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Descriptive Analysis Report of Wild Reptile Imports to the United States (2004–2009)



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Abstract: Regulatory authority over the importation of live reptiles is currently divided among several Federal agencies including the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service Veterinary Services (USDA:APHIS:VS), the U.S. Fish and Wildlife Service (FWS), and the Centers for Disease Control and Prevention (CDC). In a 2010 report to the U.S. Senate Committee on Homeland Security and Governmental Affairs, the U.S. Government Accountability Office found that because each of the agencies is focused on different aspects of live animal imports, no single entity has comprehensive responsibility for the zoonotic and animal disease risks posed by live animal imports ([GAO 2010](#)).

This report presents a summary of wild reptile import data collected by the U.S. Fish and Wildlife Service from 2004 to 2009. Imported reptiles have raised serious concerns about the risk they present to both animal and human health in the United States. Reptiles are a known source of human salmonellosis infections and have been responsible for nationwide outbreaks ([CDC 2009](#)). Non-native reptile species (i.e., Burmese python) may become established and negatively impact indigenous wildlife and ecosystems (USDA 2007a). In addition, wild reptile imports may be hosts to exotic ticks that can be introduced to the United States with imported animals. The risk of introduction or re-introduction of zoonotic and livestock diseases to the United States through competent vector ticks via reptiles has occurred in the past and is a concern (USDA 2005; USDA 2007b; CDC 2009).

Keywords: Zoonotic, imported reptiles, ticks, disease risk, emerging trends

Questions or comments on data analysis, contact: Dr. Mary Ann Bjornsen (970) 494-7310; E-mail: cahia@aphis.usda.gov

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Descriptive Analysis Report of Wild Reptile Imports to the United States (2004–2009)



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Authors*

Mary Ann Bjornsen, Project Lead

Patti Rosenfelder, Biological Analyst

Reginald Johnson, Risk Analyst

Carol LoSapio, Technical Writer-Editor

*USDA:APHIS:VS:Centers for Epidemiology and Animal Health
Center for Animal Health Information and Analysis
2150B Center Avenue, MS 2W4, Fort Collins, CO 80526

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Descriptive Analysis Report of Wild Reptile Imports to the United States (2004–2009)

INTRODUCTION

Regulatory authority over the importation of live reptiles is currently divided among several Federal agencies, including the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service Veterinary Services (USDA:APHIS:VS), the U.S. Fish and Wildlife Service (FWS), and the Centers for Disease Control and Prevention (CDC). In a 2010 report to the U.S. Senate Committee on Homeland Security and Governmental Affairs, the U.S. Governmental Accountability Office noted, “The statutory and regulatory framework for live animal imports has gaps that could allow the introduction of diseases to the United States...” The report further states that “...experts noted that because each of the agencies is focused on different aspects of live animal imports, no single entity has comprehensive responsibility for the zoonotic and animal disease risks posed by live animal imports.” ([GAO 2010](#))

This report summarizes wild reptile import data as recorded in the FWS Law Enforcement Management Information System (LEMIS) database for the period from 2004 to 2009. Reptiles have also been the source of multi-state human salmonellosis infections ([CDC 2009](#)). Non-native reptile species (i.e., Burmese python) may become established and negatively impact indigenous wildlife and ecosystems (USDA 2007a). Additionally, wild reptile imports may be hosts to various tick species that are exotic to the United States. Thirty-three exotic species of ticks have been imported to the United States via reptiles in the past 20 years. Six of those species are known vectors of livestock diseases (USDA 2005; USDA 2007b; CDC 2009).

RESULTS

Overall Trends

From 2004 to 2009, over 8.3 million wild reptiles were imported to the United States. The number of reptile imports decreased during this period from nearly 1.8 million animals in 2004 to under 1 million in 2009 (Figure 1)¹. The number of shipments decreased from just fewer than 1,800 to less than 1,300 during this same time. Nine reptile genera were imported to the United States for the first time in 2009. The overwhelming percentage (99.9 percent) of wild reptiles imported to the United States was destined for commercial purposes, while the remaining reptiles were imported for scientific purposes, breeding, and returning reptiles that were personally owned pets.

¹ Shipments containing more than one reptile species were counted once for each species; consequently, the total number of shipments by order, family, and genus appears greater than the actual number of individual shipments shown in Figure 1.

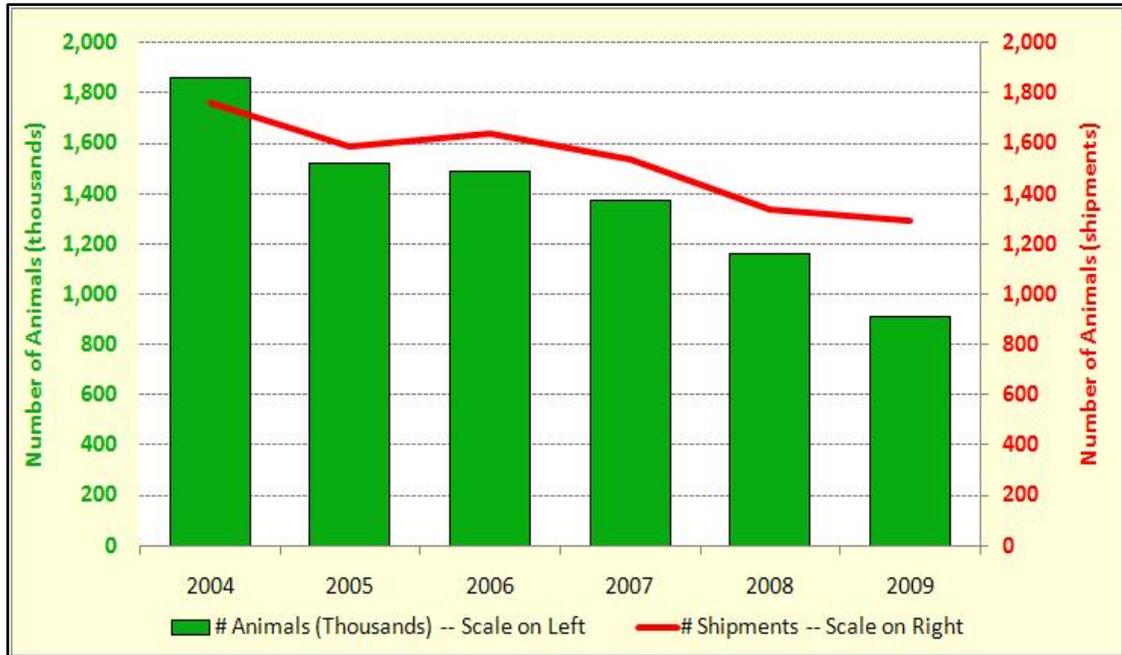


Figure 1. Live reptile imports to the United States 2004–2009

Trends by Family



Five families of reptiles dominated imports From 2004 to 2009 (Figure 2). During this six-year period, there was an overall decreasing trend in the number of animals imported. Gekkonid lizards (861 species) accounted for 22 percent of total reptile imports. Iguanid lizards (39 species) were the second most numerous imports at 21 percent over the reporting period. Agamid lizards (410 species), at 13 percent, were the third most numerous imports and also underwent a steady decline in import numbers. Boas (91 species) and pythons (41 species) were fourth, at 12.7 percent. Lacertid lizards (305 species) were the fifth most commonly imported family at 8 percent. This is a 60 percent decline in number of lacertid lizards from 2008 to 2009 (Figure 2). Several families (Testudinidae, Emydidae, Teiidae, Kinosternidae, and Hydrophiidae) showed an increase in numbers imported from 2008 to 2009; however overall percentage was less than two percent. This included an increase in sea snakes (Hydrophiidae) from 22 in 2008 to 720 in 2009.

The number of shipments of wild reptiles has also declined over the period of analysis from just over 9,000 in 2004 to under 6,500 in 2009 (Figure 3)² and are dominated by four families. The top four families (Gekkonidae, Boidae, Chamaeleonidae, and Agamidae) comprised 51 percent of all shipments.

² Shipments containing more than one reptile species were counted once for each species; consequently, the total number of shipments by order, family, and genus appears greater than the actual number of individual shipments shown in Tables 1 and 2.

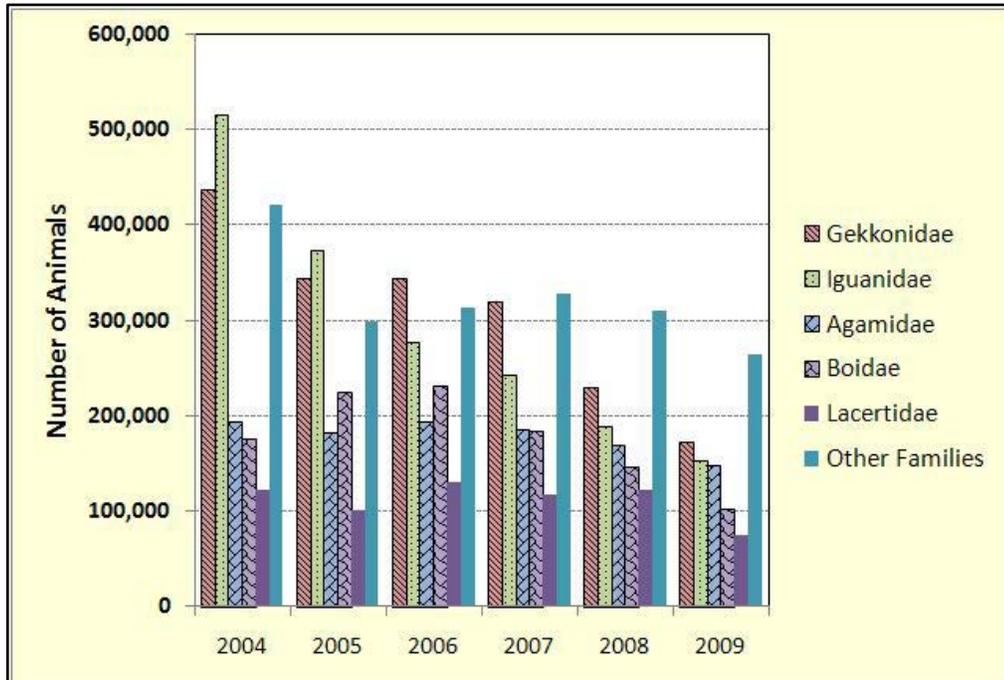


Figure 2. Top reptile families imported to the United States 2004–2009 (number of animals)

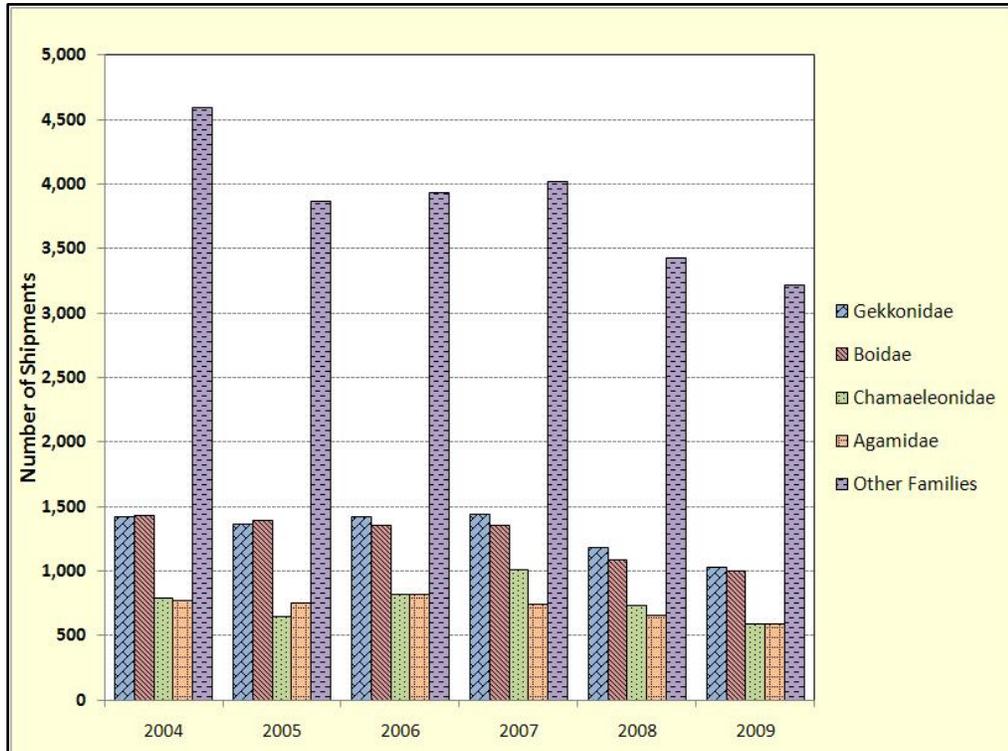


Figure 3. Shipments of reptiles imported to the United States, 2004–2009 (number of shipments by family)

Trends by Genus



The genus *Iguana*, comprised of two species, accounted for 13 percent (118,852) of wild reptile imports in 2009, and 17 percent (1,448,991) of the total for all 6 reporting years (Tables 1 and 2²). The genus *Hemidactylus*, commonly referred to as “house geckos” and encompassing over 90 species, represented 8 percent (74,693) of imports in 2009 and 11 percent of total reptile imports From 2004 to 2009. The genus *Python* comprised 8 percent (75,177) of imported reptiles in 2009 and 10 percent of the total reptile imports for the reporting period. Seventeen species are included in this genus. Oriental racers (*Takydromus*) and water dragons (*Physignathus*) accounted for 7.8 percent and 7.6 percent, respectively, of reptile imports for 2009.

Nine genera imported to the United States for the first time in 2009 came from new countries of origin. These included boas (*Boidae*) from Brazil, snakes (*Dromicodryas* and *Leptophis*) from Madagascar , and the Central Asian pit viper (*Gloydius intermedius*) from Germany. These were all imported for commercial purposes.

Over all, the number of reptile shipments decreased from 2008 to 2009 by 9 percent. Contrary to this trend, 2 of the top 15 genera, *Varanus* (monitor lizards) and *Morelia* (carpet and green tree pythons increased in shipments from 2008 to 2009 (Table 2).

Table 1. Top 15 reptile genera imported to the United States, 2004–2009 by number of animals

| Genus(example) | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|------------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|----------------|------------|------------------|------------|
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| Iguana (iguana) | 416,669 | 22 | 317,518 | 21 | 242,056 | 16 | 198,785 | 14 | 155,111 | 13 | 118,852 | 13 | 1,448,991 | 17 |
| Hemidactylus (house gecko) | 221,850 | 12 | 174,270 | 11 | 192,707 | 13 | 165,483 | 12 | 106,054 | 9 | 74,693 | 8 | 935,057 | 11 |
| Python (python) | 139,740 | 8 | 191,114 | 13 | 157,395 | 11 | 155,136 | 11 | 117,421 | 10 | 75,177 | 8 | 835,983 | 10 |
| Takydromus (Oriental racers) | 107,138 | 6 | 96,995 | 6 | 123,524 | 8 | 107,173 | 8 | 112,482 | 10 | 71,138 | 8 | 618,450 | 7 |
| Physignathus (water dragon) | 103,825 | 6 | 88,783 | 6 | 94,821 | 6 | 89,864 | 7 | 81,134 | 7 | 68,792 | 8 | 527,219 | 6 |
| Trionyx (turtle) | 118,757 | 6 | 48,487 | 3 | 44,749 | 3 | 44,145 | 3 | 63,157 | 5 | 48,354 | 5 | 367,649 | 4 |
| Gekko (gecko) | 75,235 | 4 | 61,452 | 4 | 61,168 | 4 | 55,796 | 4 | 41,415 | 4 | 31,189 | 3 | 326,255 | 4 |
| Varanus (monitor lizard) | 45,358 | 2 | 38,462 | 3 | 39,498 | 3 | 39,898 | 3 | 33,137 | 3 | 32,581 | 4 | 228,934 | 3 |
| Chamaeleo (chameleons) | 30,464 | 2 | 26,217 | 2 | 28,774 | 2 | 34,959 | 3 | 20,659 | 2 | 15,498 | 2 | 156,571 | 2 |
| Testudo (tortoise) | 19,814 | 1 | 21,766 | 1 | 39,627 | 3 | 27,154 | 2 | 23,647 | 2 | 22,034 | 2 | 154,042 | 2 |
| Mabuya (skink) | 22,222 | 1 | 18,536 | 1 | 21,398 | 1 | 25,633 | 2 | 21,048 | 2 | 16,682 | 2 | 125,519 | 2 |
| Boa (boa constrictor) | 25,787 | 1 | 23,044 | 2 | 22,245 | 1 | 17,405 | 1 | 18,572 | 2 | 15,743 | 2 | 122,796 | 1 |
| Pogona (dragon) | 14,118 | 1 | 14,457 | 1 | 14,997 | 1 | 16,722 | 1 | 23,398 | 2 | 28,851 | 3 | 112,543 | 1 |
| Rhampholeon (chameleon) | 17,355 | 1 | 10,707 | 1 | 14,449 | 1 | 22,527 | 2 | 21,107 | 2 | 18,903 | 2 | 105,048 | 1 |
| Uromastyx (lizard) | 17,412 | 1 | 22,760 | 1 | 20,588 | 1 | 17,036 | 1 | 16,638 | 1 | 7,863 | 1 | 102,297 | 1 |
| Trachemys (slider) | 32,101 | 2 | 1,641 | 0 | 1,636 | 0 | 13,708 | 1 | 20,319 | 2 | 30,663 | 3 | 100,068 | 1 |
| Other Genera | 454,584 | 24 | 364,080 | 24 | 365,221 | 25 | 341,096 | 25 | 288,162 | 25 | 234,383 | 26 | 2,047,526 | 25 |
| Grand Total | 1,862,429 | 100 | 1,520,289 | 100 | 1,484,853 | 100 | 1,372,520 | 100 | 1,163,461 | 100 | 911,396 | 100 | 8,314,948 | 100 |

Table 2. Top 15 reptile genera imported to the United States 2004–2009 by number of shipments

| Genus(example) | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|---|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|---------------|------------|
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| <i>Varanus</i> (monitor lizards) | 690 | 8 | 608 | 8 | 604 | 7 | 571 | 7 | 508 | 7 | 555 | 9 | 3,536 | 7 |
| <i>Chameleo</i> (chameleon) | 491 | 5 | 422 | 5 | 536 | 6 | 634 | 7 | 405 | 6 | 315 | 5 | 2,803 | 6 |
| <i>Python</i> (Burmese, Indian) | 506 | 6 | 528 | 7 | 422 | 5 | 404 | 5 | 301 | 4 | 281 | 4 | 2,442 | 5 |
| <i>Gekko</i> (gecko) | 371 | 4 | 389 | 5 | 387 | 5 | 375 | 4 | 277 | 4 | 238 | 4 | 2,037 | 4 |
| <i>Corallus</i> (neotropical tree boas) | 192 | 2 | 188 | 2 | 213 | 3 | 224 | 3 | 190 | 3 | 173 | 3 | 1,180 | 2 |
| <i>Boa</i> (boa constrictor) | 210 | 2 | 189 | 2 | 191 | 2 | 197 | 2 | 171 | 2 | 149 | 2 | 1,107 | 2 |
| <i>Morelia</i> (carpet python, green tree python) | 165 | 2 | 173 | 2 | 191 | 2 | 163 | 2 | 127 | 2 | 153 | 2 | 972 | 2 |
| <i>Iguana</i> (green iguana, Lesser Antillean iguana) | 230 | 3 | 177 | 2 | 164 | 2 | 147 | 2 | 118 | 2 | 103 | 2 | 939 | 2 |
| <i>Mabuya</i> (long-tailed skinks) | 188 | 2 | 131 | 2 | 156 | 2 | 191 | 2 | 142 | 2 | 116 | 2 | 924 | 2 |
| <i>Uroplatus</i> (flat- or leaf-tailed geckos) | 111 | 1 | 160 | 2 | 117 | 1 | 142 | 2 | 133 | 2 | 127 | 2 | 790 | 2 |
| <i>Acanthosaura</i> (mountain horned dragons) | 107 | 1 | 130 | 2 | 167 | 2 | 148 | 2 | 125 | 2 | 108 | 2 | 785 | 2 |
| <i>Takydromus</i> (grass lizards, oriental racers) | 128 | 1 | 136 | 2 | 146 | 2 | 139 | 2 | 121 | 2 | 94 | 1 | 764 | 2 |
| <i>Geochelone</i> (star tortoise, spurred tortoise) | 175 | 2 | 161 | 2 | 182 | 2 | 166 | 2 | 63 | 1 | 8 | 0 | 755 | 2 |
| <i>Hemidactylus</i> (house geckos) | 148 | 2 | 123 | 2 | 139 | 2 | 141 | 2 | 98 | 1 | 65 | 1 | 714 | 2 |
| <i>Physignathus</i> (water dragons) | 125 | 1 | 116 | 1 | 132 | 2 | 126 | 1 | 118 | 2 | 93 | 1 | 710 | 1 |
| Other Genera | 5,181 | 57 | 4,397 | 55 | 4,611 | 55 | 4,804 | 56 | 4,202 | 59 | 3,859 | 60 | 27,054 | 57 |
| Grand Total | 9,018 | 100 | 8,028 | 100 | 8,358 | 100 | 8,572 | 100 | 7,099 | 100 | 6,437 | 100 | 47,512 | 100 |

Trends by Exporting Country

From 2004 through 2009, 128 countries exported wild reptiles to the United States. Table 3 shows the top 10 countries by number of animals during this period. These 10 countries have remained the top 10 exporting countries for number of animals since 2004, and supplied 83 percent of all reptiles imported to the United States From 2004 to 2009.

Vietnam was the primary supplier of reptiles to the United States, exporting 2,266,580 reptiles, and accounting for 27 percent of total reptile imports. El Salvador was the second most frequent exporter, with 1,209,192 reptiles exported, or 14 percent of the total imports. Over all, reptile exports from the top ten countries from 2008 to 2009 decreased except for Colombia, which increased by 13.8 percent.

Table 3. Top 10 countries of exportation for reptiles imported to the United States, 2004–2009 (countries sorted by total number of animals exported 2004–2009)

| Country of Export | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|--------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|----------------|------------|------------------|------------|
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| Vietnam | 437,529 | 24 | 384,168 | 25 | 462,713 | 31 | 404,198 | 29 | 333,402 | 29 | 244,570 | 27 | 2,266,580 | 27 |
| El Salvador | 326,618 | 18 | 236,423 | 15 | 199,336 | 13 | 183,526 | 13 | 152,704 | 13 | 110,585 | 12 | 1,209,192 | 14 |
| Ghana | 77,641 | 4 | 108,861 | 7 | 100,948 | 7 | 105,220 | 8 | 107,274 | 9 | 91,353 | 10 | 591,297 | 7 |
| Indonesia | 119,095 | 6 | 119,656 | 8 | 87,447 | 6 | 96,916 | 7 | 68,692 | 6 | 56,560 | 6 | 548,366 | 7 |
| Togo | 98,094 | 5 | 118,683 | 8 | 95,794 | 6 | 84,599 | 6 | 58,668 | 5 | 46,343 | 5 | 502,181 | 6 |
| Tanzania | 79,379 | 4 | 56,432 | 4 | 75,600 | 5 | 106,587 | 8 | 83,344 | 7 | 65,623 | 7 | 466,965 | 5 |
| Thailand | 131,034 | 7 | 82,681 | 5 | 52,608 | 4 | 48,748 | 4 | 62,302 | 5 | 56,570 | 6 | 433,943 | 5 |
| Colombia | 125,359 | 7 | 106,111 | 7 | 71,524 | 5 | 27,213 | 2 | 26,289 | 2 | 30,513 | 4 | 387,009 | 6 |
| Egypt | 77,389 | 4 | 41,173 | 3 | 42,719 | 3 | 46,201 | 3 | 33,885 | 3 | 18,245 | 2 | 259,612 | 3 |
| Benin | 51,700 | 3 | 39,719 | 3 | 38,370 | 3 | 53,271 | 4 | 32,139 | 3 | 11,399 | 1 | 226,598 | 3 |
| Other Countries | 338,591 | 18 | 226,382 | 15 | 257,794 | 17 | 216,041 | 16 | 204,762 | 18 | 179,635 | 20 | 1,423,205 | 17 |
| Grand Total | 1,862,429 | 100 | 1,520,289 | 100 | 1,484,853 | 100 | 1,372,520 | 100 | 1,163,461 | 100 | 911,396 | 100 | 8,314,948 | 100 |

Table 4 shows the top 10 countries by number of shipments from 2004 through 2009.

Table 4. Top 10 countries of exportation for shipments of reptiles imported to the United States, 2004–2009 (countries sorted by total number of shipments exported 2004–2009)

| Country of Export | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|--------------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| Indonesia | 136 | 8 | 129 | 8 | 116 | 7 | 135 | 9 | 124 | 9 | 102 | 8 | 742 | 8 |
| Guyana | 92 | 5 | 107 | 7 | 92 | 6 | 141 | 9 | 127 | 10 | 117 | 9 | 676 | 7 |
| Vietnam | 123 | 7 | 114 | 7 | 119 | 7 | 118 | 8 | 104 | 8 | 87 | 7 | 665 | 7 |
| Ghana | 97 | 5 | 114 | 7 | 105 | 6 | 103 | 7 | 117 | 9 | 111 | 9 | 647 | 7 |
| Canada | 107 | 6 | 137 | 9 | 169 | 10 | 63 | 4 | 65 | 5 | 90 | 7 | 631 | 7 |
| El Salvador | 140 | 8 | 104 | 7 | 108 | 7 | 102 | 7 | 90 | 7 | 67 | 5 | 611 | 7 |
| Tanzania | 91 | 5 | 67 | 4 | 93 | 6 | 125 | 8 | 100 | 8 | 72 | 6 | 548 | 6 |
| Nicaragua | 93 | 5 | 52 | 3 | 69 | 4 | 64 | 4 | 51 | 4 | 45 | 4 | 374 | 4 |
| Togo | 83 | 5 | 71 | 4 | 64 | 4 | 58 | 4 | 39 | 3 | 35 | 3 | 350 | 4 |
| Thailand | 82 | 5 | 62 | 4 | 49 | 3 | 33 | 2 | 29 | 2 | 65 | 5 | 320 | 4 |
| Other Countries | 715 | 41 | 628 | 40 | 652 | 40 | 594 | 39 | 494 | 37 | 501 | 39 | 3,584 | 39 |
| Grand Total | 1,759 | 100 | 1,585 | 100 | 1,636 | 100 | 1,536 | 100 | 1,340 | 100 | 1,292 | 100 | 9,148 | 100 |

Trends by Port of Entry

The United States has 17 designated wildlife ports of entry. Additional border ports, authorized by the FWS, may accept shipments of wildlife if the shipments do not require a permit under Title 50 of the Code of Federal Regulations and if the shipments originated from and are destined for the United States ([CFR Title 50 Part 14](#)).

The top 10 ports of entry over the period 2004–2009 are shown in Table 5. The ports at Miami, Los Angeles, Dallas/Fort Worth, and New York received 98 percent of all reptiles imported from 2004 through 2009. Miami and Los Angeles accounted for 85 percent of these imports, which totaled 736,674 reptiles in 2009, down from 971,370 in 2008. The ports of Detroit, New Orleans, Houston, and Denver did show increases but they were less than 1 percent of the number of reptiles received in 2009 compared with 2008.

Table 5. Top 10 ports of entry 2004–2009 (number of animals)

| Country of Export | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|-----------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|----------------|------------|------------------|------------|
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| Miami, FL | 918,770 | 49 | 835,720 | 55 | 818,723 | 55 | 672,618 | 49 | 548,218 | 47 | 436,202 | 48 | 4,230,251 | 51 |
| Los Angeles, CA | 673,622 | 36 | 457,780 | 30 | 445,033 | 30 | 510,001 | 37 | 423,152 | 36 | 300,472 | 33 | 2,810,060 | 34 |
| Dallas/Fort Worth, TX | 104,727 | 6 | 64,233 | 4 | 101,415 | 7 | 89,716 | 7 | 88,509 | 8 | 86,201 | 10 | 534,801 | 6 |
| New York, NY | 119,915 | 7 | 98,395 | 7 | 78,521 | 5 | 63,524 | 5 | 76,247 | 7 | 61,356 | 7 | 497,958 | 6 |
| Baltimore, MD | 15,667 | 1 | 22,517 | 2 | 15,659 | 1 | 13,848 | 1 | 7,938 | 1 | 6,137 | 1 | 81,766 | 1 |
| San Francisco, CA | 7,952 | 0 | 737 | 0 | 8,294 | 1 | 5,700 | 0 | 3,111 | 0 | 231 | 0 | 26,025 | 0 |
| Detroit, MI | 3,579 | 0 | 20,078 | 1 | 23 | 0 | 5 | 0 | 0 | 0 | 25 | 0 | 23,710 | 0 |
| New Orleans, LA | 500 | 0 | 0 | 0 | 1,000 | 0 | 3,000 | 0 | 7,000 | 1 | 10,685 | 1 | 22,185 | 0 |
| Houston, TX | 21 | 0 | 10,380 | 1 | 75 | 0 | 6,212 | 1 | 674 | 0 | 3,079 | 0 | 20,441 | 0 |
| Denver, CO | 2,014 | 0 | 487 | 0 | 6,068 | 0 | 4,098 | 0 | 511 | 0 | 1,027 | 0 | 14,205 | 0 |
| Other Ports | 15,662 | 0 | 9,962 | 7 | 10,042 | 1 | 3,798 | 0 | 8,101 | 1 | 5,981 | 1 | 53,546 | 1 |
| Grand Total | 1,862,429 | 100 | 1,520,289 | 100 | 1,484,853 | 100 | 1,372,520 | 100 | 1,163,461 | 100 | 911,396 | 100 | 8,314,948 | 100 |

From 2004 to 2009, Miami and Los Angeles received 73 percent (6,668) of imported reptile shipments (Table 6). There was a general decline in the number of shipments for most ports in 2009, with the ports of New York, Dallas/Fort Worth, Buffalo/Niagara Falls, Baltimore and Chicago showing small increases.

Table 6. Top 10 ports of entry 2004–2009 (number of shipments)

| Port of Entry | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|---------------------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| Miami, FL | 798 | 45 | 740 | 47 | 779 | 48 | 804 | 52 | 713 | 53 | 654 | 51 | 4,488 | 49 |
| Los Angeles, CA | 471 | 27 | 378 | 24 | 336 | 20 | 385 | 25 | 330 | 25 | 280 | 22 | 2,180 | 24 |
| New York, NY | 121 | 7 | 95 | 6 | 86 | 5 | 72 | 5 | 58 | 4 | 89 | 7 | 521 | 6 |
| Dallas/Fort Worth, TX | 66 | 4 | 56 | 4 | 74 | 5 | 69 | 5 | 75 | 6 | 83 | 6 | 423 | 5 |
| Buffalo/Niagara Falls, NY | 53 | 3 | 70 | 4 | 110 | 7 | 16 | 1 | 20 | 2 | 24 | 2 | 293 | 3 |
| Nogales, AZ | 39 | 2 | 21 | 1 | 48 | 3 | 11 | 1 | 10 | 1 | 7 | 1 | 136 | 2 |
| Baltimore, MD | 32 | 2 | 37 | 2 | 26 | 2 | 12 | 1 | 8 | 1 | 11 | 1 | 126 | 1 |
| San Francisco, CA | 19 | 1 | 18 | 1 | 21 | 1 | 33 | 2 | 22 | 2 | 9 | 1 | 122 | 1 |
| Chicago, IL | 18 | 1 | 11 | 1 | 27 | 2 | 14 | 1 | 8 | 1 | 11 | 1 | 89 | 1 |
| El Paso, TX | 35 | 2 | 29 | 2 | 17 | 1 | 4 | 0 | 2 | 0 | | 0 | 87 | 1 |
| Other Ports | 107 | 0 | 130 | 0 | 112 | 7 | 116 | 8 | 94 | 7 | 124 | 10 | 683 | 7 |
| Grand Total | 1,759 | 100 | 1,585 | 100 | 1,636 | 100 | 1,536 | 100 | 1,340 | 100 | 1,292 | 100 | 9,148 | 100 |

DISCUSSION



The U.S. wild reptile trade decreased from 2004 to 2009, with a total of 900,000 reptiles being imported as a part of 1,300 shipments. The 900,000 wild reptiles and 1,300 shipments that were imported in 2009 represent slightly more than a 50 percent reduction in the number of reptiles imported in 2004 (1,800,000) and a 27 percent reduction in the number of shipments in 2004 (1,759). Imported wild reptiles and other imported animals have raised serious concerns about the risk that these animals present to both animal and human health in the United States and globally.

Reptiles (frogs, turtles, lizards, and snakes) are a known source of human salmonellosis and have been responsible for nationwide outbreaks of salmonella infections (CDC 2009).

Non-native reptile species (i.e., Burmese python) may become established and negatively impact indigenous wildlife and ecosystems (USDA 2007a).

Imported wild reptiles are frequently infested with numerous species of ticks that serve as vectors for a variety of infectious diseases (USDA 2005). Two exotic diseases of potentially serious economic concern to animal health in the United States that can be transmitted by tick-infested imported reptiles are cattle fever (babesiosis) and heartwater (ehrlichiosis.) Four species of *Amblyomma* ticks have been introduced into the United States (*Amblyomma variegatum*, *A. sparsum*, *A. marmoreum*, and *A. dissimile*), and all are competent vectors of the rickettsial agent that causes heartwater, a disease of domestic and wild ruminants (USDA 2007b). All four *Amblyomma* species have been found on imported reptiles. The U.S. cattle fever tick eradication program was initiated in 1906 to free the national cattle herd of bovine babesiosis, transmitted by the tick vector

Rhipicephalus (formerly *Boophilus*) *annulatus*. The disease was mostly eradicated in 1943, but the program has remained active since 1943 to prevent re-emergence of babesiosis. Recently, research funds to support an exhaustive list of objectives were approved for the five-year period from October 2009 to September 2014 (USDA 2009). The accidental re-introduction of babesiosis through importation of tick-infested wild reptiles could seriously hamper decades of progress by the cattle fever tick eradication program in Texas (Perez de Leon 2010).

The decrease in wild reptile imports from 2004 to 2009 could theoretically decrease the risk of importing parasitic vectors of cattle fever and heartwater. According to the FWS, the decrease in imports during recent years was due in part to the economic recession in the United States as well as an increase in user fees imposed by the FWS (GAO 2010). Wild reptiles were in greater demand in commercial pet trade during the years leading up to the recession, and while this demand appears to have been tempered by the recession, the demand may grow as the U.S. economy continues to recover. Thus, while it may be tempting to suggest that risk of disease transmission by imported wild reptiles may be decreasing due to the decrease in recent imports, the decrease in risk may be transient.

CONCLUSION



This report presents a descriptive summary and analysis of live reptile imports to the United States From 2004 to 2009, and provides a brief description of the potential for introduction of disease vectors via imported reptiles. The 2010 GAO report concluded with seven recommendations for Federal agencies to decrease the risk of importation of live animals carrying zoonotic and animal diseases and disease vectors. For reptiles, concentrating surveillance and inspection efforts on the ports that receive the vast majority of reptile imports (Miami and Los Angeles) may be a cost-effective method for reducing the risk of disease introduction (GAO 2010). Although there is a trend of steadily declining reptile imports, the popularity of reptiles as pets remains stable. The 2011–2012 Survey from the American Pet Products Association found that 13 million reptiles are kept as pets in 4.6 million households (APPA 2011). To evaluate risk of disease and vector introduction, cooperation and communication between the Federal agencies charged with regulatory authority over reptile imports would enhance our ability to assess potential and actual risk factors, mitigate risks at ports of entry, and strengthen our ability to protect animal and public health.

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USDA:APHIS:Veterinary Services:Centers for Epidemiology and Animal Health

Center for Animal Health Information and Analysis

2150B Centre Avenue, Mail Stop 2W4

Fort Collins, CO 80526-8117

E-mail: CEAH@aphis.usda.gov

(Phone) 970-494-7000 (FAX) 970-494-7319

http://www.aphis.usda.gov/animal_health/emergingissues

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