibian care. At the age of 13, when the den had been taken over by garter snakes and salamanders and even the guest room was filling up with turtles, John's mother gave him an ultimatum – if he caught something and wanted to keep it, he would have to give up an animal in his current collection. His parents were no longer buying him any more animals.

When he complained to Mr. Selligman about his mom's new rule, the pet store owner laughed. If John wanted to look after animals, he was more than welcome to feed the animals, sweep up, and clean cages at Selligman's Aquarium. He would even be paid for his labors.

³ Information for this report was gathered through a variety of primary and secondary sources. Our primary sources include our interactions with reptile breeders and hobbyists at two reptile expositions in San Diego, California and Daytona, Florida, as well as interviews and surveys of a number of individuals in the reptile trade. For more information on these surveys and survey methodology see Appendix I: Estimation Methodology.

⁴ Information for this report was gathered through a variety of primary and secondary sources. Our primary sources include our interactions with reptile breeders and hobbyists at two reptile expositions in San Diego, California and Daytona, Florida, as well as interviews and surveys of a number of individuals in the reptile trade. For more information on these surveys and survey methodology see Appendix I: Estimation Methodology.

⁵ The following narrative is a fictionalized composite of several of the life stories of reptile breeders operating in the United States.

By his fifteenth birthday, John was practically running Selligman's Aquarium. And he no longer just used nets to gather new reptiles as pets. He would import snakes and lizards from South America and Africa. Often, his father would often drive John to the airport to inspect and accept delivery of an insulated fifty pound box packed with neatly stacked containers. In each container was an iguana or a baby Boa constrictor. While most kids his age were working hard at mastering video games, John was learning import regulations.

When he was 16, John traveled with Mr. Selligman to Orlando, Florida to attend his first reptile trade show. To John, it was a revelation. Breeders stood behind tables covered with plastic containers filled with snakes, lizards, and turtles. All of the reptiles had such bright colors and unique markings that they looked like works of art. Each table was thronged by reptile enthusiasts, cash in hand. The best breeders were spoken of in reverent tones. Every breeder was accessible and willing to trade tips and give breeding advice. That was the life John wanted. He had found his calling. He wanted to be a snake breeder.

When he returned home, John read everything he could about snake breeding, just waiting for the National Breeders Expo to come around again. At the next year's show he bought some fantastically colored baby Boa constrictors and planned his breeding with the precision of a scientist. After four years, he sold enough snakes to recover his initial investment. Every year after that, John's business expanded. Pet stores, wholesalers, and other enthusiasts (who John counted as his friends) were eager to purchase each newly patterned Boa that he bred. Just as some people want to collect and trade Picasso paintings, John's customers wanted snakes. Some of his customers saw snakes as a good investment, some just wanted them for their collections, and some wanted them to trade. John knew that a good collectible is something one can enjoy, but could also trade if the offer is right.

It looked as if John's business would keep growing forever. At least that is what John thought. But in 2008 John's snake sales came almost to a standstill. People were no longer purchasing thousand-dollar Boas. Part of the problem was the sinking economy. Part of the problem was that, at that time, the U.S. federal government was proposing a rule change to the Lacey Act that would result in the ban on interstate shipments of Boa constrictors, as well as other constrictor species.⁶

The fear that these constrictors would come under the Lacey Act caused snake prices to drop, because people were selling their snakes cheaply in anticipation of the ban going into effect. Boa prices plunged. A Boa that a few years ago would have sold for \$1000, suddenly sold for less than \$50. Sales were barely enough to cover costs. And those costs, including food, cleaning supplies, utilities, veterinarian services continued unabated. As a result, the industry was in contraction. John noticed that even some of his suppliers were cutting staff. John thought of applying for a desk job and shuttering his breeding business, but he just could not do it. He loved the snakes too much and had too much invested in his business. The government's ban had not been enacted yet. Until it did, he just could not give up on his calling.

* * *

While the story above focuses on one fictional breeder, it is a variation on the story of most of the breeders in the reptile industry.⁷ For example:

- *Ralph Davis of Ralph Davis Reptiles*: "I was born in 1967 into an animal loving family. By the time I was ten years old, I was completely hooked on reptiles. I would go out and collect any kind of herp⁸ I could find, turtles, lizards and most

⁶ 75 FR 11808; March 12, 2010.

⁷ See also, mcreptiles.distortionsleep.net/about.html, royalconstrictordesigns.com/index.php?page=about-us; www.allboas.com/fascination.php; and www.blackpearlreptiles.com.

⁸ The term herp is short for herpetofauna. Herpetofauna refer to a category of animals which includes reptiles and amphibians.

definitely snakes! My bedroom was full of tanks and makeshift containers for all my "wild" pets. I worked off and on at the local pet shop for supplies, not money. I would also work for animals; at the time, Savannah monitors, skinks, and ball pythons were my favorites.

This passion for reptiles lasted into my teens and right into adulthood. I cannot remember as a kid or a teen ever not having a room full of reptiles...and it is still that way now!"⁹

- *Kim Thomas of The Frog Ranch: "Founder Kim Thomas spent the majority of his childhood growing up in the fields, streams, and ponds of California. He spent nearly every day collecting, keeping and caring for frogs, snakes and any other creature he was able to catch. In 1968 at the age of 12 he began his "professional" career at a pet store feeding, watering and cleaning cages. Rising every morning at 5 a.m. in order to finish in time to get to school, his afternoons were spent delivering newspapers and then it was off to the fields and creeks until dusk."*¹⁰
- *Kathy Love of CornUtopia: "I've been interested in herps (reptiles & amphibians, collectively) since early childhood. I grew up absorbed with all wildlife, including early fascinations with horses, cats & dogs. Being a veterinarian was the first career I ever dreamed of obtaining. I learned about herps through TV, visiting the local Milwaukee Zoo and Museum of Natural History, and through books.*

My first wildlife experiences were with local garter snakes, *Thamnophis sirtalis*, that neighborhood kids found in wooded lots near my home and used to try to scare me. That sure backfired on them! My initial fears quickly subsided and were replaced by curiosity as snakes soon became pets, and later a part-time pet business (called "Jungle Hut") in my hometown of Waukesha, Wisconsin, USA."¹¹

Business owners like these, the John and Jane Tills, are responsible for the rise of the United States reptile industry and for its transformation into the billion dollar industry that it is today.

The Counter-Narrative to the John Till Story.

Some critics believe that the reptile industry is dominated by unscrupulous individuals who smuggle reptiles into the United States to make easy profits. These critics contend that

⁹ <http://www.worldofballpythons.com/breeders/ralph-davis-reptiles>.

¹⁰ www.thefrog ranch.com/about.php.

¹¹

<http://www.cornutopia.com/corn%20utopia%20on%20the%20web/20about%20kathy%20love%20cornutopia%20corn%20snakes%20cornsnakes.htm>.

retailers knowingly sell these illegally smuggled reptiles to owners who are desperate to own reptiles as pets and who do not care where the reptiles come from.¹² However a review of business and trade press about reptile smuggling provide little to substantiate this picture of the reptile industry. The evidence shows that the amount of live reptile smuggling that takes place in the United States is small. The handful of high-profile cases involving reptile smuggling, which have often been repeated in the popular press, took place twenty or more years ago.¹³

Breeders not smugglers form the core of the modern reptile industry. The industry was built up by innovative, John Till-type breeders such as Bob Clark, Jesse Evans, Bob Applegate, and Mark and Kim Bell, who have pioneered and expanded captive breeding within the United States. This expansion has resulted in decreased reptile imports and has contributed to the fact that there is very little reptile smuggling in America.

U.S. federal government agencies and animal rights organizations often contend that there is an extremely large amount of wildlife and reptile smuggling worldwide and in the United States. For example, a joint September 1998 press release by the Department of Justice (“DOJ”) and the Department of the Interior (“DOI”) states that “According to INTERPOL, the value of

¹² Bryan Christy, in his book on pre-1992 reptile smugglers, *The Lizard King*, takes this counter narrative picture of reptile owners one step further. He states that “Reptile people are on a trajectory from the time that they are children: bigger, meaner, rarer, hot.” (See Bryan Christy, *The Lizard King: The True Crimes and Passions of the World’s Greatest Reptile Smugglers*, 6-7.) Christy’s view is that reptile “people,” after becoming accustomed to small and safe reptiles, soon crave bigger and meaner reptiles. Their cravings lead them rarer reptiles, and, finally, they must have hot (meaning venomous) reptiles. In short, turtles and corn snakes are nothing more than the gateway drugs leading owners to collect rare albino reticulated pythons, and then to seek out highly rare, mean, and venomous snakes such as albino cobras and mambas.

If Christy were to be believed, a significant number of the 2.8 million households that owned reptiles in 1994 for example, would now be cobra and mamba owners as they progress along Christy’s bigger, meaner, and hot continuum. In fact, the number of “mean and hot” snakes owned by Americans is insignificant. In short, Christy’s thesis is not supported by facts.

¹³ See Bryan Christy. *The Lizard King*.

illegally traded wildlife is approximately \$6 billion annually”¹⁴ and that “Reptile smuggling is a high-profit criminal enterprise, and the United States is its largest market.”¹⁵

This lurid description of the reptile industry is not supported by facts. When Bill Clark, an Interpol Secretary was interviewed about the basis for Interpol’s wildlife smuggling estimates, he said, “We have no idea where the media gets its numbers, but it’s not from Interpol.... Interpol has no reliable data on which to base an estimate.”¹⁶ Clark’s comments comport with the statements of Peter Younger, director of Interpol’s wildlife crime division. Younger states that, for wildlife smuggling, “Our best guess is anything from 10 to 15 percent of the lawful trade ... but it’s only an educated guess.”¹⁷ Based on Interpol’s educated guesses, illegal wildlife trade worldwide is \$1 to \$3 billion, a figure which is significantly lower than the figures quoted by U.S. government officials.

¹⁴ “DOJ, DOI Announce Arrest of Renowned Reptile Smuggler,” September 15, 1998. The DOJ repeats the \$6 billion wildlife smuggling claim in an 2000 press release, “Reptile Smuggler Extradited to the United States from Mexico,” U.S. Department of Justice August 23, 2000.

In 2008, the Congressional Research Service made the claim that “Global trade in illegal wildlife is a growing illicit economy, estimated to be worth at least \$5 billion and potentially in excess of \$20 billion annually.” However, the paper concedes that “the illegal trade is difficult to quantify with any accuracy.” See Sheikh, Pervaze A. and Liana Sun Wyler. “International Illegal Trade in Wildlife: Threats and U.S. Policy,” Congressional Research Service, Updated August 22, 2008.

¹⁵ “DOJ, DOI Announce Arrest of Renowned Reptile Smuggler.” See also U.S. Fish and Wildlife Service, “Probe of International Reptile Trade Ends with Key Arrests,” September 15, 1998. The Service states in this release that, “Reptiles have become increasingly popular as pets and as high-priced live collectables. Collectors and breeders are enticed by the lure of the exotic, making rare reptile species an extremely profitable black-market commodity.”

Similarly, in 2007, Joseph O. Johns, the Chief of the Environmental Crimes section in the United States attorney’s office in Los Angeles stated that “Wildlife smuggling is the nation’s second-largest black market, just behind narcotics, accounting for \$8 billion to \$10 billion a year in sales.” Jennifer Steinhauer, “Wildlife Smugglers Test Their Skills, Even at the Airport,” New York Times, April 6, 2007. <http://www.nytimes.com/2007/04/06/us/06wildlife.html>.

¹⁶ Bryan, Christy, “Wildlife Smuggling: Why Does Wildlife Crime Suck,” The Huffington Post, Updated March, 18, 2010 http://www.huffingtonpost.com/2010/01/04/wildlife-smuggling-why-do_n_410269.html.

¹⁷ http://www.america.gov/st/energy-english/2008/June/20080616142333_mlenuhre_t0_8286859.html.

Evidence indicates that only a small fraction of wildlife smuggling takes place in the United States. An even smaller fraction involves smuggling of reptiles into the United States. An analysis of smuggling in the United States was conducted by the U.S. Department of Agriculture's Economic Research Service using wildlife trade data for the years 2000-2004.¹⁸ The USDA report states: "based on fragmentary inspection of the data, wildlife smuggling accounts for approximately 1 percent of commercial wildlife shipments to the United States."¹⁹ According to the report, total earnings from wildlife smuggling in United States amounted to about \$17 million per year for the five-year period, 2000-2004. The report does not disaggregate the value of shipments by wildlife type, but it does suggest that reptile smuggling is a very minor proportion of the \$17 million. It also suggests that reptile smuggling primarily involves shoes and leather products, not live reptiles.²⁰

From another perspective, if reptile smuggling were so prevalent in the United States, one would expect to see numerous accounts of law enforcement activity involving the illegal trade. There are few such accounts. In fact, a review of the Service's enforcement records for 2006-2010 list only four cases involving smuggling of reptiles. They are:

A reptile smuggler based in Washington State was sent to prison for two years for the unlawful importation of more than 230 reptiles from Thailand; the shipments, valued at over \$30,000, entered the United States in falsely labeled express mail packages.

¹⁸ The study was based on an internal U.S. Fish and Wildlife report titled "Illegal Wildlife Trade."

¹⁹ Peyton Ferrier, "The Economics of Agricultural and Wildlife Smuggling," United States Dept. of Agriculture, Economic Research Service, no. 81, Note: Ferrier states that the November 2005 U.S. Fish and Wildlife Service internal report reports that : ". . . though enforcement personnel know a great deal about what illegal trade activities occur locally, there is less understanding of illegal trade activity nationally. . . ."

²⁰ Even if one assumes that the USDA estimate is off by a factor of 10, i.e., the USDA understates wildlife smuggling by 90%, even that suggests that total wildlife smuggling into the United States would amount to less than \$200 million. Even this upper bound estimate hardly supports the oft-heard statement that the illegal wildlife trade is second in size to only the illegal drug trade.

A Virginia man who pleaded guilty to illegally importing CITES-listed tortoises was fined \$15,000.

A California man was convicted for his role in an international conspiracy to smuggle wild-caught protected Burmese and Indian star tortoises from Singapore for distribution in the United States.

A cooperative U.S./Canadian undercover investigation exposed the smuggling of protected reptiles from Canada to dealers and collectors in the United States.²¹

The lack of public record of enforcement suggests that reptile smuggling occurs relatively rarely in the United States.

There is no doubt that some reptiles were and still are smuggled into the United States. Any product that is deemed illegal to import will be smuggled into the country if potential customers of the illegal product are willing to pay the costs necessary to induce someone to smuggle the product into the country. This is true for any product, be it lumber, caviar, or reptiles. However, the evidence suggests that smuggling is not a cornerstone of the reptile industry as claimed.

In addition, over time, the federal government has expanded the list of animals, including reptiles, that have restrictions placed on their import into the United States both by law and by regulation. As more wildlife is added to the restricted list, economic theory predicts that, *ceteris paribus*, the amount of smuggling will increase. On the other hand, economic theory also predicts that as the production of domestic captive-born reptile increases, with concomitant decreases in reptile prices, *ceteris paribus*, the benefits from smuggling illegally wild-caught reptiles decrease and the number of reptiles smuggled will also decrease. It appears as if the expansion of captive reptile breeding in the United States has helped to crowd out smuggling.

²¹ “Wildlife Trafficking Investigations 2006-2010 Highlights.” U.S. Fish and Wildlife Service, Office of Law Enforcement, p. 3.

The past two decades have witnessed a tremendous growth in the number and variety of reptiles bred in captivity in the United States. Indeed, captive breeding operations form the foundation of the modern U.S. reptile industry. These businesses have added jobs and have contributed revenues to the overall U.S. economy. It is likely that their success has also led to a significant decrease in reptile smuggling, as well as a decrease in the incentives to smuggle reptiles.

II. PARTICIPANTS IN THE MODERN U.S. REPTILE INDUSTRY

The U.S. reptile industry encompasses a vast number of participants including pet owners, hobbyists, breeders, importers, exporters, wholesalers, pet store proprietors, pet show promoters, entertainers, veterinarians, and manufacturers of pet food and ancillary pet products. Below, we describe some of these participants and the roles they play in the industry.

Reptile Pet Owners

According to the APPA, approximately 4.7 million U.S. households owned 13.6 million reptiles in 2010.²² While reptile ownership has dipped slightly in the last two years from its peak of 4.8 million households in 2008, reptile ownership is still at its second highest level since 1994, the year that APPA began surveying households about reptile ownership.²³ Based on our interviews with industry members, it is widely believed that when the economy recovers, reptile ownership will once again be on the rise.

²² 2009/2010 APPA National Pet Owners Survey (Hereafter “2010 APPA Study”). American Pet Products Association. p. 453.

²³ Id.

Demographically, reptile owners tend to be younger and have higher household incomes than the U.S. population as a whole.²⁴ Reptile owners are spread throughout the country,, without a concentration in any one region.²⁵ They are just as likely as the rest of the U.S. population to live in big cities, rural areas, or small towns.²⁶

APPA estimates that in 2010, reptile owners purchased nearly \$1.7 billion worth of ancillary products and services used for the care of reptiles.²⁷ Table 2.1 shows that turtle owners alone spent \$765 million.

Reptile Type	Percentage of Households*	Number of Households	Average Gross Expenditure Per Household (\$)	Total Gross Expenditure For Reptile Type (\$)
Iguana	9	423,000	517	218,691,000
Lizard (other)	17	799,000	511	408,289,000
Turtle	59	2,773,000	276	765,348,000
Snake	18	846,000	313	264,798,000
Other	5	235,000	5	19,975,000
Total	100	4,700,000	357	1,677,101,000
*Percent of households will not add up to 100% because some household own more than one type of reptile.				
Source: 2010 APPA Study data.				

Based on our interviews and discussions with industry participants, there are roughly three categories of reptile owners (in order of the number of owners in each category):

²⁴

Id.

²⁵

2010 APPA Survey, p. 499.

²⁶

Id.

²⁷

We believe APPA’s \$1.7 billion estimate of consumer spending on reptiles includes spending on products which can be used for both reptiles and humans, such as paper towels and Windex. For an estimate of total revenues from businesses that offer services and manufacture products specifically for reptiles. See Table 2.16.

First-time owners and novices, who tend to buy only a few small, less expensive, and easily manageable reptiles, such as turtles, corn snakes, geckos, and bearded dragons.²⁸ Novice owners are often children who do not have a good deal of experience owning a reptile. However, many novices have what some refer to as a wonder about nature, and become reptile enthusiasts²⁹

Enthusiasts, who are distinguished by the depth of their interest and knowledge about reptiles and reptile care. Spending on reptile products and medical care among enthusiasts is around four times greater than the average reptile owner.³⁰ While the number of reptiles that each enthusiast owns varies greatly, what binds them is their love of reptiles. In addition, they take an active interest in what we refer to as reptile culture. That is, they attend reptile shows, read reptile publications, and join reptile and amphibian societies. Enthusiasts tend to own not only more reptiles than novices, but the reptiles they collect are more exotic and more spectacular (in terms of morphology and coloration) than those of novices.³¹

Hobbyists, or part-time breeders, are reptile owners that actively engage in breeding reptiles. Hobbyists study the genetics of reptiles so that they can plan to breed their animals to achieve certain body types and colorations. Almost every hobbyist sells (or intends to sell) at

²⁸ Personal communication with a leading reptile retailer.

²⁹ Personal communication with a leading reptile retailer.

³⁰ *Reptiles Magazine*, a publication for reptile enthusiasts, reports in its 2010 reader survey that its average reader spends \$1500 per year on “supplies, medical care, and other necessary items for [a] reptile.” This is roughly 4.5 times the household weighted average spending reported for all reptile owners in the APPA 2010 study, \$330.

³¹ Personal communication with a leading reptile retailer.

least some of his or her collection. Many part-time breeders will sell the reptiles they have bred at local reptile shows. It is estimated that there are 8,000 to 10,000 reptile owners in this group.³²

The novice, enthusiast, and hobbyist classifications are fluid. A novice may bond with her pet and develop a more active interest in reptiles and become a reptile enthusiast. Some enthusiasts may start to breed and sell some of their captive bred reptiles, albeit on a small scale. Indeed, a particularly successful part-time breeder may decide to try to breed reptiles full-time and become a professional reptile breeder.

Reptile Suppliers

Typically, reptiles are either captive bred domestically or imported from other countries. An imported reptile is typically wild-caught but it can also be captive bred. A reptile may pass through many hands before it reaches its final owner. We attempt to describe components of the reptile supply chain, but caution that, realistically, supply chains are more complicated than our simplified descriptions. One company may provide the services that we describe as two separate links in the supply chain, such as breeders who also import. Similarly, when we categorize total revenues for a particular business, we ascribe all revenues from that business to the primary function of that business. For example, if a business primarily engages in breeding, but also exports, we ascribe all revenues that the business earns from breeding and exporting to breeders.

³² Personal communication with leading reptile retailers and manufacturers.

Reptile Breeders

An increasing number of reptiles that are purchased by pet owners, hobbyists, and private collectors come from U.S. reptile breeders. We classify reptile breeders based on the scale of their operations and the type of reptiles they breed.

Mass Producers

The largest breeders, both by average volume of production and average yearly gross receipts, gear their production toward the pet store trade with a focus on novice to intermediate pet owners. Thus, these breeders primarily produce reptiles that are meant to be cared for by a beginning to slightly experienced (i.e., intermediate) owner. Reptiles they breed include turtles, geckos, common iguanas, bearded dragons, milk snakes, corn snakes, non-morph ball pythons, and non-morph Boa constrictors.³³ We refer to these breeders as “Mass Producers” because they sell large quantities of reptiles through supply agreements, typically to pet store chains. Reptiles bred by Mass Producers that are not sold directly to pet stores, are sold to retail distributors.³⁴ Mass Producers sell very little of their stock directly to households, either via the internet or at expos or trade shows.

Mass Producers tend to have a relatively large number of employees, 20 to 30 on average, and operate large breeding facilities. Because the reptiles that Mass Producers sell are on the low end of the reptile price spectrum, profit margins in these businesses tend also to be low. While churn is high among breeders generally, larger breeding businesses tend to be long lived. There are roughly six to twelve mass producers operating in the United States.

³³ Based on responses to Major Business Survey and Small Business Survey. Eugene Bessette, a well-know breeder, refers to these reptiles as “small, safe and innocuous.”

³⁴ Based on responses to Major Business Survey and Small Business Survey.

Morphs and Large Reptiles

Aside from Mass Producers, breeders tend to focus on reptiles that can be cared for by a first-time to intermediate owners but have a rare scale coloration of body type, and thus are much more expensive than reptiles sold by Mass Producers. These reptile rarities are often referred to as designer reptiles, or more commonly, as morphs. In general, the price of a morph is positively related to the distinctiveness of the reptile's color and the rarity of the morph. Most sales of morphs are to other breeders (both domestic and foreign), hobbyists, and enthusiasts. Only a small percentage of the sales of morphs are to general pet owners.³⁵

Breeding morphs requires an investment in parents who have a genetic composition that enables some of their offspring to have distinctive colors. In much the same way that a race horse's value depends on its ability to pass on its desirable racing genes to its offspring, a reptile with a desirable skin pattern is valuable not only because of its skin pattern or the rarity of that pattern, but also because that reptile can be used to breed more morphs. Morph breeders (or those seeking to be morph breeders) will pay significant amounts (in excess of \$20,000) for a rare morph that can be added to his or her breeding stable.

A smaller group of breeders produce large and venomous reptiles. These reptiles require a high level of expertise to safely and properly care for them. These reptiles include, but are not limited to reticulated pythons, anacondas, Burmese pythons, and large lizards, such as monitor lizards. This would also include venomous (or "hot") reptiles.

Mass producers generally do not breed morphs, large, or venomous reptiles, since their customers are interested in selling reptiles to first-time and intermediate reptile owners. First-time customers are generally not interested in large and hot reptiles, and thus, general pet stores

³⁵ Based on interviews with reptile breeders.

also stay away from these reptiles. While some morphed reptiles, such as ball pythons, can be taken care of by a first-time to intermediate owner, general pet stores do not want to hold inventories of these high-priced morphed reptiles – but these stores will sell ball pythons of the non-morphed variety.

We classify those who bred large, rare, or venomous reptiles on the basis of the scale of their operations.

Large-scale Breeders

Large-scale breeders generally focus on producing morphs. They pride themselves on the depth of their knowledge of reptile husbandry and genetics. Because each new morph they produce has the potential to bring in high prices, these breeders invest in advanced animal obstetric equipment, such as veterinary ultrasound machines, to ensure the safety of each delivery. The number of employees working for these breeders varies widely, with some breeders managing large collections of reptiles without assistance, while other large-scale breeders employ up to seven full-time helpers. There are roughly eight to twelve large-scale breeders operating in the United States.

Small-scale Breeders

Another group of breeders also attempts to produce new morphs, but these breeders operate on a smaller scale. These “small-scale” breeders do not have the scale of production to consistently hit the jackpot of the genetic lottery. Therefore, they focus their production on morphs that have already been produced but are still relatively rare, using breeding stock that typically have been purchased from large scale breeders.

While the majority of small-scale breeders focus on morphs, a small subset of them breed large reptile species, like Burmese and reticulated pythons. Only a few businesses breed venomous lizards and reptiles.

Most of the small-scale breeders have space outside of their homes dedicated to breeding. They typically employ one or two employees to assist them. There are roughly 100 to 200 small scale breeders operating in the United States.

Hobbyists and Part-Time Breeders

Part-time breeders operate at the smallest scale among breeders. Breeding is a side project for most of these operations. They are typically one-person businesses, operated on a part-time basis. Sales of reptiles serve mostly to supplement their income. While some hobbyists have dedicated breeding facilities, the majority breed in their garage or basement. For many hobbyists, sales are made more to pay for supplies for their own reptiles, rather than to make a living. It is estimated that there are 8,000 to 10,000 hobbyists in the United States.³⁶

The vast majority of breeders are small businesses both by legal definition³⁷ and in a generally understood sense. Of the breeding businesses that we have interviewed, nearly all of them are family run. Some businesses are in their second generation of family ownership.

The number of breeders operating within the United States has grown dramatically in recent years. The largest growth among breeders has taken place in the hobbyist category.³⁸ The

³⁶ Based on interviews with reptile breeders.

³⁷ Reptile breeders are classified under the NAICS code 112990, “All Other Animal Production” NAICS Association, <http://www.naics.com/censusfiles/ND112990.HTM#N112990> (Accessed November 11, 2010).

The Small Business Administration defines a business of this category as small if they have annual sales of less than \$750,000. “U.S. Small Business Administration Table of Small Business Size Standards Matched to North American Industry Classification System Codes.” U.S. Small Business Administration, effective August 22, 2008.

economic downturn and increasingly restrictive laws regulating U.S. reptile sales have led many breeders to look overseas for new customers. Many breeders also report a growing trend of bypassing pets stores and selling directly to consumers over the internet.

We estimate that the 8,000 to 10,000 businesses that primarily engage in breeding earn between \$142 million and \$183 million in revenues per year. (See Table 2.2.)

TABLE 2.2				
Summary of 2009 Annual Revenues For U.S. Reptile Breeders				
Breeder Category	Number of Businesses (Low)	Number of Businesses (High)	Total Annual Revenue Low Estimate (Million \$)	Total Annual Revenue High Estimate (Million \$)
Part-Time Breeders	8,000	10,000	91.2	114.0
Small Scale Breeders	100	200	18.2	33.7
Large Scale Breeders	8	12	5.2	7.3
Mass Producers	6	12	27.1	29.3
Grand Total	8,114	10,224	141.7	183.3
Source: GES analysis based on Major Business Survey and Small Businesses Survey.				

International Trade

All imports and exports must enter or exit the United States from 18 ports that have been designated to handle all shipments of wildlife, including reptiles.³⁹ Containers for import and export must be inspected by the U.S. Fish and Wildlife Service (“Service”). Fees for these inspections are payable by the shipper. In addition, the United States Department of Customs

³⁸ Based on communications with breeders and show promoters.

³⁹ These ports are located in Anchorage, Atlanta, Baltimore, Boston, Chicago, Dallas/Ft. Worth; Houston, Honolulu, Los Angeles, Louisville, Memphis, Miami, New Orleans, New York, Newark, Portland, San Francisco, and Seattle. “Bringing Wildlife Into the United States.” United States Department of Customs and Border Protection.

and Border Protection requires that importers and exporters fill out a declaration for the animals that they wish to ship.⁴⁰

Importers

According to data collected by the Service, at least 6.9 million live reptiles were legally imported into the United States between 2005 and 2010.⁴¹ However, imports of reptiles into the United States have steadily declined from 1.5 million reptiles imported in 2005 to 900,000 reptiles imported in 2009. (See Table 2.3 below.)

TABLE 2.3	
U.S. Imports of Reptiles 2005-2010	
Year	Number of Reptiles Imported
2005	1,499,547
2006	1,441,135
2007	1,339,816
2008	1,146,570
2009	900,677
2010	572,158
Total	6,899,903
* 2010 is estimated	
Source: LEMIS data	

Table 2.4 shows that 83% of all imported reptiles entered the United States through either Miami or Los Angeles.⁴² Indeed over half of all reptiles that entered the United States from abroad in the 2005-2010 period entered through Miami.⁴³

⁴⁰ Id.

⁴¹ LEMIS data on live reptile imports into and exports from the United States from January 2005 to May 2010. United States Fish and Wildlife Service, Office of Law Enforcement, produced July 16, 2010. LEMIS data are used because it has been noted that “LEMIS data is the only detailed official record of the legal domestic reptile trade.” Robert Reed. “An Ecological Risk Assessment of Nonnative Boas and Pythons As Potentially Invasive Species in the United States,” *Risk Analysis*, Volume 25, No. 3, 2005, p 756.

⁴² LEMIS data.

TABLE 2.4		
Top Ten U.S. Ports of Import		
2005 – Jan. 30, 2010		
Port	Number of Reptiles Imported	Percent of All U.S Imports
Miami	3,486,765	50.53
Los Angeles	2,268,501	32.88
Dallas/Fort Worth	434,898	6.30
New York	409,867	5.94
New Orleans	121,685	1.76
Baltimore	64,425	0.93
Houston	20,210	0.29
San Francisco	18,735	0.27
Denver	12,819	0.19
Detroit	12,135	0.18
Top Ten Total	6,850,040	99.28
Source: LEMIS data		

The majority of reptiles that are imported are sold either directly to pet stores or to distributors and wholesalers who then sell the animals to pet stores.⁴⁴ Because of this pet shop focus, the most popularly imported animals tend to be reptiles that make good pets for novice to intermediate pet owners. The most commonly imported reptiles are Common Iguanas, Leaf-toed Geckos, Asian Grass Lizards, Oriental Water Dragons, and Ball Pythons.⁴⁵ Table 2.5 below shows the most-imported reptiles (by number) in 2009. These reptiles are generally much lower-priced than reptiles that are exported. Exports are more often rare and expensive morphs.

⁴³ The dominance of the ports of Miami and Los Angeles reflects the fact that the majority of all importers are located in Florida or California.

⁴⁴ Based on survey responses from the Major Business Survey. Companies surveyed imported 42.5% of all live reptiles from 2005 to 2009.

⁴⁵ Based on GES analysis of LEMIS data.

Reptile Type	Number of Reptiles Imported
Common Iguana	113,052
Leaf-Toed Gecko	71,324
Asian Grass Lizard	71,128
Oriental Water Dragon	68,792
Ball Python	65,028
Turtle (Sp.)	39,158
Inland Bearded Dragon	28,756
Northern Savanna Monitor	22,432
Red-Eared Slider	22,069
Tokay Gecko	18,985
Top Ten Total	520,724
Source: LEMIS data.	

Ten firms accounted for 72.3% of the number of reptiles imported into the United States in 2009. The most frequently imported reptiles by these ten firms are also the Common Iguana, the Leaf-Toed Gecko, Asian Grass Lizard, Oriental Water Dragon and the Ball Python. (See Table 2.6)

Company	Number of Shipments Imported	Number of Reptiles Imported	% of Total Reptiles Imports
L. A. Reptile Inc.	847	156,540	17.4
Strictly Reptiles, Inc.	522	90,776	10.1
The Reptile Farm, Inc.	67	79,125	8.8
Two Amigos Import & Export, Inc.	663	78,476	8.7
U.S. Global Exotics, Inc.	403	75,023	8.3
California Zoological Supply	191	55,403	6.2
Emerald Coral & Reptile	179	39,360	4.4
Lasco	41	29,681	3.3
Bushmaster Reptiles	573	24,339	2.7
Dayrich Trading, Inc.	34	22,366	2.5
Top Ten Total	3,520	651,089	72.3
Source: LEMIS data			

Exporters

According to LEMIS, 69 million live reptiles have been exported from the United States between 2005 and 2010. In contrast to imports, which have been declining steadily over the past 5 years, reptile exports increased each year from 2005 to 2007. (See Table 2.7)

Year	Number of Reptiles Exported
2005	10,035,749
2006	14,509,230
2007	18,764,290
2008	12,573,564
2009	11,290,591
2010	2,309,600
Total	69,483,024
Source: LEMIS data	

Turtles dominate reptile exports. More than 95% of all reptile exports from 2005 to 2010⁴⁶ were turtles, tortoises, or terrapins.⁴⁷ The high percentage of turtle exports is a byproduct of a 1975 regulation imposed by the FDA which ban turtles with shell lengths under 4 inches from being sold or transported within the United States. The regulation makes an exception to the commercial inter-state transport ban if the turtles are destined for export.⁴⁸

⁴⁶ Based on GES analysis of USFWS LEMIS records.

⁴⁷ We will refer to turtles, tortoises, or terrapins collectively as turtles.

⁴⁸ 21 CFR 1240.62.

Before the inter-state commerce ban, turtle farmers had produced up to 15 million turtle hatchlings for sale in U.S. pet stores. Around 5% of U.S. households had turtles as pets.⁴⁹ In the turtle ban’s aftermath, turtle farmers diverted all of their sales overseas. Hong Kong, Mexico, and China have become top destinations for turtles, and therefore the top destinations for all reptile exports. However, most turtles exported to Hong Kong and China are bought as food rather than as pets.⁵⁰

Most exports leave the United States from the port of New Orleans because most turtles are bred in Louisiana.⁵¹ Table 2.8 shows the top ten U.S. ports of export in 2009. It also shows that New Orleans and Los Angeles handle over 90 percent of reptile exports.

TABLE 2.8		
Top Ten U.S. Ports of Export, 2005 – 2010		
Port	Number of Reptiles Exported	Percent of Reptile Exports
New Orleans	55,225,244	79.37
Los Angeles	7,694,033	11.06
San Francisco	1,923,548	2.76
Miami	1,712,113	2.46
Dallas/Fort Worth	1,691,720	2.43
Atlanta	581,556	0.84
Honolulu	300,269	0.43
Houston	200,810	0.29
Minneapolis./St. Paul	143,190	0.21
Chicago	34,139	0.05
Top Ten Total	69,406,622	99.89
Source: LEMIS data		

⁴⁹ “Risky Shell Game: Pet Turtles Can Infect Kids,” FDA Consumer, Dec-Jan, 1987, Chris W. Lecos. <http://www.highbeam.com/eoc/1g1-6245151.ytml> (Accessed November 11, 2010).

⁵⁰ LEMIS data does not distinguish whether live turtles are purchased for food or as pets, but interviews with producers indicate that Chinese and Hong Kong customers buy turtles as food.

⁵¹ “Turtle Profile,” C. Greg Lutz, Pramod Sambidi, and R. Wess Harrison, Louisiana University Agricultural Center, p 1. See also Chapter 3: Turtles and Lizards. www.agmrc.com/comodities_products/aquaculture/Turtle_profile.cfm, (Accessed 8/12/2010).

As of 2009, seven of the United States' top ten reptile exporters were located in Louisiana. Turtle exports have declined from 2008 to 2010. Some reasons posited for this decline include the general economic downturn, increasing self sufficiency of Chinese reptile breeders, and hurricanes hitting the gulf coast.⁵² Table 2.9 shows that, similar to the import sector, a small number of companies export the majority of all reptiles. The top ten exporters (by number of reptiles), all of whom are believed to be turtle exporters, exported 68% of the reptiles.

TABLE 2.9			
Top Ten U.S. Exporters, 2009			
Company	Number of Shipments Exported	Number of Reptiles Exported	Percent of Total Exports
Turtle Connection, LLC*	23	2,557,610	22.5
Concordia Turtle Farms*	91	1,013,695	8.9
Assumption Turtle Farms*	147	758,992	6.7
AC International Export, Inc.*	29	700,129	6.1
Tangi Turtle Farm*	176	669,947	5.9
Global Aquatic Consulting	122	534,981	4.7
Boudreaux's Turtle Farm, Inc.*	106	445,868	3.9
Strange Brother's Turtle Farms*	75	411,400	3.6
Wei Nuo Import & Export Corp	7	341,104	3.0
Interwell, Inc.	8	317,506	2.8
Top Ten Total	784	7,751,232	68.0
* Located in Louisiana			
Source: LEMIS data			

We estimate that there are 30 to 50 businesses who primarily engage in importing or exporting reptiles. These businesses earned between \$28 and \$30 million in 2009.

⁵² "Turtle Profile," C. Greg Lutz, Pramod Sambidi, and R. Wess Harrison, Louisiana University Agricultural Center, p. 1 www.agmrc.com/comodities_products/aquaculture/Turtle_profile.cfm, Accessed 8/12/2010.

Wholesalers/Distributors

Reptile wholesalers and distributors purchase reptiles from importers, breeders, and other distributors to sell to pet stores, zoos, and educational institutions. Most distributors also import reptiles. Traditionally, breeders and importers did not have the staff to make and maintain contacts with the large network of pet stores needed to sell out their stock. This intermediary function was served by distributors. However, the number of distributors has been decreasing in recent years because breeders are increasingly bypassing distributors and selling directly to pet stores and individual customers through reptile shows and the internet.⁵³ In addition, the mass producer breeders who supply PETCO and PETsMART with reptiles have come to provide wholesaling services for these superstore chains.⁵⁴

Most of the distributors of reptiles are located in Florida and California.⁵⁵ These locations allow them to be close to a large number of breeders and importers. It also allows them to be in close proximity to ports for exporting reptiles. Wholesalers outside of major port cities have to branch out into other parts of the pet industry. This means that, in Des Moines or Denver, for example, wholesalers/distributors may also distribute bird supplies and frozen rodents in addition to reptiles. These distributors may also sell animals through store front retail locations to supplement their income.⁵⁶

There are 50 to 70 businesses that primarily engage in wholesaling and distributing reptiles in the United States. These businesses earned \$17 million to \$22 million in 2009.

⁵³ Personal communication with breeders, importers, and show promoters.

⁵⁴ See the Reptile Breeders and Retailers sections of Chapter 2 for more information on the relationship between large breeders and pet superstores..

⁵⁵ Personal communication with breeders and importers.

⁵⁶ Based on personal communication with leading importer, Christine Roscher, owner of L.A. Reptile, Inc.

Retailers

Despite the growing number of sales from breeders directly to pet owners through the internet and at local reptile shows, most pet owners purchase their animals through retailers.⁵⁷ Approximately 3,000 to 4,000 businesses sell reptiles or reptile products at over 5,000 to 6,000 locations.⁵⁸ As reptiles gain in popularity as pets, the numbers of retailers that sell reptiles will continue to grow.

Among retailers, sales of reptile products exceed sales of reptiles.⁵⁹ This is true because every reptile a) needs an array of products to keep it healthy, and b) requires continual purchases of food, cleaning supplies, and nutritional supplements.

Retailers can be classified into four types: superstores, pet stores, hobbyist shops, and online sellers (also know as “e-tailers”).

Pet Superstores

These “big-box” operations grab the biggest share of retail sales on a per store basis. There are two national superstore chains, PETCO and PETSMART, that sell reptiles and reptile supplies. PETCO and PETSMART each have over 1,000 retail stores located across the United States. Superstore chains cater almost exclusively to novice and intermediate pet owners, limiting the reptiles they sell to “small and innocuous”⁶⁰ reptiles, such as turtles, bearded

⁵⁷ APPA 2010, p. 463.

⁵⁸ Personal communication with reptile retailers and product manufacturers.

⁵⁹ PPN, p. 9. Note that PPN’s survey results were confirmed by Major Business Survey and Small Business Survey responses.

⁶⁰ Eugene Bessette, a well-know breeder, refers to these reptiles as “small, safe and innocuous.”

dragons, geckos, common iguanas, Boa constrictors, and ball pythons. They also carry a full line of products used in the care of reptiles.

Superstores purchase the majority of their reptiles and products from a handful of large breeders and product manufacturers to ensure consistent quantity, quality, and regularity of their supply. Large breeders both produce reptiles for superstores and also import and distribute reptiles and reptile foods from other smaller companies to the superstores.⁶¹ Similarly, large producers manufacture products for the superstores at their own facilities as well as import and distribute the products of smaller manufacturers to the superstores. The reliance on bigger breeders and manufacturers serves to simplify the reptile supply chain for the superstores.⁶² We estimate that superstores earned \$19 to \$23 million in revenues from sales of reptiles and ancillary products in 2009.

Pet Stores

The next largest category of retailer is pet stores. These pet stores include regional chains and local, one or two store, “mom and pop” pet shops. While no individual store or chain rivals PETsMART or PETCO in sales, as a group these stores sell more pet reptiles and ancillary reptile products than the superstores.⁶³ These retailers are also influential as leading sources of information about pets and pet products.⁶⁴ The vast majority of pet store sales are to customers in the communities in which these stores are located.

⁶¹ Personal communications with reptile breeders.

⁶² Personal communications with reptile breeders.

⁶³ APPA 2010, pps. 463, 469, and 479. This information was confirmed by personal communication with retailers.

⁶⁴ APPA, p. 481.

Pet stores can be further broken down into two categories: reptile specialty stores and general pet stores. ⁶⁵ Reptile specialty stores sell mostly reptiles and products for reptiles, though many of these stores also carry amphibians, insects, and related products. Prominent reptile specialty stores include Exotic Pets in Nevada, East Bay Vivarium in California, and Zoo Creatures in New Hampshire.

Typically, reptiles and ancillary reptile products are a small fraction of total sales at a general pet store. Among the general pet stores that we surveyed, reptile and reptile product sales made up only five to eight percent of the stores' gross yearly sales revenues. Some examples of general pet stores that sell reptiles include: Petland, a regional pet store chain, Red Crest Pet Shop of Texas, and Today's Pet in Maryland.

There are an estimated 1,100 and 1,500 pet stores. These pet stores earned between \$163 million to \$215 million in 2009.

Hobbyist Retailers

The smallest retailer both in store size and in annual revenues is the hobbyist retailer, who typically sells reptiles from his or her garage or basement. These retailers concentrate almost exclusively on live reptiles, and offer little or no ancillary products. Many hobbyist retailers specialize in a few types of reptiles, often concentrating on morphs. These home and garage sellers are typically hobbyists moving up the supply chain.

There are an estimated 600 to 800 hobbyist retailers. These retailers earned between \$15 million and \$19.5 million in 2009.

⁶⁵ The exact breakdown of specialty stores to general stores is unknown.

Online Sellers or E-tailers

There is a growing segment of retailers that conduct most of their business online. Some e-tailers started out as mail-order catalogue businesses. Others used to conduct their business by fax but are operate using email and a website. Only a few of these businesses also have storefronts. While a small group of reptile e-tailers sell only reptiles, the majority of sales made by online reptile stores are of ancillary reptile products. Selling online allows e-tailers to serve a national customer base. Prominent e-tailers include LLL Reptile and Supply, The Bean Farm, and Herpsupplies.com. There are an estimated 1,200 to 1,600 e-tailers. These businesses earned between \$81 million to \$106 million in 2009.

Summary of Retailers

We estimate that retailers as a whole earn between \$278 million and \$364 million from sales of reptiles and related products annually. Table 2.10 summarizes our revenue estimates for reptile retailers.

Table 2.10				
Summary of 2009 Annual Revenues For U.S. Reptile Retailers				
Retailer Category	Estimated Number of Businesses		Estimated Annual Revenue (in million \$)	
	Low	High	Low	High
Superstores	2	2	19.0	22.5
Pet Stores	1,100	1,500	163.0	215.7
Hobbyists	600	800	14.6	19.5
E-tailers	1,200	1,600	81.0	106.1
Total	2,902	3,902	277.6	363.8
Source: GES estimates based on Major Business Survey and Small Businesses Survey				

Ancillary Reptile Products and Services

The increase in reptile ownership in the United States and around the world has given rise to several industries dedicated to helping reptiles to lead longer, healthier lives. Manufacturers make products to simulate the light, heat, and humidity of individual reptiles' native environments; bug and rodent breeders provide reptiles with a diet that these reptiles would find in the wild; and veterinarians and pharmaceutical companies make sure that reptiles stay disease and parasite free.

Manufacturers

There are roughly 40 to 60 manufacturers that make products for reptiles in the U.S.⁶⁶ These companies range in size and product assortment from three-person, single product companies, to companies with hundreds of employees that produce a full range of reptile products. These products include food pellets, lighting, terrariums, terrarium decorations, heating products, vitamins and supplements, thermostats, snake hooks, sexing tools, and humidity products. The majority of product manufacturers do not have captive sales and distribution networks and must rely on independent distributors to supply their products to pet stores.⁶⁷

We classify reptile product manufacturers by the variety of products that they offer, their annual sales, and how widely their products are distributed. There are roughly three categories, which we refer to as “tiers” of reptile product manufacturers:

⁶⁶ Based on personal communications with reptile product manufacturers.

⁶⁷ Based on responses to the Major Business Survey.

- The companies that produce the greatest number and variety of products and generate the highest annual sales, i.e. the top tier manufacturers, are Zoo Med Laboratories, Rolf C. Hagen USA, Fluker Laboratories, Tetra, and Central Garden & Pet.⁶⁸ Top tier brands are universally recognized by reptile enthusiasts. These companies supply the superstore retailers as well as the most of the storefronts and e-tailers. Collectively, the top tier companies earn the majority of product manufacturing revenues. Unlike most other manufacturers, some of these businesses such as Central Pet & Garden⁶⁹ and Rolf C. Hagen USA⁷⁰ have their own distribution networks to distribute their products and the products of other manufacturers across the United States.
- The second tier is made up of companies with national distribution and a national reputation, but a more limited product line and lower annual sales than the top tier manufacturers. Most of these companies tend to focus on a small number of product types. For example, Vision Products focuses on cages and bowls. Products from second tier companies are sold at storefronts and, in many cases, at superstores. They are often brands that are featured by online retailers. There are roughly eight to ten second tier manufacturers. Some examples of second tier companies are Nature Zone, Pet Tech, and T-Rex Products.
- Third tier companies are more local in scope and narrow in product range than first or second tier manufacturers. These companies tend to focus on one type of product, like cages or supplements. Often these businesses will also be involved in other sectors of the reptile industry, such as reptile, cricket, or rodent breeding. Some of these companies also produce products for other animals. There are approximately 30 to 50 third tier manufacturers. Some examples of third tier manufacturers include HBH Pet Products, which makes flavored pellets for turtles; Natural Chemistry, which makes sprays to kill reptile parasites and clean enclosures; and Helix Controls, which makes thermometers, thermostats, and heating products.

Table 2.11 summarizes our revenues estimates for reptile product retailers.

⁶⁸ See “Market Leaders In Key Pet Supply Categories by Percentage of Stores Citing Brand as No. 1”, Petage.com, January 2010. Rankings for manufacturers were confirmed through discussions with retailers and product manufacturers.

⁶⁹ Central Pet & Garden’s 2009 10-K, p. 5.

⁷⁰ Distribution information can be found on Hagen’s website. <http://hagen.com/usa/about.cfm> (Accessed November 17, 2010)

TABLE 2.11				
Estimated Annual Revenues For				
U.S. Reptile Ancillary Product Manufacturers, 2009				
Manufacturer Category	Estimated Number of Businesses		Estimated Annual Revenues	
			(in million \$)	
	(Low)	(High)	(Low)	(High)
Top Tier ⁷¹	5	5	50	60
Second Tier	8	10	5	8
Third Tier	30	50	1.5	2.5
Total	43	65	56.5	70.5
Source: GES estimates based on Major Business Survey and Small Businesses Survey				

Reptile Product Distributors

Beside a few companies in the top tier, most reptile product manufacturers rely on wholesalers and distributors to transport and sell their products to superstores, pet stores, and hobbyist stores across the country. We were not able to get in contact with reptile product distributors and therefore were not able to estimate the total annual income generated by this segment.

Live Reptile Food Breeders

Live reptile food breeders provide reptiles with foods that more closely resemble their diet in the wild. The three main types of creatures bred for reptiles are rodents, insects, and worms. Rodents are fed mostly to snakes and some larger lizards. Lizards and turtles are fed insects and worms. The most popular rodents bred for snakes are mice and rats. The most popular foods bred for lizards and turtles are crickets, mealworms, and superworms.

⁷¹ Several reptile industry insiders have suggested that Table 2.16 significantly underestimates annual revenues for top tier manufacturers. Our income estimate for this manufacturer category has a high margin of error because of the low response rate among top tier manufacturers to our survey.

Most mice and rats are shipped frozen. However, several businesses deliver live mice. Transportation costs make delivery of live rodents prohibitively expensive outside of a 50 to 150 mile radius around a breeding or holding facility. All bugs⁷² are shipped live. Almost all rodents and bugs used to feed reptiles are sold to pet stores and distributors before they reach consumers.⁷³

Among both the rodent and bug breeders, a small number of companies make the majority of the sales. Leading food breeders focus on breeding food for reptiles and other animals. Smaller food breeders tend to breed bugs and rodents to feed their own animals as well as to sell to other breeders. Leading rodent breeders include Mice Direct and Rodent Pro. Leading insect breeders include Timberline Live Pet Foods and Armstrong Crickets. Leading worm breeders include Rainbow Mealworms and Nature's Way.

Thirty years ago most bugs were bred as bait for fishing. Bug farms were established near popular fishing spots to serve anglers. As reptiles gained in popularity as pets, bug breeders shifted more of their breeding toward reptiles. These breeders appreciated the constant year round demand that reptiles have for bugs, as opposed to the seasonal- and weather-dependant demand generated by the fishing season. As reptiles became more common as pets across the country, the technology for safely transporting bugs improved to the point that food breeders could serve customers that lived far from fishing sites. One prominent cricket breeder claims that cricket breeders pioneered the technology that made it safer to transport bugs longer distances, including insulated boxes and heat packs calibrated for bugs. This new technology in turn was used by reptile breeders and distributors to safely and cost effectively transport reptiles

⁷² Insects and worms are referred to collectively as bugs.

⁷³ Based on responses to Major Business Survey and Small Business Survey.

across the United States. In this way, the reptile and bug businesses grew together and nurtured each other.

There are an estimated 50 to 100 businesses who primarily engage in breeding rodents and bugs as food for reptiles. These businesses earned between \$22 million and \$25.5 million in 2009.

Reptile Delivery Services

Several package delivery services facilitate the transport of reptiles across the United States. Delta Cargo ships all reptiles,⁷⁴ FedEx will ship all non-venomous reptiles,⁷⁵ and DHL will ship non-venomous lizards, and tortoises.⁷⁶ UPS will only ship chameleons, geckos, iguanas, monitors, flying dragons, freshwater turtles, land tortoises, and sea turtles. However, UPS has designated several franchises that can approve shippers and sell the necessary packaging and labels to ship other types of reptiles using UPS.⁷⁷ Most carriers insist that reptile packages be dropped off and picked up at an airport.

We estimate that more than 500,000 packages containing reptiles and reptile supplies are shipped each year within the United States. We estimate total income from reptiles shipments to be \$5 million to \$7 million per year.

⁷⁴ Pet Travel Requirements & Restrictions. http://www.delta.com/planning_reservations/special_travel_needs/pet_travel_information/pet_requirements_restrictions/index.jsp. (November 23, 2010).

⁷⁵ FedEx terms and conditions, updated October 4, 2010. p111.

⁷⁶ Prohibited and Restricted Commodities for US shipments. DHL.

⁷⁷ Based on interviews with UPS franchisees.

Reptile Veterinarians

It takes a specialized knowledge to correctly treat the medical issues of reptiles. As reptiles have grown in popularity so has the number of veterinarians that can successfully identify and cure illnesses common to reptiles.⁷⁸ In addition to treating reptile illnesses, veterinarians see it as their responsibility to educate owners about proper reptile husbandry and diet.

Veterinary services and medications make up one of the largest expenses for reptile owners.⁷⁹ The 2010 APPA Survey reports that, collectively, reptile owners spend around \$475 million on non-surgical veterinary care for their reptiles each year. (See Table 2.12)

Reptile Type	Average Gross Expenditure Per Household(\$)	Number of Households (Thousands)	Total Expenditures By Reptile Type (Thousand \$)
Turtles	86	2,773	238,478
Snakes	68	846	57,528
Lizards	113	799	90,287
Iguanas	211	423	89,253
Other*	-	-	-
Grand Total			475,546
* Medical expenses for the "Other" reptile category were not included in the APPA Study			
.Source: Based upon APPA Study data.			

In contrast, a survey of veterinarians from across the United States conducted by GES found that reptile owning households spend on average \$59.52 annually on veterinary

⁷⁸ Reptilechannel.com has an online directory of veterinarians that treat reptiles which can be found at <http://www.reptilechannel.com/reptile-health/vet-listing.aspx>.

⁷⁹ APPA 2010, p. 465.

expenditures.⁸⁰ Thus, from these survey results we extrapolate that the 4.7 million reptile owning households spend roughly \$279.7 million annually on veterinary expenditures.

The APPA survey reports that reptile owners spent an additional \$237 million on medications for reptiles.⁸¹ (See Table 2.13)

TABLE 2.13			
Annual Medication Expenditures For Reptiles, 2010			
	Average Gross Expenditure Per Household (\$)	Number of Households (Thousands)	Total Expenditure For Type (Thousand \$)
Turtles	46	2,773	127,558
Snakes	34	846	28,764
Lizards	79	799	63,121
Iguanas	43	423	18,189
Other*	-	-	-
Grand Total			237,632
* Medication expenses for the "Other" reptile category were not included in the APPA Study.			
Source: 2010 APPA Study data.			

Using the mean of estimated expenditures by reptile owners from the GES survey of veterinarians as the lower bound and the APPA survey results as an upper bound, estimate of

⁸⁰ We surveyed 50 veterinarians. The veterinarians interviewed were randomly selected from a nationwide directory of veterinarians who see reptiles in their practices. (See <http://www.reptilechannel.com/reptile-health/vet-listing.aspx>). Thirteen of the 50 veterinarians that were called, responded to the survey. Twelve provided information on the cost of veterinary care in their area as well as an estimate of the percentage of reptile owners that bring their reptile to a veterinarian.

⁸¹ The American Veterinary Medical Association ("AVMA") also presents an estimate of medical expenditures for exotic pets, which include reptiles, large mammals, rodents, and marsupials. Because it includes several non-reptiles in its calculations, the AVMA's medical expenditure estimate is too broad to give an accurate picture of annual medical expenditures specifically for reptiles. In addition, the AVMA's figure for exotic pet medical expenditures does not include expenditures on medication. We therefore do not use the AVMA's figure in our aggregate estimate of reptile revenues. See 2007 AVMA's *U.S. Pet Ownership & Demographics Sourcebook*.

total amount of expenditures made by reptile owners to veterinarians from reptile products and services we obtain an estimate of veterinarian expenditures of \$279.7 million to \$475.5 million..

Our estimate of reptile pharmaceutical expenditure is \$139.8 million to \$237.6 million assuming the same ratio of pharmaceutical sales to veterinary expenditures for our survey data as was the case in the APPA study.

Reptile Expos or Trade Shows

On almost any weekend, wherever you are, it is likely that a reptile show can be found nearby. There were over 300 shows occurring across the country last year.⁸² These shows are part carnival, part market, and part networking opportunity. In a typical show, a hall or convention center is filled with rows of exhibitors standing behind booths and tables filled with reptiles and reptile products. Breeders and reptile retailers purchase space at nearly every reptile show. Many of the shows also have space purchased by reptile food manufacturers and breeders, reptile product manufacturers, and artists. (See Table 2.14 below)

TABLE 2.1	
Exhibitors At Reptile Shows By Type	
Exhibitor	Percent of Shows with Exhibitor Type *
Breeders	92
Retailers	92
Reptile food producers	80
Artists	76
Product manufacturers	72
Wholesalers	52
Importers	36
* Percents will not sum to 100% because shows have more than one type of exhibitor..	
Source: GES calculations based on Promoter's Survey	

⁸² GES calculations based on responses to Major Business Survey and Promoters Survey and review of advertisements for reptile shows in *Reptiles Magazine*.

Beside functioning as market places, shows provide a space where enthusiasts and hobbyists can trade care and husbandry tips with professional breeders. In addition, professionals from across the country use shows as gathering points to socialize and forge business relationships. Shows have been part of the continuing trend of connecting breeders directly with customers and retailers, eliminating the need for wholesalers and distributors to act as their middlemen.

As shows have gained in popularity and the number of shows has increased, the audience attending reptile shows has become more localized. When the first shows appeared two decades ago, enthusiasts would travel across the country to attend shows. A recent poll of enthusiasts found that a few hours is the furthest that the majority of prospective attendees are willing to travel to attend.⁸³ Only a few shows, such as the Reptile Super Shows, North American Reptile Breeders Conference, and the National Breeders Expos still attract a national audience.

The organizers of reptile shows, reptile show promoters, make money by charging exhibitors for booths to display their reptiles and products, selling merchandise, and charging the public admission. Promoters may stage anywhere between one and twelve shows per year. The average promoter puts on around five shows per year and charges an average of \$77 for booth space.⁸⁴ There are roughly 100 to 200 promoters putting on shows in the United States.⁸⁵

In total, businesses who primarily engage in show promotion make between \$10 million to \$20 million per year.

⁸³ *Reptiles Magazine* 2010 Reader's Survey, p. 21.

⁸⁴ Based on the Reptile Show Promoter's Survey.

⁸⁵ Id.

Other Reptile Organizations

Reptile Display Organizations

Beyond the pet trade, numerous public and private organizations throughout the United States own reptiles for educational and display purposes. Perhaps the most widely known group of these display organizations are zoos accredited by the Association of Zoos and Aquariums (“AZA zoos”).⁸⁶ Some well known AZA zoos include the Bronx Zoo, Zoo Atlanta, the National Zoo, and the San Diego Zoo.

According to AZA databases, around 180 AZA accredited institutions⁸⁷ hold approximately 28,000 reptiles in their collections.⁸⁸ The yearly budget for reptiles and amphibians for AZA institutions is around \$36 million.⁸⁹

Few of the reptiles that have been recently acquired by zoos come from private dealers or importers. This is the result of a trend in recent years among AZA zoos to move away from buying reptiles from private dealers. Currently, reptiles in AZA zoo collections come mostly from in-house breeding programs as well as trades and donations from other zoos. Only a handful of strictly vetted private dealers are allowed to sell to zoos.⁹⁰

⁸⁶ AZA zoos are institutions engaged in the regular display of animals which the AZA has inspected to make sure the zoo puts on displays appropriately and provides good care for the animals. AZA zoos have the stated mission of “exhibition, conservation, and preservation of the earth's fauna in an educational and scientific manner” rather than for profit. AZA. “How Does Accreditation Work,” <http://www.aza.org/becoming-accredited/> (Accessed November 16, 2010)

⁸⁷ AZA Database 2010.

⁸⁸ Zoo and Aquarium Statistics. <http://www.aza.org/zoo-aquarium-statistics>. (Accessed November 16, 2010)

⁸⁹ Budget figures listed in the AZA database are listed only for Reptiles and Amphibians and are not broken out into separate categories.

⁹⁰ Personal communication with several curators of reptile houses within AZA zoos

There is an extensive process an AZA zoo must undertake if it wants to buy from a private reptile seller. One curator referred to this process as a “vendor/dealer profile.” Zoos must do a background check on the dealer, gather letters of recommendation from other zoos, and if the facility is close by, tour the seller’s facility. This process was put in place so that zoos would avoid purchasing from a dealer that mistreats animals in any way.

In addition to displaying reptiles, AZA zoos strive to educate the public about the habits, physical characteristics, and origins of reptiles. Zoo keepers put on educational programs that allow children to see and touch reptile “ambassadors.” One curator said that one of the best ambassadors is the Burmese python. He noted that, “Burmese are big and impressive and children never forget the experience of seeing the snake.” The keeper explained that using Burmese pythons and other large reptiles contributes to zoo’s educational goals of connecting children more directly with nature and to stimulate an interest in conservation.

Zoos also see it as their duty to take-in and raise unwanted animals that are donated to them. Reptiles found or confiscated by the Parks Department and the U.S. Fish and Wildlife Service are often sent to zoos. In addition, if someone is bitten by a venomous reptile, the curator of the local AZA zoo’s reptile house is among the first to be called for assistance.

Aside from AZA zoos, private institutions also purchase and breed reptiles for display purposes. Some of these institutions, like the Reptile Gardens of South Dakota, have collections which rival AZA zoos. Others, like the Reptile Discovery Center have more specialized collections.

We were unable to gather enough revenue information for these institutions to estimate total yearly revenues for private display organizations.

Reptile Entertainment Companies

There are a small but growing number of reptile entertainment companies. One segment of these companies puts on live shows with reptiles. Many of these businesses act as side-lines for reptile breeders and pet shop owners. Some examples of companies that put on reptile shows include Scales and Tails Utah, The Wildlife Company, and the Lizard Guys. Other businesses, like Reptile Rentals, Inc., provide reptile performers for movies and television.

Because we surveyed only a small number of entertainment companies, we are not able to estimate total annual income generated by this segment. However judging from the websites of a few of these companies, popular reptiles in these shows include Burmese pythons, Boa constrictors, alligators, and giant tortoises.

* * *

In summary, we estimate that the collective efforts of all participants in the U.S. reptile industry, including breeders, importers, pet stores, ancillary product manufacturers, et. al., generate revenues of approximately \$ 1.0 to \$1.4 billion. Table 2.15 summarizes our estimates by industry participant.

TABLE 2.15 Revenues in the U.S. Reptile Industry, 2009 By Type of Business		
	Estimated Revenues⁹¹ (Million \$)	
Business Type	Lower Bound	Upper Bound
Breeders	141.7	183.2
Importers/Exporters	28	30
Wholesalers	17	22
Retailers	277.6	363.8
Manufacturers	56.5	70.5
Food Breeders	22	25.5
Medical Costs	419.5	713.2
Reptile Show Promoters	10	20
Delivery Services	5	7
Total	977.3	1,435.2

III. TURTLES, LIZARDS, SNAKES

Out of the four known orders of reptiles,⁹² only reptiles from two of the orders, Testudines (turtles) and Squamata (snakes and lizards), are popularly kept as pets. The APPA

⁹¹ Both the lower bound and the upper bound estimates in Table 2.15 are conservative as they do not include revenues from reptile product distributors, private reptile display organizations, and reptile entertainment companies. Revenue estimates for these business types were excluded because we lacked adequate data on which to make an accurate estimate.

⁹² The four orders are Squamata (lizards and snakes), Crocodylia (alligators, crocodiles, caimans, and gavials), Testudines (turtles), and Sphenodontida (tuatara). "Reptile," *Encyclopædia Britannica*.

estimates that 4.7 million U.S. households contain at least one of these reptiles.⁹³ The most popular pet reptile in the United States for many years running is the turtle (See Table 3.1 below).

TABLE 3.1 U.S Ownership of Reptiles By Type, 2010		
Reptile	Percent of Households	Number of Households
Iguana	9	423,000
Lizard	17	799,000
Turtle	59	2,773,000
Snake	18	846,000
Other	5	235,000
Total*	100	4,700,000
* Percentages do not add to 100 because some households own more than one type of reptile		
Source: 2010 APPA Study		

Turtles

Turtles have consistently been owned by more households than any other type of reptile.⁹⁴ The slow movements and attractive shells of turtles fascinate children and adults alike. Among the more popular types of turtles kept as pets are red-eared sliders, eastern box turtles,

Encyclopædia Britannica Online. Encyclopædia Britannica, 2010. Web. <http://www.britannica.com/EBchecked/topic/498684/reptile> (December 29 2010). Interviews with industry participants, as well as a review of LEMIS import and export statistics show that few crocodylians are sold as pets.

⁹³ American Pet Product Association, "Industry Statistics & Trends," http://www.americanpetproducts.org/press_industrytrends.asp (November 9, 2010)

⁹⁴ 2010 APPA Study, p. 455.

western painted turtles, map turtles, and wood turtles.⁹⁵ The APPA estimates that approximately 2.8 million U.S. household own turtles.⁹⁶ (See Table 3.1 above)

Turtles were among the first reptiles to be bred on a large scale for the pet industry in the United States. The first turtles sold as pets were taken directly from the wild. As the industry matured, U.S. Turtle breeding farms grew to dominate the trade in pet turtles. Despite various federal and state legal restrictions on importing, inter-state transporting, and selling of turtles, the United States still leads the world in pet turtle production.⁹⁷ Turtles remain the most popular reptile to be kept as pets in the United States.⁹⁸

Turtle farming in the United States has its roots in Louisiana in the 1930s when rural Louisianans gathered turtle eggs from the swamps and sold the hatchlings as pets.⁹⁹ In the late 1940s and early 1950s, egg collectors began building holding ponds at the edges of the swamps to harvest turtle eggs.¹⁰⁰ In response to the growing demand for pet turtles, the small swamp-side ponds expanded into large-scale turtle farms. At the industry's peak in the early 1970s, the U.S. turtle farmers collectively sold nearly 15 million turtle hatchlings, mostly in U.S. retail outlets,

⁹⁵ Most Popular Pet Turtles. <http://www.reptilechannel.com/reptile-magazines/reptiles-magazine/february-2010/most-popular-pet-turtles.aspx>. (December 6, 2010)

⁹⁶ 2010 APPA Study, p. 455.

⁹⁷ Louisiana is currently responsible for more than 85 percent of all pet turtle sales around the globe. "Turtle Profile, C. Greg Lutz, Pramod Sambidi, and R. Wess Harrison, Louisiana University Agricultural Center, p 1 www.agmrc.com/comodities_products/aquaculture/Turtle_profile.cfm, (August 12, 2010)

⁹⁸ See Chapter 2: The Participants in the U.S. Reptile Industry, Table 2.1.

⁹⁹ Louisiana Turtle Farmers Continue Fight For Domestic Market. Louisiana Agriculture. Winter 2007. <http://www.lsuagcenter.com/en/communications/publications/agmag/Archive/2007/Winter/Louisiana+Turtle+Farmers+Continue+Fight+for+Domestic+Market.htm>. (December 9, 2010)

¹⁰⁰ Id.

including pet stores and traditional dime stores. At that time, around 5% of U.S. households had turtles as pets.¹⁰¹

Turtle sales cratered in 1975 when the U.S. Food and Drug Administration (“FDA”) issued a regulatory ban on the sale and transport of turtles with shell lengths under 4 inches within the United States. The purpose of the FDA regulation was to limit human contact with baby turtles that may be infected with Salmonella.

Throughout the 1970s, 1980s, and 1990s, turtle farms shifted their focus from domestic sales to foreign customers. It was only in 2004, 29 years after the FDA ban was imposed, that turtle production came close to reaching to its pre-1975 level.¹⁰² China, Mexico, and Hong Kong are now the key geographic regions for turtle sales. However, Chinese and Hong Kong customers purchase the majority of their turtles for food rather than as pets.

Turtle production and sales have declined sharply in recent years because of extensive damage to turtle farm facilities as well as a major loss of breeding stock due to the effects of hurricane Gustav in 2008. The global economic downturn and the increasing self-sufficiency of China’s farmed turtle industry also contributed to the decline in turtle sales.

Louisiana currently has 48 licensed turtle farms.¹⁰³ This number is down sharply from the 67 turtle farms operating in 2009.¹⁰⁴ Many of Louisiana’s top turtle farms have been run by the

¹⁰¹ Risky Shell Game: Pet Turtles Can Infect Kids, FDA Consumer, Dec-Jan, 1987 by Chris W. Lecos. <http://www.highbeam.com/doc/1g1-6245151.html> (november 11, 2010).

¹⁰² Turtle production in 2004 was 13.5 million hatchlings in Louisiana alone. Louisiana Summary: Agriculture and Natural Resources 2005. LSU AgCenter. 2006.

¹⁰³ Louisiana Department of Agriculture & Forestry, Turtle Farm Records Database (August 12, 2010).

¹⁰⁴ Louisiana Turtle Farmers Continue Fight For Domestic Market. Louisiana Agriculture. Winter 2007. <http://www.lsuagcenter.com/en/communications/publications/agmag/Archive/2007/Winter/Louisiana+Turtle+Farmers+Continue+Fight+for+Domestic+Market.htm> (December 9, 2010).

same family for at least two generations. Prominent turtle farms include Concordia turtle farm, run by the Evans Family, Tangi Turtle farm, run by the Boudreaux Family, and the Strange Brothers turtle farm, run by the Strange family.

It is estimated that there are six to seven million turtles that were sold by American turtle farmers last year. These turtles generated roughly \$7 to \$8 million in revenues for turtle sellers.¹⁰⁵

Lizards

After turtles, lizards are among the most popular pet reptiles in the United States. A variety of lizards can be found in most pet stores. The majority of lizards sold as pets are small and have comparatively easy care requirements, making them popular for novice to intermediate pet owners. Bearded dragons and leopard geckos and are among the top selling lizards.¹⁰⁶

There is also a smaller trade in lizards that require more advanced handling skills, including larger lizards, such as monitors, and venomous lizards, including beaded lizards and Gila monsters. These lizards are sold to enthusiasts and more advanced owners.

Because of the popularity of lizards, they are bred by part-time and full-time breeders across the United States.¹⁰⁷ Lizards are also among the most widely imported reptiles, with lizard imports making up more than 51% of all reptiles imported from 2005 to 2010.¹⁰⁸ (See Table 3.2)

¹⁰⁵ Personal communication with leading turtle retailers and exporters. The Louisiana AgCenter estimates that there were 2 million hatchling turtles produced that earned sales of \$2 million.

¹⁰⁶ Based on responses to Major Business Survey.

¹⁰⁷ Based on responses to Major Business Survey and Small Business Survey.

¹⁰⁸ GES calculation based on the LEMIS data.

The leading importers of lizards from 2005 to 2010 included L. A. Reptile, Strictly Reptiles, U.S. Global Exotics, California Zoological Supply, and Two Amigos Import and Export.¹⁰⁹

TABLE 3.2		
Number of Lizards Imported		
2005-2010		
Year	Number of Lizards Imported	Percent of Total Reptile Imports
2005	716,794	47.8
2006	764,431	53.0
2007	742,735	55.4
2008	623,631	54.4
2009	470,397	52.2
2010	231,241	40.4
Total	3,549,229	51.4
Source: LEMIS data		

Snakes

Snakes have seen a surge in popularity as pets in the past two decades. As recently as twenty years ago, owning snakes was looked upon as an oddity.¹¹⁰ Today, there is growing acceptance of responsible snake ownership and a growing marketplace for snakes and ancillary snake products.¹¹¹ The snakes sold as pets can be divided into three categories, Small and Docile, Large Constrictors, and Venomous snakes.

Small and Docile

The majority of snakes sold in pet stores are small and docile species such as corn snakes, king snakes, non-morph ball pythons, non-morph Boa constrictors, and milk snakes. These

¹⁰⁹ Ibid.

¹¹⁰ Personal communication with Tim Hoen, reptile show promoter.

¹¹¹ See also Chapter 2: Retailers.

snakes are sold primarily to first-time and intermediate owners. One of the most popular snakes bred domestically, the ball python, is also one of the most commonly imported and exported snakes.¹¹² From 2005 to June 30, 2010, over 600,000 ball pythons were imported in the United States.

Large Constrictors

A small subset of enthusiasts buy snakes, not just for their color but because they are impressed by their size. These snakes include:

Burmese pythons. These pythons are the most commonly exported of the large pythons, through reticulated pythons come in at a close second. (See Table 3.2 below.) The native range for this species is southern and southeastern Asia. Burmese pythons can grow up to 27 feet.¹¹³

Reticulated pythons. These pythons are the most commonly imported of the large pythons, through Burmese pythons come in at a close second. (See Table 3.3 below.) They have been known to reach lengths of 31.5 feet.¹¹⁴

Green Anacondas. This olive colored snake has the distinction of being the world's heaviest snake. It can grow to be more than 30 feet.¹¹⁵

Yellow Anacondas. This snake has only rarely been imported or exported over the 2005 to 2010 period for which we have data. The yellow anaconda is considerably smaller than its green cousin, reaching lengths of 15 feet.¹¹⁶

Northern African Rock pythons. Despite their name, these snakes hail from North and Central Africa. They can reach lengths of 28 feet.¹¹⁷

¹¹² GES calculations based on the LEMIS database.

¹¹³ "Burmese Python". National Geographic. <http://animals.nationalgeographic.com/animals/reptiles/burmese-python/>. (April 4, 2011).

¹¹⁴ "Reticulated python." *Encyclopædia Britannica*. *Encyclopædia Britannica Online*. Encyclopædia Britannica, 2011. <http://www.britannica.com/EBchecked/topic/499976/reticulated-python>. (April 4, 2011).

¹¹⁵ "Green Anaconda." National Geographic. <http://animals.nationalgeographic.com/animals/reptiles/green-anaconda/>. (April 4, 2011).

¹¹⁶ "Yellow Anaconda Species Profile." Reptile Channel.com. <http://www.reptilechannel.com/reptile-species/snakes-profiles/yellow-anaconda-2.aspx> (April 4, 2011).

None of these large constrictor snakes are widely sold as pets.¹¹⁸ Table 3.3 shows that from 2005 to 2010 imports of these snakes greatly outnumbered exports, but none of these snakes was imported or exported in large numbers.¹¹⁹

TABLE 3.3		
U.S. Exports and Imports of Large Constrictor Snakes		
2005 - June 30, 2010		
Snake Type	Number of Snakes	
	Exports	Imports
The Indian/Burmese Python (<i>Python molurus</i>)	4,263	17,285
The Green Anaconda (<i>Eunectes murinus</i>)	239	15,904
The Yellow Anaconda(<i>Eunectes notaeus</i>)	1	25
The Reticulated Python (<i>Broghammerus reticulatus</i>)	3,354	3,535
The Northern African Python (<i>Python sebae</i>)	166	2,930
Total	8,023	39,679
Source: LEMIS data.		

Venomous snakes.

Venomous snakes round out the types of snakes available for sale as pets. Many venomous snakes have vibrant coloration and distinct color patterns, which serve as a warning in nature to potential predators. Venomous snakes kept as pets include copperheads, cottonmouths, cobras, lance-head vipers, and rattlesnakes.

Many states have laws restricting the keeping of venomous snakes as well as limiting the sale of venomous snakes. Because of these laws and the high skill level required to keep

¹¹⁷ “African Rock Python Species Profile.” Reptile Channel.com. <http://www.reptilechannel.com/reptile-species/snakes-profiles/african-rock-python-2.aspx>.

¹¹⁸ Based off of responses to the Major Business Survey and Small Business Survey.

¹¹⁹ The number of Boa constrictors imported into the United States over the 2005 to 2010 period was two times greater than the sum of all imports and exports of Burmese pythons, green anacondas, reticulated pythons, and northern African pythons.

venomous snakes safely, sales of these snakes make up only a small portions of all snake sales. Table 3.4 shows that over the 2005 to June 30, 2010 period only 3.3 thousand venomous snakes were exported and only 2.6 thousand were imported into the United States. Exports of venomous snakes outnumber imports. (See Table 3.4.) Kingsnake.com lists Glades Herp Farm, Exotic Reptiles Jungle, DTS Herps, Inc, and Tom Crutchfield as sellers of venomous snakes.¹²⁰

TABLE 3.4		
U.S. Exports and Imports of Venomous Snakes		
2005 - June 30, 2010		
Snake Type	Number of Snakes	
	Exports	Imports
Cantil	19	25
Cobra	146	980
Copperhead	285	30
Cottonmouth	96	6
Mamba	16	406
Massasauga	61	32
Rattlesnake	2,486	1,152
Sidewinder	156	3
Total	3,265	2,634
Source: LEMIS Data		

Snake Morphs

In the 1980s and 1990s snake breeding in America was transformed from a hobby to a profession by a series of discoveries of rare, colorful snakes in the wilds of South Asia, Africa, and South America. In March of 1981, *National Geographic* ran an article featuring a picture of an albino Burmese python owned by a animal dealer from Thailand.¹²¹ While the Thai dealer had intended to sell this snake as a rarity to a collector, American breeders, like Bob Clark, saw the

¹²⁰ <http://market.kingsnake.com/index.php?cat=40> (December 13, 2010)

¹²¹ Bob Clark. Python Color & Pattern Morphs. Reptiles Magazine, March 1996.

potential to breed albino Burmese pythons and generate a continual stream of income. As Clark anticipated, there was interest in American bred albino Burmese pythons. The “morphed” offspring of the snakes commanded prices of over \$2000 per baby snake. The success of these first American breeders attracted more people to try their hand at breeding Albino Burmese pythons.

Consumer enthusiasm for morphed constrictor snakes ramped up to even higher levels in the 1990s, stoked by the successful captive breeding and sale of albino ball pythons and albino Boa constrictors. These albino snakes that had been discovered in the jungles of Ghana and Columbia just a few years prior. By the mid-1990s, demand for uniquely colored snakes was high enough for amateur breeders to quit their day jobs and operate full time snake breeding operations.

Breeding uniquely colored snakes distinguished American bred snakes from the low priced imported snakes that dominated U.S. pet stores. Consumers began to look at these colorful snakes as collectors items and science projects.

The consumer market for these unique snakes continued to expand throughout the early 2000s. The majority of “designer” breeders focus on breeding Boa constrictors and ball pythons. morphs. The market for Boas and ball pythons is bigger than the market for morphs of the larger constrictor snake species. This is due to the fact that Boas and ball pythons are relatively easier to handle and less costly to maintain than the large constrictors. Since 2005, approximately U.S. breeders have shipped approximately 25,000 Boas and 60,000 ball pythons to foreign countries. Most of these exports have been high-priced morphs. A smaller number of breeders also bred Burmese python morphs and Reticulated python morphs. Dan Sutherland, Peter Kahl, Brian

Barczyk, Ralph Davis, Eric Crider, Bob Clark, and Kevin McCurley are among the top current purveyors of the art, business, and science of breeding morphs.

* * *

The American pet trade has experienced a significant shift toward domestic captive breeding over the past twenty years. For the past two decades, the number of imports have declined, while, up to 2007, the number of exports increased. However, during this time, the number of reptiles owned by United State households has also steadily increased. Increasing domestic demand and decreasing foreign supply indicate that the pet trade is less reliant on imported reptiles and more reliant on American breeders and collectors. The expansion of exports indicates that not only have American breeders been able to meet expanding domestic demand, they are also able to increasingly cater to foreign buyers as well.

The transition from supplying the U.S. market to supplying foreign markets has not always been easy for U.S. exporters. Exporters have had to learn through trial and error that each export country has different expectations with regard to service.¹²²

In summary, over the past decade, rare and thus high-priced reptiles are being delivered to the world from breeders, mostly located in the United States. This trend has, no doubt, reduced considerably the incentives of smuggling rare reptiles into the United States.

IV. CURRENT AND PROPOSED FEDERAL LAWS/REGULATIONS: THEIR IMPACT ON THE REPTILE INDUSTRY

Current federal laws concerning reptiles have a significant impact on the reptile trade within the United States.¹²³ Primarily, federal laws have focused on the import and export of

¹²² For example a healthy reptile with a small physical imperfection may be acceptable to most buyers in Mexico but every reptile delivered to Japan must be both healthy and defect free. This high standard is also known as being “Japan perfect.” Before American exporters learned how to ship Japan perfect reptiles, they experienced considerable difficulty breaking into the Japanese reptile market.

reptile species that have been deemed endangered or have been declared illegal to export by a foreign government. The effects of these laws has been to limit commerce and increase the costs of conducting reptile businesses. However, because of the increase in captive breeding, the effects of these laws have not limited the modern reptile industry from growing significantly in the past two decades.

A rule change proposed by the U.S. Fish and Wildlife Service would list nine species of constrictor snakes as injurious wildlife under the Lacey Act.¹²⁴ The rule, if enacted, will have a significant economic impact on the U.S. reptile industry. The proposed regulation will affect imports and exports of reptiles, and will also affect interstate sales of reptiles by domestic reptile breeders. We estimate that, in the first year alone, the impact of the rule change, if it is enacted, will be a loss of \$76 to \$104 million in reptile industry revenues. This amounts to roughly 5 to 7 percent of total annual industry revenues.

* * *

There are two main federal regulations that govern the import, export, inter-state sale, and keeping of reptiles in the United States-- the Endangered Species Act and the Lacey Act. We review the impact of the laws below.

The Endangered Species Act (“ESA”).

The ESA is designed to protect animals that are at risk of extinction. It does so by designating certain species as endangered or threatened, purchasing lands for the conservation of

¹²³ State laws also have an impact on the reptile industry. See Appendix II for an overview of the reptile laws for in three states with some of the most extensive reptile laws: Florida, Texas, and New York. Appendix II also contains a discussion of how these state laws have impacted the reptile industry.

¹²⁴ 75 FR 11808; March 12, 2010.

these species, prohibiting commercial purchases and sales of illegally obtained endangered species, and assessing civil and criminal penalties for violations of the act.¹²⁵ Species, or products made from species that are listed as endangered or threatened under the ESA are prohibited from import and export, except if an exception is granted to do so for scientific or conservation purposes. Currently, 119 reptile species are listed as either endangered or threatened under the ESA.¹²⁶ The reptiles listed under this act include: the San Francisco giant garter snake, the Alabama red-belly turtle, the green sea turtle, and the Monito gecko. The act is enforced by the U.S. Fish and Wild Life Service (“Service”) and the National Oceanic and Atmospheric Administration (“NOAA”).

CITES

The ESA also has a significant impact on international trade because the ESA implements the Convention on International Trade in Endangered Species of Wild Flora and Fauna (“CITES”) as U.S. law. CITES is an agreement between governments to regulate cross-country trade in rare and vulnerable plants and animals. As of November 2010, there are 175 nations that have signed the Convention.¹²⁷ Each nation which signs on to CITES must designate a Management Authority to be in charge of administering a licensing system for species listed under CITES and a Scientific Authority to advise the Management Authority on the effects of

¹²⁵ Endangered Species Act of 1973. <http://www.fws.gov/laws/lawsdigest/esact.html> (Accessed November 30, 2010).

¹²⁶ Summary of Listed Species Listed Populations and Recovery Plans. United States Fish and Wildlife Service. http://ecos.fws.gov/tess_public/pub/boxScore.jsp (Accessed November 30, 2010).

¹²⁷ List of Contracting Parties. CITES. <http://www.cites.org/eng/disc/parties/alphabet.shtml> (Accessed November 30, 2010).

trade on the species.¹²⁸ Special paperwork issued by each Management Authority is needed for the import and export of animals protected by CITES.

Species protected under CITES are listed in one of three appendices to CITES. Appendix I species are considered threatened with extinction and are thought to be adversely affected by international trade. CITES dictates that these species may not be imported for commercial purposes. A country's Scientific Authority must determine that the import of the species will not be detrimental to its survival and the importer can provide proper housing and care for the species before an import of that species can occur.¹²⁹ Currently, 75 reptile species are listed in Appendix I.

Species listed under Appendix II are considered to be at risk of becoming extinct if international trade in these species is not regulated.¹³⁰ A country's Management Authority must certify that the species is obtained legally and that trade in the species will not threaten the species' survival before an export permit for an Appendix II species will be granted.¹³¹ There are currently 527 reptile species listed in Appendix II.

Appendix III species are animals and plants that are threatened only within specific countries. Permits are required to export Appendix III species out of the country that requested the CITES listing. Certificates of origin are also required to export these species from all other

¹²⁸ How CITES Works. <http://www.cites.org/eng/disc/how.shtml> (Accessed November 30, 2010)

¹²⁹ How CITES Works. <http://www.cites.org/eng/disc/how.shtml> (Accessed November 30, 2010)

¹³⁰ Ibid.

¹³¹ Ibid.

countries that have signed onto CITES. There are currently reptile 55 species listed in Appendix III.¹³²

Impact of CITES on the Reptile Industry

Survey respondents report that CITES requirements have slowed the flow of exports of protected reptile species from the United States.¹³³ Over the past several years there has been a backup in the export permit application process which has delayed shipments up to six months for some merchants. One respondent reports that he stopped exporting CITES species because, “it was not worth the hassle.”¹³⁴ Because reptiles are often sold as babies, reptiles will grow during shipping delays. The weight that these reptiles gain during delays adds freight costs to the export. The exporter must also pay for feeding and care of the reptile during the delay. Thus, because of CITES, both the timing and the cost of exports of protected reptiles becomes uncertain, adding additional costs and risks to the export of reptiles listed under CITES.

The Lacey Act

The Lacey Act prohibits the purchase, transport, and trade of wildlife taken in violation of any law of the United States or any foreign country. The act also prohibits the import or the inter-state sale of any species determined to be ecologically harmful.¹³⁵ Such a harmful species is

¹³² “Reptiles in the International Trade.” United Nations Environment Programme <http://www.unep-wcmc.org/species/reptiles/reptiles.cfm> (Accessed November 30, 2010)

¹³³ Based on responses to the long business survey.

¹³⁴ Based on responses to the long business survey.

¹³⁵ 16 U.S.C. 42 (____)

called an “injurious wildlife.” The act also prohibits wildlife from being imported into the United States under inhumane conditions.¹³⁶

Proposed Rule to List Nine Constrictors as Injurious Wildlife

On March 12, 2010 the Service proposed a rule to amend its regulations to list nine constrictor species as injurious wildlife under the Lacey Act.¹³⁷ These nine species include:

- Four python species:
- Indian/Burmese Python(*Python molurus*);
- Northern African Python(*Python sebae*);
- Southern African Python (*Python natalensis*);
- Reticulated Python (*Broghammerus reticulatus*);
- Four anaconda species:
- Green Anaconda (*Eunectes murinus*);
- Yellow Anaconda(*Eunectes notaeus*);
- Beni Anaconda(*Eunectes beniensis*);
- DeSchauensee’s Anaconda (*Eunectes deschauenseei*); and
- The Boa Constrictor (*Boa constrictor*)

If the proposed rule is made final:

“live snakes, gametes, or hybrids of the nine species or their viable eggs could be imported only by permit for scientific, medical, educational, or zoological purposes, or without a permit by Federal agencies solely for their own use. The proposed rule, if made final, would also prohibit any interstate transportation of live

¹³⁶ Victoria Bridges, Chris Koprak, and Reginald Johnson. “The Reptile and Amphibian Communities in the United States.” USDA: APHIS:VS Centers for Epidemiology and Animal Health. January 2001. p 20.

¹³⁷ 75 FR 11808; March 12, 2010.

snakes, gametes, viable eggs, or hybrids of the nine species currently held in the United States.”¹³⁸

The rule will have significant direct and indirect economic effects on reptile industry participants.

Impact of the Proposed Rule on Imports.

Under the proposed rule, all imports of the nine constrictor species would be banned. Therefore, the value from all imports of these species would be lost and all importers who brought in these constrictors would realize a reduction in revenues. However, the import ban does not just affect importers. Imported reptiles make their way through many stages of the U.S. reptile distribution chain. Thus, the sales of reptiles at each stage of the distribution chain would also be lost. That is, banning a Boa constrictor prevents the sales of that constrictor from a) an importer to a distributor, b) a distributor to a pet store, and c) a pet store to a pet owner.

From 2005 to June 30, 2010, 133,495 snakes belonging to the nine constrictor species were imported into the United States. Table 4.1 below shows that in this five and a half year period over 70% of these imports were Boa constrictors. No Beni anacondas, DeSchauensee’s anacondas, or Southern African Pythons were imported over this period.

¹³⁸

[Id]

TABLE 4.1	
U.S. Imports of Nine Constrictor Snake Species	
2005 - June 30, 2010	
Snake Type	Number of Reptiles Imported
Boa Constrictor (<i>Boa constrictor</i>)	93,816
Reticulated Python (<i>Broghammerus reticulatus</i>)	17,285
Indian/Burmese Python (<i>Python molurus</i>)	15,904
Green Anaconda (<i>Eunectes murinus</i>)	3,535
Northern African Python (<i>Python sebae</i>)	2,930
Yellow Anaconda (<i>Eunectes notaeus</i>)	25
Total Nine Constrictor Snake Species	133,495
Source: LEMIS data	

Table 4.2 shows that imports of the nine species consistently declined from 2005 to 2010. The table shows that imports of Boas fell by over 40% in 2010 from 2009 levels. This decline can be attributed to the announcement of the proposed rule change by the Service. In short, the fear that Boas would be “outlawed” scares breeders, hobbyists, and pet owners. A similar trend is also observed in Table 4.2 for the eight other constrictors.

TABLE 4.2				
U.S. Imports of Nine Constrictor Species,				
2005 – 2010				
Year	All Nine Constrictors	Boa Constrictors	Other 8 Constrictors	Percent Boas
2005	34,398	22,275	12,123	64.8
2006	29,796	19,814	9,982	66.5
2007	22,409	15,650	6,759	69.8
2008	21,265	15,957	5,308	75
2009	19,186	15,254	3,932	79.5
2010*	12,882	9,612	3,270	74.6
Total	139,936	98,562	41,374	70.4
*2010 imports are estimated				
Source: LEMIS data				

From 1998 to 2008 there were 197 to 270 entities (including businesses and individuals), and institutions (such as universities and zoos) that imported the nine constrictor snakes.¹³⁹

Impact of the Proposed Rule on Exports

Listing these nine constrictors as injurious species will also end the export of all of the relevant snakes that are bred in non-port states. All reptiles must be exported from one of 18 designated ports.¹⁴⁰ Since the inter-state transport of species listed on the Injurious Wildlife list would be illegal, any business not located in a state with a designated port will be unable to legally export any of the restricted snakes. This would be true even for snakes that are captive bred. In short, if the Lacey Act rule change is finalized, breeders in states that do not contain designated ports will no longer be able to export their snakes, because the inter-state transport required to bring these snakes to port would be banned.

From 2005 to 2010, 29,172 snakes belonging to the nine constrictor species were exported from the United States. As with imports, over 70% of the nine constrictor snakes exported were Boa constrictors. No Beni anacondas, DeSchauensee's anacondas, or Southern African Pythons were reported as being exported over this period. (See Table 4.3 below.)

¹³⁹ IRFA, p. 4.

¹⁴⁰ For a complete list of ports see Chapter 2: Participants in the U.S. Reptile Industry, International Trade

Constrictor Type	Number of Reptiles Exported
Boa Constrictor (<i>Boa constrictor</i>)	21,149
Indian/Burmese Python (<i>Python molurus</i>)	4,263
Green Anaconda (<i>Eunectes murinus</i>)	239
Yellow Anaconda (<i>Eunectes notaeus</i>)	1
Reticulated Python (<i>Broghammerus reticulatus</i>)	3,354
Northern African Python (<i>Python sebae</i>)	166
Total – Nine Constrictors	29,172
Source: LEMIS data	

There were 3.3 thousand exports of Boa constrictors in 2005 and 7.8 thousand Boa exports in 2010. Unlike Boa imports, these exports tend to be high-morphs that are in demand by foreign breeders. Exports of the other 8 banned constrictors (also mostly high-value morphs) increased from 2005 to 2008, but exports have dropped significantly in the past two years. (See Table 4.4 below)

Number of Snakes				
Year	Total	Boa's	Other 8	% Boas
2005	3,284	2,261	1,023	68.8
2006	4,704	3,274	1,430	69.6
2007	4,150	2,749	1,401	66.2
2008	7,212	5,151	2,061	71.4
2009	5,909	4,200	1,709	71.1
2010*	7,826	6,916	910	88.4
Total	33,085	24,551	8,534	74.2
*2010 imports are estimated.				
Source: LEMIS data				

A review of the locations of exporters of the nine constrictor species in 2009 shows that roughly 20% of exports (by number) were shipped to ports located out of the exporter's home state.¹⁴¹

Export substitution Under the Proposed Rule

The effects of the FDA's 1975 ban on infant turtles provides some insight on the likely effects of the proposed listing of the nine constrictors with respect to whether domestic producers can shift to only foreign sales of the nine snakes. After the FDA passed its ban on the interstate sale of turtles with a shell lengths under 4 inches, turtle sales collapsed and the turtle businesses suffered significant economic losses. However, the FDA's ban allowed the export of infant turtles. After the 1975 ban, turtle production and sales were reduced to a tiny fraction of the numbers produced and sold before 1975. It took nearly thirty years to establish a large enough foreign customer base to allow turtle farmers to ramp production up even close to pre-ban levels. The severe impacts to turtle businesses occurred even though the FDA's regulation allows for inter-state transport for the purposes of bringing the turtles to port for export. More importantly, the majority of turtles produced in the United States were and still are produced in a port city, Louisiana. Therefore inter-state transport was not as big of an issue for turtle farmers as it is for snake breeders and distributors. Thus, the example set by the FDA turtle regulation suggests that in the short term it is unlikely that domestic sales of the nine snakes will simply shift to foreign sales.

¹⁴¹ The 20% figure underestimates the effect of the ban on exports. Some exporters that are located in port cities often purchase the reptiles that they are exporting from other breeders and distributors. Some of the breeders and distributors that exporters purchase snakes from are located in different states than the exporter. Thus, if the ban were enacted, the exporter would be unable to acquire snakes from breeders and distributors located outside of his home state. We do not know the magnitude of these inter-state transactions.

Impact of the Proposed Rule on U.S. Reptile Businesses

Because more than 99% of reptile businesses are small businesses, the vast majority of businesses that will be impacted by the change to the Lacey Act will be small businesses.¹⁴² Survey responses indicate that distribution of revenues for businesses that sell the nine constrictor snakes roughly matches the distribution of incomes for all reptile businesses. This implies that roughly 99% of all businesses affected by the constrictor snake ban will be small businesses.

Besides banning the inter-state sales of reptiles, the proposed rule change will affect snake prices and holding costs.

Prices

Survey respondents report that prices for each of the nine proposed constrictor species have decreased significantly in direct response to the Service's proposed change to its regulations to list the nine large constrictor snakes as injurious wildlife under the Lacey Act. As expected, the largest price reductions been for morphs. One dealer reports that prices for some Boa constrictor morphs have decreased from \$1000 to \$30. Breeders and potential breeders of Boas have been unwilling to invest in "good" parents (those that exhibit the desired genetic traits) over the last year if they will be limited to intra-state sales of the offspring. That is, buyers of Boas believe that without access to customers across the country, they would not be able to earn an adequate return on their investment to justify purchasing a \$1000 Boa . The lack of demand for these high priced Boas has forced down their price. Given the fact that breeders, pet owners, and retailers are increasingly conducting business at reptile shows and over the internet

¹⁴² GES estimation based on responses to short and long business survey.

and that many breeders increasingly depend on cross country sales generated by the internet and at out of state reptile shows, it is likely that breeders (especially located in non-port states) will not have access to the critical number of customers needed to continue breeding operations of the affected constrictors.

In addition, sellers will no longer have the option of selling their snakes to distributors, because without a national market, it would not be worthwhile for distributors to carry these snakes. Decreased demand in the absence of any other mitigating factor will lead to lower prices.

Holding Costs

Not only will breeders and retailers lose sales but they will be saddled with additional holding costs if they do keep their snakes, once the proposed rule change is finalized. Snakes cost money to keep. If the snakes cannot be sold, given away or disposed of, the current owners will be saddled with the costs of keeping these large and expensive snakes, without the possibility of making money from them. With money and space tied up in housing and feeding these snakes, these breeders and stores will have fewer dollars available to make new purchases. As a consequence, many breeders and stores will slow purchases for new reptiles and equipment. The decrease in purchases negatively impacts other reptile breeders, wholesalers, and product manufacturers. One snake tub manufacturer reports that Boa container sales have stagnated over the last year, leading to an increase in inventories and a decrease in new tub production.

As the additional holding costs become onerous, owners will have four options. One, they can keep the banned snakes and absorb the costs. The higher costs will be a drag on the

company's operations until the snakes die. Snakes are long lived. Some of the banned pythons, such as reticulated pythons and Burmese pythons, can live longer than 20 years.¹⁴³

A second option is that they can give the snakes to someone or some institution that will accept them. Zoos have traditionally taken in unwanted or confiscated snakes as a public service. The number of snakes that the zoos would receive, likely to be in the tens of thousands, would tax the resources of most zoos.

A third option is that snake owners can kill the snakes. This option may be particularly painful for breeders, hobbyists, and enthusiasts who spent years planning the breeding of these snakes and then raising and feeding them.

Finally, there is the option to release the snakes into the wild. Since none of these species are native to the United States, such a release would be illegal in all 50 states. Many of these released snakes would be killed by inhospitable climates. Others would be caught by wildlife authorities and either killed or taken to zoos. In all cases, such a release would act expressly against the intent of listing the constrictors as injurious wildlife. It is an option that few of the breeders we have interviewed would consider.

All of these options put a considerable economic and moral burden on constrictor owners.

The Economic Loss to the Reptile Industry of the Proposed Rule

The magnitude of the economic costs incurred by listing the nine constrictor snakes as injurious wildlife depends in large part on the actions of current Boa and large python breeders. The listing of the constrictors will result in: (1) the lost opportunity to make legal inter-state

¹⁴³ Russ Case. Know How Long Your Reptile Lives. March 13, 2009. <http://www.reptilechannel.com/reptile-blog/russ-case/reptile-impulse-buying.aspx> (Accessed November 29, 2010).

sales; (2) the lost opportunity for some breeders to make foreign sales because they must transport constrictors across state lines to a port city; and, (3) and increased per-unit holding costs from keeping these snakes.

Pet owners who possess but do not breed these nine snake will also bear a significant burden from the listing. Owners that choose keep rather than sell or dispose of their snakes will be limited in where they can move to within the United States over the course of their pet snake's life, narrowing the range of their personal and career options.

We consider two extremes. In one extreme, the Low-Impact Scenario, it is posited that some (but not all) breeders will continue to bred the listed constrictors and to make intra-state sales and (for those who can) foreign sales after the proposal is finalized. At the other extreme, the High-Impact Scenario, it is posited that the combination of higher per-unit costs of breeding and maintaining the listed constrictors as well as the reduced market for the banned snakes (and the concomitant lower prices) make it unprofitable to breed, keep, and sell these snakes. In addition, it is assumed that pet owners who do not breed these snakes will find it overly burdensome to keep their snakes. In this scenario, all revenues derived from these snakes and products and services for these snakes will not be realized after the proposal is finalized.

Low-Impact Scenario

In this scenario, we assume that breeders, retailers, and distributors will continue to make intra-state sales, but that a) no inter-state sales will be made, b) no revenues will be generated from imports, and c) businesses located in designated port cities will continue to export the nine constrictor snakes.

Responses to the short business survey indicate that around 57% of all live reptile sales were made to out-of-state consumers.¹⁴⁴ The listing will therefore likely result in approximately 57% of revenues generated from sales of the nine constrictor species from breeders, distributors, wholesalers, and retailers being lost if the nine snakes are added listed as Injurious Wildlife. Responses to the Major Business Survey also indicate that roughly 11% of revenues from the sale of live reptiles are generated from sales of the nine listed constrictor snakes.¹⁴⁵ Likewise, we also assume that 57% of revenues from ancillary products and services for the nine constrictor snakes will be lost.¹⁴⁶ In addition, we assume that 20% of all revenues from exports will be lost.

Total reptile revenues, including reptile sales as well as ancillary product sales, range from \$1.0 billion to \$1.4 billion per year.¹⁴⁷ Of these revenues, the listed constrictors account for approximately \$75.6 million to \$103.5 million per year. The first-year economic impact of the proposed rule assuming the low-impact scenario is \$42.8 million to \$58.7 million

High-Impact Scenario

We assume that all revenues from breeding, keeping,¹⁴⁸ and selling of the nine constrictor snakes and from products and services for these snakes will be lost.

¹⁴⁴ Data from the Small Business Survey was used because there was insufficient data from responses to the Major Business survey on which to base an estimation of the percentage of total live reptile sales made out of state.

¹⁴⁵ The small business survey indicated that 30% of all revenues from the sale of live reptiles are generated by sales of the nine constrictor species. To be conservative revenues from the sale of the nine constrictor snakes are estimated using the lower 11% figure.

¹⁴⁶ We estimate this amount as 11% of revenues generated from the sale of products and services.

¹⁴⁷ See Chapter 2.

¹⁴⁸ Florida has already enacted strict limitations on keeping Burmese Python, Reticulated pythons, Northern African pythons, Southern African pythons, and Green anacondas. Texas has limited who can

Responses to the Major Business Survey indicate that roughly 11% of revenues from the sale of live reptiles are generated from sales of the nine listed constrictor snakes.¹⁴⁹ We assume that 11% of all ancillary product revenues are generated by sales of products for the nine snakes.¹⁵⁰ Responses to the Major Business Survey also indicate that the listed snakes account for 28% of all snake revenue. We thus estimate that 28% of all veterinary costs for snake including medication, are for the nine constrictor snakes. Therefore, for the high impact scenario estimate, we assume that 11% of reptile sales, 11% of ancillary product sales, and 28% of veterinary costs for snakes will be lost.

Since the high-impact scenario posits that all revenues that the constrictors generate will be lost, the economic loss in the first year assuming this scenario is between \$75.6 million to \$103.6 million.

A summary of the first-year impact of the Lacey Act listing of the nine constrictor species is presented in Table 4.5.

have these snake through a permitting process for northern African rock pythons, Green anacondas, Reticulated pythons, and Southern African pythons.

¹⁴⁹ The small business survey indicated that 30% of all revenues from the sale of live reptiles are generated by sales of the nine constrictor species. To be conservative revenues from the sale of the nine constrictor snakes are estimated using the lower 11% figure.

¹⁵⁰ It is assumed that because the nine listed constrictor snakes make 11% of all reptile sales, products for these nine constrictor snake also make up 11% of all product sales. However the actual amount could be greater or less than 11%

TABLE 4.5		
Estimates of Economic Loss in First Year of Proposed Rule		
	Lower Range (Million \$)	Upper Range (Million \$)
<u>Annual Revenues</u>		
Reptile Industry	977.3	1435.2
Nine Constrictor Species	75.6	103.6
<u>Costs of Listing Constrictors</u>		
Low-Impact Scenario	42.8	58.7
High-Impact Scenario	75.6	103.6

Long-Term Economic Loss

While the one year impact of the listing of nine constrictors is substantial, it is only a fraction of the impact that U.S. reptile businesses will experience over the longer term. To project the economic costs over ten years requires one to project how revenues associated with constrictor snakes will grow, assuming that they are not listed as injurious wildlife under the Lacey Act. Revenues associated with then nine species grew by seven percent for the period of 2008 to 2010.¹⁵¹ However, the general pricing trend among morphs is for prices (and revenues from sales) to fall as breeders produce more of the existing morphs. Thus, a seven percent growth rate is considered an upper bound. A zero growth rate is considered a lower bound rate. We would expect actual growth to be between those two boundaries. Table 4.6 summarizes the revenues that are generated based on a no growth and seven percent growth assumption given the various cost scenarios discussed above.

¹⁵¹ Revenues for 2010 for the nine constrictor species were already substantially reduced because breeders and merchants were panic selling the nine constrictor species in response to the notice of the proposed listing in the Federal register in March of 2010.

TABLE 4.6		
Estimates of Lost Revenues Over First Ten Years of Adding Nine Constrictor Snakes to Injurious Wildlife List		
	No Growth (\$ Million)	7% Growth (Million \$)
<u>High-Impact Scenario</u>		
Lower Bound Estimate	756.0	1,044.5
Upper Bound Estimate	1,036.0	1,431.4
<u>Low-Impact Scenario</u>		
Lower Bound Estimate	428.1	591.5
Upper Bound Estimate	692.8	811.0

We discounted the lost revenues over the ten-year period using a 3.25% discount rate to estimate the present value of that lost revenue stream.¹⁵² The present value of the lost revenues is an estimate of the lost economic value associated with the listing of nine constrictors as injurious wildlife under the Lacey Act. Based on the low- and high-impact scenarios, and an expected 7% growth in constrictor revenues, absent the listing, the economic losses over the first ten years of the listing will be between \$505 million to \$1.2 billion. Assuming no growth, the economic losses over the first ten years will be between \$332 million to \$901 million. (See Table 4.7 below) Under even the most promising circumstances, the long term impact of the listing will be severe.

¹⁵² This is the average Bank Prime Loan Rate for 2010. Federal Reserve bank of St. Louis. <http://research.stlouisfed.org/fred2/categories/117>.

TABLE 4.7		
Estimates of Economic Costs Over First Ten Years of Adding Nine Constrictor Snakes to Injurious Wildlife List		
	No Growth (Million \$)	7% Growth (Million \$)
<u>High-Cost Scenario</u>		
Lower Bound Estimate	657.4	892.3
Upper Bound Estimate	900.9	1,222.8
<u>Low-Cost Scenario</u>		
Lower Bound Estimate	372.3	505.3
Upper Bound Estimate	856.0	692.8

V. CONCLUSIONS

The United States reptile industry is at a crossroads. The last twenty years have seen the ascendancy of American reptile breeders. Their mastery of reptile husbandry has led to a kaleidoscope of magnificently patterned snakes and lizards. Their work has also attracted millions of new pet owners. New manufacturing, wholesaling, promoting, entertaining, rodent breeding, and delivery businesses have emerged to serve all of these new owners. Even older businesses, like worm and cricket breeders and veterinarians, have gained a new customer base due to the rise in the popularity of reptiles as pets.

State and federal laws and regulations concerning reptiles have taken the industry in another direction. They have raised the costs of reptile breeding and selling in the United States. Yet, despite the growing number of regulations and the growing bureaucracies, the reptile industry remains vibrant, even in a flagging economy.

While the industry has weathered many regulations, a ban to limit the sales of nine constrictors will do deep and lasting damage to the very sector of the reptile industry that has helped to drive its growth, snakes. If the Service finalizes a proposed rule change to list nine constrictors as injurious wildlife under the Lacey Act, it will deprive the businesses that depend on these snakes, almost all of them small businesses, of \$76 million to \$104 million *per year* in revenues and result in severe job losses. These revenue losses will continue into the indefinite

future. The economic costs to the industry over the first ten years of the lost revenues are between \$505 million to \$1.2 billion, assuming historical industry sales growth. Even assuming no sales growth, the economic costs over the first ten years are between \$372 million to \$901 million. Under even the most promising circumstances, the long term impact of the listing will be severe.