Scales and Tails

The Welfare and Trade of Reptiles Kept as Pets in Canada

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INTRODUCTION

Wild reptiles throughout the world are in peril. In addition to the ongoing threat of habitat destruction, commercial exploitation for the pet and meat trade rank among the most significant threats to reptiles as entire populations are stripped from wild habitats. Few, if any, species are safe.

While this introduction was being written, the World Wildlife Fund issued a media release entitled *WWF Announces 10 Most Wanted Species*.[1] Two of the species listed were reptiles. The release was part of an effort to highlight wildlife trade issues in advance of the 2004 Convention on International Trade in Endangered Species (CITES) meeting.

The Pig-Nosed turtle, a large, unusual, freshwater turtle from Papua New Guinea, Indonesia and Australia, was the first reptile listed. Valued by collectors around the world, this turtle is in high demand in the pet trade. All 10 species of Leaf-tailed geckos, small Madagascar lizards, were the second listing. Threatened by pet trade collectors and loss of habitat, this unique group of lizards is in trouble and may not survive.

Here in Canada, an astounding 62% of native reptile species are listed as being at risk by COSEWIC (Committee on the Status of Endangered Wildlife in Canada).[2] While there are many factors, such as habitat destruction and road kills, causing the decline of Canadian reptile populations, a contributing factor is the incidental and organized collection of reptiles for the pet trade.

In addition to the millions of reptiles that are removed from wild habitats each year, millions more are bred in captivity. Here in Canada, thousands of wild-caught and captive reptiles are imported, exported, bought, sold, traded and given away each year. All of these animals are part of a vast, poorly regulated, largely unknown international trade that causes the suffering and death of millions of individual reptiles each year.

To date, very little has been published about the reptile pet trade in Canada and the animal welfare, conservation and human health concerns associated with it. *Scales and Tails: The Welfare and Trade of Reptiles Kept As Pets In Canada* is a small step toward filling that void. It provides an overview of some of the major issues associated with the trade and keeping of reptiles as pets; a cursory look at the reptile pet industry; and a review of Canadian reptile import/export trade data for species listed under the Convention on International Trade in Endangered Species (CITES).

The information contained in this report has been compiled from hundreds of different sources. The import and export statistics were compiled from Environment Canada CITES permits obtained through the federal Access to Information process.

WSPA recognizes that reptile pet keeping is a relatively widespread practice and that segments of the Canadian reptile pet trade may be growing. We also recognize that a small number of private reptile keepers are highly qualified individuals who make every effort to husband their reptiles as humanely as possible. Many of these people are also ardent reptile conservationists.

However, as this report indicates, the trade and keeping of reptiles as pets has caused significant animal suffering, disrupted natural ecosystems and threatened human health and safety. For these reasons, WSPA is opposed to the commercial trade and keeping of live reptiles as pets.

The main aims of this report are to:

- create interest in the largely unknown plight of reptiles kept as pets in Canada;
- generate support for restricting or prohibiting the trade, sale and keeping of live reptiles;
- prompt improvements in the welfare of reptiles already held in captivity.

WSPA urges reptile pet keepers and sellers to carefully consider:

- the enormous numbers of individual reptiles in trade;
- the role the reptile pet trade plays in the decline of wild reptile populations;
- the suffering inherent in the captivity of most reptiles; and
- the human health costs associated with the keeping of reptiles as pets

WSPA strongly encourages reptile pet keepers to carefully consider the information in this report. We hope that many will put aside their own self-interest in the interest of reptile welfare, conservation and human health. By choosing not to be a part of this largely wasteful, destructive and unnecessary industry, both reptiles and humans will benefit.

No doubt, many reptile enthusiasts will argue an alternative point of view and challenge the information, opinions and analysis contained in this report. WSPA welcomes constructive criticism and discussion that raises the profile of reptile issues and that results in improvements to the welfare of reptiles.

"Here in Canada, an astounding 62% of native reptile species are listed as being at risk."

WHAT ARE REPTILES?

Reptiles are a Class of vertebrate animals comprised of more than 6,600 species worldwide. The other Classes of vertebrate animals are fish, amphibians, birds and mammals.

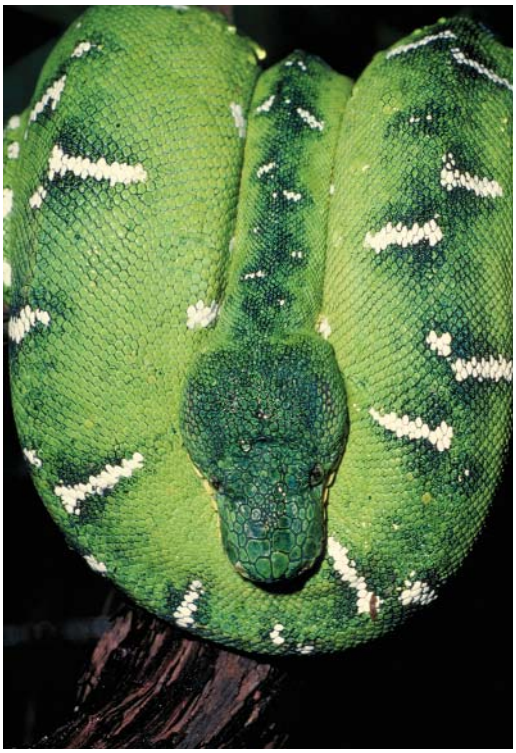
The Class Reptilia is divided into four Orders of living reptiles. They are the Chelonia (turtles, tortoises and terrapins), Squamata (lizards and snakes), Crocodylia (crocodiles, alligators and gavials) and Rhynchocephalia, comprised of a single species, the Tuatara *(Sphenodon punctatus)*, a lizard-like reptile found only on several small New Zealand islands. Only two Orders, Chelonia and Squamata are native to Canada.

Reptiles have a number of unique characteristics that make them different from other kinds of animals, although in isolation, no single characteristic is unique to reptiles alone.

Most reptiles are ectothermic, meaning their body temperature is dictated by the ambient temperature of their environment and particularly by solar radiation. In the past, reptiles were labeled "cold blooded" but are now more commonly referred to as ectothermic or poikilothermic (having variable body temperatures). A few reptiles, such as the giant sea turtles, large monitor lizards and crocodilians are able to exert some control over their internal body temperature, through gigantothermy (maintaining a high temperature through sheer size) and heat generation through muscular activity, so they are not entirely ectothermic.

Reptiles produce amniotic eggs with leathery shells that are laid on land. The eggs are fertilized internally. However, some reptiles have evolved viviparity with the development of placentation, while others are ovoviviparous, meaning they retain and hatch their eggs internally. There are no larval forms as in amphibians.

Reptiles have dry skin with scales which are made of keratin, the same material that fingernails are made of, and none have feathers or hair. They have well developed lungs and a three chambered heart (except crocodilians which have a four chambered heart). Skeletal features may include limbs, usually with five clawed fingers or toes. Numerous other characteristics are shared by reptiles but they are too numerous to mention in this publication.



"Reptiles have a number of unique characteristics that make them different from other kinds of animals,..."

OVERVIEW OF ISSUES

Throughout Canada, thousands of private individuals keep reptiles as pets. Everything from common corn snakes to anacondas, anoles to monitor lizards, crocodilians to venomous reptiles and even very rare species can be found in the homes of reptile hobbyists.

Pet keepers are now able to purchase hundreds of different reptile species through internet suppliers, reptile shows and fairs, pet stores and by direct import.

The reptile pet trade has experienced significant growth during the past fifteen years, with many millions of individual reptiles now being bought, sold and traded annually around the world. According to the *American Pet Products Manufacturers Association 2005-2006 National Pet Owner's Survey* the number of reptiles and amphibians being kept as pets in the United States, the world's largest consumer of reptiles, increased by 22% from 2002.[3] The biggest consumer markets for pet reptiles are North America (including Canada), the European Community and Japan.

While a proportion of animals in the reptile pet trade are captive-bred, a large number are still caught from the wild with potentially devastating consequences to wild reptile populations. Collection for the pet trade is recognized as a major threat to wild reptiles in many areas of the world.

The reptile pet trade also has a negative impact on individual animal welfare. During the past several years, the Humane Society of the United States, International Fund for Animal Welfare and the UK-based Animal Aid and Royal Society for the Prevention of Cruelty to Animals have published materials highlighting the suffering of reptiles during capture, holding, transit and post-purchase, and the unacceptable levels of mortality inherent during each step of the trade process.[4]

Many reptiles are held and shipped in unsanitary, inhumane conditions, without food, water or proper environmental conditions.[5] When they reach the pet store, they are often poorly maintained, malnourished and ill. Even when their most basic physical survival needs are satisfied, their full range of biological and behavioural needs are typically ignored.

Remarkably, a significant number of reptile exporters, importers, retailers and hobbyists still seem to hold the belief that reptiles are relatively simple creatures that are highly adaptable to captive conditions. There often seems to be only minimal recognition that reptiles have evolved very specific, often complex biological and ethological needs that must be satisfied in captive situations to keep their welfare at an acceptable level.

A cursory review of popular pet industry reptile care publications supports the notion that minimal attention is paid to the biological and ethological needs of captive reptiles. Many care guides promote the keeping of reptiles in extremely restrictive environments, such as small aquariums (that were originally designed for the display of fish), plastic containers and terrariums with the most basic environmental conditions.

Many of these containers provide reptiles with no real opportunity for natural movement, especially for highly active, fast moving reptiles. Other larger enclosures permit limited locomotor activity, which in some cases may include walking, climbing and/or swimming.

Unfortunately, it seems many reptile breeders hold the belief that as long as reptiles remain alive, free from obvious disease and/or are breeding, then their health and welfare must be satisfactory. Unfortunately, that may not be the case.

Many animals can survive and even reproduce in poor conditions, so feeding and reproduction are not necessarily indicators of acceptable welfare.[6] For example, many breeders keep their reptiles in barren, clinical conditions that bear no resemblance at all to the kinds of wild environments those animals have evolved to live in. Their normal movement patterns and behaviours are suppressed, and in many cases, entirely eliminated. Yet, these animals still feed (although some may have to be force fed) and, if certain key conditions are met, they may breed. Does that mean their welfare is high? The short answer is no.

In the wild, reptiles live in complex environments where they engage in a range of movements and behaviours. They run, jump, climb, burrow and swim. They forage for food, track prey, establish territories, find appropriate locations for thermoregulation, search for mates, ward off or evade predators, dig burrows, protect nests, socialize and engage in a broad range of other movements and behaviours. Even many "sit-and-wait" predators don't just sit in one spot all the time, but may move from one location to another over relatively expansive areas engaging a range of complex behaviours as they do so. All of their activities are influenced by a broad range of natural factors, some challenging, others rewarding, that cannot be duplicated, except perhaps superficially, in captivity.

"Even many "sit-and-wait" predators don't just sit in one spot all the time, ..."

The keeping of many kinds of reptiles in captivity is even more concerning because their natural lifestyles in the wild, particularly those species that are new to the pet trade, may not have been well-studied. Important aspects of their biology and behaviour may not be very well known, or known at all, making their captive

management needs difficult or impossible to determine. Many of these reptiles are subject to trial and error care. This is reminiscent of how 19th century zoos dealt with new, foreign species they knew little about. These poor animals were kept in highly artificial, prison-like conditions in an attempt to keep them alive as long as possible. Animal keepers wanted sterile, easy to clean environments to prevent a build-up of potentially pathogenic organisms that might kill their animals. In most cases it didn't work and their animals died anyway.

Admittedly, there are some highly competent reptile enthusiasts who leave no stone unturned in their attempts to husband reptiles according to their specific biological and behavioural requirements. Many of these reptile keepers also have an active interest in conservation. Unfortunately they seem to be a relatively small part of a very large and destructive industry. Most reptile pet owners are not quite so diligent and many appear unable or unwilling to devote the time, energy or resources necessary to keep their reptiles in a humane manner.

No reptile is a low maintenance pet, despite what reptile sellers may say. While a few species may be less troublesome than a dog or cat, and are able to survive, or even breed, in extremely cramped conditions, that doesn't mean they are experiencing good welfare.

Since there are millions of reptiles already captive in private homes throughout the world, the least that responsible reptile keepers can do is to make every attempt possible to husband their animals in as humane and natural a way as they can. They should obtain as much information as possible about the natural lifestyle of the animals and seek expert, scientific advice about their captive management. They should not rely solely on information contained in the often simplistic reptile care guides carried by most pet stores.

Reptile pet owners should also understand just how long particular animals may live and how large they will grow. Many tortoises, turtles and crocodilians are very long-lived animals, some surviving for decades in captivity, while monitor lizards, giant snakes and crocodilians that look cute when they are young become large, dangerous and expensive to house when they get older.

For hobbyists intent on keeping reptiles, every effort should be made to avoid purchasing wild-caught animals, although determining the source of reptiles in trade is sometimes difficult. As well, native reptiles should never be removed from wild habitats; some long-lived species cannot tolerate even the occasional removal of one or two individuals. Collecting native reptiles may also be illegal.

Reptile owners should also be aware of the disease risks associated with the keeping of reptiles as pets. Virtually all reptiles carry potentially pathogenic organisms (e.g., salmonella) as part of their natural internal flora. Touching reptiles or surfaces that reptiles have touched may result in the transmission of these disease organisms to humans. In fact, many public health agencies have advised that certain people, such as young children or immuno-compromised persons avoid all contact with reptiles or surfaces reptiles have touched.[7]

> "Reptile owners should also be aware of the disease risks associated with the keeping of reptiles as pets."

Recently, a University of Michigan study published in the September 2004 issue of *Clinical Infectious Diseases* highlighted the risk posed by pet reptiles. The study noted that in the Michigan Department of Community Health records they examined, up to 11.8% of the salmonella cases in children up to age 5 were related to contact with reptiles.[8] While the reptile pet industry seems to downplay the risk of salmonella and other diseases, it is real and should be taken seriously.

Wild reptiles may also be at risk from captive reptile diseases. When pet owners release their animals into the wild, as some inevitably do, they increase the risk that previously unknown diseases will be introduced to native reptile populations. Another risk is that foreign reptile species will establish themselves and displace indigenous reptiles. This has already happened with the release of "pet" red-eared sliders who have established themselves in many areas of Canada and in other countries around the world.

THE WILD ANIMAL (EXOTIC) PET TRADE

At any point in time hundreds of thousands of wild animals are in transit from one location to another throughout the world. Captured from the wild by collectors in Asia, Africa, Latin America, Europe and North America, they are transported by air to customers around the world.

The global market for exotic pets has grown substantially in recent years. The US experience illustrates the extent of this trend. Between 1992 and 2002, the US trade in wildlife and wildlife products jumped by 62%, while the number of different species in trade increased by 75% to more than 352,000. In 2002, 38,000 live mammals, 365,000 live birds, two million live reptiles, 49 million live amphibians and 216 million live fish were imported into the United States.[9]

The craze for wild animals as pets has fuelled a legal trade worth many billions of dollars annually. According to the WWF/TRAFFIC report *Switching Channels, Wildlife Trade Routes into Europe and the UK*, the trade in live animals, plants, parts and derivatives is estimated to be approximately US $15 billion annually.[10] No one really knows the extent of the illegal trade in live wildlife, since crime by its very nature tends to be hidden, but it is thought to be substantial.

The National Network to Fight Traffic in Wild Animals, a Brazilian-based wildlife protection organization, estimates the value of live animal smuggling at nearly $15 billion per year, with approximately 37% of animals in the trade originating in Brazil. They believe the number of individual animals, including insects, fish, amphibians, reptiles, birds and mammals, exported from Brazil each year is a mind-boggling 38 million.[11]

Interpol sets the value of the illegal animal trade at more than $10 billion annually, second only to drug trafficking.[12] But the dollar figures do not truly reflect the ecological, social and health costs of the trade.

The removal of animals from the wild for the pet trade is now considered a major threat to wild animals populations, including many reptiles, driving species toward extinction and disrupting ecosystems. For example, overcollecting for the pet trade is posing a serious threat to the ocellated mountain viper in eastern Turkey, while here in North America numerous box turtle populations in the United States have been decimated.[13] Rhinocerous iguanas in Haiti and the Dominican Republic and plowshare tortoises in Madagascar are also being depleted.[14] But capture is not the only threat to wildlife posed by the wild animal pet trade. Ex-pets that are released to fend for themselves in the wild will sometimes survive and prosper. If they grow in number, they can out-compete native wildlife species. They may also harbour pathogens that could be transmitted to native wildlife species, livestock and humans with potentially devastating consequences.

The trade also causes untold suffering to many millions of creatures each year with significant mortality occurring during capture, transport and post purchase in the homes of exotic animal hobbyists.

In many jurisdictions throughout the world, legislation prohibiting the removal of wildlife for commercial purposes is in place. But even when laws exist, they are often ineffective because the resources required to enforce them are not provided. One study of the wild bird trade reported that the pet trade was affecting 50 endangered parrot species, only 32 of them traded legally.[15] Despite being protected by law, the numbers of protected parrots in the wild fell. Lack of resources to effectively enforce wildlife protection laws and the sheer scale of the problem were factors in the decline.

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THE REPTILE PET TRADE

Since the early 1990s, the reptile pet trade has grown substantially.[16] In fact, the trade has now reached a point where reptiles (both wild caught and captive-bred) are considered a mainstay of the pet industry. While the demand for a few reptile species can at times be satisfied through captive breeding, an estimated 90 - 95% of non-farmed live reptiles in trade are still wild-caught.[17] Because rarer species tend to command higher prices, the pet trade poses a significant threat to rare reptiles.[18]

These unfortunate animals are often subjected to harsh handling and marginal conditions during the capture process. They may be trapped in nooses, nets and buckets or they may be chased and grabbed by hand. Many suffer from twisted tails and spines, broken limbs, torn claws or from being crushed by others that are stacked on top of them.[19]

Those that survive the capture process may be crammed into crude containers and shipped in the cargo holds of aircraft to destinations around the world. Dehydrated and emaciated, many will die in transit. Some species, such as Florida softshell turtles and map turtles can suffer mortality rates as high as 30%.[20]

The International Air Transport Association (IATA) requires that live animals be shipped according to their guidelines. However, due to the high volume of animals being shipped and the relatively small number of enforcement personnel, the cruel and wasteful shipment of reptiles continues. For example, the US Fish and Wildlife Service inspects less than 25% of live animal shipments coming into the country.[21]

Making this situation even worse is the fact that in many countries shipping reptiles in poor conditions is not considered a serious matter. Even illegal smuggling of reptiles and other wildlife may not be viewed as particularly serious.[22] In their report titled *The International Wildlife Trade and Organized Crime*, Cook, Roberts and Lowther say, "there is no simple relationship between serious crimes and crimes which are taken seriously: the illegal wildlife trade is clearly the former but not always treated as such."[23] "Despite the level of seriousness of these offenders, wildlife crime offenses are often not taken seriously by those who make and implement the law - whether in the UK, European Union (EU) or global context."[24]

According to TRAFFIC, a wildlife trade monitoring organization, many of the existing laws in Southeast Asia are adequate to protect the various turtle species in the region, but enforcement of laws and regulations are insufficient. They also point out, "In every country, the inability of customs officers, wildlife enforcement agency staff and others to identify turtle species with any accuracy is a serious obstruction to effective enforcement. Without being able to identify animals in trade, it is nearly impossible to determine which species are traded legally and which are illegal. This problem is exploited by traders, who intentionally misidentify and make false declarations of the contents of shipments."[25]

If reptiles don't die in transit, they may die later from the long-term effects of capture and transport. Additional numbers may expire from the effects of inappropriate housing, poor husbandry and/or an inadequate diet provided by well-meaning but naïve owners.

The explosion in popularity of reptiles as pets can be attributed to a number of different factors, such as an increase in the number and variety of imported reptiles; an increased demand for reptiles caused by the pet industry's erroneous promotion of them as affordable, easy to keep animals; and an increase in the number of professional and amateur importers and reptile breeders.

An additional factor in this growth is the emergence of restrictions on the trade in wild caught birds. Reduced availability of wild birds, due to trade restrictions has caused suppliers to shift to alternate, exploitable species to fill the gap.[26]

For example, according to TRAFFIC, Tanzania's live bird exports decreased by more than 75% since 1994 when trade restrictions were imposed, while reptile exports increased more than ten-fold between 1991 and 1998.[27]

Shifts even occur among similar species. The 2002 TRAFFIC report, *Making A Killing Or Making A Living? Wildlife trade, trade controls and rural livelihoods* explains that when Madagascar placed a moratorium on the export of all but four species of chameleon, exports of two of the four legally tradable species increased dramatically, while the other two experienced a noticeable increase.[28] This trend of shifting from one group of animals to another less protected group has been well documented.

While the majority of wild-caught reptiles in the pet trade are supplied by African, Asian and Latin American nations, the primary markets for pet reptiles are in North America, Europe and Japan. Worldwide, the number of individual reptiles in the trade is staggering.

Between 1989 and 1997, more than 18.3 million reptiles[29], were imported into the US alone, including more than 2.5 million in 1995. In 1997, the US exported more than 9 million live reptiles, most of them red-eared slider turtles.

According to the American Pet Product Manufacturers Association, approximately 3.9 million households or 3% of the total number of US pet owners, keep one or more reptiles and amphibians. In his book *Survivors in Armor, Turtles Tortoises and Terrapins*, zoologist Ronald Orenstein states that there are between 2.5 million and 15 million pet turtles in the US alone.[30]

The number of pet reptiles is also high in the European Union. A study conducted by TRAFFIC Europe-France found a 250% increase in the importation of live reptiles into France between 1994 and 1999. According to the study 91% of all geckos, 77% of all chameleons and 64% of all imported varanid lizards were wild-caught.[31] Another study by the Belgian Police Force found that import transactions of live reptiles increased 81% between 1995 and 1996.[32]

Recently, the UK-based Royal Society for the Prevention of Cruelty to Animals (RSPCA) called on the European Union (EU) to ban the importation of reptiles requiring specialist care because so many of them die at the hands of inexperienced, ill-equipped owners. According to the RSPCA, the EU is one of the largest markets for live, exotic reptiles, even for some of the larger, more difficult to care for reptiles. For example, between 1992 - 2002, the EU imported 28,000 live crocodiles and more than 80,000 live monitor lizards.[33]

From 1994 to 1999, the exotic pet trade in Japan rose in value nearly 30% to an estimated $7.8 billion annually. Smaller animals, including a multitude of reptile species, have become popular in many of Japan's relatively cramped homes and apartments where traditional pets, such as dogs and cats, have been deemed unsuitable.[34]

In 1996, the Japanese market for illegally imported tortoises comprised 55% of the global total. Approximately 80,000 households are believed to keep reptiles as pets.[35]

Unfortunately, the exact scale of the reptile pet trade may remain a matter of guesswork. Customs authorities in both exporting and importing nations typically inspect only a tiny fraction of declared shipments to verify their contents. And in some countries, hundreds of reptile species are poorly tracked or not tracked at all, so there is little or no information about their status in trade.

THE REPTILE PET TRADE IN CANADA

While the reptile pet trade in Canada has not been comprehensively studied, there is some evidence to suggest that, like other jurisdictions around the world, it has experienced some growth in recent years.

Reptiles are now routinely featured in high traffic locations in franchise/chain pet stores across the country, while numerous privately-owned specialist reptile stores have continued to operate. Reptile fairs, shows and sales also take place throughout Canada on a periodic basis and pet industry consumer shows often feature reptile displays and sellers.

While the Canadian reptile trade is not nearly as large as its counterpart in the US, probably due to Canada's proportionately smaller population, it is nevertheless a significant industry involving the trade of many thousands of animals annually. While a substantial number of reptiles are imported into Canada directly from their countries of origin, other reptiles are re-exports from suppliers in the US. Imported reptiles come in all shapes and sizes and include both common and rare species.

The number of private reptile breeders serving the Canadian marketplace also seems to be growing. At the moment, most Canadian breeders appear to concentrate primarily on smaller varieties of snakes and lizards, although breeders of large constricting snakes and venomous reptiles can be found.

The actual number of reptiles in the pet trade in Canada is unknown. Reptile species listed on any one of the three CITES' ANNEXES (identifying them as threatened or potentially threatened by trade) require an import permit before being brought into Canada. Turtles and tortoises also require an import permit prior to shipment into Canada. But all other reptiles are unregulated and can be brought into Canada without restriction for almost any purpose. According to Ted Leighton, executive director of the Canadian Cooperative Wildlife Health Center, “There are no statistics kept on how many exotic animals are brought into Canada. The number could be in the thousands or it could be in the millions.”[36]

THE WELFARE OF REPTILES IN CAPTIVITY

Most modern definitions of animal welfare accept that welfare involves both the biology of animals and the feelings they experience.

For example, according to Donald Broom, Professor of Animal Welfare at Cambridge University, "The welfare of an animal is its state as regards its attempts to cope with its environment. The origin of the concept is how well the individual is faring or traveling through life. It can be good or poor but, in either case, there will often be feelings associated with the state which we should try to measure, as well as using more direct measures."[37]

Dr. John Webster, Professor of Animal Husbandry, University of Bristol School of Veterinary Science and author of *Animal Welfare, A Cool Eye Towards Eden* provides a more succinct definition of animal welfare, "The welfare of an animal is determined by its capacity to avoid suffering and to sustain fitness."[38]

Poor welfare can result in suffering, especially when animals find themselves unable to cope with inadequate environments or inappropriate situations. University of Guelph animal welfare scientist Ian Duncan believes suffering is, *"a wide range of unpleasant physical and emotional state.' (Duncan and Hawkins, 1983). These states would include pain, frustration, fear, various states of deprivation and, in some phylogenetically higher species, boredom."*[39]

Clearly, animal welfare and suffering are dependent on both physical and psychological (emotional) factors and most experts agree that welfare is highest when animals are free from pain and suffering. The absence of negative emotional states (suffering) and the presence of positive emotional states (pleasure) are the primary measures of animal welfare.

Some reptile sellers and keepers dismiss the notion that reptiles may experience negative emotional states that can lead to suffering. Instead they prefer to believe that reptiles, for the most part, simply respond to stimuli without complex thought. There is however, little evidence to suggest that reptiles do not experience these negative emotional states or the suffering that may result from them. In fact, there is growing evidence that reptiles are far more intellectually and socially complex than previously thought. For example, a recent study conducted at Quebec's Laval University has convinced scientists that lizards experience pleasure.[40] Another study involving the tracking of saltwater crocodiles by satellite revealed that these animals are not solitary and sedentary as previously thought, but are in fact quite active and sociable.[41] New findings about the rich intellectual, emotional and social lives of reptiles surface every year.

Reptiles have evolved to inhabit a diverse range of marine, freshwater aquatic, terrestrial, subterranean and arboreal habitats. While a few reptile species are flexible enough to survive in a diversity of habitat types, most reptiles require very specific conditions to maintain health and well-being. Unfortunately, most captive situations cannot replicate in any meaningful way the space, complexity and environmental conditions experienced by reptiles in nature. Even in the best of circumstances, only the most rudimentary aspects of their living conditions can be provided.

Compared to the wild, captive reptiles live in spatially limited, sterile, unchanging environments. Their social environments are imposed and artificial; there is no diversity of species; there are no predators or prey; and they are required to eat a fixed diet that often bears no resemblance to what they would eat in the wild.

While some reptile enthusiasts have focused attention on the physical needs of some reptile species, the behavioural needs of captive reptiles have remained an often neglected aspect of their husbandry. Evidence of this neglect can be found in even the most cursory examination of conditions in pet stores, breeding facilities, reptile shows and in the homes of many reptile keepers. A significant percentage of captive reptiles are still kept in grossly undersized, clinical conditions that provide virtually no opportunity for normal movement or the expression of natural behaviours.

A number of different factors have led to the current state of poor reptile welfare. They include, but are not limited to:

- the erroneous belief that reptiles are simple, highly adaptable animals that do well in captivity;
- poor quality information supplied to purchasers of reptiles as pets;
- a lack of knowledge about the natural lifestyles of many reptiles, including their intellectual, emotional and social capabilities;
- difficulty recognizing distress and suffering in captive reptiles; and
- a reluctance to substantially change husbandry methods.

MOST REPTILES ARE NOT EASY TO KEEP

Reptiles are often promoted as easy to keep, alternative pets that are suitable for people who don't have the time or resources to care for other more labour intensive animals such as dogs. In fact, some of the claims of sellers make reptiles seem almost maintenance-free.

For example, The Aquatic Critter website states, "How about a pet that doesn't bark, scratch the furniture, dig up the yard or squawk and screech? How about a quiet, low-maintenance pet you don't have to take for walks, don't have to get a rabies shot for every year and won't chew your shoes?"[42]

Another reptile seller, featured in an Ontario newspaper article entitled *Demystifying Reptiles as Pets* said the reptiles he sells are easy to manage, not needing to be walked, only requiring to be fed once a week, and ideal for someone looking for something a little more exotic."[43]

While some reptiles are certainly easier to care for than others, all reptiles require specific environmental conditions and diets. Many species are quite fragile and will expire if conditions are inappropriate. Others are hardier and may survive for long periods of time in less than ideal conditions. Giant snakes, monitor lizards and some of the larger tortoises pose their own, unique housing and handling challenges to their keepers, who often lack the space, interest, skill or finances to deal with them appropriately.

Impulse buyers who purchase low-cost reptiles, such as red-eared sliders and green anoles, may do so because they see them as expendable or they perceive them to be highly adaptable to captivity, requiring little care. These animals are often purchased as a child's first pet, with many expiring quickly due to inappropriate accommodation and care.

Red-eared sliders have been a mainstay of the reptile pet industry for many years. In fact, tens of millions of them have been produced and distributed around the world. Despite these huge numbers, large adult specimens are relatively uncommon. The majority have probably died because of inappropriate accommodation, poor diet and other basic husbandry failures.

Even when keepers are provided with captive husbandry information, they may be reluctant to commit the resources, time and energy necessary for the upkeep of their reptile, particularly if the animal has been obtained for just a few dollars.

Acquiring a reptile is often only the first, and least expensive, part of reptile keeping. Housing, equipment and food have to be purchased and, if an animal becomes ill or is injured, expensive veterinary care may be required. These costs can easily accumulate into the hundreds or thousands of dollars.

Some pet owners may not be able or willing to commit the appropriate level of funds to properly care for their reptile, preferring instead to provide only inexpensive, inappropriate housing and equipment, and to leave injury and illness unaddressed.

POOR QUALITY INFORMATION FOR REPTILE PURCHASERS

Poor quality information provided to reptile buyers exacerbates the current problematic situation. While a few pet stores employ staff with a reasonably good knowledge of reptilian biology and captive management, many employ part-time, student personnel with relatively little experience or expertise.

In opportunistic conversations with staff at several Canadian pet stores, a number of different reptile species were described by staff members as having very basic, easy to meet environmental needs and all were characterized as being behaviourally simplistic. One pet store employee incorrectly stated that in the wild most reptiles are fairly inactive and just sit around waiting for food, a dangerous assumption for someone charged with selling reptiles and conveying information about their care to purchasers. Another pet store employee didn't know the lifespan of the snakes and lizards he was selling. While these employees may represent one extreme in a fairly broad spectrum of knowledge and experience, they are certainly not unique. The fact that inexperienced, poorly informed pet store employees may be providing care advice to potential reptile purchasers is concerning to say the least.

A 2003 Royal Society for the Prevention of Cruelty to Animals report about UK pet stores found similar problems, citing numerous shortfalls in the advice given to customers interested in purchasing exotic animals, including reptiles.[44]

In an Arrowhead Reptile Rescue Opinion Editorial entitled *What's Wrong With the Reptile Industry?* the author laments about the state of the industry and the fact that so many reptiles end up in the hands of ill-informed owners who are not provided with accurate information.

"Alligators, crocodiles, giant snakes and many other large and/or imposing species are readily available to anyone with money in hand. Iguanas and hatchling turtles are cranked out by the thousands and dumped on the market into public venues, to be sold to anyone who comes along who discovers a temporary interest in them. I have yet to see one pet store or retailer give complete, accurate information to the average naïve buyer before they purchase these animals."[45]

While more conscientious pet store staff and hobbyists do make an attempt to learn about the care and housing of the species they sell and keep, only the most serious, advanced hobbyists seem to research all aspects of reptilian natural history, biology, behaviour and captive management. In fact, some reptile keepers feel that rigorous investigation into the natural lifestyles of reptiles is unnecessary; this may be rooted in the belief that reptiles are highly malleable creatures that do well in captivity.

"Many reptile pet proponents claim there is sufficient information about reptile care and management available to those keepers who want it."

Many pet store staff also appear to have little or no knowledge about other issues, such as how reptiles are acquired and transported, reptile conservation and trade, and the health risks reptile pets pose to humans.

Many reptile pet proponents claim there is sufficient information about reptile care and management available to those keepers who want it. In an article entitled *Setting the Facts Straight for Reptile Owners*, Gail Watson, founder of the West Coast Society for the Protection and Conservation of Reptiles, said "Information on their care is available from quality books and magazines, the Internet, the monthly newsletter and website of WSPCR and the free caresheets the WSPCR distributes by the thousands. In 15 minutes at my local library I found over 100 books on the subjects of reptiles and reptile care."[46] Certainly there has been a considerable volume of information produced about reptile care, much of it from the people who profit from their sale or the sale of reptile-related products. Unfortunately, a great deal of it is simplistic and questionable. The more detailed scientific materials that some serious hobbyists acquire are expensive and hard to find for casual consumers.

LACK OF INFORMATION ABOUT REPTILIAN BIOLOGY AND BEHAVIOUR

Providing incomplete, misleading or inaccurate information to consumers may be a contributing factor in poor welfare. Unfortunately, the natural biology and behaviour of many species is not known. This makes determining their captive management needs difficult, if not impossible.

There are now in excess of 500 reptile species represented in the pet trade[47] with approximately 25 - 35 species being relatively common. While the biology of some of the more popular species (e.g., painted turtle, leopard gecko, green iguana, corn snake) has been investigated and their captive management requirements established (at least to some degree), for many species that is not the case.

In recent years, as international air transport has become cheaper and more accessible, rare species of reptiles have entered the trade with regularity. Wholesalers and importers often market these animals as new or first-time imports, a rather concerning moniker considering that their husbandry requirements are probably not known. New species may not have not been studied extensively in the wild, if at all. According to Mark K. Bayless and Ben Aller in their article entitled *Dumeril's Monitor Lizard, A look at an Uncommon Monitor Lizard*, "Virtually nothing is known of *V. dumerilii* in the wild,"[48] yet these monitors are found in the pet trade. The care and housing needs of many reptiles new to trade are determined through a trial and error process.

Even the natural lifestyles of species that have been in the pet trade for quite some time may not be fully known. For example, it had long been assumed that most, if not all, snakes were largely asocial and did not engage in complex, maternal behaviours.[49] While some snakes were known to coil around their eggs at night, warming them through the radiation of body heat, it was generally thought that once the eggs were hatched, the female's parental duties were over. After hatching, the young were thought to be pretty much on their own. Not so.

In fact, rattlesnakes, pythons and other snakes exhibit rather complex, maternal behaviours that may help to increase the survival rate of their offspring. For example, black-tailed rattlesnakes may remain with their offspring for up to two weeks after birth. They also exhibit a range of social behaviours. Both rattlesnakes and pythons have been observed staying near their burrows during daylight hours, protecting their offspring from predators. Female pythons and their young have been observed reentering burrows at dusk and sleeping together, with the young often nestling in the coils of their mother's body. At the time these behaviours were first observed, they were quite unexpected and shed new light on an important aspect of snake behaviour.

Other aspects of behaviour and their importance to captive welfare are also not known. Some neotropical tree boas suppress activity on nights with bright moonlight. Perhaps it's because activity on moonlit nights increases predation on them, so they become less active to avoid the attention of predators. Alternatively, it could be that because rodent activity is depressed on bright nights, it makes more sense to conserve energy and hunt on nights when rodent activity is high and there is an increased chance of success.[50] No one can say for sure why this occurs because this aspect of tree boa behaviour has never been properly studied. So no one can really say with certainty what role moon phase and/or other natural cycles play in maintaining the health and well being of tree boas and whether or not their quality of life in captivity is diminished because they do not experience them.

As the intellectual capacities, emotional states and social lives of reptiles are explored, it becomes increasingly clear that their captive care is often rudimentary and does not properly address their full range of needs.

The nutritional needs of many reptiles have also not been studied in any real depth. According to reptile veterinarian Elliot R. Jacobson, "Most [captive reptile] diets have been contrived empirically. Often reptiles are fed items in captivity that have no counterpart in the wild."[51] If captive reptilian diets consist of unnatural food items, typically provided in a container or at a feeding station, then in all likelihood the natural feeding strategies employed by reptiles are altered, hindered or of little use.

Many aspects of the natural lifestyles of reptiles, including some relatively common species, are not fully understood, so identifying and addressing their full range of biological and ethological needs in captivity may be difficult, if not impossible. Even in the best circumstances, it seems doubtful that the complete range of a captive reptile needs are being satisfied.

DIFFICULTY RECOGNIZING STRESS AND SUFFERING

While major health problems, such as physical injury (e.g., broken limbs, lacerations) or debilitating disease may be easy to identify, many signs of poor welfare are more subtle and may go unnoticed by reptile keepers, especially when their animals are feeding and appear "normal." Unlike many other kinds of animals, reptiles may exhibit very subtle signs of stress and suffering that are only recognizable to expert observers.

While stress[52] is a natural part of every animal's life, the stressors that wild animals experience are very different from those experienced by captive animals. Wild animals possess natural coping mechanisms that allow them to mitigate the stresses they encounter on a daily basis in the wild. Captive animals do not have coping mechanisms that allow them to deal with chronic, captivity-associated problems, such as the stress caused by confinement in a small, highly artificial environment. There is little the animal can do to deal with it, so they become frustrated, bored and prone to the development of abnormal behaviours, such as stereotypies,[53] as well as other effects.

The failure of reptiles to adapt to captive circumstances is called Maladaption Syndrome.[54]

According to herpetologist Clifford Warwick, there are two voluntary ethological reactions to highly inadequate and stressful environments. They are "(1) mobile activities by which individuals use considerable motor energy" and"(2) hypoactivity[55]/ lethargy and anorexia."

Warwick believes that mobile activities are "related to searches for more appropriate environments" and that hypoactivity is a reptilian attempt to wait out a problem until it goes away.[56]

Warwick has developed an excellent list of signs of psychological quiescence and comfort, arousal and discomfort, and behaviour-related self injury[57] that all reptile keepers should learn to recognize (See ANNEX 2).

Behavioural reactions to stress may also have corresponding biochemical and physiological reactions, such as the release of stress hormones or the suppression of physiological functions.

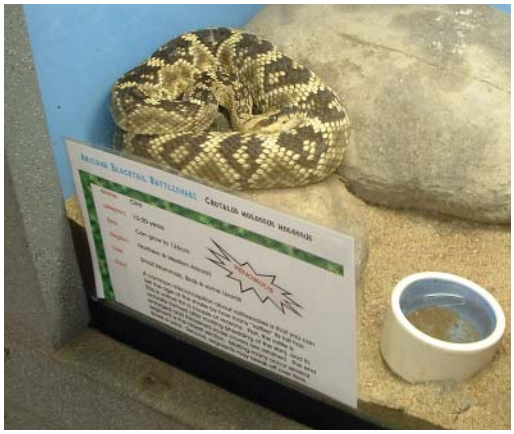
Since some biochemical and physiological changes (such as elevated levels of certain stress hormones) may be caused or impacted by non-stress related factors, they should be examined in association with behavioural indicators of stress, and not on their own.

ACCOMMODATION AND CARE CONSIDERATIONS

Specific housing and environmental conditions are required by all captive reptiles. While some reptiles are admittedly easier to maintain than others, all reptiles should nonetheless be provided with complex environments that encourage natural movements and behaviours, and that allow them to make choices and exercise some measure of control over their own lives. In other words, all captive reptiles, like other sentient creatures in captivity, must be able to make a meaningful contribution to the quality of their own lives. Facilitating this state of affairs requires a careful examination of the natural lifestyle of each reptile.

Needless to say, the captive management needs of reptiles can be varied and complex. Some of the housing and environmental factors that must be addressed include, but are not limited to, the amount of space provided, the quality of that space, heat, light, hygiene and nutrition.

Unfortunately, many reptile sellers and keepers seem to ignore or be unaware of the natural lifestyles of the reptiles they keep. They house them in relatively uniform, glass or plastic containers that allow easy viewing and cleaning. These containers are certainly convenient but do little to address the needs of reptiles. Their widespread use is probably due more to benefits that are perceived than real. There is little evidence to suggest that these kinds of clinical conditions provide any positive benefits to the reptiles themselves.[58]



SPACE

The need for adequate space cannot be overestimated. But many reptile sellers and keepers seem to pay little attention to the spatial needs of reptiles. Animals are routinely kept in spaces that do not allow natural movements and behaviours. The majority of reptiles seem to be housed in small glass-sided boxes (e.g., aquaria, terraria) or plastic containers. A review of conditions in pet stores in most cities would reveal snakes with little ability to move normally; active lizards in aquariums hardly longer than they are; and wide-ranging tortoises in accommodation just a square meter or two in size.

In determining how much space a captive reptile needs, there are three questions that must be answered.

1) Is there enough space for natural locomotion and the expression of a full range of natural behaviours?
2) Is there enough space for each reptile to feel secure (in other words, is the space sufficient to avoid violating the animal's fight or flight response[59])?
3) What are the consequences of not providing enough space?

Reptiles use various methods to get from one place to another. They may crawl, slither, burrow, run, swim, climb or even glide through the air. They live in a diversity of habitat types and engage in a wide range of complex behaviours, such as establishing territories, finding mates, evading predators and searching for food, to name just a few. They have evolved specific physical and behavioural traits that allow them to survive in particular conditions and environments. While some reptiles are relatively sedentary, most are active.

Even the smallest reptiles live complex lives and inhabit very large areas. During a September 2003 visit to the Kuala Lumpur Bird Park, I observed a 10 cm lizard (unidentified species) foraging through an uncultivated garden. The lizard traveled throughout an area more than 100 square meters in less than 1 hour, moving horizontally across the ground, vertically on walls, shrubs and trees, running, walking, climbing and engaging in a wide variety of other movements and behaviours. The author has observed other small lizard species throughout Asia covering similar distances in short periods of time. Most reptiles are quite active.

> "Even the smallest reptiles live complex lives and inhabit very large areas."

Unfortunately, space allocation for most captive reptiles has traditionally been rather minimal. While some dedicated hobbyists may attempt to provide their reptiles with expansive accommodation, it appears that most reptiles are not provided with an opportunity to move about normally or to express natural behaviours. This can result in frustration (as the reptile is thwarted in its attempts to move and behave normally), deprivation, boredom, abnormal behaviours and physical problems, such as lack of fitness and obesity. Many reptiles are kept in spaces so small they are barely able to move at all.

All captive animals, including reptiles, need to feel secure, yet this is an often overlooked aspect of captive husbandry. The provision of sheltered, privacy areas is one way of providing security. All captive reptiles should be provided with opportunities to remove themselves from the view of human observers and, if necessary, their cage-mates. Many reptile sellers and keepers seem to attach little importance to privacy needs, so it is not uncommon to see very rudimentary forms of shelter, or no shelter at all, and few visual barriers in the animal's living space. This can result in disturbance that triggers the fight or flight response[60] or hypoactivity as the reptile attempts to wait out perceived threats.

Some reptiles may also be stressed by the close proximity of other reptiles, especially if their cage-mates are dominant and monopolize preferred perching/basking locations and food items. Subordinate individuals must be provided with sufficient space to remove themselves from dominant animals and to feel secure. Stress levels can be very high when the fight/flight distance is violated and when territorial reptiles are kept in overcrowded conditions.

What are the consequences of not providing enough space? For many reptiles, they can be quite severe. Frustration from being thwarted in their attempts to range and express natural behaviours can lead to excessive interaction with transparent boundaries (ITB)[61] , resulting in rostral[62] abrasions and other injuries caused by rubbing against enclosure walls, as well as a range of other abnormal behaviours. When flight reactions are triggered, reptiles may injure themselves against cage walls or floors as they attempt to flee.

When it comes to space, there is no upper limit. It is far better for a reptile to have more space than it requires, than to require more space and not have it. Unfortunately, most reptile housing appears to based on convenience, budget and, in some cases, ignorance of the true spatial needs of reptiles. For example, many reptile keepers house their animals in shoe-box or sweater-box sized containers. Snakes are the reptiles most commonly kept this way. In fact, "many of the enclosures at pet stores and breeders, and pictured in many snake books, have barely a few inches of exposed floor space, the rest of the enclosure being filled with the snake and its bowl."[63]

While mammal and bird keepers have acknowledged that animals require far more space than they have traditionally been allocated, many reptile keepers still appear to believe that confining reptiles in spaces that are thousands or millions of times smaller than what they would inhabit in nature is acceptable.

Active, fast moving reptiles require spaces that allow them to accelerate to full speed and decelerate without hitting the walls of their enclosure. Ground dwelling lizards require substantial floor space and should be able to run freely, while arboreal lizards must have ample vertical space, equipped with sufficient climbing facilities to move about normally. Aquatic reptiles must have ample space to submerge, swim and engage in normal water-related activities.

If a reptile does not have sufficient space to satisfy its biological and ethological needs, then the captivity of that reptile must be questioned.

HEATING

Since most reptiles are ectotherms, appropriate heating is an especially critical aspect of their husbandry. To a large extent, the physiological functions and behaviour of reptiles are dictated by temperature. For example, low temperatures may decrease activity and hinder digestion, whereas extremely high temperatures may result in lethal overheating.

Most reptiles thrive within a specific temperature range and employ any one of a number of behavioural and physiological thermoregulatory strategies to stay within that range, even in environments where the ambient temperature fluctuates widely. They may bask in the sun to increase body temperature or seek sheltered areas to prevent overheating. Some reptiles change their periods of activity, their perching/resting locations or they may shift from one microclimate to another on the ground or in their own burrows. Others will use physiological mechanisms to regulate body temperature, such as increasing or decreasing their heart rate. Regardless of what strategies they employ, free ranging reptiles usually have a range of microclimates and thermoregulatory opportunities available to them.

In captivity, most reptiles exist in artificial, relatively uniform thermal environments. They typically do not have the range of conditions present in a natural situation. Often a single overhead lamp or heating device (such as a pad or hot rock) is the only heat source provided, dividing the animal's space into one warm and one cool area. This is probably the most common setup in pet stores. Yet some reptiles rely on a variety of different heat sources for thermoregulation, so simply providing a warm and a cool spot may be unnatural and inadequate. The complex thermal environments that reptiles experience in nature are rarely replicated in captivity.

In addition to negative physiological impacts and distortions in thermoregulatory behaviour, inappropriate temperatures and heating can cause other problems. For example, the use of substrate pads, hot rocks and other heat generating devices may cause thermal burns to reptiles. These burns can range from relatively insignificant to life threatening. If the ambient temperature is too low, the reptile may move very close to or directly contact heat generating devices as they attempt to raise their body temperature, resulting in thermal burns.

Some reptiles, especially species that inhabit very hot climates, may not react to intense heat the way other animals do and may appear oblivious to it, even while they are being burned. Many factors may influence this kind of behaviour, including the fact that reptiles do not encounter these kinds of intense artificial heat sources in nature, so they may not be able to recognize whether or not they are beneficial or damaging.

When nothing else is available large reptiles may spend long periods of time very close to or in direct contact with small, intense heat sources that are insufficient to raise their overall body temperature. As one part of their body is warmed, heat is lost through other cooler parts of the body that are not exposed to the heat source, so they never reach their preferred temperature. This can result in prolonged exposure and burning.

Ideally, in captivity, reptiles should be housed in environments that already provide a natural temperature range with artificial heating devices used as supplementary heating and situated outside of the exhibit.

Unfortunately, captive environments rarely provide a good array of microclimates to facilitate a range of thermoregulatory behaviours. Most reptile pets are forced to exist in simplistic thermal environments that bear no resemblance to those their wild counterparts experience in nature.

LIGHTING

The quantity and quality of light received by captive reptiles may impact their physiology and health.[64] In fact, it was only recently that photoperiod and light quality was recognized as important.[65]

Some reptiles require ultraviolet (UV) light for the synthesis of Vitamin D3 in their skin which has a role in calcium and phosphorous metabolism. All diurnal reptiles should receive direct, unfiltered sunlight or unfiltered, artificial, full spectrum light. Dietary supplementation of Vitamin D3 can also be beneficial to some reptiles.

Commercially available full-spectrum lighting varies in quality and intensity and should be used with caution. While some open-range reptiles are equipped to deal with strong sunlight (at least for limited periods of time), nocturnal reptiles or those normally inhabiting shady forest areas, undergrowth or burrows cannot. For those reptiles, prolonged exposure to intense light may be stressful and physically harmful.

The efficiency of commercial UV bulbs and tubes tends to diminish over time. Even though they continue to produce light, the quality of that light may be very poor.[66] Therefore, UV bulbs and tubes should be changed on a regular basis.

According to Joseph Franke and Teresa Telecky in *Reptiles As Pets, An Examination of the Trade in Live Reptiles in the United States*, full spectrum lights do a very poor job of simulating natural sunlight. In fact, to receive the same amount of UV-B as it would take in five minutes at the equator, a reptile would have to spend more than 44 hours under a Vita-Lite placed 30 inches away. If the light were only six inches away, it would require more than 7 hours of basking time.[67]

Photoperiod may also be important. Ideally, the natural seasonal variations experienced by each species in the wild should be replicated in captive situations. Simply turning the light on and off at the same time each day may be convenient but it does little to maintain the reptile's natural rhythms and cycles. It is important to provide natural seasonal variations in photoperiod.[68]

HYGIENE

Hygiene is another important factor in reptile husbandry. While the mere presence of excreta, sloughed skin, uneaten/discarded food and other materials can at times pose risks to captive reptiles, it is the extent of these risks rather than their existence that give cause for concern. While excessive build-up of materials that could potentially harbour pathogenic bacteria, viruses, fungi or parasites should be avoided, a balance must be struck between the need for good hygiene and the biological and ethological needs of reptiles. While some reptile keepers prefer to house their animals in clinical conditions for reasons of hygiene, they often do so at the expense of reptile welfare. Regardless, it is not possible to achieve a completely sterile state when animals are kept.

As well, naturalistic environments may mitigate against some of the effects of a marginally more contaminated environment by providing reptiles with significantly higher comfort levels, less stress and improved disease resistance.

Appropriate hygiene is particularly important when wild-caught animals are brought into captivity. The majority of wild caught animals harbour parasites, though most of them are not overly harmful to their host in its wild state. The stress of captivity however, combined with sub-optimal captive conditions, including poor hygiene, may cause imbalances resulting in the outbreak of disease and infection of other animals.

NUTRITION

Nutrition is a very important aspect of reptile husbandry. Lack of an appropriate diet can result in a range of problems and diseases, one of the most prevalent, and often preventable, being Metabolic Bone Disease (MBD), often described simply as calcium deficiency. Common in herbivorous or omnivorous species, such as green iguanas, that are fed a low quality diet of greens or insectivorous species that are fed entirely on crickets or mealworms, MBD can result in back, limb and jaw deformities.

Other reptiles can suffer from obesity due to unbalanced diets and lack of activity. This is occasionally seen in larger lizards and snakes. Vitamin deficiencies or overdoses can result in a range of other problematic conditions.

While the nutritional needs of some species are easier to meet than others, careful attention must always be paid to food quantity, quality, food intake/exercise ratio, inter-individual competition and species-specific feeding behaviours.

From a behavioural perspective, feeding is extremely important. It can be a critical enrichment vehicle that promotes natural movements and behaviours. Some reptiles seek out food on a daily basis, while others are intermittent, opportunistic feeders that require feeding far less frequently. Many reptiles, including some ambush predators, seek out food over relatively expansive areas. They may move from a poor hunting location to a better one or they may track prey that they have injured or debilitated.

Understanding when, how and what wild reptiles consume greatly improves the chances of providing them with an appropriate diet in captivity. Unfortunately, the natural feeding habits of many reptiles have not been comprehensively studied and, for some reptiles, the foods they consume in the wild may be difficult or impossible to obtain.

Finding and consuming food of the right type and quantity is an important facet of every animal's life. Many animals spend a considerable portion of their active hours searching for food and eating. Captive reptiles should be able to engage in natural food-related activities that will help maintain fitness and well-being.

A range of factors determine the level of welfare experienced by captive reptiles. Unfortunately, many of those that can be addressed are often overlooked or ignored. Others, such as the provision of complex environments replete with a range of microclimates, are difficult or impossible to replicate in pet keeping situations.

"Some reptiles seek out food on a daily basis, while others are intermittent, opportunistic feeders that require feeding far less frequently."

HOW REPTILES ARE CAPTURED, FARMED AND TRANSPORTED

WILD CAPTURE

While reptile pet proponents often claim that the majority of reptiles in trade are now bred by expert hobbyists and commercial breeders, trade records indicate a very different state of affairs. A significant percentage of reptiles sold and kept as pets in North America were caught in the wild, with many of them originating in African, Asian and Latin American countries. A significant number of reptiles are also legally (and illegally) caught in the United States and a much smaller but still significant number in Canada.

Reptile collectors are a diverse group, comprising both amateur and commercial collectors, as well as individuals who only occasionally remove reptiles from the wild for sale or personal use.

Opportunistic or incidental collectors remove reptiles when they encounter them in the field. They may be hikers, boaters or fishermen who collect reptiles for their own use or to sell locally. Children also pick up small snakes and turtles from time to time to take home as pets.

Amateur collectors typically hunt for reptiles to add to their own collections or to trade with fellow collectors. Occasionally, their reptiles will be advertised for sale.

Commercial collectors may operate on a part-time or a full-time basis collecting a large number of individual animals from the wild. Some focus on particular species, while others collect whatever reptiles they can find. Full-time commercial collectors sometimes work over a vast territory and may subcontract some of their work out to local collectors, while part-time collectors focus their activities in a smaller area.

CAPTURE TECHNIQUES

A variety of techniques are used for catching wild reptiles. They include, but are not limited to, simply picking animals up when they are found, chasing and grabbing, trapping, forcing them out of their burrows and hiding spots with noxious materials and occasionally by line and hook, although animals captured in this way are more often than not destined for the food trade, being damaged and unsuitable for sale as pets.

Reptile collectors may be familiar with reptile habits and use that information to hunt them. For instance, turtle collectors may know that at certain times of the year, often in specific weather conditions, significant numbers of turtles will bask in particular locations and are vulnerable to collection. Turtle crossings at roads may also be targeted. More often than not though, collectors simply patrol marshes, ponds, streams and riverbanks looking for turtles to collect.

In some areas, traps are used. These are usually simple wire traps, often in a funnel shape, that prevent the turtles from escaping once they've entered. To prevent theft by other collectors, the traps may be kept low in the water to reduce their visibility. If not properly set, the possibility of the trapped turtles drowning increases substantially.

Occasionally, turtles, such as snapping and softshell turtles, are caught using a line and baited hook, which can cause considerable damage to the turtle as it struggles to get free. Most of these animals are destined for human consumption but some do find their way into the pet trade.

Tortoises, being relatively bulky, slow moving animals, are just picked up as they go about their business. Burrowing tortoises may be forced out of their burrows by noxious fumes that are produced when gasoline is poured inside.

A variety of methods are used to catch lizards. Collectors familiar with the habits and habitat of a target lizard species know where to find and catch them by hand. The simplest way to catch a lizard is by overturning rocks and logs and grabbing them when they try to escape. Pry bars and other tools can be used to reach lizards that refuse to come out from under large rocks or crevices. Some collectors use poles and nooses, to snare lizards from a distance. In the American southwest, they frequent roadsides during times when lizards are known to be basking in the sun.

In countries where chameleons are collected, they are often knocked out of trees with a pole and then simply picked up and placed into a bag. Many are injured from being struck and falling to the ground. Green and brown anoles in the United States are caught at night; shining a spotlight on them causes a short period of immobility, possibly a defensive strategy, allowing enough time for them to be captured by hand. Monitor lizards in Indonesia and other Asian countries are chased and caught by hand or noose.

Another lizard collection method is an old-style pit trap. This involves the strategic positioning of a container, such as a bucket, with a wooden board rising up over the lip of the container. Lizards will bask at the end of the board and a percentage of them will fall into the bucket, ready to be collected later.

In some areas, snakes seek out warm surfaces at night, such as roads that absorb heat during the daytime and radiate it at night. Snake collectors use this knowledge to patrol select roads at appropriate times picking up snakes as they go.

Other collectors raid snake hibernacula, sites where hundreds or thousands of snakes congregate while hibernating. Probably the most famous example is the garter snake hibernacula of Manitoba. Thankfully collection was outlawed in the late 1980s because of concerns that it was not sustainable.

Many snakes, such as some of the larger boas, pythons and some venomous snakes are simply caught by hand by collectors who have developed their own capture and handling techniques.

All of the capture techniques described above can be stressful and physically damaging to the animals involved. Most wild reptiles have never been restrained or handled, so it is likely, when they are chased, caught, picked up, stuffed into containers, poked, prodded, knocked off branches or pried out of crevices or burrows, they perceive those actions as a predatory attack and suffer as a result.

CONDITIONS PRIOR TO AND DURING TRANSPORT

The conditions that many wild-caught reptiles experience prior to export can be poor. They may be kept in filthy, overcrowded cages and enclosures, without access to food, water or proper shelter. This can result in overheating, dehydration and excessive levels of stress.

In preparation for and during transport, reptiles may be packed closely together, sometimes even piled on top of each other. Close confinement may result in abrasions and lacerations, loss of claws and digits, broken tails, crushing and other injuries.

According to the Box Turtle Partnership of Texas, "Once collected for the pet trade, box turtles are often kept in filthy conditions, stacked on top of one another and often without access to food or water. It is estimated that up to half the box turtles die before being sold, and box turtles sold from pet stores and flea markets often suffer from malnutrition, dehydration and infection. It is probably safe to say that being collected for the pet trade is a death sentence for most box turtles."[69]

But injury is not the only problem experienced by wild-caught reptiles in transit. Being closely confined may also result in other kinds of stress. For example, some reptiles are territorial, so placing them together in small containers or enclosures causes hyper-aggressiveness as individuals make failed attempts to drive off their counterparts, who, of course, have nowhere to go.

Another problem associated with overcrowding and poor conditions is the spread of disease. Bacteria, viruses, ticks, mites and a variety of other organisms can spread rapidly from one animal to another when they are kept in overcrowded conditions. Importers and hobbyists generally know that wild-caught reptiles are far more likely to be carrying parasites or disease than domestically-raised, captive-bred reptiles, so they are typically quarantined upon arrival.

REPTILE FARMS (RANCHES)

Throughout Latin America, parts of the United States and other regions of the world, reptile farms (sometimes called reptile ranches) have sprung up to satisfy the demand of the reptile pet, food and skins trade. Most of these facilities mass produce relatively common, high-demand reptile species. For example, hundreds of thousands of green iguanas have been exported from Latin American farms to North America, Europe and Japan, while millions of red-eared sliders have been exported from US turtle farms (primarily in Louisiana) to countries around the world.

Reptile farms in many regions have been touted as a practical way to supply reptiles for trade, while at the same time protecting wild reptile populations and increasing local employment. But reptile farms have been known to recruit wild adult breeding stock on a regular basis to replenish their existing breeders or to collect eggs produced by wild reptiles for hatching in captivity, so their impact on wild populations can still be substantial.

In their book, *The Savannah Monitor Lizard*, The truth about Varanus exanthematicus, authors Daniel Bennett and Ravi Thakoordyal discuss the issue of breeding farms. They write,

In recent years a large proportion of savannah monitors have been sold as captive hatched, captive born, ranched or farmed. This means that instead of capturing large numbers of juvenile lizards for export, only gravid females are collected. They are kept in captivity until they produce eggs, which are incubated artificially. This gives the impression of being more sustainable and ecologically friendly than dealing in wild caught animals, but in fact the opposite is true for the following reasons.[70]

They explain that during the breeding season, female savannah monitors are very active so they are easy to collect. Their capture and confinement (often in unsanitary conditions), combined with egg laying leave them physically depleted and stressed. Some farms claim they release the females back into the wild, but there is no incentive for them to do so. Even if they did, most probably wouldn't survive in their compromised state. According to Bennett and Thakoordyal, most of them are "recycled into the pet trade, sold for meat and skin or just dumped at a roadside." Targeting adult females has a detrimental effect on wild populations as entire clutches and egg producing females are removed.[71]

The potential negative consequences for wild reptile populations increase even more if farms are used to launder wild caught reptiles, especially for species populating regions in which farms are located. Wild reptiles can be very easily assimilated into existing farm populations and then labeled captive-bred.

While it is possible that some farms operate in an open, aboveboard manner, the system itself is difficult to regulate and open to abuse. Captive-bred specimens command higher prices, but wild-caught animals are cheaper to produce, so there may be a strong incentive to launder wild-caught reptiles.

Some agencies are concerned about the possibility of laundering. For example, in a paper presented at the 2nd Symposium Journal of Sustainable Use, about the Madagascar chameleon and gecko trade, Robert Jenkins, Chair of the CITES Animals Committee said,

…the majority of officers of the Management Authority do not presently possess the technical skills necessary to audit operations and verify captive-breeding activities. Under the circumstances, a real risk exists that captive-breeding operations will simply serve as mechanisms to disguise wild-caught lizards as captive-bred progeny and export these specimens outside the established quotas. [72]

"Wild reptiles can be very easily assimilated into existing farm populations and then labeled captive-bred."

Red-eared sliders, the dime store turtles widely available in the past, have been a pet industry staple for decades. Over the years, tens of millions of red-eared sliders have been produced on farms in the United States for buyers in the US, Canada and around the world. In 1975, US authorities prohibited the sale of turtles with a shell length of 4 inches or less, due to the large number of salmonella cases attributed to the handling of pet turtles. It was thought that turtles with a shell length greater than 4 inches would be less likely to be handled by children.[73] Shortly after the US move, Canada banned turtle imports.[74] Even though the turtle trade was restricted by these new measures, red-eared slider exports from the US to countries around the world have continued, although in recent years, many farms have expanded their operations to include additional turtle species.

Just like their counterparts in other regions of the world, US farms have recruited significant numbers of wild-caught turtles, sometimes hundreds of thousands of individual animals annually, to replenish their breeding stock. Despite this, many claim the bulk of their breeding stock now comes from captive-bred animals. Certainly, most breeding stock for newly farmed species has come from the wild.

Regardless of where reptiles are farmed, they may experience a variety of welfare problems with the most significant being overcrowding, high stress levels and disease. The farmed turtles sold and shipped out to retailers around the world often suffer even more in transit and post-purchase.

CONDITIONS IN TRANSPORT

Reptiles are transported in a variety of ways with minimal consideration given to their health and well being. This lack of attention may be due to the fact that reptiles are sometimes low value commodities. For example, individual anoles, geckos and certain turtles may wholesale for as little as a few dollars, or even less, so it makes sense for exporters to ship them in the cheapest way possible.

Reptiles may be shipped in boxes, bags, buckets, plastic containers and wooden crates in cars, trucks or aircraft. In some cases, live reptiles are sent by mail or private courier. Packed tightly together or on top of each other, they may leave the exporting facility having received no food or water. This kind of deficient care is often done out of ignorance, but at times it can also be purposeful. Denying food to reduce the overall weight of a reptile shipment, by reducing the weight of each individual animal, may result in lower shipping costs, as well as preventing excessive container soiling by the animals.

"Reptiles may be shipped in boxes, bags, buckets, plastic containers and wooden crates in cars, trucks or aircraft."

Reptiles shipped by air are supposed to be "packaged" according to International Air Transport Association (IATA) guidelines. The guidelines, established in 1969 and updated periodically, are voluntary and apply only to CITES-listed species. There are no penalties for non-compliance and enforcement of the guidelines by individual airlines is often poor or lacking altogether.[75] While transport mortality has been reduced somewhat over the years, it remains a hidden cost of the trade.

The often poor condition of imported wild-caught reptiles has led many hobbyist organizations to recommend the purchase of captive-bred animals whenever possible. Despite this, a significant portion of reptiles in the pet trade are still wild-caught animals.

In a *Tortuga Gazette* article entitled *Exploitation of Turtles for the Pet Trade* (June 1993), herpetologist James Harding describes the horrendous conditions turtles endure after capture:

Turtles collected in the wild are typically piled into boxes, burlap sacks or wooden crates, and transported in car trunks or vans to holding areas. There they may be held in crowded pens or livestock tanks, often without access to clean water. Shipment to wholesalers and retailers often involves another trip packed into boxes and crates…

When a normally solitary, sun-loving creature is suddenly removed from the habitat it has perhaps occupied for decades, is crammed into a box with other turtles, exposed to extremes of heat or cold, and kept under generally unsanitary conditions for days or weeks, it is obviously under extreme stress. Disease is often the result. A former reptile dealer told me that he believed the mortality rate was, at times, as high as 50% between their collection and arrival at the retailer, and was rarely less than 20%. Of those that arrived alive, many were dehydrated and suffering from pneumonia, eye infections and nutritional deficiencies.[76]

During the entire process of capture, transport and relocation into the consumer's home, reptiles may suffer and die. This can be due to capture trauma, poor transport conditions, inappropriate post-purchase husbandry, long-term captivity-associated stress, etc. The actual mortality level at each step is difficult to determine, but it may be high.

According to veterinarian Lianne McLeod, "The stress of capture and transport and adjustment to captive conditions is extremely stressful and leaves reptiles susceptible to illness. Wild caught reptiles also tend to carry very heavy parasite loads…For every wild caught reptile that makes it to a pet store and into a home, many more die from stress, injury, and/or illness related to capture, transport, overcrowding, etc."[77]

On the Uromastyx Home Page website, Matthew Moyle and Nancy Kingston (1995) say, "Virtually all of the *U. ornatus* that are sold in pet stores are wild-caught. Therefore they are subject to potentially life-threatening parasitic infection and are generally not acclimated to captivity. Many of the specimens imported in the past three years have fared poorly in captivity, likely due to the above reasons."[78]

CAPTIVE BRED VS. WILD CAUGHT

Throughout North America and around the world, hundreds of small scale commercial breeders produce thousands of individual reptiles for the pet trade annually. Some breeders are single individuals who produce a small number of surplus animals each year from their own personal collections, while others are more significant commercial operations. Collectively, they produce a variety of species, including geckos, chameleons, bearded dragons, corn snakes and Burmese pythons. They are quite different from and should not be confused with the many mass production reptile farms (sometimes called ranches) that can be found in the United States, Latin America and other parts of the world.

Many reptile breeders extol the virtues of captive-bred animals, claiming they are healthier, more tractable and a better choice for the reptile consumer. They also assert that captive-bred animals are almost always free of parasites and disease. Because a significant percentage of captive-bred reptiles are produced in relatively controlled, clinical conditions with little or no direct exposure to the same types and number of parasites and diseases that wild reptiles are, they may indeed be free of some of the parasites and diseases carried by their wild counterparts.

Most wild reptiles carry a natural load of parasitic organisms, just as most wild birds and mammals do. When reptiles are captured and confined, the natural mechanisms that allow them to cope with parasites and disease may be compromised. As well, the negative effects of capture trauma and chronic captivity-related stress may hinder the ability of wild-caught reptiles to cope with parasites and disease.

Reptile breeders occasionally claim captive-bred animals are hardier and in better overall condition than their wild-caught counterparts. While it is true that captive-bred animals are not subject to the same kinds of capture trauma and stress that many wild-caught reptiles are, and may therefore be free from capture-associated injury, the sedentary lifestyles imposed upon captive-bred specimens may make them less fit in some respects than their wild counterparts.

Another claim made by breeders is that captive-bred reptiles are less likely to be behaviorally problematic. For example, wild-caught pythons that have always sought and killed their own prey may not recognize or readily accept unnatural food items such as pre-killed, frozen and thawed mice, whereas captive bred specimens will. Wild-caught reptiles may be severely stressed by even modest handling, perceiving it as a threat, while captive-bred animals may be somewhat more habituated to physical handling and be less threatened.

Many breeders acknowledge that captive-bred animals are more expensive than wild-caught individuals but feel the benefits to the consumer outweigh the higher cost. Many of them however tend to overlook the fact that captive-bred animals are still non-domesticated, wild animals. Even though they may be raised in artificial conditions, they still retain the natural, hard-wired behaviours and instincts of their wild counterparts. They still experience many of the same kinds of trauma and stress as their wild cousins when they are transported, confined and handled. And the majority, once purchased and taken home, don't live that much longer than wild-caught animals.

DOES CAPTIVE BREEDING REDUCE WILD CAPTURES?

Another claim by reptile hobbyists is that captive breeding decreases the number of reptiles taken from the wild. They claim that by producing animals in captivity, there will be no need to remove them from the wild. In certain cases, there may be some validity to this argument, but overall, the effect of captive breeding in this regard has been rather minimal.

Despite the purported advantages of captive-bred reptiles, breeders may find it difficult to compete with imported wild-caught animals that can be procured at a much lower cost by wholesalers and retailers. As well, the growth in the reptile pet market has far outpaced the ability of breeders to satisfy the demand. While the number of reptile breeders has increased, so have the number of wild-caught animals. Certainly some of the demand for particular kinds of reptiles (e.g., red-eared sliders, leopard geckos, corn snakes) may at times be satisfied through captive breeding, but overall this does not seem to have resulted in a decrease in removals from the wild.

THE FATE OF UNWANTED REPTILES

The increasing popularity of reptiles as pets has brought with it a corresponding increase in the number of unwanted, abandoned pet reptiles. Just like the dogs, cats and pot-bellied pigs before them, reptiles are being discarded after they've lost their novelty appeal or they have become too big, difficult, expensive or problematic for their owners. Many humane society shelters, zoos and volunteer reptile rescue organizations receive calls from pet owners wanting to place their animals.

Unfortunately, many reptile owners assume that if they lose interest in their pet or if for some reason they find they are no longer able to keep their animal, they can just drop it off at their local zoo, which of course will be happy to accept it. Unfortunately, nothing could be further from the truth. While some zoos consider offers of unwanted pet reptiles and other exotic animals on a case by case basis, many are so overburdened with ex-pets they simply refuse them altogether.

Humane societies, wildlife rehabilitation centers, wildlife educators and others who deal with wild animals are not an option either. Most are already filled to capacity with unwanted animals and are unable to take in any more.

REPTILE RESCUE GROUPS

Because zoos, humane society shelters, wildlife educators and others are only able to accept a fraction of the unwanted reptiles offered to them, dozens of reptile rescue organizations, most of them run by volunteers out of their own homes, have formed in Canada and throughout the United States. Some herpetological societies have also started their own adoption programs for unwanted pet reptiles.

In Canada, organizations such as the Rainforest Reptile Refuge in British Columbia, Saskatchewan Reptile Rescue and Reptile Rescue in Ontario take in, and in some cases adopt out, unwanted pet reptiles. In the United States, dozens of primarily volunteer organizations, such as Arrowhead Reptile Rescue, Broken Reptile Rescue and Education and North Texas Giant Snake Rescue take in a diversity of reptiles in the hope that they can be re-homed to appropriate accommodation elsewhere.

Unfortunately, even the combined resources of the many organizations involved in reptile rescue can make only the tiniest dent in the problem, caused by the easy availability and low price of reptiles.

Reptile rescue organizations are often overwhelmed by requests for help. For example, since it opened its doors in 1992, the Rainforest Reptile Refuge in British Columbia has been flooded with requests to take in iguanas and other reptiles. During their first six months of operation, they took in 43 unwanted animals. Between January 1993 and December 1995, they took in 597 more. Despite limited space and resources, the calls from owners wanting to "dump" their reptiles keep coming.[79]

Other rescue operations echo the same story, particularly for common species. The website of North Texas Giant Snake Rescue makes their situation quite clear, "Due to the enormous number of requests for rescue and the limited number of people willing to take them in, we will no longer be accepting iguanas in house."[80]

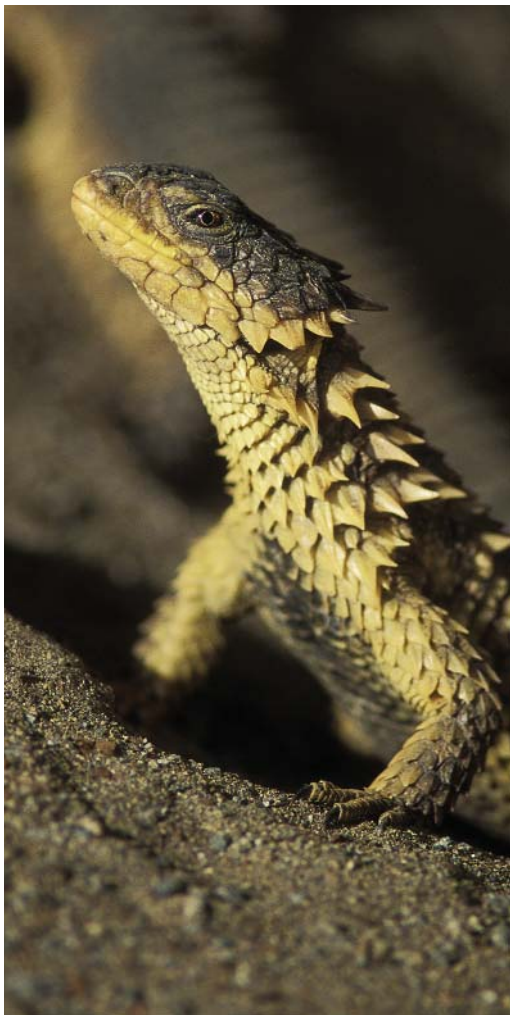
While there are many reasons reptile owners give to explain why they are trying to place their pets elsewhere, they typically fall into four categories: 1) size and temperament; 2) time and financial commitment; 3) ill health; and 4) loss of interest.

For many years, green iguanas have been one of the reptile species most commonly offered to rescue organizations and zoos. During the 1990s, tens of thousands of wild-caught and farmed iguanas were imported into the United States and Canada annually, so they were widely available at very low prices. In fact, they were sometimes even given away. Several years ago, the Canadian National Exhibition, an annual summer fair in Toronto, featured a midway booth that was offering young green iguanas as prizes for game winners.

The practice of giving away reptiles also occurs in the United States. On their website, the Marion County Herpetological Society describes iguanas and red-eared sliders being offered as prizes at the Interstate Amusements of America carnival. The reptiles were kept in totally inadequate enclosures and were sent home with game winners in plastic cups.[81]

While popular and widely available, green iguanas grow quite large (up to 2 meters in length) with males becoming territorial and aggressive as they reach sexual maturity. Some iguana owners even employ shields to fend off attacks when they are near their pets.

Young, Burmese pythons, which grow into large, robust, potentially dangerous adult snakes, and other giant snake species, are also offered to rescue operations, humane societies and zoos on a regular basis. Purchased when they were young they become far more than their owners bargained for when they reach maturity.



The same holds true for many of the monitor lizards which grow into large, difficult to house adults that frequently test the limits of their owners.

Unknowing consumers may also purchase reptiles with the mistaken impression that they are easy to care for. In fact, the pet industry often promotes many reptile species as easy, "alternative" pets that require far less labour and resources than do dogs or cats.

While a few hardy species may be managed by novice hobbyists at a relatively modest expense, a great many reptiles require expansive enclosures and specialized care. Purchasing enclosures and all of the assorted paraphernalia necessary to keep reptiles alive and healthy can be expensive and time consuming. For many owners, it soon becomes more trouble than they anticipated, so they look for a convenient way to dispose of their animal. The lucky few are taken in by rescue operations, humane societies or zoos, but many end up languishing in grossly substandard conditions in bedrooms and basements, eventually expiring because of poor accommodation and care.

Another reason for the disposal of reptiles is illness or injury. Lack of proper care and/or inappropriate handling can result in a multitude of diseases and injuries. Unfortunately, treatment can be expensive as veterinarians specializing in reptiles are few and far between. For many reptile owners, spending hundreds or thousands of dollars on veterinary care for an animal that may have cost just a few dollars is out of the question. Some owners may not even recognize the signs of illness, disease or injury. So they either let their animal succumb to its illness or injury or look for a convenient way to dispose of it.[82] If they ever decide they want another reptile, they are cheap and easy to find.

Like many other animals, including cats and dogs, reptiles are purchased for a variety of reasons. Sometimes they are purchased on impulse after a customer is attracted to an animal's color, shape, size or just because they think it would be an interesting animal to own. Others are purchased because of a more serious, but often passing, interest in reptiles or exotic pets, or they are purchased for a child who eventually loses interest. Sadly, a significant number of reptiles are abandoned simply because their owners lose interest and don't want them anymore.

THE RELEASE OF PET REPTILES INTO THE WILD

In many cases, pet reptile owners unable to place their animals elsewhere release them into the wild. Reptile pets should never be released into wild areas. Most of them lack the physical and behavioural attributes necessary for survival in foreign habitats that are outside of their natural, geographic range, so they nearly always suffer as a result. Some will die of starvation or predation, while others will die because of cold weather.

Newspapers regularly report reptiles turning up in the most unlikely places. The July 29, 1999 edition of *The Toronto Sun* featured a short article entitled "Icy river no party for 'gator'." It described a young, half-meter long alligator that was captured in the Oldman River near Lethbridge, Alberta. Local officials suspect the alligator was dumped into the river by a pet owner who grew tired of the rapidly growing animal.[83]

Green iguanas, giant snakes and many other reptiles are found from time to time throughout Canada. These animals are almost certainly pets that have been dumped by irresponsible owners.

Occasionally, reptile pets that are abandoned into foreign environments with climatic conditions similar to their countries of origin survive. In some cases they prosper with potentially devastating effects to native wildlife.

In Florida, Nile monitor lizards, believed to be ex-pets, are proliferating and may pose a threat to native wildlife. They have a varied diet and will eat almost anything they can catch, including crustaceans, snakes, other lizards, young alligators, birds, eggs and small mammals. The lizards could even be a danger to one of the state's largest populations of the protected burrowing owl living in Cape Coral.[84]

In Marathon, Florida, introduced green iguanas are increasingly being viewed as nuisance animals, generating complaints from residents.[85] What actual effect these iguanas and other populations in the state now have on native wildlife, or will have as they spread further, is unknown.

In Kanapolis State Park, Kansas, non-native, western diamondback rattlesnakes are turning up with some regularity. While the source of the snakes has not been determined, Park Manager Rick Martin believes it's possible they are released pets.[86]

While most foreign reptiles could not survive the cold winters experienced in most areas of Canada, some introduced species have nevertheless been able to establish themselves. For example, in the City of Toronto, red-eared slider turtles now populate part of Grenadier Pond and Riverdale Farm, where they have displaced most other turtles[87] and the Leslie Street Spit.

Introduced populations of red-eared sliders are now also found in many other locations throughout the Great Lakes region and British Columbia.

Red-eared sliders have also established themselves in other parts of the world, including South Korea, where their importation is now prohibited. The Ministry of Environment announced the ban in response to complaints that the turtles were killing off native fish. A study by the Environmental Planning Center of Seoul National University found that red-eared sliders also eat aquatic insects, frogs and young snakes.[88]

The Nature Conservation Society of Japan conducted a survey of 802 turtle sites in July and August 2003. Most of the turtles they found were non-native red-eared sliders. They conclude that 60% of all turtles in Japan are species that were imported as pets.[89]

Other introduced reptile species include eastern box turtles in southern Ontario and Western pond turtles and European wall lizards in British Columbia.90 No one in Canada has yet studied the impact these introduced reptiles have on resident, native species in the areas in which they have become established.

European wall lizards were introduced to Victoria, British Columbia in the late 1970s. They survived in the moderate climate and have since spread throughout the Saanich peninsula. No one yet knows if they are having a negative impact on native Alligator lizards. University of Victoria biology professor Pat Gregory thinks all foreign species should be taken seriously, "Just because we haven't observed a depressing effect on the population of the Alligator Lizard doesn't mean it isn't happening. There's nothing really obvious in terms of their negative effects, but here might be some less obvious effects."91

Releasing pets into the wild also has the potential of introducing potentially damaging disease organisms to existing wildlife populations.

In many areas the release of reptiles or any captive wild animals for that matter, may also be illegal. Many jurisdictions prohibit the release of wild animals into natural environments, except by special government permit.

"Green iguanas, giant snakes and many other reptiles are found from time to time throughout Canada."

THE ORIGIN OF REPTILES KEPT AS PETS IN CANADA

Both wild caught and captive bred reptiles can be found in the pet trade in Canada. Many wild caught specimens are exported from their countries of origin directly into Canada, while others are exported to another country and then re-exported to Canada.

THE IMPORT OF REPTILES INTO CANADA

Canada does not comprehensively document the trade in live reptiles. Species listed on the ANNEXES of the Convention on International Trade in Endangered Species (CITES) require a CITES import permit before entering Canada, but non-CITES-listed species do not.

All turtles and tortoises however do require an import permit from the Canadian Food Inspection Agency (CFIA), largely because of disease concerns. Other reptiles are no longer regulated under the *Health of Animals Regulations,* so no CFIA import permit or health certificate is required before entry into Canada and no inspection will normally be done at the border.

The majority of the statistics contained in this section have been compiled from a review of CITES import and export permits acquired through the federal Access to Information process. CFIA turtle and tortoise import permits were not examined.

From 1995 until 2000, 117,657 CITES-listed live reptiles (excluding personal pets imported by private individuals) were imported into Canada. There are no statistics regarding the number of non-CITES-listed reptiles imported into Canada, but it is thought to be greater than the number of listed specimens.

For example, according to the Humane Society of the United States (HSUS) report *Reptiles As Pets, An Examination of the Trade in Live Reptiles in the United States* (2001) 21,574 Green anoles *(Anolis carolinensis)* were exported into Canada from the United States in 1997 alone. The number of that one non-CITES-listed species is 2,069, greater than the number of all CITES-listed reptile species for that same year. Clearly a great many unrecorded reptiles enter Canada each year.

The HSUS report also indicates that several years earlier in 1993, the United States exported 224,768 reptiles (both CITES and non-CITES-listed species) to Canada. Clearly, Canada's CITES import records do not accurately reflect the actual numbers of reptiles entering Canada.

While evidence suggests the reptile pet trade as a whole has continued to experience growth, the number of CITES-listed live reptiles imported into Canada seems to have remained relatively constant averaging around 20,000 individuals per year. The growth in trade may be the result of increased captive breeding within Canada and a greater number of imports of non-CITES-listed reptile species.

In the 2001–2002 time period, the Green iguana *(Iguana iguana)* was the most common CITES-listed species brought into Canada with 15,970 specimens represented in the records. Ball pythons *(Python regius)* were the next most popular with 7,846 individuals imported, followed by the Longtail lizard *(Takydromus sexliniatus)* at 3,800 individuals and the Savannah monitor *(Varanus exanthematicus)* at 2,811. The top 10 CITES-listed species imported into Canada in 2001-2002 totaled 40,991 individuals.

Wild-caught CITES-listed specimens imported in 2001-2002 came from around the world. Indonesia was the top exporter to Canada with 14,975 individuals, followed by El Salvador with 12,658 and then Ghana with 12,468. In total, at least 54,738 wild-caught animals were imported during this period.

Quebec was the most substantial importer of CITES-listed reptiles with 45,467 individuals, while Ontario was a distant second with 10,171 and British Columbia third with 933.

The Green iguana was also the most common CITES-listed species imported into Canada from 1995 – 2000. In total, 65,372 green iguanas were brought into the country. 11,274 individuals were imported in 1995 growing to a high of 13,893 in 1997 and then falling to 9,980 in 2000.

During that same period, 3,669 Savannah monitor lizards *(Varanus exanthematicus)*, 945 Nile monitors *(Varanus niloticus)*, 9,166 ball pythons *(Python regius)*, 1,780 boa constrictors *(Boa constrictor)* were also imported. The 10 most commonly imported CITES-listed species comprised 93,217 of the total number imported.

Lizards comprised the greatest number of CITES-listed reptile species imported into Canada, followed by snakes and the turtles/tortoises and crocodilians.

Wild caught CITES-listed reptiles were shipped to Canada from Indonesia (9,776 individuals) Suriname (8,505), Madagascar (7,794) and a number of other countries.

During this time period Quebec ranked first as the province with the largest number of imported CITES-listed reptiles, while Ontario was second and British Columbia a distant third. The most significant importers of live reptiles were Mirdo Imports and Animart in Quebec and Massassauga Imports, Ontario

Pet Supply and the Port Credit Pet Center in Ontario. Tens of thousands of reptiles enter Canada every year. Many of these animals are wild caught, including many monitor lizards, a diverse range of snake species, significant numbers of chameleons, anoles and other species. The rest of the imports are non-CITES-listed species. These animals are in addition to those that are caught from the wild or captive-bred within Canada, and those that are illegally acquired.

NOTE: The information contained in the various charts that follow has been compiled from CITES documents obtained from Environment Canada through the federal Access to Information process. In a few cases, the documents were incomplete, unclear or contained misspelled common and scientific names. For that reason, some information included in the charts has been designated as N/A (information not available) or U (unknown).

A number of abbreviations can be found in the import charts. Designations for the type of permit (issued in the country of origin prior to import into Canada) are: E (export), R (reexport) and O (other).

In several charts, the following source codes can be found: W (wild caught), C (captive-bred), F (specimens resulting from the exchange of gametes under captive conditions or propagated asexually in captivity that do not fulfill the definition of bred in captivity), R (ranched) and U (unknown).

SOURCES OF CAPTIVE-BRED REPTILES

Two major sources of captive-bred reptiles for the Canadian pet trade are breeding farms in the United States, Latin America and a small number of other regions and small scale reptile breeding operations in Canada and the United States.

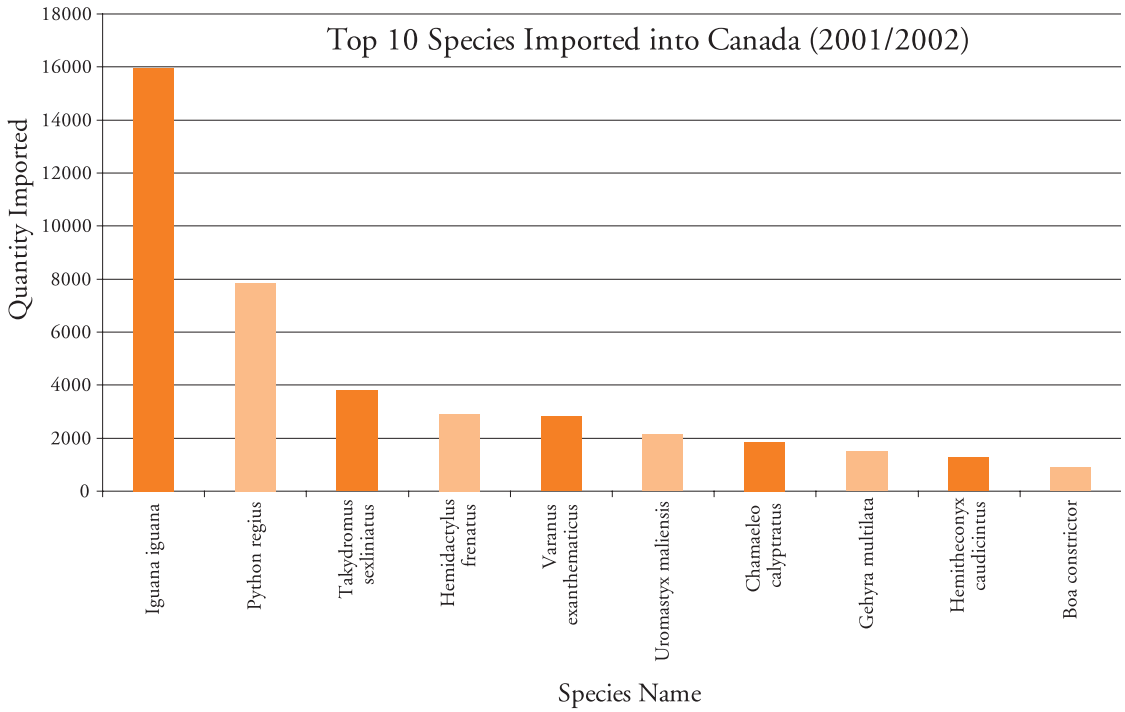
Reptile ranches and farms tend to produce very large quantities of a few high-demand species such as red-eared sliders or green iguanas that can be mass-marketed to consumers.

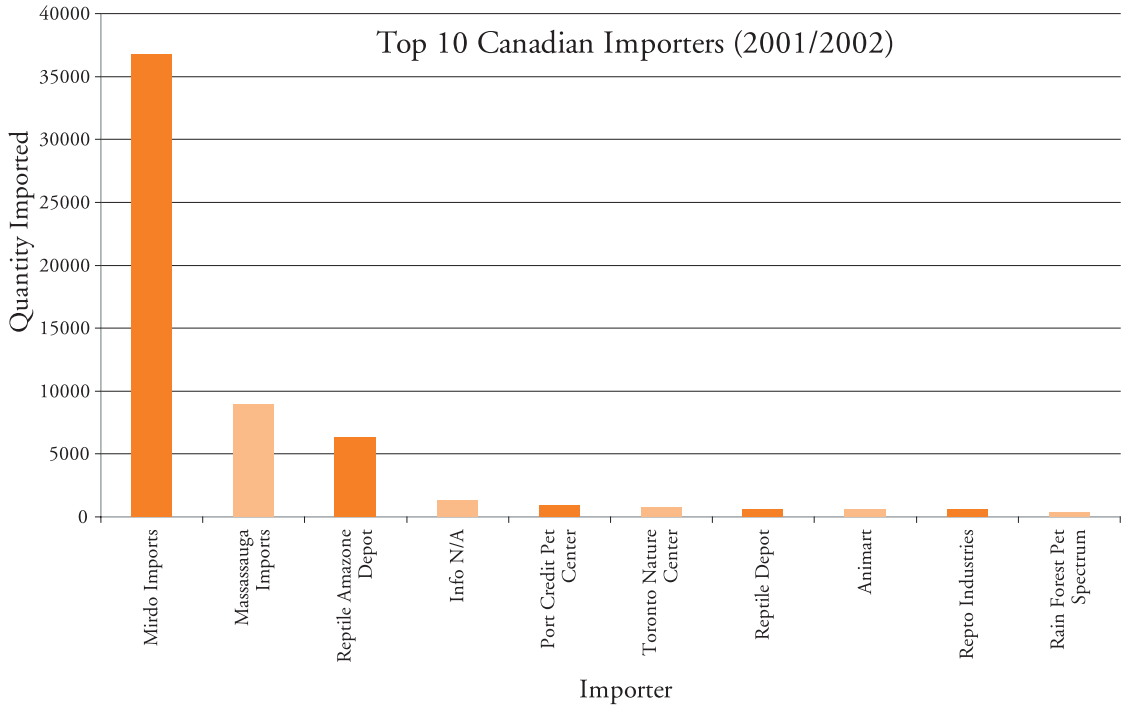
Most of the smaller breeding operations on the other hand produce a lesser number of reptiles but a much wider range of species. Some breeding operations are single person businesses producing just a few surplus animals each year, while others are larger scale commercial operations producing hundreds or thousands of animals annually. Some of them specialize in producing bizarre colour variations of particular snake and lizard species.

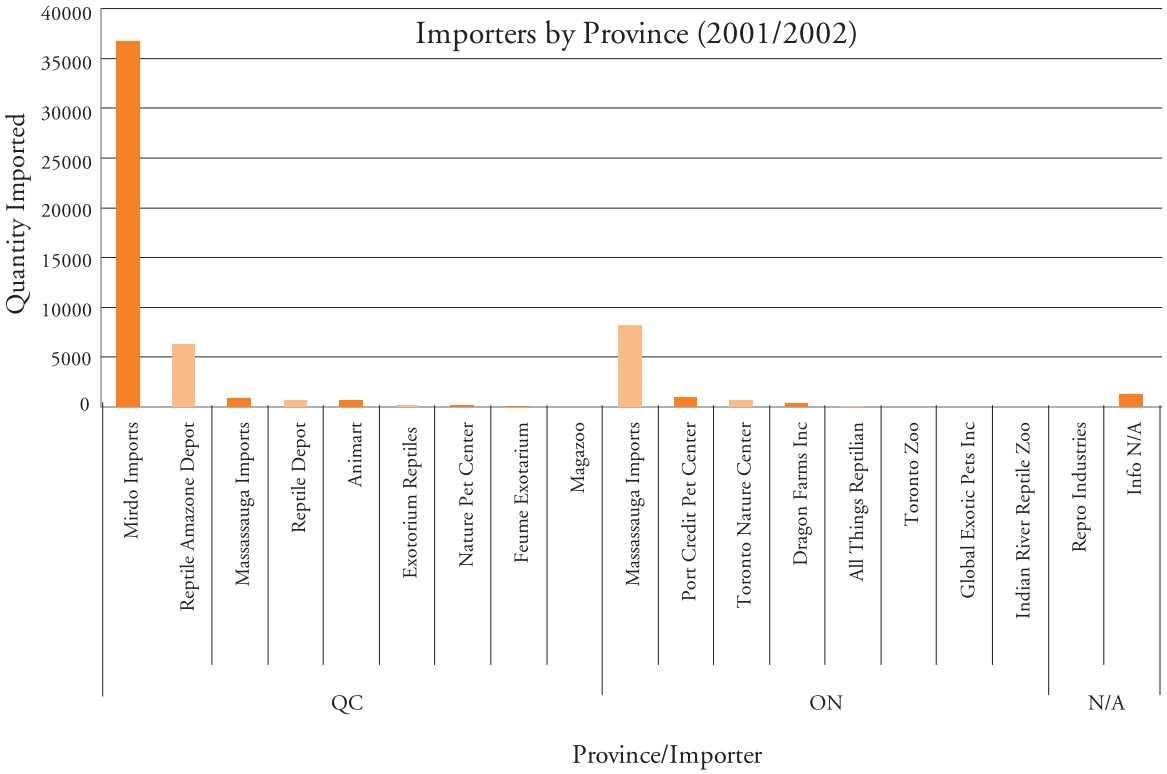
CHART ABBREVIATIONS

Canada	
AB	Alberta
BC	British Columbia
MB	Manitoba
ON	Ontario
QC	Quebec

International			
BEN	Benin	MLI	Mali
BDI	Burundy	MOZ	Mozambique
BRA	Brazil	MYS	Malaysia
BWI	British West Indies	NIC	Nicaragua
CHE	Switzerland	NLD	Netherlands
CMR	Cameroon	NOR	Norway
COL	Columbia	PRY	Paraguay
CRA	Comores	RUS	Russia
CRI	Costa Rica	SDN	Sudan
CYM	Cayman Islands	SLB	Solomon Islands
CZE	Czech Republic	SLV	Slovakia
DEU	Germany	SVN	Slovenia
DNK	Denmark	SWE	Sweden
GBR	Great Britian	SUR	Suriname
GHA	Ghana	TGO	Togo
GUY	Guyana	THA	Thailand
GTM	Guatemala	TZA	Tanzania
HTI	Haiti	USA	United States
IDN	Indonesia	UKR	Ukraine
JPN	Japan	VEN	Venezuela
LBN	Lebanon	YEM	Yemen
MDG	Madagascar	ZAI	Zaire
MEX	Mexico		

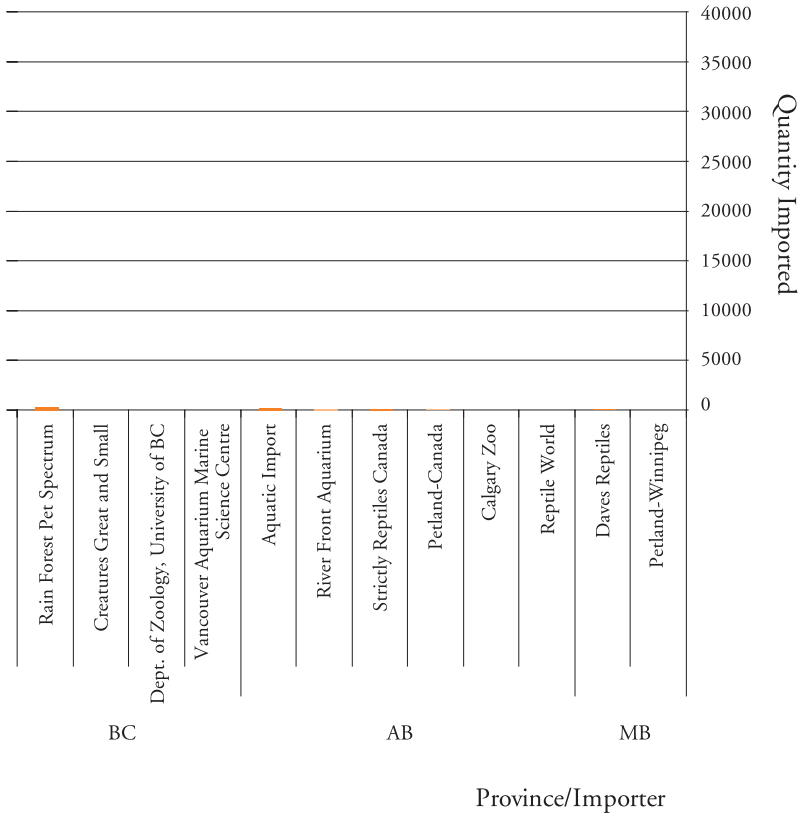

Top 10 Species Imported into Canada (2001/2002)
Quantity Imported
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Iguana iguana
Python regius
Takydromus sexliniatus
Hemidactylus frenatus
Varanus exanthematicus
Uromastyx maliensis
Chamaeleo calyptratus
Gehyra multilata
Hemitheconyx caudicintus
Boa constrictor
Species Name

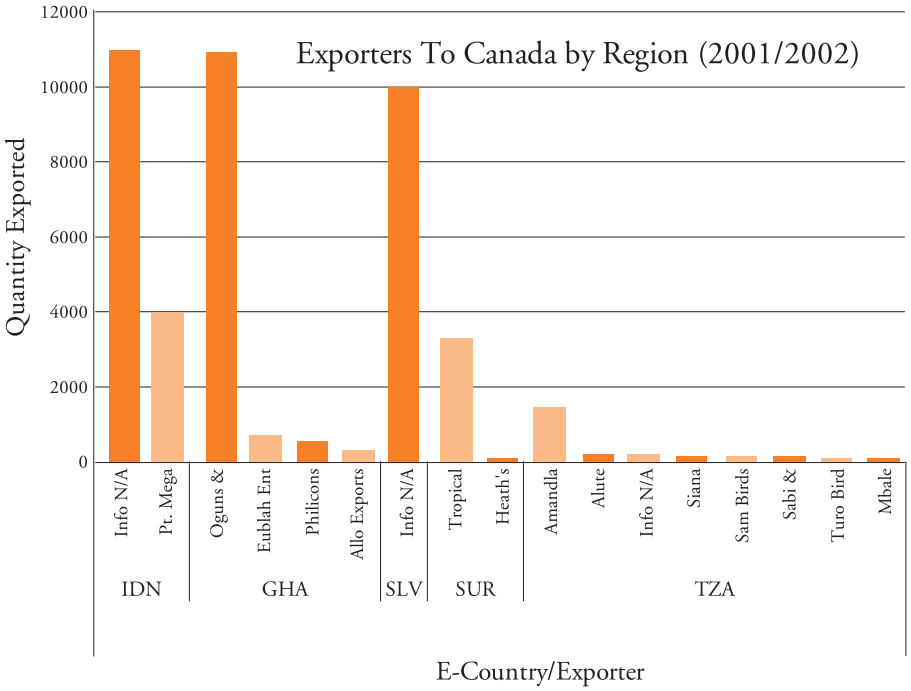

Top 10 Canadian Importers (2001/2002)
Quantity Imported
40000
35000
30000
25000
20000
15000
10000
5000
0
Mirdo Imports
Massassauga Imports
Reptile Amazone Depot
Info N/A
Port Credit Pet Center
Toronto Nature Center
Reptile Depot
Animart
Repro Industries
Rain Forest Pet Spectrum
Importer

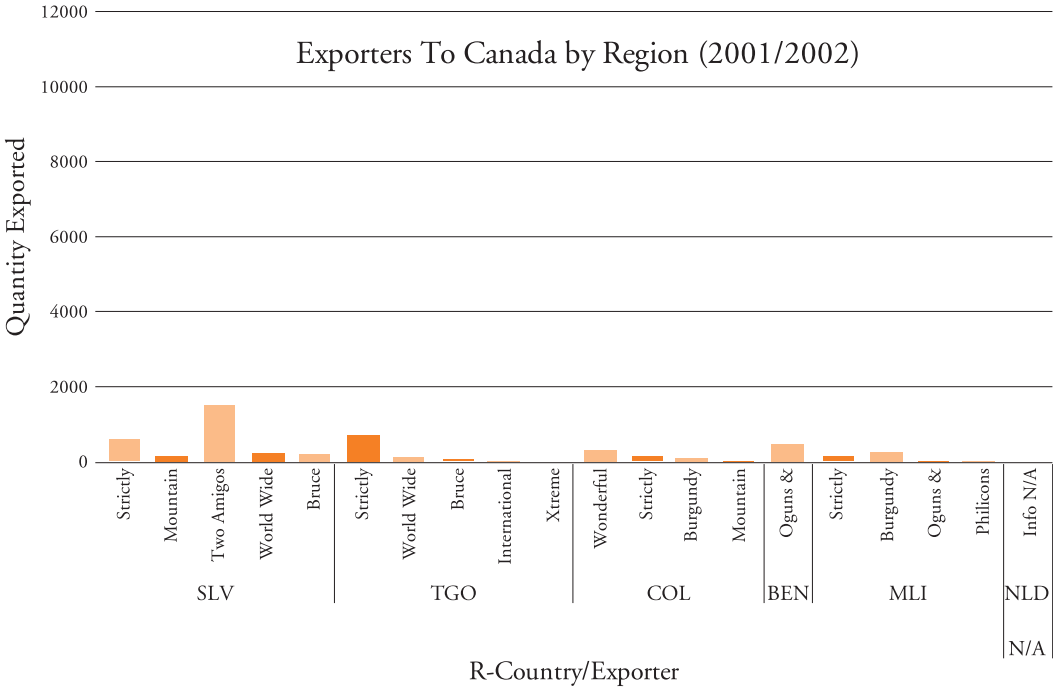


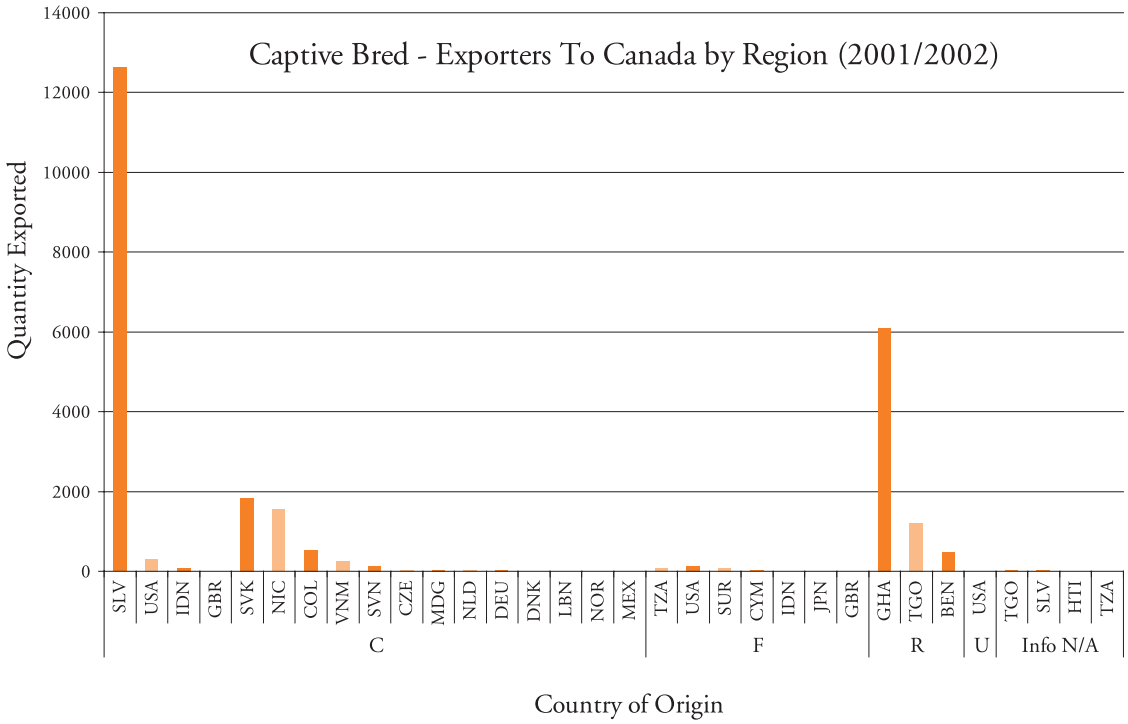
Importers by Province (2001/2002)

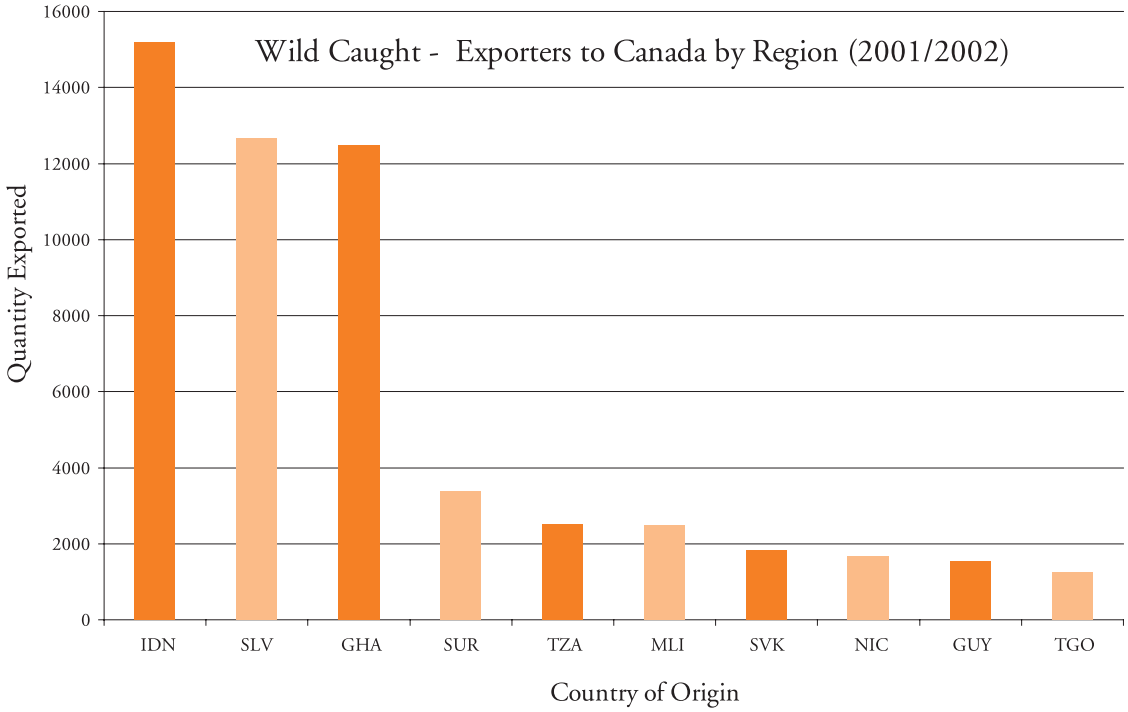
continued

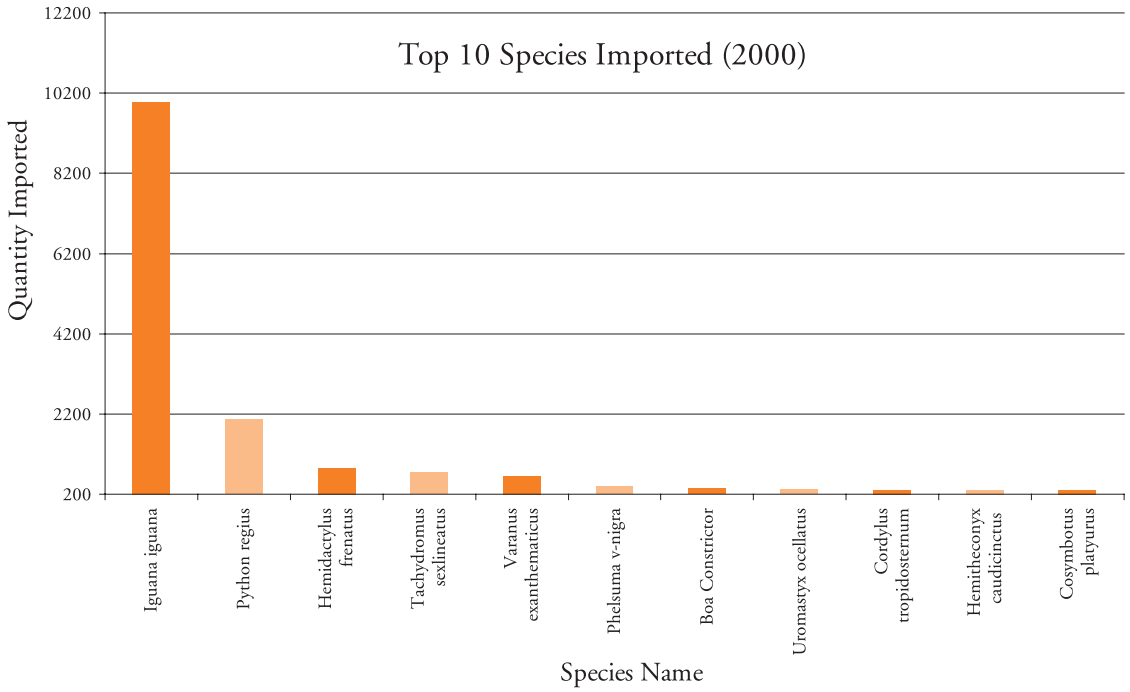


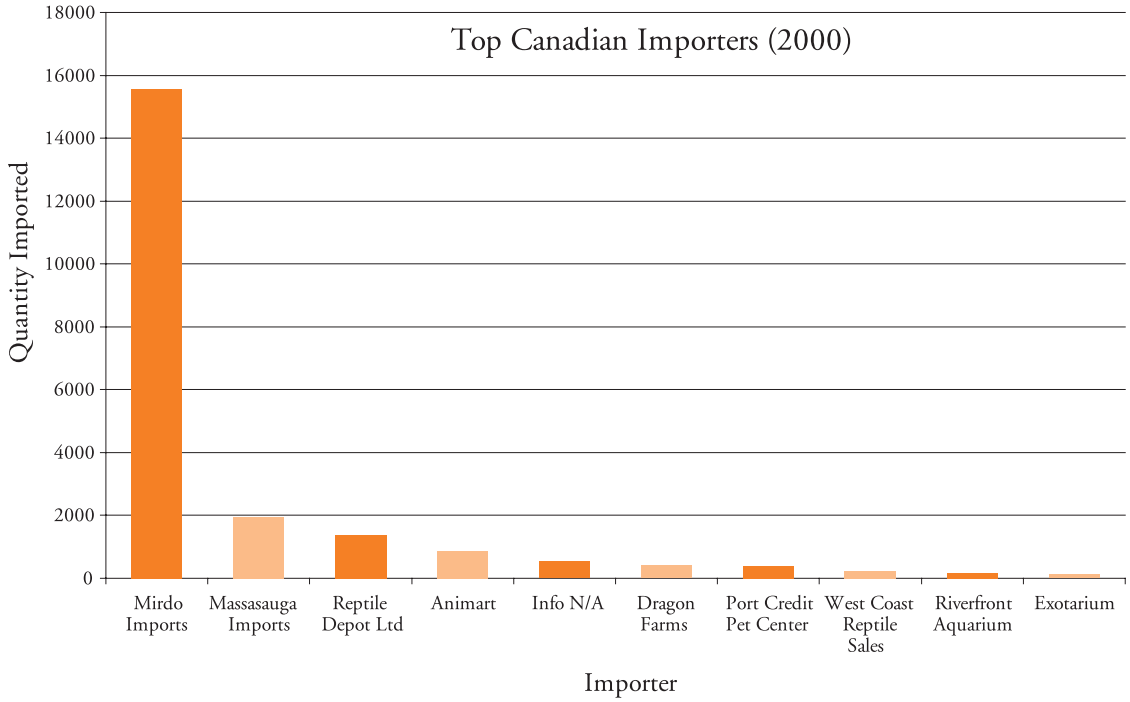

Exporters To Canada by Region (2001/2002)
Quantity Exported
12000
10000
8000
6000
4000
2000
0
Info N/A
Pt. Mega
Oguns &
Eublah Ent
Philicons
Allo Exports
Info N/A
Tropical
Heath's
Amandla
Alute
Info N/A
Siana
Sam Birds
Sabi &
Turo Bird
Mbale
IDN
GHA
SLV
SUR
TZA
E-Country/Exporter

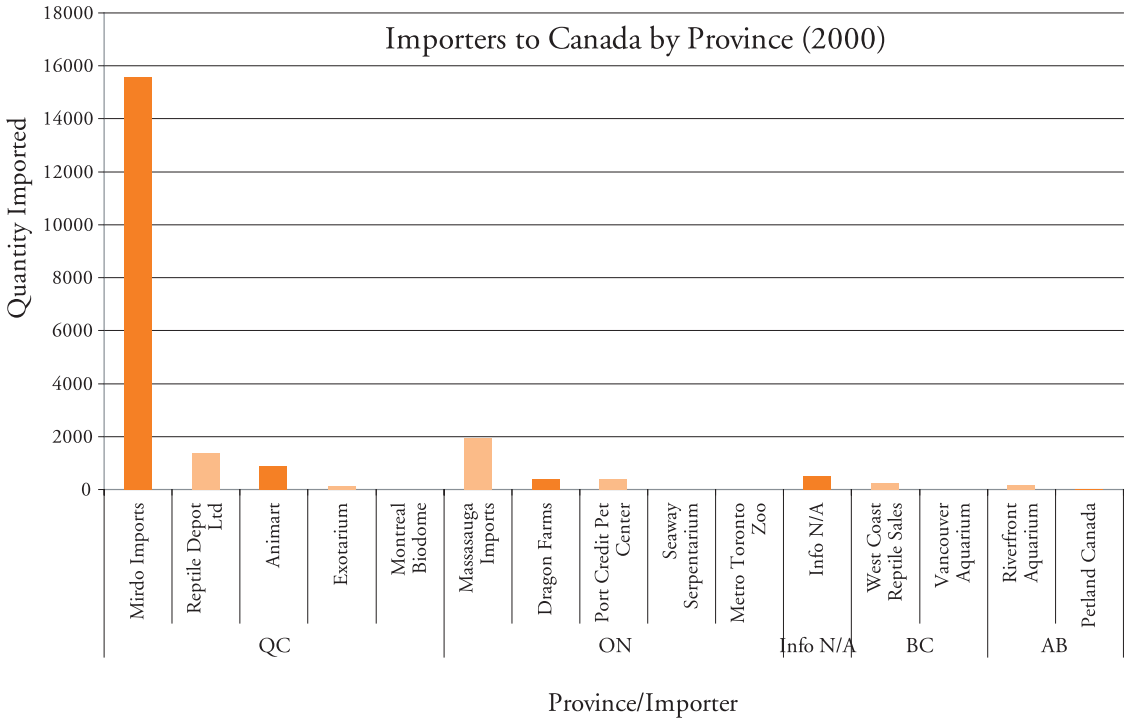

Exporters To Canada by Region (2001/2002)
Quantity Exported
12000
10000
8000
6000
4000
2000
0
Strictly
Mountain
Two Amigos
World Wide
Bruce
Strictly
World Wide
Bruce
International
Xtreme
Wonderful
Strictly
Burgundy
Mountain
Oguns &
Strictly
Burgundy
Oguns &
Philicons
Info N/A
SLV
TGO
COL
BEN
MLI
NLD
N/A
R-Country/Exporter

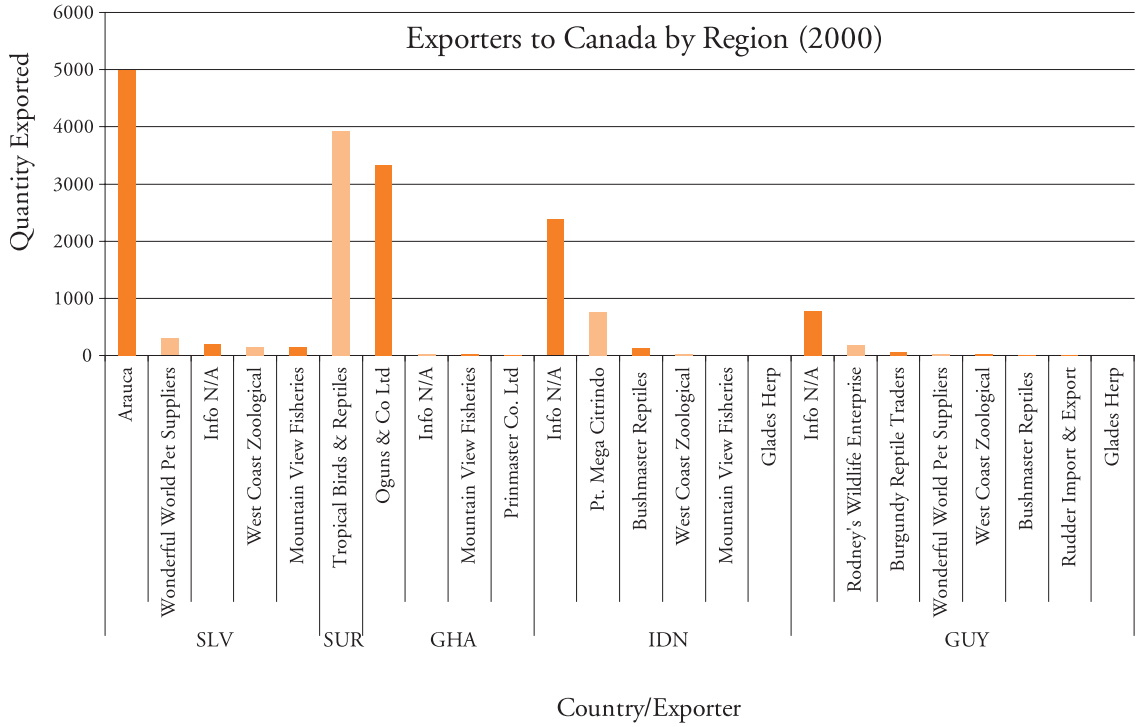

Captive Bred - Exporters To Canada by Region (2001/2002)
Quantity Exported
14000
12000
10000
8000
6000
4000
2000
0
SLV
USA
IDN
GBR
SVK
NIC
COL
VNM
SVN
CZE
MDG
NLD
DEU
DNK
LBN
NOR
MEX
TZA
USA
SUR
CYM
IDN
JPN
GBR
GHA
TGO
BEN
USA
TGO
SLV
HTI
TZA
C
F
R
U
Info N/A
Country of Origin

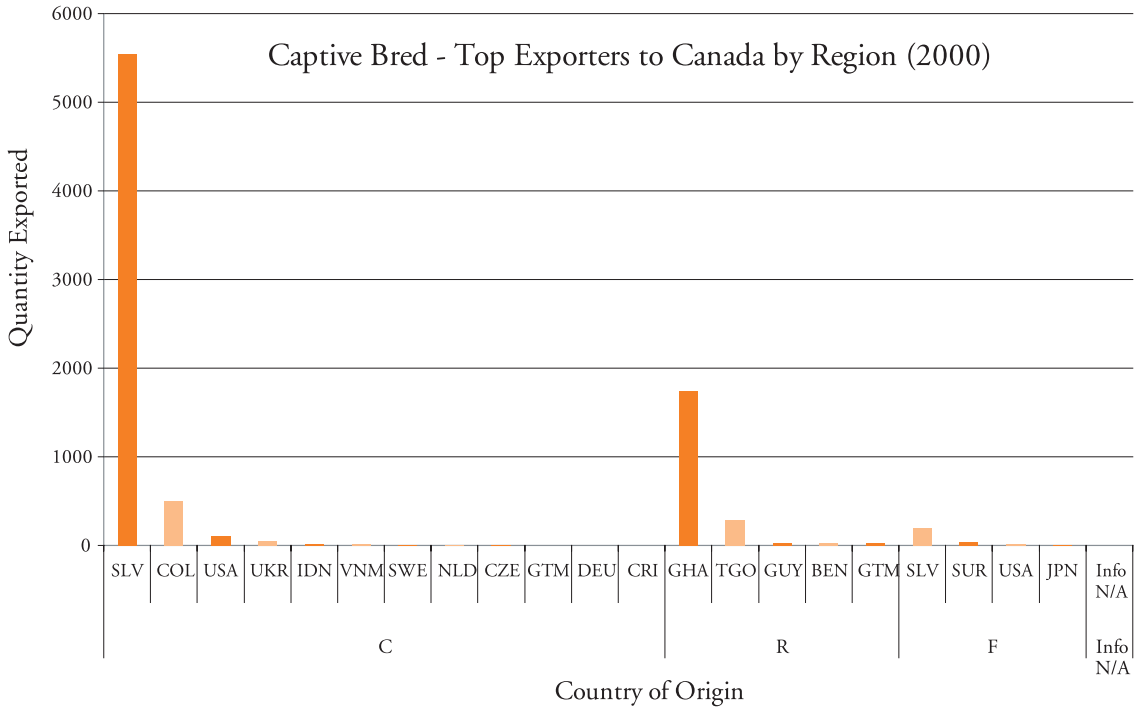

Wild Caught - Exporters to Canada by Region (2001/2002)
Quantity Exported
16000
14000
12000
10000
8000
6000
4000
2000
0
IDN
SLV
GHA
SUR
TZA
MLI
SVK
NIC
GUY
TGO
Country of Origin

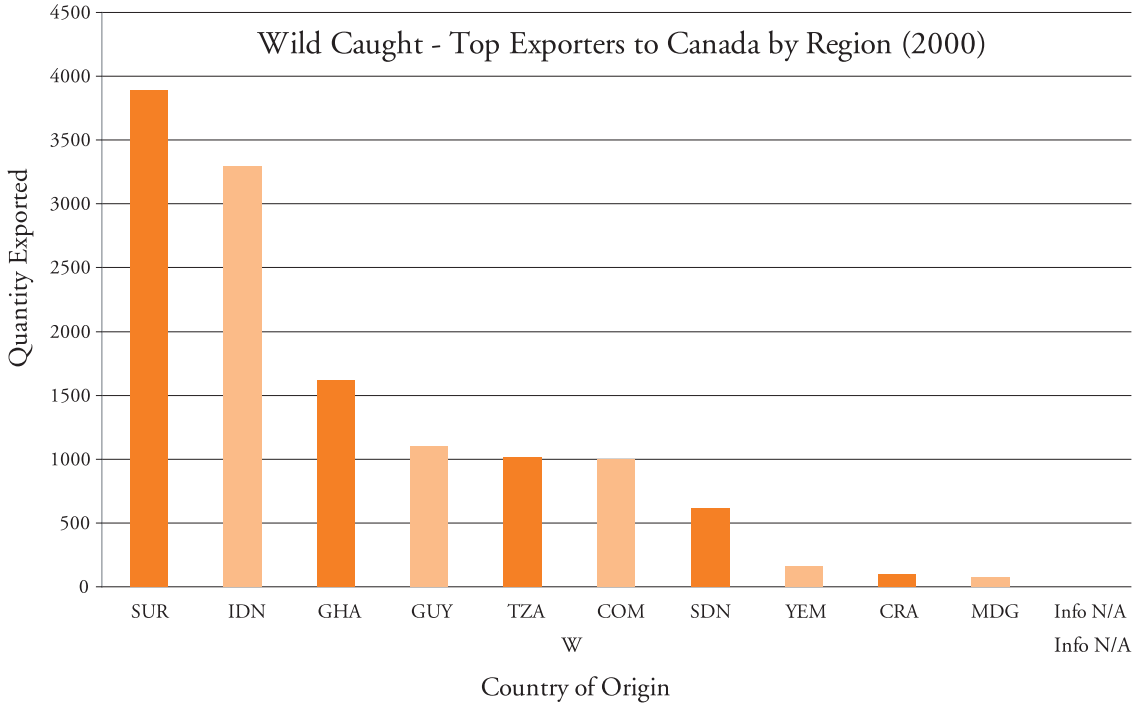

Top 10 Species Imported (2000)
Quantity Imported
12200
10200
8200
6200
4200
2200
200
Iguana iguana
Python regius
Hemidactylus frenatus
Tachydromus sexlineatus
Varanus exanthematicus
Phelsuma v-nigra
Boa Constrictor
Uromastyx ocellatus
Cordylus tropidosternum
Hemitheconyx caudicinctus
Cosymbotus platyurus
Species Name

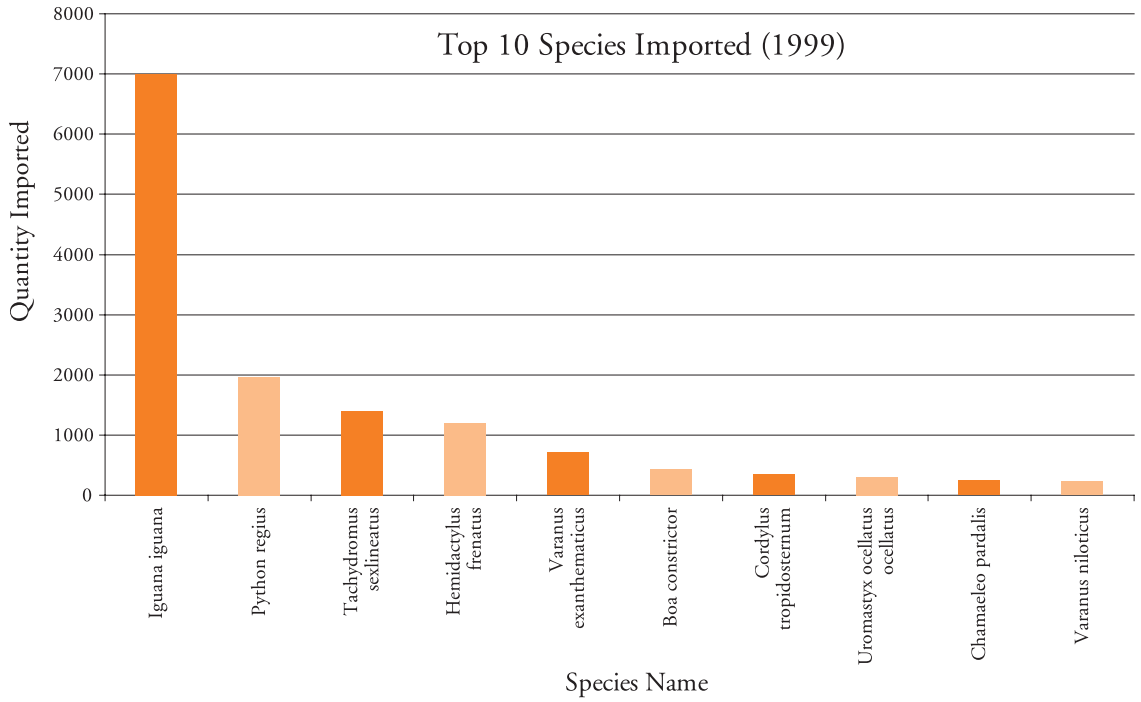

Top Canadian Importers (2000)
Quantity Imported
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Mirdo Imports
Massasauga Imports
Reptile Depot Ltd
Animart
Info N/A
Dragon Farms
Port Credit Pet Center
West Coast Reptile Sales
Riverfront Aquarium
Exotarium
Importer

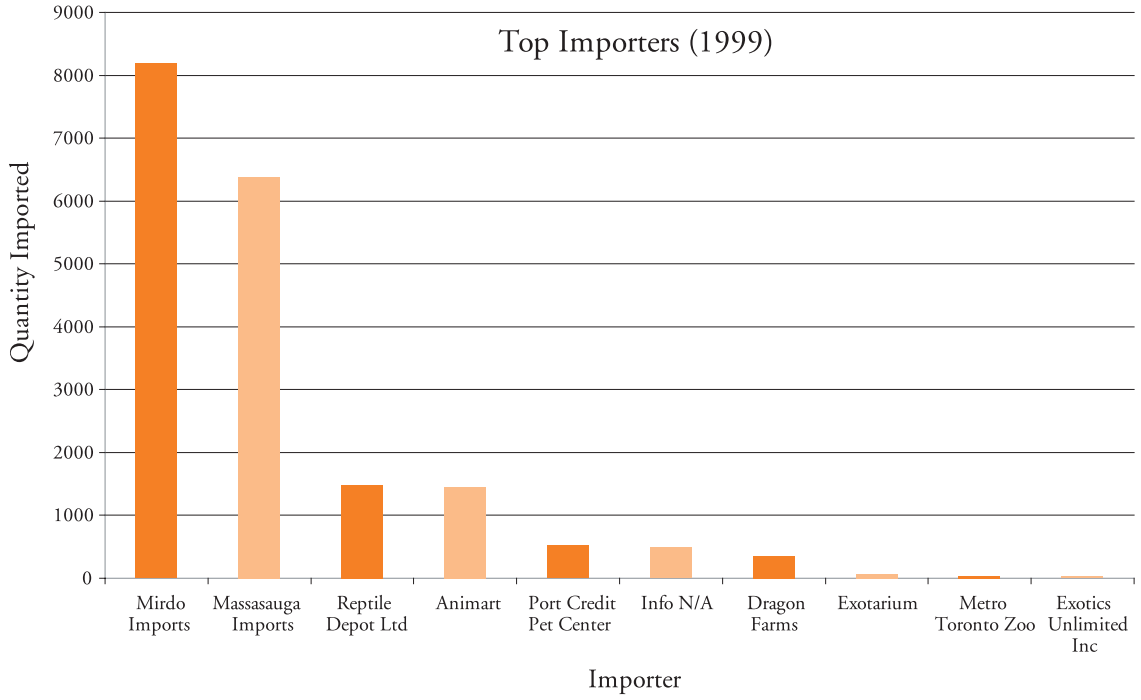

Importers to Canada by Province (2000)
Quantity Imported
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Mirdo Imports
Reptile Depot Ltd
Animart
Exotarium
Montreal Biodome
Massasauga Imports
Dragon Farms
Port Credit Pet Center
Seaway Serpentarium
Metro Toronto Zoo
Info N/A
West Coast Reptile Sales
Vancouver Aquarium
Riverfront Aquarium
Petland Canada
QC
ON
Info N/A
BC
AB
Province/Importer

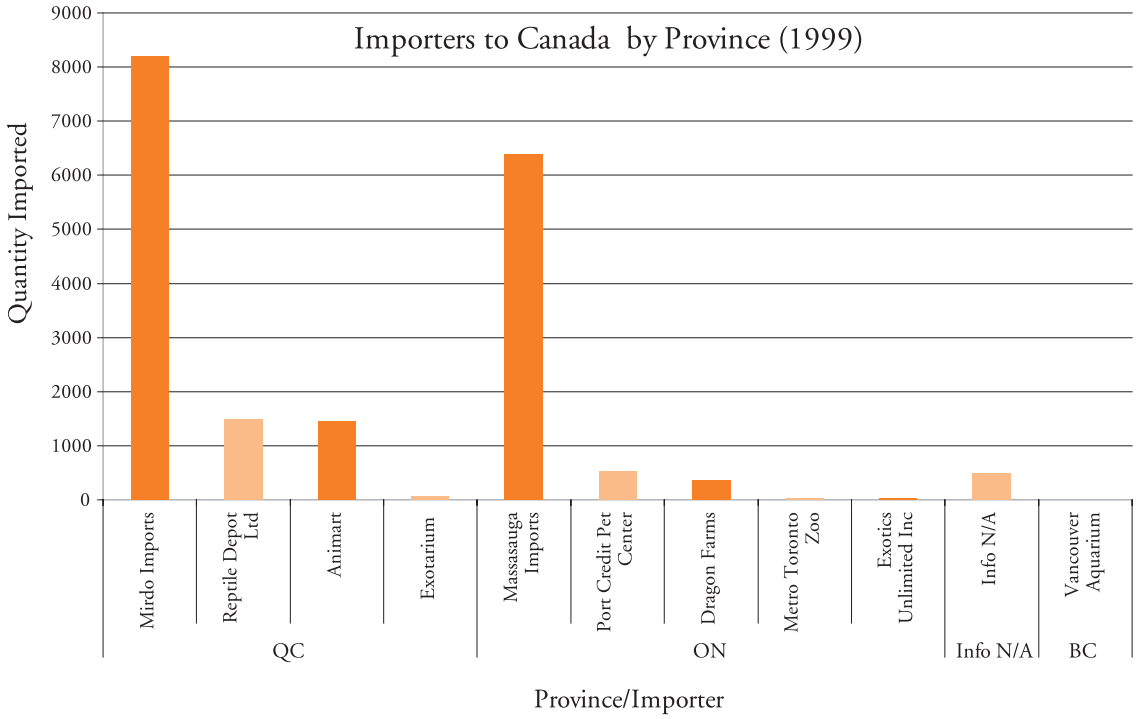

Exporters to Canada by Region (2000)
Quantity Exported
6000
5000
4000
3000
2000
1000
0
Arauca
Wonderful World Pet Suppliers
Info N/A
West Coast Zoological
Mountain View Fisheries
Tropical Birds & Reptiles
Oguns & Co Ltd
Info N/A
Mountain View Fisheries
Prinmaster Co. Ltd
Info N/A
Pt. Mega Citrindo
Bushmaster Reptiles
West Coast Zoological
Mountain View Fisheries
Glades Herp
Info N/A
Rodney's Wildlife Enterprise
Burgundy Reptile Traders
Wonderful World Pet Suppliers
West Coast Zoological
Bushmaster Reptiles
Rudder Import & Export
Glades Herp
SLV
SUR
GHA
IDN
GUY
Country/Exporter

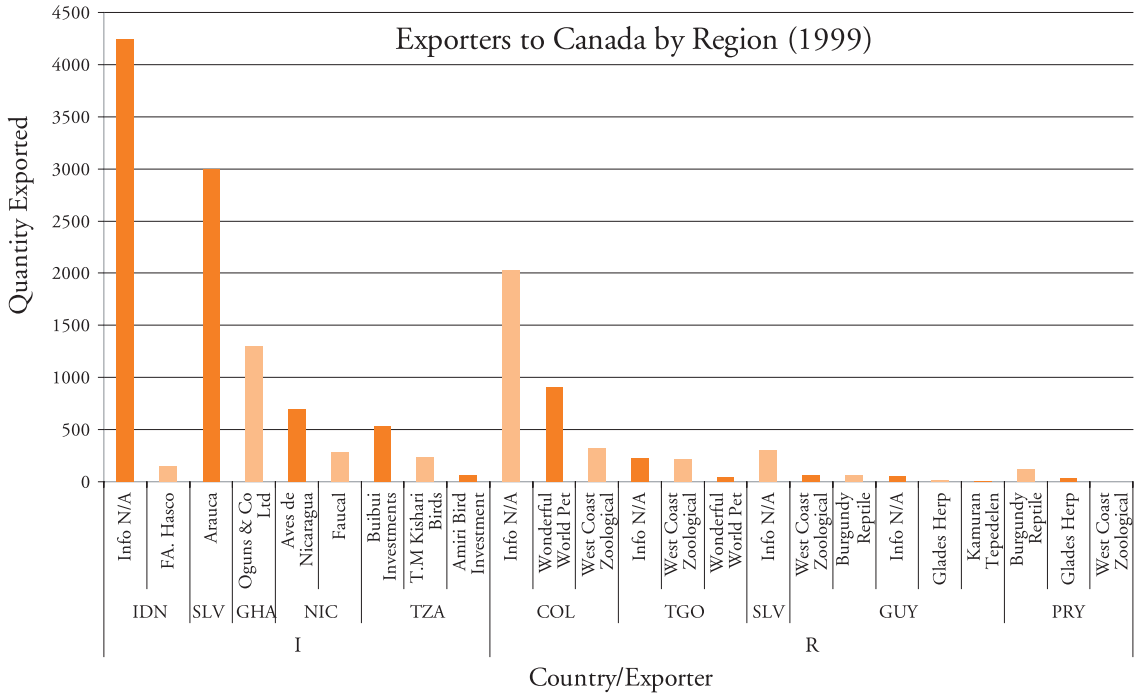

Captive Bred - Top Exporters to Canada by Region (2000)
Quantity Exported
6000
5000
4000
3000
2000
1000
0
SLV
COL
USA
UKR
IDN
VNM
SWE
NLD
CZE
GTM
DEU
CRI
GHA
TGO
GUY
BEN
GTM
SLV
SUR
USA
JPN
Info N/A
C
R
F
Info N/A
Country of Origin

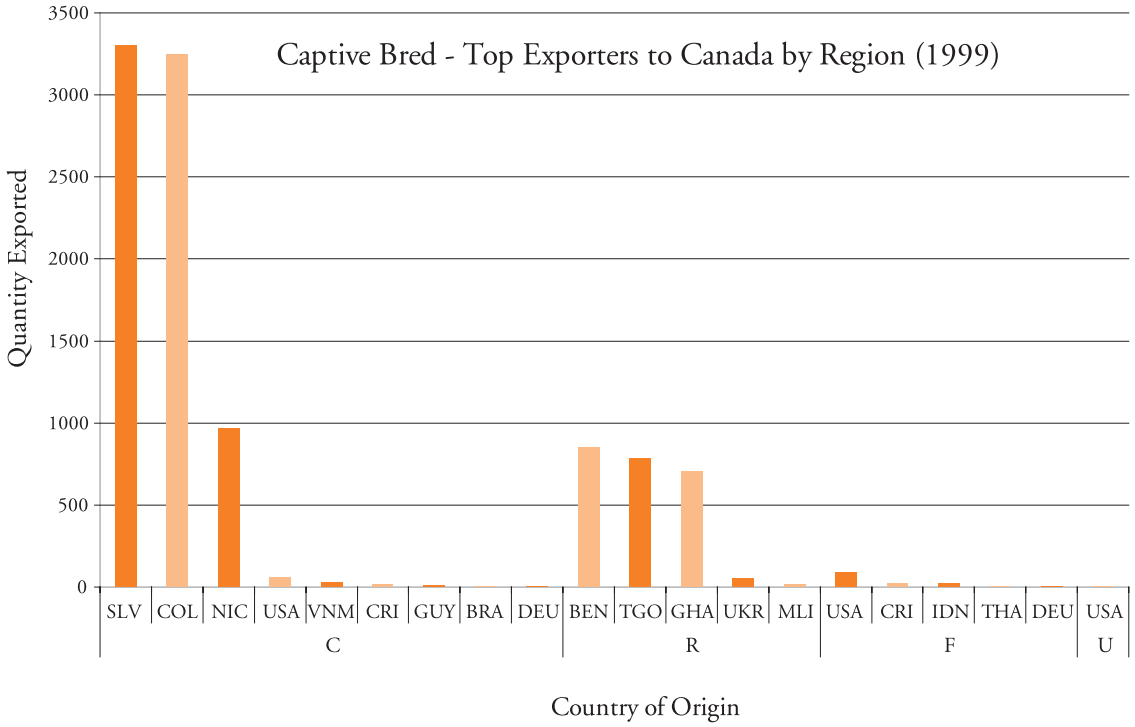

Wild Caught - Top Exporters to Canada by Region (2000)
Quantity Exported
4500
4000
3500
3000
2500
2000
1500
1000
500
0
SUR
IDN
GHA
GUY
TZA
COM
SDN
YEM
CRA
MDG
Info N/A
W
Info N/A
Country of Origin

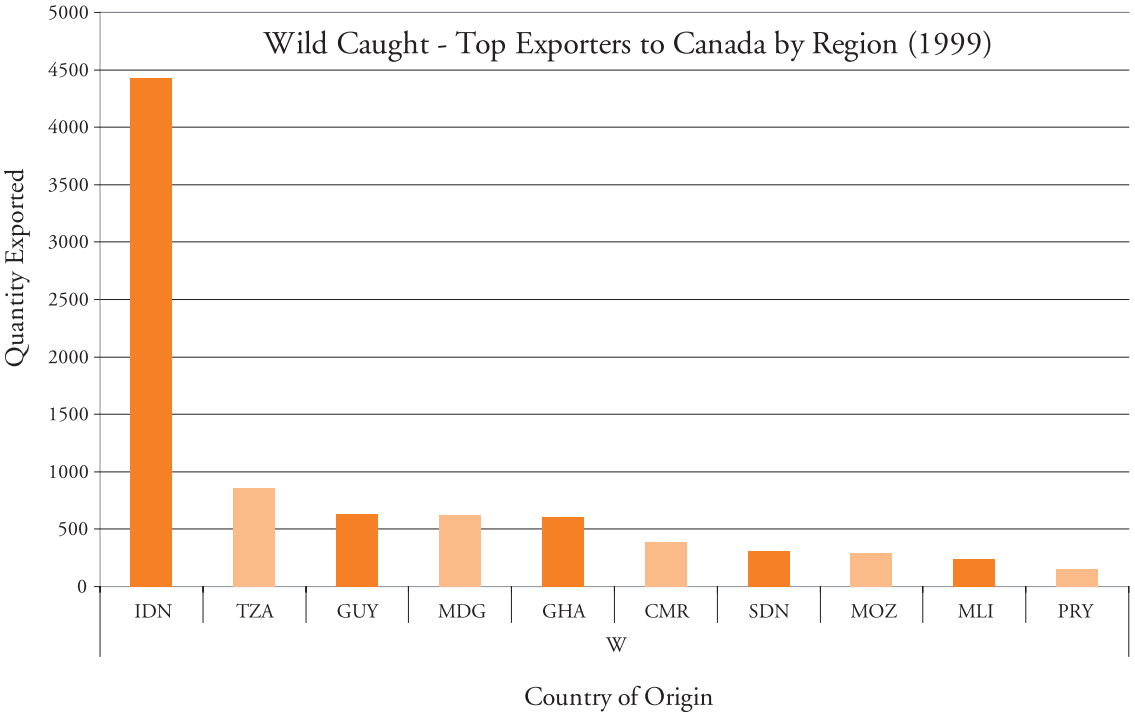

Top 10 Species Imported (1999)
Quantity Imported
8000
7000
6000
5000
4000
3000
2000
1000
0
Iguana iguana
Python regius
Tachydromus sexlineatus
Hemidacylus frenatus
Varanus exanthematicus
Boa constrictor
Cordylus tropidosternum
Uromastyx ocellatus ocellatus
Chamaeleo pardalis
Varanus niloticus
Species Name

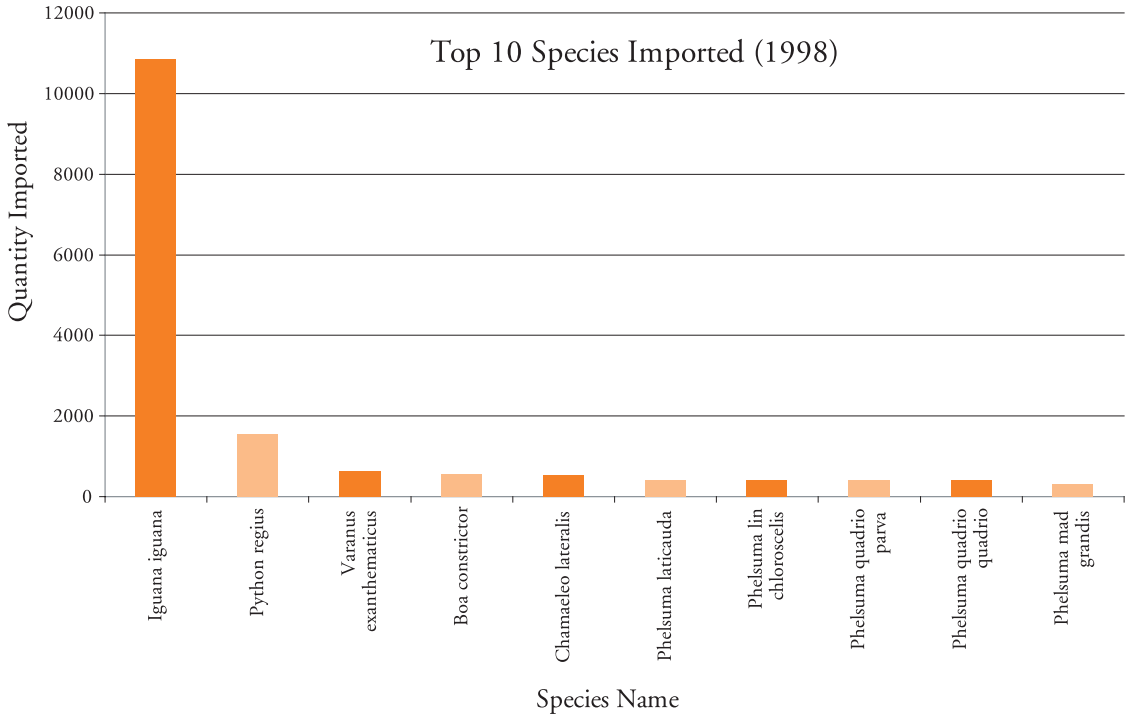

Top Importers (1999)
Quantity Imported
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Mirdo Imports
Massasauga Imports
Reptile Depot Ltd
Animart
Port Credit Pet Center
Info N/A
Dragon Farms
Exotarium
Metro Toronto Zoo
Exotics Unlimited Inc
Importer

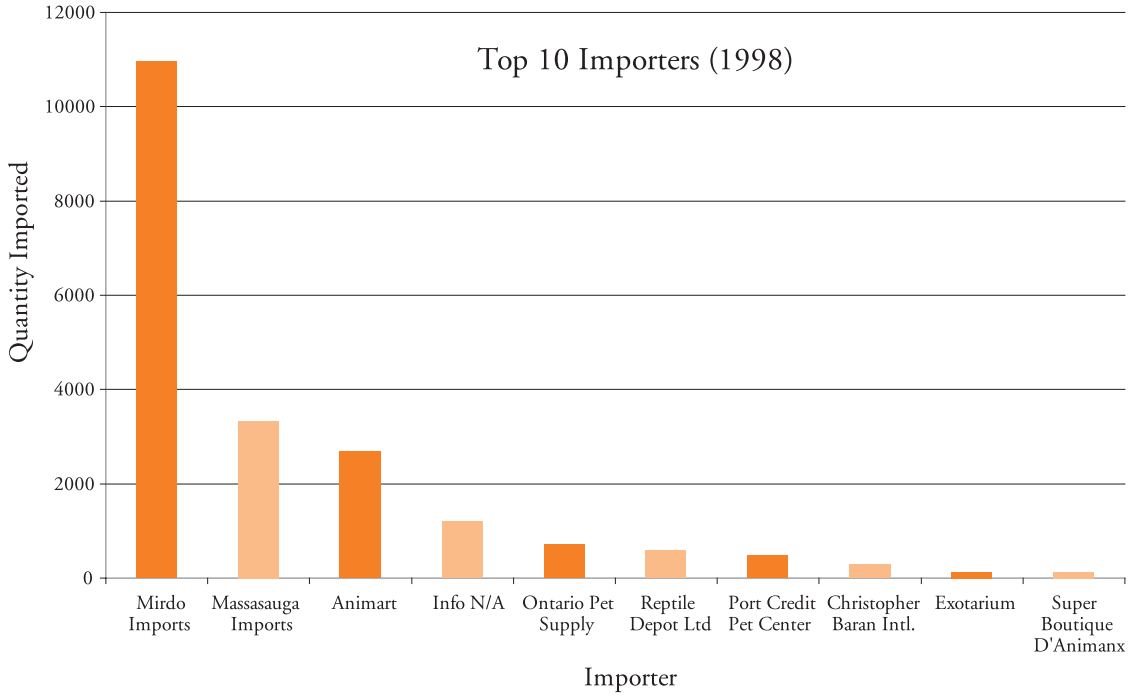

Importers to Canada by Province (1999)
Quantity Imported
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Mirdo Imports
Reptile Depot Ltd
Animart
Exotarium
Massasauga Imports
Port Credit Pet Center
Dragon Farms
Metro Toronto Zoo
Exotics Unlimited Inc
Info N/A
Vancouver Aquarium
QC
ON
Info N/A
BC
Province/Importer

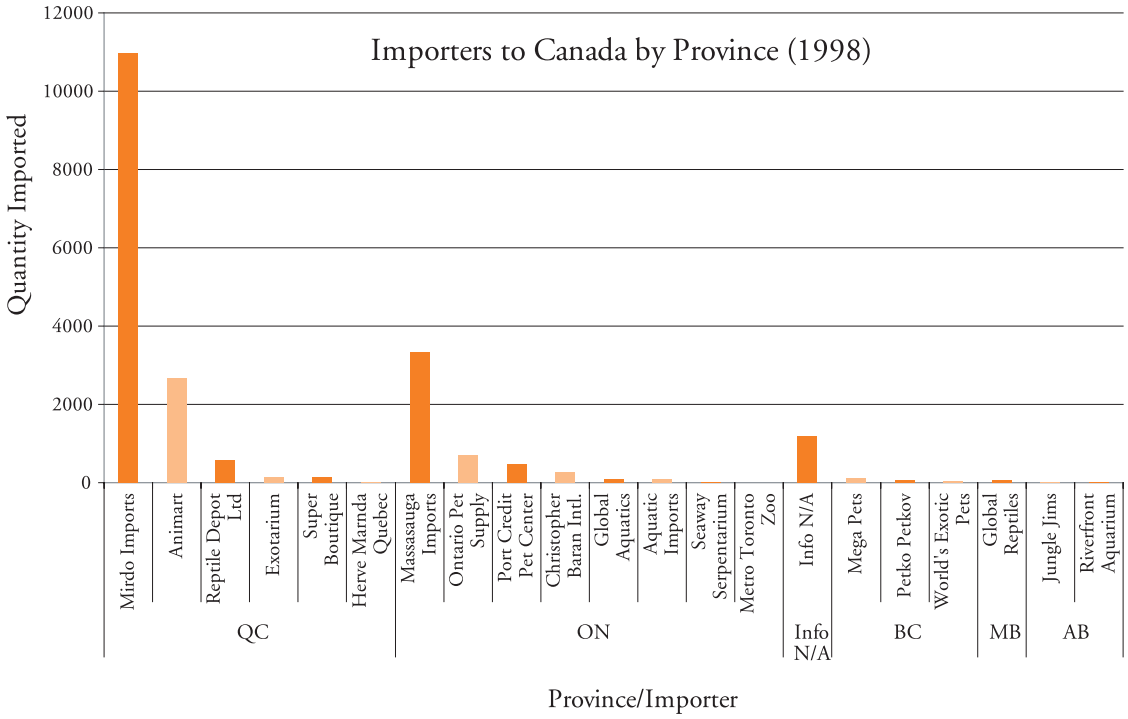

Exporters to Canada by Region (1999)
Quantity Exported
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Info N/A
FA. Hasco
Arauca
Oguns & Co Ltd
Aves de Nicaragua
Faucal
Buibui Investments
T.M Kishari Birds
Amiri Bird Investment
Info N/A
Wonderful World Pet
West Coast Zoological
Info N/A
West Coast Zoological
Wonderful World Pet
Info N/A
West Coast Zoological
Burgundy Reptile
Info N/A
Glades Herp
Kamuran Tepedelen
Burgundy Reptile
Glades Herp
West Coast Zoological
IDN
SLV
GHA
NIC
TZA
COL
TGO
SLV
GUY
PRY
I
R
Country/Exporter

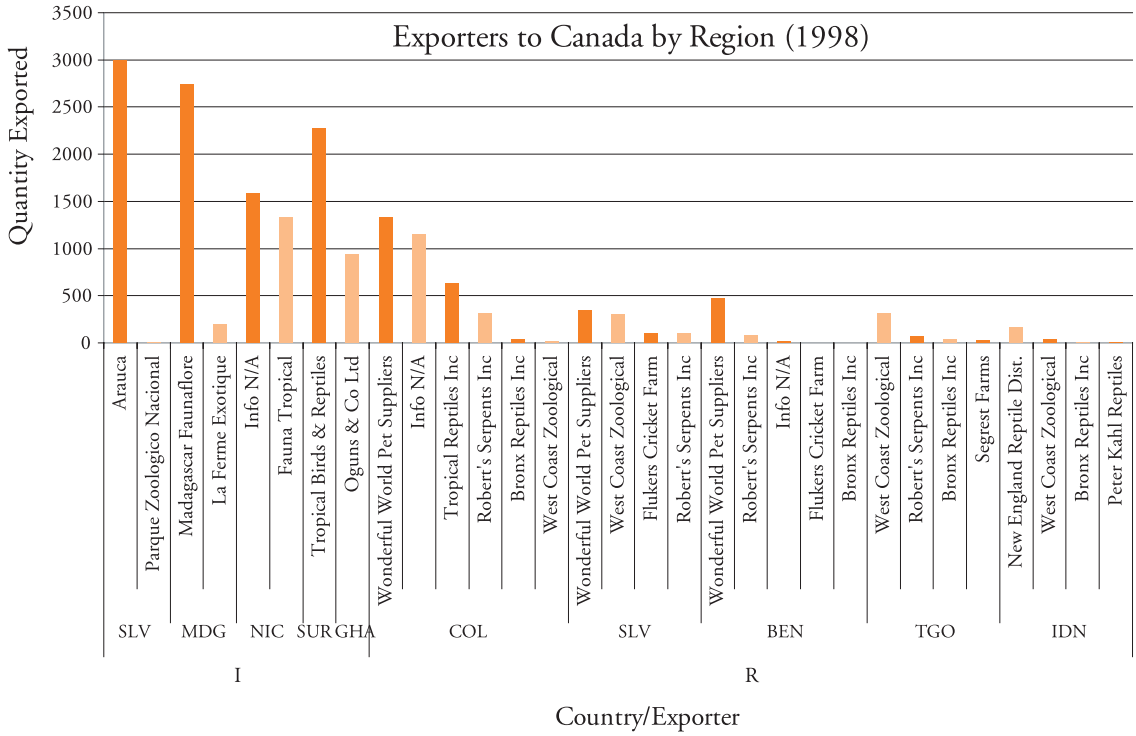

Captive Bred - Top Exporters to Canada by Region (1999)
Quantity Exported
3500
3000
2500
2000
1500
1000
500
0
SLV
COL
NIC
USA
VNM
CRI
GUY
BRA
DEU
BEN
TGO
GHA
UKR
MLI
USA
CRI
IDN
THA
DEU
USA
C
R
F
U
Country of Origin

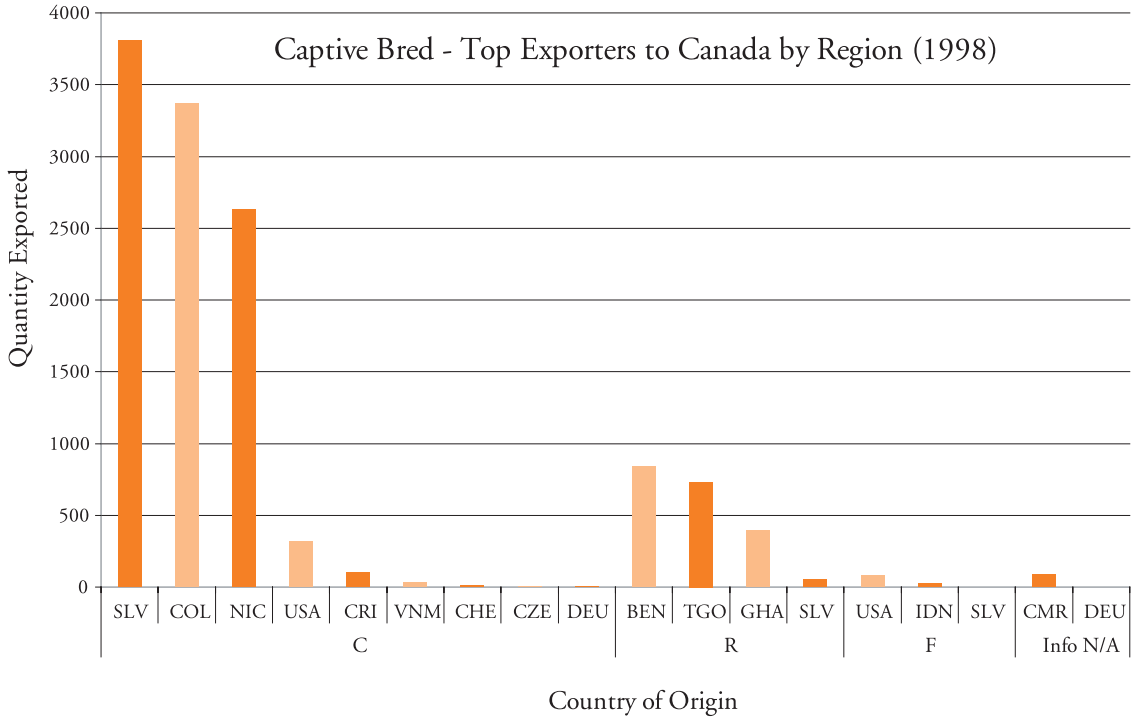

Wild Caught - Top Exporters to Canada by Region (1999)
Quantity Exported
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
IDN
TZA
GUY
MDG
GHA
CMR
SDN
MOZ
MLI
PRY
W
Country of Origin

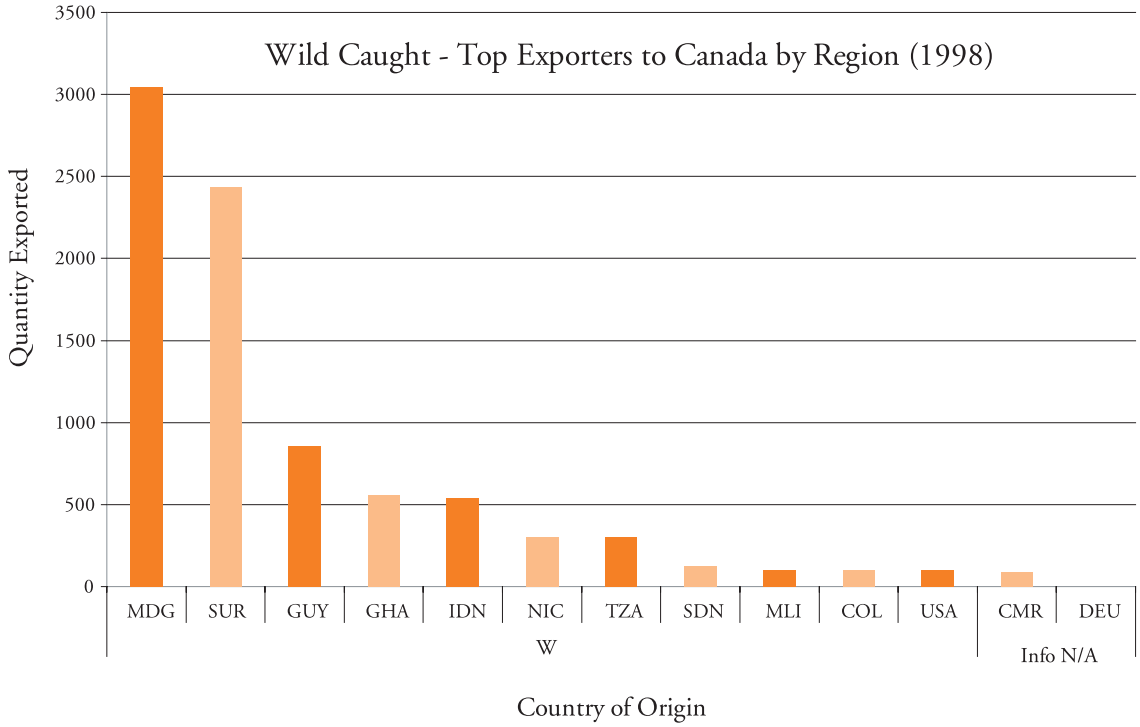

Top 10 Species Imported (1998)
Quantity Imported
12000
10000
8000
6000
4000
2000
0
Iguana iguana
Python regius
Varanus exanthematicus
Boa constrictor
Chamaeleo lateralis
Phelsuma laticauda
Phelsuma lin chloroscelis
Phelsuma quadrio parva
Phelsuma quadrio quadrio
Phelsuma mad grandis
Species Name

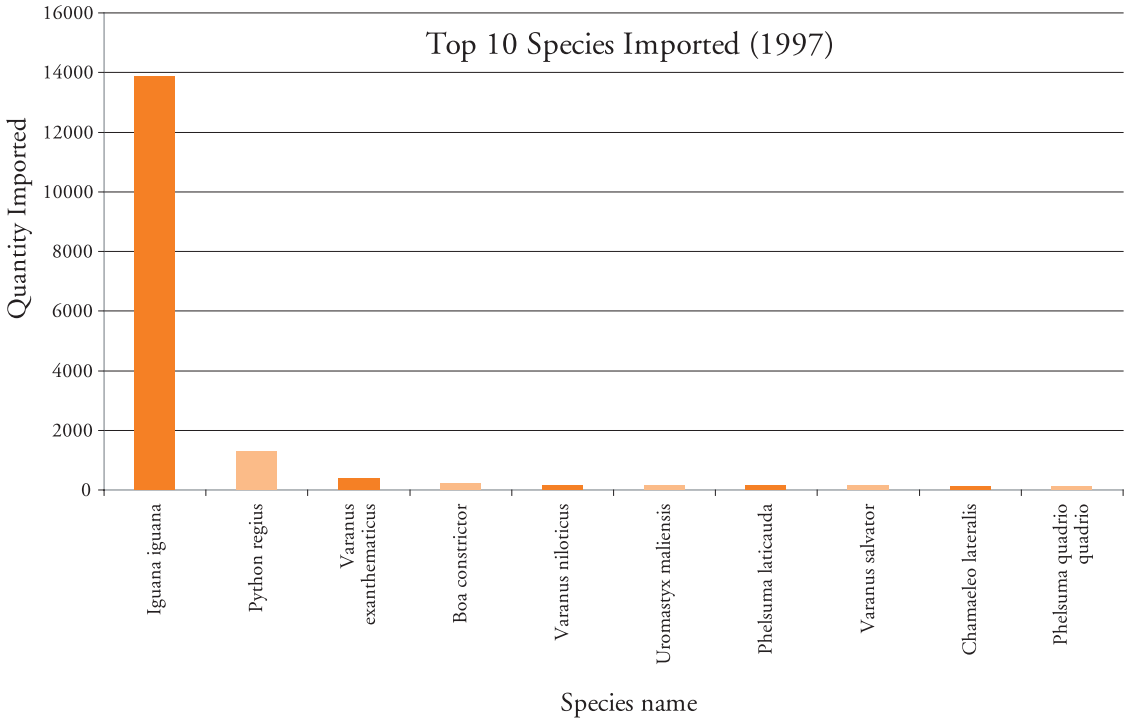

Top 10 Importers (1998)
Quantity Imported
12000
10000
8000
6000
4000
2000
0
Mirdo Imports
Massasauga Imports
Animart
Info N/A
Ontario Pet Supply
Reptile Depot Ltd
Port Credit Pet Center
Christopher Baran Intl.
Exotarium
Super Boutique D'Animanx
Importer

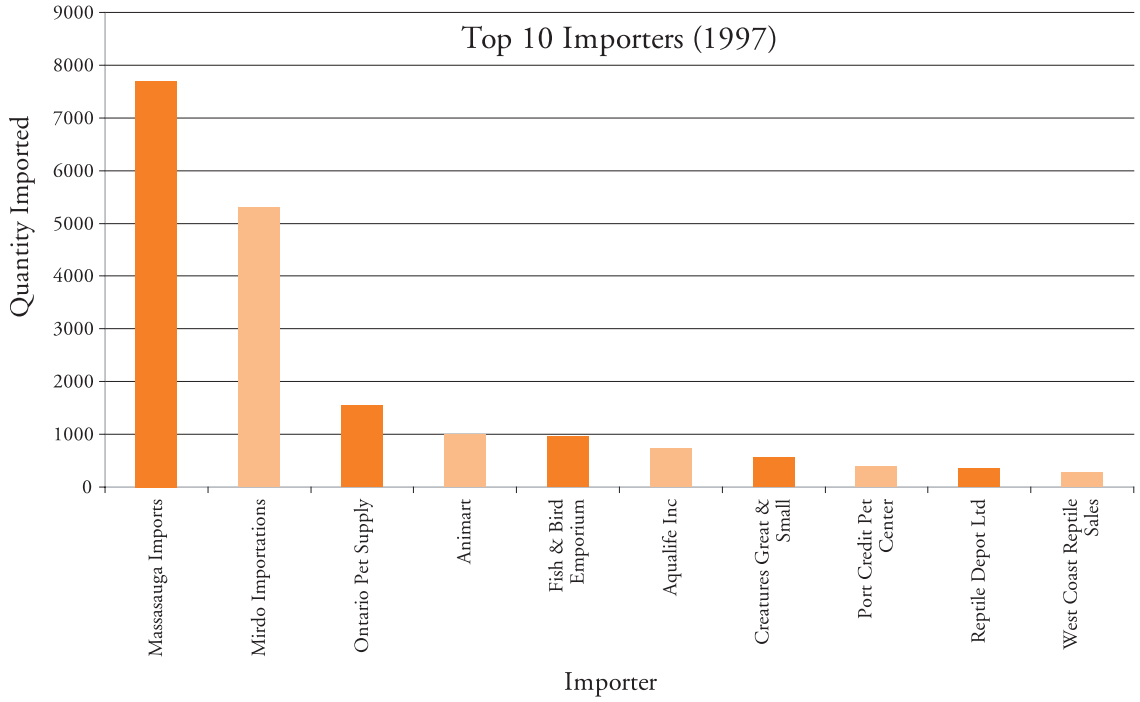

Importers to Canada by Province (1998)
Quantity Imported
12000
10000
8000
6000
4000
2000
0
Mirdo Imports
Animart
Reptile Depot Ltd
Exotarium
Super Boutique
Herve Marnda Quebec
Massasauga Imports
Ontario Pet Supply
Port Credit Pet Center
Christopher Baran Intl.
Global Aquatics
Aquatic Imports
Seaway Serpentarium
Metro Toronto Zoo
Info N/A
Mega Pets
Petko Petkov
World's Exotic Pets
Global Reptiles
Jungle Jims
Riverfront Aquarium
QC
ON
Info N/A
BC
MB
AB
Province/Importer

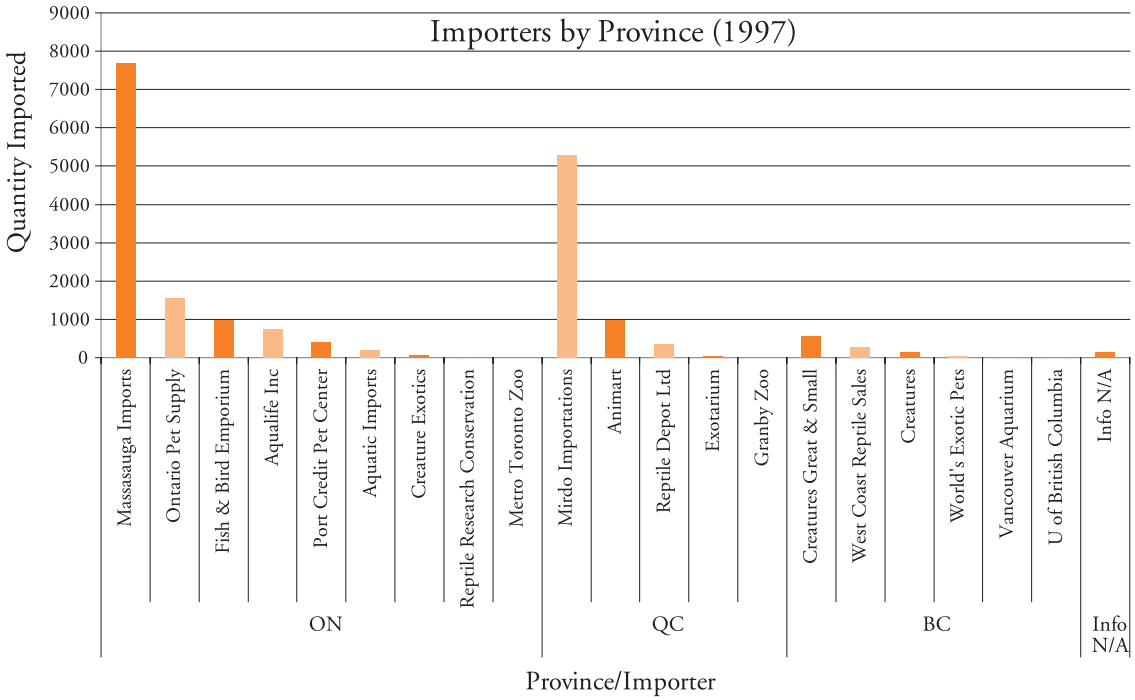

Exporters to Canada by Region (1998)
Quantity Exported
3500
3000
2500
2000
1500
1000
500
0
Arauca
Parque Zoologico Nacional
Madagascar Faunaflore
La Ferme Exotique
Info N/A
Fauna Tropical
Tropical Birds & Reptiles
Oguns & Co Ltd
Wonderful World Pet Suppliers
Info N/A
Tropical Reptiles Inc
Robert's Serpents Inc
Bronx Reptiles Inc
West Coast Zoological
Wonderful World Pet Suppliers
West Coast Zoological
Flukers Cricket Farm
Robert's Serpents Inc
Wonderful World Pet Suppliers
Robert's Serpents Inc
Info N/A
Flukers Cricket Farm
Bronx Reptiles Inc
West Coast Zoological
Robert's Serpents Inc
Bronx Reptiles Inc
Segrest Farms
New England Reptile Dist.
West Coast Zoological
Bronx Reptiles Inc
Peter Kahl Reptiles
SLV
MDG
NIC
SUR
GHA
COL
SLV
BEN
TGO
IDN
I
R
Country/Exporter

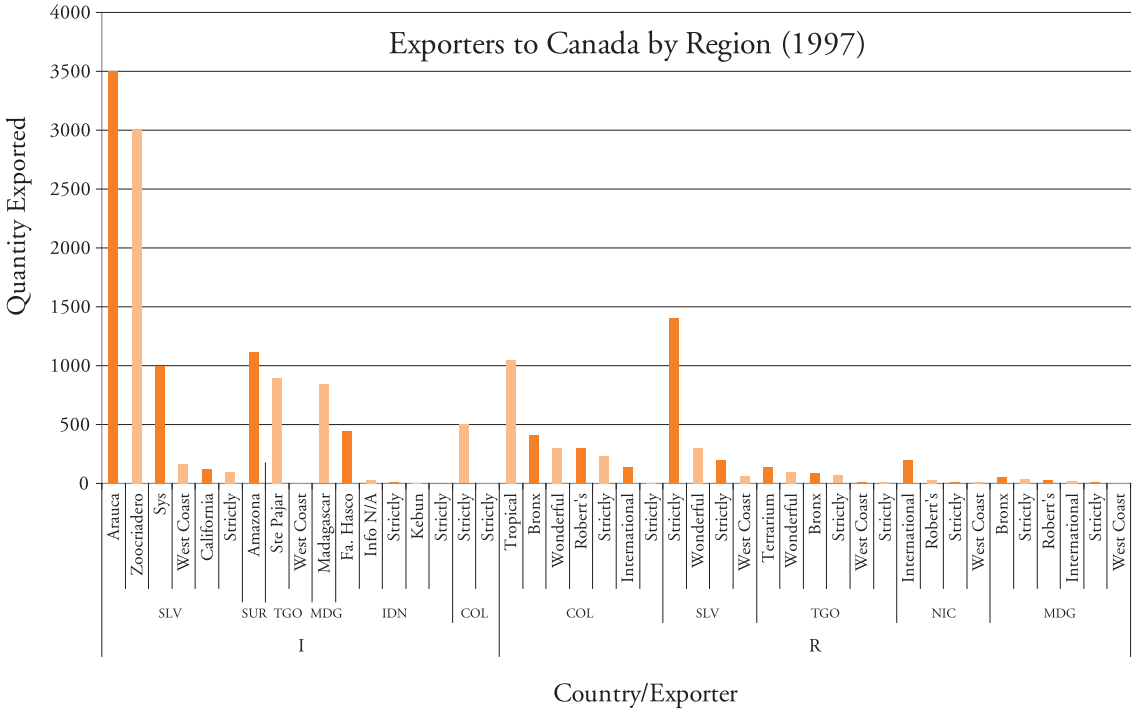

Captive Bred - Top Exporters to Canada by Region (1998)
Quantity Exported
4000
3500
3000
2500
2000
1500
1000
500
0
SLV
COL
NIC
USA
CRI
VNM
CHE
CZE
DEU
BEN
TGO
GHA
SLV
USA
IDN
SLV
CMR
DEU
C
R
F
Info N/A
Country of Origin

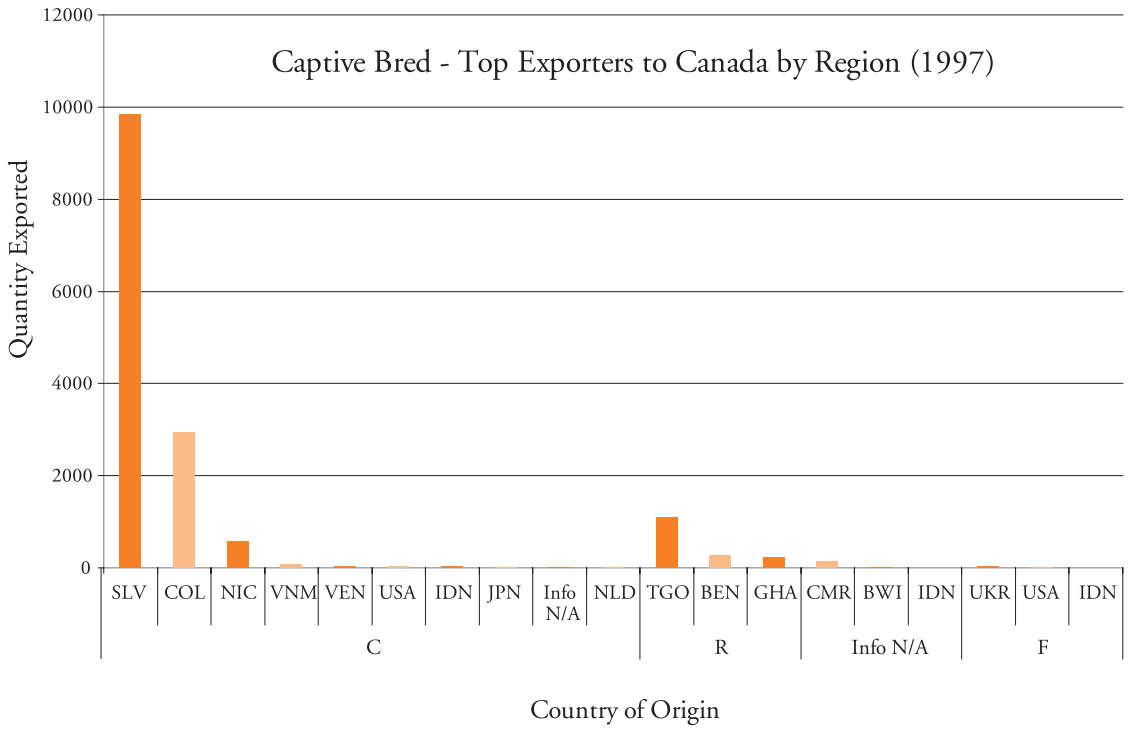

Wild Caught - Top Exporters to Canada by Region (1998)
Quantity Exported
3500
3000
2500
2000
1500
1000
500
0
MDG
SUR
GUY
GHA
IDN
NIC
TZA
SDN
MLI
COL
USA
CMR
DEU
W
Info N/A
Country of Origin

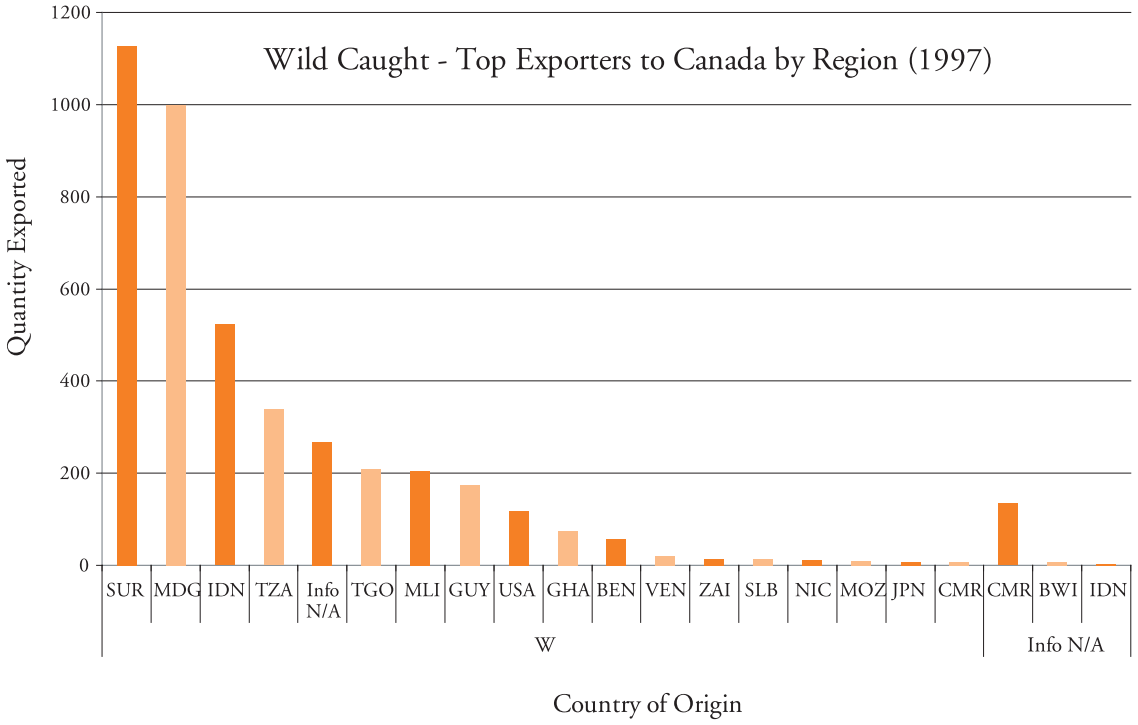

Top 10 Species Imported (1997)
Quantity Imported
16000
14000
12000
10000
8000
6000
4000
2000
0
Iguana iguana
Python regius
Varanus exanthematicus
Boa constrictor
Varanus niloticus
Uromastyx maliensis
Phelsuma laticauda
Varanus salvator
Chamaeleo lateralis
Phelsuma quadrio quadrio
Species name

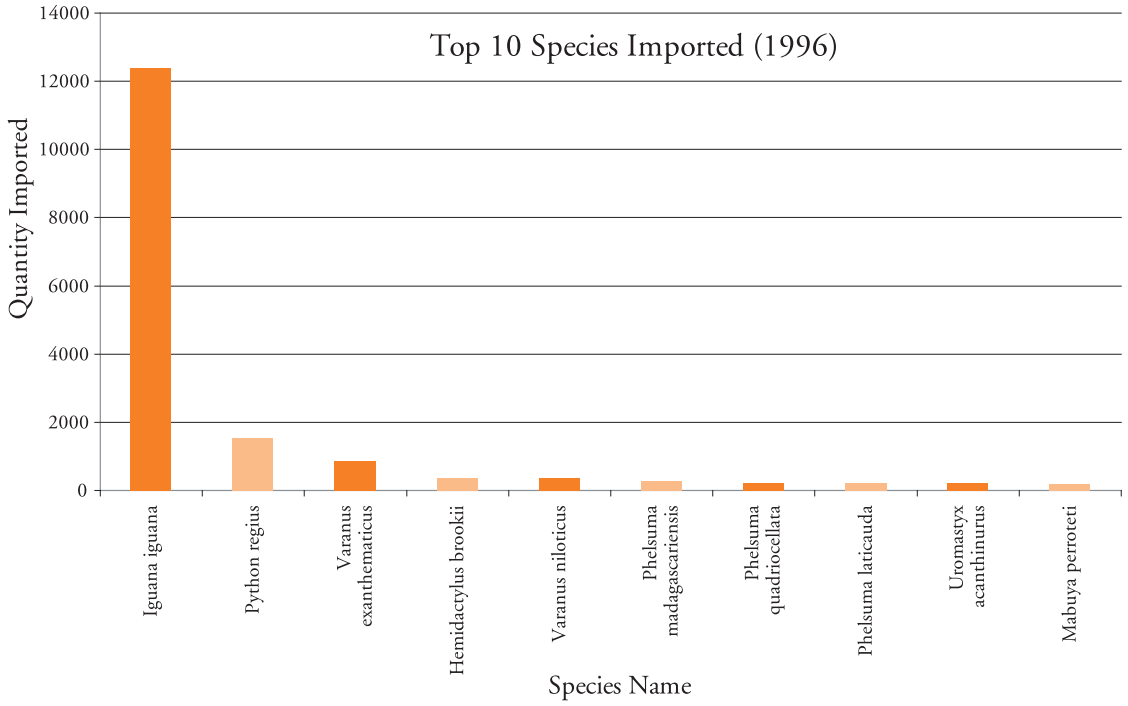

Top 10 Importers (1997)
Quantity Imported
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Massasauga Imports
Mirdo Importations
Ontario Pet Supply
Animart
Fish & Bird Emporium
Aqualife Inc
Creatures Great & Small
Port Credit Pet Center
Reptile Depot Ltd
West Coast Reptile Sales
Importer

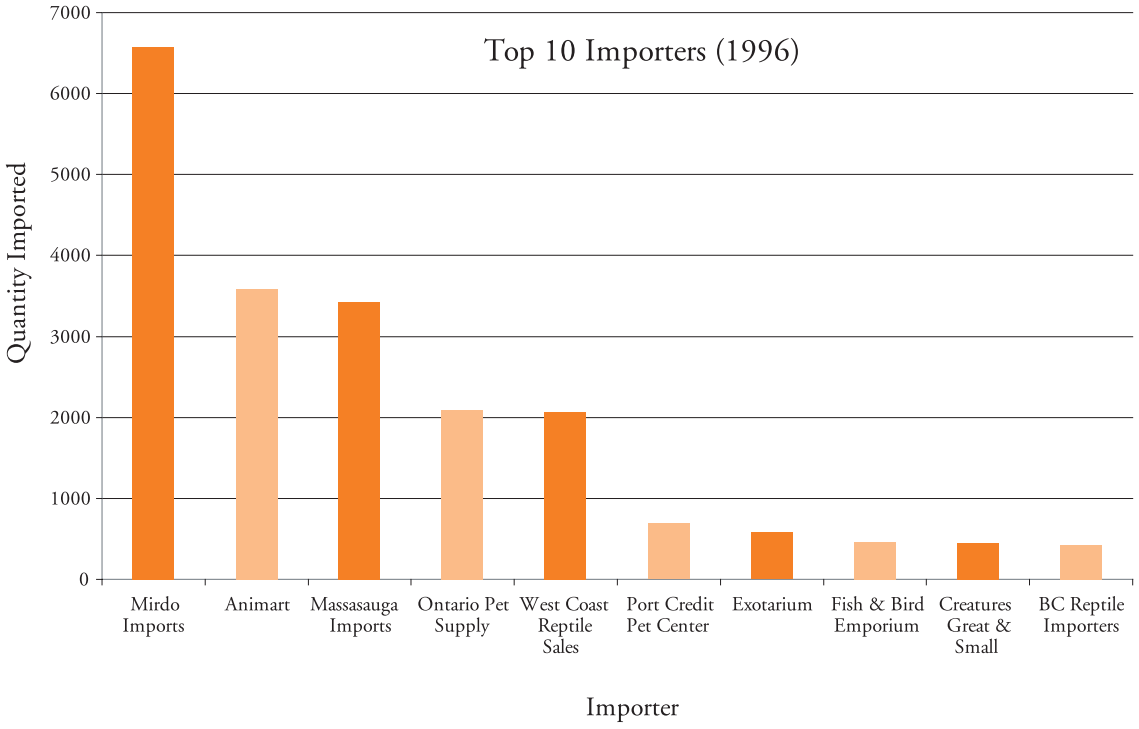

Importers by Province (1997)
Quantity Imported
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Massasauga Imports
Ontario Pet Supply
Fish & Bird Emporium
Aqualife Inc
Port Credit Pet Center
Aquatic Imports
Creature Exotics
Reptile Research Conservation
Metro Toronto Zoo
Mirdo Importations
Animart
Reptile Depot Ltd
Exotarium
Granby Zoo
Creatures Great & Small
West Coast Reptile Sales
Creatures
World's Exotic Pets
Vancouver Aquarium
U of British Columbia
Info N/A
ON
QC
BC
Info N/A
Province/Importer

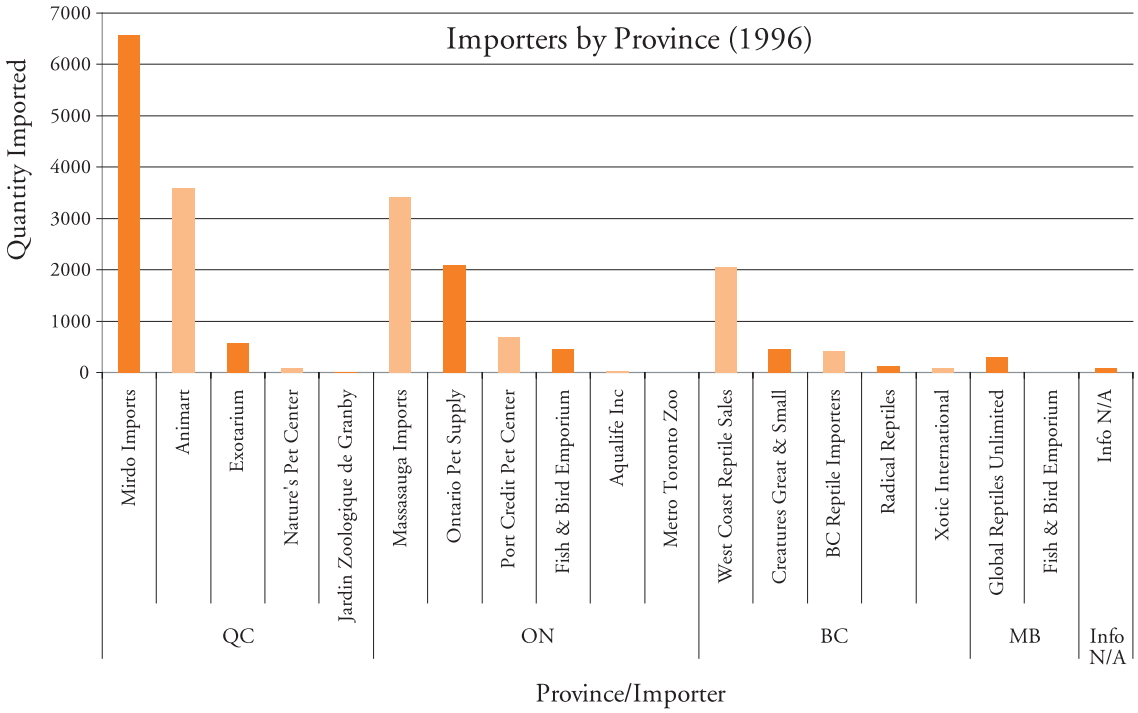

Exporters to Canada by Region (1997)
Quantity Exported
4000
3500
3000
2500
2000
1500
1000
500
0
Arauca
Zoocriadero
Sys
West Coast
California
Strictly
Amazona
Sre Pajar
West Coast
Madagascar
Fa. Hasco
Info N/A
Strictly
Kebun
Strictly
Strictly
Strictly
Tropical
Bronx
Wonderful
Robert's
Strictly
International
Strictly
Strictly
Wonderful
Strictly
West Coast
Terrarium
Wonderful
Bronx
Strictly
West Coast
Strictly
International
Robert's
Strictly
West Coast
Bronx
Strictly
Robert's
International
Strictly
West Coast
SLV
SUR
TGO
MDG
IDN
COL
COL
SLV
TGO
NIC
MDG
I
R
Country/Exporter

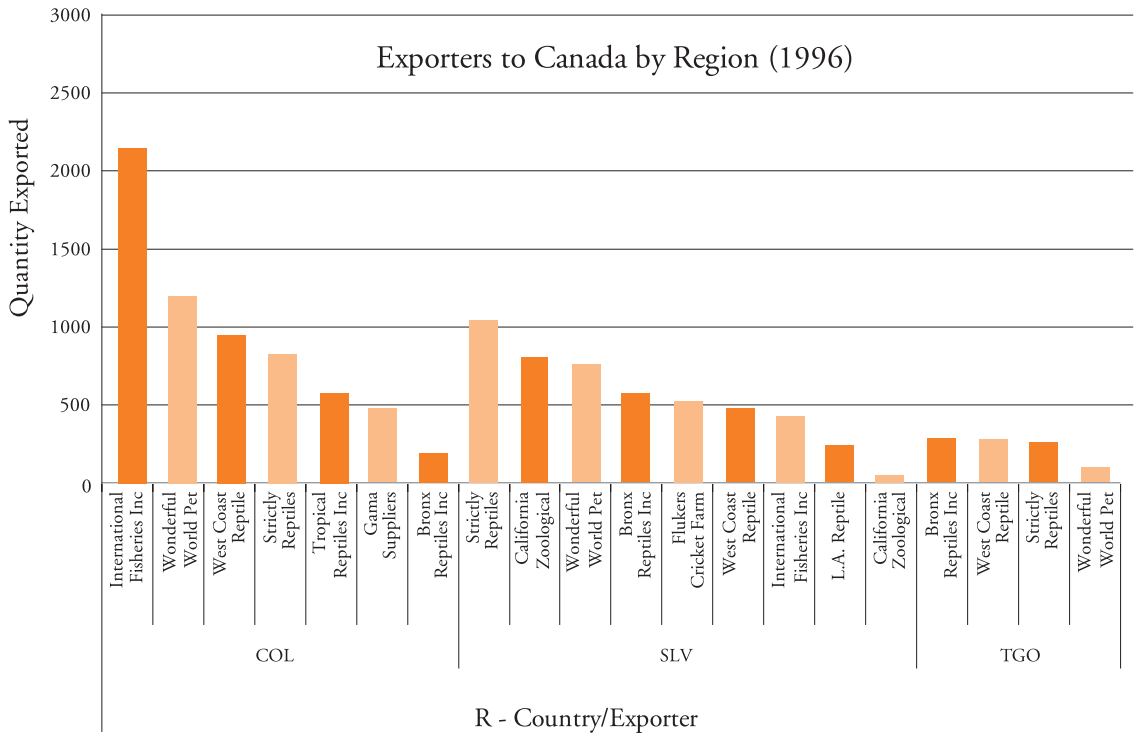

Captive Bred - Top Exporters to Canada by Region (1997)
Quantity Exported
12000
10000
8000
6000
4000
2000
0
SLV
COL
NIC
VNM
VEN
USA
IDN
JPN
Info N/A
NLD
TGO
BEN
GHA
CMR
BWI
IDN
UKR
USA
IDN
C
R
Info N/A
F
Country of Origin


Wild Caught - Top Exporters to Canada by Region (1997)
Quantity Exported
1200
1000
800
600
400
200
0
SUR
MDG
IDN
TZA
Info N/A
TGO
MLI
GUY
USA
GHA
BEN
VEN
ZAI
SLB
NIC
MOZ
JPN
CMR
CMR
BWI
IDN
W
Info N/A
Country of Origin


Top 10 Species Imported (1996)
Quantity Imported
14000
12000
10000
8000
6000
4000
2000
0
Iguana iguana
Python regius
Varanus exanthematicus
Hemidactylus brookii
Varanus niloticus
Phelsuma madagascariensis
Phelsuma quadriocellata
Phelsuma laticauda
Uromastyx acanthinurus
Mabuya perroteti
Species Name

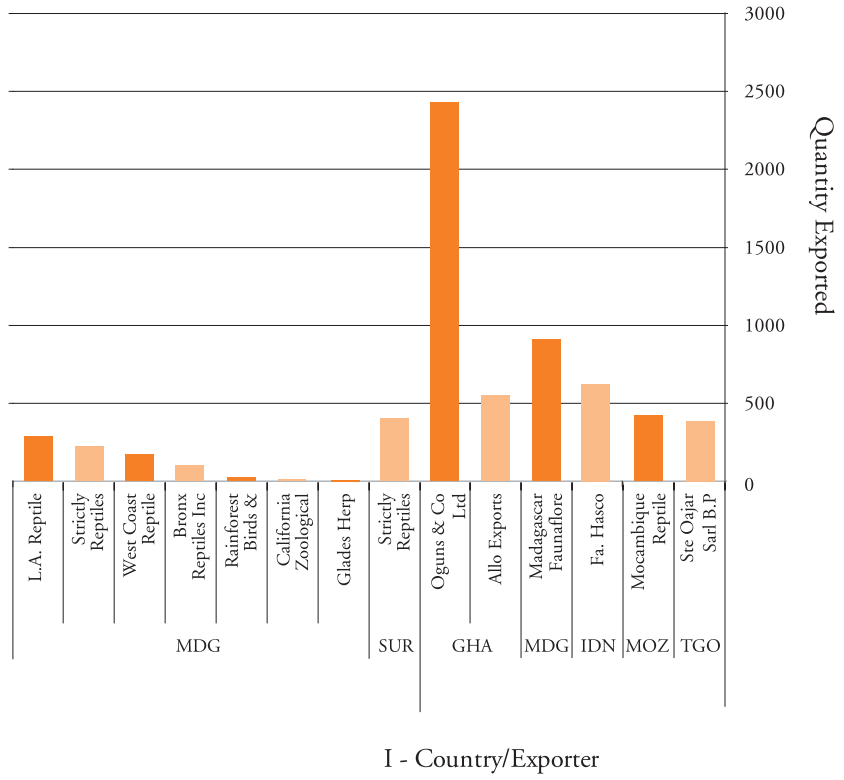

Top 10 Importers (1996)
Quantity Imported
7000
6000
5000
4000
3000
2000
1000
0
Mirdo Imports
Animart
Massasauga Imports
Ontario Pet Supply
West Coast Reptile Sales
Port Credit Pet Center
Exotarium
Fish & Bird Emporium
Creatures Great & Small
BC Reptile Importers
Importer

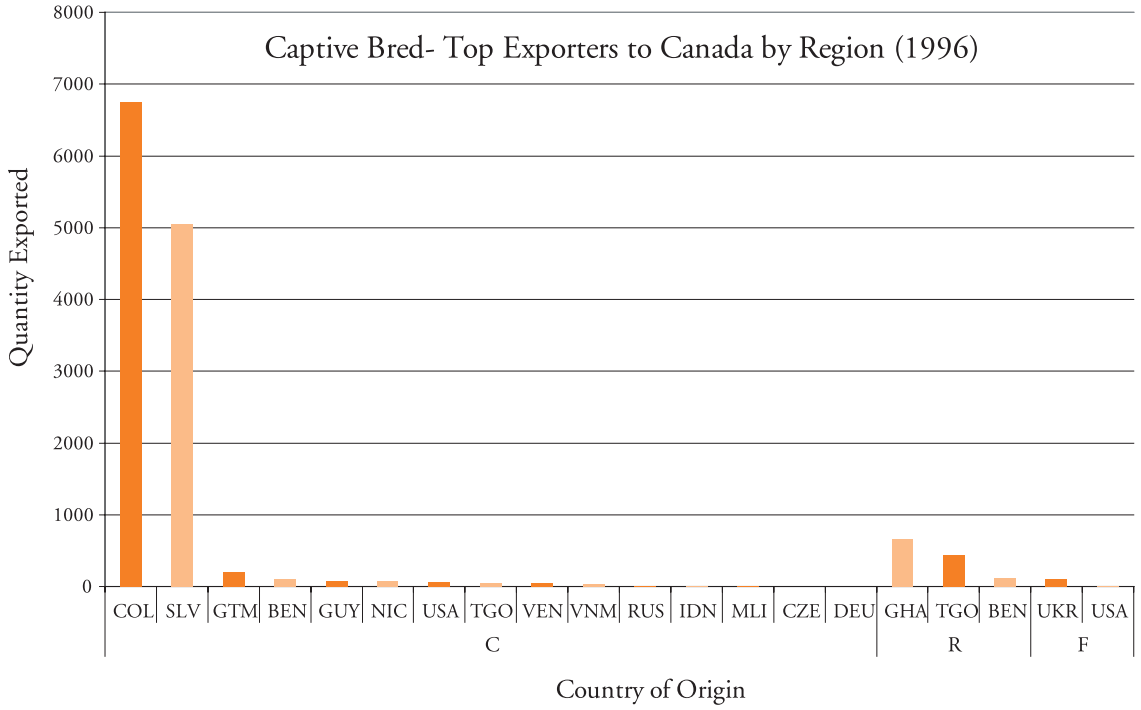

Importers by Province (1996)
Quantity Imported
7000
6000
5000
4000
3000
2000
1000
0
Mirdo Imports
Animart
Exotarium
Nature's Pet Center
Jardin Zoologique de Granby
Massasauga Imports
Ontario Pet Supply
Port Credit Pet Center
Fish & Bird Emporium
Aqualife Inc
Metro Toronto Zoo
West Coast Reptile Sales
Creatures Great & Small
BC Reptile Importers
Radical Reptiles
Xotic International
Global Reptiles Unlimited
Fish & Bird Emporium
Info N/A
QC
ON
BC
MB
Info N/A
Province/Importer

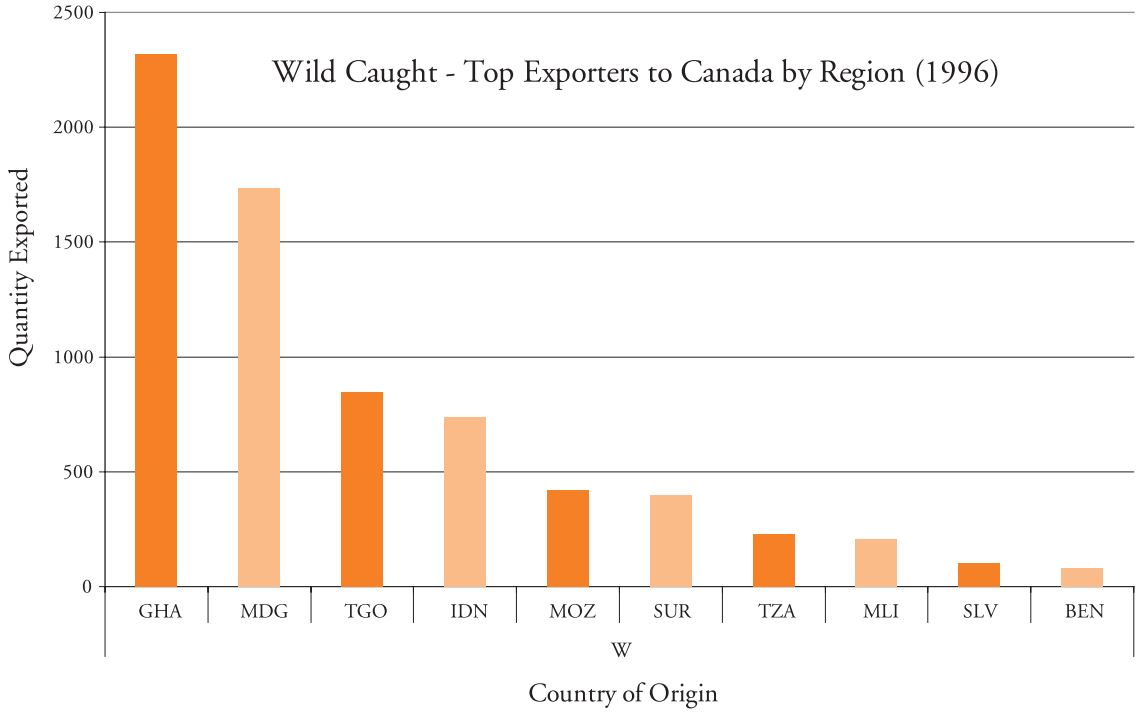


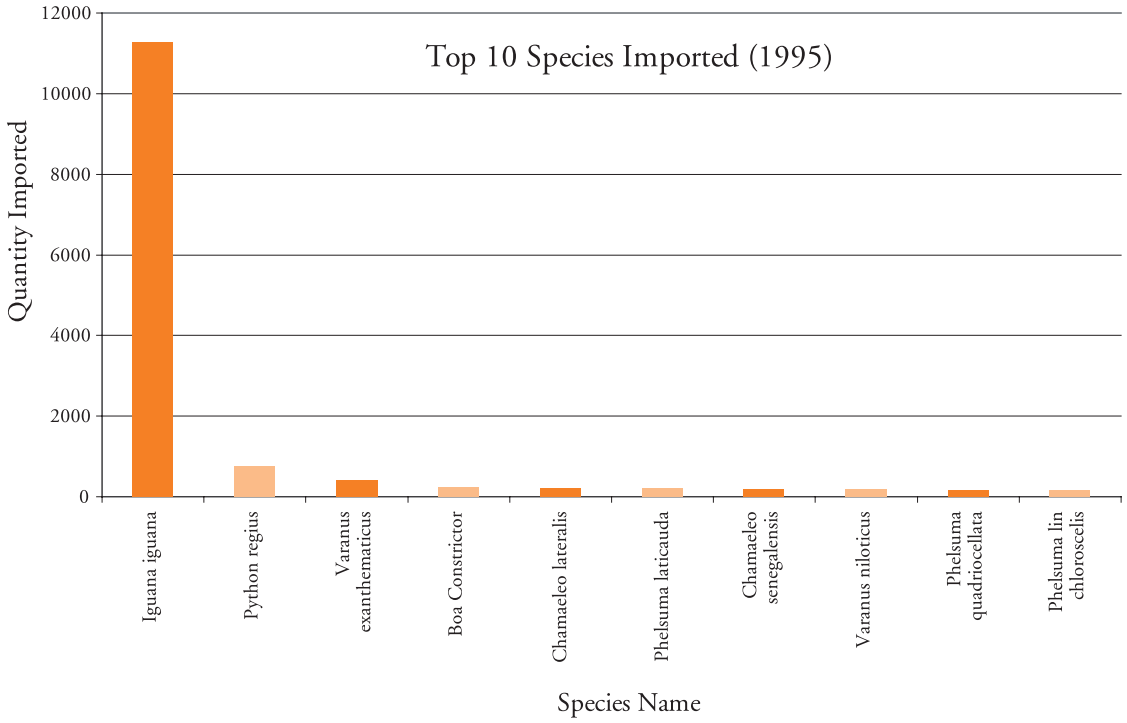
Exporters to Canada by Region (1996)

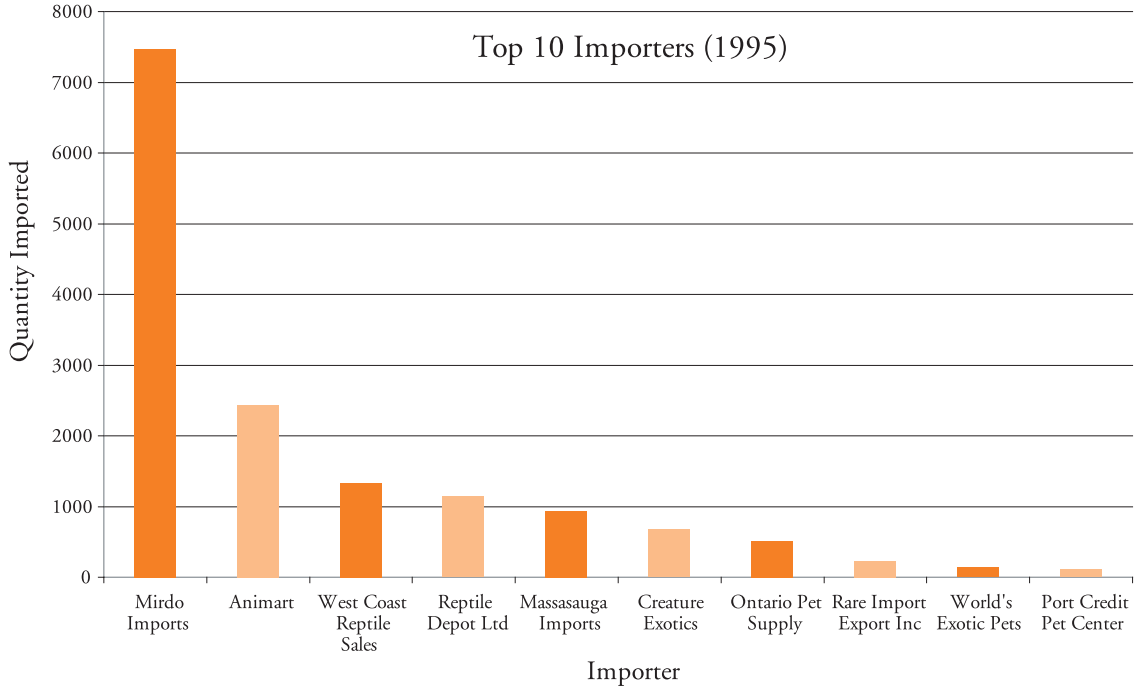
continued

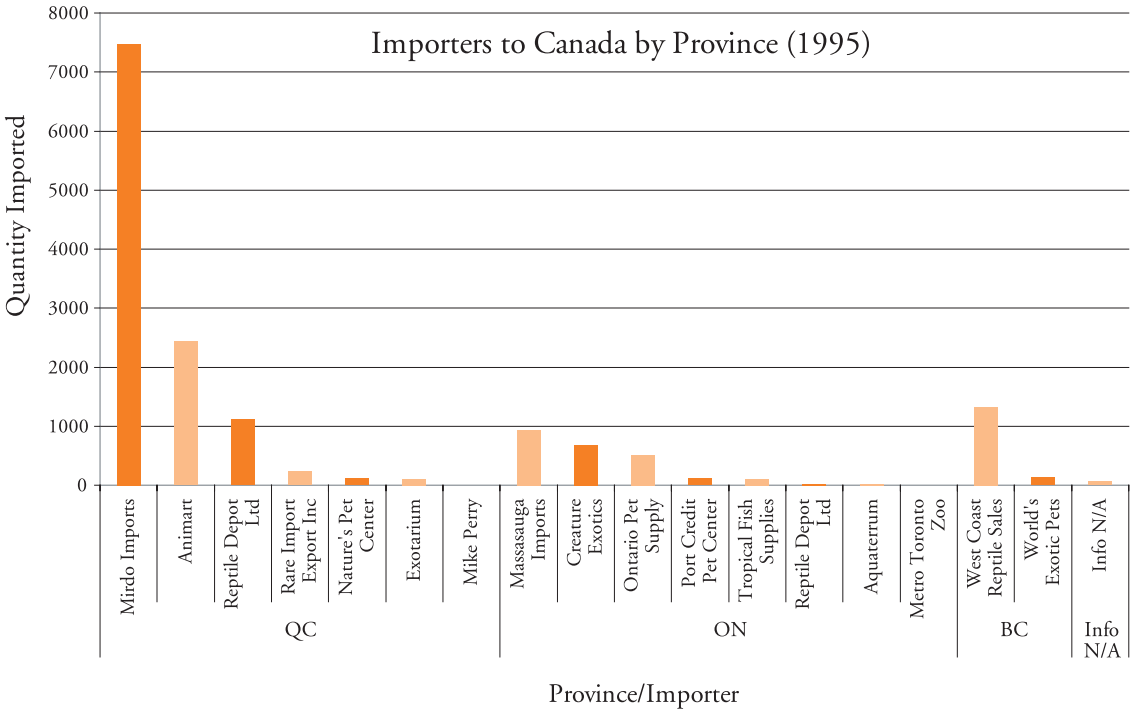


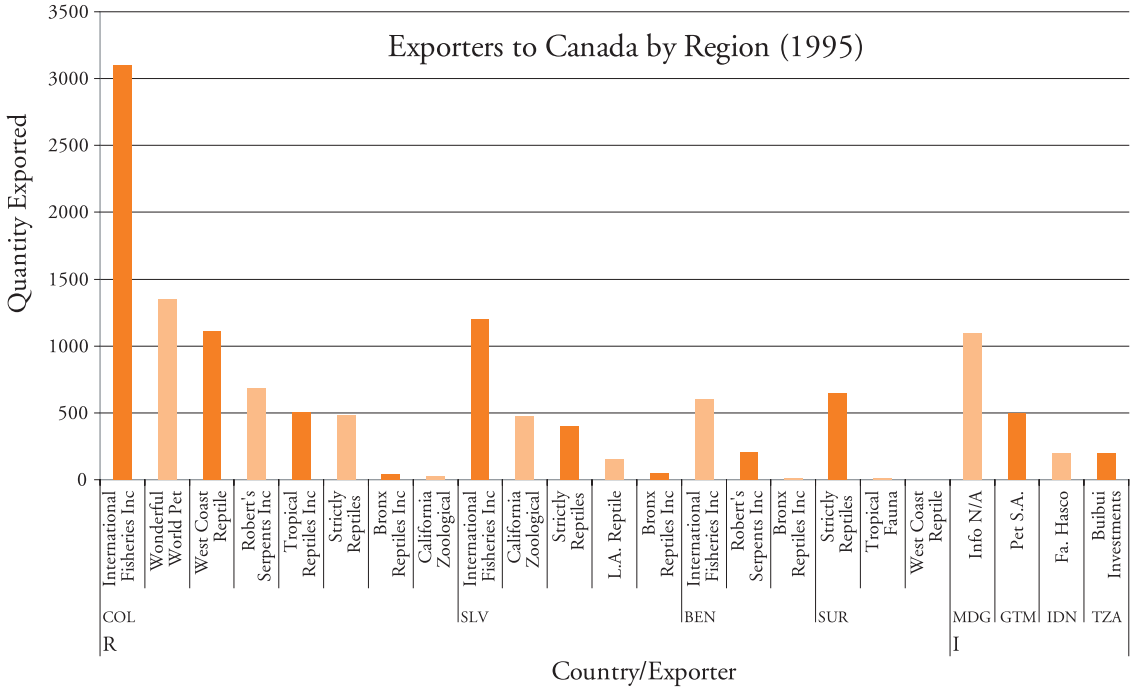

Captive Bred- Top Exporters to Canada by Region (1996)
Quantity Exported
8000
7000
6000
5000
4000
3000
2000
1000
0
COL
SLV
GTM
BEN
GUY
NIC
USA
TGO
VEN
VNM
RUS
IDN
MLI
CZE
DEU
GHA
TGO
BEN
UKR
USA
C
R
F
Country of Origin

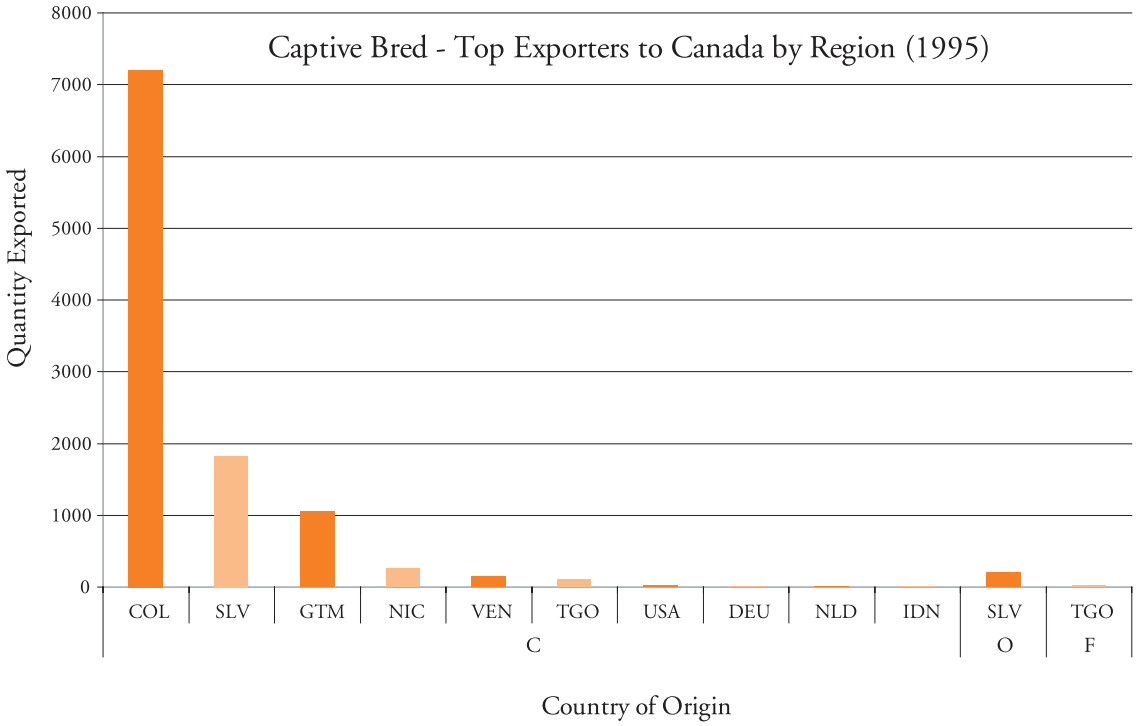

Wild Caught - Top Exporters to Canada by Region (1996)
Quantity Exported
2500
2000
1500
1000
500
0
GHA
MDG
TGO
IDN
MOZ
SUR
TZA
MLI
SLV
BEN
W
Country of Origin

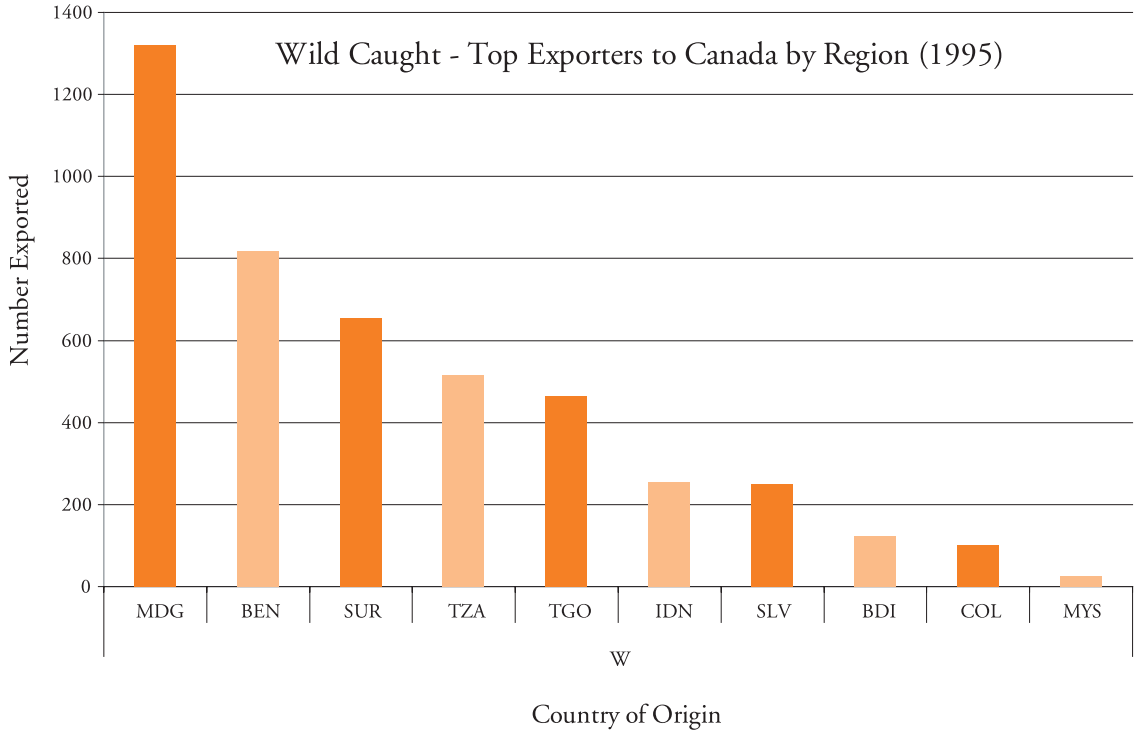

Top 10 Species Imported (1995)
Quantity Imported
12000
10000
8000
6000
4000
2000
0
Iguana iguana
Python regius
Varanus exanthematicus
Boa Constrictor
Chamaeleo lateralis
Phelsuma laticauda
Chamaeleo senegalensis
Varanus niloticus
Phelsuma quadriocellata
Phelsuma lin chloroscelis
Species Name

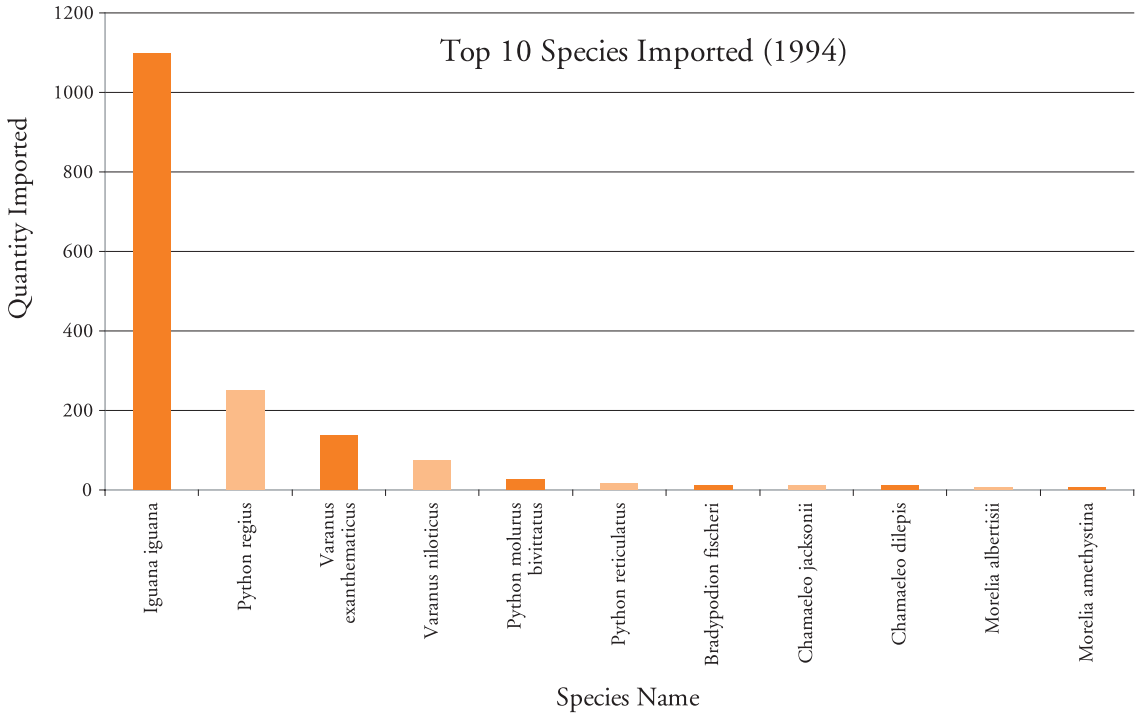

Top 10 Importers (1995)
Quantity Imported
8000
7000
6000
5000
4000
3000
2000
1000
0
Mirdo Imports
Animart
West Coast Reptile Sales
Reptile Depot Ltd
Massasauga Imports
Creature Exotics
Ontario Pet Supply
Rare Import Export Inc
World's Exotic Pets
Port Credit Pet Center
Importer

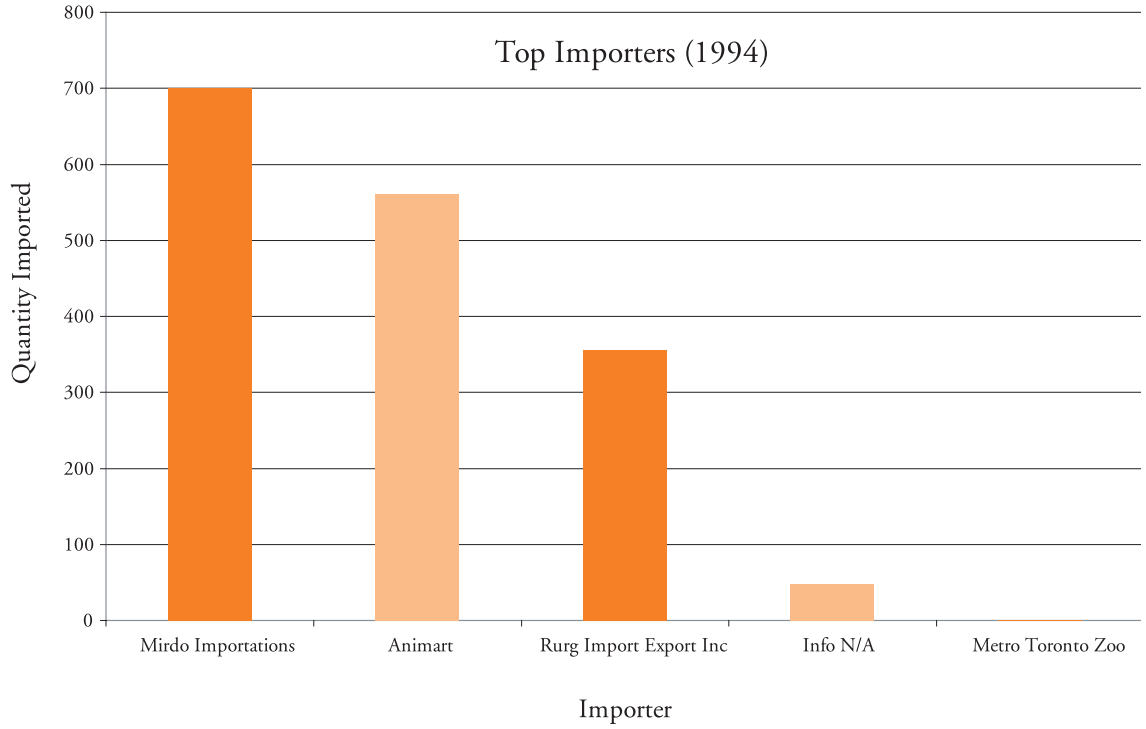

Importers to Canada by Province (1995)
Quantity Imported
8000
7000
6000
5000
4000
3000
2000
1000
0
Mirdo Imports
Animart
Reptile Depot Ltd
Rare Import Export Inc
Nature's Pet Center
Exotarium
Mike Perry
Massasauga Imports
Creature Exotics
Ontario Pet Supply
Port Credit Pet Center
Tropical Fish Supplies
Reptile Depot Ltd
Aquaterrum
Metro Toronto Zoo
West Coast Reptile Sales
World's Exotic Pets
Info N/A
QC
ON
BC
Info N/A
Province/Importer

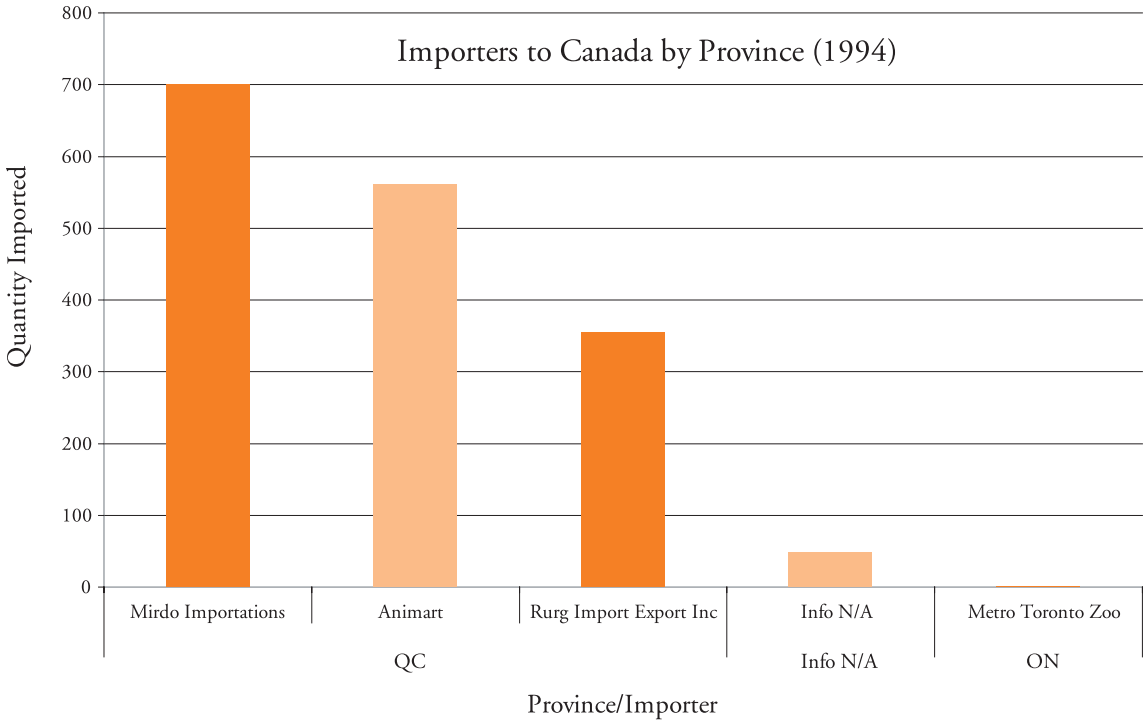

Exporters to Canada by Region (1995)
Quantity Exported
3500
3000
2500
2000
1500
1000
500
0
International Fisheries Inc
Wonderful World Pet
West Coast Reptile
Robert's Serpents Inc
Tropical Reptiles Inc
Strictly Reptiles
Bronx Reptiles Inc
California Zoological
International Fisheries Inc
California Zoological
Strictly Reptiles
L.A. Reptile
Bronx Reptiles Inc
International Fisheries Inc
Robert's Serpents Inc
Bronx Reptiles Inc
Strictly Reptiles
Tropical Fauna
West Coast Reptile
Info N/A
Pet S.A.
Fa. Hasco
Buibui Investments
COL
SLV
BEN
SUR
MDG
GTM
IDN
TZA
R
I
Country/Exporter

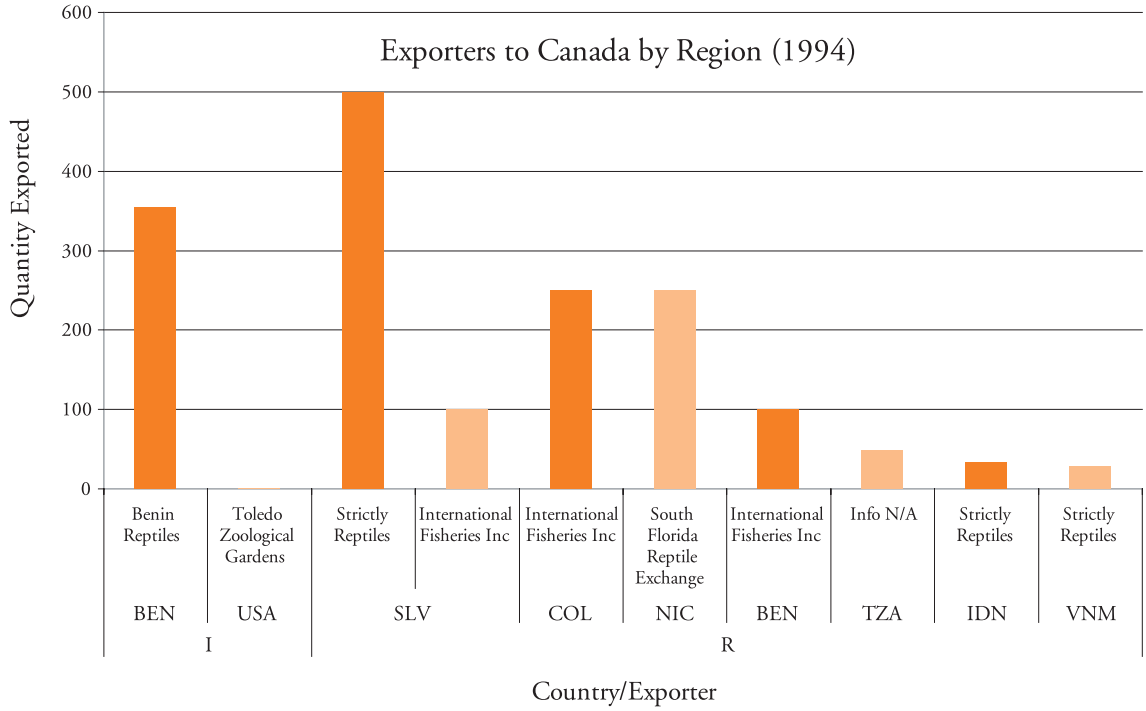

Captive Bred - Top Exporters to Canada by Region (1995)
Quantity Exported
8000
7000
6000
5000
4000
3000
2000
1000
0
COL
SLV
GTM
NIC
VEN
TGO
USA
DEU
NLD
IDN
SLV
TGO
C
O
F
Country of Origin

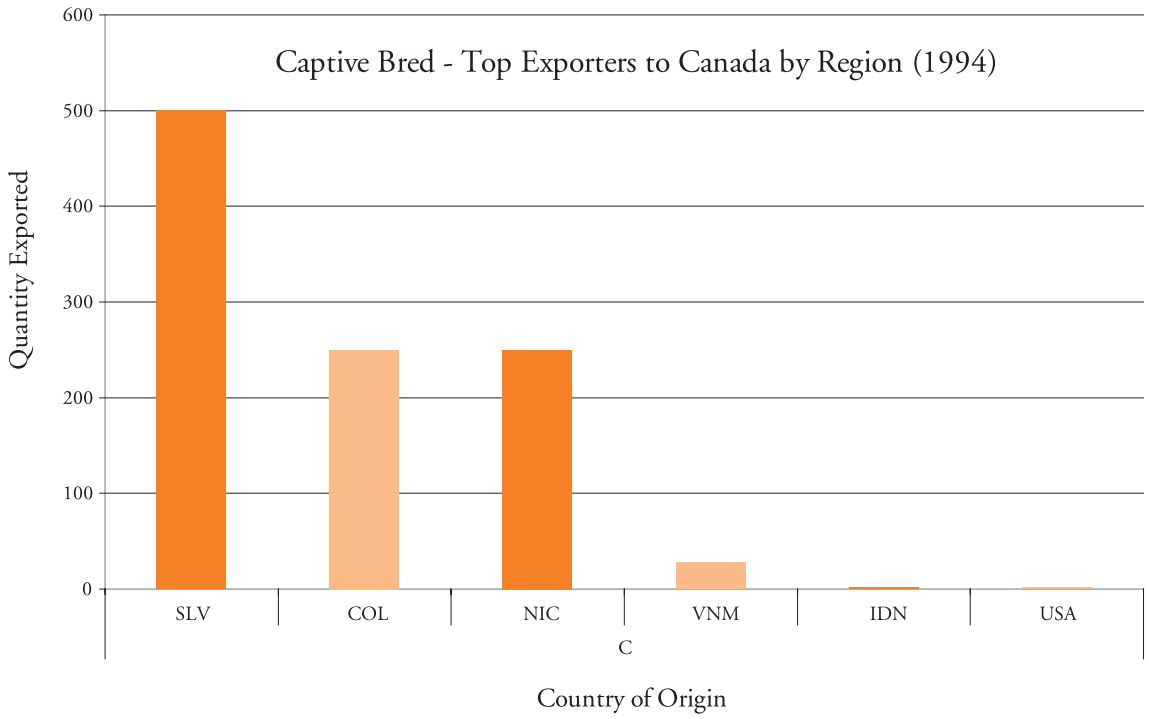

Wild Caught - Top Exporters to Canada by Region (1995)
Number Exported
1400
1200
1000
800
600
400
200
0
MDG
BEN
SUR
TZA
TGO
IDN
SLV
BDI
COL
MYS
W
Country of Origin

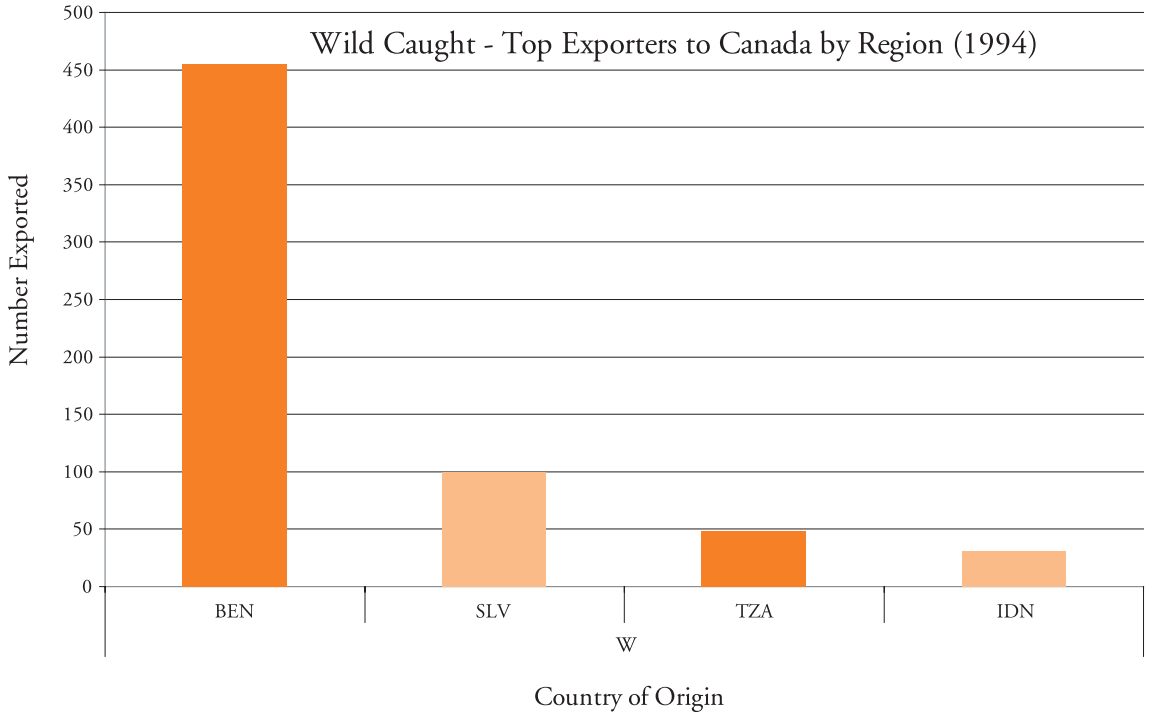

Top 10 Species Imported (1994)
Quantity Imported
1200
1000
800
600
400
200
0
Iguana iguana
Python regius
Varanus exanthematicus
Varanus niloticus
Python molurus bivittatus
Python reticulatus
Bradypodion fischeri
Chamaeleo jacksonii
Chamaeleo dilepis
Morelia albertisii
Morelia amethystina
Species Name

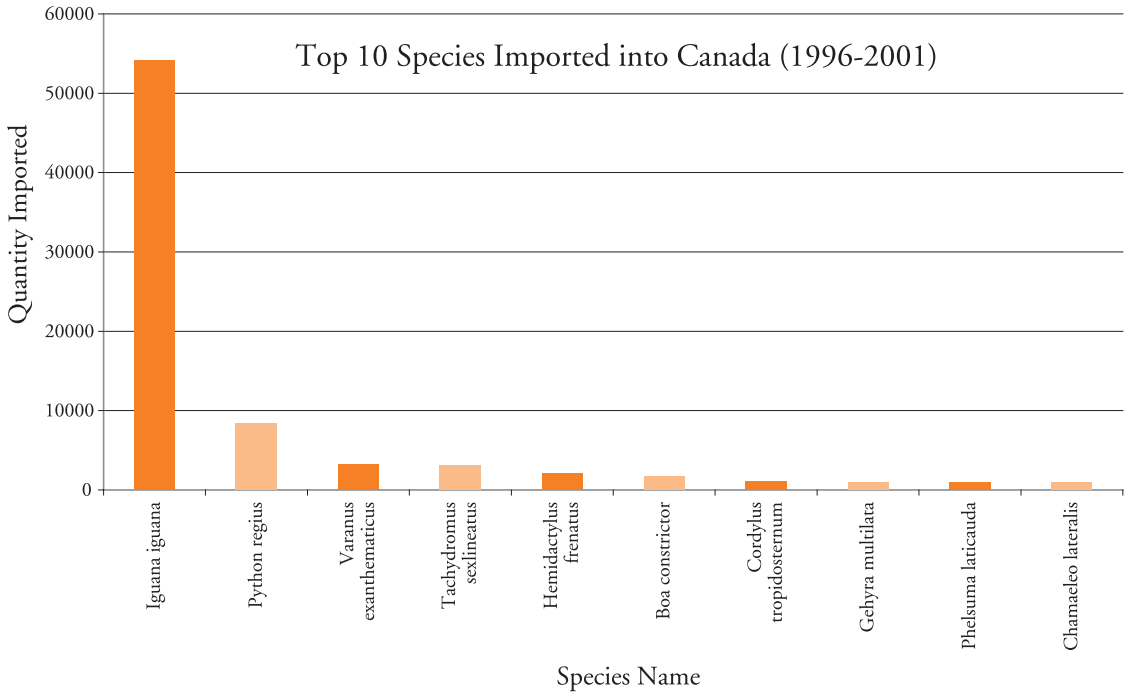

Top Importers (1994)
Quantity Imported
800
700
600
500
400
300
200
100
0
Mirdo Importations
Animart
Rurg Import Export Inc
Info N/A
Metro Toronto Zoo
Importer

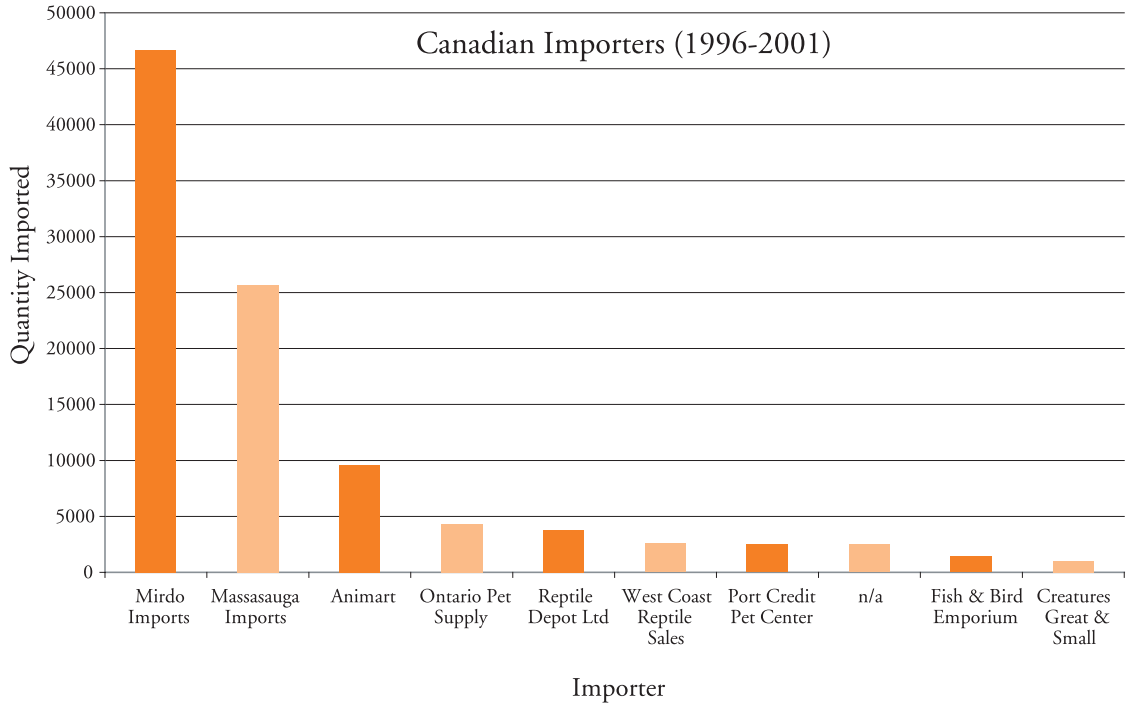

Importers to Canada by Province (1994)
Quantity Imported
800
700
600
500
400
300
200
100
0
Mirdo Importations
Animart
Rurg Import Export Inc
Info N/A
Metro Toronto Zoo
QC
Info N/A
ON
Province/Importer

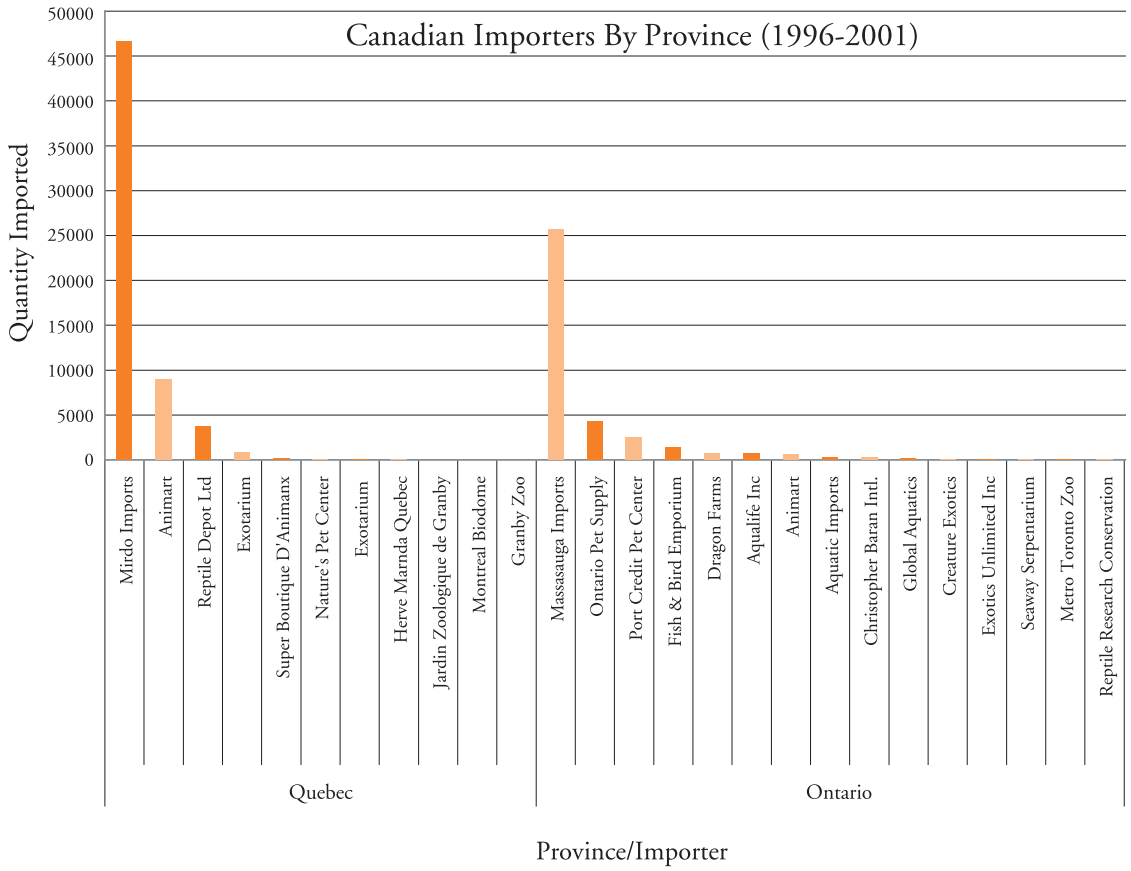

Exporters to Canada by Region (1994)
Quantity Exported
600
500
400
300
200
100
0
Benin Reptiles
Toledo Zoological Gardens
Strictly Reptiles
International Fisheries Inc
International Fisheries Inc
South Florida Reptile Exchange
International Fisheries Inc
Info N/A
Strictly Reptiles
Strictly Reptiles
BEN
USA
SLV
COL
NIC
BEN
TZA
IDN
VNM
I
R
Country/Exporter


Captive Bred - Top Exporters to Canada by Region (1994)
Quantity Exported
600
500
400
300
200
100
0
SLV
COL
NIC
VNM
IDN
USA
C
Country of Origin

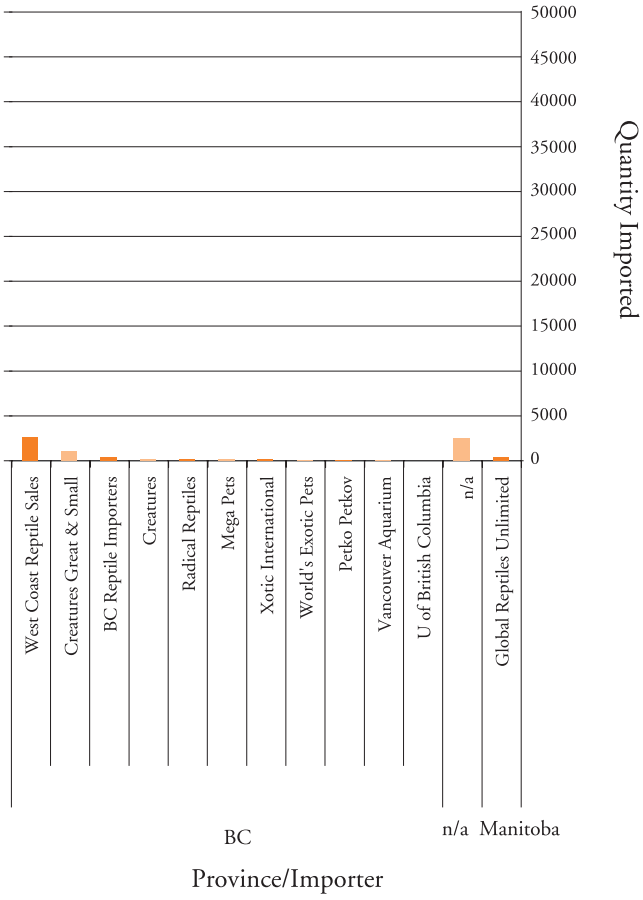

Wild Caught - Top Exporters to Canada by Region (1994)
Number Exported
500
450
400
350
300
250
200
150
100
50
0
BEN
SLV
TZA
IDN
W
Country of Origin

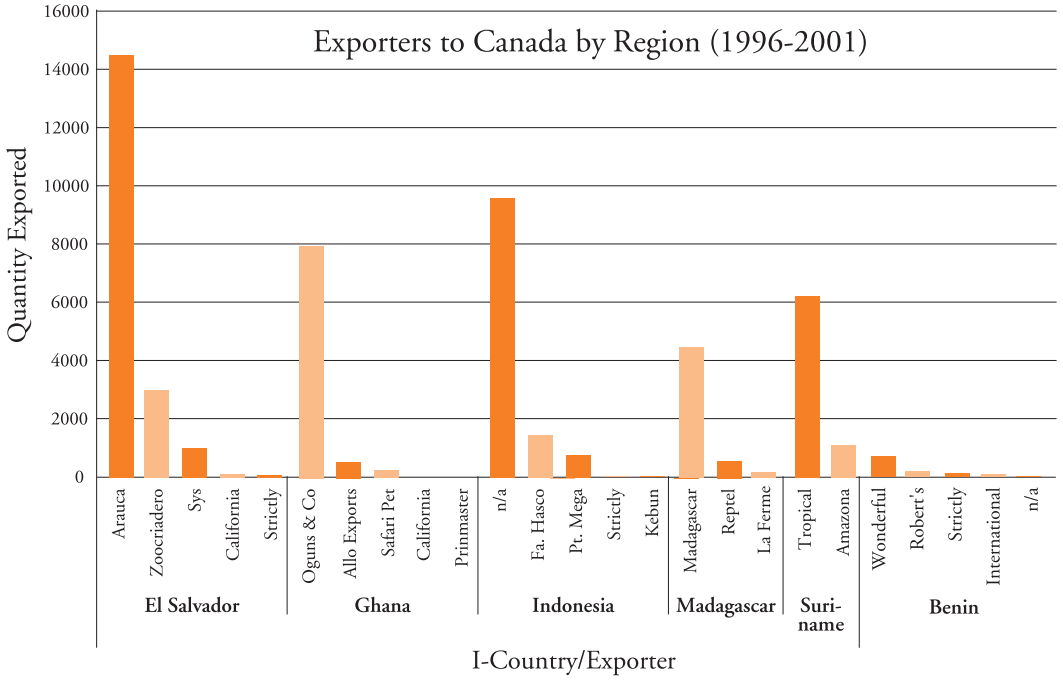

Top 10 Species Imported into Canada (1996-2001)
Quantity Imported
60000
50000
40000
30000
20000
10000
0
Iguana iguana
Python regius
Varanus exanthematicus
Tachydromus sexlineatus
Hemidactylus frenatus
Boa constrictor
Cordylus tropidosternum
Gehyra multilata
Phelsuma laticauda
Chamaeleo lateralis
Species Name

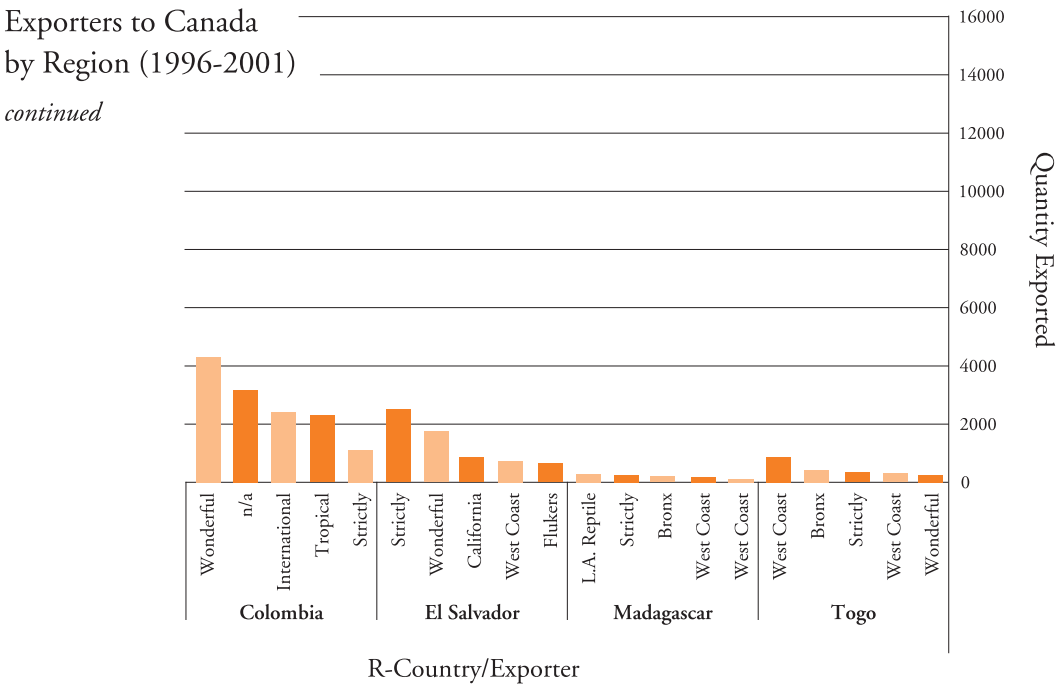

Canadian Importers (1996-2001)
Quantity Imported
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Mirdo Imports
Massasauga Imports
Animart
Ontario Pet Supply
Reptile Depot Ltd
West Coast Reptile Sales
Port Credit Pet Center
n/a
Fish & Bird Emporium
Creatures Great & Small
Importer

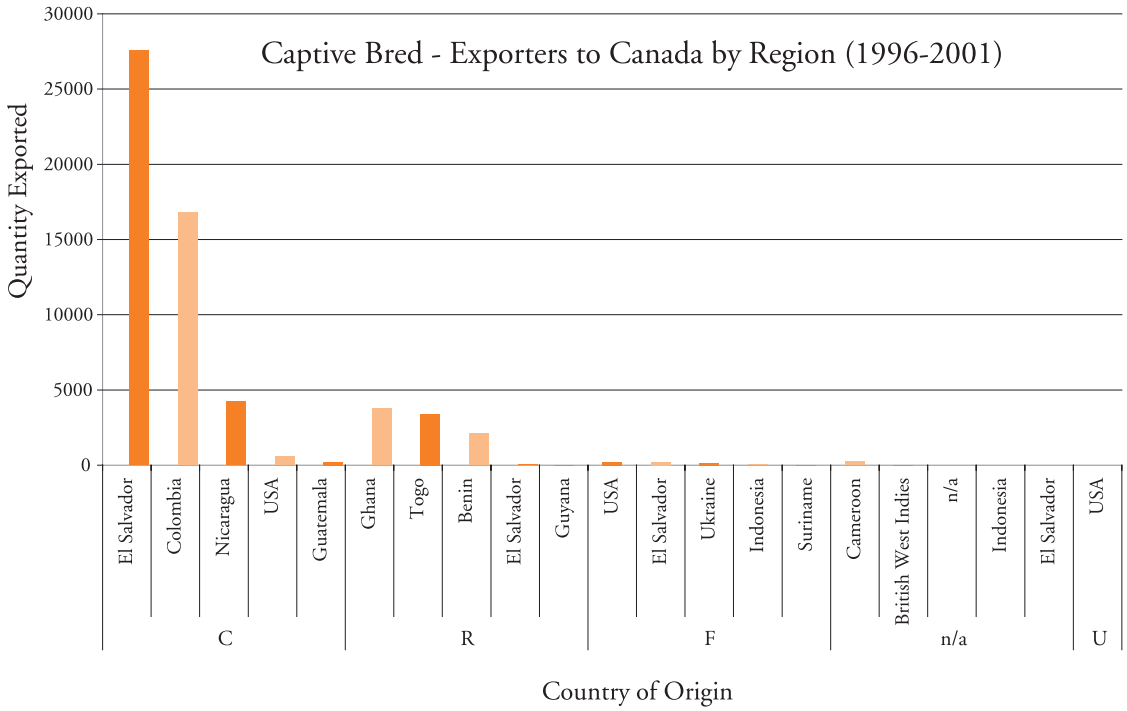


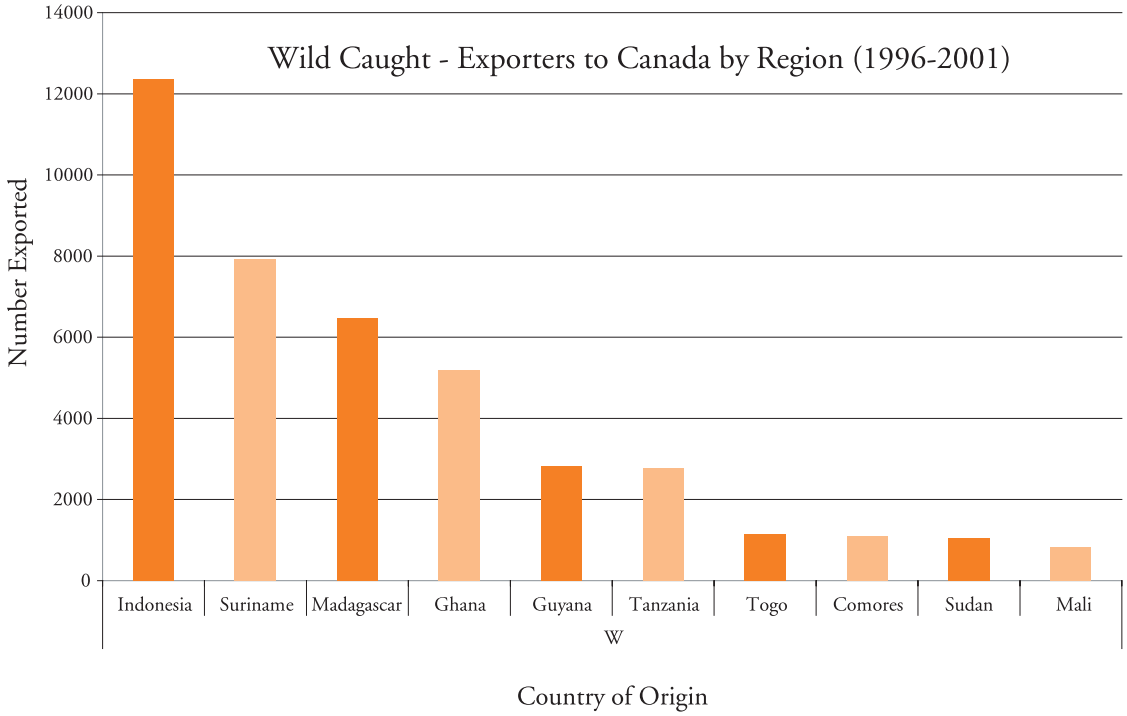
Canadian Importers
By Province (1996-2001)
continued




Exporters to Canada by Region (1996-2001)
Quantity Exported
16000
14000
12000
10000
8000
6000
4000
2000
0
Arauca
Zoocriadero
Sys
California
Strictly
Oguns & Co
Allo Exports
Safari Pet
California
Prinmaster
n/a
Fa. Hasco
Pt. Mega
Strictly
Kebun
Madagascar
Reptel
La Ferme
Tropical
Amazona
Wonderful
Robert's
Strictly
International
n/a
El Salvador
Ghana
Indonesia
Madagascar
Suri-name
Benin
I-Country/Exporter


Exporters to Canada
by Region (1996-2001)
continued
16000
14000
12000
10000
8000
6000
4000
2000
0
Quantity Exported
Wonderful
n/a
International
Tropical
Strictly
Strictly
Wonderful
California
West Coast
Flukers
L.A. Reptile
Strictly
Bronx
West Coast
West Coast
West Coast
Bronx
Strictly
West Coast
Wonderful
Colombia
El Salvador
Madagascar
Togo
R-Country/Exporter


Captive Bred - Exporters to Canada by Region (1996-2001)
Quantity Exported
30000
25000
20000
15000
10000
5000
0
El Salvador
Colombia
Nicaragua
USA
Guatemala
Ghana
Togo
Benin
El Salvador
Guyana
USA
El Salvador
Ukraine
Indonesia
Suriname
Cameroon
British West Indies
n/a
Indonesia
El Salvador
USA
C
R
F
n/a
U
Country of Origin


Wild Caught - Exporters to Canada by Region (1996-2001)
Number Exported
14000
12000
10000
8000
6000
4000
2000
0
Indonesia
Suriname
Madagascar
Ghana
Guyana
Tanzania
Togo
Comores
Sudan
Mali
W
Country of Origin

WHO PROMOTES AND SELLS REPTILES IN CANADA

A wide range of businesses, organizations and individuals promote the trade and keeping of reptiles as pets in Canada. Among these are some national and regional pet store chains, local pet stores, specialty reptile stores, small scale commercial breeders, internet retailers, hobbyist organizations, reptile zoos, traveling reptile shows and individual hobbyists.

In Canada, the sale of live reptiles and reptile associated products is a significant part of the pet market and seems to be growing each year. In the United States, the reptile sector of the pet industry is estimated to be worth $2 billion annually.[92]

Reptiles are sold by individual collectors, importers, commercial breeders, internet dealers and retail outlets.

Reptile prices range from just a few dollars for very common species (e.g., green anoles) to thousands of dollars for rare species or special colour variations. A sample list of reptile prices is contained in ANNEX 3 of this report.

PET STORES AND THE PET INDUSTRY

Many national and regional pet store chains, private non-chain retailers, specialty reptile stores and the Pet Industry Joint Advisory Council (PIJAC), Canada's national pet industry association, promote the keeping of reptiles as pets, claiming they are a logical alternative to more labour intensive and sometimes problematic animals, such as dogs.

Many of the larger pet store chains in Canada offer customers live reptiles and reptile products. These chains include PetSmart, Super Pet and Petland. While some of them position live reptiles and amphibians in specialty areas, others, such as PetSmart, often place their reptile displays closer to the main entrance of each store, presumably for increased customer exposure.

Interestingly, one of western Canada's largest pet store chains, Petcetera, does not stock or sell exotic animals. Dan Urbani, President and Founder of Petcetera, believes exotics are often the result of pop culture trends. People often want them, "but they don't have the knowledge to care for them properly."[93] Because of lack of knowledge and misunderstanding of exotic animals, Petcetera does not support their sale. They do however facilitate the adoption of some exotic animals through their Adoption Centre.[94]

A number of non-chain pet stores carry live reptiles and reptile products, with several focusing almost entirely on reptiles and amphibians. For example, the Port Credit Pet Centre in Mississauga, Ontario advertises itself as "Reptile Central" and features a range of species for sale. In February 2003, their website listed numerous python species (e.g., blood, green tree, Burmese), a diversity of boa constrictors, as well as bull, pine, rat, corn and king snakes as being available. At the time, they were also advertising several monitor lizard species, as well as geckos, chameleons, bearded dragons, water dragons and skinks. In September 2003 their website claimed "Our vast collection is increasing daily, allowing us to bring you just about anything you could possibly wish for."95

Another retailer, The Reptile Store, in Hamilton, Ontario bill themselves as a top retailer of reptiles and specialty products. In addition to carrying relatively common reptile species, such as royal pythons, bearded dragons and leopard geckos, the store also tells customers they can obtain more unusual species, such as tree boas and monitor lizards.96

PET INDUSTRY JOINT ADVISORY COUNCIL (PIJAC) CANADA

PIJAC is the national organization that represents and promotes the interests of all segments of the pet industry. In their mission statement, they say they are "dedicated to ensuring the highest level of pet care attainable and a guarantee of a fair and equitable representation for all facets of the Canadian pet industry."[97]

PIJAC Canada started in 1988 when a number of Toronto-area pet industry members set up the organization in response to local legislative activity. Other regional pet trade associations were asked to join resulting in the creation of Canada's first national pet trade organization. Since that time, PIJAC has established several regional divisions.[98]

In addition to representing the interests of the pet industry in the political arena, PIJAC offers several services to their members. One of these is a voluntary training initiative called the Certified Companion Animal Specialists Program, which includes a Certified Reptile Specialist course. Their specialty courses involve one home study module and one seminar module.

In addition to defending the keeping of reptiles in political debates and offering their course on reptile housing and care, PIJAC also allows reptile retailers to participate in their trade shows.

PIJAC is opposed to the keeping of crocodilians and venomous reptiles.

COMMERCIAL IMPORTERS

A number of relatively small scale businesses and private individuals import reptiles into Canada for the pet trade. They handle a diversity of species including wild caught, farmed and privately-bred specimens. While some of these animals are shipped directly from their countries of origin, many are re-exports from the United States.

One of the largest commercial operations is Mirdo Importations Canada Inc. According to their website, they maintain a large number and variety of reptiles in "150 assorted sizes of terrariums and aquariums and 500 assorted sizes of drawer system for keeping reptiles and snakes individually. Our inventory is extensive, and has many species of captive-bred reptiles from our facility, which are in demand worldwide."[99]

DOMESTIC BREEDERS AND INTERNET RETAILERS

A large number of small scale reptile breeders in Canada and the United States offer animals for sale to other retailers and/or the general public. While most suppliers in Canada are quite small, with many being individual hobbyists who simply sell whatever offspring they produce from their personal collections, others are more professional, commercially-oriented operations. The majority of them do not operate walk-in retail locations but instead advertise their animals through internet websites and other means. A number are also involved in the importation of captive-bred and wild caught animals from the United States and abroad.

Many of these small breeders focus on particular groups or species of reptiles. For example, Henry Piorun Reptiles in British Columbia offers primarily python species for sale,[100] as does Constable Reptiles in Ontario,[101] while High Quality Reptiles specializes in designer leopard geckos.[102]

HOBBYIST ORGANIZATIONS

A number of amateur reptile hobbyist organizations exist in Canada. Most have a relatively small membership base and their activities are usually organized and carried out by volunteers. These organizations include the Westcoast Society for the Protection and Conservation of Reptiles, the Alberta Reptile and Amphibian Society and the Ontario Herpetological Society.

Despite their small size and numbers, these organizations are often the most vocal opponents of municipal measures to control the reptile trade and prohibitions on the keeping of certain kinds of reptiles.

In addition to hobbyist groups focused only on reptiles and amphibians, exotic pet groups surface from time to time. For example, the Canadian Exotic Animal Owners Association, a group that claimed to represent a diversity of hobbyists and experts, was active several years ago, but now appears to be inactive.

REPTILE EXPOS AND FAIRS

Reptile expos and fairs in Canada are much smaller and occur less frequently than they do in the United States. However, collectively they still involve dozens of vendors and thousands of individual reptiles annually. Most reptile events are organized by local and regional hobbyist organizations and provide a way for members and other reptile enthusiasts to buy, sell, trade and display their animals and associated products to their peers. Reptile expos and fairs have occurred in British Columbia, Alberta and Ontario.

The largest North American event is the National Reptile Breeders Expo which is held twice yearly in Florida. This show typically features more than 500 vendor tables and thousands of individual reptiles ranging in price from $10 to $10,000.

Consumer pet shows featuring a range of domesticated and exotic animal species also feature a significant reptile component. For example, the September 2003 Totally Pets Show in Mississauga, Ontario included a range of retailers selling reptiles, including bearded dragons, panther chameleons, tegu lizards, ball pythons and other species. The show also included several businesses that offer reptile presentations to schools, clubs and private functions.

"Reptile prices range from just a few dollars for very common species (e.g., green anoles) to thousands of dollars for rare species or special colour variations."

TRAVELING REPTILE SHOWS

As the number of reptiles kept as pets has increased, so has the number of traveling reptile shows. Some of them are ad hoc, being individual hobbyists who bring their animals into schools, community centers, shopping malls and service clubs on an occasional basis. A few of these people charge a nominal fee, but typically their presentations are done free of charge.

There are also a number of organized, commercial operations that provide reptile displays and shows to schools, community groups, businesses, parties and special events. Examples include Sciensational Snakes, Reptilia, Safari Jeff, The Reptile Roadshow and the SCALES Zoo. Most have fixed fees for single shows and a sliding scale for additional shows. Reptilia, SCALES Zoo and some others offer presentations both on and off-site.

Sciensational Snakes offers small group presentations at a rate of $150 for one show, $250 for a half day and $350 for a full day.[103] Large group rates for displays and shows run from $300 to over $1000 depending on the size and duration of the events and the number of shows involved.[104]

Reptilia advertises a number of different programs. Small group presentations run from $185 for one show to $460 for five shows. Auditorium presentations are priced at $500, while combination reptile displays and shows start at $900.[105]

REPTILE & EXOTIC ANIMAL MAGAZINES

Several commercially produced US-based reptile magazines are sold in pet stores across Canada. *Reptiles Magazine* produced in Mission Viejo, California and *Reptile & Amphibian Hobbyist* produced in Neptune City, New Jersey are two of the most popular.

Animal Finder's Guide (AFG), a publication produced in Prairie Creek, Indiana caters to producers and owners of exotic pets and alternative livestock. Each edition of this monthly magazine contains hundreds of classified ads, and often includes a number from Canada, offering everything from turtles to tigers for the right price and a number of articles written by exotic animal owners. The magazine claims to have thousands of subscribers throughout North America.

In Canada, a short-lived publication called *The Canadian Conservationist Journal* surfaced a number of years ago but disappeared after several issues. More recently, *A Breed Apart, Canada's Exotics Digest*, produced in Bradford, Ontario started up. Each edition of this magazine features a variety of articles about a range of non-domesticated animal species. Several reptile hobbyist groups also produce their own newsletters or magazines but these are not usually available at commercial newsstands.

THE EXPORT OF REPTILES FROM CANADA

Although the exact number of reptiles exported out of Canada is not known, an examination of CITES export documents suggest that the number is relatively modest. This stands in sharp contrast to the United States which exports millions of reptiles every year.

From 1996 until 2001, 10,909 CITES-listed live reptiles were exported from Canada. There are no statistics regarding the number of exported, non-CITES-listed reptiles.

The Green iguana *(Iguana iguana)* was the most commonly exported CITES-listed species with 5,082 individuals exported between 1996 and 2001. 1,362 individuals were exported in 1996, 1,490 in 1998 and less than 1,000 in other years during that time period.

During that same period, 947 veiled chameleons *(Chamaeleo calyptratus)*, 746 panther chameleons *(Chamaeleo pardalis)*, 352 ball pythons *(Python regius)* and 285 Boettger's day geckos *(Phelsuma v-nigra)* were also exported. The 10 most commonly exported CITES-listed species comprised 8,361 of the total export number.

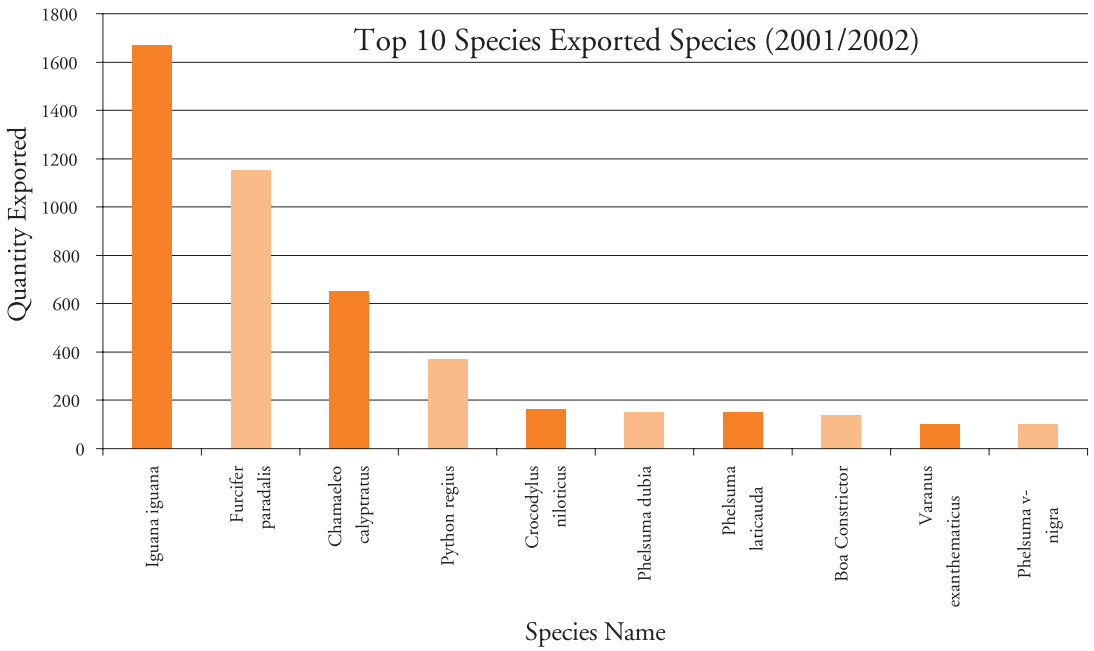
"SINCE THERE IS LITTLE TRACKING OF REPTILE EXPORTS, THE ACTUAL NUMBERS OF ANIMALS LEAVING THE COUNTRY CANNOT BE DETERMINED WITH ANY CERTAINTY."

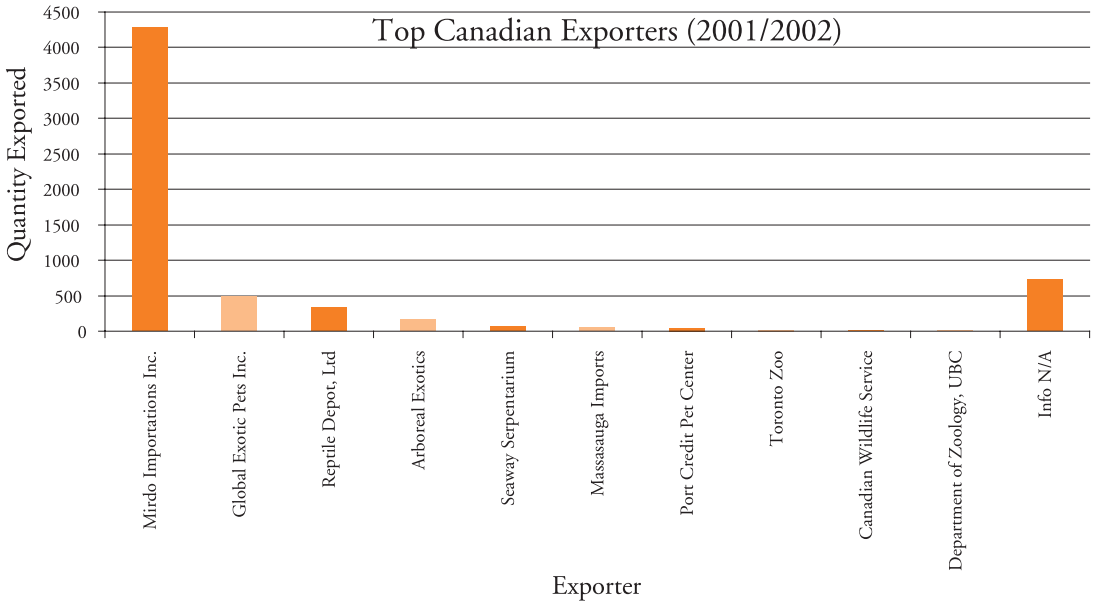
Lizards comprised the greatest number of CITES-listed reptile species exported Canada, followed by snakes and then turtles, tortoises and crocodilians.

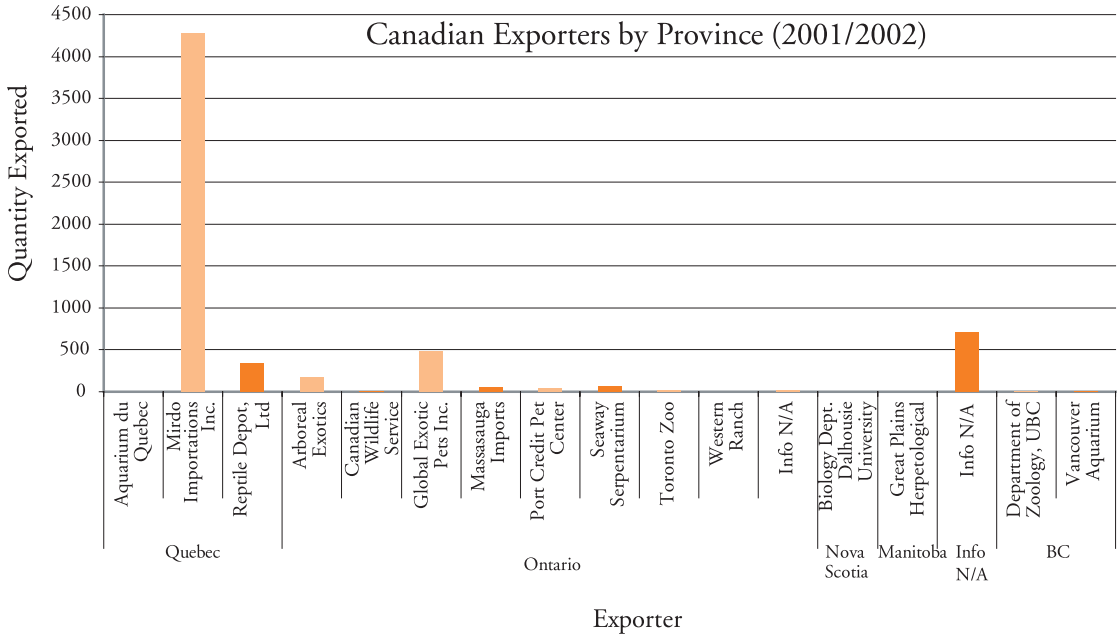
The United States was the primary recipient of CITES-listed reptiles from Canada receiving 2,953 individuals. Japan was a not too distant second receiving 2,205 animals, while France received 1,601, Hong Kong 1,092, Thailand 1,000, Ukraine 877 and Poland 693.

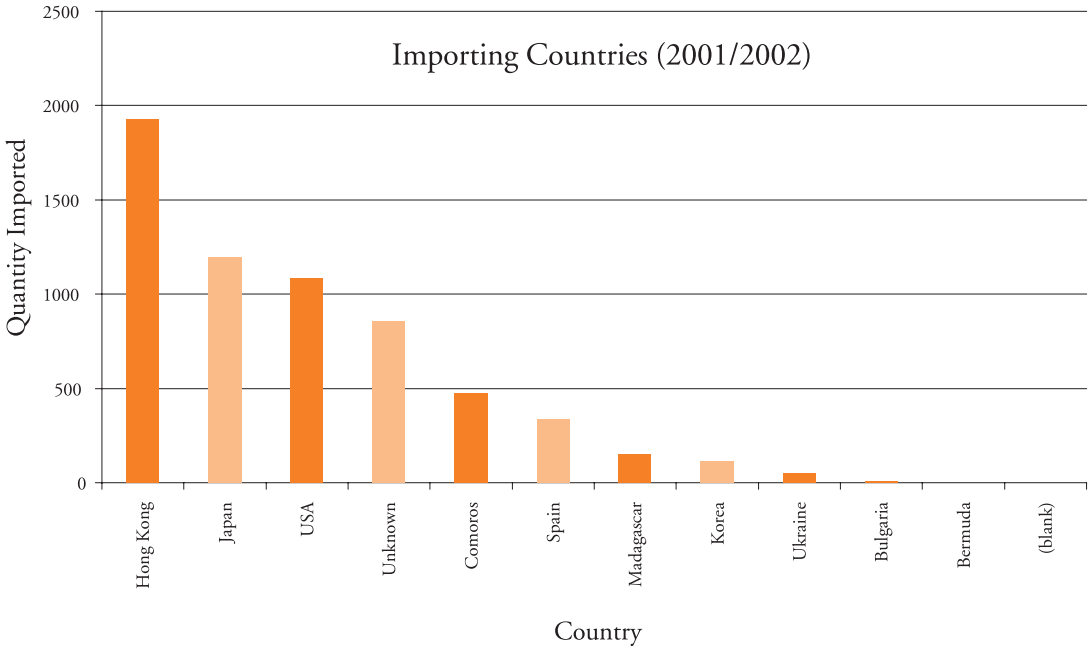
Quebec ranked first as the province with the greatest number of exports (7,283), followed by Ontario (2,517) and British Columbia (612).

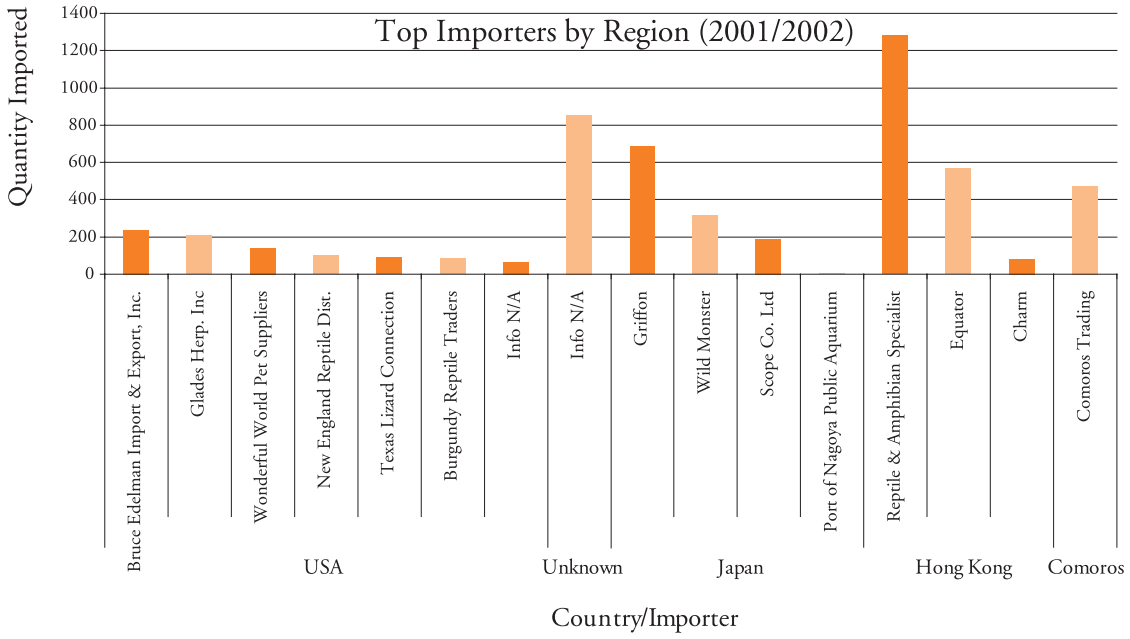
Since there is little tracking of reptile exports, the actual numbers of animals leaving the country cannot be determined with any certainty.

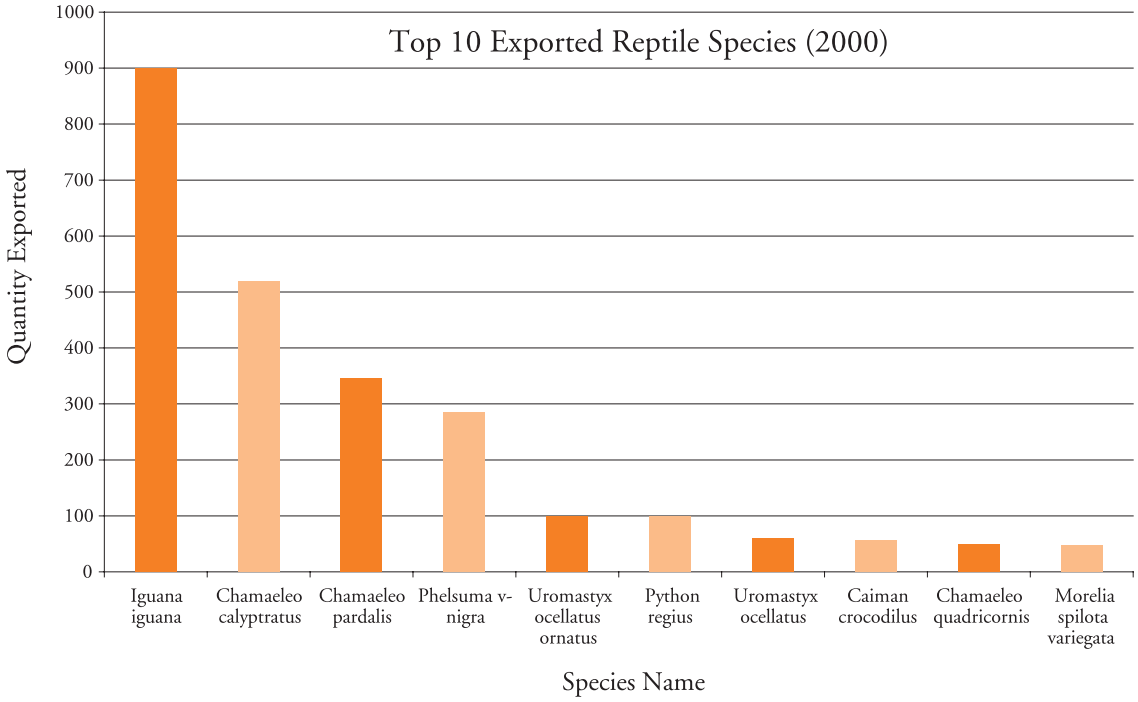

Top 10 Species Exported Species (2001/2002)
Quantity Exported
1800
1600
1400
1200
1000
800
600
400
200
0
Iguana iguana
Furcifer paradalis
Chamaeleo calyptratus
Python regius
Crocodylus niloticus
Phelsuma dubia
Phelsuma laticauda
Boa Constrictor
Varanus exanthematicus
Phelsuma v-nigra
Species Name

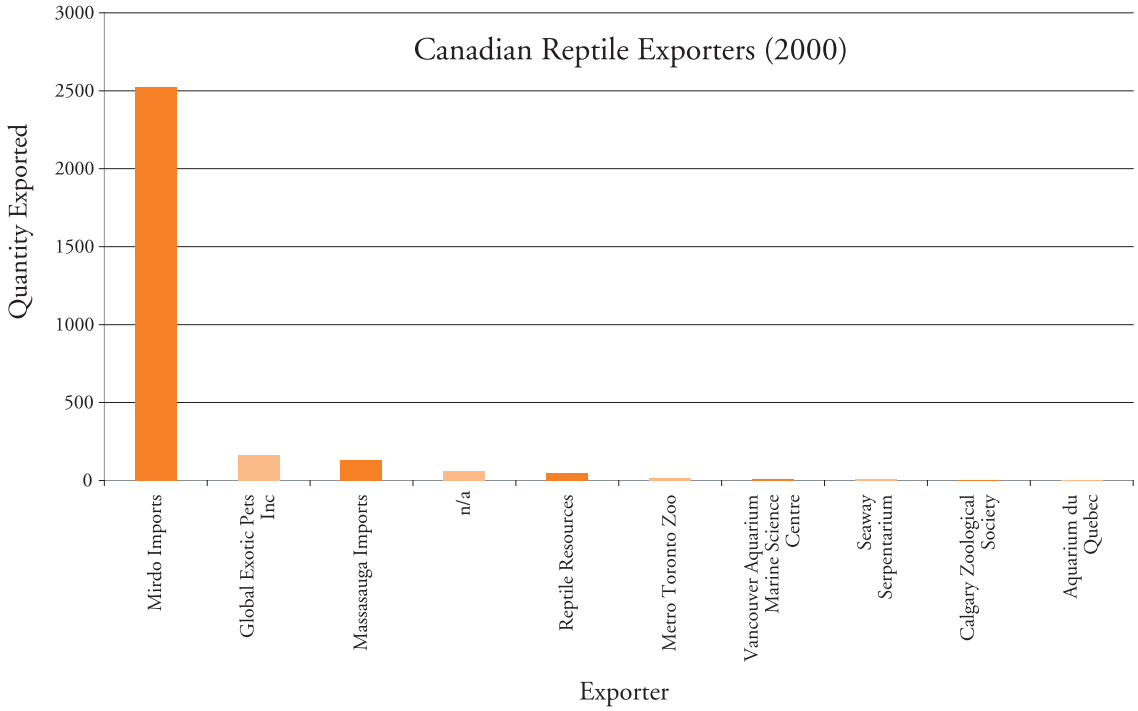

Top Canadian Exporters (2001/2002)
Quantity Exported
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Mirdo Importations Inc.
Global Exotic Pets Inc.
Reptile Depot, Ltd
Arboreal Exotics
Seaway Serpentarium
Massasauga Imports
Port Credit Pet Center
Toronto Zoo
Canadian Wildlife Service
Department of Zoology, UBC
Info N/A
Exporter

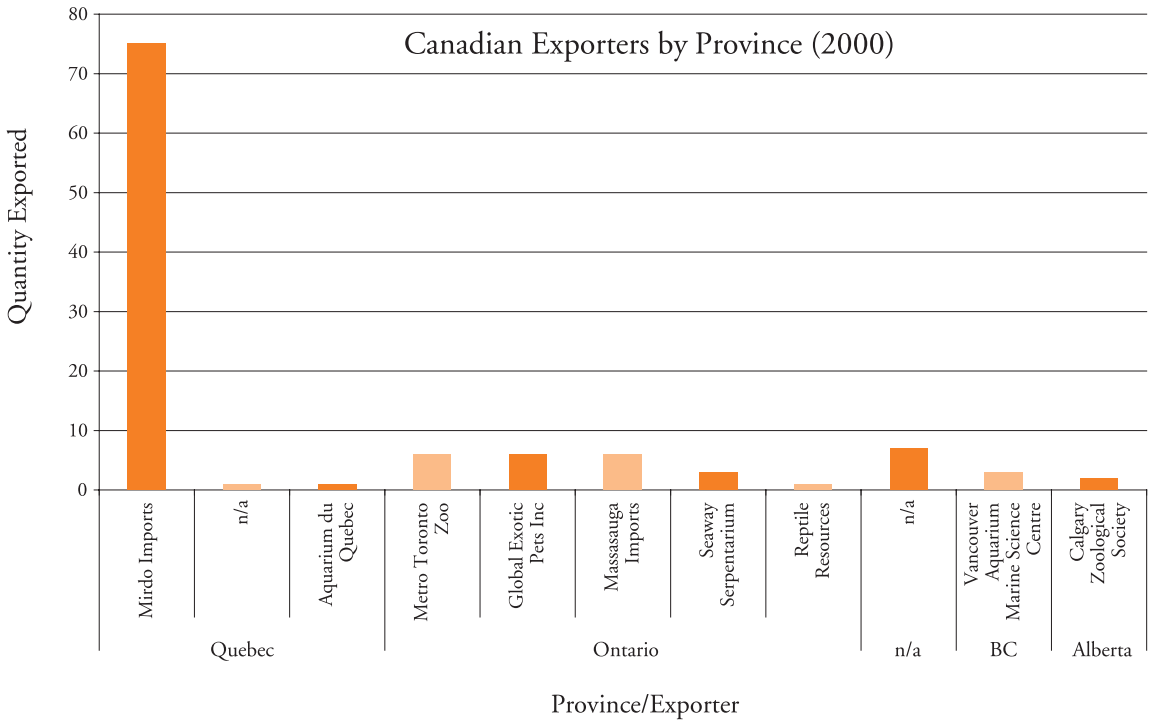

Canadian Exporters by Province (2001/2002)
Quantity Exported
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Aquarium du Quebec
Mirdo Importations Inc.
Reptile Depot, Ltd
Arboreal Exotics
Canadian Wildlife Service
Global Exotic Pets Inc.
Massasauga Imports
Port Credit Pet Center
Seaway Serpentarium
Toronto Zoo
Western Ranch
Info N/A
Biology Dept. Dalhousie University
Great Plains Herpetological
Info N/A
Department of Zoology, UBC
Vancouver Aquarium
Quebec
Ontario
Nova Scotia
Manitoba
Info N/A
BC
Exporter

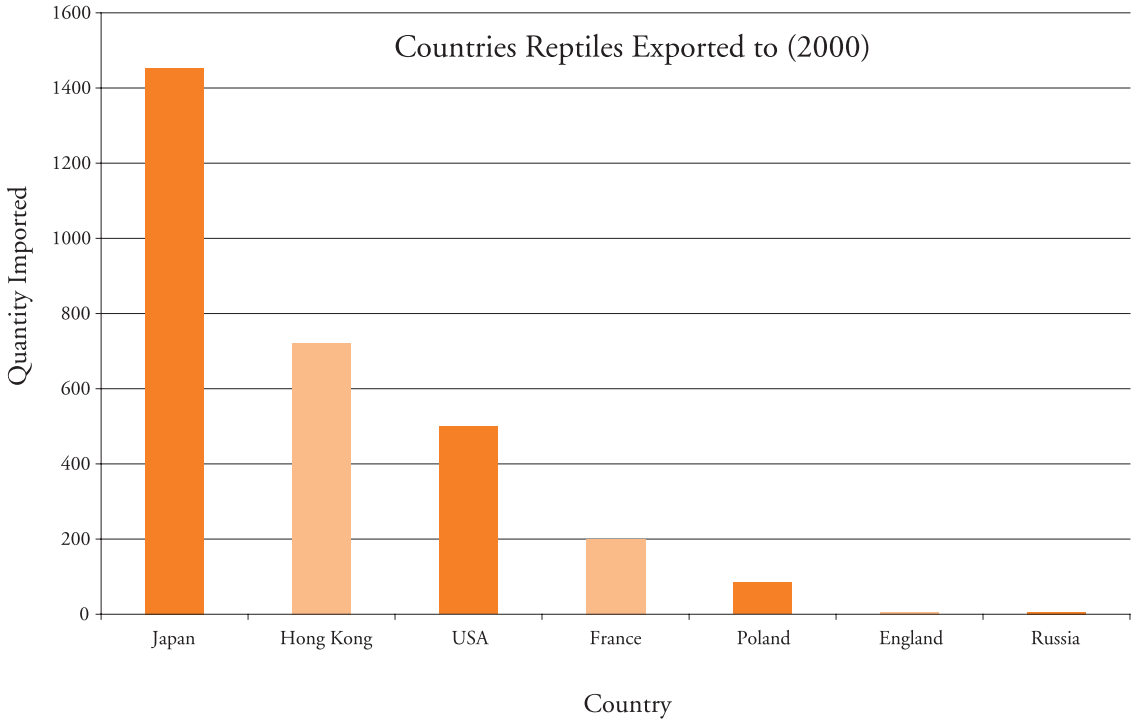

Importing Countries (2001/2002)
Quantity Imported
2500
2000
1500
1000
500
0
Hong Kong
Japan
USA
Unknown
Comoros
Spain
Madagascar
Korea
Ukraine
Bulgaria
Bermuda
(blank)
Country

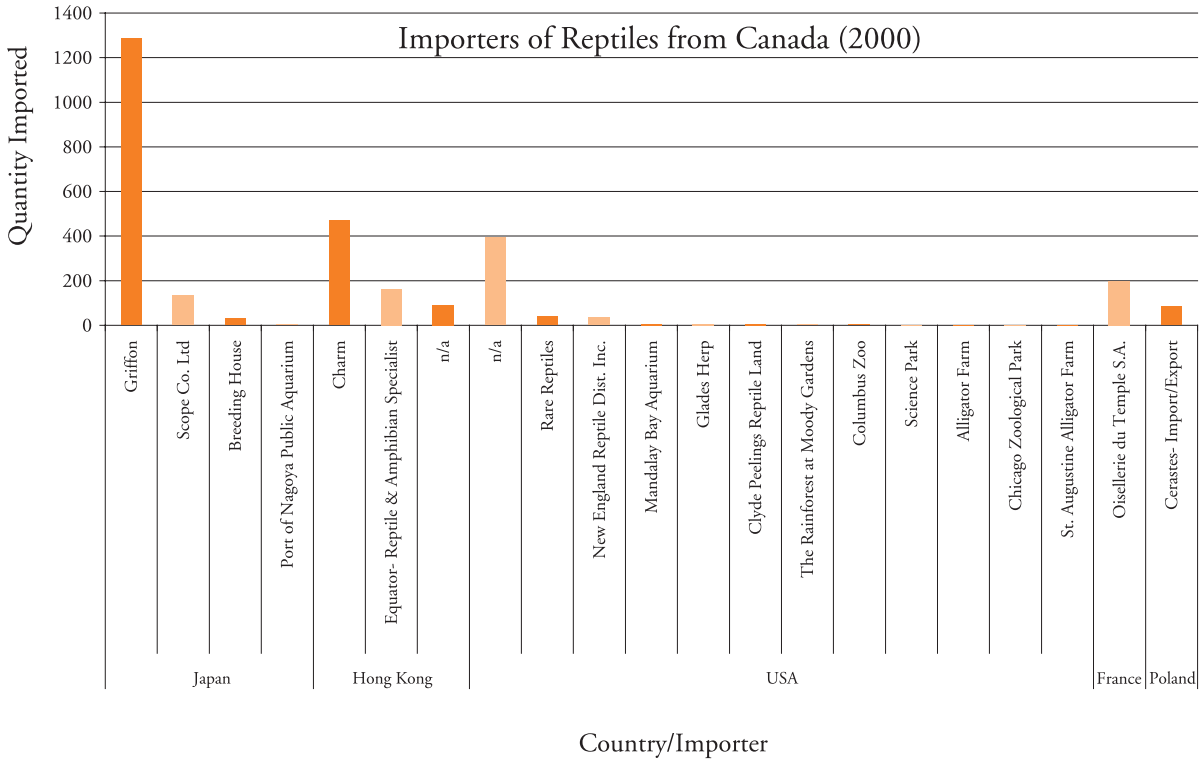

Top Importers by Region (2001/2002)
Quantity Imported
1400
1200
1000
800
600
400
200
0
Bruce Edelman Import & Export, Inc.
Glades Herp. Inc
Wonderful World Pet Suppliers
New England Reptile Dist.
Texas Lizard Connection
Burgundy Reptile Traders
Info N/A
Info N/A
Griffon
Wild Monster
Scope Co. Ltd
Port of Nagoya Public Aquarium
Reptile & Amphibian Specialist
Equator
Charm
Comoros Trading
USA
Unknown
Japan
Hong Kong
Comoros
Country/Importer

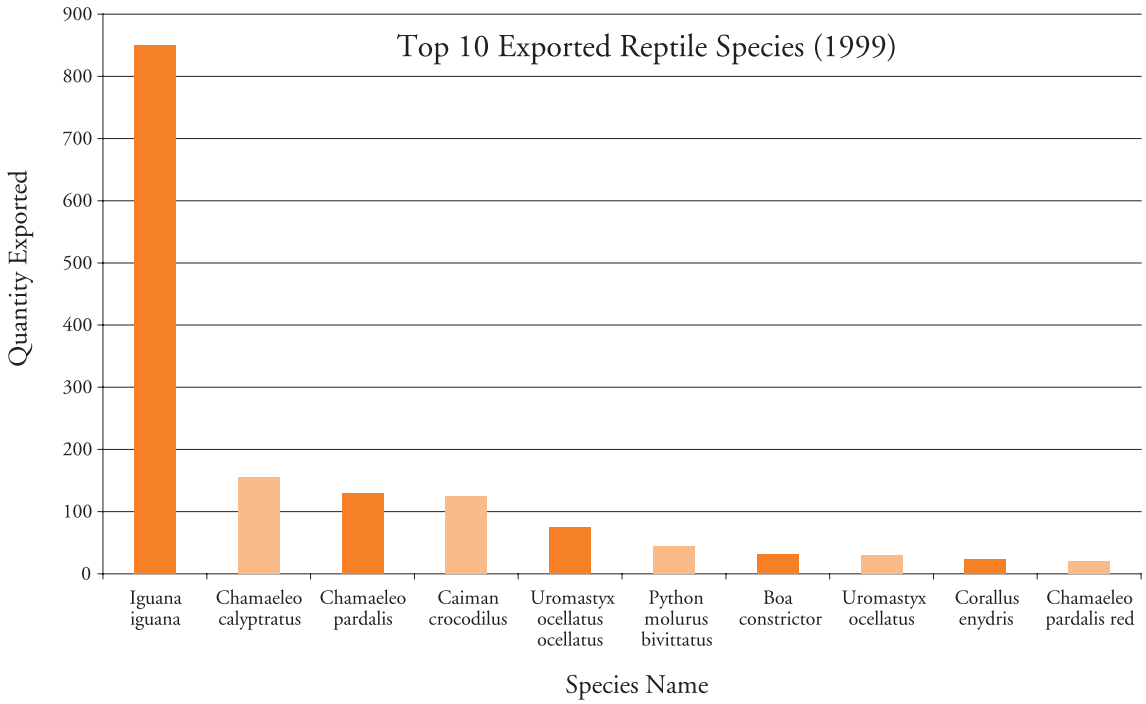

Top 10 Exported Reptile Species (2000)
Quantity Exported
1000
900
800
700
600
500
400
300
200
100
0
Iguana iguana
Chamaeleo calyptratus
Chamaeleo pardalis
Phelsuma v-nigra
Uromastyx ocellatus ornatus
Python regius
Uromastyx ocellatus
Caiman crocodilus
Chamaeleo quadricornis
Morelia spilota variegata
Species Name

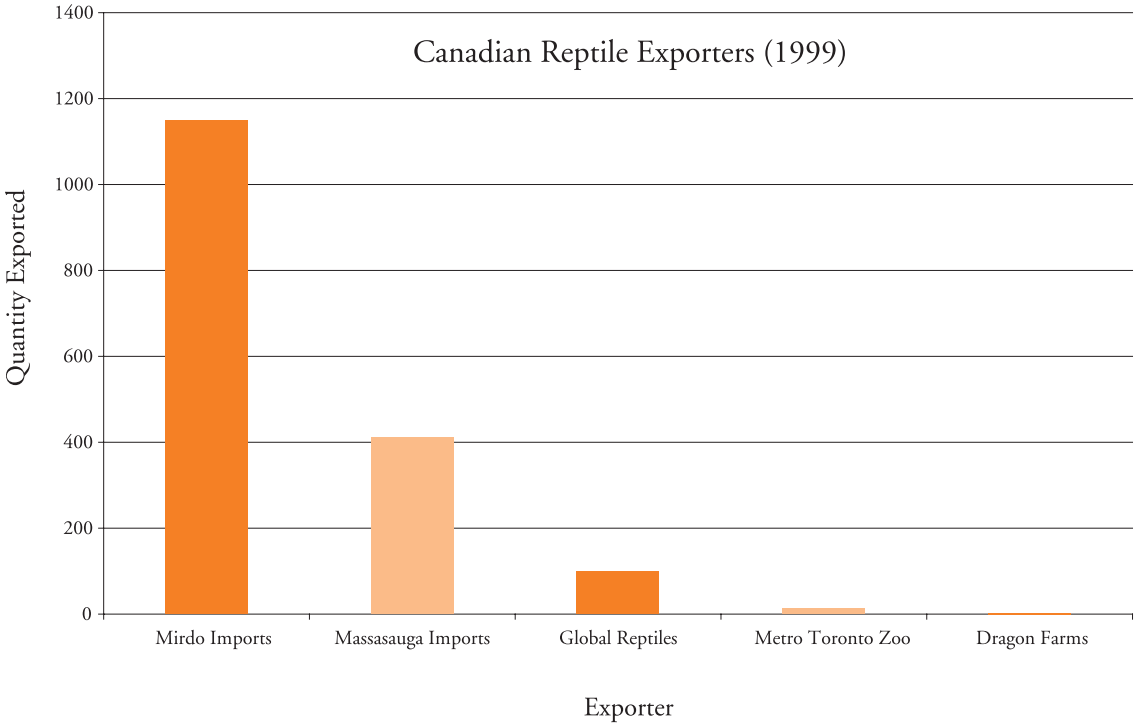

Canadian Reptile Exporters (2000)
Quantity Exported
3000
2500
2000
1500
1000
500
0
Mirdo Imports
Global Exotic Pets Inc
Massasauga Imports
n/a
Reptile Resources
Metro Toronto Zoo
Vancouver Aquarium Marine Science Centre
Seaway Serpentarium
Calgary Zoological Society
Aquarium du Quebec
Exporter

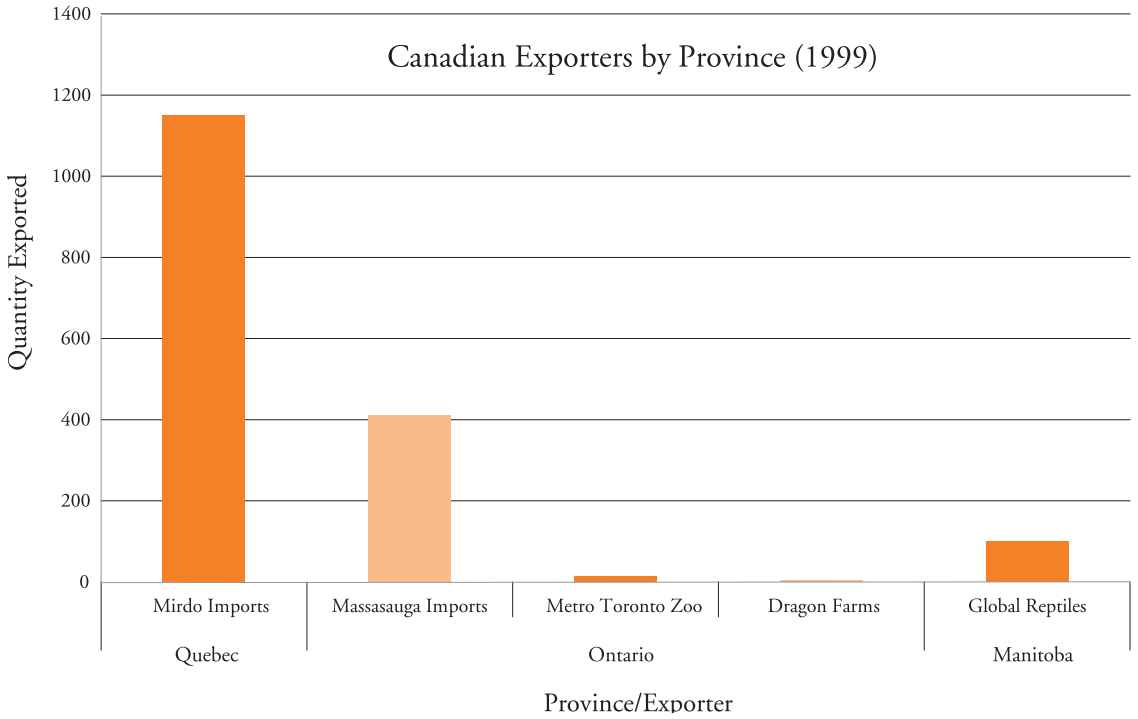

Canadian Exporters by Province (2000)
Quantity Exported
80
70
60
50
40
30
20
10
0
Mirdo Imports
n/a
Aquarium du Quebec
Metro Toronto Zoo
Global Exotic Pets Inc
Massasauga Imports
Seaway Serpentarium
Reptile Resources
n/a
Vancouver Aquarium Marine Science Centre
Calgary Zoological Society
Quebec
Ontario
n/a
BC
Alberta
Province/Exporter

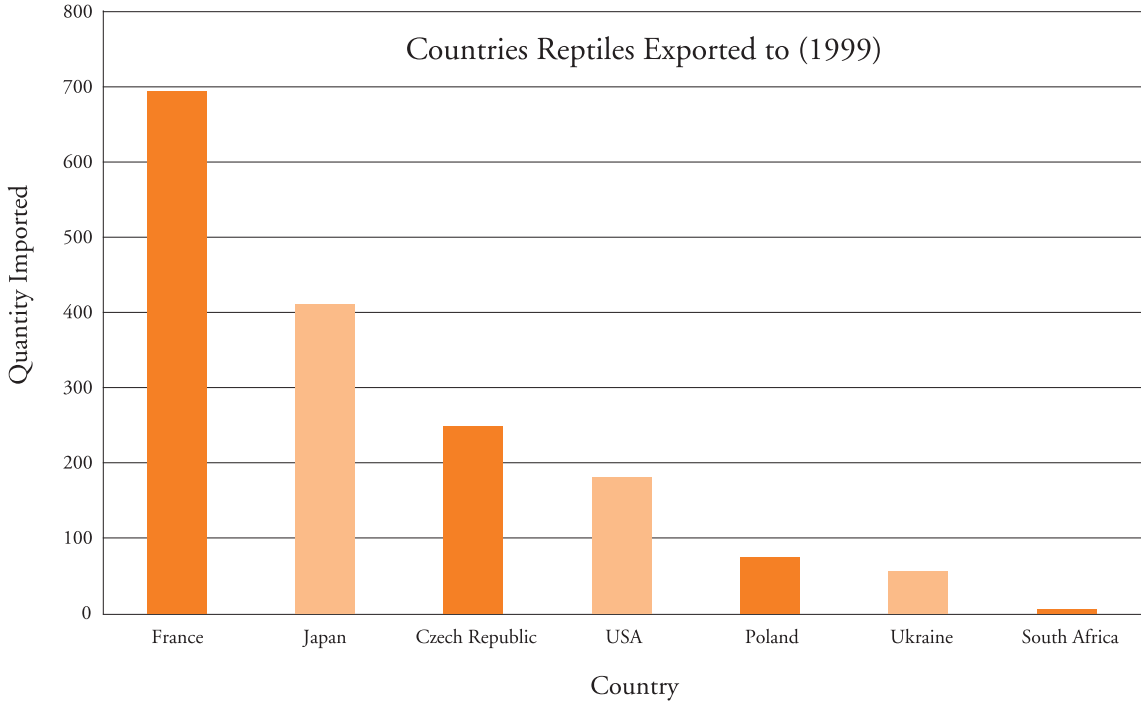

Countries Reptiles Exported to (2000)
Quantity Imported
1600
1400
1200
1000
800
600
400
200
0
Japan
Hong Kong
USA
France
Poland
England
Russia
Country

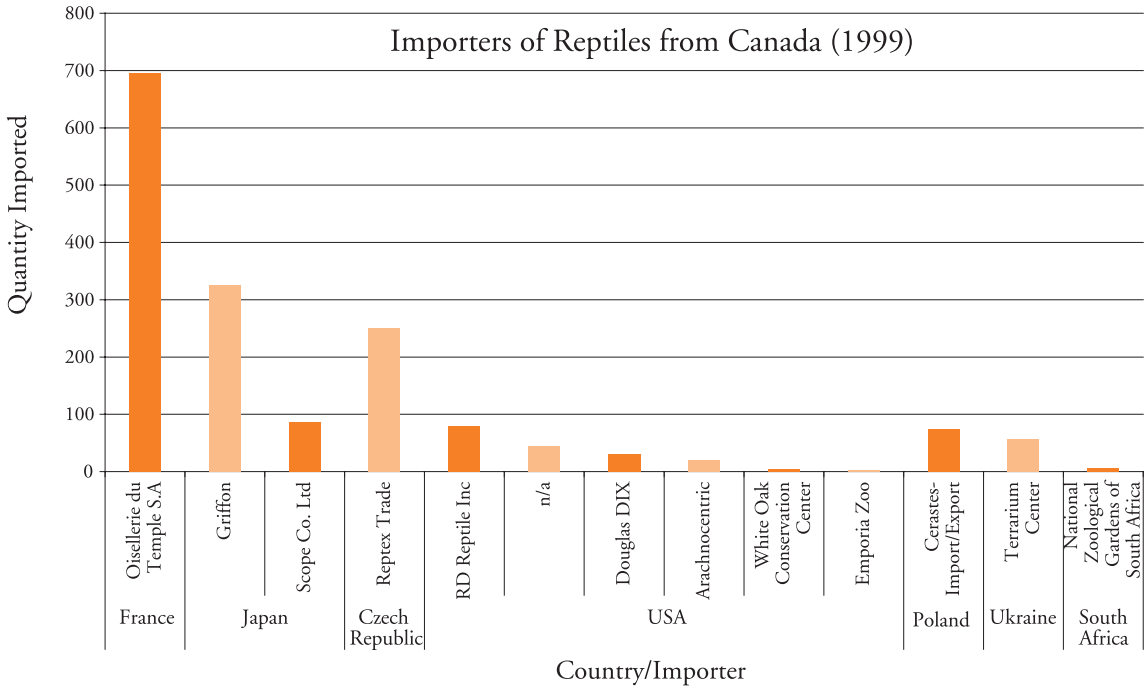

Importers of Reptiles from Canada (2000)
Quantity Imported
1400
1200
1000
800
600
400
200
0
Griffon
Scope Co. Ltd
Breeding House
Port of Nagoya Public Aquarium
Charm
Equator- Reptile & Amphibian Specialist
n/a
n/a
Rare Reptiles
New England Reptile Dist. Inc.
Mandalay Bay Aquarium
Glades Herp
Clyde Peelings Reptile Land
The Rainforest at Moody Gardens
Columbus Zoo
Science Park
Alligator Farm
Chicago Zoological Park
St. Augustine Alligator Farm
Oiselleric du Temple S.A.
Cerastes- Import/Export
Japan
Hong Kong
USA
France
Poland
Country/Importer

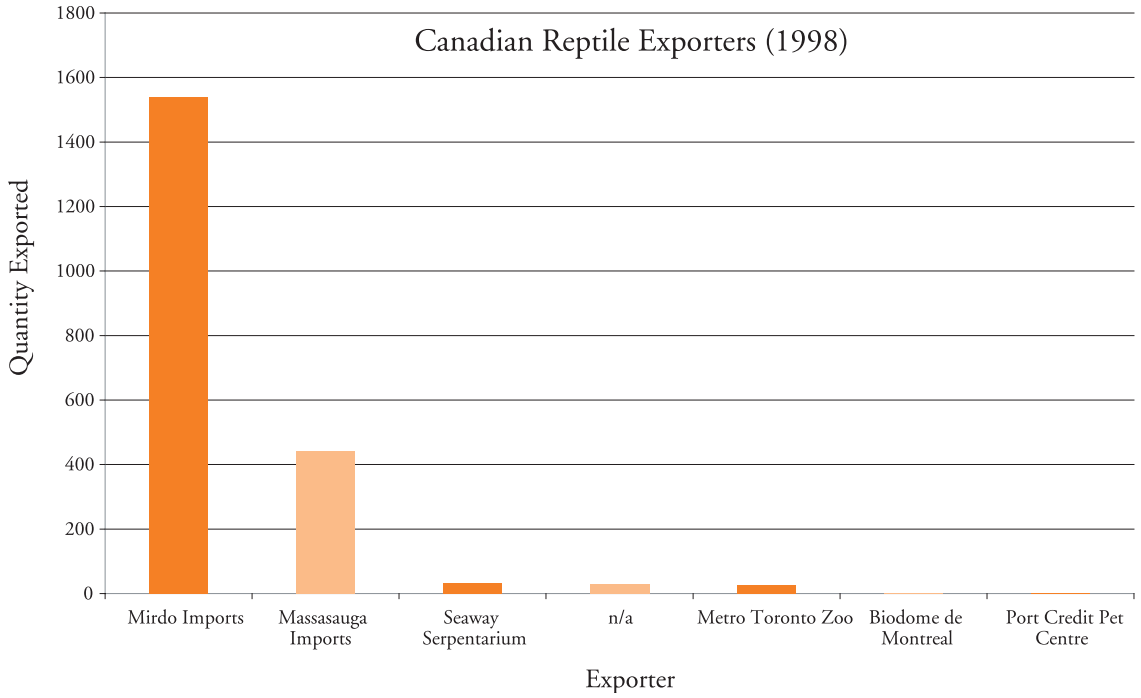

Top 10 Exported Reptile Species (1999)
Quantity Exported
900
800
700
600
500
400
300
200
100
0
Iguana iguana
Chamaeleo calyptratus
Chamaeleo pardalis
Caiman crocodilus
Uromastyx ocellatus ocellatus
Python molurus bivittatus
Boa constrictor
Uromastyx ocellatus
Corallus enydris
Chamaeleo pardalis red
Species Name

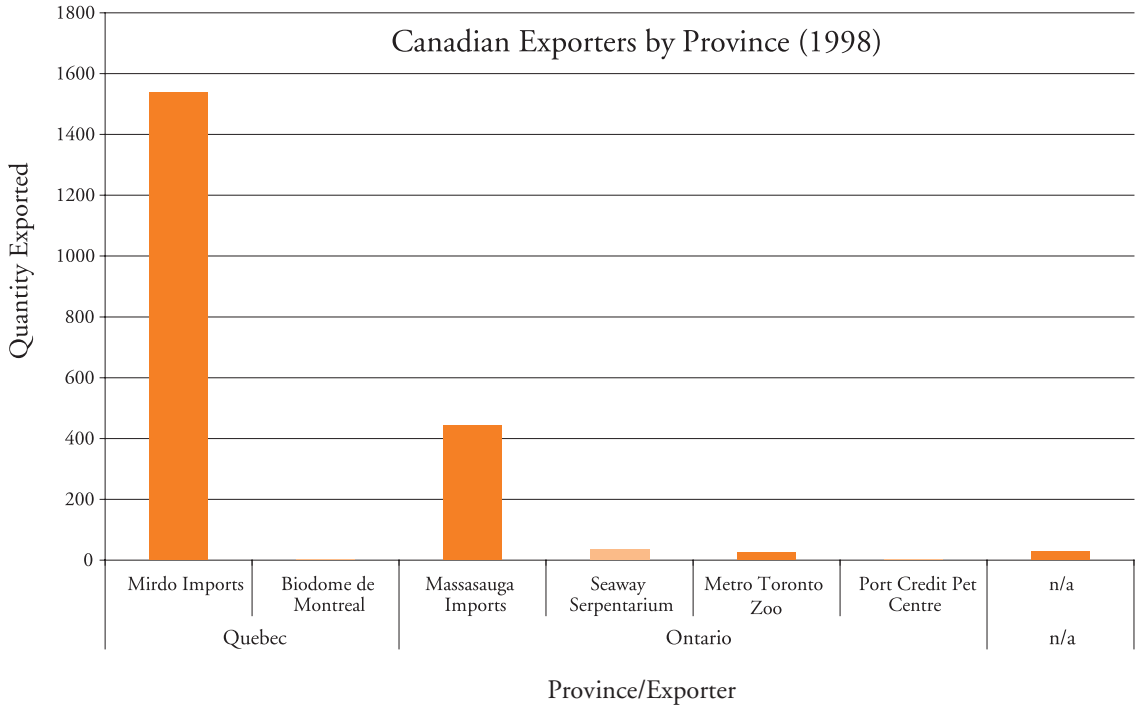

Canadian Reptile Exporters (1999)
Quantity Exported
1400
1200
1000
800
600
400
200
0
Mirdo Imports
Massasauga Imports
Global Reptiles
Metro Toronto Zoo
Dragon Farms
Exporter

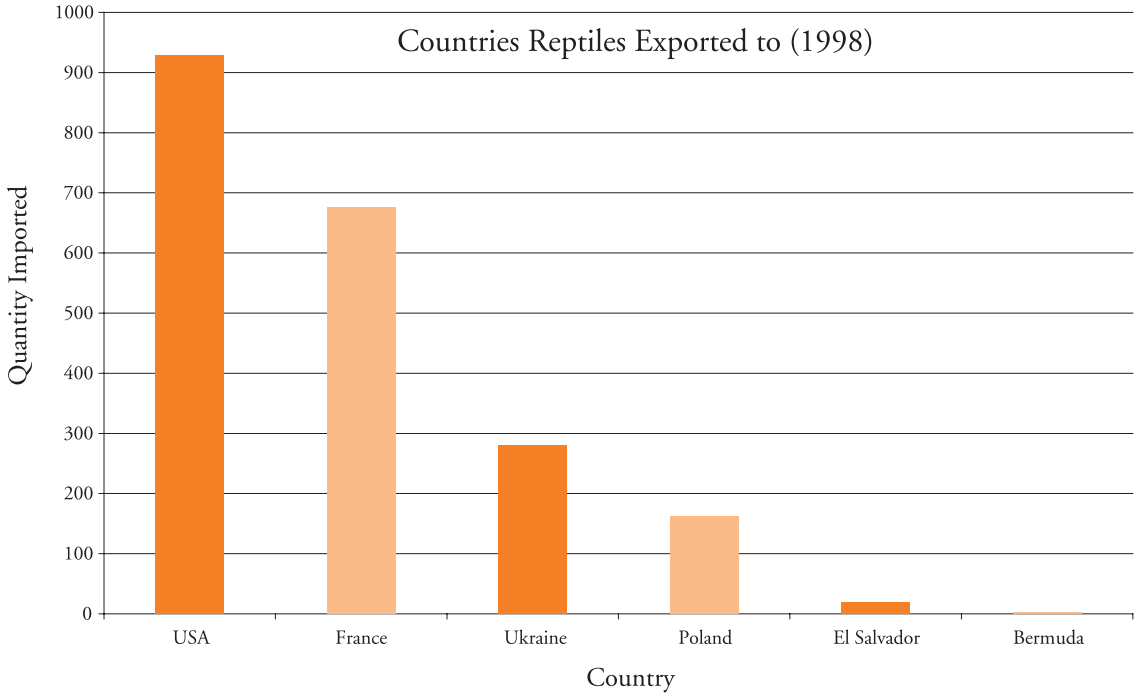

Canadian Exporters by Province (1999)
Quantity Exported
1400
1200
1000
800
600
400
200
0
Mirdo Imports
Massasauga Imports
Metro Toronto Zoo
Dragon Farms
Global Reptiles
Quebec
Ontario
Manitoba
Province/Exporter

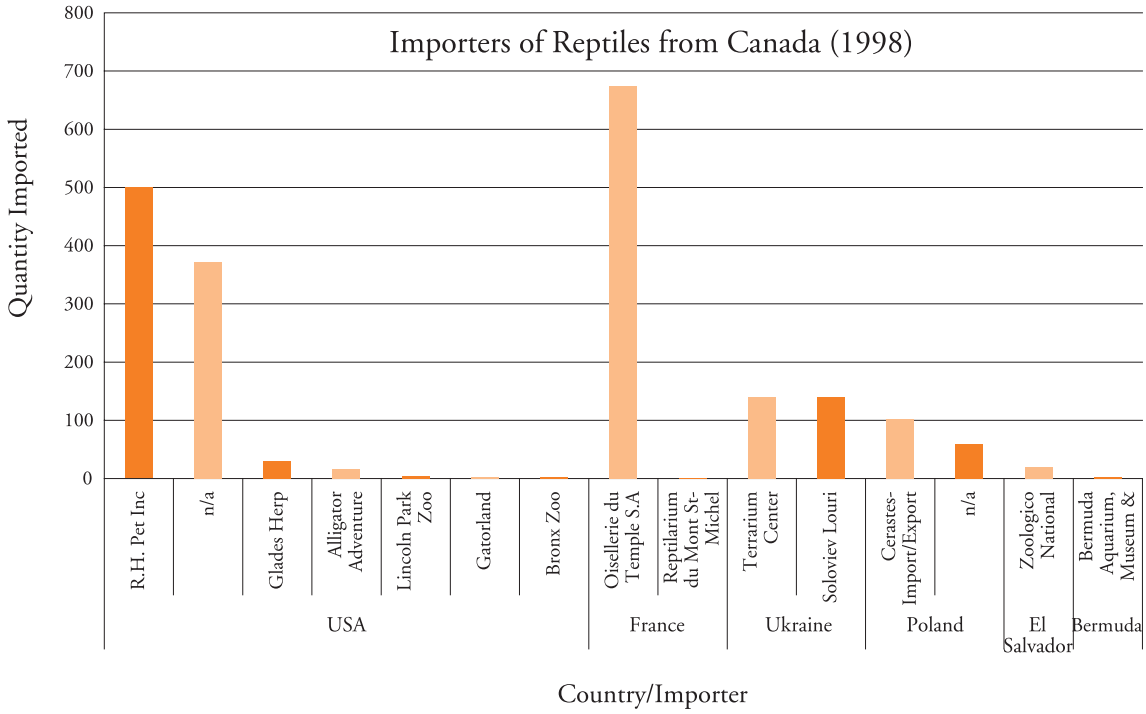

Countries Reptiles Exported to (1999)
Quantity Imported
800
700
600
500
400
300
200
100
0
France
Japan
Czech Republic
USA
Poland
Ukraine
South Africa
Country

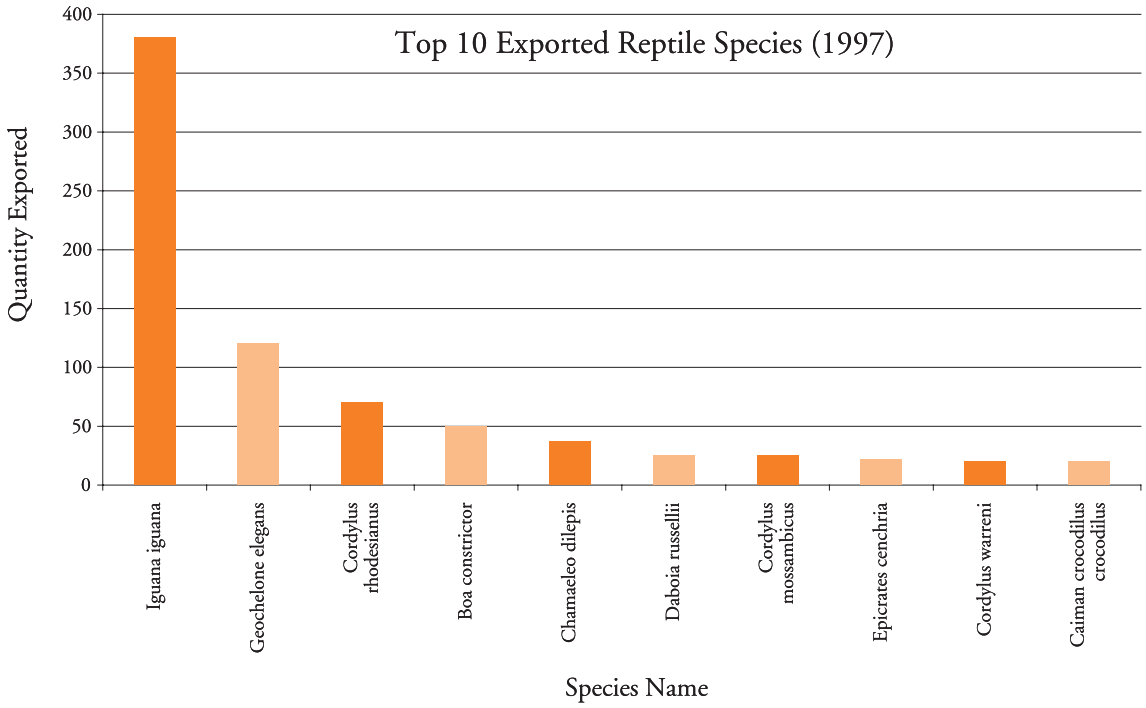

Importers of Reptiles from Canada (1999)
Quantity Imported
800
700
600
500
400
300
200
100
0
Oiselleric du Temple S.A
Griffon
Scope Co. Ltd
Reptex Trade
RD Reptile Inc
n/a
Douglas DIX
Arachnocentric
White Oak Conservation Center
Emporia Zoo
Cerastes-Import/Export
Terrarium Center
National Zoological Gardens of South Africa
France
Japan
Czech Republic
USA
Poland
Ukraine
South Africa
Country/Importer

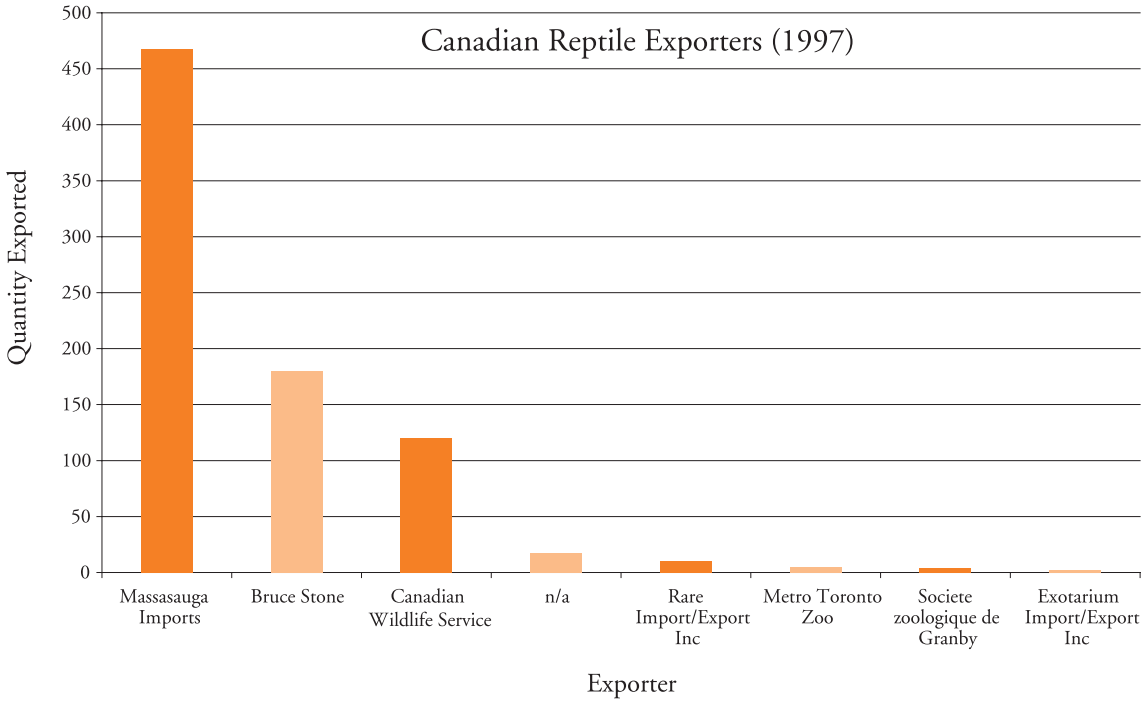

Canadian Reptile Exporters (1998)
Quantity Exported
1800
1600
1400
1200
1000
800
600
400
200
0
Mirdo Imports
Massasauga Imports
Seaway Serpentarium
n/a
Metro Toronto Zoo
Biodome de Montreal
Port Credit Pet Centre
Exporter

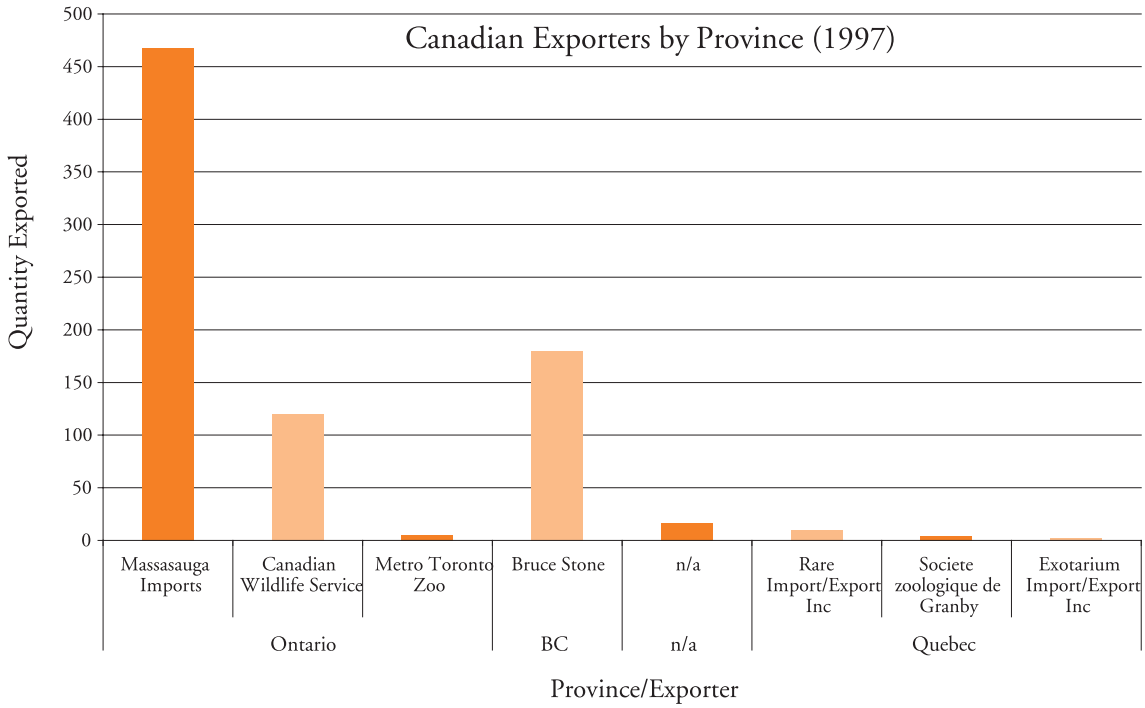

Canadian Exporters by Province (1998)
Quantity Exported
1800
1600
1400
1200
1000
800
600
400
200
0
Mirdo Imports
Biodome de Montreal
Massasauga Imports
Seaway Serpentarium
Metro Toronto Zoo
Port Credit Pet Centre
n/a
Quebec
Ontario
n/a
Province/Exporter

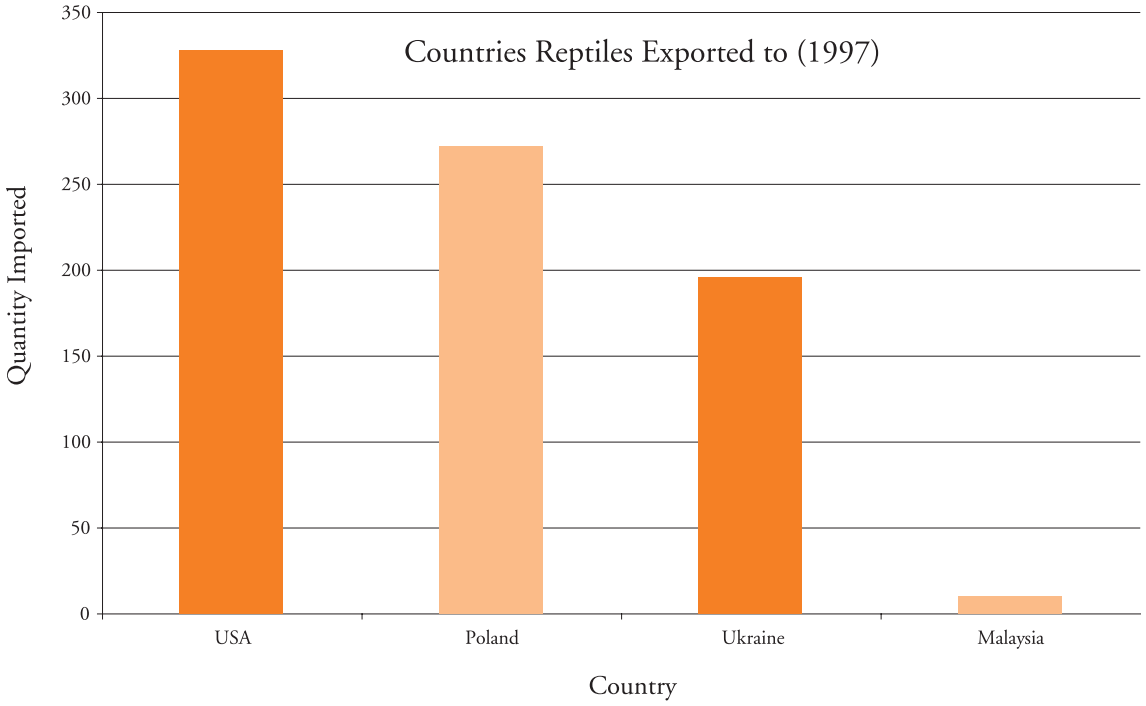

Countries Reptiles Exported to (1998)
Quantity Imported
1000
900
800
700
600
500
400
300
200
100
0
USA
France
Ukraine
Poland
El Salvador
Bermuda
Country

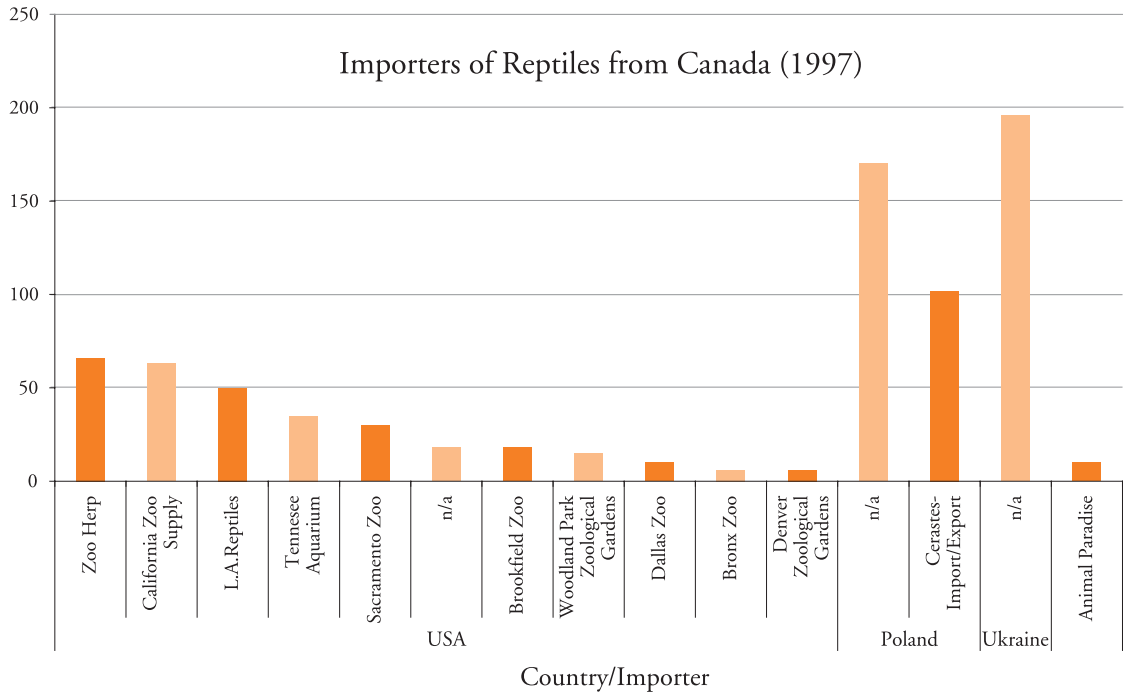

Importers of Reptiles from Canada (1998)
Quantity Imported
800
700
600
500
400
300
200
100
0
R.H. Per Inc
n/a
Glades Herp
Alligator Adventure
Lincoln Park Zoo
Gatorland
Bronx Zoo
Oisellerie du Temple SA
Reptilarium du Mont St-Michel
Terrarium Center
Soloviev Louri
Cerastes-Import/Export
n/a
Zoologico National
Bermuda Aquarium, Museum &
USA
France
Ukraine
Poland
El Salvador
Bermuda
Country/Importer

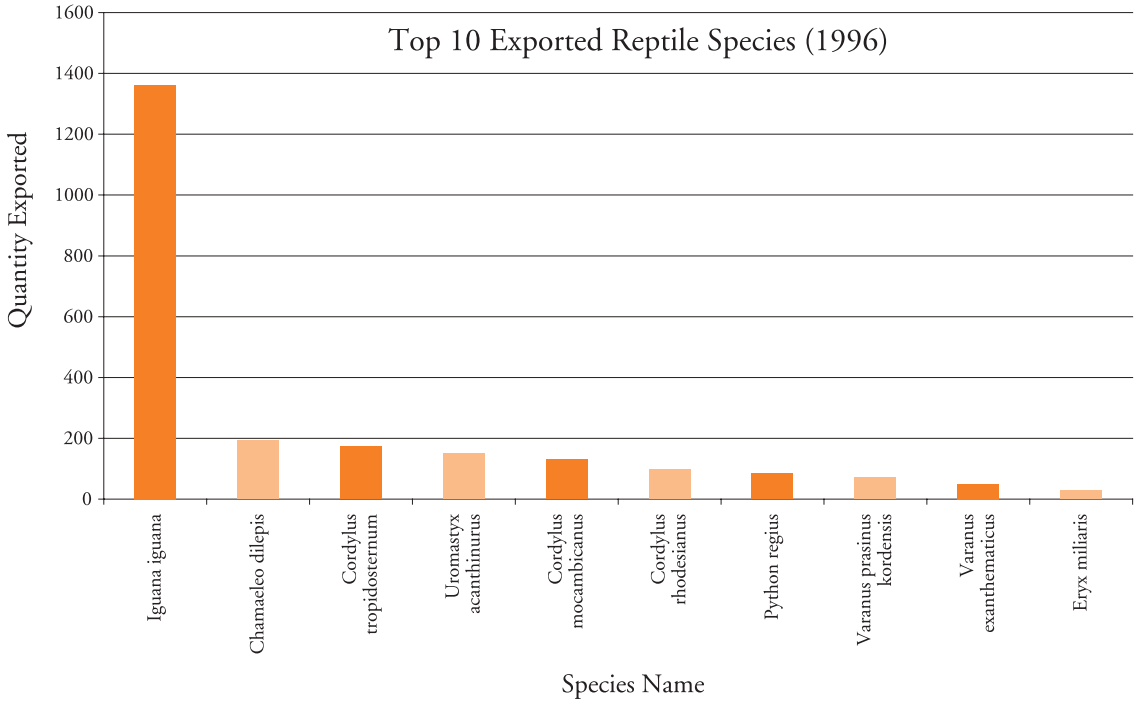

Top 10 Exported Reptile Species (1997)
Quantity Exported
400
350
300
250
200
150
100
50
0
Iguana iguana
Geochelone elegans
Cordylus rhodesianus
Boa constrictor
Chamaeleo dilepis
Daboia russellii
Cordylus mossambicus
Epicrates cenchria
Cordylus warreni
Caiman crocodilus crocodilus
Species Name

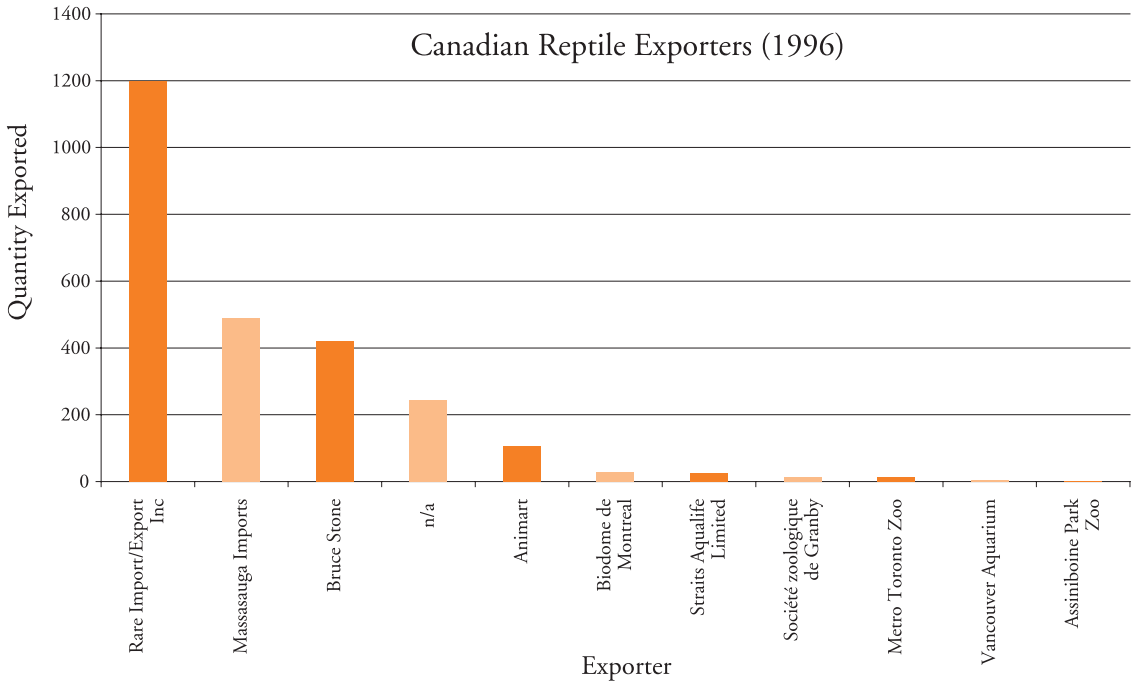

Canadian Reptile Exporters (1997)
Quantity Exported
500
450
400
350
300
250
200
150
100
50
0
Massasauga Imports
Bruce Stone
Canadian Wildlife Service
n/a
Rare Import/Export Inc
Metro Toronto Zoo
Societe zoologique de Granby
Exotarium Import/Export Inc
Exporter

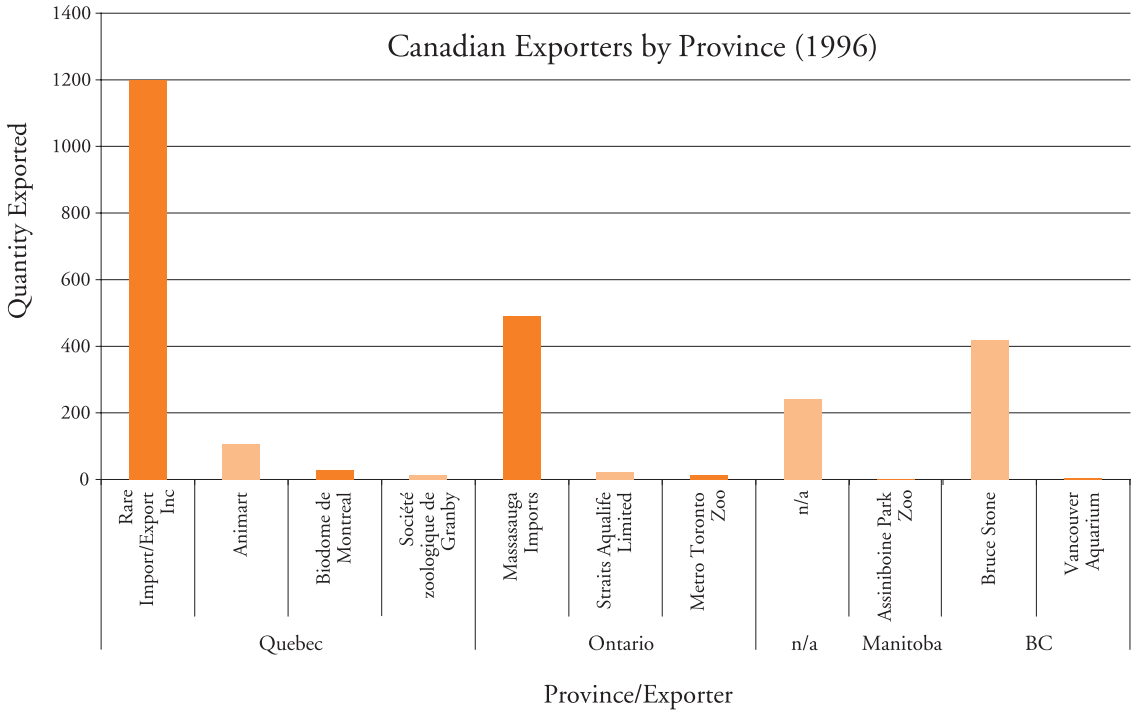

Canadian Exporters by Province (1997)
Quantity Exported
500
450
400
350
300
250
200
150
100
50
0
Massasauga Imports
Canadian Wildlife Service
Metro Toronto Zoo
Bruce Stone
n/a
Rare Import/Export Inc
Societe zoologique de Granby
Exotarium Import/Export Inc
Ontario
BC
n/a
Quebec
Province/Exporter

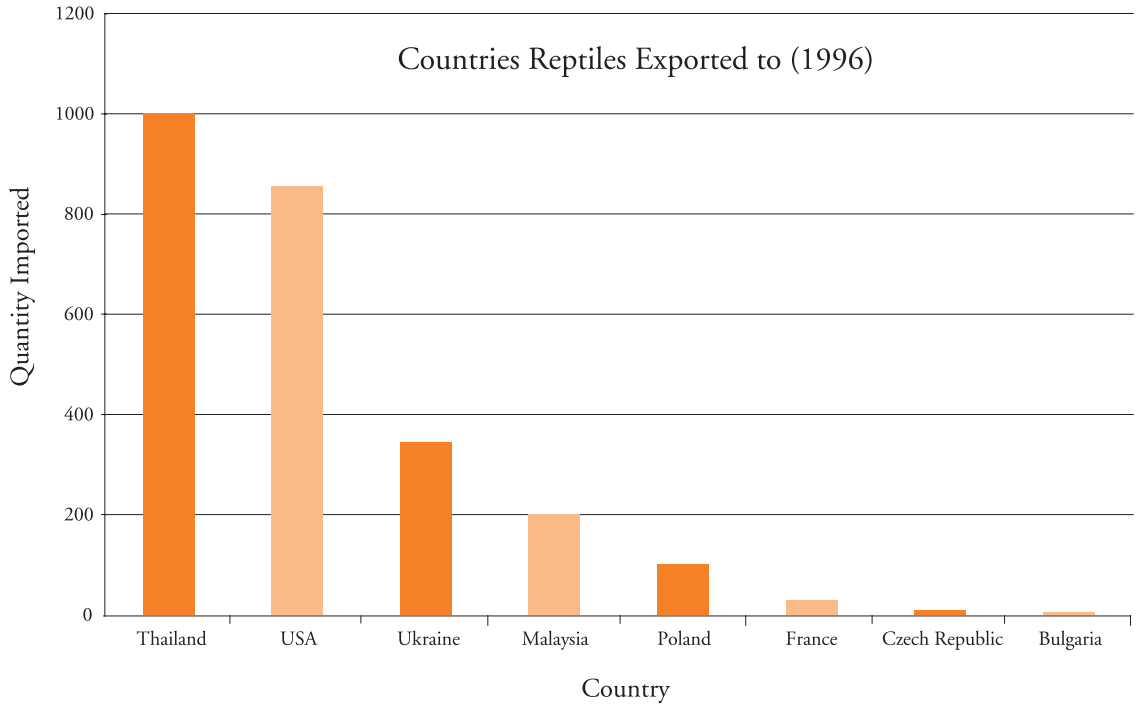

Countries Reptiles Exported to (1997)
Quantity Imported
350
300
250
200
150
100
50
0
USA
Poland
Ukraine
Malaysia
Country

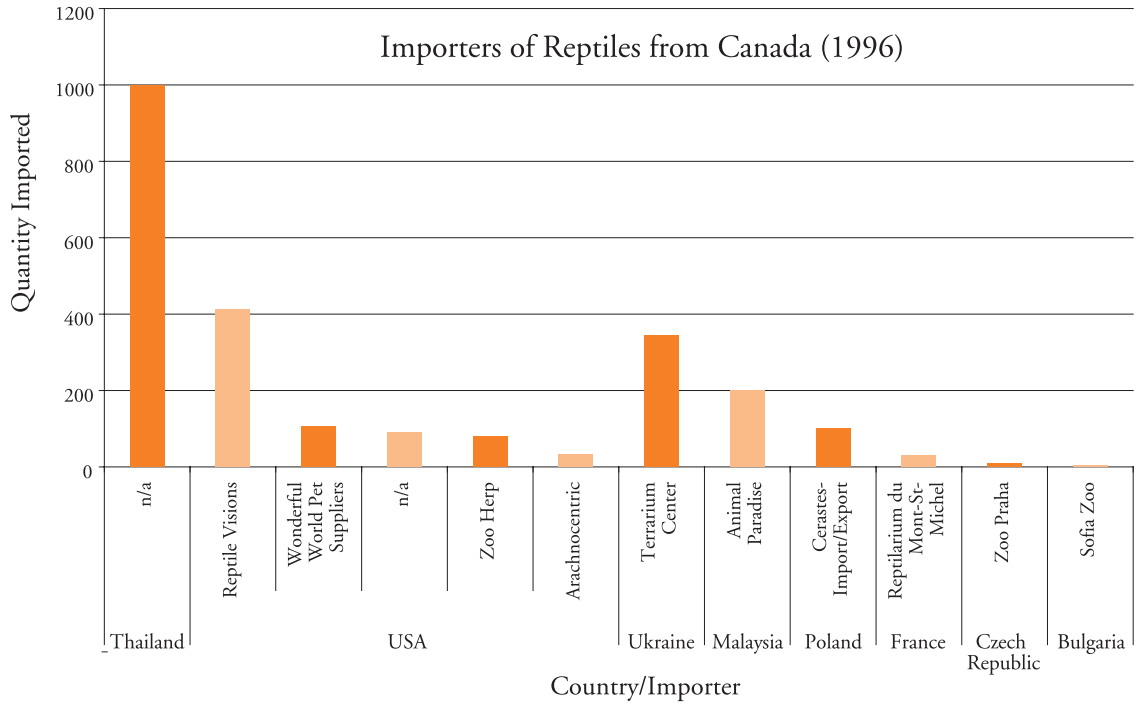

Importers of Reptiles from Canada (1997)
250
200
150
100
50
0
Zoo Herp
California Zoo Supply
L.A.Reptiles
Tennesee Aquarium
Sacramento Zoo
n/a
Brookfield Zoo
Woodland Park Zoological Gardens
Dallas Zoo
Bronx Zoo
Denver Zoological Gardens
n/a
Cerastes-Import/Export
n/a
Animal Paradise
USA
Poland
Ukraine
Country/Importer


Top 10 Exported Reptile Species (1996)
Quantity Exported
1600
1400
1200
1000
800
600
400
200
0
Iguana iguana
Chamaeleo dilepis
Cordylus tropidosternum
Uromastyx acanthinurus
Cordylus mocambicanus
Cordylus rhodesianus
Python regius
Varanus prasinus kordensis
Varanus exanthematicus
Eryx miliaris
Species Name


Canadian Reptile Exporters (1996)
Quantity Exported
1400
1200
1000
800
600
400
200
0
Rare Import/Export Inc
Massasauga Imports
Bruce Stone
n/a
Animart
Biodome de Montreal
Straits Aqualife Limited
Société zoologique de Granby
Metro Toronto Zoo
Vancouver Aquarium
Assiniboine Park Zoo
Exporter


Canadian Exporters by Province (1996)
Quantity Exported
1400
1200
1000
800
600
400
200
0
Rare Import/Export Inc
Animart
Biodome de Montreal
Société zoologique de Granby
Massasauga Imports
Straits Aqualife Limited
Metro Toronto Zoo
n/a
Assiniboine Park Zoo
Bruce Stone
Vancouver Aquarium
Quebec
Ontario
n/a
Manitoba
BC
Province/Exporter


Countries Reptiles Exported to (1996)
Quantity Imported
1200
1000
800
600
400
200
0
Thailand
USA
Ukraine
Malaysia
Poland
France
Czech Republic
Bulgaria
Country


Importers of Reptiles from Canada (1996)
Quantity Imported
1200
1000
800
600
400
200
0
n/a
Reptile Visions
Wonderful World Pet Suppliers
n/a
Zoo Herp
Arachnocentric
Terrarium Center
Animal Paradise
Cerastes-Import/Export
Reptilarium du Mont-St-Michel
Zoo Praha
Sofia Zoo
Thailand
USA
Ukraine
Malaysia
Poland
France
Czech Republic
Bulgaria
Country/Importer

THE ILLEGAL TRADE IN REPTILES

Worldwide, the illegal trade in live wildlife and wildlife products is estimated to be worth billions of dollars annually. While no one knows exactly what percentage of the illegal wildlife trade involves reptiles, it is thought to be substantial.

Rare and endangered reptiles often command very high prices and pound for pound may be more valuable than other kinds of contraband. For example, rare New Zealand tree geckos (small lizards that can fit into a jar) are being stolen and sold to foreign collectors for more than US $2,000.[106] The potentially large profits, combined with relatively minimal penalties if caught, especially for a first offense, have resulted in a large number of smugglers and a diversity of smuggling techniques.

At one end of the spectrum are individuals who smuggle a few animals in their own luggage, in specially designed clothing or under their own street clothing. At the other end of the spectrum are elaborate smuggling rings dealing in thousands of animals. Because the trade in exotic species is so lucrative, many experts believe it has attracted the attention of organized crime. For example, Australian authorities believe that international drug syndicates are now involved in reptile smuggling. According to Anne-Marie Delahunt, Environment Australia Wildlife Assistant Secretary, "To be involved (in reptile smuggling) you need a network on the ground and the information to find the species you want. Certainly from my discussions with the federal agencies…investigating a range of crimes, the same names turn up in relation to wildlife and drug matters."[107]

Many smugglers go to great lengths to conceal their activities. One of the most routine and often effective, strategies employed by smugglers moving animals is simply falsifying import and export documentation. Enforcement of existing trade laws is often lax, so a great many illegally shipped animals simply go by undetected.

In his 1993 paper about the tortoise and turtle trade TRAFFIC Europe Enforcement Officer Wil Luiijf said, "Hatchlings of certain [turtle] species fetch high prices in the pet trade and are easily smuggled worldwide."[108] He goes on, "Unfortunately, failures in enforcement of CITES requirements have prevented the successful application of CITES as a conservation tool. These, as well as failures in compliance with International Air Transport Association (IATA) regulations…have resulted in the inhumane treatment and the death of large numbers of tortoises…"[109]

In August 2003, ten thousand turtles destined for the meat trade were illegally shipped from Malaysia to Hong Kong. Malaysian authorities said their Customs Department practiced "a relaxed form of check-ups on local goods meant for foreign markets to create a more conducive trading environment which will benefit the country's business environment." After news of the shipment hit the press, they offered to meet with animal and consumer protection groups to discuss ways of improving export checks.[110]

Even in the United States, less than 25% of the live animal shipments are inspected by the Fish and Wildlife Service. [111]

Illegally caught reptiles may also be laundered through breeding farms and dealers. Because it is extremely difficult or impossible to identify the exact source of most reptiles, exporters may take in illegally caught animals, declare them captive-bred and sell them off at a bigger profit. For example, according to allAfrica.com, "Kenya recently lifted a ban on trading in reptiles and some of the traders who had relocated to Uganda smuggle the animals to Kenya where they can easily export them" to Europe and the United States.[112]

Other factors have facilitated an increase in both the legal and illegal wildlife trade. One of the biggest has been the Internet. It has revolutionized the reptile trade by connecting sellers and buyers throughout the world in a way that was never before possible. A buyer can simply contact one of the thousands of online sellers of exotic animals and order almost anything they want. Even the Komodo dragon and the tuatara are available on the black market for a reported price of $30,000.[113]

According to the group ProFauna Indonesia, the trade in protected species in their country is a booming business. ProFauna estimated the value of protected species trade in their country in 1996 at between $400,000 – 500,000. In 2000, they estimated the value of the trade at more than ten times that amount. Overseas, where prices can be more than 100 times higher, the illegal trade in protected species from Indonesia is probably worth hundreds of millions of dollars.[114]

According to Willie Smits, Director of the Schmutzer Primate Center in Jakarta, illegal trade has become the biggest cause of extinction for many animal species. Reptiles, birds and primates are most popular and routinely show up in public markets. "If you go to Pramuka bird market, you can buy Komodo dragons and orangutans every day. There seems to be no species that you cannot buy there," Smits said.[115]

For some animals, the illegal transport process can be long, dangerous and life-threatening. For example, a wildlife trade report produced by the World Wildlife Fund and TRAFFIC describes one of the routes used to smuggle birds from Guyana. After being captured in Brazil and shipped to Guyana, the birds are transported by boat to Grenada, via Suriname. They were then moved to Barbados, flown to Cuba and then on to Moscow and Hungary. The final leg of their journey involved transport overland into Europe.[116]

The scale of the illegal trade in wildlife, including reptiles, in Canada is unknown. Apparently, Environment Canada is concerned about this. In a June 30, 1999, Environment Canada news release, Gary Colgan, Chief of Enforcement and Compliance for the Canadian Wildlife Service said, "Reptile smuggling is a high-profit, criminal enterprise that jeopardizes the world's most vulnerable animals."[117] A *Macleans* article entitled Animal Wrongs points out that "The national wildlife service currently operates with only 38 full and part-time officers. A dozen of them patrol Ontario, annually home to more than 50 per cent of import into Canada and hundreds of smuggling operations."[118] Gary Colgan is quoted, "Right now, we are not even scratching the surface. We just don't have the resources."[119]

Three relatively recent cases illustrate the kinds of activities that are occurring.

A number of rare and endangered reptiles were seized at the Halifax International Airport. The reptiles, all of them from Haiti, included four dwarf boa constrictors, one Hispanolian tree boa, one Galliwasp lizard and a giant toad, were destined for a local pet store.[120]

On June 13, 2003, a surprised York Region police officer pulled over a speeding car in the town of Whitchurch-Stouffiville, Ontario. He found 123 bullfrogs, 10 live snapping turtles and two Midland painted turtles crammed into the back seat. These animals are considered a delicacy by some cultures and were most likely destined to be sold as food. Forty-seven year old Sun Huynh was charged under the Ontario Fish and Wildlife Conservation Act for illegally transporting bullfrogs and snapping turtles; he was required to pay a CA $10,000 or US $7226 fine.[121] The reptiles were returned to Lake Scugog, north of Oshawa, Ontario. The removal of native Canadian reptiles, particularly turtles, seems to be a growing, difficult to monitor problem. While this case presumably involved the poaching of reptiles for the food trade, it does serve as a reminder that enforcement is difficult and sometimes depends on nothing more than blind luck. No one really knows the true extent of this aspect of the trade.

Another case exposed a more organized smuggling ring involving exotic reptiles. In August of 1998, Environment Canada and Revenue Canada officers discovered an illegal reptile smuggling ring involving five individuals from various cities across Canada. Of these five, three were charged with importing and exporting reptiles into and out of Canada. Dale Hickson of Windsor, Ontario was charged with unlawfully exporting from Canada 4 Madagascar tree boas, 19 radiated tortoises and 4 spider tortoises worth approximately CA $64,346 or US $46,500. Deborah Abbot of Vancouver was charged with smuggling into Canada 14 Madagascar tree boas, 26 radiated tortoises and 6 spider tortoises worth about CA $82,789 or US $59,827.[122]

A few months earlier another associate, Marc Lachaine of Toronto, Ontario, was charged with illegally importing and buying reptiles. After pleading guilty on April 30, 1999, Mr. Lachaine was fined $2,000 for illegally importing two Madagascar tree boas into Canada. He was fined another $2,000 for buying four illegally imported ringed pythons.[123]

EXAMPLES OF RECENT CASES OF ILLEGAL TRADE IN REPTILES REPORTED IN THE MEDIA

The illegal trade in reptiles is substantial and is believed to be equal to or greater in value than the legal trade. Most wild-caught reptiles, whether legally or illegally collected, are destined for buyers in North America, Europe or Japan. Some illegally collected reptiles are laundered through so-called reptile farms or other facilities where they are labeled captive-bred and then sent on to buyers in other locations through a vast network of collectors, exporters, importers, wholesalers and retailers. Almost certainly, some of these illegally acquired reptiles end up in the hands of reptile hobbyists in Canada.

ANNEX 6 of this report contains some cases of illegal reptile trading as reported by various media around the world. They represent the proverbial tip of the iceberg in the world of illegal reptile trading.

NATIVE REPTILES IN CANADA

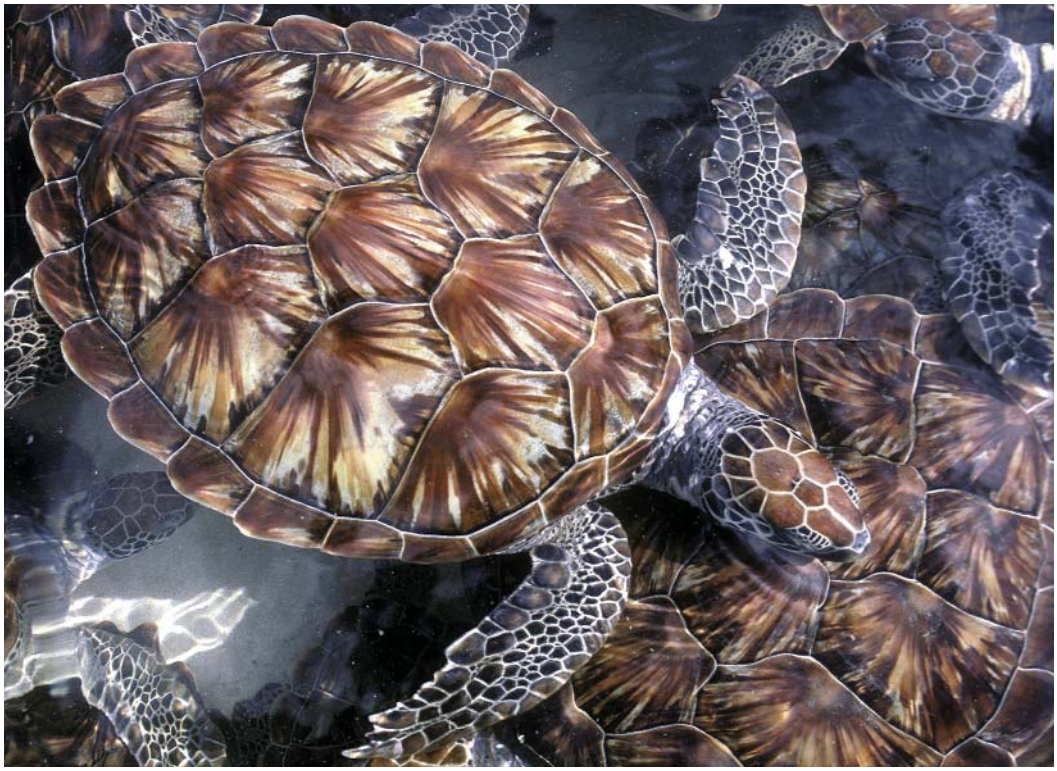
Reptiles are native to most provinces and territories in Canada, except Newfoundland and the Yukon and Nunavut territories.

Reptile diversity and numbers are greatest in the southern portions of Canada, gradually diminishing the further north you go. For a number of species, such as the Ringneck snake and the Night snake, Canada represents the northern extent of their range. Only one species, the Common garter snake, lives in the Northwest Territories and no reptiles live above the treeline.

While the majority of native reptile species inhabit the forests of southwestern Ontario, and the rainforests of British Columbia, a significant number of reptile species can also be found in the relatively arid regions of Manitoba, Saskatchewan, Alberta and the arid, interior valleys of southern British Columbia. A number of native British Columbian reptile species are not found anywhere else in Canada.

A listing of native reptile species and the provinces/territories they inhabit can be found in ANNEX 4 of this report.

"Reptile diversity and numbers are greatest in the southern portions of Canada, ..."



THE COLLECTION OF NATIVE REPTILES FOR THE PET TRADE

While the impact of the pet trade on native Canadian reptiles has not been fully studied, several reptile species, including wood turtles, box turtles, five-lined skinks and numerous kinds of snakes are found in the pet trade from time to time and in some cases are highly prized. [124]

There are several ways in which native reptiles may end up being kept as pets. They may be removed from natural areas by visitors (often children) who pick up one or two animals; amateur collectors who take several animals for their own use; and/or commercial collectors who remove large numbers of reptiles for sale to the pet and meat trade. While collecting reptiles in some situations may be legal and subject to a quota, in many instances it is illegal.

Media frequently carry stories describing how customs officials have intercepted illegal shipments of rare or endangered reptiles from Africa, South America or southeast Asia that were destined for the pet trade in North America or Europe. But there has been little media attention paid to the legal removal of exotic reptiles from the wild in foreign countries or to the removal of native reptiles from the wild in Canada and the United States.

In many respects North America is no different than other parts of the world. In addition to the legal "harvesting" of specific reptile species for the pet and meat trade, the illegal poaching of wild reptiles is also a serious problem. This can have serious ramifications for those populations that are being poached, as well as for the individual reptiles themselves who suffer through the capture and transport process and the ongoing stresses of captivity.

Collection for the pet trade poses several serious risks to native Canadian reptile populations, including the reduction of wild populations. While several native snake and lizard species are occasionally found in trade, turtles seem to be the taxa most vulnerable to collection.

A field biologist studying wood turtles in a southwestern Ontario location reported that her study population declined by approximately 60% in just five years. The decline was consistent with only one cause: poaching.[125]

Wood turtles are notoriously easy to collect after they emerge from winter hibernation. They tend to rest on stream and pond banks and make little, if any, attempt to escape when approached. Collectors simply walk along, picking up turtles as they go. In a very short period, it's possible for collectors to remove enough turtles to irreparably harm a population and eventually wipe it out.[126]

In Ontario, it is illegal, except under permit, to remove reptiles from the wild, so it is particularly alarming that the decline of study populations occur in protected areas. Reptiles in unprotected areas are especially vulnerable to illegal collection.

A January 2001 *Reptiles Magazine* article about North American wood turtles said, "Although predation and automobiles take their toll, collecting these turtles from the wild has had the most serious impact on many populations. Whether specimens are taken for the pet trade or private use, many populations have been eradicated by collecting alone."[127]

For more than 20 years, Steve Garber studied a wood turtle population on 2700 acres controlled by the South Central Connecticut Regional Water Authority. After public access to the watershed was permitted in 1983, his 133 marked study animals started to disappear. He eventually discovered that visitors were picking up the turtles and taking them home one at a time. By 1991, only 14 individuals remained, and by 1992, they were gone as well.[128]

Alarming declines of wood turtles have also been recorded in other regions of North America, with pet trade collection being considered a major factor. While the Canadian problem does not yet seem to have reached the level it has in the United States, once US populations are depleted enough, collectors may turn to Canadian reptile populations for their supply.[129]

The northern population of the bog turtle is known to exist in fewer than 200 sites, according to the US Fish and Wildlife Service (USFWS). Its numbers have declined by 50 per cent within the past 20 years. According to the USFWS, a major factor in the decline is "Illegal collection, primarily for the national and international pet trade…Bog turtles are highly prized in the pet trade, bringing high prices from collectors and dealers."[130]

According to a November 1997 *New York Times* article, "Domestically, a bog turtle can sell for $250 to $450, but there are reports of the animals fetching $2,000 a pair in Japan."[131]

"WHETHER SPECIMENS ARE TAKEN FOR THE PET TRADE OR PRIVATE USE, MANY POPULATIONS HAVE BEEN ERADICATED BY COLLECTING ALONE."

Michigan has been particularly hard hit by the pet trade. Turtles and snakes, including black rat and fox snakes, are frequently taken by collectors supplying the pet trade. A 1993 Michigan Department of Natural Resources Interoffice Communication leaves no room for doubt, "There is convincing evidence that many populations of these species [reptiles and amphibians] are being decimated by the commercial pet trade."[132]

Many US turtle populations have also been hit hard. Unfortunately, turtles tend to be long-lived animals that experience a very high degree of egg and hatchling mortality. Adult animals tend to survive for long periods of time, a natural strategy that compensates for the rather minimal recruitment rate of new breeding stock into the adult population. Anything that causes a rapid loss of breeding adults may be enough to tilt a particular population toward oblivion. There may be few, if any, harvestable adults to remove from a population.

So box turtles, turtles in the genus *Clemmys*, many tortoise species and a variety of other reptiles that share these population characteristics are vulnerable in this regard. They are highly susceptible to exploitation of any kind.

Other reptiles are not immune to the pet trade either. In the State of Nevada alone, between 1993 and 1997, more than 130,000 reptiles, the majority of them lizards, were removed from the wild for sale to reptile distributors in the east, who then resold them to pet stores or individual buyers, sparking concern among conservation groups.[133]

In a 1994 *Iguana Times* article, Breck Bartholemew provides a sobering description of reptile road collecting, "For example, areas such as River, Baghdad and Ajo roads are littered with collectors during the 'herpin' season.' Nearly every desirable herp that crosses the road is either collected or killed on these roads. In time, these herp populations are depleted, especially along the roads. This has already happened to the desert tortoises *(Gopherus agassizii)* and it appears rosy boas *(Lichanura trivirgata)* are facing the same fate."[134]

Green anole lizards, commonly called American chameleons because they have the ability to change colour, are found throughout the southeastern United States. They are collected in large numbers for the pet trade with significant numbers being exported to Canada. For example, in 1997, pet dealers imported 58,095 green anoles from the United States.[135]

Collection for the pet trade has been detrimental to native reptiles in North America and has resulted in a substantial reduction in reptile numbers in many areas.

"There is convincing evidence that many populations of these species [reptiles and amphibians] are being decimated by the commercial pet trade."

ARE REPTILES IN TRADE PROTECTED FROM CRUELTY AND EXPLOITATION?

Many reptile enthusiasts point to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as proof that the international reptile pet trade is well regulated. However, many of the people making this claim do not fully understand CITES and how it works, nor do they realize that the majority of reptile species are not covered by CITES.

CITES

CITES is an international trade agreement aimed at protecting certain species of animals and plants against over-exploitation through international trade. Each Party (signatory nation) to CITES must require that all import, export and re-export ('Re-export' means the export of a specimen that was imported) of species covered by the Convention be authorized through a licensing system.

Each Party must designate a Management Authority to administer the licensing system and a Scientific Authority to advise them on how trade will affect the status of wildlife populations. CITES does not regulate the trade in animals that are not listed on any of its three ANNEXES, nor does it regulate trade within national boundaries.

In 1992, Canada passed the *Wild Animal and Plant Protection and Regulations of International and Interprovincial Trade Act* (WAPRITTA) to ensure compliance with CITES regulations. The coordination of law enforcement and compliance activities is the responsibility of the Environment Canada Wildlife Trade Enforcement Section.

Wildlife species covered by CITES are listed in three ANNEXES, according to how much protection they need:

- ANNEX I lists species threatened with extinction. CITES prevents any trade in these species for primarily commercial purposes.
- ANNEX II lists species that are not necessarily threatened with extinction, but could become so if trade is not controlled. It also includes some species that are similar in appearance to threatened species. This is to prevent rare species being passed off by traders as their more common lookalikes.
- ANNEX III lists species that are protected in at least one country and that country has asked other CITES Parties for assistance in controlling trade.

The Convention allows for certain exceptions to the general principles described above. For example, Parties may create exemptions for:

- specimens in transit or being transhipped;
- specimens that were acquired before CITES provisions applied to them (known as pre-Convention specimens);
- specimens that are personal or household effects;
- animals that were bred in captivity (this term is carefully defined in Resolution Conf. 10.16 Rev.); Note: ANNEX 1 breeding facilities must be registered with CITES Secretariat Res Conf 12.10.
- specimens that are destined for scientific research;
- animals or plants forming part of a travelling collection or exhibition, such as a circus.

There are special rules in these cases and a permit or certificate will generally still be required.

A large number of reptiles in the pet trade qualify for one or more of the above listed exemptions, so CITES has little impact on their trade. In addition, there are concerns that some signatory nations issue export permits without sufficient knowledge of the species status in the wild and/or without verification of the authenticity of the export permit applicant's information.

Another problem is that many countries do not vigorously enforce CITES or IATA regulations at border crossings, so significant numbers of reptiles may be transported in uninspected "legal" shipments or in undetected illegal shipments. Poor enforcement may be due to lack of funds, lack of inspectors, inadequate training, corruption and other factors.

CITES and WAPPRITTA do not address the conditions under which animals that have been "lawfully" imported must be kept. An exception to this is contained in Article III 3(b) which states that, for ANNEX 1 species, an import permit should only be issued if the Scientific Authority of the State of import is satisfied that the proposed recipient of a living specimen is suitably equipped to house and care for it.

A list of reptile species contained in the three CITES ANNEXES can be found in ANNEX 1 of this report. Only a small proportion of known reptile species are covered by CITES.

ARE PET REPTILES PROTECTED FROM CRUELTY AND ABUSE IN CANADA?

FEDERAL LEGISLATION

There is a common belief in Canadian society that all animals are legally protected from suffering. This is only true to a very limited extent for some animals.

There are two types of Canadian legislation that enforcement agencies can use when addressing the issue of animal suffering. The first is the Criminal Code of Canada, which has two sections dealing with cruelty to animals. The laws in the Criminal Code apply across the country.

The second kind of legislation that somewhat addresses animal suffering is provincial legislation which establishes the provincial SPCA Act or otherwise addresses animal protection or welfare. Each province's laws are different in this regard.

Unfortunately, both the Criminal Code and the various provincial laws tend to deal with animal cruelty in a retroactive fashion - punishing only certain kinds of harmful behaviour only after it has occurred. They do little to prevent suffering from occurring in the first place. There are a range of problems with all of these laws that prevent them from effectively protecting reptiles in trade or kept as pets.

Both the Criminal Code and provincial animal protection laws are not particularly useful in dealing with the trade and keeping of reptiles for a number of reasons. Beyond being punitive, rather than preventative, the offenses are very limited, any punishment is minimal and any fines given could just be seen by owners and commercial businesses as one of the costs of doing business. Most importantly, they do not allow for the creation of regulations or the prohibition of reptile keeping.

There is one way however, that local municipalities can help to protect reptiles under the law. By establishing by-laws that prohibit the keeping and sale of reptiles and other wild animals as pets, municipal governments can take a stand against animal suffering and protect their constituents at the same time.

THE CRIMINAL CODE OF CANADA

The Criminal Code contains all of Canada's criminal laws, including two sections meant to address cruelty to animals. These provisions are very modest in scope, most of them dating back to 1892.

When it comes to animals suffering in reptile pet trade, the problem with respect to the law is not that there are one or two isolated incidents that could be the subject of particular charges. Criminal laws are meant to address specific incidents. Criminal laws however, are not the way to address institutionalized practices (e.g., transport) that are widespread within a particular industry. In the reptile pet trade the problem is not that in one particular case, one particular animal was abused by its "owner." The problem is the whole way of life that is imposed upon most of these animals all of the time, from birth or capture until death.

PROVINCIAL ANIMAL PROTECTION LEGISLATION

Provincial animal protection legislation is not an effective manner of addressing the problems related to the keeping of wild animals as pets. The *Ontario Society for the Protection of Cruelty to Animals Act*, for example, provides the authority for humane societies to assist animals in certain circumstances. OSPCA agents and inspectors are authorized to take certain actions in respect of animals that are determined to be in 'distress'. The fact that OSPCA powers only come into force once an animal is suffering is one of the many limitations inherent in our current legal approach to animals.

Another problem is the fact that reptile abuse and neglect typically occurs in people's living rooms, bedrooms and basements after the animal has been purchased, so it remains largely hidden. In fact, reptile pet owners often do not even realize they are causing their animal to suffer, as signs of discomfort, stress and suffering may be difficult to recognize.

Even humane society inspectors who are charged with enforcing the law may not be able to determine whether or not a reptile is in distress. Inspectors typically have little expertise in reptilian biology, behaviour or captive management, so they are ill-prepared to cope with situations of reptile abuse.

MUNICIPAL BYLAWS

Due to the limited way our current federal and provincial laws deal with the animal cruelty, the most effective way to control and govern the treatment of reptiles and other exotic animals may be through local, municipal bylaws that restrict or prohibit the sale and keeping of reptiles as pets.

WILDLIFE LAWS IN CANADA

Both the Government of Canada and individual provincial and territorial governments have the authority to create laws and regulations governing the import and export of live wildlife and/or the management of indigenous wildlife species. Provincial governments are also, for the most part, delegated with responsibility for the regulation and management of wildlife in captivity.

A list of provincial laws relevant to reptiles is contained in ANNEX 5 of this report. Since most of the legislation listed in ANNEX 5 deals primarily with native wildlife in a general sense, and not with reptiles specifically, only the most relevant highlights have been included. Specific questions about each piece of legislation should be directed to the appropriate government agency responsible for that legislation.

Municipal and regional governments also have the authority to pass laws regarding what animal species can be kept within their boundaries and under what conditions. A significant number of local governments have passed laws prohibiting the keeping of all venomous reptiles, giant snakes and crocodilians, while others, such as the City of Halifax have prohibited certain uses of reptiles, such as the use of snakes in live public presentations.

Federal and provincial cruelty to animals laws that may impact on the treatment of reptiles in certain situations are described in the previous section of this report.

"MUNICIPAL AND REGIONAL GOVERNMENTS ALSO HAVE THE AUTHORITY TO PASS LAWS REGARDING WHAT ANIMAL SPECIES CAN BE KEPT WITHIN THEIR BOUNDARIES AND UNDER WHAT CONDITIONS."

REPTILES THAT ARE DANGEROUS DUE TO THEIR SIZE OR STRENGTH

A number of reptiles pose a potential risk to human safety due to their large size and strength. They include the largest constricting snakes (sometimes referred to as "giant snakes"), large varanus (monitor) lizards and the crocodilians.

LARGE CONSTRICTORS

Of particular concern are the large boas and pythons which each year are responsible for a number of injuries and/or deaths.

Often referred to as "giant snakes," they may reach lengths in excess of four meters. They include the following species:

Green anaconda *(Eunectes murinus)*
Reticulated python *(Python reticulatus)*
African rock python *(Python sebae)*
Indian python *(Python molurus)*
Australian scrub python *(Morelia amethystine)*
Boa constrictor *(Boa constrictor)*

Reticulated pythons, Indian pythons and Boa constrictors are the giant snakes most commonly found in the pet trade.

The potential danger posed by large boids was brought to national attention in 2001 when media reported that Mrs. Kerry-Ann Koop, a resident of Kelowna, British Columbia, allowed her nine children, including a nine month old baby, to play with their 5 ½ metre, 63 kg Indian (Burmese) python. Photographs in several newspapers showed Mrs. Koop smiling while holding the snake, named Boaz, while another shows two very young children sitting on their living room floor playing with the snake. [136]

Mrs. Koop acquired the snake in 1997 and ran into problems soon afterward. She was contacted by the British Columbia Ministry of Children and Family Development who were quite concerned about the children being attacked and/or contracting salmonella from contact with the animal.

Mrs. Koop claimed her snake posed no danger to her children.[137] Reportedly, she continues to keep Boaz in her residence, according to certain rules dictated by the British Columbia Ministry of Children and Family Development.[138] Fortunately, most reptile keepers don't dismiss the danger posed by large boids.

The majority of large snake attacks are thought to occur because a snake has mistaken its caretakers hand, arm or another body part as food. Snakes have a very acute sense of smell, so detection of food odors on a body part can trigger an attack. Some attacks may also be defensive in nature, if the snake perceives something as threatening.

When a constricting snake bites, it grasps its victim's body part with rows of recurved teeth. It then coils itself around the engaged body part, or if the snake is large enough and the victim small enough, around the entire body, tightening its grip each time the victim struggles or exhales. Eventually, the victim dies of asphyxiation, at which point the snake will then start swallowing its victim head first. It does this to ensure that the limbs are folded against the body so the swallowing process is not impeded.

The snake cannot be pried off the victim, as the recurved teeth hold the head secure. In fact, trying to remove the snake may result in the snake clenching its jaws more tightly. Hitting the snake will also not cause the animal to release its grip.

North American media have reported on a number of giant snake attacks (as well as serious attacks by snakes much shorter than 4 meters in length), some of them resulting in injury or death.

One of the more famous Canadian incidents occurred in 1992, when a Brampton, Ontario man was killed by his pet python. Reportedly, he was handling the snake while drunk; the snake attacked him, coiling around his neck in the process. He died of asphyxiation. The motivation for the attack was not determined.[139]

A 10 foot long, 80 pound Burmese python killed a 43 year old man in Aurora, Colorado in 2002 after the snake became aggressive while being handled. Officials believe the snake was coiled around the man, who died from asphyxiation, for approximately 10 – 15 minutes. It took seven firefighters and two police officers to uncoil the snake. Neighbors reported that the snake was very tame and had never bitten anyone.[140]

In August 2001, an 8 year old Irwin, Pennsylvania girl died after one of her family's five snakes, a 10 foot, 70 pound Burmese python, wrapped itself around her neck. The snake reportedly escaped from its enclosure which was kept in the bedroom.[141]

Another case took place in Florida in 1999, when a 12 ½ foot reticulated python grabbed its owner's forehead and then proceeded to wrap its body around him.[142]

Even relatively small constricting snakes can be dangerous at times. In Springfield, Illinois in 1999, a 7 ½ foot African python escaped from its enclosure and wrapped itself around a 3 year boy sleeping next to some relatives. An autopsy revealed compression marks around the boy's chest and bite marks on his neck and ears. The boy died of asphyxiation.[143]

Even the bite from a giant snake can be serious, leaving multiple puncture wounds and lacerations. In 1995, a 23 year old Edmonton man was attacked by his unidentified 5 ½ metre python resulting in a badly chewed arm. The victim's brother said, "All I heard from screaming, so I ran there and I didn't know what to do. He was biting on his hand and it was wrapped around his arm. I was stunned."[144]

Many reptile hobbyists recognize the potential danger posed by large snakes, so they try to mitigate that danger by employing certain safety and security measures. For example, the American Federation of Herptoculturists (AFH) publicizes specific housing and husbandry guidelines for large boids. They recommend, among other things, that, snakes be transported in a way that precludes possibility of escape; snakes exceeding 8 feet in length be confined in secure, lockable enclosures; that another individual be present when snakes exceeding 8 feet in length are being handled; a snake stick or hook be used to remove a large snake from an enclosure; food should never be offered by hand; and that minors, without parental consent, not be allowed to keep giant snakes.[145]

In *The Proper Care of Reptiles*, author John Coborn cautions reptile hobbyists about the dangers posed by large boids. In a section on Reticulated pythons, he states "Wild specimens are extremely aggressive and can give vicious lacerating bites with their numerous recurved teeth. Tamed from juvenile size and handled frequently, some may remain quite docile, but there is no doubt that most Reticulated Pythons are dangerous animals."[146] Some reptile hobbyist websites suggest that it may be best not to handle reticulated pythons exceeding 20 feet in length handled at all.[147]

LARGE VARANID LIZARDS

Adult varanids range in size from less than 1 meter in length *(Varanus brevicauda)* to more than 3 meters for the Komodo dragon *(V. komodensis)*. One species, *V. salvadori,* has been reported to reach 4 meters in length, but that length has not been scientifically verified. Adult varanid eights range from less than 1 kg to approximately 140 kg for the largest Komodo dragons.

Several varanids common in the pet trade are capable of growing to lengths of 2.5 – 3 meters. They include the Nile monitor *(V. niloticus)*, water monitor *(V. salvator)* and Savannah monitor *(V. exanthematicus)*.

All monitors are predators with strong jaws, sharp claws and relatively muscular bodies. Medium and large varanids are capable of inflicting rather serious bite wounds and scratches and should be considered dangerous, especially around children. According to author John Coborn, "Due to their large size and aggressive disposition, most monitor species are not recommended as a family pet, though some herpetologists have reared juveniles that have become remarkably tame, even on reaching adult size. Do not purchase a baby monitor without weighing the potential consequences. These are large, sometimes dangerous lizards that need accordingly large and secure cages and a lot of care. They are not for beginners."[148]

CROCODILIANS

Most reptile hobbyists and many professional pet industry organizations, such as the Pet Industry Joint Advisory Council (Canada), discourage the keeping of crocodilians as pets. Nevertheless, crocodilians are found in pet stores across Canada from time to time. The most common crocodilian in the pet trade is the Caiman *(Caiman crocodilus)* which can grow to an adult length of 2.5 meters. Other species found occasionally in the trade may grow in excess of 4 meters in length.

Most adult crocodilians are large, powerful and often aggressive. They require large, complex enclosures, far beyond what the typical reptile hobbyist is able to provide, and special handling practices. They should be considered dangerous at all times. Some pet industry organizations, such as the Pet Industry Joint Advisory Council (PIJAC) Canada recommend that they not be kept as pets.

A BRIEF OVERVIEW OF SEVERAL POTENTIALLY PROBLEMATIC REPTILES

THE GIANT SNAKES

GREEN ANACONDA

Name: Green anaconda *(Eunectus murinus)*

Description: The green anaconda is one of the largest growing snakes in the world with adult animals reaching a length of 7 meters (23 ft.) and a weight of more than 100 kilograms (220 lbs.). They are generally dark green in color with black and yellow oval spots. This constrictor is capable of catching prey on land, in trees or in the water. They tend to be rather short-lived snakes with a life expectancy of approximately 10 years.

Distribution: Green anacondas are found throughout tropical South America, east of the Andes, primarily in the Amazon. The Yellow anaconda can be found as far south as Argentina.

Habitat: Anacondas can be found in tropical rainforests, tropical deciduous forests and in freshwater lakes and rivers. They are normally found at relatively low altitudes, in shallow caves, lying in still, shallow water or basking in the sun.

Habits: For the most part, the anaconda is a nocturnal snake that spends much of its time in slow moving, shallow water. While they have been known to hunt in trees and on land, these snakes are much more versatile in the water. When caught, prey either suffocates or drowns before being swallowed whole.

Difficulties in Captivity: The sheer size and strength of adult anacondas make them dangerous and difficult to handle. They are quite capable of killing an adult human. Anaconda bites can be serious, resulting in painful punctures and lacerations requiring medical treatment. These snakes require extremely large, complex, secure enclosures and special handling.

RETICULATED PYTHON

Name: Reticulated Python *(Python reticulates)*

Description: There are a few pattern variations in this species but the most common is a complex, geometric pattern that resembles netting. The reticulated python is the longest growing snake in the world. It can reach a length of 8 meters (26 ft.) or more. The longest surviving individual in captivity was a female that lived for 28 years, 10 months at the Fort Worth Zoo.

Distribution: The reticulated python occurs throughout Indonesia, Malaysia, Burma, Indo China and its surrounding islands, and other parts of southeast Asia.

Habitat: These snakes are found in hot, humid, tropical environments near rivers and ponds, and prefer temperatures in the 80-92 degrees F range. They prefer to hunt in trees, but they are also capable of hunting while swimming.

Habits: Reticulated pythons tend to be ambush predators who sit and wait for unsuspecting prey, such as pangolins, porcupines, monkeys, wild pigs and mouse deer. Since they have a slow metabolic rate, they can sometimes go for weeks or months between feedings.

Difficulties in Captivity: Reticulated pythons are large, powerful snakes that can be extremely aggressive and unpredictable. When kept in captivity, they often have trouble adjusting and may bite their human caretakers to avoid being handled. Furthermore, captive specimens must often be fed in separate quarters to minimize aggressive feeding responses. They require captive conditions that are beyond the ability of private keepers to provide. Zoos are overwhelmed with offers of pet reticulated pythons that their owners no longer want.

AFRICAN ROCK PYTHON

Name: African Rock Python *(Python sebae)*

Description: These very large snakes are tan in color with brown blotches outlined by black. They can grow to approximately 6 meters (19 ft.) in length and reach weights of up to 90 kilograms (200 lbs.) African rock pythons can be expected to live to approximately 25 years of age.

Distribution: These snakes can be found in sub-Saharan Africa.

Habitat: The African rock python is found in savanna and forest habitats. To escape the heat, they may locate themselves near water or occupy burrows dug by other animals. They are capable of hunting at or above ground level and in aquatic environments.

Habits: The African rock python tends to lay dormant during extreme heat and during prolonged dry periods. For the most part, they are dependent on water to hunt. They can be found submerged near river banks and shallow streams waiting for prey and are capable of holding their breath up to two hours. Divers have reported seeing these pythons as deep as 6 - 7 meters. The African rock python has been characterized as a very active and nervous snake.

Difficulties in Captivity: African rock pythons can be very aggressive. Many experts consider them to be nervous snakes that are prone to biting. Wild-caught specimens can be problematic as they have great difficulty adjusting to captive conditions. While these snakes are non-venomous, they can strike rapidly at their prey with large sharp teeth that can inflict deep lacerations. Large adult specimens are capable of killing inexperienced handlers. Like other giant snakes, African rock pythons require expansive enclosures that are beyond the ability of amateur hobbyists to provide.

INDIAN (BURMESE) PYTHON

Name: Indian Python or Burmese Python *(Python molurus bivitattus)*

Description: This large constrictor has a brown background with irregular dark dorsal and lateral blotches. Adult specimens can reach a length of 5.8 meters (19 ft.) and weigh as much as 120 pounds. These pale grey, tan or brown background snakes have characteristic dark irregular dorsal and lateral blotches.

Distribution: This snake is native to India, Pakistan, Sri Lanka and Nepal.

Habitat: Habitats can range from river valleys, woodlands, grasslands, swamps, marshes and rocky foothills. The Indian python is most often found near a continuous water supply.

Habits: Indian Pythons are adept climbers and swimmers. Mostly they can be found on the ground utilizing their unique color to blend with the surrounding terrain. They feed primarily on medium-sized animals about the size of a house cat.

Difficulties in Captivity: Indian pythons prefer to live in habitats where they can roam freely without being disturbed and have been known to strike out at humans when threatened. Even when they are handled daily by experienced individuals, Indian pythons are still unpredictable. Their large size and strength makes them dangerous to handle. They grow rapidly from hatchling to adult size. Most zoos receive offers of Burmese pythons that their owners find too large or difficult to keep.

AUSTRALIAN SCRUB PYTHON

Name: Australian Scrub Python *(Morelia amethstina)*

Description: Australian scrub pythons range from olive-yellow to olive-brown in color. Black or brown bands form irregular patterns along the snake's body. In direct light, they may have a purplish sheen. Adult pythons can be expected to grow to a length of approximately 4 meters (13 ft.).

Distribution: These snakes are found in Australia.

Habitat: Australian scrub pythons can survive in various habitats including tropical rainforests, dry woods and open savanna.

Habits: The "ground" color of the Australian scrub python allows it to blend well with its natural environment and to strike at ground dwelling prey. Like most large reptiles, this snake feeds infrequently due to its slow metabolic rate. In the wild, this snake may prey on ground dwelling birds, bats, wallabies and kangaroos.

Difficulties in Captivity: Australian scrub pythons are aggressive snakes with a long reach that are able to strike and grasp prey very quickly. While not as robust and powerful as some of the other giant snakes, they are still capable of inflicting quite serious bites and should be considered dangerous.

BOA CONSTRICTOR

Name: Boa Constrictor or Red-Tail Boa *(Boa constrictor)*

Description: The boa constrictor can grow to 4.2 meters (14 feet) and reach weights of 45 kilograms (100 lbs.). They are generally pinkish or tan with dark cross-bands along their body and head. It is common for these snakes to live more than 25 years in captivity.

Distribution: This snake is found in Brazil, Columbia, Guyana, Surinam and countries throughout Central America, including Mexico.

Habitat: The boa constrictor can survive in many diverse habitats, including wet tropical forest, temperate forest, tropical scrub forest, tropical savanna, grassland and desert.

Habits: Boa constrictors are only moderately arboreal. After sunset, they can usually be found on the ground where they feed on large lizards, small birds, opossums, mongoose, rats, squirrels and bats.

Difficulties in Captivity: Boa constrictors are one of the larger snake species. Their size and strength can make handling difficult and they should be considered dangerous. Individual boa constrictors have varying dispositions, but younger snakes tend to be more bad-tempered. Zoos and other institutions receive a regular influx of offers of pet snakes that have grown too large for the owners to handle.

"Individual boa constrictors have varying dispositions, but younger snakes tend to be more bad-tempered"

VARANID LIZARDS

Name: Monitor Lizards

Description: Monitor lizards are a group of reptiles that belong to the Varanus genus. This family includes at least 50 species that vary in physical description and temperament. Some species can grow up to 3 meters in length (with at least one species thought to reach 4 meters) and a weight of more than 100 kg. Some of the most common species in the pet trade are listed in the chart below.

Distribution: Monitors can be found in parts of Africa, Asia and Australia as well as smaller islands in and around these areas.

Habitat: Monitors are found in both arid climates and rainforests, near rivers and in trees. Depending on the type of monitor, they tend to feel most secure when burrowing or hiding in tree tops.

Habits: Monitors use escape as their main defense against predators. They will run, burrow, swim or climb to avoid confrontation. However, if cornered they will rise on their hind legs, hissing and inflating their bodies before using their teeth and claws to defend themselves. Monitors are all insectivorous or carnivorous and hunt a wide range of prey species.

Difficulties in Captivity: Monitors are relatively robust, powerful lizards that are capable of inflicting quite serious bites. Some specimens can be very aggressive. The American Federation of Herpetoculturists notes that their large well-developed claws, sharp teeth and whip-like tail make them potentially dangerous to humans.

Name	Size	Description
Savanna Monitor *Varanus exanthematicus*	1.51 m (5 ft.)	These lizards are very strong and good at escaping from their enclosures. They require expansive, complex accommodation. Adult specimens can inflict rather serious bites and scratches. Imported animals may be ill or injured and require veterinary care.Potential lifespan of 20 - 30 years.
Dumeril Monitor *Varanus dumerilii*	1 m (3.3 ft.)	These lizards tend to be quite secretive. They require large enclosures that allow them to express a full range of natural movements and behaviours. Imported animals may be ill or injured and require veterinary care. Potential lifespan of 10+ years.
Mangrove Monitor *Varanus indicus*	1.51 m (5 ft.)	This lizard must be provided with enough space to climb, bask, swim and burrow. Most mangrove monitors are shy and prefer not to be handled.
Nile Monitor *Varanus niloticus*	2.12 m (7 ft.)	Nile monitors are very strong and capable of using their sharp claws to escape. Young specimens are popular pets but grow very aggressive with age. Bites can be serious. Require expansive, complex enclosures. Imported specimens may be ill or injured and require veterinary care. Potential lifespan of 20 years.
Crocodile Monitor *Varanus salvadori*	2.72 m (9 ft.)	This lizard needs an extremely large amount of space that is properly furnished and secure.n the average size bedroom.When threatened this rather powerful lizard uses it claws, teeth and tail to defend itself. Bites can be severe.
Water Monitor *Varanus salvator*	2.12+ m (7+ ft.)	One of the largest monitor lizards. Water monitors tend to be rather aggressive and should not be kept with other reptiles. Bite wounds can be serious. Require expansive enclosures. Imported specimens may be ill or injured and require veterinary care. Potential lifespan of 14+ years.

CROCODILIANS

Families: Alligatoridae *(alligators and caimans)*, Crocodylidae *(true crocodiles)*, Gavialidae *(gharial)*.

Description: All crocodilians have a small head held horizontally in front of their bodies, short legs and heavy scales. These reptiles are specially designed for both terrestrial and aquatic travel. Crocodilians can be as small as 1.5 m (5 ft.) and as long as 7 meters (23 ft.). There are 23 species of crocodilians; some of the most popular in the pet trade are listed in the chart below.

Habitat: Habitats include swampy wetlands, isolated pools and major rivers in North, Central and South America, Africa, Asia and Australia. Most crocodilians are found in freshwater, although a few, like the saltwater crocodile can tolerate saline conditions.

Habits: Crocodiles are highly evolved and very intelligent. Some female crocodilians show maternal behaviours protecting their young from predators. Hatchlings may stay near their mother for up to two years before moving away to fend for themselves. While crocodilians tend to be solitary, they have been observed hunting together in areas where food is abundant.

Difficulties in Captivity: Crocodilians are highly evolved predators that tend to become rather large and powerful. They are capable of rapid, short bursts of energy to catch prey. Larger crocodilians are more than capable of catching and eating extremely large animals. Adult crocodilians can also be very territorial. They are capable of inflicting serious injury to human caretakers and should be considered dangerous at all times.

Name	Size	Description
American alligator *Alligator mississippiensis*	4.4 m (14.5 ft)	The large size of these animals at adulthood makes them inappropriate for keeping as pets
Chinese alligator *Alligator sinensis*	2 m (6.5 ft)	These animals have a tendency to be aggressive in captivity. Most adults are very difficult to handle.
Cuvier's dwarf caiman *Paleosuchus palpebrosus*	1.6 m (5.2 ft)	This species is very secretive, especially during the day. They are shy, but aggressive if cornered and frequently fight with other captive animals.
Schneider's dwarf caiman *aleosuchus trigonatus*	2.3 m (7.5 ft)	This species is similar to P. palpebrosus except much more aggressive.
Spectacled caiman *Caiman crocodiles*	2.6 m (8.5 ft)	These caiman are the most popular captive crocodilian. However, they become very large and aggressive with age.
Yacare caiman *Caiman yacare*	2.5 m (8 ft)	This caiman requires a great deal of space. They are very vocal, especially at night, and can be dangerous to handle.
African dwarf crocodile *Osteolaemus tetraspis*	1.9 m (6.2 ft)	These crocodiles are capable of killing animals or humans that are significantly larger than themselves. They are extremely aggressive, territorial and not at all social. Younger specimens are excellent climbers and can easily escape from enclosures.

REPTILES THAT ARE DANGEROUS DUE TO VENOM

SNAKES

Four families of snakes *(Elapidae, Viperidae, Colubridae, Aractaspididae)* include individual species, about 450 in total, that are venomous and may pose a danger to human health and safety.

No Canadian provinces and only a relatively small number of municipalities prohibit the keeping of venomous reptiles by private individuals.

A significant number and range of venomous snake species are freely available to consumers at relatively low cost, with many being advertised through mail-order catalogs and on the internet. In 2000, a Canadian based internet reptile dealer was advertising black spitting cobras for US $75, black mambas for $395, king cobras for $600 and red-headed kraits for $1250.[149] In 2004, that website was no longer available.

The danger posed by venomous snakes varies according to the toxicity of the venom, the venom delivery system, the amount of venom entering the victim, location of the bite, the victim's size, health and age, and several other factors.

Venom delivery systems vary according to species. Some snakes inject their venom into their victim through hollow fangs that act like a hypodermic syringe and needle. Others bite and hold their prey, and then chew to inject venom into the wound.

The potency of venom depends on the amount injected into the victim (envenomation). Some of the more toxic venoms are carried by vipers, kraits, cobras and sea snakes. But even less toxic venoms can be lethal if sufficient quantities are injected into the victim.

The effects of venoms are variable. They may be local, in that they are restricted to the limb or part of the body where the bite occurred, or they may be systemic, affecting the entire body. Serious bites by venomous snakes require immediate medical attention, as they can result in painful, permanent tissue and organ damage or death.

Venomous reptile keepers are usually bitten somewhere on the upper body (i.e., hands, arms, torso, head), areas that are particularly problematic because bites there are generally more serious than bites to the lower extremities.

The usual course of treatment for snakebite is the administration of an antivenin (also called antivenom) after the bite has occurred. In some cases antivenin may be withheld for a period of time to determine if it is actually required, as the antivenin itself can pose risks, such as heart attack, to some people. Antivenin is typically of two types: monovalent or polyvalent.

"Antivenins are typically derived from horse serum and are very expensive, sometimes running as high as US $450 per vial."

Monovalent antivenin is snake specific, safe and more effective for the victim, but it requires that the snake species be known. Polyvalent antivenin, which incorporates antibodies for several different snake species, is less effective and should be administered in situations where there is no positive identification of the snake.

Hospitals typically stock appropriate antivenins to treat bites from native snake species, but few carry antivenins for exotic species. There are three species of venomous snake extant in Canada. They are the Eastern Massassauga rattlesnake *(Sisturus catenatus catenatus)*, Prairie rattlesnake *(Crotalus viridis viridis)* and Northern Pacific rattlesnake *(Crotalus viridis oreganos)*.

A telephone hospital survey by Zoocheck Canada in 2000 revealed that they carried antivenin for native rattlesnakes but none carried monovalent antivenins to treat bites from exotic snake species. [150]

Antivenins are typically derived from horse serum and are very expensive, sometimes running as high as US $450 per vial.[151] The average dosage per snakebite victim is 20 – 40 vials,[152] although the number administered could be substantially lower or much higher depending on the severity of the bite.

Even in cases where medical treatment has been obtained, there is still a possibility of permanent neurological and structural damage. Ideally, antivenin should be administered as quickly as possible after a bite has occurred. Since antivenin will probably not reverse damage that has occurred prior to its administration, it is possible to receive very good medical care but still be left with permanent injury.

Each year in North America, there is an estimated 8,000 snake bite incidents,[153] many of them resulting in serious injury or death. While most are the result of human-snake interaction in the wild, a number involve exotic snake species kept as pets.

In August of 1992, the founder of the British Columbia Association of Reptile Owners, Larry Moor, died shortly after being bitten by one of his Egyptian cobras. Mr. Moor regularly took reptiles to schools to teach children about their biology and proper handling.[154]

In 1992, another herptoculturist, Brian Leslie West, from Emmitsburg, Maryland went into cardiac arrest and died after he was bitten by an Indian King cobra. Mr. West taught local paramedics how to treat snakebite.[155]

In 1999, a Los Angeles Zoo volunteer was killed after she was bitten by either a Gaboon viper or a Finch's hog-nosed sand viper that she kept as pets. Police found the victim at home with a note in her badly

swollen hand that read, "Northridge Hospital" – ICU. She was attempting to get help for herself but was unable to do so.[156]

On August 19, 2003, Russ Anderson, a resident of Tampa, Florida received multiple bites from a 3 meter black mamba he kept in his home. Anderson ended up in the intensive care unit at Tampa General Hospital.[157]

In September 2004, Alexandria Hall of Cincinnati, Ohio died after being bitten by a South American pit viper that she kept as a pet.[158]

If they escape, venomous snakes can also endanger other people, cause considerable alarm and result in valuable municipal resources being expended to locate them.

In September 2000, Dragon Farms owner Michael Baran was bitten by a viper causing his arm to swell to five times normal size. After arriving at the Port Colborne General Hospital, where he had hoped to get an ambulance ride to Toronto, he was reportedly told it would be quicker if he drove himself the 130 km from Port Colborne to the Toronto General Hospital, so that's what he did.[159] One has to wonder how dangerous it was for himself and others to be driving after being bitten by a highly venomous snake.

Another incident that year in Toronto also illustrates how problematic venomous snakes can be. After a young reptile hobbyist in a downtown neighborhood reported that one of his snakes, a highly venomous saw-scaled viper, had slipped out of its tank in his apartment closet, police evacuated neighbouring apartments and cordoned off the area. Emergency services personnel were brought in and monovalent antivenin was on stand-by, ready to be flown in from the United States. The snake was on the loose for at least 24 hours, but its owner indicated that he hadn't seen the snake in several days. Eventually the snake was found.[160]

Another incident occurred in Stoneham, Massachusetts in 1996, when a 23 year old man's Egyptian cobra escaped from his apartment and was on the lam for three months. It was finally found by a fourth grade student in his school classroom. Municipal staff had been looking for the snake since its escape.[161]

Louisville Zoo herpetologist William Bird summed it up accurately when he said, "If you handle these animals you will be bitten. That's just the way it is. People who buy these snakes don't only put themselves at risk. They put everyone who lives around them at risk. Snakes are master escape artists."[162]

There can also be liability issues to contend with. After being bitten by a West African Gaboon Viper at the Long Island Reptile Museum, keeper Robert McDonald, who sustained a 20 cm scar on his arm and a 20 cm scar on each hand, received a $1.6 million award from the Nassau County Supreme Court.[163]

Many reptile hobbyists and professionals recognize the potential danger posed by venomous snakes. They recommend a number of safety and security measures be in place, including:[164]

- Rooms where venomous snakes are kept should be large, with minimal clutter on the floors. All gaps between floor boards, around pipework, vents and other entry points should be securely covered or blocked. The room should be locked whenever it is vacant.
- Snake cages should be strongly constructed, lockable (with locks fastened at all times), and placed on strong, solid bases or in wall units.
- A second person, trained in emergency procedures, should be in the room when the cages are opened.
- A local doctor or hospital should be notified that venomous snakes are nearby and procedures arranged in the event of a bite.
- Appropriate antivenins should be kept in the same building as the snakes. It must be labeled properly and not allowed to expire. It should only be administered by a trained medical professional, except in cases of immediate emergency.

Additional precautions when working directly with venomous snakes should be adhered to. They include:

- Never open a cage until the exact location of the snake is known.
- Do not reach near a snake and do not lose sight of a snake during enclosure servicing.
- When cage cleaning, move the snake to another enclosure before starting.
- Never touch or handle a venomous snake with bare hands. On occasions where snakes must be moved, use appropriate equipment such as snake sticks, graspers, gloves, etc.
- On occasions where snakes must be handled, use appropriate methods, such as acrylic tubes that a snake can crawl into but not turn around.

LIZARDS

One family of lizards, the Helodermatidae, contains two venomous species, the Gila Monster *(Heloderma suspectum)* and the Beaded Lizard *(H. horridum)*. While their venom is not considered fatal to humans, except perhaps to young children or the elderly, it can still cause very painful side effects. Heloderma lizards are not suitable as pets.

SALMONELLA, CAPTIVITY-RELATED STRESS AND THE HUMAN HEALTH IMPLICATIONS OF PET REPTILES

While the popularity of keeping reptiles as pets has soared in recent years, many reptile owners and sellers have misunderstood, understated or ignored the potential threats to human health and safety posed by pet reptiles. Even people who do not sell or keep reptiles can sometimes be at risk.

In September 2003, while attending the Totally Pets Show in Mississauga, Ontario, vendors in at least four booths where reptiles were being displayed or were on sale encouraged people to handle their animals. In one case, a vendor placed a large Burmese python around the authors neck Throughout Canada, there are a growing number of essentially unregulated reptile displays and interactive traveling reptile shows where participants are encouraged to touch, hold and otherwise handle live reptiles. Many of the operators of these businesses do not screen participants that touch reptiles.

WHAT ARE THE HEALTH CONCERNS?

The threats posed by reptile zoonoses deserve additional consideration and study. Clearly, it has been established that reptile pet keeping has been and continues to be a public health concern.

A variety of pathogenic organisms can be transmitted from reptiles to humans both by direct contact or indirect contact with surfaces contaminated with reptile feces or by particulate fecal matter on the integument or claws. Some of the most commonly occurring reptile-related zoonoses are *Campylobacter, E. coli*, *Mycobacterium* and *Streptococcus*, but the most frequently encountered is *Salmonella*.

An estimated two million cases of salmonellosis occurred in the United States in 1970 and 1971. Approximately 14%, or 280,000 cases, were attributed to contact with pet turtles.[165] At the time, the pet turtle trade involved some 15 million animals per year, predominantly red-eared sliders. These were often purchased by children who would handle the reptiles without understanding the potential health risks or taking the necessary precautions to prevent disease.

Historically, the rising incidence of reptile-associated salmonellosis cases led to a number of American states prohibiting the sale of pet turtles not certified as 'Salmonella-free'. In the 1970's, the authorities did not realize that it is not possible to reliably eradicate Salmonella from reptiles–pet turtles cannot be made 'salmonella-free.'[166] The first turtle-related public health regulation was enacted in 1968. In 1972, the United States Food and Drug Administration (FDA) followed suit by banning the importation of turtles and turtle eggs and the interstate shipment of turtle hatchlings not certified as Salmonella-free.[167]

In 1975, the FDA went even further and prohibited the sale of turtle eggs or live turtles with a carapace length of 10.2 cm (4") or less.[168] It was assumed that children were less likely to purchase or handle larger turtles. That assumption proved correct and resulted in a 77% decrease in turtle-related salmonellosis cases.[169] Later that same year, Canadian authorities also banned the importation of turtles.[170]

During the last ten years, large numbers of wild caught and ranched green iguanas *(Iguana iguana)* have been imported into the United States, with a significant portion of those animals then being re-exported to Canada. Green iguanas are now one of the most popular reptilian pets. The expanding popularity of green iguanas and other reptile species appears to have been accompanied by a corresponding increase in reptile-related salmonellosis cases.[171]

WHAT IS SALMONELLA?

Salmonella is the genus name for a group of bacterial species that typically cause diarrheal illness in humans. The strains more commonly found in reptiles and causally related to reptile-associated salmonellosis in humans are *S. java*, *S. stanley*, *S. marina*, *S. poona*, and *S. pomona*. The strains most commonly found in domestic animals, food products, and causally related to other salmonelloses in humans are *S. typhimurium* and *S. enteritidis*.

Many salmonella species are extremely robust, being able to survive adverse physical conditions both inside and outside of their hosts. For example, pathogenic Salmonella in food are able to survive passage through the gastric acid of the stomach on their way to the intestines. Other salmonellae have survived 89 days in tap water and 30 months in dried reptile stool.[172]

Once in the intestines, Salmonella bind themselves to specific receptors in the epithelial wall followed by invasion of the epithelial layer. This prompts the release of proinflammatory proteins called cytokines. The resulting inflammation and fluid production causes diarrhea and can lead to ulceration and destruction of the epithelium.

Pathogenic Salmonella infection is typically confined to the gastro-intestinal region (hence causing gastroenteritis). Most Salmonella infections are likely to be eradicated by natural defense mechanisms should they migrate beyond the gastro-intestinal tract (GIT). In some cases, the salmonellae disseminate systemically from the GIT to other parts of the body. Whether or not the disease spreads depends in part on the resistance of the patient and the potency of the Salmonella strain. If not self-remediating and untreated with antibiotics, the disease may lead to enteric fever (e.g., typhoid fever), meningitis, and death. Survivors of serious infections may suffer persistent neurological and other problematic symptoms.

Symptons of salmonella usually surface between 6 and 72 hours after infection and include diarrhea, fever, vomiting and abdominal pain. Typically the illness lasts from 4 to 7 days and does not require treatment. However, more severe cases may last longer and require hospitalization.

WHERE IS SALMONELLA FOUND?

Salmonella is a naturally occurring bacterial organism found in the digestive tracts of many animals, as well as in the general environment. Research has shown that Salmonella should be considered a part of normal reptilian flora[173] as it is found in the intestinal tracts of most, if not all, reptiles. The organism is usually carried asymptomatically.

Salmonella in reptiles was first isolated in snakes in 1944, and turtles and lizards in 1946. Nearly 2,000 serotypes have been identified. Because reptilian-borne Salmonella cannot be reliably eradicated, all reptiles should be considered potential carriers. Attempts to 'cleanse' reptiles of these bacteria through the administration of antibiotics have failed.[174] Use of antibiotic treatments against Salmonella in reptiles increase the likelihood that additional strains of chemotherapy-resistant Salmonella will develop.

Because the microorganisms are typically shed in fecal matter, Salmonella is also found in contaminated foods or on surfaces that have been contacted directly by reptile feces or indirectly through contact with particulate fecal matter on the integument or claws. Shedding of the bacteria cannot be prevented.

Determining whether or not an animal is infected with Salmonella may require a series of fecal examinations over a period of days or weeks, because the organism may not be shed each time fecal matter is evacuated. However, testing is not foolproof. A reptile that tests salmonella-free may begin to shed the bacteria after testing.[175] There is no way to determine that a reptile is salmonella-free. Other virulent organisms may also be detected through fecal examinations or blood analysis.

HOW ARE SALMONELLA SPREAD?

Physical contact with an infected reptile can result in the direct transfer of pathogenic organisms. Salmonella and many other potential pathogens may invade the body through oral ingestion, open skin-lesions, the ears, and eyes. Thus contaminated hands, for instance, that touch these invasive routes may facilitate introduction transmission. Transmission may also occur through such factors as reptile bites or scratches.

Pathogens may also be indirectly acquired through contact with materials that harbor pathogens including reptile housing and furnishings, enclosure substrates, contaminated household surfaces (such as tables, walls, floors, sinks, basins, and countertops – especially where reptile-related items are cleaned), and contaminated water.

An example of a Salmonella outbreak caused by indirect transmission occurred in 1996. According to the October 15th, 1996 edition of *The Medical Post*, nearly 600 people were infected with *Salmonella enteriditis* after visiting an exhibit of Komodo dragons at the Denver Zoo. Komodo dragons are the world's largest lizards, potentially growing to lengths of more than 10 feet and several hundred pounds in weight. In the wild, they inhabit several remote Indonesian islands. Local health officials were puzzled when *S. enteriditis* was identified in the stools of 20 patients, all of whom had visited the Komodo dragon exhibit at the Denver Zoo. Additional cases soon surfaced, with the majority involving young children. The median age was seven years. All patients experienced diarrhea, with 58% having more severe bloody diarrhea. Six patients required hospitalization.[176]

Investigators found that transmission of the pathogen was achieved through contact with a two-foot high wooden barrier around the Komodo dragon exhibit. The animals were kept on a Salmonella-infected, feces–laden brown mulch substrate. By standing on their hind limbs and putting their front limbs on the barrier they contaminated it with salmonella. The barrier itself was separated from the public by a chain, but that failed to prevent zoo visitors from walking over to the barrier and resting their hands on it.

Dr. Cindy Friedman, a epidemiologist from the Centers for Disease Control and Prevention (CDC), presented the findings of the medical investigation. She said, *"…transmission to exhibit visitors most likely occurred when the dragons, after standing in mulch containing Salmonella-infected feces, touched the barriers."* She adds, *"Our thought was there was a veneer of Salmonella coating the whole exhibit."*[177]

Applying an attack rate of 3.2 % to the total estimated number of visitors to the exhibit, investigators believe that close to 600 people may have been infected with the disease.[178]

"SALMONELLA IS A NATURALLY OCCURRING BACTERIAL ORGANISM FOUND IN THE DIGESTIVE TRACTS OF MANY ANIMALS, AS WELL AS IN THE GENERAL ENVIRONMENT."

WHO DOES IT AFFECT THE MOST

Even the less virulent strains of salmonella can be lethal to someone with a compromised or immature immune system. For this reason, children, pregnant women, persons undergoing various kinds of medical treatment, the elderly and others with temporarily or permanently impaired immunity are particularly at risk. Predictably, the majority of reptile-associated salmonellosis cases involve infants, especially bottle-fed infants, and small children.[179] In addition, children who are allowed to handle reptiles often do not know how to restrain and handle them properly, so in such examples there is the possibility of infection through scratches and bites.

Most documented cases of reptile-associated salmonellosis in small children did not involve actual handling of a reptile by a child. Instead, the children acquired Salmonella from infected third parties. For example, *Morbidity and Mortality Weekly* (Jan. 1992) cites the case of an 8-week old infant diagnosed with *S. poano* infection. The only pet in the household at the onset of illness was a python. The python was acquired from a pet store in exchange for a savannah monitor lizard. The snake did not test positive for *S. poano*, but fecal specimens on the cage carpet and stone water dish left by the lizard more than three months previously were infected with the bacteria. The infant did not have direct contact with either reptile. However, the father cleaned the lizard's cage in his bare feet and washed reptile accessories in the kitchen sink. [180]

The Centres for Disease Control (CDC) advise that the following categories of people avoid all direct or indirect contact with reptiles:

- Infants and children up to 5 years of age.
- Anyone with HIV/AIDS or other immunodeficiency disorders.
- Anyone who has had transplant surgery who is receiving anti-rejection therapy.
- Anyone who is on any drug that suppresses or alters immune function, including steroids, cancer chemotherapy, biological response modifiers and others.
- Anyone receiving radiation treatment.
- Pregnant women.
- Elderly, frail or people with poor nutritional status.
- Anyone subject to chronic infections.
- Anyone currently receiving or who has recently been receiving antibiotic treatment.

Numerous other public health agencies have also issued alerts about the potential health risks of keeping and handling reptiles.

PREVENTION

Two US-based Centers for Disease Control make a number of recommendations to prevent transmission of Salmonella from reptiles to humans.[181] They are:

- Pet store owners, health-care providers and veterinarians should provide information to owners and potential purchasers of reptiles and amphibians about the risks for and prevention of salmonellosis from these pets.
- Persons at increased risk for infection or serious complications from salmonellosis (e.g., children aged <5 years and immunocompromised persons) should avoid contact with reptiles and amphibians and any items that have been in contact with reptiles and amphibians.
- Reptiles and amphibians should kept out of households that include children aged <5 years or immunocompromised persons. A family expecting a child should remove any pet reptile or amphibian from the house before the infant arrives.
- Reptiles and amphibians should not be allowed in child-care centers.
- Persons should always wash their hands thoroughly with soap and water after handling reptiles and amphibians or their cages.
- Reptiles and amphibians should not be allowed to roam freely throughout a home or living area.
- Pet reptiles and amphibians should be kept of out kitchens and other food-preparation areas. Kitchen sinks should not be used to bathe reptiles and amphibians or to wash their dishes, cages or aquariums. If bathtubs are used for these purposes, they should be cleaned thoroughly and disinfected with bleach.
- Reptiles and amphibians in public settings (e.g., zoos and exhibits) should be kept from direct or indirect contact with patrons except in designated animal contact areas equipped with adequate hand-washing facilities. Food and drink should not be allowed in animal contact areas.

While the pet industry often attempts to portray the potential health risks posed by contact with reptiles and other exotic animals as comparable to the risks posed by contact with domesticated companion animals, such as dogs and cats, they at least acknowledge that the risks associated with reptile contact are real. However, many sellers and buyers don't seem to take the risks seriously.

A June 2001 visit to a Canadian reptile show revealed both dealers and customers carrying reptiles in their bare hands or attached to their clothing while walking through the show area. Some of them were observed

touching countertops, tables, walls and doorknobs. These kinds of shows have been criticized for their particular human health risks.[182]

Two months earlier, an unsupervised children's animal touch area was observed at a reptile zoo display. There was no signage warning visitors of the potential health threats posed by contact with reptiles, and the only hand-washing facilities consisted of "wet towels" available from a wall mounted dispenser.

A review of literature from a reptile-based educational business outlines numerous programs in which participants are encouraged to touch a variety of reptile species. Groups of up to eighty children, some including children younger than 5 years of age, are able to touch a reptile if they choose. They also offer birthday party events where reptiles may be touched. Their material also warns that during shows snakes may defecate on handlers and/or children that they may bite someone or they may try to escape – especially if they are allowed to run on the floor.[183]

It is unclear whether or not participants are screened to make sure they are not in any of the categories identified as particularly vulnerable to reptile-associated disease; how large numbers of children are discouraged from putting their fingers in their mouth or rubbing their eyes or ears after contacting a reptile; and whether or not hand-washing after contact is stipulated.

A question about Salmonella in turtles is found in the question and answer section of their teaching materials package. The answer states, "…salmonella is caused by bacteria and is a function of how clean the animal's home is kept." It then says, "If they're [the reptile accommodation] kept clean, then Salmonella and bacteria are not a problem, but if it gets dirty, then it's a potential concern." The final sentence states, "It's always a good idea to wash your hands after handling any animal."[184]

The three examples mentioned above clearly demonstrate that reptile buyers and sellers are commonly unaware of, have minimal appreciation for, or ignore the public health threats posed by reptiles.

CAPTIVITY RELATED STRESS AND DISEASE

Each reptile species has its own unique set of biological and behavioural requirements that must be satisfied for it to achieve homeostasis, a physiological state of equilibrium with its environment. The natural ecology of many reptile species is not fully understood (indeed commonly only minimally known) and most captive reptiles live in conditions that only superficially resemble the environments they inhabit in the wild. Accordingly, their specific biological and behavioural needs routinely remain unaddressed. This situation creates numerous artificial stressors that threaten erosion of homeostasis.

Reptiles, like other animals, have numerous coping mechanisms that prepare them to deal with the natural stressors they may encounter in the wild. They respond to these using biological and behavioural strategies that allow them to successfully deal with stress – thereby enhancing their individual, and their species', chances of survival. Unfortunately, many of the responses mounted by reptiles to deal with stress are ineffective when dealing with the long-term, artificial stresses of captivity.[185]

Reptilian stress responses typically involve an increase in endocrine activity, particularly of the adrenal gland.[186] Elevated hormone levels can result in disruption of normal body functions, and if the stressor is chronic and severe, may result in the death of the animal.[187]

Ultimately, inability to satisfactorily cope with chronic stress can result in a general deterioration of health, as well as the emergence of diseases directly related to a reptile's failure to adapt to captive conditions. This is usually referred to as' maladaptation syndrome'[188] and may also involve a decreased ability to cope with natural parasitic organisms due to a breakdown in the symbiotic relationship between parasite and host. Indeed, there are many diseases that result from 'opportunistic' infections – the result normally harmless to the reptile–microorganism associations that become pathogenic due to stressors.

For example, according to reptile veterinarian Dr Frederic Frye only rarely do wild-caught iguanas *"clinically display disease as a result of…microbial colonization however, when these wild-caught iguanas are stressed sufficiently to lower their cell-mediated and humoral immunity, they may 'break' with life-threatening salmonellosis"*.[189]

"Handling stress can cause dramatic hormonal changes even in reptiles that are habituated to humans."

Handling stress is an area that is often overlooked or ignored by reptile hobbyists eager to interact with their animals. While some reptiles occasionally engage in what could be described as social behaviour, they are generally considered asocial, as physical contact typically occurs in specific circumstances and for many is not a routine part of their daily lives. Being physically picked up and/or restrained may be extremely stressful to reptiles. Because they probably have no psychological mechanism for determining the context of the contact, it may be perceived as a threat or an attack. For this reason, it elicits the same physiological and behavioural responses as threats from a natural predator. However, unlike in nature, the handler/perceived 'predator' will present an ongoing 'threat' in an unnatural context.

For example, according to Frye, *"Excepting physical contact during basking, mating and territorial disputes, mutual touching is not noted to be a large part of an iguana's usual communications. So, for the captive iguana, the human touch may be perceived as anything from an attack to a minor annoyance."*[190] Frye does go on to say that once tame, some iguanas may actually enjoy being gently stroked on some areas of their body. [191]

"Handling stress can cause dramatic hormonal changes even in reptiles that are habituated to humans.[192] While some evidence suggests that individual members of some species (e.g., green iguana) may become limitedly habituated to physical contact, the detrimental impact of handling and its effect on reptile health and well-being should not be underestimated.

Some reptiles, including many small lizards remain extremely nervous throughout their lives[193] and should interfered with as little as possible.

Clearly then, handling stress may be a contributing factor in the development of disease and reptiles that are handled 'stressfully' and regularly may be at increased risk of harbouring pathogenic organisms.

CONCLUSIONS ABOUT ZOONOSES

For nearly six decades reptiles have been known to harbour pathogenic organisms that pose a potential threat to human health. In recognition of the major source of human infection that reptiles presented in the 1970's, the pet turtle ban has remained in force. As other reptiles have become popular, the incidence of human disease has again increased significantly. During this time it has become clear that most, if not all, reptiles may be persistent carriers of Salmonella and other potentially pathogenic microorganisms as a normal part of their internal flora, and also as an incidental veneer generally dispersed about their bodies.

Numerous public health agencies have issued various and multiple advisories to pet stores and the public warning them of the potential health hazards of handling reptiles or infected reptile-related accessories. There is little evidence to suggest that these advisories have been effective in reducing the number of cases of reptile-associated salmonellosis.[194]

While the relationship between captivity-related stress and reptile health requires further examination, it is known that captivity in general, along with certain other factors such as handling, can be strong stressors. Because such pressures are usually chronic, degenerative effects result concerning the ability of reptiles to fight off disease.

A dramatic reduction in cases of reptile-associated salmonellosis and other reptile-related diseases, can only be achieved when contact between reptiles and humans is substantially reduced or eliminated. Until that time, to reduce the possibility of disease transmission, anyone who physically contacts reptiles, or objects and surfaces that have been contacted by reptiles, should follow the guidelines set out by the Centers for Disease Control. As well, those persons identified as being particularly at risk should avoid all contact with reptiles. However, no amount of advice of this type, will protect the public from some indirect sources of infection, such as a reptile-keeper visiting a household, or through intermediary sources with which a carrier reptile or its keeper have had contact.

Because the pet industry has been so ineffective in dealing with reptile husbandry concerns and the potential health threats posed to their customers by keeping and handling pet reptiles, they should terminate the sale of this class of animal. Also, as there is no way to conduct comprehensive screening of customers and audience members to determine who is at increased risk, proprietors of reptile displays and educational shows that allow members of the public to contact reptiles should terminate that aspect of their business. Daycare centers, schools and children's camps should refrain from acquiring reptiles or hiring reptile shows.

HOW THE PET INDUSTRY RESPONDS TO ANTI-REPTILE PET CAMPAIGNS

While the reptile pet industry has been subjected to periodic criticism over the years, concern about the sustainability of the trade in wild caught reptiles and reptile welfare issues has escalated in recent years. In just the past four years alone, reports by the Humane Society of the United States (HSUS), International Fund for Animal Welfare (IFAW) and the UK-based Royal Society for the Prevention of Cruelty to Animals (RSPCA) and Animal Aid have all focused attention on reptile trade and welfare issues. As well, a 2003 report by the UK-based Companion Animal Welfare Council (CAWC) provided commentary on the suitability of reptiles and a wide variety of other non-traditional animals as pets, while groups, such as TRAFFIC, published reports examining the scope and sustainability of the reptile pet trade.

The professional reptile pet industry, amateur hobbyist groups and private reptile keepers have responded, in some cases quite vigorously, to the initiatives of animal welfare and conservation groups, challenging their information, conclusions and recommendations. In their publications and on their websites, these groups offer an alternate, pro-reptile trade voice. For example, in 2003, the Federation of British Herpetologists (FBH) website displayed several of the welfare group's reports on their homepage, along with links to their own rather scathing responses to them. In one FBH press release about the RSPCA reports *Far from home – reptiles that suffer and die in captivity and Morbidity and mortality in private husbandry of reptiles* they said, "Responsible reptile keepers throughout the UK are increasingly alarmed about recent inaccurate and irresponsible press releases from the RSPCA." The release continues with an explanation about why keeping pet reptiles is a positive activity in terms of education, conservation and even animal welfare.[195]

In response to the 2002 HSUS report, *Reptiles As Pets, An Examination of the Trade in Live Reptiles* in the United States, the US-based Association of Reptilian and Amphibian Veterinarians said that while there are serious concerns associated with the reptile trade "such problems can be overcome by effective education, legislation and research." They oppose the HSUS initiative to end the reptile pet trade.[196]

In Canada, the Pet Industry Joint Advisory Council (PIJAC), Canada's national pet industry association, supports the keeping of reptiles as pets. On its website, PIJAC claims "Most of the species available through pet retailers enjoy proven track records as pets and are available through the efforts of local captive breeding programs."[197] They do acknowledge that certain types of reptiles, such as crocodilians and venomous snakes, are not appropriate as pets.

At times, PIJAC has become more vocal in their defense of reptile keeping. In an August 2003 article in *The Leader*, PIJAC Executive Director Louis McCann called Surrey, British Columbia's initiative to ban the sale and keeping of reptiles as "ridiculous."[198]

Most reptile hobbyists in Canada bristle at the suggestion that reptiles should not be kept as pets or that their needs are difficult to meet. In a letter pubished in the August 26, 1999 edition of *The Vancouver Sun*, Gail Watson, a founder of the pet owner's group, the Westcoast Society for the Protection and Conservation of Reptiles said, "Fifteen million North Americans know precisely how to look after reptiles."[199]

In 2002, a small group of western Canadian reptile hobbyists organized the Canadian Reptile Owners Coalition (CROC) to "protect the future of herptoculture (reptile keeping)."[200] CROC hoped to pull together reptile keepers from across Canada into a unified force. They wanted to "serve as leverage in having proper laws passed which will protect reptiles, but also allow the reptile keeping hobby to continue."[201]

Reptile sellers and buyers often argue vigorously in defense of reptile trade and keeping. Four relatively common arguments and a brief response commentary are listed below.

1. ANY PROBLEMS WITH CAPTURE, TRANSPORT OR WELFARE CAN BE DEALT WITH THROUGH EDUCATION.

The claim that all of the problems associated with the trade and keeping of reptiles can be dealt with through education is naive. The global trade in live reptiles involves hundreds of thousands of individuals, including small-scale trappers, reptile brokers, commercial exporters and importers, breeders, retailers and hundreds of thousands of private hobbyists throughout the world. They come from different backgrounds, cultures and value systems. There is no consensus amongst these people as to how reptiles should be captured, transported, housed and cared for. What is entirely acceptable to one person may be considered horrifyingly abusive to the next.

Even if a universal standard for the trade and keeping of reptiles were developed, there is scant hope of it being adopted by more than a handful of participants. Expecting voluntary compliance is entirely unrealistic and has no precedent in such a freewheeling, relatively uncontrolled, international industry.

As well, it's doubtful that businesses would voluntarily adopt measures that would increase costs and decrease profits.

To be fair, most proponents of the education argument do not usually talk about education on a global basis. Instead, they typically promote the idea of education of consumers on a local or regional level. While this kind of initiative may result in marginal reptile welfare improvements, it does little to address the plethora of problems associated with the trade and keeping of reptiles.

Each year millions of wild-caught and captive bred reptiles suffer and die in the pet trade, ecosystems are disrupted and human health has been put at risk. Despite this, some reptile enthusiasts claim there are more "educated" reptile keepers today than ever before. Given the current state of affairs, if there has been any kind of widespread educational initiative in process, it has to rank as an unmitigated failure of the highest order.

2. THERE ARE ALREADY ADEQUATE LAWS IN PLACE TO PROTECT REPTILES.

Unfortunately, Canada's current laws are rife with limitations that prevent them from effectively protecting reptiles in the pet trade. Both the Criminal Code of Canada and our various provincial laws deal with individual acts of animal cruelty in a retroactive fashion, punishing only certain kinds of harmful behaviours after they have occurred. Our laws have no ability to prohibit or regulate animal-use activities and they do not contain any meaningful animal housing or care standards.

In addition, because the suffering of reptiles is often not as easily recognizable as it may be in other kinds of animals, enforcement authorities, who generally have no special training in reptilian biology, behaviour and captive management, find it difficult to identify poor conditions, improper husbandry practices and acts of cruelty.

Reptile sellers and keepers often claim that reptiles are protected through the Convention on International Trade in Endangered Species (CITES) of which Canada is a signatory. Unfortunately, CITES is only focused on protecting species or populations of animals that are threatened by trade and only those species that are listed on one of its three ANNEXES. Most of the reptile species found in the pet trade are not covered by CITES.

3. KEEPING REPTILES AS PETS CONTRIBUTES TO THEIR CONSERVATION.

Reptile pet trade proponents often claim that the keeping and breeding of their reptile pets somehow contributes to their conservation. Unfortunately, nothing could be further from the truth. The reptile pet trade involves the suffering and death of millions of individual animals every year; the removal of millions of reptiles from wild habitats around the world; and the disruption of ecosystems.

There may be a role for a small number of elite hobbyists to participate in scientifically-managed, captive breeding and research initiatives aimed at saving critically endangered reptiles, but there is no conservation role for the rest. It appears that the bulk of reptile breeding involves either individual specimens that are not part of a scientific, conservation-based program or that represent common species that there is no necessity to breed. There is also a significant amount of breeding focused on the creation of bizarre colour morphs that increase the sales value of individual animals, but they too have no conservation significance. Like it or not, the reptile pet trade is an environmentally destructive industry that has little, if anything, to do with conservation.

4. MOST REPTILES ARE CAPTIVE-BRED

While the majority of red-eared sliders, and a small number of other species are captive bred, there is no question that huge numbers of wild reptiles still enter the pet trade every year. Regional demand for a few species (such as some geckos) can at times be satisfied by captive breeding, but for most that is not the case. The majority of reptile species in trade today are not being bred in substantive numbers in captivity, if they are being bred at all. Trade information from North America, Europe, Japan and other regions around the world clearly show that the wild-caught reptile trade is alive and well.

There is no doubt that the number of reptile breeders worldwide has grown. At the same time, the number of wild reptiles entering the pet trade has grown as well. Except for red-eared sliders, that are produced by the millions on turtle farms, and a few others, the majority of reptile species in the trade are represented by wild-caught individuals.

CONCLUSIONS

During the past fifteen years, the trade in live reptiles and their keeping as pets has grown substantially in Canada and around the world. A wide variety of reptile species, many shipped from the most remote corners of the globe, are now available to even casual consumers. They include very small, relatively harmless snakes and lizards; extremely large, potentially dangerous giant snakes; rare turtles and tortoises; and even many venomous reptiles.

A large number of wild reptiles are removed from their natural habitats each year for the pet trade. These animals are ill-suited to captivity and suffer as a result. Some experts estimate that 90% of wild caught reptiles in the pet trade die within their first year of captivity.

Millions of reptiles, the bulk of them red-eared slider turtles mass-produced on farms in the United States, are produced and shipped around the world. Many farmed reptiles experience the same stressful travel arrangements, inappropriate living conditions and early mortality as their wild-caught counterparts.

Many reptiles are inexpensive and widely available. Anole lizards and red-eared slider turtles can often be purchased for just a few dollars. Because these animals have such little value as individuals, they may be shipped in the cheapest way possible; stacked in boxes or piled in bags lacking adequate space, heat, ventilation, food and water. Some exporters accept a certain level of transport mortality as the cost of doing business.

A significant number of importers and retailers market reptiles to members of the public as easy to care for, adaptable, alternative pets that do not require the energy and commitment that dogs or cats might. Unfortunately, many reptile keepers, especially casual owners who have purchased a reptile on impulse, lack the knowledge, skill, finances and interest to properly care for their animals.

The natural history and captive management needs of many reptiles are poorly understood, creating husbandry challenges for even experienced reptile hobbyists. Satisfying the biological and ethological needs of captive reptiles, even some very common species, can be difficult, and at times impossible. It is no surprise then that many reptiles purchased by casual consumers don't survive very long.

All reptiles have evolved to live in specific environmental conditions as one component of an ecosystem. In captivity, particularly in the clinical environments that a great many reptile pets are kept in, the animals are unable to engage in a full range of natural movements and behaviours. They may experience physical disability and disease, as well as damaging physiological biochemical and behavioural changes induced by captivity-associated stress. Reptiles are not adapted to deal with the artificial stresses of captivity.

For the most part, the reptile pet industry is built on a perishable commodity that is not expected to survive over the long-term. In much of the industry, all that seems to matter is that the animal reaches the consumer and is sold for a profit before it dies.

Collecting reptiles from the wild can lead to habitat destruction and the disruption of ecosystems, in addition to damaging the health and welfare of those individual animals that have the misfortune of being caught. Reptile collectors may cause physical damage to natural areas through their collection practices or they may disrupt ecosystems by decimating indigenous reptile populations. Some wild reptile populations, especially long-lived species (e.g., various turtles and tortoises) have few if any surplus individuals, so removing even a few on an occasional basis can have serious consequences to those populations.

When reptile owners lose interest in their pets, as many do, they may abandon them in wild habitats. Not only is this cruel because most reptiles are ill-suited to survive in foreign environments, those animals can be a potential vector for the introduction of new disease organisms into native wildlife populations. In some cases, released animals survive (e.g., red-eared sliders), establish themselves and out-compete native reptile species who are not equipped to deal with the foreign intruders.

Most reptiles carry potentially pathogenic organisms as part of their normal internal flora and fauna. Probably the best known is salmonella which can be found in virtually all reptiles. As the keeping of reptiles as pets has increased, so has the number of salmonella cases. The Centers for Disease Control (US Department of Health and Human Services) has called reptile-related salmonellosis "a substantial health threat to humans." Despite this, only a small number of reptile sellers and buyers seem to take the threat seriously.

The increased popularity of potentially dangerous giant snakes and venomous reptiles has resulted in additional threats to human health and safety. As the numbers of these animals have increased, so have the number of scratches, bites, injuries and deaths to their human keepers. Clearly some of these animals are ill-suited as pets because they are too large, difficult to handle or dangerous.

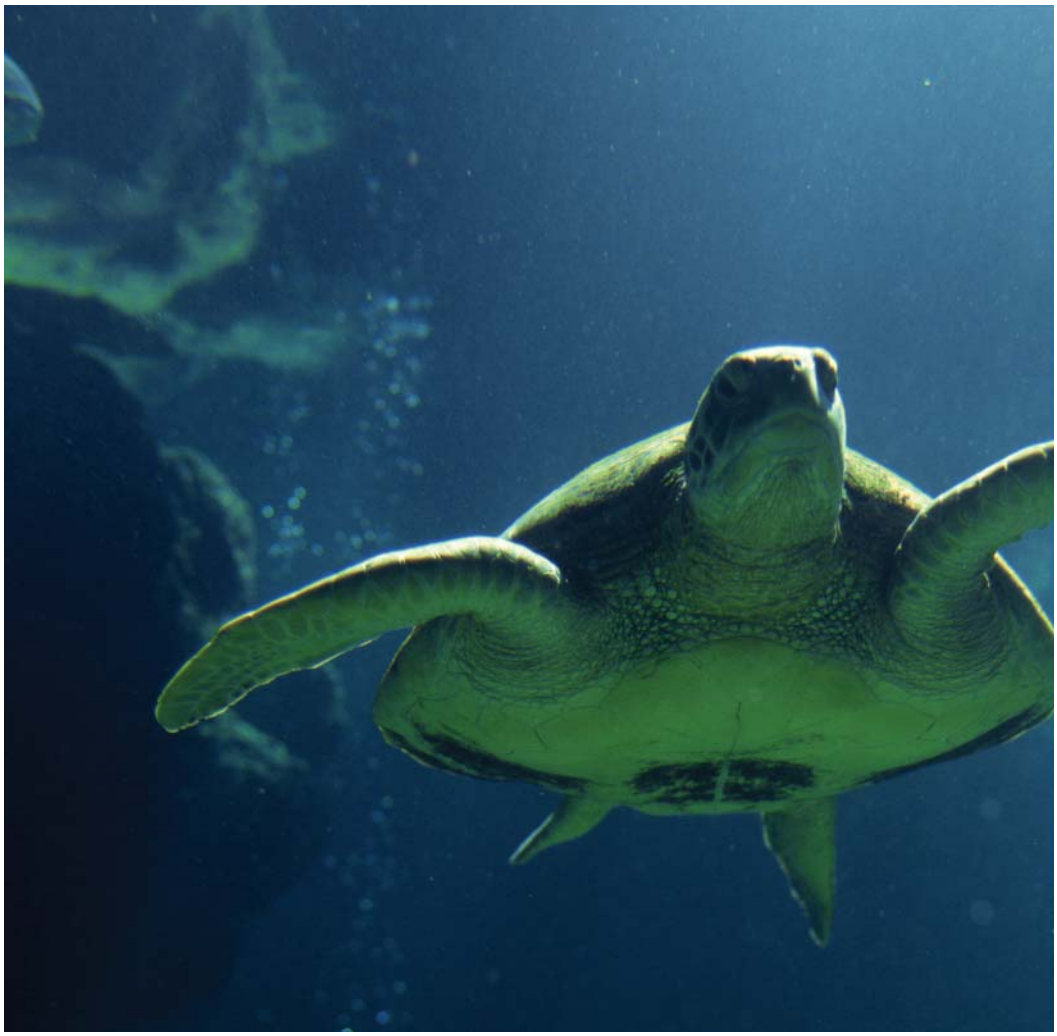
The World Society for the Protection of Animals (WSPA) opposes the keeping of non-domesticated wild animals as pets and discourages the keeping of reptiles by private individuals. WSPA takes this position because the reptile pet trade:

- causes the suffering and death of millions of animals each year,
- is environmentally destructive,
- is potentially damaging to native wildlife, and
- threatens public health and safety.

Further, WSPA opposes the use and keeping of reptiles in educational institutions, daycare centers, shows, fairs and all other locations where handling by the public is allowed or encouraged. Not only is handling potentially damaging to the animals' involved, it poses a risk to the health and safety of any children or adults who contact the animals.

WSPA encourages municipal, provincial and federal agencies to do the following:

1. Prevent the collection of reptiles from the wild.
2. Prohibit the importation of both wild-caught and captive-bred reptiles for the pet trade.
3. Prohibit the sale and keeping of reptiles as pets.



10 WAYS TO HELP REPTILES

1. DO NOT KEEP REPTILES AS PETS

Satisfying the biological and ethological needs of captive reptiles can be difficult, time consuming and expensive. This task is made even more difficult because the natural lifestyles and captive management needs of many species in the pet trade are poorly understood. Most reptiles require complex, specialized environments that cannot be properly replicated in a home situation.

While reptiles may be interesting to look at, there is little chance of establishing a reciprocal relationship with one, as a pet owner may with a dog or cat. The relationship that exists between a human owner and a reptile is one-sided and of little benefit to the animal.

Do not keep reptiles as pets. If you want to own a pet, adopt a dog or cat from your local humane society.

2. DO NOT SUPPORT THE REPTILE TRADE

The reptile pet trade is a large, wasteful industry built on the exploitation of animals that are generally ill-suited as pets. While several common reptile species are captive bred in sufficient numbers to satisfy demand at certain times, millions of wild reptiles are still removed from their natural habitats for the pet trade. These animals are shipped around the world, enduring physical hardship, injury, disease and tremendous stress in the process. Mortality can be high during transport, while survivors may arrive dehydrated, malnourished or injured. Some experts estimate that 9 out of every 10 wild caught reptiles that make it to the consumer die within 12 months because of the effects of capture, transport and confinement.

Do not support businesses involved in the reptile pet trade.

3. ASK YOUR LOCAL PET STORE TO CONSIDER NOT SELLING REPTILES

Many pet stores keep their reptiles in barren, transparent containers (e.g., aquariums) that lack appropriate environmental conditions. In some stores, conditions may be so deplorable that animals become physically debilitated. In other stores, untreated ill or dying reptiles can be found.

As well, poorly trained staff who possess minimal knowledge about reptilian biology, behaviour, captive management and conservation are often given responsibility for selling live reptiles and reptile-related products. In order to make a sale these people may incorrectly characterize reptiles as easy to keep animals with very simple needs.

Bring any concerns about the treatment of reptiles in pet stores to the attention of the store owner. Encourage them to discontinue the sale of live reptiles for animal welfare, conservation and human health reasons.

4. REPORT INAPPROPRIATE CONDITIONS

Many reptile pets are subject to inappropriate accommodation and care in pet stores and other situations. While Canada's laws addressing cruelty to animals are rather outdated and convictions for animal cruelty are uncommon, it is still important that reptile neglect and abuse be reported to local authorities (e.g., humane societies, animal control departments). Only by urging law enforcement agencies to investigate cases of reptile abuse will they become more familiar with reptile issues and more effective in enforcing, to the fullest extent possible, those laws that currently exist.

5. LEARN ABOUT REPTILES IN THEIR NATURAL HABITATS

If you are interested in reptiles, learn about them without keeping one captive as a pet. You do not have to keep reptiles in your home to learn about their biology, behaviour and conservation. A range of educational materials, including books, videos and internet sites now provide detailed information about reptiles. Most areas of southern Canada, including many urban parks, also offer opportunities to view wild reptiles. Join a reptile conservation group and participate in their wild reptile protection initiatives.

6. AVOID DISTURBING WILD REPTILES

Never disturb a reptile in the wild. If you encounter a reptile, view it from a distance so it doesn't become unnecessarily alarmed. Never chase, poke or prod a reptile with a stick or other object and never pick up or move a reptile, unless you are moving it from a potentially dangerous road or path to a safe location.

7. DO NOT REMOVE REPTILES FROM THE WILD

In many areas of Canada, it is illegal to remove a reptile from the wild. These laws are in place to protect reptile populations, which may be vulnerable to even modest levels of exploitation. 62% of Canada's reptile species are currently considered at risk. Under no circumstances should a reptile ever be removed from the wild. Learn to enjoy and appreciate reptiles in their natural habitats.

8. WRITE TO YOUR ELECTED MUNICIPAL AND PROVINCIAL GOVERNMENT REPRESENTATIVES

If you are concerned about the decline of wild reptile populations in Canada; the impact of the pet trade on reptiles around the world; the welfare of reptiles in Canada; or the health risks posed by reptile pets, then write a letter to your own elected representatives outlining your concerns. Ask them to look into ways of addressing the problems you've brought to their attention.

9. EDUCATE OTHERS ABOUT REPTILES AND REPTILE ISSUES

Reptiles are a misunderstood group of animals. Significant numbers of people continue to harbor irrational fears about snakes and other reptiles, and often kill them whenever they are encountered. Inform your family, friends and colleagues that wild reptiles are a beneficial part of natural ecosystems and should be left alone. Let them know that reptiles, just like domesticated dogs and cats, are capable of experiencing pain and suffering. Encourage them to refrain from keeping reptiles as pets. Speak up when you see a reptile being kept in inappropriate conditions.

10. SUPPORT LOCAL AND INTERNATIONAL ANIMAL PROTECTION ORGANIZATIONS

Support local, national and international animal protection organizations that work to protect reptiles and/or the natural areas in which they live. Initiatives that improve reptile welfare, restrict or eliminate trade or that protect wild habitats or prevent their fragmentation is critical to the long-term survival of reptiles. Supporting organizations that work in these areas will help ensure that captive reptiles do not suffer needlessly and that wild reptiles remain in the wild where they belong.

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ANNEXES

CITES LISTED REPTILES

Available: http://www.cites.org/

CLASS REPTILIA (REPTILES)

Appendix I	Appendix II	Appendix III
TESTUDINES		
Dermatemydidae Central American river turtle		
	Dermatemys mawii	
Platysternidae Big-headed turtle		
	Platysternon megacephalum	
Emydidae Box turtles, freshwater turtles		
	Annamemys annamensis	
Batagur baska		
	Callagur borneoensis	
	Clemmys insculpta	
Clemmys muhlenbergi		
	Cuora spp.	
Geoclemys hamiltonii		
	Heosemys depressa	
	Heosemys grandis	
	Heosemys leytensis	
	Heosemys spinosa	
	Hieremys annandalii	
	Kachuga spp. (Except the species included in Appendix I)	
Kachuga tecta		
	Leucocephalon yuwonoi	
	Mauremys mutica	
Terrapene coahuila		
Testudinidae Tortoises		
	Testudinidae spp. (Except the species included in Appendix I.)	
Geochelone nigra		
Geochelone radiata		
Geochelone yniphora		
Gopherus flavomarginatus		
Psammobates geometricus		
Pyxis planicauda		
Testudo kleinmanni		
Testudo werneri		

Cheloniidae Marine turtles		
Cheloniidae spp.		
Dermochelyidae Leatherback turtle		
Dermochelys coriacea		
Trionychidae Softshell turtles, terrapins		
Apalone ater		
Aspideretes gangeticus		
Aspideretes hurum		
Aspideretes nigricans		
	Chitra spp.	
	Lissemys punctata	
	Pelochelys spp.	*Trionyx triunguis* (Ghana)
Pelomedusidae Afro-American side-necked turtles		
	Erymnochelys madagascariensis	
		Pelomedusa subrufa (Ghana)
	Peltocephalus dumeriliana	
		Pelusios adansonii (Ghana)
		Pelusios castaneus (Ghana)
		Pelusios gabonensis (Ghana)
		Pelusios niger (Ghana)
	Podocnemis spp.	
Chelidae Austro American side-necked turtle		
Pseudemydura umbrina		
CROCODYLIA Alligators, caimans, crocodiles		
	CROCODYLIA spp. (Except the species included in Appendix I)	
Alligatoridae Alligators, caimans		
Alligator sinensis		
Caiman crocodilus apaporiensis		
Caiman latirostris (Except the population of Argentina, which is included in Appendix II)		
Melanosuchus niger (Except the population of Ecuador, which is included in Appendix II)		
Crocodylidae Crocodiles		
Crocodylus acutus		
Crocodylus cataphractus		
Crocodylus intermedius		
Crocodylus mindorensis		

Crocodylus moreletii		
Crocodylus niloticus (Except for certain African populations included in Appendix II)		
Crocodylus palustris		
Crocodylus porosus (Except the populations of Australia, Indonesia and Papua New Guinea, which are included in Appendix II)		
Gavialidae Gavial		
Gavialis gangeticus		
RHYNCHOCEPHALIA		
Sphenodontidae Tuatara		
SAURIA		
Gekkonidae Geckos		
	Cyrtodactylus serpensinsula	
		Hoplodactylus spp. (New Zealand)
		Naultinus spp. (New Zealand)
	Phelsuma spp.	
Agamidae Agamas, mastigures		
	Uromastyx spp.	
Chamaeleonidae Chameleons		
	Bradypodion spp.	
	Brookesia spp. (Except the species included in Appendix I)	
	Brookesia perarmata	
	Calumma spp.	
	Chamaeleo spp.	
	Furcifer spp.	
Iguanidae Iguanas		
	Amblyrhynchus cristatus	
Brachylophus spp		
	Conolophus spp.	
Cyclura spp.		
	Iguana spp.	
	Phrynosoma coronatum	
Sauromalus varius		
Lacertidae Lizards		
Gallotia simonyi		
	Podarcis lilfordi	
	Podarcis pityusensis	

Cordylidae Spiny-tailed lizards	
Cordylus spp.	
Teiidae Caiman lizards, tegu lizards	
Crocodilurus amazonicus	
Dracaena spp.	
Tupinambis spp.	
Scincidae Skink	
Corucia zebrata	
Xenosauridae Chinese crocodile lizard	
Shinisaurus crocodilurus	
Helodermatidae Beaded lizard, gila monster	
Heloderma spp.	
Varanidae Monitor lizards	
Varanus spp. (Except the species included in Appendix I)	
Varanus bengalensis	
Varanus flavescens	
Varanus griseus	
Varanus komodoensis	
Varanus nebulosus	
SERPENTES Snakes	
Loxocemidae Mexican dwarf boa	
Loxocemidae spp.	
Pythonidae Pythons	
Pythonidae spp. (Except the subspecies included in Appendix I)	
Python molurus molurus	
Boidae Boas	
Boidae spp. (Except the species included in Appendix I)	
Acrantophis spp.	
Boa constrictor occidentalis	
Epicrates inornatus	
Epicrates monensis	
Epicrates subflavus	
Sanzinia madagascariensis	

Bolyeriidae Round Island boas		
	Bolyeriidae spp. (Except the species included in Appendix I)	
Bolyeria multocarinata		
Casarea dussumieri		
Tropidophiidae Wood boas		
	Tropidophiidae spp.	
Colubridae Typical snakes, water snakes, whipsnakes		
		Atretium schistosum (India)
		Cerberus rhynchops (India)
	Clelia clelia	
	Cyclagras gigas	
	Elachistodon westermanni	
	Ptyas mucosus	
		Xenochrophis piscator (India)
Elapidae Cobras, coral snakes		
	Hoplocephalus bungaroides	
		Micrurus diastema (Honduras)
		Micrurus nigrocinctus (Honduras)
	Naja atra	
	Naja kaouthia	
	Naja mandalayensis	
	Naja naja	
	Naja oxiana	
	Naja philippinensis	
	Naja sagittifera	
	Naja samarensis	
	Naja siamensis	
	Naja sputatrix	
	Naja sumatrana	
	Ophiophagus hannah	
Viperidae Vipers		
		Crotalus durissus (Honduras)
		Daboia russelii (India)
Vipera ursinii (Only the population of Europe, except the USSR; these latter populations are not included in the Appendices)		
	Vipera wagneri	

APPENDIX 2

A CAPTIVE REPTILE CHECKLIST

(Warwick, C. (1995). Psychological and behavioural principles and problems. In *Health and Welfare of Captive Reptiles*. Chapman & Hall, USA)

SIGNS OF PSYCHOLOGICAL QUIESCENCE AND COMFORT

- normal alertness (not hyper-alertness)
- relaxed (not alarmed) interest/awareness in proximate or novel objects such as visual exploration
- calmly smelling or tasting objects or the air
- subtle changes in body posture (such as stretching of limbs while basking)
- unhurried body movements and locomotion
- moderate to relaxed grasp on handler or object
- normal (relaxed) drinking
- normal feeding
- normal to relaxed breathing
- physical quiescence
- relaxed immobility
- sleep
- absence of signs in the following list

SIGNS OF PSYCHOLOGICAL AROUSAL AND DISCOMFORT

- hyper-alertness
- moderate (or greater escape attempts)
- mock or actual strikes using the jaws or tail
- 'clutching' (animal tightly grasps human or object)
- death feigning
- head-hiding
- loop-pushing (with an 'arch' of the body to resist/deflect physical contact - snakes)
- eye contact with observer or handler associated with 'freezing' or defence arousal
- tense immobility and freezing
- grating of jaw plates (testudines)
- hesitant mobility
- 'wincing' (hypersensitivity to minor stimuli causing retraction of head, limbs or tail)
- prolonged retraction of the head, limbs or tail
- hissing
- biting
- scratching
- inflation of the body
- repeated inflation and deflation of the body
- panting
- rapid gular pulsation; (repeated inflation and deflation of the throat)
- open-mouth defence posture
- open-mouth breathing
- gasping
- laboured breathing
- defecation
- urination
- excretion of malodorous material from cloaca
- projection of penis or hemi-pene(s)
- voluntary regurgitation of food
- tail autotomy (some lizards)
- pseudo-vocalization (in crocodilians, some lizards and some testudines)
- venom-spitting
- squirting blood from eye region (some lizards)
- pigmentation change
- collapse
- absence of signs in the preceding list

BEHAVIOUR RELATED SELF INJURY

- friction lesions, usually on rostrum, due to interaction with transparent boundaries
- friction lesions on rostrum, damaged claws and abrasions to (usually) forelimbs arising from general exploratory and escape activities
- friction lesions on rostrum, feet and underside of body and tail arising from hyperactivity
- dermal lesions arising from hypoactivity and associated prolonged contact with substrate
- thermal burns from too close proximity or prolonged contact with a heat source
- damaged claws from trying to burrow into shallow or hard substrata
- impact injuries resulting from flight responses
- impact injuries resulting from rapid descents on to insufficiently absorbent substrata or into an insufficiently deep water pool
- related matters include, for instance, deliberate or incidental ingestion of substrata and other environmental items, and climbing-related falls

APPENDIX 3

LIST OF REPTILE PRICES IN CANADA

This section contains a list of 2004 reptile prices from a randomly selected group of reptile sellers.
Note: Prices from Dragon Farms were obtained in 2000.

SUPER PET (2004)
Mississauga, Ontario
Note: At the time these prices were surveyed, Super Pet identified their reptiles as captive-bred or wild-caught. This identification was not noted during visits to three Super Pet locations in 2005.

Lizards

Haitian Curly-Tailed Lizard	$36 (wild import)
Tokay Gecko	$30 (wild import)
Bearded Dragon (adult)	$100
Vietnam Golden Gecko	$30 (wild import)
African Fat-tailed Gecko	$105 (captive bred)
Bibron's Gecko	$27 (wild import)
Fire Skink	$75 (farmed)
White-lined Skunk Gecko	$45 (wild import)
Chinese Cave Gecko	$300 (wild import)
Savannah Monitor (baby)	$75 (farmed)
Lined Leaf Tail Gecko	$250
Green Anole	$12 3 or more $10 each
Desert Iguana	$120 (wild import)
Blue-tongued Skink	$300 (captive bred)
Ornate Uromastyx	$540
Leopard Gecko	$44.88
Australian Water Dragon	$240
Leopard Gecko	$55

Snakes

Corn Snake (albino)	$150 (captive bred)
Mali Uromastyx (juvenile)	$175 (captive bred)
Northern Pine Snake	$195 (captive bred)
Bull Snake (albino)	$300 (captive bred)
Pueblon Milk Snake	$240 (captive bred)
Mexican Black King Snake	$220 (captive bred)
Kenyan Sand Boa	$210 (captive bred)
Okeetee Corn Snake	$120
Corn Snake (Albino)	$150
Taiwan Beauty	$300

PJ'S PET CENTER (2004)
Toronto, Ontario

Lizards

Crested Gecko	$165.99
Belize Ground Gecko	$149.99
C. A. Banded Gecko	$94.99
Leopard Gecko	$65
Red-tailed Gecko	$149.99
Blue Spiny Lizard	$79.99
Veiled Chameleon	$75
Uromastyx	$150
Ridge-tail Monitor	$749.99

Snakes

Great Plains Rat Snake	$150.00
Coastal Carpet Python	$399.99
Jungle Carpet Python	$599.99
Albino Boa	$3000
Kenyan Sand Boa	$250
Honduran Milk Snake	$350
Boa Constrictor	$249.99
Children's Python	$249.99
Green Tree Python	$1499.99
Coastal Carpet Python	$749.99

Turtles/Tortoises

Red-Footed Tortoise	$599.99
Wood Turtle	$550
Red-eared Slider	$69.99

REPTILE RAINFOREST (2004)
Kemptville, Ontario
Website

Snakes

Corn snake	$40
Anerythristic corn snake	$45
Albino corn snake	$45 - 55
Snow corn snake	$50
Creamsicle corn snake	$60
Crimson corn snake (hypomelanistic phase)	$75
Caramel corn snake	$70
Butter corn snake	$125
Albino Texas ratsnake	$60
Albino prairie kingsnake	$85
Western hognose snake	$80
Black pine snake	$90
Colombian rainbow boa	$115
Mid-Baja rosy boa	$125
Ball python	$85

Lizards

Leopard gecko	$35 - 60
Patternless leopard gecko	$45
Albino leopard gecko	$75
African fattail gecko	$45
Bearded dragon	$75

PORT CREDIT PET CENTRE (2005)
Mississauga, ON
Website

CB Eastern Kingsnakes 36"	$145
CB California Kingsnakes Babies	$95
CB California Kingsnakes 22"	$125

CB Eastern Indigo Snakes	$1295
Rough Green Snakes	$39
Madagascar Giant Hognose Snakes	$249
Madagascar Golden Hognose Snakes	$249
Madagascar Speckle Hognose Snakes	$249
CB Tangerine Honduran Milksnakes 26"	$229
CB Tangerine Honduran Milksnakes	$189
CB Pueblan Milksnakes Babies	$119
CB Albino Nelsons Milksnakes	$325/ea
CB Sinaloan Milksnakes	$109
CB Black Pinesnakes (Babies)	$179
CB Red Albino Cornsnakes	$79
CB Motley Corns (Het Caramel)	$95
CB Albino Motley Corns (Het Caramel)	$95
CB Motley Corns	$95
CB Mexican Boa Constrictor	$595
CB Boa Imperator 30"	$259
CB Bolivian Boa Constrictors 30"	$595
CB Guyanan Red-Tailed Boa Constrictors (Babies)	$375
CB "Nuclear" Kenyan sand Boas (Babies)	$159
CB Kenyan Sand Boas (Babies)	$149
CB Rough-Scale Sand Boas (Babies)	$190
CB Indian Sand Boas (Babies) $250	
Cooks Tree Boas	$149
CB Colombian Rainbow Boas $150	
CB San Andreas Boas	$650
CB Hog Island Boas	$550
Haitian Tree Boas	$350
CB Sonoran Desert Boas	$350
CB Solomon Island Ground Boas	$159
CB Peruvian Boa	$659
Amethysitine Pythons	$450
Baby Blood Pythons	$225
CB Ball Pythons (Babies)	$150
CB Spotted Python	$275
CB Sawu Pythons 30"	$359
CB Jungle Carpet Pythons 32"	$295
CB Coastal Carpet Pythons 5.5"	$329
CB Irian Jaya Carpet Pythons (Adults)	$359
CB "Sorong" Green Tree Python	$950
CB "Aru Green Tree Pythons	$750
CB Macklotts Python	$199
CB Bredls Python	$1200
CB Sumatran Blood Python	$329
CB Jaguar Siblings	$450
CB Baby Albino Burmese Pythons	$225
Timor Monitor "Special"	$150
Mangrove Monitor	$350
Red Tegus	$225
CB African Fat-tail Geckos (babies)	$39
CB Albino Leopard Geckos (Babies)	$59
CB Hi Yellow Leopard Geckos	$55
African Velvet Geckos	$69.95
CB New Caledonian Crested Geckos (Babies)	$95
CB New Caledonian Crested Geckos Adult Males	$95
CB Chinese Cave Geckos	$145
Golden Geckos	$22
CB Austrailian Barking Geckos	$325
CB Hypo Tangerine Leopard Geckos	$125
CB Carrot-Tail Leopard Geckos	$125
CB Baby Veiled Chameleons	$69
CB Baby Bearded Dragons	$75
CB Yellow Ackies	$595
White Lipped Anoles	$39.95
CB Cunningham Skinks	$195
CB Schneiders Skinks	$44.95
Mountain Horned Dragons	$39.95
Eastern Blue Tongue Skinks (Adults)	$289

HENRY PIORUN REPTILES (2005)
Website

3 Adult Mexican Black Kingsnakes (for the group)	$450
2 Adult 50/50 California Kingsnakes (for the pair)	$300
Young Adult Female Albino Corn Snake	$200
2 Pueblan Milksnakes	$125 each
for both	$200
3 Macklot's Pythons (2004)	$150 each
	$275 for 2
	$375 for 3
2 Amethystine or Scrub Pythons (for the pair)	$750
Bredl's Python	$1000
2 Stimsons Python (2003)	1 for $600
	2 for $1000
2 Brazilian Rainbow Boas (2004) (for the pair)	$500
2 Children's Pythons (2004) (for the pair)	$250
3 Spotted Pythons (2004)	$100 each
	$180 for 2
Green Tree Python	$750 - $800
Green tree Python (Blue Spotted male)	$1000
2 Yearling Hog Island Boas (for the pair)	$750
2 Hog Island Boas (for the pair)	$650
Sub adult female Hog Island Boa	$400
Irian Jaya X Jungle Carpets	$150 males
	$250 females
Coastal Carpet Python (Jaguar Sibling)	$350
2 Irian Jaya Carpet Pythons (for the pair)	$450
Irian Jaya Carpet Pythons	$200 males
	$225 females
Jungle Carpet Pythons	$150 - $300
Albino Reticulated Python	$2250
Dwarf Albino & Reticulated Pythons (for the pair)	$7000
Super Dwarf Reticulated Pythons	$2200 for 2
Savu Pythons	$325 each
	$600 for 2

NIAGARA REPTILES (2005)
Guelph, ON
Website

Fat Tail Geckos	$80 - 275
Lesser Frog Eyed Gecko	
Teratoscincus microlepis	$125
Western Hognose Snake	
Heterodon nasicus	$140
Orange Ghost/Hypo Python regius	
Males	$2500+
Females	$4000+
Pastel Jungle Python regius	
Males	$1500
Females	$2500

REPTILIA (2005)
Vaughan, ON
Website

Basilisk - Plumed*	
Basiliscus plumifrons	$80
Bearded Dragon* *Pogona vitticeps*	$75
Chameleon - Veiled	
Chameleo calyptratus	$75
Chameleon - Panther -Nose Be	
and Rainbow *Furcifer pardalis*	$180
Frilled Lizard *Chlamydosaurus kingii*	$450
Gecko -	
Bibron's *Pachydactylus bibronii*	$30
Gecko -	
Crested* *Rhacodactylus ciliatus*	$89
Gecko -	
Helmeted *Geckonia chazaliae*	$199
Gecko - Leopard (Adult)	
Eublepharis macularius	$68
Gecko - Leopard (Subadult)*	
Eublepharis macularius	$50
Gecko - Leopard Tangerine**	
Eublepharis macularius	$70
Gecko - Leopard Leucistic	
Eublepharis macularius	$80
Gecko - Leopard Blizzard	
Eublepharis macularius	$80
Gecko - Leopard Albino	
Eublepharis macularius	$75
Gecko - New Caledonia Giant	
Rhacodactylus leachianus	$750
Gecko - Viper Teratolepis fasciatus	$69
Uromastyx-Mali - Subadult Male	
Uromastyx maliensis	$300
Uromastyx-Nigerian	
Uromastyx acanthinurus	$450

Snake Price List
(* indicates animals bred at Reptilia)

Boa - Brazilian Rainbow	
Two year old *Epicrates cenchria*	$425
Boa - Venezuelan Rainbow	
Epicrates cenchria	$230
Boa - Colombian Boa constrictor	$175
Boa - Colombian - Albino	
Boa constrictor	$2000
Boa - Colombian-Yearlings	
Boa constrictor	$199
Boa - Guatemalan Boa constrictor	$189
Boa - Colombian Rainbow-Yearlings	
Epicrates c. maura	$175
Boa - Rough Scaled Sand	
Eryx conicus	$175
Bull Snake *Pituophis c. sayi*	$100
Bull Snake - Subadult *Pituophis c. sayi*	$125
Corn - Aztek/Aberrant Subadult	
Elaphe guttata	$125
Corn - Regular Phase*	
Elaphe guttata	$79
Corn - Regular Subadults*	
Elaphe guttata	$99
Corn - Okeetee *Elaphe guttata*	$99
Corn - Okeetee - Subadult	
Elaphe guttata	$120
Hognose - Western *Heterodon nasicus*	$149
King - California Black and White	
Banded - Subadults	
Lampropeltis g. californiae	$150
King - Brook's-Yearlings	
Lampropeltis g. floridana	$110
King - Gray Banded	
Lampropeltis alterna	$115
King - Mexican Black*	
Lampropeltis g. nigrita	$99
King - Variable-Yearlings	
Lampropeltis theyri	$176
Milk Snake - Honduran* Yearling	
Lampropeltis t.hondurensis	$150
Milk Snake - Honduran-Albino	
2.1 available *Lampropeltis t. hondurensis*	$500
Milk Snake - Honduran Het for Albino	
4.1 available *Lampropeltis t. hondurensis*	$250
Milk Snake - Tangerine Honduran*	
Lampropeltis t.hondurensis	$235
Milk Snake - Tangerine Honduran-	
Vanishing Phase *Lampropeltis*	
t. hondurensis	$235
Milk Snake - Tangerine Honduran*-	
Subadult *Lampropeltis t. hondurensis*	$250
Milk Snake - *Pueblan**	
Lampropeltis t. campbelli	$110
Milk Snake - Sinaloan*	
Lampropeltis t. sinaloae	$110
Pine - Black *Pituophis m. lodingi*	$159
Pine - Northern	
subadult *Pituophis melanoleucus*	$150
Pine - Northern hatchlings	
Pituophis melanoleucus	$99
Python - Ball*-Yearlings *Python regius*	$195
Python - Carpet, Coastal	
Subadult *Morelia s. macdowelli*	$189
Python - Carpet, Jungle Subadult	
Morelia s. cheynei	$400
Python - Green Tree-Yearling	
Morelia viridis	$975

Python - Green Tree- Aru Morelia viridis	$850
Python - Green Tree Biak *Morelia viridis*	$1200
Python - Macklot's *Liasis mackloti*	$175
Python - Australian Water *Liasis fuscus*	$225
Ratsnake - Baird's* Subadult *Elaphe bairdi*	$99
Ratsnake - Bubblegum adults *Elaphe obsoleta*	$99
Ratsnake - Everglades Subadult *Elaphe obsoleta*	$79
Ratsnake - Steppe's *Elaphe dione*	$125
Taiwan Beauty Snake *Elaphe taeniura*	$150
Taiwan Beauty Snake Subadults *Elaphe taeniura*	$199
Trinket Snake *Elaphe helena*	$125

REPTILE RAINFOREST (2005)
Kemptville, ON
Website

Anerythristic Corns	$45
Albino corns	$45-$55
Volcano corns	$55
Snow corns	$50
Creamsicle corns	$60
Frosted creamsicle corns	$60
Candy Creamsicle corns	$70
Okeetee corns	$60
Crimson corns	$65
Blizzard corns	$85
Caramel corns	$70
Butter Corns	$125
Motley Corns	$75
Motley Caramel Corns	$125
Motley Butter Corns	$200
Lavender Corns	$115
Ghost Corns	$75
Albino Texas Ratsnakes *(Elaphe o. lindheimeri)*	$60
Albino Prairie Kingsnake	$75
Western hognose snakes	$80
Black pine snakes *(Pituophis m. lodingi)*	$100

Colubrids:

Cornsnakes *(Elaphe guttata)*	$40
Emory's ratsnake Anerythristic Frosted Creamsicle corn snake	$75
Ghost Emory's ratsnake	$250
Albino Nelson's Milksnakes *(Lampropeltus t. nelsoni)*	$225

Boas & Pythons:

Colombian rainbow boas *(Epicrates maurus)*	$115
Kenyan sand boas (Eryx colubrinus loveridgei)	$60
Anerythristic Kenyan sand boa	$115
Mid-Baja rosy boas *(Lichanura t. myriolepis)*	$125
Ball pythons *(Python regius)*	$75
Spotted pythons *(Antaresia maculosa)*	$100
Pinstriped Spotted Python	$200
Brazilian rainbow boas *(Epicrates cenchria)*	$225

Lizards:

Leopard Geckos (Eublepharis macularius)	$35-$60
Patternless Leopard Geckos *(AKA Leucistic)*	$50
Albino Leopard Geckos	$60
Texas Banded Geckos *(Coleonyx brevis)*	$55
African Fattail geckos *(Hemitheconyx caudicinctus)*	$50
Bearded Dragon *(Pagona vitticeps)*	$75
Nosy Be Blue Panther Chameleons *(Furcifer pardalis)*	$150
Crested geckos *(Rachodactylus ciliatus)*	$75
Bearded Dragons	$75
Albino leopard geckos	$60
Leopard Geckos	$35
Albino zig-zag cornsnake (partial stripe)	$55
Crimson corns	$65
Albino Texas ratsnakes	$55
Western hognose snakes	$80
Albino Cornsnakes	$45
Cornsnakes (Volcano X albino)	$115/pr.
Frosted cornsnakes	$50
Snow Frosted Creamsicle cornsnakes	$60
Regular cornsnakes	$40
Mexican milksnakes	$90
Ball Pythons	$75
African Fattail geckos (regular and striped)	$45 each
Crested geckos	$75 each
Texas Banded gecko	$45 each

DRAGON FARMS (2000)
Port Colborne, Ontario
Website

Venomous snakes

West African Gaboon Viper	$125 USD
Rhinoceros Viper	$125 USD
Black Spitting Cobra	$75 USD
Eastern Green Mamba	$250 USD
Black-headed Bushmaster	$3000 USD
Sharp-nose Viper/Hundred Pacer	$250 USD
Taylor's Cantil	$150 USD
Levant Viper	$125 USD
Cascavel	$135 USD
Red-headed Krait	$1250 USD

APPENDIX 4

CASES OF ILLEGAL TRADE REPORTED IN THE MEDIA

UNITED STATES

January 2004 - State and federal wildlife authorities served search warrants in Utah, Arizona and California as part of Operation Slither, a sting aimed at stopping the illegal possession and sale of native reptiles. Two homes in Salt Lake City and one in Davis County were searched. One home contained more than 1,000 snakes. Approximately 100 illegal animals were seized including several snake species and Gila monsters.

July 2003 - Reid Turowski owner of Captive Bred Specialties, a reptile store in Wisconsin, was charged with smuggling shipments of wildlife from Bangkok, Thailand using falsely marked Federal Express packages. Upon investigation of packages labeled "wooden handicrafts", authorities discovered various species of tortoise, such as Indian Star tortoises, and Chinese water dragons. One package contained 85 reptiles. All confiscated animals were removed to the Minneapolis Zoo.

July 2003 - Failure to produce a permit to keep snakes forced Federal wildlife officers to remove 98 snakes from the Colorado home of Brook Berntson and Cindy Sue Jahn. The two women were illegally selling various species of snakes, including venomous species, from their home.

July 2003 - Two southeast Asian men were arrested on charges of smuggling endangered wildlife to U.S. collectors. Lawrence Wee Soon Chye and Leong Tian Kum were arrested after investigators confiscated more than 200 rare turtles and lizards from a University of Central Florida student. The lizards were sent via Federal Express from Singapore. The student admitted to illegally shipping Florida king snakes, corn snakes, milk snakes, fat-tail geckos and leopard geckos to Chye and Kum in exchange for the turtles and lizards. Kum has also been connected to other reptile dealers in the United States.

June 2003 - Operation Endangered and Threatened Species was developed by Ohio authorities to stop the illegal sale and possession of endangered reptiles and amphibians. Reports from this operation describe a man who in three days managed to collect 2,000 snakes from denning areas in Western U.S. states. Officers confiscated more than 800 animals from various individuals, including a black mamba and 80 spotted salamanders collected from the wild.

June 2003 - Christopher Coroneos faces charges of animal cruelty and possession of a dangerous animal after police investigated a warehouse that housed 1,500 animals. On June 4, 2003, Coroneos was in possession of 2 king cobras, an alligator, 26 Gaboon vipers, 100 Emperor scorpions, 2 Death Stalker scorpions, 1,000 baby ball pythons, boa constrictors and King and corn snakes. All of these animals were housed in unsafe and unsanitary conditions and had to be moved to local zoos. 199 of the animals were found dead.

June 2001 - Jeffrey Allen Doth, a resident of Houston, Texas, attempted to smuggle five green tree pythons from Indonesia through Los Angeles International Airport. All five snakes were hidden in a stocking under the man's clothing. Doth was charged and convicted of smuggling protected wildlife.

July 1999 - The curator of reptiles at the San Diego Zoo was caught obtaining Australian pythons and lizards through the zoo for the purpose of breeding and selling the reptiles to wildlife dealers. Earl Thomas Schultz admitted to making over $100,000 US ($138,000 CA) from the sale of bearded dragons, woma pythons and other species of reptiles. Convicted and sentenced February 17, 2000.

October 1998 - Dwayne and Patricia Cunningham and Robert Lawracy were convicted of trafficking wildlife from 1992 to December of 1997. Several reptiles, including ground iguanas and rock iguanas, were smuggled into the U.S. on Caribbean and Bahamian cruise ships. The trio was also in possession of adult red-footed tortoises stolen from the Curacao Zoo in 1995. Various other species were collected in Madagascar and shipped to Florida via Germany. Several German citizens have also been indicted.

August 1998 - Tom Crutchfield, owner of Tom Crutchfield's Reptile Enterprises Inc., the largest reptile importer/exporter in the United States, was indicted for wildlife smuggling, conspiracy and money laundering. Crutchfield and his associates imported hundreds of rare and endangered snakes and tortoises from Madagascar into Germany. Once imported into Germany, the reptiles were exported to Canada and the United States. The reptiles were transported aboard commercial flights inside suitcases. Crutchfield's arrest came after a 5-year investigation by the U.S. Fish and Wildlife Service into the illegal export/import industry in the United States.

1996 - 1998 - An on-going undercover investigation by the U.S. Fish and Wildlife Service revealed an extensive smuggling ring headed by Keng Liang "Anson" Wong of Penang, Malaysia. Anson's business, Sungai Rusa Wildlife, imported and exported various species of rare and endangered wildlife including Komodo dragons, Chinese alligators, gavials, radiated tortoises, monitor lizards, spider tortoises, Burmese star tortoises, Indian star tortoises and various species of python. Authorities believe that Wong shipped his illegal cargo into Canada and then transported over 300 protected animals into the United States by hiding them in airline baggage, Federal Express packages and amongst shipments of legally imported/exported animals. Wong pled guilty to 40 felony

charges including money laundering, conspiracy, smuggling and violations of U.S. wildlife protection laws. He was given a sentence of six years and a fine of $60,000 US ($83,000 CA). Several other business associates of Wong's have also been charged.

1995 - Arizona authorities set up the Operation Viper task force to monitor the numerous reptile collectors who frequent southern Arizona deserts searching for snakes, lizards, including the venomous Gila Monster and toads. Between 1995 and 1998 Operation Viper caught 11 poachers in Saguaro National Park. In 1999, members of Operation Viper investigated Ralf Michael Schmieg, a German national who had been traveling through Arizona to Utah and New Mexico looking for reptiles. Further examination of his hotel room revealed 20-30 snakes, some already packed in his suitcase. Schmieg pleaded guilty to taking wildlife without a license and was fined $162 US ($224 CA).

INTERNATIONAL

Russia - August 14, 2003, customs officials at Moscow International Airport in Russia confiscated two rat snakes and two cobras from abandoned luggage in the customs zone. One of the rat snakes was found decomposing while the cobras had their mouths sown shut and fangs ripped out. The smugglers are unknown but officials believe the snakes were headed for Vietnam.

United Kingdom - On July 15, 2003 customs officers seized ten African dwarf crocodiles from the cargo hold of a plan en route from Nigeria to Korea. Authorities believe these endangered crocodilians were destined for the pet trade. Forged documents claimed the species were the more common American alligators and Nile crocodiles, ranched in Benin, West Africa. Ninety-five other reptiles and amphibians were also confiscated, including 12 royal pythons and 13 monitor lizards.

Italy - On April 11, 2003 two individuals on a flight from Tripoli, Lebanon attempted to smuggle into Italy four Greek testuggine tortoises cramped into a shoe box. Greek tortoises are a protected land turtle. The animals were handed over to the authorities and set free in an appropriate area.

Singapore - On August 2, 2002 a man arrived from Chennai, India with four pieces of luggage containing star tortoises. This was the largest smuggling attempt of star tortoises discovered at the Singapore Airport. In total 1,092 turtles were confiscated. The man was fined, jailed for eight weeks and ordered to pay for veterinary care and shipment of the turtles back to India. Between January and August 2002, the airport seized a total of 2,400 star tortoises from smugglers.

Vietnam - On February 18, 2003 shipments containing two and a half tons of live iguanas were confiscated en route to China from Malaysia. The reptiles were sent to a local wild animal rescue, but more than half did not survive the trip.

Australia - On March 12, 2002, a 68 year old woman attempted to board a plan in Sydney, Australia carrying seven poster tubes containing four tiger snakes, 91 lizards and three diamond pythons. The woman, who was en route to the Czech Republic via Vienna, was charged under the federal Environment Protection and Biodiversity Conservation Act. One poster tube contained 44 geckos and a rare rock knobbed-tail gecko. The animals were confiscated and taken to the Taronga Zoo.

United Arab Emirates (UAE) - For most of 2002, two hundred endangered Mediterranean tortoises were kept in a breeding center in Sharjah. The UAE government has confiscated large shipments of this species of tortoise from various border points and animal markets around the country. During one seizure, cardboard boxes were found with sixty or more tortoises stacked inside while others were found bound together in sacks in the back of cars.

Hong Kong - Hong Kong airport officials have reported numerous incidents were individuals attempted to export live animals from Hong Kong. On December 11, 2001, a passenger was found with eight frogs, six lizards and eight endangered turtles gift-wrapped in two boxes. Apparently, the animals went undetected by x-ray machines and security staff.

South Africa - Two Slovak men were apprehended when officials found that they were in possession of 112 angulated tortoises. On November 14, 2001, Martin Kyskyn and Martin Juricek were caught collecting tortoises on the road side and storing them in their suitcases. Both men were convicted of hunting, possessing and transporting the tortoises. Examination of their passports showed they had also visited Indonesia, Mauritius, Madagascar and Peru since the beginning of the year. Authorities believe the men planned to export the tortoises.

France - On Friday July 20, 2001, forty-nine pythons and monitor lizards were discovered tied in sacks in the suitcase of an American tourist traveling to Germany. The protected reptiles originated in Indonesia. The snakes were taken to a zoo in Amneville near the German border.

Australia - On June 7, 2001, Australian postal workers were alarmed to find a package of snakes and lizards from the UK, labeled as baby gifts. Two East African sand boas, two hatchling ball pythons and two spiny-tailed dragon lizards were confiscated. Of the six reptiles, only one sand boa survived the ordeal.

Cayman Islands - Three Germans were accused of possessing hundreds of reptiles, frogs and plants for export to Europe. The three men had suitcases packed with curly tailed lizards, frogs, freshwater turtles and snakes that appeared to be from the Cayman Islands or Bahamas. They were also accused of smuggling various reptiles into the Bahamas on January 20, 2001.

Kenya - 190 Pancake tortoises were returned to Kenya after a suspected trafficker was caught at Uganda's airport in early 2001. The tortoises were found tightly packed in a hand bag at the airport. Some of the animals suffered severe shell damage causing death, while others were squeezed to death. The surviving tortoises were placed in a temporary sanctuary.

Australia - Three Italians were charged after Australian authorities found more than 60 snakes, including desert death adders, carpet pythons and netted dragons packed into their suitcases. In February 2001, the trio traveled from Perth to Melbourne through remote desert regions catching reptiles and documenting their trip on video recorder. The snakes were taken to the Melbourne Zoo.

Malaysia - In 2001, Malaysian police investigated reports of suspicious men and an abandoned minivan found near the Thai border. Investigation of the van revealed four pythons, two sacks of Asian giant terrapin, a sack of water monitor lizards and 12 baskets of rice field terrapins. Authorities believe the animals were smuggled across that boarder from Thailand.

Malaysia - In two weeks the Malaysian Department of Wildlife and National Parks seized two separate shipments of reptiles. In February 2001, authorities removed 1,100 reptiles from the Sultan Abdul Aziz Shah Airport cargo bay. One week later, 61 rare snakes, tortoises and spiders were intercepted on their way into Malaysia from a neighboring country.

New Zealand - A German reptile collector was stopped and searched on his way out of the country on January 28, 2001. Authorities found two green geckos hidden in the man's underwear. The lizards, a male and a pregnant female, were taken from the man. The female died later. The man was fined $5,300 US ($7,325 CA).

Kampala, Uganda - 209 pancake tortoises were found packed in hand luggage on a bus traveling through Nairobi on January 11, 2001. The suspected animal traffickers abandoned the tortoises and fled after their luggage was inspected at a road checkpoint. Eleven of the animals were found squeezed to death while others had severely damaged shells and likely died as a result of their injuries. Authorities believe these tortoises were destined for the European pet market. The remaining animals were removed to an animal sanctuary.

Costa Rica - A shipment of hundreds of baby iguanas was intercepted on route to the Salvadoran border in April 2000. About 1,300 iguanas were stuffed into cloth bags and hidden at the bottom of backpacks, buried under piles of clothing. The man and woman smuggling the reptiles were also found with 20 young lizards and an eagle. A Costa Rican judge set the couple free and ordered the reptiles returned to the wild.

APPENDIX 5

REPTILES THAT ARE NATIVE TO CANADA

British Columbia (13 species)
Painted turtle *(Chrysemys picta)*
Pygmy short-horned lizard *(Phrynosoma douglasi)*
Northern alligator lizard *(Gerrhonfus coeruleus)*
Western skink *(Eumeces skiltonianus)*
Rubber boa *(Charina bottae)*
Racer *(Coluber constrictor)*
Sharptail snake *(Contia tenuis)*
Night snake *(Hypsiglena torquata)*
Gopher snake *(Pituophis melanolecus)*
Western terrestrial garter snake *(Thamnophis elegans)*
Northwestern garter snake *(Thamnophis ordinoides)*
Common garter snake *(Thamnophis sirtalis)*
Western rattlesnake *(Crotalus viridis)*

Alberta/Saskatchewan (8 species)
Painted Turtle *(Chrysemys picta)*
Short-horned Lizard *(Phrynosoma hernandezi)*
Western Hognose Snake *(Heterodon nasicus)*
Gopher Snake *(Pituophis melanoleucus)*
Western Terrestrial Garter Snake *(Thamnophis elegans)*
Plains Garter Snake *(Thamnophis radix)*
Common Garter Snake *(Thamnophis sirtalis)*
Western Rattlesnake *(Crotalus viridis)*

Manitoba (8 species)
Common Snapping Turtle *(Chelydra serpentina)*
Painted Turtle *(Chrysemys picta)*
Prairie Skink *(Eumeces septentrionalis)*
Western Hognose Snake *(Heterodon nasicus)*
Smooth Green Snake *(Opheodrys vernalis)*
Redbelly Snake *(Storeria occipitomaculata)*
Plains Garter Snake *(Thamnophis radix)*
Common Garter Snake *(Thamnophis sirtalis)*

Ontario (25 species)
Common Snapping Turtle *(Chelydra serpentina)*
Spiny Softshell Turtle *(Apalone spinifera)*
Common Musk Turtle *(Sternotherus odoratus)*
Painted Turtle *(Chrysemys picta)*
Spotted Turtle *(Clemmys guttata)*
Wood Turtle *(Clemmys insculpta)*
Blanding's Turtle *(Emydoidea blandingi)*
Common Map Turtle *(Graptemys geographica)*
Five-lined Skink *(Eumeces fasciatus)*
Racer *(Coluber constrictor)*
Ringneck Snake *(Diadophis punctatus)*
Eastern Fox Snake *(Elaphe gloydi)*
Rat Snake *(Elaphe obsolete)*
Eastern Hognose Snake *(Heterodon platirhinos)*
Milk Snake *(Lampropeltis triangulum)*
Northern Water Snake *(Nerodia sipedon)*
Smooth Green Snake *(Opheodrys vernalis)*
Queen Snake *(Regina septemvittata)*
Brown Snake *(Storeria dekayi)*
Redbelly Snake *(Storeria occipitomaculata)*
Butler's Garter Snake *(Thamnophis butleri)*
Eastern Ribbon Snake *(Thamnophis sauritus)*
Common Garter Snake *(Thamnophis sirtalis)*
Timber Rattlesnake *(Crotalus horridus)*
*extirpated Massassauga Rattlesnake *(Sisturus catenatus)*

Quebec (15 species)
Common Snapping Turtle *(Chelydra serpentina)*
Spiny Softshell Turtle *(Apalone spinifera)*
Common Musk Turtle *(Sternotherus odoratus)*
Painted Turtle *(Chrysemys picta)*
Spotted Turtle *(Clemmys guttata)*
Wood Turtle *(Clemmys insculpta)*
Blanding's Turtle *(Emydoidea blandingi)*
Common Map Turtle *(Graptemys geographica)*
Ringneck Snake *(Diadophis punctatus)*
Milk Snake *(Lampropeltis triangulum)*
Northern Water Snake *(Nerodia sipedon)*
Smooth Green Snake *(Opheodrys vernalis)*
Queen Snake *(Regina septemvittata)*
Brown Snake *(Storeria dekayi)*
Redbelly Snake *(Storeria occipitomaculata)*
Common Garter Snake *(Thamnophis sirtalis)*

New Brunswick (7 species)
Common Snapping Turtle *(Chelydra serpentina)*
Painted Turtle *(Chrysemys picta)*
Wood Turtle *(Clemmys insculpta)*
Ringneck Snake *(Diadophis punctatus)*
Smooth Green Snake *(Opheodrys vernalis)*
Redbelly Snake *(Storeria occipitomaculata)*
Common Garter Snake *(Thamnophis sirtalis)*

Nova Scotia (9 species)
Common Snapping Turtle *(Chelydra serpentina)*
Painted Turtle *(Chrysemys picta)*
Wood Turtle *(Clemmys insculpta)*
Blanding's Turtle *(Emydoidea blandingi)*
Ringneck Snake *(Diadophis punctatus)*
Smooth Green Snake *(Opheodrys vernalis)*
Redbelly Snake *(Storeria occipitomaculata)*
Eastern Ribbon Snake *(Thamnophis sauritus)*
Common Garter Snake *(Thamnophis sirtalis)*

Prince Edward Island (3 species)
Smooth Green Snake *(Opheodrys vernalis)*
Redbelly Snake *(Storeria occipitomaculata)*
Common Garter Snake *(Thamnophis sirtalis)*

APPENDIX 6

PROVINCIAL/TERRITORIAL WILDLIFE LAW

NEWFOUNDLAND

There are no reptiles native to Newfoundland.

The Newfoundland Animal Protection Act defines animals as all non-human vertebrates. The purpose of the act is "to provide a method to help animals that are in distress and to prevent cruelty to or other mistreatment of animals."

Under prohibited activities the Act states: "A person shall not mistreat an animal." "A person mistreats an animal where the person causes the animal to be in need of proper care, food or shelter or causes the animal to be injured, sick or in pain or suffer undue or unnecessary privation or neglect."

If a peace officer (RCMP, police officer or special constable appointed for the Act) finds an animal in distress, he is required to find the animal's owner and request that the owner relieve the animal's distress. If the owner can't be found, the peace officer can take custody of the animal, arrange for necessary transportation, food, care, shelter and veterinary treatment or deliver the animal to the SPCA. If a member of the public finds an animal in distress he can deliver the animal into the custody of the SPCA.

Under the Act the peace officer may enter the premises, vehicle or other thing to search for an animal with or without a warrant provided he has reasonable grounds for believing an animal is in distress. The peace officer can also (without a warrant) inspect premises where animals are kept for sale, hire or exhibition.

Penalties for contravening the Act are between $50 and $200 (or up to 3 months in jail) for 1st and 2nd offenses and $200 to $500 (or max 6 months in jail) for 3rd or subsequent offenses.

NOVA SCOTIA

The Nova Scotia Wildlife Act defines wildlife as "any species of vertebrate which is wild by nature and hence not normally dependent on man to directly provide its food, shelter or water." The Act requires that a license or permit be held to hunt wildlife or destroy nuisance wildlife.

Harvestable Wildlife
Regulations under the Act state that the only "harvestable" native reptiles are "snapping turtles," which may be hunted from July 15 to September 30. A valid license is required.

Wildlife in Captivity
A permit is required to keep both native and exotic wildlife in captivity. The permit is valid for a period of one year. Conservation officers "may at any reasonable time inspect captive wildlife and the enclosures in which they are kept." According to the regulations, captive wildlife must not be allowed to roam free, escape or be released to the wild.

The regulations state that the wildlife should be kept in a suitable enclosure approved by the Director of Wildlife. They specify the following: the enclosure must consist of an outside run and a shelter. They also specify that the person holding wildlife should: a) provide a fresh and adequate supply of water available at all times; b) provide a nutritive, uncontaminated and adequate food supply at least once daily; c) keep the enclosure sanitary and clean: and d) keep the wildlife in a humane manner.

Import/Export
According to the regulations, a permit is required to import or export wildlife, both native and exotic, or their parts. However, in an e-mail sent by Barry C. Sabean, he states that they "maintain a list of exceptions which includes species which are normally kept as pets and for which they have determined there is no environmental risks to Nova Scotia. Conditions for importation of these species include that they originate from a reputable captive breeding program or can legally be taken from the wild in the originated jurisdiction and that they are disease free"

Sale of Wildlife
Most wildlife can be bought and sold. With regard to reptiles, the only exception appears to be snapping turtles which require a license.

PRINCE EDWARD ISLAND

The *Wildlife Conservation Act* defines wildlife as: "all wildlife, wild mammals, birds, reptiles, amphibians, fish, invertebrates, plants, fungi, algae, bacteria and other wild organisms except those prescribed by regulation."

Under the act, a permit may be issued for the following activities:

a) to trap or kill any wildlife
b) to import, export or engage in the interprovincial transportation of any wildlife
c) to salvage dead wildlife for educational, ornamental or other purposes:
d) to collect or possess an endangered, threatened or vulnerable species for scientific, educational or other purposes related to the conservation of that species.

According to government staff, there are no laws yet specifically dealing with native reptiles. Non-native or exotic species need a permit by law but this is not enforced. New legislation is being written that would be enforceable."

NEW BRUNSWICK

The *Fish & Wildlife Act* defines wildlife as "a) any vertebrate animal or bird, excluding fish, that is wild by nature in the Province; and b) any exotic wildlife that has been introduced into the wild in the province. Exotic wildlife is defined as "all birds, mammals and other vertebrates that are not indigenous to the Province and that in their natural habitat are usually wild by nature, and includes any part of such birds, mammals or other vertebrates.

Hunting
A license is required to hunt or trap most wildlife.

Captive Wildlife
A permit is required to keep native wildlife in captivity. With regard to exotic wildlife a permit is required to import, possess or release into the wild, except for those species listed in Schedule A. Schedule A lists about 43 different species of reptiles that are exempt from this regulation.

Export
A permit is required to export wildlife out of the province.

QUEBEC

An Act respecting the conservation and development of wildlife defines animal as "any mammal, bird, amphibian or reptile of any genus, species or sub-species propagating naturally in the wild in Quebec or elsewhere from indigenous stock, or not easily distinguishable from wild species by its size, colour or shape, whether or not it is born or kept in captivity; this term also applies to any part or to the flesh of such an animal."

Hunting & Capture
A license is required for hunting and trapping. A license is required to capture an animal for the purpose of keeping it in captivity.

Export
A license is required for the export of wildlife.

Regulation Respecting Animals in Captivity - General Obligations
Any person who keeps an animal in captivity shall:
1) provide it with drinking water at all times and with sufficient quantity and of sufficient quality to meet its physiological needs;
2) keep it in a clean place;
3) ensure that it has access at all times to a shelter that meets the needs of its species;
4) ensure that it receives the required health care.

Native reptiles
A license is required to keep most native reptiles in captivity. However, a license is not required to keep up to 2 common garter snakes. The snakes must be captured using a method that does not injure the animal.

Exotic reptiles
A license is not required to keep exotic reptiles in captivity, except for crocodiles, venomous snakes and lizards, and sea turtles. Consequently you may also sell, give away or kill the exotic reptile as you please. However, if you do sell the animal at retail, "the merchant must provide the purchaser with an information sheet approved by the Minister of the Environment and Wildlife and on which he must indicate the name of the species, its normal adult size and the conditions essential to its well-being."

A teaching institution or a research agency does not need a license to keep in captivity an animal of an exotic species.

A zoological garden license authorizes its holder to keep native and exotic animals in captivity and to exhibit them to the public for educational, recreational, scientific and touristic purposes.

A wildlife observation centre license authorizes its holder to keep animals native to Quebec in captivity and to exhibit them to the public for education, recreational, scientific or touristic purposes for at least 3 months per year.

A wildlife rehabilitation centre license authorizes its holder to keep in captivity, for rehabilitation purposes injured or orphaned animals of native species.

An animal broker's license authorizes its holder to keep in captivity, for commercial purposes, native or exotic animals of any species. The holder of a broker's license may not keep an animal for more than: 1) 30 days in the case of an animal that is neither imported nor exported; 2) 30 days in addition to the quarantine period where the animal is imported; 3) 3 months where the animal is exported.

A license to keep animals for exhibition purposes authorizes its holder to keep in captivity, for exhibition purposes, tame native or exotic animals, other than crocodilians, venomous snakes and lizards, and sea turtles.

ONTARIO

Wildlife in Captivity
The *Fish and Wildlife Conservation Act* requires anyone keeping native wildlife in captivity to obtain a license, regardless of the origin of the animal. "A herpetologist may keep the species indicated on a license to keep amphibians and reptiles in captivity." (Sic)

Regulations for the keeping of native wildlife species are currently being developed.

Reptiles and Amphibians
"Every person keeping, propagating or selling game or specially protected amphibians and/or reptiles must be licensed under the Act. This includes more than 30 native species of designated snakes, skinks, turtles, frogs, salamanders, toads, and tree frogs."

You do not need a license to keep legally harvested snapping turtles alive before butchering them.

The Act also states that individuals may keep one specimen of a reptile. This clause was presumably meant to exempt children and other individuals involved in the incidental take of reptiles for personal use.

Rehabilitation
The Act stipulates that the only individuals who may care for sick, injured or young game or specially protected wildlife are veterinarians or authorized wildlife custodians. However, you can keep wildlife temporarily (less than 24 hours) to transport to an authorized custodian.

MANITOBA

The *Wildlife Act* defines reptile as a Red-sided garter snake, Western Plains garter snake
Snapping turtle or Painted turtle.

The Act defines wildlife as: "vertebrate animal of any species or type that is wild by nature in the province, but does not include fish."

Hunting
A license is required for hunting.

Buying and selling
"No person shall sell, buy, trade or barter, or attempt or offer to sell, buy, trade or barter, or keep for the purpose of sale, trade or barter, any wild animal or parts of a wild animal except under the authority of a license or permit."

Possession
"Except as may be otherwise permitted by the Act, no person shall capture alive or have possession of any live wild animal."

Importing or Exporting
The importation or exportation of wildlife requires a license.

SASKATCHEWAN

The *Wildlife Act* defines "exotic wildlife" as all birds, mammals and other vertebrates that are not indigenous to Saskatchewan, and that in their natural habitat are usually found wild in nature, and includes any part of such birds, mammals or other vertebrates. It defines "wildlife" as i) a vertebrate animal of any species, excluding fishes, that is wild by nature in the province; ii) any part of (i); and iii) any exotic wildlife.

Hunting
A license is required for the hunting of wildlife.

Import & Export
A license is required for the import or export of wildlife.

Wildlife Regulations - Permitted hunting
Without a license reptilia (snakes and turtles), other than rattlesnakes, bullsnakes, hognosed snakes, smooth green snakes, eastern yellow-bellied racers, northern red-bellied snakes, short-horned lizards and snapping turtles, may be hunted, except when they are in a gram preserve, wildlife refuge or other protected area.

Traffic in Wildlife
Any person may without a license engage in, carry on or be concerned in the tanning, dressing, plucking, dyeing or treating or the raw or undresses hide, skin or pelt of any wildlife.

Captive Wildlife Regulations

License not required
A license is not required to keep the following native wildlife in captivity: reptilia (snakes), except for rattlesnakes, eastern yellow-bellied racers, northern red-bellied snakes, eastern short-horned lizards or turtles that have not been reared in captivity.

A license is not required to keep the following exotic wildlife in captivity: lizards, crocodilians and snakes, other than venomous snakes or snakes of the family Boidae (constrictors).

License required
Zoos which keep reptiles in captivity, other than those exempt above, require a license.

Dangerous wildlife
"No person shall hold captive wildlife which is dangerous by nature or known to be dangerous except in an enclosure which is surrounded by a secondary fence constructed so that the public cannot enter within one metre of the enclosure."

ALBERTA

The *Wildlife Act* defines an animal as a vertebrate, other than a human being or fish. It defines wildlife as big game, birds of prey, fur-bearing animals, migratory game birds, non-game animals, non-license animals and upland game birds, and includes any hybrid offspring resulting from the crossing of 2 wildlife animals.

Hunting
A license is required to hunt wildlife.

Possession and Commerce in animals
A permit is required to possess wildlife and controlled animals, unless you own a fur farm or a game animal production farm.

"Except as prescribed, a person shall not be in possession of an animal that is not a subject animal and that was imported into Alberta unless it was lawfully acquired in and lawfully exported from a jurisdiction outside Alberta."

A permit is required to import or export wildlife into or out of Alberta.

Trafficking
Not permitted unless specifically authorized by a permit.

Damage or threat caused by private animals
Privately owned animal means any animal that is not owned by the crown.

"Where a privately owned animal is believed to pose an immediate danger to any person or is damaging or is imminently likely to damage property, an officer or guardian may, if it is in the public interest to do so and he believes that doing so will remove the danger or prevent the damage or further damage, capture or destroy or attempt to capture or destroy the animal."

BRITISH COLUMBIA

The *Wildlife Act* defines wildlife as "raptors, threatened species, endangered species, game or other species of vertebrates, prescribed as wildlife..." Under Schedule A the following reptiles are included: pond and river turtles, soft-shelled turtles, snapping turtles, vipers, wall lizards, horned lizards, skinks, alligator lizards, garter snakes, rubber boa, racer, sharptail snake, night snake gopher snake, ground snake.

Import/Export
A permit (either provincial or CITES) is required to import or export live wildlife or the eggs of wildlife.

Hunting & Killing
A license is required to hunt. It is an offence to hunt endangered or threatened species. Snapping turtles are exempt from being hunted at a time not within the open season. A person is exempt from accidentally killing or killing in defense of property.

Possession
A license or permit is required to possess live or dead wildlife, except for slider turtles.

Trafficking
Trafficking in wildlife is not permitted except as authorized and this is only authorized for meat.

Release or escape of wildlife
Not permitted unless authorized by regional manager.

YUKON TERRITORY

The *Wildlife Act* defines wildlife as "vertebrate animals of any species or type that is wild by nature in the Yukon, but does not include fish."

Illegal and specially protected wildlife
According to the Act you cannot possess any animal that is wild by nature outside the Yukon.

Live animals
No person shall capture alive or have possession of any live wildlife. No person shall import into the Yukon any live animal that is wild by nature. No person shall release into the wild any animal that is wild by nature.

Hunting
A license is required to hunt or trap.

APPENDIX 7

SELECTED SCIENTIFIC & COMMON NAMES OF EXOTIC REPTILES

Scientific Name	Common Name(s)
Boa constrictor	Boa constrictor
Bradypodion fischeri	Fischer's chameleon, Uluguru two-horned chameleon
Caiman crocodilus	Brown caiman, Common caiman, Spectacled caiman
Chamaeleo bitaeniatus	Montane chameleon, Side-striped chameleon, Two-lined chameleon
Chamaeleo calytratus	Veiled chameleon
Chamaeleo dilepsis	Flap-necked chameleon
Chamaeleo jacksonii	Jackson's chameleon, Jackson's three-horned chameleon
Chamaeleo johnstoni	Johnston's chameleon, Ruwenzori three-horned chameleon
Chamaeleo laterispinis	Spine-sided chameleon, Spiny-flanked chameleon
Chamaeleo pardalis	Panther chameleon
Chamaeleo quadricornis	Four-horned chameleon
Chamaeleo senegalensis	Senegal chameleon
Chamaeleo verrucosus	Madagascar giant chameleon, Madagascar giant spiny chameleon, Warty chameleon
Corallis enydris	Amazon tree boa (also listed as *Corallus hortalanus*)
Corallus hortalanus	Amazon tree boa (also listed as *Corallis enydris*)
Cordylus mossambicus	N/A
Cordylus rhodesianus	Rhodesian girdled lizard, Zimbabwe girdled lizard
Cordylus tropidosternum	East African spiny-tailed lizard, Tropical girdled lizard, Tropical spiny-tailed lizard
Cordylus warreni	Warren's girdled lizard, Warren's spiny-tailed lizard
Cosymbotus platyurus	Flat-tailed house gecko, Common flat-tailed gecko, Asian house gecko
Cyrtodactylus consobrinus	Peter's slender-toed gecko
Daboia russelii	Russell's viper
Epicrates cenchria	Rainbow boa
Eryx Gongylophis colubrinus loveridgei	Kenyan sand boa
Eryx miliaris	Desert sand boa, Dwarf sand boa
Furcifer lateralis	Jeweled chameleon, Carpet chameleon
Furcifer verrucosus	Madgascar giant chameleon, Madagascar giant spiny chameleon, Warty chameleon
Gehyra mutilata	Mutilated gecko, Four clawed gecko
Gekko gecko	Today gecko
Gekko vittatus	White-lined gecko
Geochelone elegans	Indian star tortoise, Star tortoise
Gonocephalus chameleontinus	Eared tree dragon
Hemidactylus brookii	Brook's house gecko
Hemidactylus frenatus	House gecko
Hemitheconyx caudicinctus	Fat-tailed gecko, African fat-tailed gecko

Iguana iguana	Green iguana, Common iguana
Leiopython albertisii	White-lipped python, D'Albert's python
Lophognathus temporalis	Northern water dragon, Striped water dragon
Mabuya perrotetii	Fire-sided skink, Red-sided skink
Morelia amethistina	Amesthystine (rock) python, Scrub python
Morelia spilota	Carpet python, Diamond python
Morelia spilota variegata	Northwestern carpet python
Phelsuma kochi	Koch's day gecko
Phelsuma l. chloroscelis *Phelsuma laticauda*	Flat-tailed day gecko, Gold-dust day gecko
Phelsuma madagascariensis	Madagascar day gecko
Phelsuma quadriocellata	Four-spot day gecko, Peacock day gecko
Phelsuma v-nigra	Boettger's day gecko
Ptychozoon kuhli	Flying gecko
Python curtus	Sumatran short-tailed python
Python molurus bivittatus *Python regius*	Ball python, Royal python
Python reticulatus	Reticulated python
Takydromus sexlineatus	Longtail lizard
Tiliqua scincoides	Eastern blue-tongued lizard
Tupinambus merianae	Argentine black and white tegu
Tupinambus nigropunctatus	Golden tegu lizard
Tupinambus rufescens	Argentine tegu, Red tegu
Uromastyx acanthinura	Bell's Dabb lizard, Black spiny-tailed lizard
Uromastyx maliensis	Mali uromastyx
Uromastyx occelata	Eyed Dabb lizard, Ocellated Mastigure
Uromastyx ocellatus ornatus	Ornate spiny-tailed lizard
Varanus exanthematicus	African savannah monitor, Northern savannah monitor, Bosc's monitor, African large-grain lizard
Varanus niloticus	Nile monitor lizard, African small-grain lizard
Varanus prasinus	Emerald monitor lizard
Varanus salvator	Common water monitor, Water monitor, Malayan monitor, Plain lizard, Rice lizard, Ring lizard, Two-banded monitor

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