Quiroz, Ines Arroyo (2003) *Developing countries and the implementation of CITES: a case study of Mexico in the international reptile skin trade.* Doctor of Philosophy (PhD) thesis, University of Kent.

Developing countries and the implementation of CITES: a case study of Mexico in the international reptile skin trade

By

Inés Arroyo Quiroz

PhD in Biodiversity Management

Department of Anthropology

Durrell Institute of Conservation and Ecology (DICE)

University of Kent

October 2003

Abstract

This thesis examines the role of Mexico in international wildlife trade and the result for wildlife conservation in Mexico of becoming a Party to CITES. Mexico imports substantial quantities of non-native species of birds, mammals and reptiles, which exceed its exports of native species in the same taxonomic groups. Mexico has been the second largest re-exporter of products and derivative products from wild species in the Western Hemisphere, after the United States.

CITES was drafted with little attention to the problems faced by developing countries in maintaining their natural resources. Therefore, this thesis seeks to understand why Mexico acceded to CITES and how this relates to the way in which Mexico now seeks to implement its responsibilities under CITES. Many official and unofficial sources of political data were used to shape this study. Key informants were the main source of information, and were approached through semi-structured and focused interviews.

Mexico has a major role as importer, manufacturer, producer and distributor centre of reptile skins from non-native and native species. Indeed, the majority of re-exported commodities in Mexico are reptile skins. Therefore, this thesis also examines the use of reptile skins in the Mexican leather industry, through a combination of documentary research and survey methods. The main manufacturing centre in Mexico of reptile skin products made from both native and non-native species is Leon, Guanajuato. In contrast, Ciudad Juarez, Chihuahua, specializes in making cowboy boots mainly from non-native reptile skins. However, there is no formal and thorough study of the use of reptile skins in Leon and Ciudad Juarez. The only available information has been generated by economists and social scientists, and this is insufficient for making conservation decisions.

The World Conservation Monitoring Centre (WCMC) CITES Trade Database and the US Fish and Wildlife Service Law Enforcement Management Information System Trade Database (LEMIS) were employed to analyse imports, exports and re-exports of reptile skins and skin products from non-native and native species. Because Mexico only joined CITES in 1991, net trade figures from the CITES database could not be used. Instead, data on Mexican imports were those compiled from exporting countries as imported to Mexico. Likewise, data on Mexican exports and re-exports were those compiled by importing countries as exported or re-exported from Mexico. These data were used to determine the volume of trade and trends of specific species or genera over 1980-2001.

Since 1996, Mexico has implemented a programme for wildlife conservation and sustainable use (SUMA). Mexican policies on the use of reptile skins from native species under the SUMA were studied through documentary research, survey and semi-structured interviews methods. Through a combination of documentary research, survey and semi-structured interview methods, critical areas for illegal trade were identified where the harvesting of species, tanning of skins, manufacturing of skin products, and distribution of skins and skin products is more evident.

A number of key findings were derived from this study. Mexico was slow to adopt environmental policies and, when it did so, they mainly related to issues of pollution. When Mexico did finally recognise wider environmental concerns, the prospect of acceding to CITES was not considered seriously because of existing laws that, in theory, banned all wildlife trade in native species. Nevertheless, there was considerable national and international concern that large volumes of illegal cross-border trade were occurring with the US. When free trade negotiations were underway, Mexico responded to international pressure and acceded to CITES in 1991. However, it did so without fully weighing up the consequences of being a Party to the Convention. Internal disagreements over Mexico's position about acceding were accompanied by a lack of public debate and any clear understanding of the obligations of the treaty. It is only now that Mexico is beginning to understand its obligations and to play a full role in the workings of the Convention.

The use of reptile skins from native and non-native species is a distinctive industry for the Mexican leather and footwear sector in relation to other countries. The leather and footwear industry of Leon is larger and more intricate than that of Ciudad Juarez. Although Mexico has adopted the SUMA, the Mexican leather industry still relies on reptile skins from non-native species taken from the wild. In contrast, the smaller numbers of skins used from native species mainly derive from captive breeding schemes that although biologically sustainable, provide no incentive for habitat conservation. Contrary to its objectives of protecting native species, the bans on use of native species has increased the illegal distribution of reptile skins and skin products from native species. Levels of illegal trade and the impact of this trade on wild populations are difficult to estimate since status information is limited, dispersed and hard to access. Sustainable use of reptile skins from native species could positively encourage conservation in Mexico. However, as a megadiverse country with potential to produce wildlife, Mexico will have to implement an appropriate regulatory framework to support local communities to promote the sustainable use of native species.

Acknowledgements

I would like to thank numerous people and institutions for their support and advice during the developing of this thesis.

I am very grateful to the Consejo Nacional de Ciencia y Teconlogía (CONACYT) for funding my tuition at the University of Kent and covering my stipend throughout the Phd programme.

My deepest indebtedness goes to my supervisor Professor Nigel Leader-Williams of the Durrell Institute of Conservation and Ecology (DICE) who has followed my development from the very start of the project to this stage and has provided much valuable advice on the design, execution and write up of the study. I am also indebted to my co-supervisor M. en C. Ramón Pérez-Gil for his unreserved help and encouragement throughout the study.

Special thanks to Dr. Alison Rosser of IUCN Wildlife Trade Programme who has been an inspiration, and I thank her for all her support. I am also grateful to Director Simon Habel and Deputy Director Craig Hoover of TRAFFIC North America for assisting in the design of the study, for sharing their experience gained over the years of studying wildlife trade, for allowing me to gain access to the WCMC CITES Trade Database and USFWS LEMIS Trade Data while based in Mexico and US at start of the project, and for responding quickly to my requests at all times. Dr. John Caldwell of WCMC also gave me access to the WCMC CITES Trade Database while in UK. Thanks are extended to Biol. Oscar Sánchez, Biol. Eleazar Loa and Biol. Juan Pérez for inspiring me in conservation, assisting in the design of the study in the early stages of the project development and for all the help provided over the years. Also I would like to thank Dr. Raúl García Barrios for his advice during different stages of the project.

Gratitude is also extended to all staff of institutions and private individuals who were welcoming and supportive of the project. These include the Office of the Attorney General for Protection of the Environment (PROFEPA) in Mexico, who provided permits, access to custom offices, and enthusiasm. Special thanks are due to Dr. José Bernal Stoppen, Biol. Silvia Philippe, MVZ Luis Domenzain, Biol. Carlos Contreras, Biol. Guadalupe Ávila, Biol. Lilia Mondragón, and MVZ Uhry Adib. TRAFFIC Mexico provided help whenever requested. Special thanks are due to Biol. Adrián Reuter who kindly supported my fieldwork.

FAUNAM AC provided open access to library, office space, and access to telephone, fax and e-mail. Special thanks are due to Roberto Romero and Dolores Corral who provided assistance and enthusiasm throughout the project. COCOMEX gave approval to visit its crocodile farm in Culiacán, Sinaloa. Special thanks are due to Biol. Francisco León and Verónica Beltrán who had the patience to answer all of my questions. I am also grateful to Prof. Ernesto Badillo, Dr. Raul Avila, DI Julio Enriquez, Biol. Francisco Villegas, Victoria Fernández and Marta Pacheco, who openly and kind-heartedly shared their valuable knowledge and experience with me.

I would like to thank DICE staff who has helped me in every stage of the project. Special thanks go to Joan England, Shelley Roffey and Nicola Kerry-Yoxall. I would also like to thank my fellow students at DICE for caring for me and making my stay in Canterbury enjoyable. Thank you Bob Smith, Hector Magome, Lim Chan Koon, Norha Abu Hanifah, Noah Sitati, Julia Baker, Matt Walpole, Matt Linkie and, Mounir Abi-Saida. I specially thank Melissa Arriola for her support in every stage of the project.

For their love and support thanks are extended to families Yaschine-Arroyo, Avila-Akerberg, Arroyo-Cano and friends Alejandro Cadaval, Itziar Familiar, Dagmar Gerdes, Deni Rayn, Maria Fernanda Sahagun and Sue Hopkinson.

Finally, my thanks go to my family, who constantly inspired me to continue my studies. Particular thanks go to my mother Sara Quiroz and my father Pedro Arroyo who have always embraced me in every way. Special thanks to my sister Claudia Arroyo and her husband André Dorcé for encouragement and making my stay in the UK easy and musical. My profoundest gratitude goes to my husband Andrés Avila for his love and care sustained me throughout the project.

Table of Contents

Page

List of Plates

Table of Figures

List of Tables

Chapter 1

1 General Introduction

This thesis focuses on the commercial trade in wildlife in Mexico. Wildlife trade has directly and indirectly affected the conservation of Mexican biodiversity at the species level. Mexico has also been an important entrepôt for wildlife trade to the United States, as well as a consumer and manufacturer of wildlife products. Equally, Mexico has been a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1991. The study aims to compare Mexican policies on wildlife trade before and after it acceded to CITES, with special reference to policy, including administrative arrangements and legal instruments, and the implications for Mexico resulting from being a Party. A major rationale of this study is to explore the role of Mexico in international wildlife trade and any resulting success for wildlife conservation in Mexico as a result of being a Party to CITES. The thesis examines the reptile skin trade, both in non-native as well as native species, to determine the extent to which Mexico has, and is currently, implementing its policies towards CITES. I begin this thesis with two introductory chapters. Chapter 1 outlines the concerns of conservationists regarding wildlife trade, the measures taken internationally to regulate it, and the importance of measures that have to be implemented nationally by countries like Mexico. Chapter 1 also shows how important is Mexico as a centre of global biodiversity. Chapter 2 reviews what is known from already published sources about the extent of Mexico's involvement in the wildlife trade. These two chapters provide the basis for defining the aims and objectives of this thesis, which are outlined at the end of Chapter 2.

1.1 Conservation and Wildlife Trade

International wildlife trade comprises the import, export, or re-export of live animals and plants, as well as their parts and products, across national borders. When this trade is uncontrolled or mismanaged, it can seriously affect the survival of some of the Earth's most spectacular flora and fauna. Rhinos, sea turtles, macaws, and certain species of cacti are just some of the wildlife threatened by exploitation for international markets. Commercial hunters and collectors frequently kill or remove these and other species, with little or no regard for how many individuals the population can replace through natural reproduction (Fitzgerald, 1989). Resource economists have documented the financial benefits of harvesting the whole stock immediately and reinvesting the proceeds in an enterprise yielding a higher rate of return than that of a naturally growing stock (Clark, 1973, 1990). As a result, trade in wildlife and its products makes conservationists understandably nervous (Caughley & Gunn, 1996; Milner-Gulland & Mace, 1998), while some authors suggest that no form of commercial trade in wildlife can ever be sustainable (Robinson & Bennett, 2000).

The excessive harvesting of wildlife species for commercial gain is one of the main threats to species diversity (Diamond, 1989; McNeely, A.J. *et al.* 1990; Mace & Balmford, 2000). History is replete with examples of wild animals exterminated for commercial exploitation (King, 1978; Robinson & Bennett, 2000). It is estimated that almost 40% of all vertebrate species that now face extinction do so because of hunting for trade (Fitzgerald, 1989). World trade in wild species is a large, complex, and lucrative business from which substantial earnings are made (Fuller *et al.*, 1987; Fitzgerald, 1989; Roe *et al.*, 2002). As an exploited species becomes more rare, or as the consumer demand grows, their value increases further (King, 1978). International trade in wildlife species was estimated to be worth at least $5 billion annually in 1989. It included some 40,000 live primates, tusk ivory from at least 90,000 killed African elephants, at least 1 million live orchids, 4 million live birds, 10 million reptile skins, 15 million pelts from wild furbearers, over 350 million tropical fish, as well as other items as diverse as kangaroo leather and tortoiseshell trinkets (Fitzgerald, 1989). The minimum declared value for the wildlife trade worldwide now exceeds $10 billion, excluding timber and fisheries products (Hemley, 1994; Dobson, 1998; Roe *et al.*, 2002).

Depending on which way particular species move in international commerce, nations can be classified as exporters, re-exporters or entrepôts, and importers. Twenty-five years ago, the greatest volume of international trade in wild species was unidirectional and moved from the less developed nations of Latin America, Africa, and Asia, which are primarily exporters or producers of wildlife, to the affluent industrialised nations of North America, the European Economic Community (now EU), and the Far East (Japan, China, Korea, Taiwan and Hong Kong), which are the major importers or consumers (Figure 1.1) (King, 1978; Fuller *et al.*, 1987; Cantú & Sánchez, 2000). Developing countries were an abundant source of skins, furs, meat and manufactured products, as well as live animals and plants. Their export trade was fuelled by the strong consumer demand in the industrialised nations (Hykle, 1988). It supplied their profitable fashion and food industries, as well as by users of rare animals and plants for medical/pharmaceutical research, exhibition or collection purposes (Sand, 1997).

Main Exporters		Main Importers
Argentina, Bolivia, Brazil, Central African Republic, China, Congo, Guyana, Honduras, Indonesia, **Mexico**, Paraguay, Peru, Philippines, Senegal, South Africa, South Korea, Sudan, Tanzania, Thailand, Turkey, USSR and Zaire	→	Canada, Korea, China, EEC, Hong Kong, Japan, Singapore, Taiwan and United States

Figure 1.1 Some of the major exporters and importers of wildlife
(modified from Fitzgerald, 1989)

There is now increasing production through captive breeding in the United States and elsewhere. Nevertheless, despite increased home production, most exports from developing countries still go to Europe, US, Japan and, increasingly, to China. For example, exports to the US include: hyacinth macaws from Brazil; monitor lizards from Indonesia; butterflies from New Guinea; chimpanzees from Zaire; chameleons from Madagascar; and parrots from Mexico; among others. Exports to Europe include: orchids from Thailand; grey parrots from Ivory Coast; reptile skins from Argentina; cacti from Mexico; and ivory from Zimbabwe; among others. Exports to the Far East include: whale meat from Antarctic; rhino horn from South Africa; tiger bones and skins from India; and bear legs and gall bladders from Canada; among others (Cantú & Sánchez, 2000).

International trade also uses countries like re-export springboards. For example, in Central America, the traffic of species flows towards El Salvador and from that country to others; in South America, the main re-exporters are Argentina and Surinam; in North America, Mexico and Cuba; in Europe, Holland, Belgium and the Czech Republic; in Africa, Senegal and South Africa; in the Southeast of Asia, Indonesia and Thailand, and in the Far East, Taiwan and Hong Kong (Cantú & Sanchez, 2000).

Although there are no reliable estimates of the total volume or value of annual wildlife exports from Latin America, trade data from major wildlife importing nations suggest that approximately one third of the wildlife commodities on the world market come from this region (Fuller *et al.*, 1987). Millions of crocodile, turtle and snake skins, as well as other products, were exported from Latin America during the 20th century. Many species such as felids have been hunted nearly to extinction throughout their geographic range (Ceballos & Sanchez, 1994). In South America, Brazil, Colombia, and Peru are home to the fauna most sought by animal traffickers, while Argentina, Paraguay and Uruguay typically serve as transit points or re-exporters for markets in Asia, Europe and the US (Epstein, 2000).

The world market for wildlife is particularly varied. International trade in wild species may be of live specimens, such as plants for display, and butterflies, fish, snakes, parrots for pets. It may also include dead specimens or derivatives, such as shells and insects for collections, ivory, rhino horns, skins, furs and bones for trade, and invertebrates for medicinal use (UNEP, 1995). Some species may be used for a variety of purposes. For example, sea horses (*Hippocampus* spp.) are globally exploited for use as medicines, aquarium fishes, curios, and even foods. The trade in live and dead seahorses is thought to encompass at least 32 countries and territories in all continents, and new seahorse fisheries are appearing all the time (Vincent, 1996). Many other examples abound. The market for swiftlet nests (*Collocallia* spp.) increased dramatically in the late 1980s in Hong Kong, Taiwan and Japan. In 1989, an absolute minimum of 159 tons of swiftlet nests entered international trade, which is equivalent to approximately 19.9 million nests, based on an average nest weight of 8g (Lau & Melville, 1994). Rhino horns are used in medicines and as dagger handles, and other rhino products such as skin and blood are also used (Leader-Williams, 1992). More than 120,000 cubic meters of big-leafed mahogany (*Swietenia macrophylla*) from Latin America enters international trade annually (Freese, 1998). The species is exported from at least 14 Latin American countries and imported by 15 countries, primarily in North America and Europe. In 1998, for example, the equivalent of an estimated 57,000 big-leafed mahogany trees was harvested and shipped to the US to supply a robust business in mahogany furniture (Robbins, 2000).

Although the world market for wildlife incorporates numerous and diverse species of flora and fauna, particular species predominate in the trade worldwide, including primates, live birds, and reptiles (Table 1.1).

Table 1.1 Significant species traded worldwide

Taxonomic group	Estimated minimum annual world trade	Description
Primates	25,000-30,000 Live specimens	Most of the primates traded around the world are non-endangered species, such as crab-eating macaques, used for biomedical research. Nevertheless, some highly endangered monkeys and apes such as chimpanzees are still seriously threatened by pet, circus, and biomedical trade demands.
Birds	2-5 million Live specimens	Although perching birds or passerines, such as finches, constitute the greatest number of birds traded internationally, parrots, or psittacines, are perhaps most threatened. In the early 1970s, possibly 7.5 million birds were traded each year. Because of increased restrictions and better enforcement of regulations, the wild bird trade has declined significantly. In recent years, major exporters have been Argentina, Guyana, Indonesia, Senegal and Tanzania. Many of the large parrots, such as macaws and cockatoos, are rare as a result of habitat loss and commercial exploitation because of high prices paid by some bird traders. This perpetuates the smuggling of these and other rare birds out of countries such as Brazil, Mexico, and Australia.
Reptiles	3 million live farmed turtles; 2-3 million other live reptiles; 10-15 million raw skins; 50 million manufactured products	Illegal trade in reptile skins has traditionally been a lucrative business because high prices are paid for many reptile-leather products in fashion markets. However, certain crocodilian species are increasingly farmed or ranched for commercial use in a legal and controlled manner. Equally, illegal trade problems remain with species such as caiman, which are poached in Brazil and smuggled into neighbouring countries for illicit export to international markets. Endangered species, like the South American black caiman, are also sometimes killed illegally for their high-quality hides. Products from endangered sea turtles, especially the hawksbill turtle, from the Caribbean and Southeast Asia, continue to be of worldwide conservation concern. Many other species, particularly snakes and lizards, are traded live in the hundreds of thousands.

Modified from Hemley (1994)

The scale of over-exploitation for trade aroused such concern for the survival of species during the 1960s and 1970s that moves were made to draw up an international treaty to protect wildlife against such over-exploitation, and to prevent international trade from threatening species with extinction (CITES/C&M, 1994).

1.2 The International Trade in Wildlife and its Regulation

In 1963, the IUCN, currently known as the World Conservation Union, passed a resolution calling for "an international convention on regulations of export, transit and import of rare or threatened wildlife species or their skins and trophies". This resolution eventually gave rise to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. A first draft of the Convention was circulated in 1964, while a list of species to be regulated was presented at the 1969 IUCN General Assembly. A second draft of the Convention was circulated in 1971. The UN Stockholm Conference on the Human Environment adopted Recommendation 99.3 in 1972. In response to this, 88 countries discussed the draft Convention at a plenipotentiary conference held in Washington DC in February and March 1973. CITES was signed on 3 March 1973 and entered into force after its tenth ratification in July 1975 (Wijnstekers, 2000).

This Convention was the culmination of several decades of concern about the rapid growth in wildlife trade and its effects at the species level (O'Connell, 1996). Nevertheless, the direct role of international trade in causing extinctions is generally less significant than other factors, particularly habitat loss (OECD, 1999). For instance, the most pervasive and over-riding threat to the birds, mammals and plants on the 2000 IUCN Red List is habitat loss and degradation, which affects 89% of all threatened birds, 83% of the threatened mammals and 91% of threatened plants (Hilton-Taylor, 2000). However, the IUCN Red List also showed that direct loss and exploitation, of which international trade is a subdivision also have a major impact on 37% of all birds, 34% of all mammals and 8% of all plants. The analysis showed that trade, both legal and illegal, impacts 13% of the total number of threatened birds and threatened mammals in the group sampled, while less than 1% of the total number of threatened plants were impacted by trade.

Since CITES came into force in 1975, its guiding philosophy has gradually, and sometimes grudgingly, evolved away from the relatively simple structure of controls towards a more sophisticated approach incorporating positive or innovative measures and conservation benefits (Hutton & Dickson, 2000). The new measures include the split listing of different populations of the same species in different appendices; the use of quotas for trade; provision for the ranching (or captive rearing) of wild species; commercial captive breeding for Appendix I species; non-commercial trade in Appendix I trophies, ranching, quotas for trophies of certain Appendix I listed species; special conditions for the transfer of species from Appendix I to Appendix II;

annotations allowing the transfer of species listed in Appendix I under specified circumstances; and the Significant Trade Process for species listed in Appendix II (IUCN, 1998; Dickson, 2002). This philosophical change has resulted from a number of developments (Dickson, 2002) including:

- a better understanding of the complex threats facing wild species;
- the fuller participation of developing countries who have been increasingly vocal in putting their case to CITES;
- the increased influence of social scientists in general, and of economists in particular, on conservation thinking;
- the increasing emphasis on various forms of community-based conservation (CBC) in place of protected area (PA) models of conservation; and,
- the greater concerns over listing more commercial species of timber and fish, and less patience with purely conservation concerns.

1.2.1 The aims of CITES

The Preamble of the Convention states that the objective of CITES is to prevent the overexploitation of species through international trade and to ensure their long-term survival. The ultimate aim of the Convention is undoubtedly to promote species conservation (IUCN, 1998). CITES establishes an international legal framework for the prevention of trade in endangered species and for an effective regulation of trade in certain other species (Rosser & Haywood, 2002). It aims to regulate the exploitation of nature for profit, the trafficking in illegal goods, and the use, killing or capture of wild animals (Huxley, 2000).

CITES gives producer and consumer countries joint responsibilities and creates a forum for international cooperation. It also provides for monitoring of trade levels (Rosser, 1997). CITES has been recognized by many professionals working in the field of wildlife conservation as a remarkably potent tool which, if used well and applied correctly, could lead to substantial progress in halting the overexploitation of wildlife resources (Huxley, 2000). The relevance and significance of CITES (see Groombridge, 1992; O'Connell, 1996; Caughley & Gunn, 1996; Swanson, 1997) has been recognised worldwide through the steady increase in the number of Parties. By October 2003, 164 nations had ratified the treaty since its original signing in 1973 (CITES Secretariat, 2003).

CITES offers a mixture of bans on international trade for endangered species, and regulation of the trade in species not now threatened with trade, but which may become so if trade were not regulated. However, part of the weakness of CITES is that it has not always been successful in enforcing its bans and regulations (Dickson, 2003). Where it has attempted to ban trade, illegal trade has often flourished, and where trade has been allowed, CITES has often been unable to regulate it effectively. Given also that the loss of suitable habitat is the most significant threat for many species, the measures that can be taken under CITES may be quite inappropriate. Indeed, in restricting trade in wild species, and so limiting the benefits that humans can derive from them, CITES may have actually reduced the incentive to maintain wildlife habitat for some species (Hutton & Dickson, 2000).

A recent study by IUCN (2001) explicitly recognised the difficulty of assessing the effectiveness of CITES trade measures. There is often a lack of suitable data. As importantly, many different factors, of which trade measures are just one, can affect what is happening to a species. The authors suggested, for example, that factors such as price elasticity of supply and demand, the taste for illegal goods and the costs of enforcement, may all and variously affect the success of trade bans (Dickson, 2002).

The growing acknowledgement of the importance of habitat loss as a threat to wildlife has led some to conclude that the human use of wildlife, and commercial trade in particular, can actually be a positive force for conservation provided it is carried out at biologically sustainable levels. If people can benefit from wildlife, they have a positive incentive to maintain wild habitat and not to convert it to other uses (Hutton & Leader-Williams, 2003). The key issue is whether the off-take of a species is biologically sustainable in the long-term, and not the use to which the species is being put. This poses a key challenge to the basic assumptions contained in CITES, and the debate over the effectiveness of CITES has quickened in recent years. Nevertheless, while the Convention has also gone some way towards recognizing the conservation benefits that use can have (Hutton & Dickson, 2000).

1.2.2 The implementation of CITES

CITES maintains three appendices that determine the level of restriction placed on the trade in listed species of animals and plants (O'Connell, 1996). Appendix I includes all species threatened with extinction, which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances[1]. Appendix II contains all species which, although not necessarily now threatened with extinction, may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival. In addition, Appendix II can also list the so-called "look-alike" species that must be subject to regulation in order that trade in specimens of certain species may be brought under effective control (CITES Secretariat, 2003). "Look-alike" species are not necessarily threatened themselves, but closely resemble other listed species, in order to help customs officials recognize shipments that should be checked (Hemley, 1994). Appendix III includes all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the co-operation of other Parties in the control of trade (CITES Secretariat, 2003).

CITES regulates international trade through a system of permits and certificates required for the export, re-export, or import of wildlife and wildlife products [Articles III, IV, V and VI]. The degree of regulation applying to trade in particular animal and plant species varies according to Appendix. For Appendix I species, both a CITES import permit and export permit must be granted subject to various specific conditions, notably whether the trade will be detrimental to the survival of the species [Article III].[2] Appendix II species can be traded only if a CITES export permit is granted, which requires that the CITES Scientific Authority considers that any trade will not be detrimental to the survival of the species and will not affect its role in the ecosystem. However, in practice, countries vary in their capabilities and incentives to provide these "non detriment findings" on the basis of sound, scientific knowledge (OECD, 1999; Rosser &

[1] Exemptions concern acquisition of the specimen before the Convention entered into effect for that species, personal effects, certain captive bred or artificially propagated specimens, and use for scientific institutions (Article VII).
[2] The language of the CITES articles and subsequent resolutions ties the term "detrimental" specifically to the survival of the particular species. When applied to single species, survival is the opposite of extinction. On this basis, biological principles offer the best hope of leading towards appropriate definition(s) of the term "detrimental" in relation to international trade in species. In contrast, economic or social sustainability

Haywood, 2002). In the case of Appendix III species, the permitting process differs according to whether exports originate in the listing country or in another range State. For the former, an export permit must be granted following a finding that the specimen was legally obtained. For the latter, Management Authority of any other Party exporting an Appendix III species must issue certificates of origin (OECD, 1999).

The vast majority of CITES-listed species are on Appendix II. These listings are central to the future effectiveness of CITES, in that they prevent the endangerment of a species before it gets caught in the downward spiral toward extinction and must be listed on Appendix I (OECD, 1999; Wijnstekers, 2000; Leader-Williams, 2002). If an Appendix II species becomes threatened with extinction as a result of utilisation incompatible with its survival, Parties to CITES face the prospect of including this species on the more restrictive Appendix I that does not allow international trade for commercial purposes. Therefore, a central tenet within CITES remains making effective non-detriment findings for Appendix II species (Rosser & Haywood, 2002). Equally, successive CITES Conference of the Parties (COP) have acknowledged that non-detriment findings were not always being made. Resolutions have been drafted to encourage the Scientific Authority of the exporting country to undertake the necessary scientific review to determine whether harvests of species listed on Appendix I and II, and destined for international export, are appropriate in relation to factors affecting the status of populations under their care (Leader-Williams, 2002).

Concerned at the lack of appropriate non-detriment findings and mechanisms to address these concerns other than trade bans, the Parties established an ongoing review process to review trade volumes and identify species for which trade volumes appeared to be 'significant', i.e. potentially detrimental. After some years of initial development the 'significant trade review process' for animal species was formalized in Resolution Conf. 8.9 (Rev.) (Trade in specimens of Appendix II-listed species taken from the wild). In addition to providing for a CITES Animals and Plants Committee review of trade volumes and the identification of species for which there are potential problems, the process allows for recommendations to be made to range States about information needs and/or proposed remedial actions such as reducing trade volumes. In cases where range States fail to respond adequately to these recommendations, Resolution Conf. 8.9 (Rev.) also

as they apply to our current understanding of sustainable use do not appear relevant, as the Convention does not appear to require a Scientific Authority to give advice on these issues (Leader-Williams, 2002).

provides for further measures under the auspices of the CITES Standing Committee including, if necessary, the suspension of further imports (Mulliken & Barden, 2002).

The significant trade process clearly has an important role to play in ensuring that the trade of Appendix II species remains within sustainable levels (Hutton, 2002). The review called for by the Animals and Plants Committees would allow the Parties to analyse the responses to and effectiveness of different types of recommendations applied thus far, as part of assessing how the process might be improved further in future, including through taking into account socio-economic considerations. However, the significant trade process alone will not be sufficient to secure the future of Appendix II species in trade. Increased investment is needed to improve the capacity of exporting range States to make accurate non-detriment findings. A stronger link between the significant trade process and capacity building for Scientific Authorities will be necessary if the goals of species conservation and sustainable use are to be achieved (Mulliken & Barden, 2002). Only through ensuring that non-detriment findings are properly implemented can we enjoy the benefits that well-managed trade can make to species conservation in the long term (Hutton, 2002).

1.2.3 CITES in developing countries

CITES was drafted with little attention to the problems faced by developing countries in maintaining their natural resources. The CITES focus on identifying endangered species and regulating trade in these species might make sense in developed countries. However, for those who share their lands with the vast majority of the remaining wildlife, it is not a very constructive approach to conservation (Swanson, 1997; 2000).

Biodiversity-rich countries support the most species, yet face unprecedented development and population pressures (Balmford *et al.*, 2002). In these areas, a doubling and redoubling of the human populations is a virtual certainty over the next 50-100 years. Population growth rates of 3-4 % per year are the norm throughout much of sub-Saharan Africa, Latin America and southeast Asia. In addition, there is also pressure for development in these regions. Of the 15 countries that feature prominently in terms of diversity of higher species, including reptiles, birds, and mammals, none has an average per capita annual income greater than US$2,000. In fact, most of these countries register average incomes that are among the lowest in the world, around US$200-500 annually. Hence, the vast majority of the world's species lie within the borders of the poorest nations (Swanson, 2000).

Negotiators of CITES did not have sustainable development *per se* uppermost in their minds when working on its successive drafts. Indeed, the final text does not contain terms "development" or "developing countries". Furthermore, the CITES system of controls quickly ran into one of the realities of under-development, namely the lack of institutional capacity in many developing countries to administer a complex agreement. This had two key consequences. Firstly, there were difficulties in getting the system to function with the lack of basic infrastructure to administer trade controls. In several cases, exporting countries had no specialised administrative authority in charge of issuing export permits. In others, there was no capability to print the official security CITES permits. Secondly, importing countries realised that export permits issued by many developing countries, were not necessarily based on particularly sound non-detriment findings by a competent Scientific Authority (OECD, 1997).

As a result, the Third COP recognised that two-thirds of CITES Parties were developing countries, which encounter special difficulties in implementing CITES. Therefore, the COP called on Parties to include technical assistance in bilateral and multilateral programmes of development aid (Resolution Conf. 3.4). Requests for training were met through training seminars by the Secretariat (OECD, 1997). Liaison has also been established with the World Customs Organization (WCO) to harmonize procedures and training materials, and with INTERPOL to coordinate training for police officers in charge of combating illegal trade. However, compliance also requires behavioural changes in wildlife consuming countries (Sand, 1997).

Another important aspect of how CITES is addressing developing country interests concerns the growing profile afforded to use resources sustainably. Resolution Conf. 8.3 recognises that commercial trade may benefit the conservation of species and ecosystems and/or the development of local people when carried out at levels that are not detrimental to the survival of the species in question (Rosser & Haywood, 2002). If the various provisions in the Convention requiring non-detriment findings before allowing trade were implemented, the mechanisms of the Convention would be sufficient to allow for sustainable utilisation. However, a review of the effectiveness of CITES found a spectrum of views on the issue of sustainable utilisation among CITES Parties (OECD, 1997). Indeed, it was suggested that the national experience in applying the concept of sustainable utilisation should be analysed, perhaps most fruitfully in cooperation with a partner organisation, such as the IUCN and the CBD.

Recently, developing countries have come to recognise CITES as a forum in which they can press their interests with some success. In response to these pressures, CITES has shown itself to be a flexible instrument and, although it has not always evolved in a consistent direction, it has developed a range of tools and mechanisms for achieving conservation goals. In recent years there have been attempts to assess how effective trade measures are in promoting conservation aims and tentative moves to address the relationship between conservation and development goals (Dickson, 2002). Today, for instance, developing countries have become more forceful in putting forward their own case. Southern African countries have been particularly prominent in promoting a new perspective on conservation. Many wish to distance themselves from the preservationist approach that they see as a legacy of the colonial period. Indeed, they emphasise that if conservation is to be successful it must provide tangible benefits to those who live closest to the wildlife (Hutton & Dickson, 2000).

1.2.4 CITES implementation at the national level

Like any international agreement, the success of CITES can only be as good as the measures taken nationally by its Parties. With 30,000 plant and animal species, and a range of commodities from live elephants to plant-derived medicinal preparations subject to trade controls, CITES implementation and enforcement can present a considerable challenge (TRAFFIC Dispatches, 1998).

When a country becomes a Party to CITES, it agrees to fulfil certain obligations described in the treaty text. It then remains for individual Parties to decide how best to fulfil their responsibilities under CITES. New signatories should be prepared to take appropriate, usually legislative, measures to implement the Convention. At a minimum, the legislation should commit the country to abide by all CITES mandates, and it may also incorporate measures stricter than the convention itself (Hemley, 1994).

The enactment of national laws for this purpose, and the empowerment of suitable national administrative agencies to enforce them is a crucial step in the effective implementation of CITES at a national level. As a non-self executing treaty, the enforcement of CITES depends entirely upon the adoption of appropriate legislation in each signatory country (Sand, 1997). Parties must take a series of appropriate measures, including those to prohibit trade in specimens violating the Convention. Furthermore, they must also design legislation that penalises violations of the latter provision and provides for the confiscation of any specimens traded illegally (OECD, 1997).

There is no single uniform 'model law' suitable for CITES implementation in all countries, given the diversity of national legal systems and administrative traditions (Sand, 1997). Nevertheless, the implementation of CITES does call upon government action in the case of wildlife conservation and foreign trade, including Customs, to each have their own specific legislation, procedures and authority. There are, in addition, usually a number of other laws that apply to the import or export of wild animals or plants and their products. These include wildlife legislation governing the export, and sometimes the import, of indigenous protected species; laws establishing controls on wildlife trade for public health, welfare, veterinary or phytosanitary purposes; and, rules controlling the introduction of alien species (de Klemm, 1993).

As a result, several government departments are usually involved in the international trade in CITES specimens: wildlife and natural resources; foreign trade; finance, usually also covering customs; and agriculture, for animal and plant health matters. Foreign affairs ministries are also concerned, because the implementation of an international convention is at stake. In addition, federal states are also competent in some nations, under their constitutions, in certain matters such as the granting of permits or the control of possession of CITES specimens or domestic trade. The distribution of powers between the legislative and executive branches of government is determined by the constitutions of individual Parties, and may vary from one country to another. Nonetheless, it is of major importance that national legislation sets out clearly what are the respective duties of the various authorities concerned in order to avoid duplication, discrepancies or confusions as to which is the competent authority in each case (de Klemm, 1993).

The failure to adopt appropriate domestic legislative and regulatory measures may prevent Parties from utilising the trade policy instrument foreseen for implementation of CITES. In other words, countries without appropriate legislation have no framework to verify the validity of the import, export and re-export permits and certificates essential for regulating trade in CITES-listed species, or to interdict or seize shipments, or to prosecute violators. The lack of a legal framework for the implementation of CITES also affects the ability of many Parties to monitor and report trade effectively (OECD, 1997).

The problems of combating illegal trade are often related to the extent to which individual states are prepared to implement the treaty (Heijnsbergen, 1997). Whenever seizures are made or serious irregularities are noted, it is important to inform the CITES authorities of the countries of destination or origin. Such information can be useful to investigate wrongdoings (Hjarsen, 1999).

CITES does not provide explicitly for incentive measures aimed at ameliorating the costs of implementing the Treaty. However, as noted earlier CITES has adopted "innovative or positive" trade measures, which act to facilitate carefully regulated trade under certain conditions, thereby providing economic benefits as an incentive to promote species conservation. The innovative measures show that the Convention is evolving to meet new challenges associated with the regulation of international wildlife trade (IUCN, 1998). Mexico is one 'megadiverse' country that is seeking to meet these challenges.

1.3 Mexico

1.3.1 CITES implementation

In Mexico, CITES is incorporated into national law and is found on a normative level, between the Constitution and ordinary law. CITES is incorporated into the law of the Republic and as such its entire text is subject to compliance through Mexico. The ratification of international treaties by Mexico become law once the Senate has approved them and they are published in the National Federation Diary (DOF), in accordance with the Law governing International Treaties (UNEP-CITES Secretariat, 1997).

An analysis of the legislation for countries such as Mexico that are governed by civil law should consider: first, the distribution of CITES provisions among different laws; and, second, the large quantity of rules of different hierarchies derived from the laws. In accordance with the hierarchy of Mexican judicial process, an analysis of the legislation applicable to the CITES Convention should begin with the Constitution, as Mexico's supreme law, and continue with International Treaty law and Federal law, and then proceed to ordinary law, regulations, official Mexican Norms, and other administrative laws (UNEP-CITES Secretariat, 1997).

1.3.2 Megadiversity status

Mexico has a wide variety of ecological characteristics that are unique worldwide, due to its geographical location, shape, climate, orography and geology (INEGI, 2002). Mexico's biological richness arises from a great variation in habitats and diverse ecological regions, complex topography, heterogeneity of soils and climate, geological history, and geographic location. Mexico bridges two major biogeographic realms of the world, namely the Neartic and the Neotropical (Figure 1.2), which has facilitated the exchange between elements of northern boreal and tropical origins. This great array of interacting species and organisms has created unique ecosystems of international importance (McNeely, 1990).

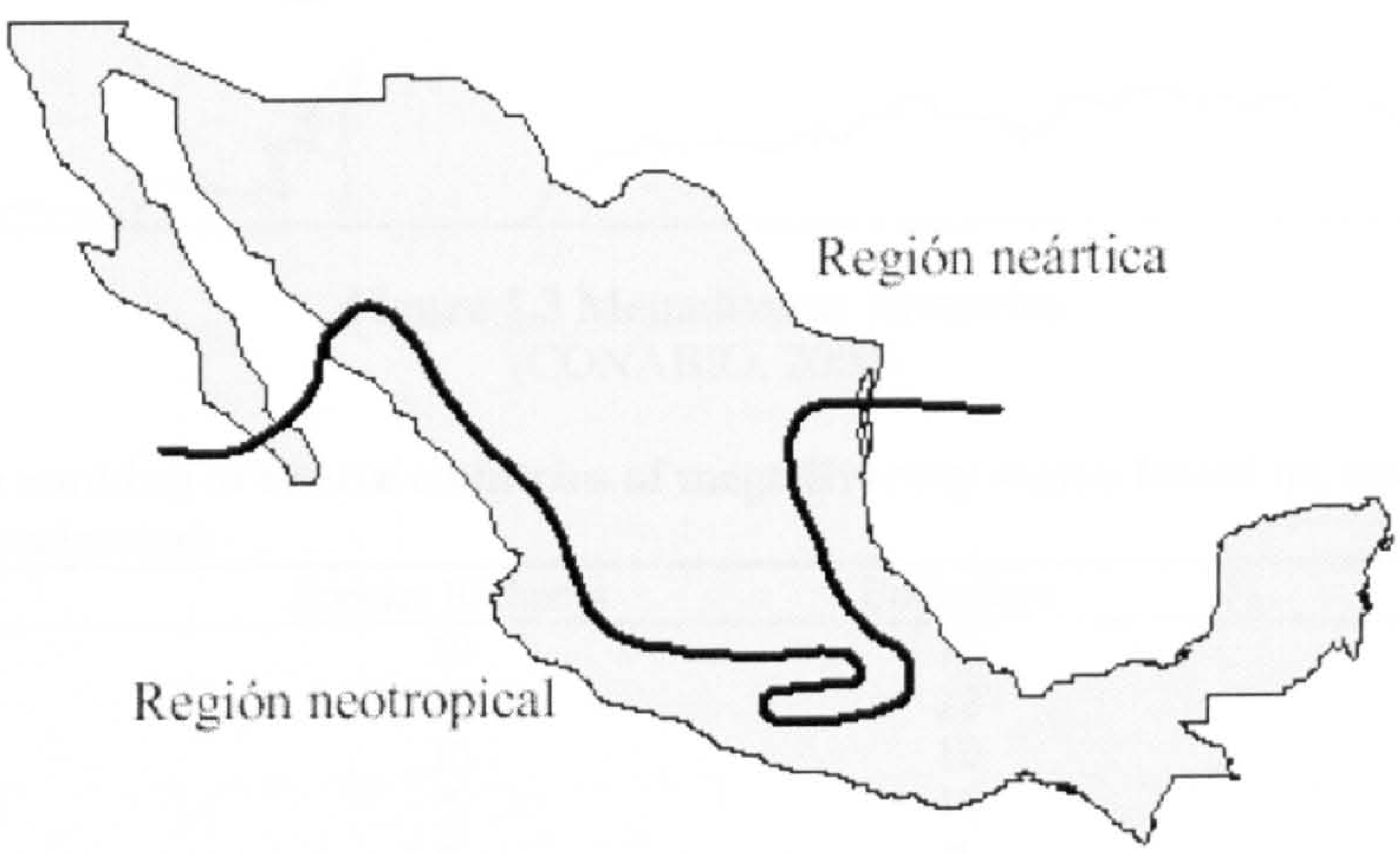


Figure 1.2 Biogeographic regions of Mexico
(CONABIO, 1998a)

Mexico is one of the main centres of global biodiversity (Mittermeier *et al.*, 1997). It is the world's fifth most biologically rich nation, after Brazil, Colombia, Australia, and Indonesia (Figure 1.3, Table 1.2). All seven of the most prominent megadiverse countries share certain characteristics, including: (1) tropical rain forest ecosystems within their territory; (2) marine ecosystems and, to a varying degree, a high coast-to-land ratio; (3) a considerable diversity of ecosystems; (4) a very rich diversity of cultures; and, (5) with the exception of Australia, are developing countries in which their biological diversity faces considerable levels of threat (Toledo & Ordoñez, 1993).

Figure 1.3 Megadiverse countries
(CONABIO, 2000)

Table 1.2 The ranking of twelve countries of megadiversity status based on scores of species richness and endemism

Country	Species Richness	Endemism	Total
Brazil	30	18	48
Indonesia	18	22	40
Colombia	26	10	36
Australia	5	16	21
Mexico	**8**	**7**	**15**
Madagascar	2	12	14
Peru	9	3	12
China	7	2	9
Philippines	0	8	8
India	4	4	8
Ecuador	5	0	5
Venezuela	3	0	3

Source: Mittermeier *et al.* (1997)

Six well-defined terrestrial ecological regions can be distinguished in Mexico: humid and sub-humid tropical lowlands, humid and sub-humid temperate mountains, deserts, and wetlands (Toledo & Ordoñez, 1993). Mexico supports 10% of the world's higher plant species, and more than 40% of them are endemic. Mexico also supports a large number of animal species within different taxonomic groups (Table 1.3). Mexico supports the second most diverse number of reptiles globally, and its 717 species comprise 11% of the world's known species, of which 52% are endemics. For amphibians, Mexico occupies fourth place and its 284 species comprise approximately 7% of the worldwide total, of which 60% are endemic to Mexico and 3% are endemic to Mesoamerica. For mammals, Mexico occupies the fifth place with 450 species, of which 29% are endemic (CONABIO, 2000).

Table 1.3 Countries with the greatest diversity of species of vascular plants and terrestrial vertebrates

Group	Country and Number of Species				
Vascular plants	Brazil 53 000	Colombia 48 000	Indonesia 35 000	China 28 000	**Mexico** **26 000**
Reptiles	Australia 755	**Mexico** **717**	Colombia 520	Indonesia 511	Brazil 468
Amphibians	Colombia 583	Brazil 517	Ecuador 402	**Mexico** **284**	China 274
Mammals	Brazil 524	Indonesia 515	China 499	Colombia 456	**Mexico** **450**
Birds	Colombia 1 815	Peru 1 703	Brazil 1 622	Ecuador 1 559	Indonesia 1 531

Source: Mittermeier *et al.* (1997)

Megadiversity countries such as Mexico are experiencing significant alterations to their natural ecosystems, and this degradation seriously threatens their biological resources. The main threats in these countries are the current patterns of land use that lead to deforestation and habitat fragmentation, and to species overexploitation. More than 50% of the seriously threatened plants, birds, mammals, amphibians and reptiles at the global level is concentrated in the megadiversity countries (Sarukhán & Dirzo, 2001). In Mexico, environmental deterioration is a multidimensional problem, and its forms and rates vary among regions depending upon the prevailing productive activities, the ecological setting, the degree of industrialisation, and very importantly on the socio-economic scenario in which these phenomena take place (Table 1.4) (Landa *et al.*, 1997).

Table 1.4 Main ecological problems of natural resource use in Mexico and the solutions needed

Area of concern	Environmental constraints	Improvements needed
Agriculture	Rain fed areas; irrigated areas; soil depletion, overuse of water and agrochemicals, salinization, genetic erosion, chemical pollution	Ecologically oriented intensification of agriculture in rain fed areas and re conversion of irrigated ones; development of agro ecological techniques
Livestock production	Conversion of temperate and tropical forests to pasture land for extensive cattle ranching; inefficient use of space, forages, and water; biodiversity and soil depletion; very low productivity	Intensification of cattle raising by integrated management of animals, soil, and plants; diversification of forages; efficient use of water; improvement of animal genetics
Forestry and agro forestry	Unsustainable use of forest species in arboreal and shrub ecosystems; fires; biodiversity depletion	Sustainable harvesting of timber and non timber products; design of sustainable polyspecific agro forests (coffee, cocoa); management of secondary forests; valuation of environmental services
Fishing and aquaculture	Over fishing; depletion of fish stocks by inappropriate techniques; degradation of coastal ecosystems; pollution of inland and sea waters	Improvement of fishing techniques; design of ecologically sound aquaculture farms; sustainable use of marine and freshwater species
Wildlife management	Habitat loss; overexploitation of species	Sustainable management of species and preservation of their habitats
Conservation of habitats, species, and genes	Endangered habitats and species; genetic erosion; ineffective management of protected areas	Design of management plans for protected areas; management of populations of threatened species; *in situ* conservation of local germplasm
Land Use Planning	Inefficient use of natural resources due to absence of landscape evaluation	Design of household and community-scale agrosilvo pastoral systems based on land evaluations; application of SIG to land-use planning at regional, micro regional, and community levels
Use of local knowledge	Inefficient use of local natural resources due to ignorance of long-term experience gained by indigenous peoples	Rescue of indigenous ecological knowledge; inventory of traditional techniques; rescue of varieties of plants and animals under indigenous management
Ecological restoration	Deforested lands and degraded soils; depletion of marine and freshwater ecosystems	Rehabilitation of natural and managed ecosystems; reintroduction of endangered or rare species; reforestation with native species

Source: Castillo & Toledo (2000)

Mexico's natural resources have suffered a dramatic depletion because of the activities of rural producers. This decline in the quality of the natural resource base is reflected in stagnant levels of production within the agricultural, livestock, forestry, and fisheries sectors. In fact, Mexico is now a net importer of corn, sorghum, beans, milk, and other foodstuffs (Castillo & Toledo, 2000). In Mexico, absolute rates of deforestation are of the order of 700,000 ha per year, with greatest losses in tropical wet and dry forests, where most biological diversity is concentrated. Certain areas are particularly badly affected. In the tropical forests of southern Veracruz, rates of deforestation reach 4.3% per year (Sarukhán & Dirzo, 2001). Serious erosion occurs over 80% of Mexico's surface area. Most agriculture is carried out in an unsustainable manner. The frontiers of agriculture and cattle raising have expanded, especially in tropical regions. Forest fires seriously damage lands, especially in temperate zones. Disorderly urban development and insufficient development of services also compromise the sustainability of Mexico's population centres (Carabias, 1999). Less than 40% of the country is still considered natural habitat (McNeely, 1990; Challenger, 1998).

Although threats to Mexico's biodiversity mainly come from conversion of land to agriculture and cattle ranching, there is also an active trade in wildlife, both legal and illegal both native and non-native species (McNeely, 1990; Challenger, 1998), which I review in the next chapter.

Chapter 2

2 The International Trade in Wildlife involving Mexico: A Review

2.1 Introduction

Mexico imports substantial quantities of non-native species of birds, mammals and reptiles, which exceed its exports of native species in the same taxonomic groups. Over 11 years, the value of Mexico's imports of wild vertebrates surpassed exports by more than 100%. However, the demand for wild species in the Mexican market has changed over time. During 1981-1983, the most sought after species were reptiles, while mammals were the most sought after taxa during 1987-1992 (Rodríguez-Uribe, 1985b; Pérez-Gil *et al.*, 1996).

Mexico has also been the second largest re-exporter of products and derivative products from wild species in the Western Hemisphere, after the United States, and reptiles were the most frequently re-exported non-native species. In 1985, for example, it was estimated that 250,000 reptile skins proceeding from South American, African and Asian countries were crossing the Mexican border (Rodríguez-Uribe, 1985a; Pérez Gil *et al.*, 1996). Furthermore, weak enforcement by Mexico of regulations governing trade in non-native species has apparently turned Mexico into an important centre for transhipments of illegally captured wildlife (Fuller, *et al.*, 1987; Fitzgerald, 1989; Rose, 1991; TRAFFIC USA, 1992).

Mexico has been also a major wildlife producer in its own right (Fuller, *et al.*, 1987; Dietrich, 1989). For example, Mexico supplied the largest quantity of amphibians to the US during the 1980s (Rodríguez-Uribe, 1985a; Pérez-Gil *et al.*, 1996). During 1987-1992, Mexican exports of wild fauna had a value of more than US$2.5 million, of which reptiles and amphibians represented the highest financial return (76.8%), followed by mammals (17.6%) and birds (5.5%). The most prized products were live frogs (95% of the exported volume, 32.7% of the total profit) and eggs, meat and footwear from marine turtle species *Caretta caretta*, *Chelonia mydas*, *Eretmochelys imbricata*, and *Lepidochelys olivacea* (Pérez-Gil *et al.*, 1996).

Mexico has legally imported, exported and re-exported specimens, parts and derivative products from non-endangered wild species. However, endangered species have been also present in these commercial transactions on several occasions. Between 1979 and 1982, the following species were involved in Mexican exports and re-exports to Asian and European countries: peregrine falcon (*Falco peregrinus*), jaguar (*Panthera onca*), ocelot (*Leopardus pardalis*), margay (*Leopardus wiedii*), volcano rabbit (*Romerolagus diazi*), galápago de Mapimí (*Gopherus flavomarginatus*), river crocodile (*Crocodylus acutus*), swamp crocodile (*C. moreletii*), howler monkey (*Alouatta pigra*), and marine turtles *Chelonia mydas*, *Lepidochelys olivacea* and *Eretmochelys imbricata.* About half of these species were listed as either threatened or endangered by the IUCN Red List (Rodríguez-Uribe, 1985a; Rodríguez-Uribe, 1985b).

Many of the commercial transactions involving wildlife that have taken place between Mexico and other countries, mainly with the US, have been illegal. Mexico is home to many endemic (Table 1.2) and often rare, species that are in high demand in international markets and that travel easily across the US-Mexico border (Fuller, *et al.*, 1987; Fitzgerald, 1989; Rose, 1991; TRAFFIC USA, 1992). Mexico has become the hub for the smuggling of millions of dollars worth of rare and often endangered wildlife (Rohter, 1987; Anders, 1989). Despite the implementation of national policies and regulations, orchids, cacti, bromeliads, butterflies, tarantulas, macaws, parrots, crocodiles, birds, and felids have been hunted in Mexico and traded in staggering, though unrecorded, quantities (Ramos, 1986; Anders, 1989). During the 1980s, US officials estimated that between 50,000 and 150,000 birds, mostly parrots, were smuggled across the border from Mexico every year (Brautigam, 1986a; Fitzgerald, 1989). In the 1983 CITES annual report, trophies and skins from the following species were recorded as being seized by the US: jaguar (*Panthera onca*), bobcat (*Felis rufa escuinipae*), margay (*Leopardus wiedii*), and ocelot (*L. pardalis*). These commercial transactions took place even though these species were listed on both the US Endangered Species Act and CITES Appendix I.

A common route by which illegal wildlife trade has taken place in Mexico is through tourism. Tourists have been responsible for importing or exporting: stuffed animals (e.g. raptors, caimans, iguanas, and small mammals); claws, feathers and teeth (e.g. raptors and spotted cats); oils, eggs and meat (e.g. marine turtles); coral and shell raw items; live birds; and plants (e.g. cacti, cycads and orchids) (Brautigam, 1986a; Rose, 1991; WWF, 1997).

This chapter has two aims. The first aim is to compile and review the available information on the international trade in wildlife involving Mexico during the 1980s and 1990s. An extensive bibliographic revision of levels of international wildlife trade to and from Mexico was undertaken from compiled information in Mexico and in the United States. Work sessions and individual semi-structured interviews took place with relevant specialists to help develop this chapter. The second aim was to assess, based on this compilation, which aspects and case studies of wildlife trade would provide the most important themes to investigate in this study. This review was therefore an important precursor to the main study given that it would not be possible to study every aspect of wildlife trade in Mexico.

2.2 International Trade in Wildlife Review

Rodríguez-Uribe (1985b) and Pérez-Gil *et al.* (1996) have provided comprehensive reviews of the role of Mexico as importer and re-exporter of non-native species. These reviews make a first attempt at quantifying imports and re-exports in terms of volume and price, based on consistent sources, and combined with qualitative data and anecdotal information. There are few other studies of imports and re-exports of non-native species (see Dietrich, 1989). Apart from Pérez-Gil *et al.* (1996) very little work is in the public domain and some occasional reports by the government are not widely available (e.g. INE, 1997a). The study of Rodríguez-Uribe (1985b) was developed internally by the government and, though a pioneering work, was not published. At times, some authors have contributed unpublished reports to inform about seizures (e.g. Sánchez, 1999). However, most papers on the role of Mexico as importer and re-exporter of non-native species have been published by the TRAFFIC Network, particularly by TRAFFIC North America (e.g. Brautigam, 1986b; Rose, 1991; TRAFFIC International, 1999; Fleming, 1999). These papers have examined wildlife trade between US-Mexico through the analysis of data sets on exports and imports over time.

The legal trade in native species has been somewhat better studied than the trade in non-native species. In Mexico, early work on legal exports of native species was undertaken by Rodríguez-Uribe (1985a, 1985b), Iñigo-Elías (1986), and Dietrich (1989), while the most recent comprehensive work was by Pérez-Gil *et al.* (1996). Occasional reports were also published by the government (e.g. INE, 1997a). TRAFFIC North America has also produced numerous articles and several reports (e.g. Brautigam, 1986b; Rose, 1991; Fleming, 1999; Mast & Brautigam, 1986; Rose, 1992; Iñigo-Elías, 1986; Fuller 1985a, 1985b; Fisher & Campbell, 1990). Most data that are available on illegal trade in native species over time, either in published or unpublished reports, comes from studies of trade in psittacines (e.g. Iñigo-Elías & Ramos, 1991; Cantú & Sánchez, 1994, 1996; INE, 1997b; INE, 2000; Fitzgerald, 1989; Rose, 1991; Fleming, 1999; TRAFFIC International, 1996; Gobbi *et al.,* 1996; Mulliken & Thomsen, 1990; Thomsen & Hemley, 1987; Thomsen & Brautigam, 1991; Brautigam, 1986a; TRAFFIC USA, 1988; Cantú & Sánchez, 1996; TRAFFIC North America, 1998), and cacti and orchids (e.g. Fuller, 1985a; Pérez-Gil, 1986; TRAFFIC USA, 1986; Restrepo, 1990; Rose, 1991; Hágsater & Dumont, 1996; TRAFFIC International, 1997; TRAFFIC USA, 1997c; Fleming, 1999; INE, 1997b; INE, 2000; López, 2000).

2.3 Imports of Non-native Species

Mexico has imported a very diverse set of commodities from non-native species such as live animals, specimens for zoological collections, hunting trophies, skins, and derivative products such as meat, hair, bones, oil, bristles, and substances (Pérez-Gil *et al.,* 1996). Nevertheless, the main commodities imported by Mexico have been reptile skins (Figure 2.1).

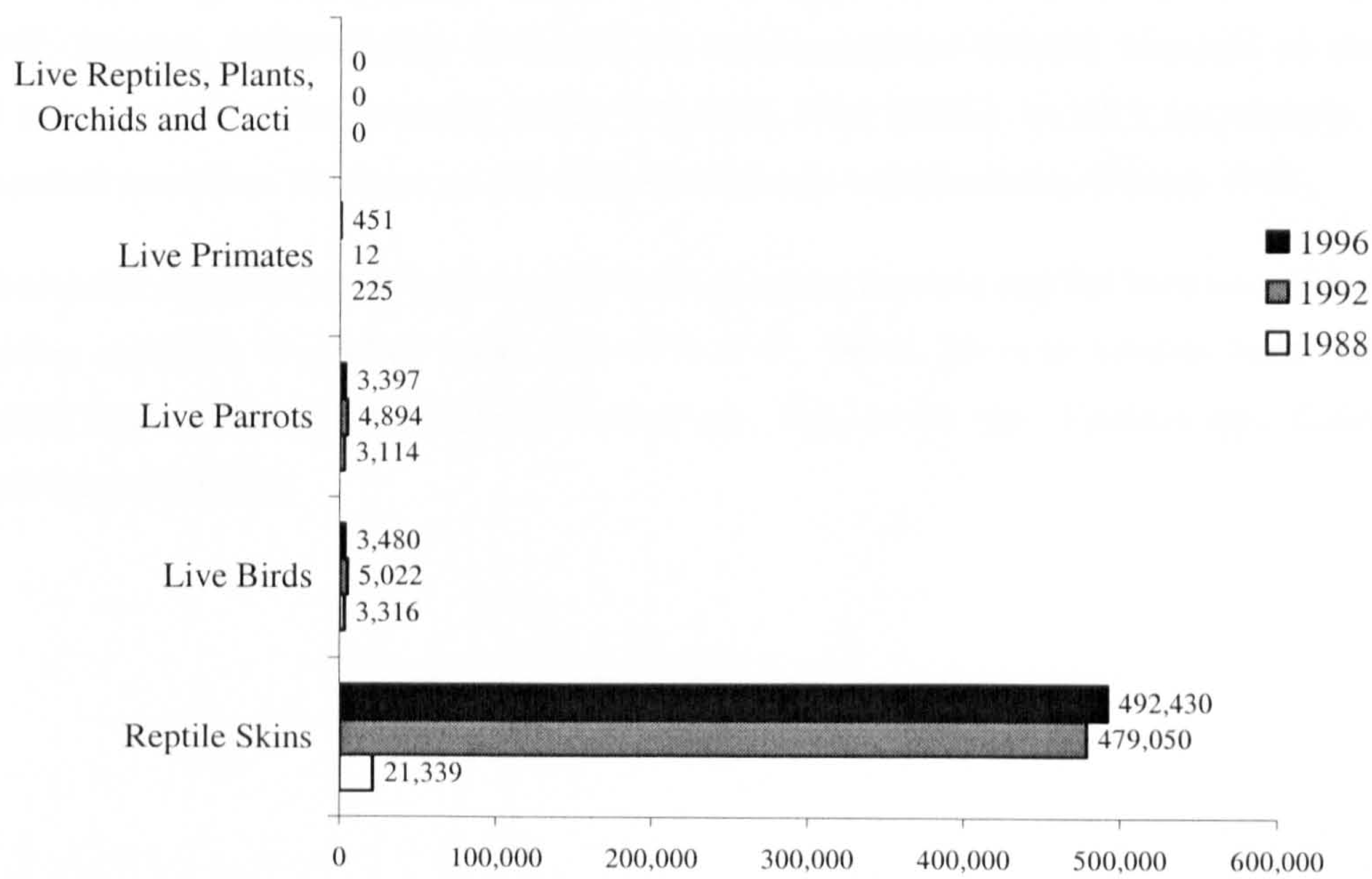


Figure 2.1 Mexican net imports in selected species and products of CITES-listed wildlife
(Modified from Fleming, 1999)

Mexico has had a thriving leather industry that uses non-native reptile skins imports (Fleming, 1999) to meet the demand in the US, Europe and Asia for manufactured leather products (Rodríguez-Uribe, 1985b), at which Mexico has excelled. Annually, hundreds of kilometres of snakeskin enter Mexico legally for the manufacture of purses, belts and other articles processed by the leather industry.

Among the most common reptiles imported by Mexico have been *Varanus* spp., *Caiman* spp., *Python* spp. and *Tupinambis* spp.[1] However, between these genera, there are certain reptile species in which Mexico has relied to satisfy the demand of its market. The most common species imported by Mexico have been tegus (e.g. *Tupinambis teguixin, T. rufescens*), reticulated python (*Python reticulatus*), caiman (e.g. *Caiman crocodilus fuscus*) and monitors (e.g. *Varanus salvator, V. niloticus*). During 1982-1984, for example, *Tupinambis teguixin* was the most heavily imported species (Rodríguez-Uribe, 1985b).

Traditionally, Mexico's reptile leather industry has placed the most value on crocodilian leather, followed by sea turtle leather, lizard and snakeskin. Desirability is related to a number of factors, including strength and durability, patterns, size of usable skin and suitability for tanning (Gaski, 1992; Fleming, 1999). During 1993-1998 the Mexican leather industry imported an average of 35,114 crocodilian skins annually (Table 2.1) (INE, 1996; 2000c). In 1995, for example, Mexico imported more than 40,000 crocodile skins for domestic manufacturing (Perran, 1998).

Mexico has imported many reptile skins for the footwear industry and has been one of the world's leading exporters of cowboy boots (Pérez-Gil *et al.*, 1996). Mexican cowboy boots have been mainly made from imported skins of *Python* spp., *Tupinambis* spp., *Varanus* spp., *Caiman* spp. and *Crocodylus* spp..

[1] Between 1982 and 1983 a total of 403,665 skins were imported by Mexico and almost 100% (401,670 skins) came from the mentioned genera (Rodríguez-Uribe, 1985b). Between 1990 and 1991, *Tupinambis* spp. and *Varanus* spp. accounted for the highest volume imported by Mexico. In 1995, *Python* spp. accounted for 52% of Mexican skin imports, followed by *Tupinambis* spp. (20%) and *Varanus* spp. (15%) (Pérez-Gil *et al.*, 1996) (Figure 2.3).

Table 2.1 Mexican Imports of crocodilian skins by species during 1993-1998

Species	1993	1994	1995	1996	1997	1998	Total
Alligator mississippiensis	526	1,377	758	795	7,615	7,453	18,524
Caiman crocodilus crocodilus	-	-	-	10	-	143	153
C.c. chiapasus	-	-	-	13,972	-	-	13,972
C.c. fuscus	181	899	5,650	43,334	24,550	41,807	116,421
C.c.yacare	-	210	9,396	15,450	23,713	2,999	51,768
Crocodylus johnstoni	-	-	2	-	40	-	42
C. moreletii	-	-	-	35	40	-	75
C. niloticus	-	-	-	8,190	204	1,080	9,474
C. novaeguineae	1	-	-	-	-	-	1
C. porosus	-	100	152	-	-	-	252
Total	**708**	**2,586**	**15,958**	**81,751**	**56,157**	**53,522**	**210,682**

Source: INE (2000c)

The source countries for the import of these skins have changed over time. For example, during 1999, Mexico imported reptile skins mainly from Colombia (74%), followed by the US (12%) and South Africa (5%) (Figure 2.2)

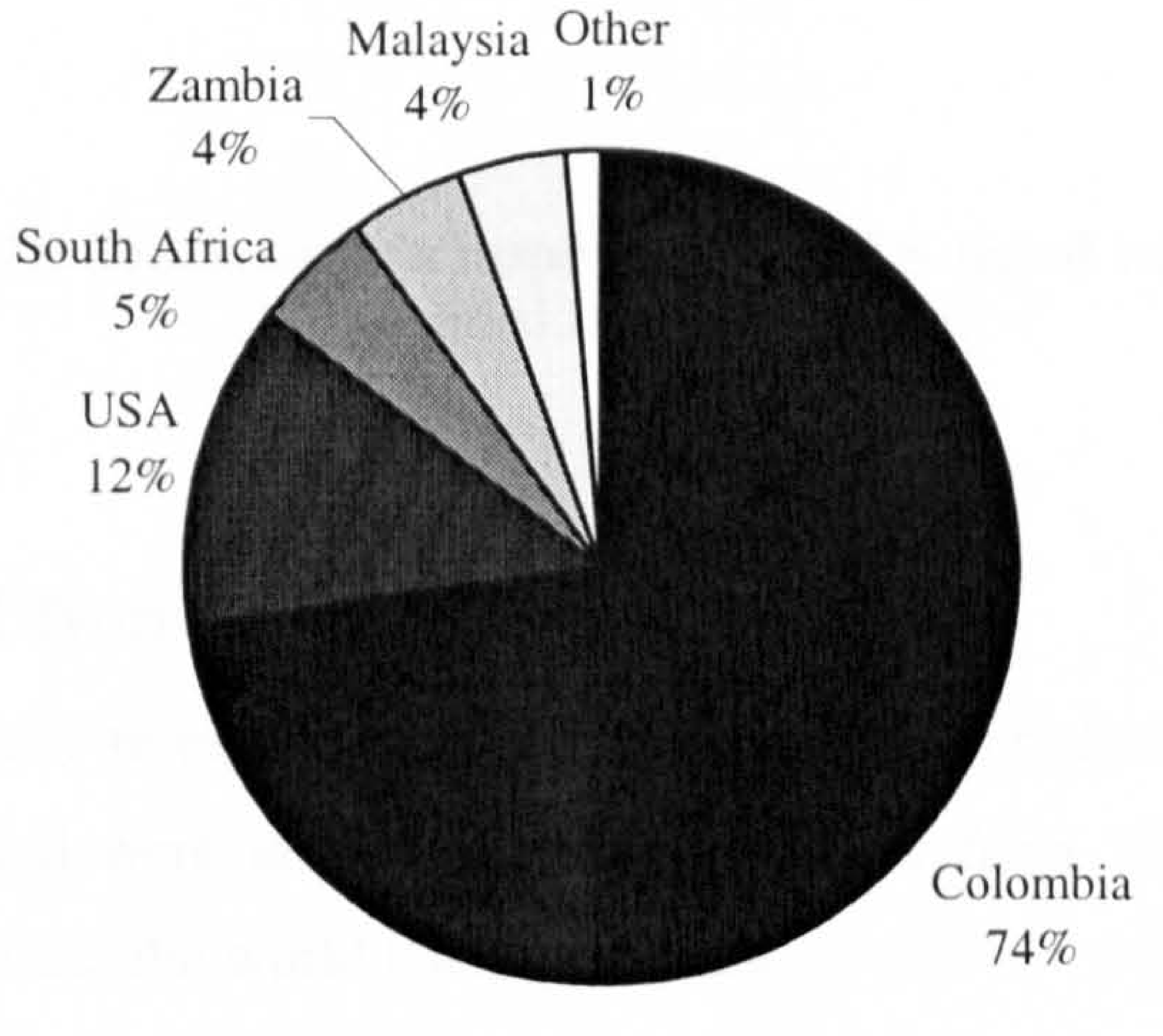


Figure 2.2 Main countries of origin for Mexican Imports of Reptile Skins 1999
(INEGI, 1999; Bancomext, 2001)

After reptiles, the skins of mammals have been the most common specimens imported by Mexico for the leather industry (Rodríguez-Uribe, 1985b). In 1984, for instance, mammal skins accounted for 69% of the total shoe pairs exported by Mexico, followed by reptiles (27%) and birds (3%) (Rodríguez-Uribe, 1985b). Mammal species imported have included, among others, kangaroo *Macropus rufa* and pangolin *Manis pentadactyla*. Kangaroos were the most commonly imported mammal skin in 1983 (Pérez, 1999). In 1995, 24,370 pangolin skin pieces were imported by Mexico (Figure 2.3).

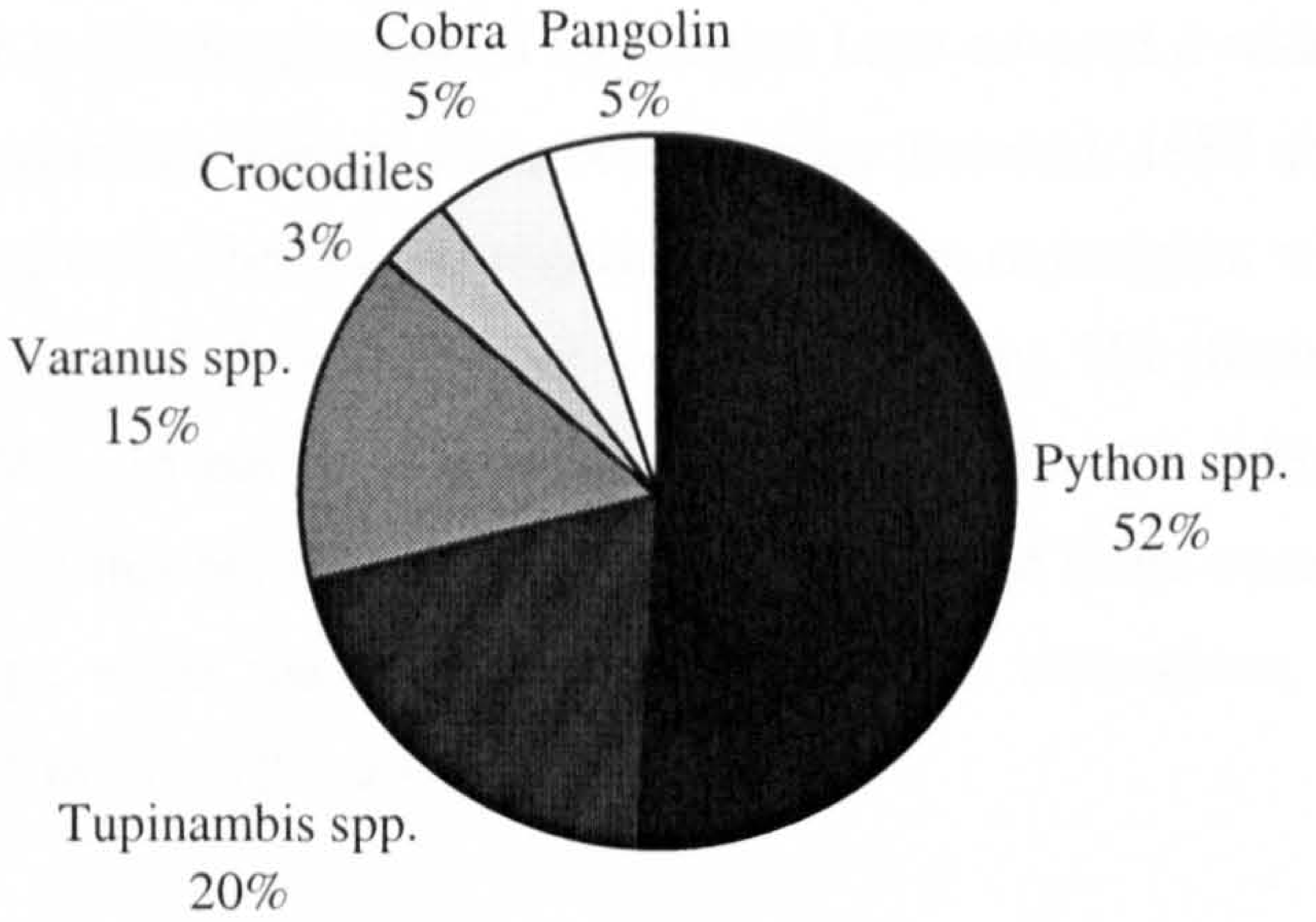


Figure 2.3 Mexican skin imports of CITES-listed wildlife in 1995
Modified from INE (1997a)

2.4 Re-exports of Non-native Species

Mexico has been a major re-exporter of non-native species, products and derivatives. The main commodities re-exported were skins and leather products from various species, to supply the international skin trade and the world leather industry.

2.4.1 Legal re-exports

Mexico has re-exported skins of many non-native species, primarily to the US. From 1987 to 1989, for instance, the value of skins and leather products imported by the US from Mexico annually averaged more than US$14 million, or an estimated 65-92% of the annual declared value of US wildlife imports and products from Mexico (Rose, 1991; Fleming, 1999). African and Asian wildlife and wildlife products have flowed through Mexico, much for the well-established and largely legal cowboy boot trade manufacture and trade between Mexico and the US (Brautigam, 1986b). During 1980-1989, the US-Mexico leather trade involved the following non-native species: African elephant, hippopotamus, water buffalo, kangaroo, pangolin, rhea, ostrich, crocodiles, caimans, monitor and tegu lizards, pythons, boas, anacondas, rat and water snakes, and eels. These species were originally imported into the US and subsequently re-exported to Mexico for the manufacture of cowboy boots, shoes, boots, wallets, belts, watchbands, handbags, and clothing (Dietrich, 1989).

The skins and leather products re-exported by Mexico have covered a wide range of non-native species, but the most common species have been reptiles. Between 1980 and 1982, for example, the most traded species were *Tupinambis teguixin* and *Python reticulatus*, which represented 94% of the total 77,740 pairs of shoes exported by Mexico to the US (Rodríguez-Uribe, 1985b). Between 1990 and 1991, 15 out of 19 non-native species used by the Mexican leather industry were of reptiles. During this period, the most traded and valued skins were those of *Tupinambis* spp. and *Varanus* spp., while the most valued commodities were shoes, which accounted for approximately US$4.5 million (Pérez-Gil *et al.*, 1996).

The amount of non-native species imported by Mexico has not always equalled the amount re-exported. For example, during 1990-1991, Mexico imported around seven times more skin pieces of *Tupinambis* spp. compared with those re-exported (Pérez-Gil *et al.*, 1996). There has not always been a balance between imports and re-exports, suggesting that illegal re-exports are important.

2.4.2 Illegal re-exports

As defined by CITES, 're-export' means export of any specimen that has previously been imported to the same range State (Rosser and Haywood, 1996; CITES, 2000). However, in Mexico, cases classed as re-exports have occurred without been previously reported as imported (Iñigo-Elías & Ramos, 1991; Pérez-Gil *et al.*, 1996). These are considered illegal re-exports. Shipments of non-native species have entered Mexico illegally, in most cases, with US as the final destination. In 1983, for example, the following species were seized by the US: 280 iguanas (*Conolophus* spp.), endemic to and fully protected in the Galapagos Islands, were imported into the US, with Mexico declared as country of origin; and, 750 skins of American alligator

(*Alligator mississippiensis*), were imported by Japan from France, with their origin declared as Mexico, which lies outside the species' range (Brautigam, 1986a).

On September 1998, for example, an animal trader from Malaysia was arrested at Mexico City Airport for smuggling more than 300 animals into the country from Asia. He was apprehended as he tried to complete a deal with undercover federal agents disguised as reptile dealers. Among the smuggled animals were several CITES Appendix I species like ploughshare tortoises (*Geochelone yniphora*), which occur at only few sites in Madagascar, the Komodo dragon (*Varanus komodoensis*) native to a relatively small area of Indonesia, and tuataras (*Sphenodon punctatus*) native to New Zealand (TRAFFIC International, 1999). In 1999, Mexican authorities seized 20 palm cockatoos (*Probosciger* spp.) at Mexico City Airport. The unofficial information was that the shipment originated in Bangkok, passed through the Narita Airport in Japan and was abandoned in Mexico. The shipment came in by Japan Airlines without any documentation. The Palm Cockatoos seemed to be adults, with no rings or signs that they were captive bred (Sânchez, 1999).

2.5 Exports of Native Species

Mexico has also been a major wildlife producer. Among the most prized Mexican exports that reach world markets each year are native parrots, raptors, marine turtles, iguanas, tarantulas, caimans, cacti, and cycads (Fuller *et al.*, 1987; Dietrich, 1989).

2.5.1 Legal exports

Mexican wildlife exports are mainly imported by the US. Most US wildlife imports from Mexico have encompassed the following broad categories: reptile skin products, fur skins, animal curios (e.g., stuffed specimens, claws, teeth, and feathers), live animal specimens, coral, shells, and live plants (Rose, 1991). For example, during 1980-1989, trade between Mexico and the US in live animals for the pet market in species such as parrots, tarantulas, snakes, iguanas, freshwater turtles, and tropical fish, was particularly common (Rose, 1991; Fleming, 1999). During 1982-1991, Mexico exported around 1.3 million specimens sought by zoological collections in 22 countries, and the US alone imported 95.8% of these specimens (Pérez-Gil *et al.*, 1996).

Although Mexico's legal exports of native species are now mainly imported by the US, this has not always been the case. Between 1982 and 1991, Mexico exported around 8.6 billion native live animals to Guatemala (88%) and Libya (8.4%). Although not the main importer in terms of volume, US was nevertheless the most significant importer in economic terms (56.6% of the export value) followed by Guatemala (25.5 %) (Pérez-Gil *et al.*, 1996).

2.5.1.1 Skin trade

Mexico was a major international supplier of sharkskin and marine turtle leather during the 1980s, especially to the US (Brautigam, 1986b). Between 1984 and 1989, for instance, the US leather industry absorbed most of Mexico's skin exports especially for the cowboy boot industry (Dietrich, 1989). In turn, this led to the commercial exploitation of sea turtles in Mexico during the 1980s.

Mexico's turtle leather trade during the 1980s placed particular pressure on the olive ridley (*Lepidochelys olivacea*) and pacific green turtles (*Chelonia mydas*). During 1980-1984, for example, over half of Mexico's reported skin exports apparently went to Japan, the world's leading importer of turtle leather and the only CITES party then permitting trade in olive ridley turtles. Japanese custom statistics indicate that around 38,000 kg of Mexican sea turtle hides were imported to Japan between 1980-1984 (Mast & Brautigam, 1986). During the 1980s, the Cahuama (*Caretta caretta*) skin and their derivative products were also listed as an important commodity exported by Mexico. In particular, between 1982-1992, Cahuama skin exports accounted for 16.1% of the total declared value of wild vertebrates exported by Mexico (Pérez-Gil et al., 1996).

Also, during the 1980s, Mexico exported large volumes of shark skins, primarily to Japan, Spain, and the US. From 1982-1991, Mexico exported around 38,264 kg of raw shark skins and around 79,000 kg of tanned skins (1982-1987). From 1987 to 1990, the US alone imported from Mexico more than 100,000 shark skins and more than 200,000 shark leather products (Rose, 1992).

2.5.1.2 Mammals

Mexican exports of native mammal species have consisted mainly of hunting trophies. Sport hunters have taken a steady flow of carcasses and trophies across the US-Mexican border, including white-tail deer (*Odocoileus virginianus*), mule deer (*O. hemionus*), desert bighorn-sheep (*Ovis canadensis*), bobcat (*Felis rufus*), wolf (*Canis* spp.), puma (*Puma concolor*), occasionally endangered jaguar (*Panthera onca*), as well as various species of antelopes, doves, waterfowl, and game fish (Rose, 1991). In 1978, the following species were reported as being exported by Mexico: margay (*Leopardus wiedii*) (261 skins), Lutrinae (162 skins) and ocelot (*Leopardus pardalis*) (54 skins). During 1979-1981, the main exports were trophies of bighorn-sheep (*Ovis canadensis*): 28 (1979), 33 (1980), 12 (1981), and 16 (1982). In 1982, trophies of Lynx (*Felis rufa*) were also reported (Rodríguez-Uribe, 1985b).

2.5.1.3 Birds

Mexico has been a major exporter of wild birds and one of the most important Latin American suppliers of wild birds, mainly of psittacines, to the US (Iñigo-Elías & Ramos, 1991; Thomsen & Brautigam, 1991; Fleming, 1999). Between 1970 and 1982, Mexico legally exported an average of 14,500 psittacines per year to the US (Iñigo-Elías & Ramos, 1991; Fleming, 1999). During 1977-1980, the Psittacidae family accounted for 65% of all the birds exported by Mexico (Rodríguez-Uribe, 1985b). From October 1979 to June 1980, the US imported more psittacines from Mexico than from any other country[2] (Roet, Mack & Duplaix, 1981). Between 1981-1982, the US alone imported 80% of the psittacines exported by Mexico, while all European countries imported only 20% (Rodríguez-Uribe, 1985b).

Psittacines indigenous to Mexico and found in international trade have included the red-crowned parrot/green-checked amazon (*Amazona viridigenalis*), yellow-headed amazon (*Amazona oratrix*), and thick-billed parrot (*Rhynchopsitta pachyrhyncha*), among other species (Fleming, 1999). Between 1978 and 1982, the most exported psittacines by Mexico to the US were *Aratinga canicularis*, *Amazona viridigenalis*, *A. ochrocephala*, *A. albifrons*, and *A. finschi* (Rodríguez-Uribe, 1985a; 1985b; Iñigo-Elías, 1986).

After psittacines, raptors have been the Mexican species most sought after by the world market. However, recorded numbers of traded species have barely exceeded one hundred specimens per year during the 1980s (Rodríguez-Uribe, 1985b).

[2] US imports from Mexico included over 2,700 yellow-crowned amazons (*Amazona ochrocephala*); around 3,300 green-cheeked amazons (*A. viridigenalis*), an endemic species found only in a small area of Mexico; and, orange-fronted conures (*Aratinga canicularis*). Over half of these exports were amazons (Roet, Mack & Duplaix, 1981).

In 1982, Mexico banned the legal export of its entire wild native species. Some studies suggested that Mexican bird exports probably declined in response to the 1982 Ban. USFWS trade data showed that US bird imports from Mexico peaked between 1981 and 1982, but little trade was reported thereafter (Rose, 1991).

2.5.1.4 Plants

The most common plants exported by Mexico, especially to the US, have been cycads, orchids and cacti, either artificially propagated, from the wild or from unknown sources (Table 2.2) (Fuller, 1985b).

Table 2.2 US plant imports from Mexico in 1982

	Declared Source			
Taxonomic Group	**Wild**	**Unknown**	**Artificially propagated**	**Total**
Cacti	42,010	31,146	-	73,156
Orchids	10,834	4,125	2,800	17,759
Cycads	4,770	2,329	100	7,199

Modified from Fuller (1985a)

Native cacti and orchids have been especially popular species sold abroad. Each year, almost 80,000 artificially propagated orchids have been legally exported from Mexico to the US, Denmark, Canada, Italy, Germany, Japan, Finland, and South Africa (TRAFFIC USA, 1997b). Thousands of cacti have also entered the US market from Mexico every year. In 1981, 167,000 of the estimated 2.6 to 2.9 million cacti that entered the US came from Mexico. Nevertheless, only half were identified to species level and many like *Ariocarpus agavoides*[3] were threatened with extinction in the wild (Thompson, 1983). In early 1980s, the Mexican cacti most sought after by the world market were *Ariocarpus* spp., *Astrophytum* spp., *Mammillaria* spp., and *Echinocactus* spp. Between 1980 and 1983, for example, more than 50,000 specimens of the following native cacti were exploited: *Ariocarpus retusus*; *A. kotschoubeyanus*; *Echinocactus asterias*; *E. horizonthalonius*; *Astrophytum myriostigma*; *A. asterias;* *Thelocactus bicolour*; *Echinocereus pectinatus*; *Epithelantha micromeres*; *Ferocactus latispinus*; *Lophophora diffusa*; *L. echinata*;

[3] Between 1979 and 1981, for example, 8,300 individual specimens of *Ariocarpus agavoides* were recorded as entering the US. According to the Red Data Book, *A. agavoides* can be raised from seed but is very slow growing so Mexican exports were almost certainly taken from the wild. In addition, a disturbingly high proportion of such Mexican exports were not identified to species level. If the US imported nearly 30,000 plants identified only as *Ariocarpus* spp., it is impossible to determine how many of these 30,000 plants were, in fact, *A. agavoides* or for that matter, the other two *Ariocarpus* species known to be extremely rare (Thompson, 1983).

and, *Mammillaria candida*. Among these, *Astrophytum myriostigma*, *A. asterias* and *Thelocactus bicolor* were in most demand species by the US (Rodríguez-Uribe, 1987).

During 1982, the US imported most cacti from Brazil, Peru and Mexico. Those from Brazil were probably propagated plants, those from Peru were those commonly found in cultivation, and those from Mexico were most likely of wild origin (Fuller, 1985b).

The development of propagation units for orchids and cacti in Mexico is still at an early stage, and their production is somewhat inconsistent. During 1993-1996, for example, Mexico exported 152,239 orchids and 117,527 cacti but 75% of these specimens were produced in 1995. For both groups, the US has been once again the main importing country, absorbing around 78% of the orchids and 87% of the cacti (Tables 2.3; 2.4).

Table 2.3 Exports of Mexican Orchids

Importing Countries	1993	1994	1995	1996	Total (Units)
US	3,664	8,883	96,567	9,164	118,258
Japan	2.3	1,925	6,419	6,171	16,815
Germany	1,919	2,695	2,600	500	7,714
Australia	196	409	455	457	1,517
Canada	0	0	770	787	1,557
Denmark	0	666	400	441	1,507
Italy	155	219	0	245	609
Finland	0	346	84	0	430
Ecuador	0	0	58	0	58
France	113	0	265	0	378
South Africa	0	137	0	0	137
Colombia	0	0	1,033	525	1,558
Guatemala	0	0	324	0	324
Costa Rica	0	0	352	0	352
England	0	0	0	658	658
Brazil	0	0	0	163	163
Sweden	0	0	0	194	194
Total	**8,327**	**15,280**	**109,327**	**19,305**	**152,239**

Modified from INE (1997a).

Table 2.4 Exports of Mexican cacti

Importing Countries	1994	1995	1996	Total (Units)
US	13,000	88,651	662	102,313
Japan	1,356	18,000	0	3,156
Canada	0	0	12,058	12,058
Total	**14,356**	**90,451**	**12,720**	**117,527**

Modified from INE (1997a)

2.5.2 Illegal exports

Mexico has been one of the main international suppliers of illegally exported wildlife. In fact, there are those who claim that this crime is the second most profitable business in Mexico after drug trafficking (Riquelme, 1996). Indeed, some drug dealers are also involved in wildlife trafficking as both feature huge profit margins and because the products involved are often shipped from the same regions.[4] There is also at least one known instance when wildlife smuggling has occurred in concert with gunrunning[5] (Fitzgerald, 1989).

In Mexico, the illegal wildlife trade has provided the market with the following (Cantú & Sanchez, 2000):

- Pets: psittacines, *tapayaxines* (*Phinosomas* spp.), boas, tarantulas, desert turtles, spider monkeys, lizards, raccoons and badgers. ·
- Ornate: toucans, owls, salamanders, frogs, fish and crabs.
- Traditional medicine or witchcraft: hummingbirds, foxes, vipers, coyotes, toads and snakes.
- Falconry: hawks, kestrels, eagles and sparrow hawks.
- Products of fauna: marine turtles, crocodiles, feline, deer and armadillos.
- Collections: butterflies, beetles, and mollusc shells
- Ornate Plants: cacti, orchids, palms, cycads and bromeliads.

Of these, the status of endemic cacti, orchids and birds have probably been the most affected by the illegal trade, since all have restricted distributions and are affected by large demands in world markets (Peña & Neyra, 1998).

[4] In June 1985, Miami drug investigators arrested a local couple after finding over US$70 million worth of cocaine; only two years earlier, the pair had been caught smuggling 100 Indonesian palm cockatoos. Miami agents also found US$33 million in cocaine wafers tucked inside tropical fish containers from Colombia in 1985. A group of Latin American drug dealers reportedly laced caiman skins en route to Europe with cocaine, passed the goods through customs, and then vacuumed up the pricey 'skin preservative'. There are also isolated reports of dead Bolivian parrots arriving in the Netherlands stuffed with pure cocaine (Fitzgerald, 1989).

[5] California wildlife authorities reportedly found a father-and-son team involved in the pet trade who were illegally importing parrots from Mexico in exchange, it later turned out, for US firearms (Fitzgerald, 1989).

2.5.2.1 Fish and Invertebrates

Species of native tarantulas and fish have been subject to international illegal trade. On June 1994, for example, a Californian wildlife dealer was convicted of smuggling 600 Mexican red-kneed tarantulas (*Brachypelma smithi*) into the US. This species is which are protected by Mexican law, listed on CITES Appendix II and protected by ESA (TRAFFIC USA, 1994). On July 2000, Mexican authorities announced the seizure by the German government of about 1,000 tarantulas (*Brachypelma* spp.) originating from the Mexican States of Michoacán and Colima. These specimens were being smuggled by a French citizen and were going to be sold for US$200 each as pets in the European black market (García, 2000).

On February 1996, US Custom agents at the San Isidro border crossing discovered 36 tropical fish hidden in five plastic bags inside the converted petrol tank of a pickup truck. The fish were being smuggled from Mexico into the US, and included specimens of the brilliant golden-red garibaldi (*Hypsypops rubicundus*), California's official state marine fish and a favourite of aquarists. Though not considered threatened or endangered, both Mexico and California list *H. rubicundus* as a protected species (TRAFFIC USA, 1996).

2.5.2.2 Reptiles

Mexico has prohibited the export of its native reptiles, although a substantial illegal trade has remained (Hoover, 1998). Over the last 20 years, for instance, commercial exploitation has drastically reduced the once abundant populations of Mexican sea turtles. All seven of Mexico's native species of sea turtles (Table 2.5) are critically endangered due to over-harvesting for national and international markets (Mast & Brautigam, 1986; Fitzgerald, 1989; INE, 2003).

Although marine turtles have been slaughtered in Mexico for their meat, eggs and oil (Dietrich, 1989; Steiner & MacLamb, 1990), sea turtles have been mainly killed for their skins (Mast & Brautigam, 1986; Fitzgerald, 1989; Steiner & MacLamb, 1990). Sea turtle leather boots were the most common endangered wildlife products seized from US tourists returning from Mexico during the 1980s. Other sea turtle products offered to unsuspecting tourists included tortoiseshell jewellery, stuffed sea turtles, and turtle oil cosmetics. Since all sea turtles are included in CITES Appendix I and protected under the ESA, these products may not legally enter the US and are subject to seizure on arrival. CITES figures for 1983 revealed the following seizures by USFWS from returning tourists: over 800 sea turtle leather articles including boots, shoes, and handbags;

34 stuffed turtles and turtle shells; 65 pieces of tortoiseshell jewellery; and 97 turtle oil products and other souvenirs (Brautigam, 1986a).

Table 2.5 The distribution of the world's sea turtles in Mexico

Genus	Species	Subspecies	Common Name	Distribution
Caretta	*caretta*	*caretta*	*Cahuama*	Gulf of Mexico and Caribe
Caretta	*caretta*	*gigas*	*Perica**	Pacific
Chelonia	*mydas*		*Blanca*	Gulf of Mexico and Caribe
Chelonia	*agassizi*		*Prieta*	Pacific
Eretmochelys	*imbricata*	*imbricata*	*Carey*	Gulf of Mexico and Caribe
Eretmochelys	*imbricata*	*bissa*	*Carey*	Pacific
Lepidochelys	*kempii*		*Lora*	Gulf of Mexico and Caribe
Lepidochelys	*olivacea*		*Golfina*	Pacific
Dermochelys	*coriacea*	*coriacea*	*Laúd*	Gulf of Mexico and Caribe
Dermochelys	*coriacea*	*sonlegeiii*	*Laúd*	Pacific

* It does not nest in Mexican beaches
Source: INE (2003)

In 1990, Mexico agreed to close down its legal fisheries for sea turtles (D.O.F., 31 May 1990). This Mexican agreement prohibited the take, capture, prosecution, and disturbance of sea turtles. While the ban helped to stem an enormous illegal trade at the time, the harvest and trade of sea turtles for meat, eggs, shell and leather continued (Sanchez, *in litt.*, 1999 cited by Fleming, 1999). In 1993, Mexican authorities admitted that marine turtle depredation persisted in Mexico. During a three-month period 47,000 eggs and 350 skins were seized in the State of Oaxaca, despite coordinated protection programmes (El Nacional, 1993).

In addition to sea turtles, native species of crocodiles, snakes and iguanas were also subject to illegal international trade during the 1980s and 1990s (Rose, 1991; Fleming, 1999). In 1983, for instance, the following species were seized by the US: 15 stuffed caimans and 14 leather products; 40 items of *Crocodylus* spp.; 50 live boas (*Boa constrictor*); and, 1,250 live iguanas (*Iguana iguana*) (Brautigam, 1986a). In 1996, TRAFFIC reviewed the price lists of US reptile dealers who offered Mexican reptile species for sale in the US, which included: *Lampropeltis zonata agalma*; *Lampropeltis zonata herrerae*; *Lichanura trivirgata salowi*; *Pterosaurus thalassinus repens*; *P.t. thalassinus*; *Sauromalus hispidus*; *Sauromalus varius*; *Crotaphitus dickersonae*; *Bipes biporus*; *Lichanura trivirgata*; and, *Ctenosaura hemilopha hemilopha*. The price lists stated that these specimens had been captive bred in the US (Fleming, 1999).

There are also cases of illegal re-exports of native reptile species. Between 1990 and 1991, native species of *Chelonia*, *Lepidochelys* and *Crocodylus* left the country, supposedly as 're-exports' (Pérez-Gil *et al.*, 1996). Based on the CITES definition, the re-export of native species is contradictory, since re-export means export of any specimen that has previously been imported.

2.5.2.3 Birds

Among birds, psittacines remain the most illegally traded species in Mexico. Although Mexico has officially prohibited the export of its parrot species (e.g. *Ara* spp. and *Amazona* spp.) and the US prohibits their importation, a number of factors conspire to drive illegal cross-border trade, namely the huge US demand for these species, profit margins along the market chain and a minimal chance of being caught on either side of the border (Rose, 1991; TRAFFIC International, 1996; Fleming, 1999). During 1988, for example, a scarlet macaw (*Ara macao*) would be sold in Mexico City for US$450, but could fetch US$4,000 in a pet store in Florida depending on its age, feather condition, and whether it was a captive or wild bred bird. Most of the value is added by the major commercial dealers who export and import parrots. The same bird sold by an exporter in Mexico for between US$400 and US$3,000 brings only US$19 or less to the bird trapper in the Lacandona forest in Chiapas. The trapper thus receives 2.5% of the final value for the bird, while commercial dealers add 97% of the final price (Iñigo-Elías & Ramos, 1991). Several factors have contributed to this situation (Gobbi *et al.*, 1996):

- psittacines are extremely popular pets in the US;
- every level of the market chain has offered incentives for trapping and smuggling parrots, even for the trappers who benefit least from the trade;
- the long US-Mexican border has been difficult to monitor;
- insufficient staff and low budgets have long limited the effectiveness of law enforcement on both sides of the border; and,
- the difficulty of enforcement has been exacerbated by the large number of small shipments smuggled across the border.

Such being the case, it has not been possible to determine the exact number of parrots smuggled annually into the US from Mexico, although several authors have made estimates over the past 20 years. Smugglers interrogated by US border agents in three cases estimated that 20,000 to 25,000 birds were moved during a one-year period in the Rio Grande Valley alone (TRAFFIC

International, 1996). USDA estimated that 25,000 birds are illegally imported annually (Mulliken & Thomsen, 1990). As many as one-third of the 250,000 live parrots reported as entering the US annually do so illegally through laundering (Thomsen & Hemley, 1987). Finally, the US Department of Justice has estimated than 150,000 birds are smuggled into the US from Mexico each year (Mulliken & Thomsen, 1990).

While the estimates are large, the assessment of actual off take requires consideration of pre-export mortality (Thomsen & Brautigam, 1991). In Mexico, wild birds have a high mortality rate during different parts of the trading process. The mortality rate of psittacines in the illegal trade has been estimated to be 40-50% higher than in the legal trade. The mortality rate during nestling capture has been at least 10%, depending on the species captured and the techniques used. The greatest mortality rate, approximately 30%, has occurred when birds are confined by trappers prior to shipment to Mexico City, mainly because of poor nutrition, stress and overcrowding (Iñigo-Elías & Ramos, 1991). Birds have also died during export, as they are concealed in small containers without food or water when smuggled across the border (Fleming, 1999).

Whatever the actual volumes, it remains clear that despite sting operations and efforts of wildlife inspectors and agents, bird smuggling has remained a serious problem. Despite the lack of reliable data on the exact number of parrots smuggled across the US-Mexican border, bird seizures have demonstrated that the US-Mexican border has been probably the most widely used route for illegal importation of parrots into the US (Gobbi *et al.,* 1996). USFWS seizures of Mexican birds in 1983 included: 78 green-cheeked Amazons (*Amazona viridigenalis*) and 8 yellow-crowned Amazons (*Amazona ochrocephala*) (Brautigam, 1986a). Between 1985-1986, large numbers of thick-billed parrot (*Rhynchopsitta pachyrhyncha)* were smuggled into the US, with estimates varying from several hundred to several thousand (Collar *et al.*, 1994 cited by Fleming, 1999). On June 1988, the owner of a pet shop in Bell, California, received a 30-month jail sentence for being involved in smuggling US$25,000 worth of parrots (*Amazona ochrocephala*) and military macaws (*Ara militaris*) into the US from Mexico. The USFWS and the Customs Service received evidence that this dealer ordered parrots from suppliers in Tijuana, Mexico, and paid smugglers to bring the birds across the border (TRAFFIC USA, 1988). During 1990-1993 at least 2,464 parrots were seized along the Texas-Mexico border in 468 reported incidents. The seizures included 14 of the 22 psittacine species indigenous to Mexico. Three species (*Amazona auropalliata, A. oratrix* and *A. viridigenalis*) accounted for 62.5% of all seizures (Gobbi *et al.,* 1996).

Although a decrease in parrot seizures from Mexico was noted in the early 1990s (Cantú & Sánchez, 1996), illegal bird dealings and seizures continue and illegal wildlife trade had increased in Mexico City by 1994 (Cantú & Sánchez, 1994).[6] Mexican authorities released a price list in 1996 of those bird species that attracted the highest demand in the illegal market (Table 2.6). In May 1998, a joint undercover operation by the US Customs Service and the USFWS culminated with the arrest and indictment of 31 individuals for alleged involvement in a major international endangered wildlife smuggling operation. Customs and USFWS agents seized more than US$600,000 worth of endangered or threatened birds, including 356 yellow-headed Amazon parrots (*Amazona ochrocephala*), 110 yellow-naped Amazon parrots (*A.o. auropalliata*), 57 Mexican red-headed parrots (*A. viridigenalis*), 31 red-lored Amazons (*A. autumnalis*), 8 military macaws (*Ara militaris*), and smaller quantities of several other protected psittacine species (TRAFFIC North America, 1998).

Table 2.6 Bird Species with Highest Demand in Illegal Market 1996

Common Name	Scientific Name	Market Price (MX$)	International Market Price (US$)
Red-Crowned Parrot	*Amazona viridigenalis*	400	1,500
Yellow-Headed Parrot	*Amazona oratrix*	1,000	3,000
Small Parrot	*Amazona ochrocephala*	300	1,500
Red Macaw	*Ara macao*	6,000	5,000
Green Macaw	*Ara militaris*	3,000	4,000
Yellow-Breasted Toucan	*Ramphastus sulfuratus*	500	6,000
Red-Tailed Sparrow Hawk	*Buteo jamaicensis*	500	-
Peregrine Falcon	*Falco peregrinus*	1,000	1,500

Modified from INE (1997b); INE (2000a)

In addition to Psittacines, Falconiformes and Strigiformes (diurnal and nocturnal raptors) have been also subject to national and international illegal trade. While international trade data are difficult to come by, it is clear that raptors have entered Mexico, sometimes accompanied by false documentation. USFWS seizures of Mexican birds in 1983 included: 1 peregrine falcon (*Falco peregrinus*) and 16 stuffed hawks and owls, including 7 red-tailed hawks (*Buteo jamaicensis*) (Brautigam, 1986a). In 1984, the Mexican government recorded an export of 10 peregrine falcons (*F. peregrinus*) bound for Abu Dhabi, United Arab Emirates by way of the Netherlands. The birds were subsequently seized upon arrival in the Netherlands (Iñigo-Elías, 1986).

[6] Shops and aquariums would assure that the offered specimens were perfectly legal and that they either came from a foreign country or from some breeding facility. None of the stores would show import permits, CITES certificates or the name or whereabouts of the breeding centres. Any of the birds had rings that could verify the legal origin either national or international (Cantú & Sánchez, 1994).

2.5.2.4 Plants

Mexico has been a major supplier of wild cycads, cacti and orchids (Pérez-Gil, 1986). The volume and the uncertain legality of Mexican exports of wild plants to the US have made this trade particularly troublesome. While a decree issued in 1940 prohibited commercial collection of native wild plants, the US continued to receive them in large numbers (Fuller, 1985a). During 1980-1989, high volumes of cacti, orchids and cycads were traded with most specimens reportedly taken from the wild, rather than artificially propagated (Rose, 1991; Fleming, 1999).

2.5.2.4.1 Cycads

Many of the illegally collected cycads (e.g. Cicadacea, *Ceratozamia* spp., *Dioon* spp., and *Zamia* spp.) have been exported from Mexico to the US, often times misidentified as comparatively common species. For example, in October 1984, 2,000 stems of *Ceratozamia* spp. crossed the border at Brownsville, Texas. US authorities seized the shipment labelled as *Ceratozamia mexicana* and returned the stems to Mexico where they were distributed to the botanic gardens in Jalapa, Veracruz, and elsewhere. When the stems grew leaves, botanists at Jalapa discovered that the species was the rare *Ceratozamia hildae* classified as endangered by the IUCN. A similar incident occurred in November 1984 when Mexican traders attempted to ship 20,000 seedlings of *Zamia furfuracea* through Miami airport as by passing them off as *Chamaedora* spp. (Vovides, 1986).

2.5.2.4.2 Cacti

Cacti have been also illegally collected and exported from Mexico to the US. In March 1986, Federal and state USFWS agents, in what has been dubbed as the biggest seizure of endangered cacti in California history, engineered simultaneous early morning raids on three homes and nurseries in southern California, netting 200 rare cacti believed to have been smuggled into the US from Mexico. Confiscated specimens included 56 *Ariocarpus* spp. or 'living rock' plants, 96 *Aztekium ritteri*, the slow-growing "Aztec" cactus, and 54 *Lophophora* spp., commonly known in Mexico as "peyote" (TRAFFIC USA, 1986). In May 1990, Mexican authorities from the State of Tamaulipas, stopped a truck carrying 'ornament plants'. Instead, the truck was carrying 10 tons of cacti collected in San Luis Potosí (Restrepo, 1990).

There have also been documented cases of attempted cacti smuggling involving foreigners. In late November 1996, a citizen from the Czech Republic was arrested in the Mexican municipality of Galeana for possessing rare species of cactus and seeds, and the tools to illegally remove them (TRAFFIC USA, 1997a). In December 1996, police in Nuevo León arrested 10 Czech Republic citizens attempting to illegally take endangered cacti out of that state. Much of the confiscated plant material consisted of two highly sought after CITES Appendix I species – *Geohintonia mexicana* and *Aztekium hintonii* – and specimens of two newly discovered species of *Strombocactus* that occur in Querétaro – *S. jarmilae* and *S. pulcherriumus*. The total seizure included 290 cactus plants, 103 samples of lichens, 5,000 cactus seeds of various species, 450 grams of other varieties of plants, and 39 cactus fruits. Plants of the newest and rarest of cacti – *Turbinucarpus alonsoi* and *Ariocarpus bravoanus* – have been reported "in heaps of collected" in nurseries in the Czech Republic (TRAFFIC USA, 1997a).

Although it has been very difficult to detect all the illegal shipments in Mexico before they make their way across borders, there are cases were other countries have succeeded in seizing illegally collected cacti. For example, an alleged smuggling attempt was reported to Japanese customs officials at Narita Airport, in Tokyo. Upon investigating an anonymous tip, they discovered 203 abandoned packages of plants and 17 packets of seeds of some of the very rarest of Mexican cacti. The abandoned plants consisted of the following CITES Appendix I cacti species: 72 *Strombocactus disciformis*; 36 different types of *Epithelantha* spp.; 25 *Aztekium ritteri*; 11 *Turbinucarpus alonsoi*; five *Geohintonia mexicana*; five *Aztekium hintonii*; four *Pelecyphora asselliformis*; 3 *Ariocarpus fissuratus* var. *hintonii*; and, one *Astrophytum asterias*. A Japanese newspaper reported that members of a group of Japanese collectors who toured Mexico illegally took the cactus plants and seeds (TRAFFIC USA, 1997b).

In February 1997, customs officials at France's Orly Airport seized 541 specimens of rare cacti from Mexico, valued at more than US$53,000. Various species of cacti in various stages of growth – some possibly 100 years old – were discovered as part of a shipment made by a German landscape gardener out of Dallas, Texas. Due to their fragility, the cacti were handed over to the Natural History Museum in France, where all but two plants were identified as *Ariocarpus* spp. (CITES Appendix I) or *Echinocereus* spp. (CITES Appendix II) (TRAFFIC USA, 1997b). On May 2000, the Netherlands Inspection General Service seized 927 Mexican cacti, mostly (80%) considered species at risk according to Mexican law (López, 2000).

2.5.2.4.3 Orchids

Many species of orchid have undergone major declines because of unsustainable levels of harvest for trade. Commercial collectors have been very selective with regard to the taxa they gather, choosing those species that are in high demand for the beauty and rarity of their flowers (Hágsater & Dumont, 1996).

Several Mexican orchids have been appreciated in horticulture since "orchid fever" gripped Europe in the 19th century. Large quantities of plants were exported to satisfy this great demand, and the practice has continued almost to this day. In the past, some species were brought to the verge of extinction because of international trade, such as *Laelia anceps dawsonii*, *Lycaste skinneri*, *Phragmipedium exstaminodium*, and *Rossioglossum grande* (Hágsater & Dumont, 1996).

Other species of orchid in Mexico have been endangered by other causes, mostly habitat destruction through changes in land use. In the late 1990s, orchids collected in the wild have been exported illegally as ostensibly propagated plants (Hágsater & Dumont, 1996). In January 1997, for example, Mexican authorities seized a shipment of 843 orchids at Mexico City Airport in the process of being exported to Australia. The orchid exporter possessed CITES permits for exportation of nursery-grown plants and claimed that the orchids were artificially propagated at a Mexican nursery in Fortín de las Flores, Veracruz. Inspectors considered the specimens to be wild-collected and orchid experts from the National University confirmed this to be the case. Forty species were identified in the shipment, including: *Laelia speciosa*, *Encyclia hanburii*, *E. mariae*, *Maxillaria densa*, *Oncidium cebolleta*, *Alamania punicea*, *Mormodes maculata* var. *unicolor*, *Epidendrum stanfordianum*, *Meiracylium trinasutum*, and *Lemboglossum rossii*. Many of the specimens were threatened species endemic to Mexico (TRAFFIC USA, 1997c; TRAFFIC International, 1997).

As well as pressures imposed on native orchid populations by the international trade, some orchids are sought in large numbers for ornamental plants for the Mexican market. A well documented case of an orchid species threatened by collection for the local market is *Laelia speciosa*, a Mexican endemic restricted to the southern limits of the Central Plateau. Many thousands of plants have been collected wholly or in part when in flower and sold in streets of Mexico City and several other cities and towns. Most of these plants are discarded after the flowers fall, or die slowly as a consequence of inadequate culture (Hágsater & Dumont, 1996).

2.6 Discussion

This chapter has sought to provide an overview of the available information on the international trade in wildlife involving Mexico during the 1980s and 1990s. The information has been compiled from disparate sources and should be considered as work in progress. Inclusive studies on the theme of wildlife trade in Mexico have been sporadic and this overview may contribute to forming a basis for further research, by bringing all literature references into a single document. It is hoped that this review will also highlight areas were further detailed systematic work is needed.

This chapter has shown that there are substantial levels of import and re-export of non-native species in Mexico, also with some illegal smuggling of non-native species. Mexico's major role in wildlife trade is as an entrepôt nation. The main imports of non-native species are reptile skins for the national leather industry. Most wildlife re-exports from Mexico are imported by the US. The largest component of the US-Mexico commercial trade are reptile skins and products. There are also high levels of trade in native species, much of it illegal and mainly comprising reptile skins, birds and plants. I now discuss these issues in more detail.

2.6.1 Non-native species

The review shows that Mexico imported and re-exported large volumes of non-native species during the 1980s and 1990s. The greatest volumes of trade have been in reptile skins. The US takes the bulk of Mexico's declared imports and re-exports. The volumes actually traded can only be estimated to minimum values because under-reporting and under-counting occurs to an unknown extent. There was still considerable smuggling during the 1980s and 1990s. The declared trade statistics are useful, ironically, in showing the ineffectiveness of bans in controlling trade. Despite the availability of disparate statistics, the trade on non-native species in Mexico has not been systematically studied.

Government officials have undertaken little analysis during the 1980s and 1990s, even though the Mexican government had access to its own official statistics and to USFWS trade data during the 1980s, and to the WCMC trade statistics after Mexico acceded to CITES in 1991.

2.6.2 Native species

The review shows that Mexico was involved in considerable levels of legal and illegal trade in native species during the 1980s and 1990s. The trade route from Mexico-US involved a variety of native species, particularly of reptile skins, leather products, psittacines, and cacti.

Although some comprehensive studies of trade in native species were undertaken in Mexico during the 1980s and 1990s, most studies arose from research promoted in the US. The study of international wildlife trade in Mexico has been hampered by several factors such as limited funding, the low priority accorded to such studies by government, the lack of interest among specialists in wildlife trade issues, among other reasons.

Even though Mexico instituted a national ban on native species, became Party to CITES in 1991, constructed a broad legal framework to deal with all wildlife commodities, developed a regulatory model, and instituted penalties for offenders, the plunder and transhipment of non-native and native species still occurs and is little researched. Mexico suffers because many of its native species are in high demand, and it has a long border with the US across which a large number of small shipments are smuggled. There is also a general lack of awareness of this problem among the Mexican public, there are too few people who protect wildlife resources, and there is no easy way to monitor the illegal trade. Above all, the illegal trade in native species makes economic sense given current legal options.

2.7 Aims of the Study

Since Mexico became a Party to CITES in 1991, no systematic research has been carried out that seeks to review CITES implementation in Mexico. The research that is available is limited in scope, scarce and dispersed. Since the extent to which CITES is successfully implemented by its member states determines the Convention's overall effectiveness, it is important to learn of different national experiences. Hence, this study aims to understand Mexico's approach to implementing CITES, and the key role of Mexico in international wildlife trade, through the analysis of trade data of selected taxa.

CITES has been poorly implemented in developing countries, due to the lack of human and economic resources. Nevertheless, it has been suggested that Mexico, as a developing country, has not responded appropriately to its commitment to CITES due to an inefficient internal structure and inappropriate domestic regulations (see Bowles *et al.*, 1994; Pérez-Gil *et al.*, 1996). Despite these difficulties, to comply with CITES, Mexico began the process of acceding to the Convention with a significant preparatory work (SEMARNAP, 1997). This study specifically seeks to respond the following questions:

- How did Mexico seek to regulate its international wildlife trade before signing CITES?
- Why did Mexico accede to CITES?
- Did Mexico have a clear idea of CITES philosophy when it was considering accession to CITES?
- Was the Mexican government genuinely concerned about CITES when it joined the Convention?
- Did Mexico have a policy during the early years that adhered to the philosophy of CITES?
- Did the accession to CITES influence the development of sustainable use policies in Mexico?
- What has been the main role of Mexico within the international wildlife trade?
- In terms of the conservation of native species, is Mexico benefiting from the extensive regulation of trade in such species?
- Is Mexico currently promoting the sustainable use of its native species?

The current thesis aims to take a constructive approach in contributing to how Mexico, a developing country rich in biodiversity, can more effectively implement its obligations towards CITES.

2.8 Thesis Outline

Chapter 1 has already given an overview of the importance of regulating international wildlife trade and has introduced the megadiverse status of Mexico. Chapter 2 has already examined the roles of Mexico in international trade as an importer, exporter and re-exporter of wildlife. This chapter has also described the particular importance of Mexico within international reptile skin trade and the problem faced by Mexico in relation to controlling illegal wildlife trade. Chapter 3 introduces the study area and gives an overview of the general methods used throughout the study. Chapter 4 analyses the process that led Mexico to acceding to CITES and the process of incorporation and implementation from 1991 to 2001 counting Mexican policies on wildlife trade, administrative arrangements and legal instruments. Chapter 5 examines the leather industry where the Mexican market for reptile skins takes place with emphasis in the regions where the skins are manufactured and distributed. Chapter 6 examines the use of non-native reptiles in the legal skin trade in Mexico. Chapter 7 examines the use of native reptiles in the legal skin trade in Mexico. Chapter 8 examines how Mexico is promoting sustainable management schemes for reptile species and their contribution to the production and commercialisation of skins. Chapter 9 examines the presence of native species in the illegal reptile skin trade, main species involved and main regions of harvest and distribution. Chapter 10 summarizes the conclusions of every chapter. Chapter 11 produces recommendations on sustainability, proposals related to the role of Mexico in CITES and the conservation aspects of Mexican species in general.

Chapter 3

3 Study Area and General Methods

3.1 Mexico

This section will describe the geography, physical characteristics, geopolitical units and development status of Mexico. This section will also introduce CITES implementation and the use of reptile skins in Mexico.

3.1.1 Geographical position

Mexico forms part of North America, together with Canada and the US. Mexico lies between latitudes 118º 27' 24" W, along the coast of Baja California on the Pacific Coast, and 86º 42' 36" W, to the east, along *Isla Mujeres* in the Caribbean Sea; and between longitudes 32º 43' 06" N, on the northern border with the United States, and 14º 32' 27" N to the south at the mouth of the *Suchiate* River on the border with Guatemala (Figure 3.1).

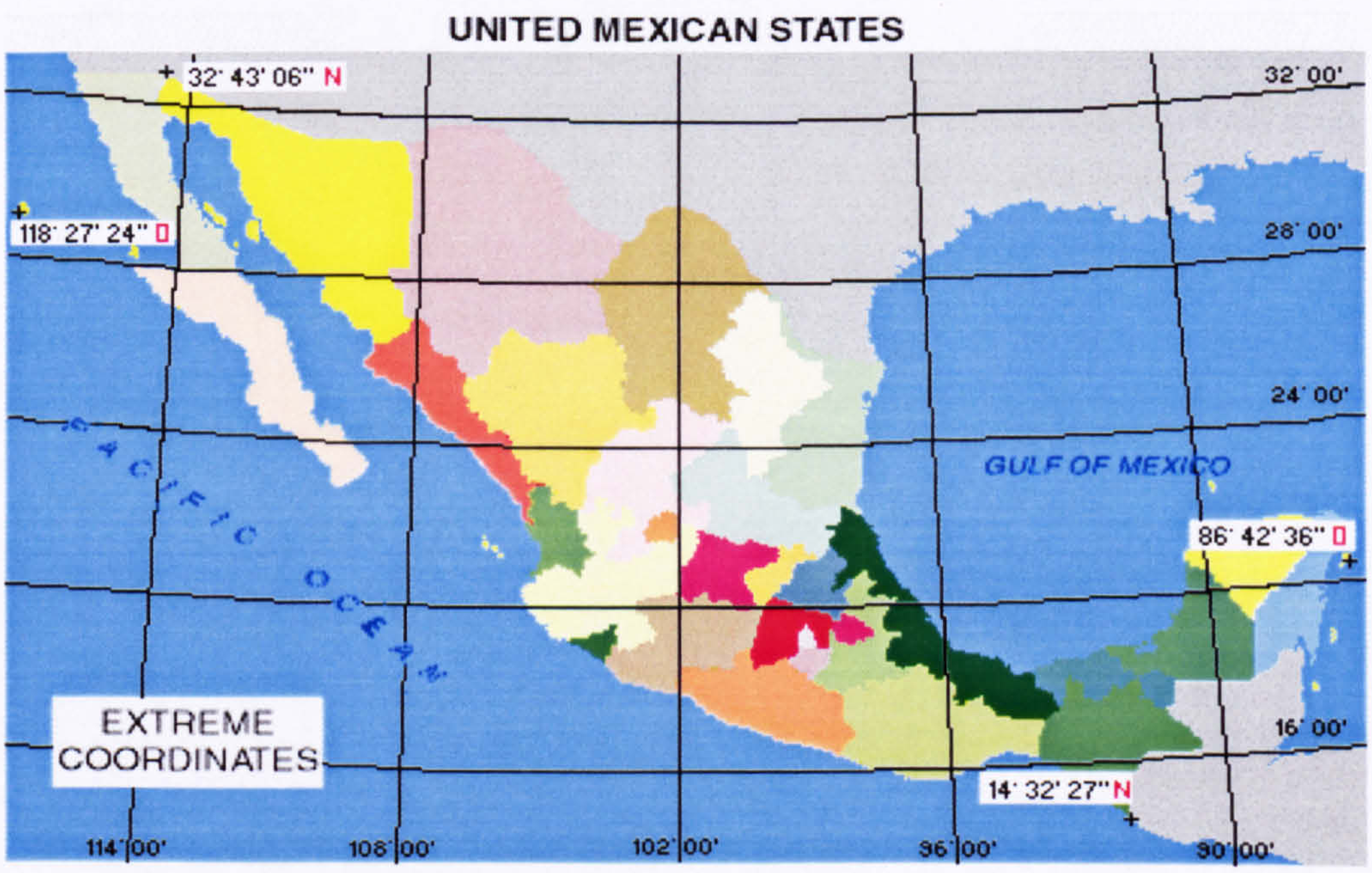


Figure 3.1 Geographic position of the Mexican territory
(INEGI, 2002)

The country covers an area of 1,964,375 sq km, of which 1,959,248 sq km are on the mainland and 5,127 sq km comprise islands. It is the fourteenth largest country in the world. Mexico shares a 3,152 km border with the United States to the north, and a total border of 1,149 km with Guatemala and Belize to the southeast. Its continental coastline spans 11,122 km, making it the second longest in the Americas after Canada. The country's territory is very irregular and is characterized by mountains, plains, valleys and plateaus (INEGI, 2002).

3.1.2 Physical characteristics

The main physical characteristics of Mexico are: the Baja California Peninsula to the north; the Mexican Plateau that comprises a great portion of the north-central parts of the country, and which is delimited by the Sierra Madre Occidental; the Sierra Madre Oriental; and, the Neo-volcanic Axis. Towards the south is the *Mixtec* Shield, located where the Southern Sierra Madre and the Neo-volcanic Axis meet, and where the Sierra of *Chiapas* begins and elongates towards Central America. At the south and southeast ends of the country are the Yucatan Peninsula and the *Chiapas* depression (Figure 3.2) (CONABIO, 2002). The highest mountains in the country are its main volcanoes, the highest being the Pico de Orizaba with an altitude of 5,610 m above sea level (INEGI, 2002).

Source: National Institute of Statistics, Geography and Informatics.
Physiographic Sheets, Scale: 1 : 4 000 000. Mexico

Figure 3.2 Main physical characteristics of Mexico
(INEGI, 2002)

Mexico's latitude and topography account for its highly varied climate, which ranges from warm, with annual mean temperatures above 26°C (78.8°F), to cold, with annual mean temperatures under 10°C (50°F). However, annual mean temperatures range between 10°C (50°F) and 26°C (78.8°F) in 93% of the country's territory, of which 23% has a warm-sub humid climate, 28% is dry, 21% is very dry and 21% is temperate-sub humid (INEGI, 2002).

The great diversity of Mexico's relief makes it one of the world's most heterogeneous countries in terms of contrasting, topographical characteristics. The different topographical formations play an important role in the country's economic and social activities, since they influence climatic conditions, types of soils and vegetation, which in turn affect agricultural, livestock, forestry, industrial activities and human settlements (INEGI, 2002).

3.1.3 Geopolitical units

Mexico is a representative, democratic and Federal Republic governed by three branches of power: the executive, the legislative and the judiciary. The President of Mexico for the six-year term from 2000-2006 is Lic. Vicente Fox Quesada (INEGI, 2002).

The country is made up of 32 politically autonomous, administrative units, comprising 31 sovereign states, and the Federal District, the seat of the Executive, which is also where the national capital is located (Figure 3.3). Each state is subdivided into municipalities, of which there are a total of 2,417 whose areas range in size from 6 to 51,952 sq km. Considering the complexity of working with units of such heterogeneous size, municipalities are the geopolitical units from which numerous national institutions obtain information about economic and social subjects including agricultural, forestry, fishery, and cattle production (CONABIO, 2002).

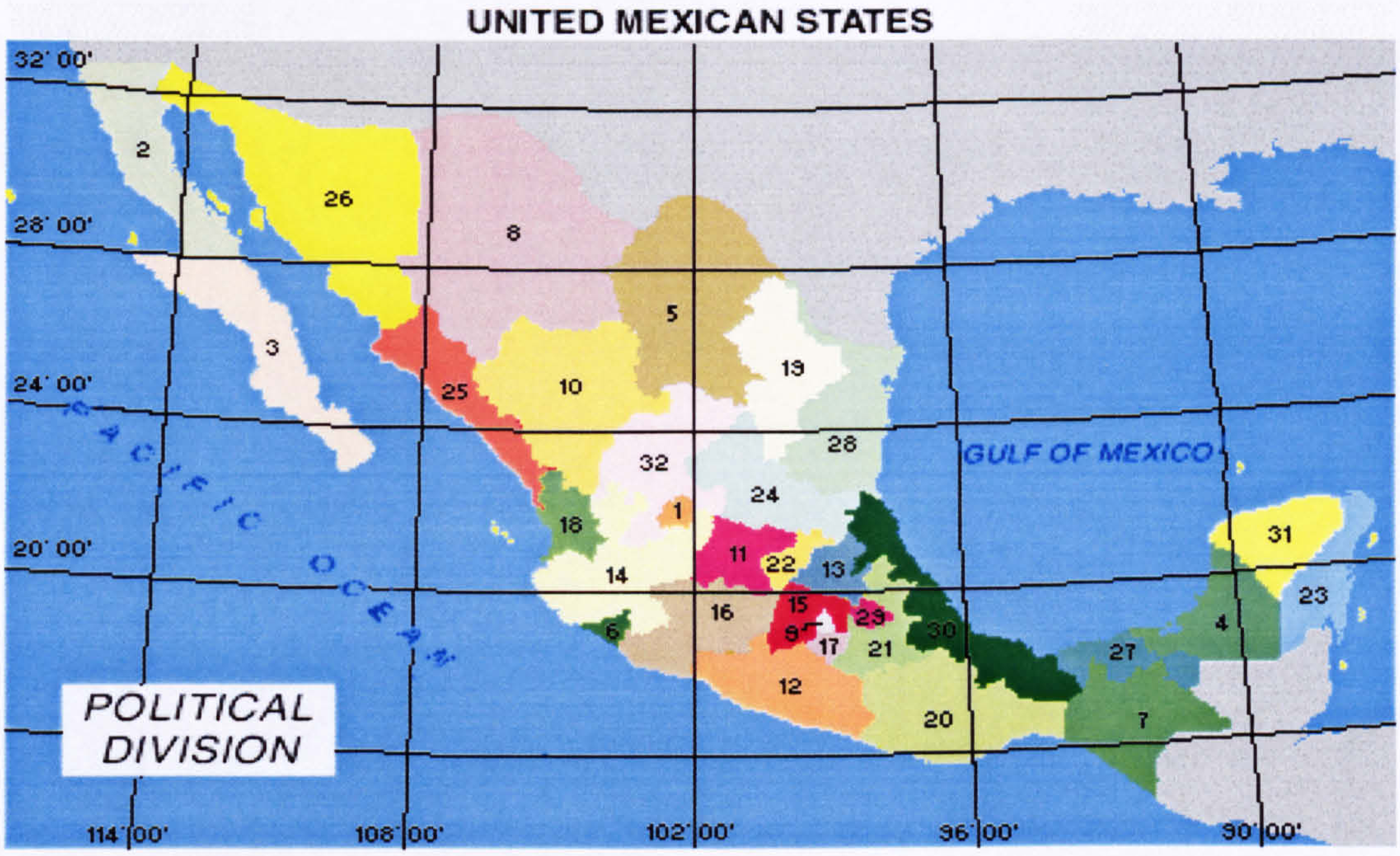


Figure 3.3 The 32 States of Mexico
(INEGI, 2002)

	STATE	CAPITAL		STATE	CAPITAL		STATE	CAPITAL
1	Aguascalientes	Aguascalientes	**12**	Guerrero	Chilpancingo	**23**	Quintana Roo	Chetumal
2	Baja California	Mexicali	**13**	Hidalgo	Pachuca	**24**	San Luis Potosi	San Luis Potosi
3	Baja California Sur	La Paz	**14**	Jalisco	Guadalajara	**25**	Sinaloa	Culiacan
4	Campeche	Campeche	**15**	Mexico	Toluca	**26**	Sonora	Hermosillo
5	Coahuila	Saltillo	**16**	Michoacan	Morelia	**27**	Tabasco	Villahermosa
6	Colima	Colima	**17**	Morelos	Cuernavaca	**28**	Tamaulipas	Ciudad Victoria
7	Chiapas	Tuxtla Gutierrez	**18**	Nayarit	Tepic	**29**	Tlaxcala	Tlaxcala
8	Chihuahua	Chihuahua	**19**	Nuevo Leon	Monterrey	**30**	Veracruz	Xalapa
9	Federal District		**20**	Oaxaca	Oaxaca	**31**	Yucatan	Merida
10	Durango	Durango	**21**	Puebla	Puebla	**32**	Zacatecas	Zacatecas
11	Guanajuato	Guanajuato	**22**	Queretaro	Queretaro			

3.1.4 Development status

There are two separate facets to Mexico's development status: industrial and rural (Ramos, 1988). Mexico's GDP for the year 2001 was US$618,031 million, and its sectoral distribution was: agriculture (4.3%); industry (26.4%), of which manufacturing industry comprises 72.4%; and services (69.3%), of which 35.6% includes communal, social and individual services (INEGI, 2002).

Mexico faces enormous economic problems because most of the financial capital is concentrated in a few hands, leaving the majority of rural and urban people living well below the poverty line (Ramos, 1988). Rural communities in Mexico are generally poor and have been marginalized from the benefits of the country's overall social development (Castillo & Toledo, 2000). Although population growth has slowed to 1.9% per year (INEGI, 2002), the 2000 population comprised 102,400,000 residents (UNDP, 1996), which places Mexico as one of the most populated countries in the world (Table 3.1).

Table 3.1 Demographic, social, physical, and resource utilization parameters in megadiverse countries

Country	Population (year 2000 estimate 10^6)	Growth rate % yr^{-1}, 1993-2000	Rural pop. (% of total in 1993)	Area (ha. 10^6)	Forested area (% of total)	Cultivated area (% of total)
Brazil	174.8	1.6	23	851.2	57.3	4.9
Indonesia	212.7	1.5	67	190.5	58.7	9.9
Colombia	37.8	1.5	28	113.9	43.9	3.4
Australia	19.2	1.3	-	771.3	18.8	6
Mexico	**102.4**	**1.9**	**26**	**195.8**	**24.9**	**11.8**
Ecuador	12.6	2	43	28.3	55	5.7
Madagascar	17.3	3.2	74	58.7	39.5	4.4
Peru	26.1	1.9	29	128.5	66	2.6
Venezuela	24.2	2.1	8	91.21	32.9	3.5
China	1284.60	1	71	956,100	13.5	9.6
India	1022	1.8	74	328,759	20.8	50.5
Philippines	74.6	2	48	30	45.3	18.4

Modified from UNDP (1996)

The country's plight is largely the result of development policies that, for decades, have omitted the environmental dimension. Changes in rural land use have been influenced by agricultural development, which in turn has increased poverty, inequalities, and overall social polarization. This has brought about overexploitation of natural resources, accelerated population growth, and social conflicts related to land tenure. Economic development has not been based on a parallel technological development that incorporates the particular environmental characteristics of each region (Landa *et al.*, 1997). The rural population of Mexico is widely dispersed and organized in small villages, with different levels of community organization and various cultural identities (Sarukhán & Dirzo, 2001).

Forms of community-based corporate ownership that are currently recognized and supported by law are *ejidos* (communal lands) and indigenous communities. Although certain agricultural activities, such as cattle ranching, irrigated agriculture, and some rain fed agriculture, are dominated by agro-industrial farms, small-scale rural communities constitute the main economic agents in most forested areas and rain fed agricultural lands (Castillo & Toledo, 2000).

The politics of the environment and its conservation are poorly defined in Mexico, with few clear policies. Legislation is frequently enacted in response to conflicting priorities and emergency situations. Government officers are politically appointed, and communication among them or between their agencies is limited, because of strong territoriality at that level. In addition, Mexican international environmental policy is not well defined. The acceptance of many international conventions generally depends on favourable opinions from different agencies within the government, which have trouble reaching agreement. Analysis of the conventions has not been completed, and their value is not well understood (Ramos, 1988).

Mexico shares the general condition often found in less-developed countries of having a limited scientific infrastructure and little formal experience of natural resource management. However, for various historical reasons, efforts to advance the knowledge of the flora and fauna of Mexico go back to the middle of last century, when plant and animal collections were made, museums were organized, and a limited amount of institutional support was established. With time and the development of public institutions of higher education, many herbaria and museums sprang up in different regions of the country. This brought about the current situation in which taxonomic research, the botanical and zoological survey of the country, and other activities related to an understanding of biodiversity were fairly evenly distributed throughout many institutions across Mexico (Sarukhán & Dirzo, 2001). In fact, despite the small size of the Mexican ecological community, ecologists in Mexico have been centrally involved in the formulation of the current environmental policy and have contributed significantly to the understanding of the diverse ecosystems of the country (Castillo, 2000).

3.1.5 CITES implementation

In the Political Constitution of the United States of Mexico (1917), Article 133 establishes that the supreme laws of the Republic are the provisions contained in the Constitution, as well as the laws of the Congress that are derived from the Constitution and the international treaties signed by the President and approved by the Senate. Upon enactment, in accordance with constitutional provisions and the CITES Convention itself, the law of approval and the CITES Convention will rank above ordinary law in the federal legal hierarchy (See also Article 2 of the Law of Implementation of Treaties, DOF 1992b).

The applicable provisions to CITES in the Political Constitution of Mexico (1917) are Articles 25, 26, 27, 28, 42, 48, 73, 115 and 133. The relevant environmental constitutional principles for the application of CITES in Mexico are: Article 25, which establishes that national economic development should be based on criteria of social equality and productivity, and concern for the conservation of natural resources and the environment; Article 26, which establishes the national development plan as being of mandatory compliance for any programmes of the federal public administration; Article 27, which provides that the exploitation of natural resources should be subject to necessary measures to preserve and restore ecological equilibrium; and, Article 73 (section XXIX, letter G), which empowers the Congress of the Republic to enact laws that establish the concurrence of the Federal Government, the State and Municipal governments, in their respective functions, for the protection of the environment and the preservation and restoration of ecological equilibrium (UNEP-CITES Secretariat, 1997).

3.1.6 Use of reptile skins

The main manufacturing centre in Mexico of diverse reptile skin products both from native and non-native species is Leon, Guanajuato (Figure 3.4), a traditional centre for Mexican footwear since the last century. Ciudad Juarez, Chihuahua, in turn, specializes in making cowboy boots mainly from skins of non-native reptile species. Chapter 5 examines the use of reptile skins in these two industrial centres.

Figure 3.4 Leon, Guanajuato, and Ciudad Juarez, Chihuahua

3.1.6.1 León, Guanajuato

Guanajuato State, central Mexico (Figure 3.5) lies on the interior plateau at an average elevation of about 1,800 m above sea level and has a total area of 30,491 sq km. The north is mountainous, while the south, consisting of fertile plains, is largely devoted to agriculture (INEGI, 2002).

Figure 3.5 State of Guanajuato, Mexico
INEGI (2002)

The city of León, northwestern Guanajuato State, stands in a fertile plain on the Turbio River, 1,884 m (6,182 feet) above sea level. Once subject to disastrous floods, the city is now protected by a large dam and has developed into an important industrial and commercial centre for the surrounding hinterland, considered as one of the richest cereal-producing districts of Mexico. Leather goods, gold and silver embroideries, steel products, textiles, and soap are manufactured in the city, which also contains tanneries and flour mills.

3.1.6.2 Ciudad Juárez, Chihuahua

The state of Chihuahua is located at the northern end of Mexico, on the Northwest Central Plain. It is bordered to the north and northeast by the United States, to the west and south by the state of Sonora, and to the southeast by the state of Sinaloa (Figure 3.6). Chihuahua covers a surface area of 244,938 sq km, making it the largest state in Mexico (INEGI, 2002). Ciudad Juarez, Chihuahua (Figure 3.6), on the Rio Grande opposite El Paso, Texas, is connected with the US by three international bridges. Except for the river valley, under intense cultivation southeast of the city, Ciudad Juarez is hemmed in by desert. It has experienced extremely rapid population growth and has been a favoured location for the placement of *maquiladoras*, foreign-owned manufacturing plants that finish goods for sale in the US.

Figure 3.6 State of Chihuahua, Mexico

3.2 General Methodology of the Study

This section presents an overview of the key information and main bibliography collected and the analytical methods used throughout the thesis. Detailed description of methods and data analysis techniques are presented in the pertinent chapters.

3.2.1 CITES implementation study

In certain kinds of research it is crucial to explain events or situations in the present by reconstructing the past (Warwick, 1983). In this study, historical qualitative data was combined to understand the present policies of Mexico towards CITES.

Since there was little scholarly information available on the topic, a wide variety of sources were used to shape the study. Comparisons of data from different sources may reveal reassuring similarities or highlight interesting inconsistencies. Furthermore, the aggregation of data from different sources may help build up a fuller or more balanced picture of the social phenomenon of interest (Pole & Rampard, 2002). Many official and unofficial sources of political data were used for this study. However, key informants among the government and academic communities were the main source of information. This involved calling on numerous influential people for strategic personal contact. Potential respondents were informed that written permission of the appropriate authorities had been given for field research and their own consent to participate was sought. Gaining access to documents or potential respondents was accomplished through the use of individuals (or sponsors) who were personally acquainted with the key informants. These social networks supplied the appointments with the appropriate officials and the names of the officials most likely to provide the information needed. My success at obtaining the cooperation of the research subjects depended on the influence of my sponsors, the history of research in the area and consequent attitudes toward it, and my ability to demonstrate that the study would have positive results for the individuals concerned.

The approach of *semi-structured interviews* (Robson, 1993) was used. I began with an informal talk and used open questions to encourage respondents to talk at length about topics which interested them rather than being pushed rapidly from one closed question to the next. I introduced an initial topic but I was then to some extent guided by the interviewee's responses as to the succeeding sequence of topics. Notes were made during the interview. In this way, I had greater freedom in the sequencing of questions, in their exact wording, and in the amount of time and attention given to different topics.

Focused interviews (Robson, 1993) were also used, which allowed people's views and feelings to emerge, but which also gave me some control during the interview. This approach was used to investigate individuals who had been involved in particular situations. The first task was to carry out a situational analysis, by means of documentary analysis, which covered the important aspects of the situation to those involved; the meaning these aspects have for those involved; and, the effects they have on those involved. An interview guide was then developed covering the major areas of enquiry and the research questions.

3.2.2 Case study of Mexican reptile skin trade

The case study is a strategy for doing research, which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence. Whatever kind of case study is involved, there is always the need to have a research design (Robson, 1993). Based on my review of international wildlife trade in Mexico (Chapter 2), I chose to study the reptile skin trade. To design the case study I developed a conceptual framework; a set of research questions; a sampling strategy; and decided on methods and instruments for data collection.

3.2.2.1 Manufacture and distribution

Since there was little systematic information available on the reptile skin trade in Mexico, a wide variety of sources were used to shape the study. The most obvious reason for expanding the number of data sources is to obtain crucial information that is not available from a single method. A second reason for combining data sources is to increase confidence in the accuracy of measurements or observations made on a given phenomenon. A combination of methods, while no panacea for the limits of social research, at least holds the promise of counteracting, as well as comprehending, the biases of single data sources. More creative possibilities of integration arise when the same topic is covered in the same study by two or more data sources (Warwick, 1983).

Data are raw facts that describe people, objects, and events in an organization. Data flows are groups of data that move and flow through a system and include a description of the sources and destinations for each data. Data flow diagrams are very useful for representing the overall data flows into, through, and out of an information system (Hoffer *et al.*, 1996). They can be used to show an existing system and how it works physically. They provide an abstraction (logical or conceptual view) of the system, illustrating what is going on without reference to how and where it happens or who does what (Tudor & Tudor, 1997).

Data flow diagrams have only a few symbols and straightforward conventions, to make them readily understandable. Data flow diagrams rely on only four symbols to represent the four conceptual components of such models (Figure 3.7): data flows (these can be data or materials), data stores (these can be data or materials), processes, and sources / sinks (Hoffer *et al.*, 1996; Tudor & Tudor, 1997).

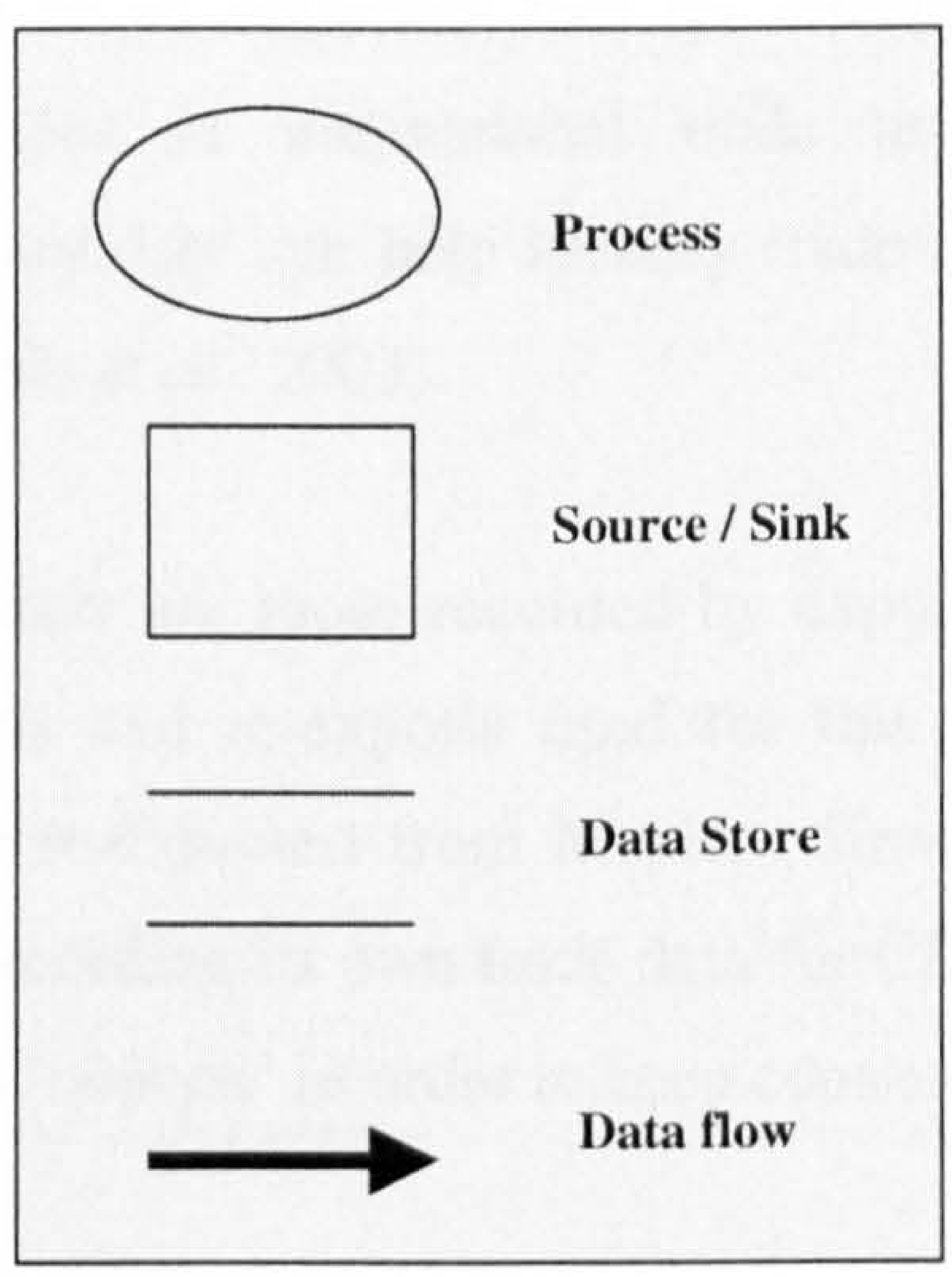


Figure 3.7 Data Flow Diagram symbol sets

Data flow diagrams were used to depict the flow of data in an information system. A system is an inter-related set of components with an identifiable boundary, working together for some purpose. A system has nine characteristics: components, inter-related components, a boundary, a purpose, an environment, interfaces, input, output, and constraints. A key aspect of a system is the system's relationship with its environment. Some systems, termed 'open systems', interact freely with their environments, taking in input and returning output. In contrast, a closed system does not interact with the environment. In a closed system changes in the environment and adaptability are not issues (Hoffer *et al.*, 1996). The Mexican reptile skin trade functions as an open system taking in reptile skins from non-native species and returning out reptile skins and skin products.

What is the value of thinking of a system in a process? Visualizing a set of processes and their inter-relationships as a system allows a specific physical situation to be translated into more general, abstract terms. From this abstraction, the essential characteristics of a specific situation can be analysed. This in turn allows insights that might never be gained from focusing too much on the details of the specific situation. Also, we can question assumptions, provide documentation, and manipulate the abstract system without disrupting the real situation (Hoffer *et al.*, 1996).

3.2.2.2 Trade data

This study analyses imports, exports and re-exports of reptile skins and skin products from non-native and native species recorded in the annual reports submitted by the Parties of CITES for the years 1980-2001. CITES trade can be an important tool for informing decisions concerning the management of harvests of species in international trade and other aspects of CITES implementation. Reviews of summary data can help identify trade trends over time and pinpoint aspects for more detailed focus (Harris *et al.*, 2003).

Records of imports used for this study are those recorded by exporting countries as imported to Mexico. In turn, records of exports and re-exports used for this study are those recorded by importing countries as exported or re-exported from Mexico. Since Mexico was not a party to CITES until 1991 and only began recording its own trade data for CITES in 1992-93, these figures are used rather than 'net (re) exports/ imports' in order to keep consistent data over 1980-2001.

The trade data were provided from the CITES trade database in a Microsoft Excel spreadsheet format. Microsoft Excel was used to sort and sum subsets of the data appropriately and also to generate the graphic representations. A variety of graphs and charts have been used to illustrate CITES trade data. For the purposes of illustration, pie charts have been used to present proportional data. Bar charts have been used to show changes in trade volumes over time, and stacked bars to depict percentage contributions to total trade, allowing relative comparisons of the data. Absolute volumes were also plotted using stacked bars. Discrete quantities such as annual trade quantities have been represented on graphs as discontinuous values as un-linked set of points.

Statistical analyses have not been undertaken in conjunction with this study. As a result, for those examples making use of trends, it must be borne in mind that while these indicate a possible direction of trend, no statistical significance can be attached to these trends.

Any effort to describe the international wildlife trade must unfortunately begin with the recognition that this cannot be done with any accuracy. International wildlife trade is very poorly documented in terms of the species or products involved, trade volumes and trade values. There are two main sources of data on the international wildlife trade: Customs data and CITES data (Roe *et al.*, 2002).

Customs data include information on trade volumes and declared values upon export and import. These data are compiled by national governments and organised according to commodity types, most often using the Harmonised Commodity Description and Coding System (HS). Customs data provide information on levels of processing and overall trade volumes, but rarely on the species or number of specimens involved (Roe *et al.*, 2002).

As a result of CITES, the trade in CITES-listed species is relatively well documented. CITES Trade Database is unique and holds over 2 million records of trade in wildlife and 29,000 names of taxa listed (WCMC, 1996). However, the number of species covered by CITES is small relative to the overall number of wildlife species in trade. Furthermore, problems with the accuracy of CITES trade reporting mean that trade data are indicative rather than actual. CITES trade data are better for live animal specimens than for plants or for animal and/or plant products (Roe *et al.*, 2002).

The analysis of the World Conservation Monitoring Centre (WCMC) CITES Trade Database (Cambridge, UK) and the US Fish and Wildlife Service Law Enforcement Management Information System Trade Database (LEMIS), provided the chief basis for the assessment of trade in individual species detailed here. The data were used to determine the volume of trade and trends over a certain period of time of specific species or genera.

3.2.2.2.1 WCMC

CITES requires that Parties prepare and submit to the CITES Secretariat annual reports documenting their imports and exports of species listed in the three appendices to the Convention. The CITES Trade Database is managed by UNEP-WCMC on behalf of the CITES Secretariat. Included in each entry are data on the year, CITES Appendix, species, term, country of import, country of export, country of origin, quantity, unit, purpose and source. Any order can be chosen from the selected categories (WCMC, 1996). Parties can request data from the database in several formats to support a variety of analyses. An analysis undertaken using CITES trade data is only as accurate as the original reporting of the data (Harris *et al.*, 2003).

Although the information provided by CITES reporting is far more detailed than that available before the Convention came into operation, it is nevertheless far from complete reflection of trade, or necessarily accurate as far as it goes. Three major factors account for this (Jenkins & Broad, 1994; Harris *et al.*, 2003):

- **Illegal trade:** Either through misdeclaration, under-declaration or non-declaration of shipments, illegal trade is a widespread problem in the international reptile skin trade. Being by its very nature unquantifiable, it seriously hampers accurate assessment of the trade. Few Parties provide comprehensive information on wildlife confiscations or seizures in their annual reports. The data therefore do not give an accurate indication of the amounts of illegally-traded CITES-listed specimens confiscated and/or seized by enforcement authorities.
- **Poor reporting:** Inaccurate reporting of imports and exports of CITES-listed species is a widespread problem. Some countries have had a policy until recently of not reporting trade in Appendix II taxa, which has led to considerable under-representation of trade in some taxa.
- **Inconsistent reporting:** Parties may fail to use standard units to record the trade in wildlife, especially in processed or manufactured products. A countervailing factor may also lead to over-representation of trade. Reptile skins may be reported as numbers of watchstraps, belts, shoes, skins, by weight of skin, by length and by area. As a result, analysis of the trade in processed and manufactured items, and specifically, equating this trade to the number of animals and plants traded, is especially difficult. However, the majority of transactions in the majority of taxa are now counted by number of skins and it thought that double counting has not significantly inflated the apparent levels of trade in most cases.

3.2.2.2.2 LEMIS

The U.S. Fish and Wildlife Service's (Service) Law Enforcement Management Information System (LEMIS) contains all imports and exports of wildlife that have been declared to the Service. Included in each entry are data on the species, volume, origin, wildlife description, destination, importer, exporter, port, date of import or export, and other information. Though LEMIS provides very valuable information on species and volumes in trade, there remain a number of inadequacies that limit the value of these data. Perhaps the most significant limitation is that species are often recorded at the genus level or higher, or recorded using no longer valid taxonomic names. Thus, there may be several different four-letter codes to record a single species. Though some of these issues can be addressed with careful analysis of the data, all numbers should be interpreted as minimum figures for volumes in trade. Another problem that arises with LEMIS data is that entries can use a variety of units of measure to record animals in trade. For example, reptile skins are often recorded in kilograms instead of as whole skins. Therefore, in order to determine how many individuals are involved in a shipment, the weight must be interpreted based on the average weight of a single reptile skin (Hoover 2003, Pers. comm.).

3.2.2.3 SUMA

Information on the use of reptile skins in the UMA System was studied through a combination of documentary search, survey and semi-structured interviews methods. Semi-structured interviews were conducted with key informants from the academic, governmental and private sectors to establish facts on the current status of reptile skin production in Mexico, the main reptile species involved and the ongoing reptile skin production schemes.

3.2.2.4 Illegal trade in reptile species

Information on the illegal use of reptile skins in Mexico was examined through a combination of documentary search, survey and semi-structured interview methods. Semi-structured interviews were conducted with key informants from the academic and governmental sectors to identify main reptile species involved, as well as main regions in Mexico where this type of trade takes place.

Chapter 4

4 CITES Implementation: The Mexican Experience

4.1 Introduction

In a perfect world, every nation state would possess strong, competent agencies, whether in wildlife, forestry, fisheries, customs and police, to conserve and manage its fauna and flora sustainably, and to minimize illegal trade. However, in our imperfect world, different states vary widely in their capacity, motivation and political will to conserve natural resources. As a result, individual nation states harbour widespread mistrust and dissatisfaction over how to subdivide the responsibility to conserve what is perceived a global heritage (Martin, 2000). Because trade in wild animals and plants crosses borders between countries, its regulation requires international cooperation to safeguard certain species from overexploitation (CITES Secretariat, 2003). CITES was conceived in the spirit of such cooperation and more than 160 countries are now signatories. There is little doubt that CITES has become a very important and influential conservation treaty (Jenkins, 2000).

The major challenge for CITES is to ensure that legal trade remains within sustainable levels. While only around 15% of CITES parties had adequate legislation for implementing the Convention in 1993 (De Klemm, 1993; OECD, 1999), specific implementing legislation has now been adopted in 146 countries, of which more than 60% addressed most or all of the CITES requirements (Young, 2000). However, many exporting countries still lack the resources to undertake sufficient research and monitoring to make non-detriment findings, and the political will to enforce trade controls (Rosser & Haywood, 2002). Importing countries, in turn, often lack the means by which to regulate trade known to be detrimental. To date, Parties to CITES have been far more successful at identifying problematic trade than they have been at directing resources toward improved management of listed species (Freese, 1998).[1]

[1] For example, Parties report on infractions which in turn permits the CITES Secretariat produce a report that provides a "Review of alleged infractions and other problems of implementation of the Convention", known as the 'Infractions Report'. The Infractions Report is produced to try to alleviate problems of illegal trade and implementation within the CITES context by providing examples from which the Parties can learn and draw conclusions (TRAFFIC, 2003).

In addition, the philosophy behind CITES was initially generated by western cultural values, which had a profound effect on the way it has developed, as well as promoting the false impression that actions of the treaty are real conservation actions. This latter point has given rise to rifts between Parties and factions within CITES, and to a frequent failure to recognize that CITES is not an end in itself, but a tool to be used to assist real conservation actions (Huxley, 2000).

A key issue to set in context, therefore, is the different philosophical positions of Parties to the Convention. For example, the southern African countries have promoted a strong policy of sustainable use over species as elephants and rhinos within the framework of the Convention, in distinct opposition to more protectionist Parties both in East Africa, India and indeed among developed countries (Hutton & Dickson, 2000). Parties may well have different positions and reasons for having acceded to the Convention, and for their continued and ongoing participation in the affairs of the Convention. Little formal research seems to have been devoted to understanding the positions of individual Parties to the Convention, which in turn relate to the different policies adopted by each Party towards biodiversity conservation. If CITES is indeed going to make important contributions to stemming biodiversity loss, it is important to understand such positions, particularly of mega-diversity countries.

Mexico is one such mega-diversity country that also has an important role in international wildlife trade as an entrepôt for trade to the US. Among Mexico's earliest measures to conserve its natural resources were the 1936 Convention for the Protection of Migratory Birds and Game Animals (*Convenio para la proteccion de aves migratorias y de mamiferos cinegeticos)* between Mexico and the US that restricted trade and hunting to certain seasons (Alcérreca & Rodríguez, 1984; INE, 1999c); the 1940 Agreement *Lázaro Cárdenas*, which addressed the regulation of exports on native plants (Trejo 2000, Pers. comm.); and, the 1952 Federal Hunting Law (*Ley Federal de Caza*), which in turn addressed the regulation of use of wild fauna species within national territory (Alcérreca & Rodríguez, 1984). However, as international interest came to be focused on issues of wildlife trade in the 1970s, Mexico adopted a very ambivalent attitude towards CITES. Therefore, in this chapter, I seek to analyse the social and political characteristics of Mexico in relation to its philosophy for regulating wildlife trade. The chapter seeks to understand why Mexico acceded to CITES and how this relates to the way in which Mexico now seeks to implement its responsibilities under CITES. This chapter is subdivided into five major phases that relate to major changes in Mexico's policies towards environmental concerns more generally, and to CITES in particular, for which I seek to answer particular questions, as follows:

Background environmental concerns

- What first stimulated the Mexican government to adopt environmental policies?
- How did policies start to emerge that addressed biodiversity loss?

Emerging policies for wildlife: 1980s

- What policies did the Mexican government follow during the 1980s to regulate international wildlife trade?
- What position did the Mexican government adopt towards CITES during the 1980s?

The process of acceding to CITES: 1989 – 1991

- When did the Mexican government begin its approach towards CITES?
- Why did the Mexican government decide to accede to CITES?
- How did the NAFTA negotiations influence Mexico's accession to CITES?
- Did Mexico have genuine reasons for acceding to CITES?

Early lack of understanding of CITES: 1992 – 1996

- Did Mexico understand its obligations as a CITES Party?
- How did Mexico initially participate in the affairs of CITES?
- What steps did the Mexican government take to involving national stakeholders in CITES implementation?

More effective implementation of CITES: 1997 – 2001

- Has Mexico now better defined its policy towards CITES and sustainable use?
- Has Mexico now adopted a more active role in the affairs of CITES?
- Has the Mexican government now allocated sufficient resources for effective implementation of CITES?

4.2 Methodology

Research for this chapter was carried out through extensive bibliographic searches of government literature, and by a range of social science approaches. Most of the information regarding Mexican policies on wildlife trade during the period 1980-1991 and the process of CITES implementation from 1991 to 2001 was not available from documents. Therefore, semi-structured and focused interviews were undertaken throughout the study with key informants comprising Mexican government authorities and specialists involved in the administration and conservation of wildlife from 1980 to 2001 and/or involved in the implementation of CITES in Mexico from 1991 to 2001.

Extensive bibliographic research was undertaken regarding Mexican policies towards wildlife trade during the period 1980 to 1991, and regarding CITES implementation from 1991 to 2001, including administrative arrangements and legal instruments. Such research was undertaken in Mexico City (DF) from June to August 1999, January to February 2000, and August-September 2000, when the archives reviewed comprised the following:

- June-July 1999: FAUNAM AC (Present and Historic Files).
- July 1999: Dirección General de Vida Silvestre, INE (SEMARNAP); CONABIO publications and Library.
- January 2000: Computerized searchable database, reports and publications of the INE (SEMARNAT); FAUNAM AC (Present and Historic Files); SECOFI.
- August-September 2000: CONABIO publications and Library; reports and publications of the INE (SEMARNAT).

This bibliographic search was supplemented by work undertaken in the Library and files of TRAFFIC North America (Washington DC) from February-March 2000, and by searching the computerized database of Johns Hopkins University and Library of Congress (Washington DC) from September-December 1999, February-August 2000 and January-March 2001.

Throughout this study, special and regular work sessions were held with Eleazar Loa Loza (CONABIO; SEMARNAT) and Ramon Perez-Gil (FAUNAM AC), who were the main key informants in formulating the approach to the development of this chapter. In addition, the following key informants were also interviewed for this study:

- June 1999: José Juan Pérez, Dirección General de Vida Silvestre, INE (SEMARNAP).
- July 1999:
  - Ma. Elena Sanchez, TEYELIZ AC
  - Oscar Sanchez, Wildlife Management and Conservation Consultant
  - Miguel Ángel Cobián, Dirección General de Vida Silvestre, INE (SEMARNAP)
- August 1999: José Juan Pérez, Dirección General de Vida Silvestre, INE (SEMARNAP).
- January 2000:
  - Miguel Ángel Barrios, Escuela de Ciencias Biológicas, IPN.
  - Adulfo Jiménez Peña, Consejería Jurídica y de Servicios Legales, DDF
  - José Maria Reyes, Dirección General de Vida Silvestre, INE (SEMARNAT).
  - José Juan Pérez, Dirección General de Vida Silvestre, INE (SEMARNAT).
  - Mauricio Trejo, Dirección General de Vida Silvestre, INE (SEMARNAT).
- February 2000: Mario Ramos, Global Environmental Facility (GEF).
- September 2000:
  - Luz Maria Ortiz, Unidad Coordinadora de Asuntos Internacionales (SEMARNAT)
  - Ana Silvia Arocha, Senate.
  - Hugo Rodríguez, UAM.
- January 2001: Oscar Sanchez Herrera, Wildlife Management and Conservation Consultant.
- November 2001: José Maria Reyes, Dirección General de Vida Silvestre, INE (SEMARNAT).
- February 2002: Hesiquio Benítez and Yolanda Feria Cuevas, Dirección de Enlace y Asuntos Internacionales (CONABIO).
- March 2002: Mónica Herzig, Dirección General de Vida Silvestre, INE (SEMARNAT).

All the information gathered in Mexico City and Washington DC, including books, reports, articles, unpublished reports, and interviews was compiled, classified, read, and arranged to construct this chapter. A database was elaborated for every year between 1971-2001 to arrange the results systematically. All the sources of information examined for this chapter, whether bibliographic or interview-based, are presented as references in the body of the chapter, and presented in full in the reference list.

4.3 Results

4.3.1 Background environmental concerns

Even though environmental problems were already evident in Mexico during the 1970s, the environment was marginalized within national development strategies, legally, institutionally, and politically (Carabias & Provencio, 1994). Future President Luis Echeverría did not encompass environmental problems in his 1970 presidential campaign. However, his subsequent administration (1970-1976) became receptive to demands for environmental regulation shortly after he assumed office in December 1970 (Mumme *et al.* 1988). This was in response to pressure from a small group of academics, engineers, health officials, and private citizens. Action was taken principally because of fears that the severity of environmental problems in Mexico would result in political and social unrest (Simonian, 1999).

Three institutional improvements occurred during President Echeverría's administration (Carabias & Provencio, 1994; UNEP-CITES Secretariat, 1997):

- promulgation of the Federal Law for the Prevention and Control of Environmental Pollution (*Ley Federal para Prevenir y Controlar la Contaminación Ambiental*) in 1971;
- extension of functions of the Health Council to prevent and combat environmental pollution in 1971; and,
- creation of the Sub-ministry of Environmental Improvement and the Directorate of Ecological Development within the Ministry of Health and Welfare (*Secretaría de Salubridad y Asistencia*, SSA) in 1972.

The Federal Law for the Prevention and Control of Environmental Pollution was the first anti-pollution legislation in Mexico. Furthermore, it provided the legal framework for Mexico's first group of environmental policies. This law embodied a palliative approach to environmental problems, by proposing technological remedies. This approach had obvious advantages, as it was seen to take steps to control pollution without disrupting industrial production or social development (Rivera, 1992; Simonian, 1999). Equally, this legislation was generated almost entirely in-house at the upper levels of Mexico's Ministry of Health and foreign policy bureaucracy, with little participation by organized interest groups or private citizens (Mumme, 1995). As a result, environmental problems were now included within government policies, but were limited to concerns over pollution and its health effects, and received attention only from the health sector (Carabias & Provencio, 1994; Simonian, 1999).

At no time during President Echeverría's administration did other environmental issues receive high-level presidential attention (Mumme *et al.*, 1988).

In the international context, the United Nations Conference on the Human Environment took place in 1972. Through the United Nations, a new perspective began to emerge on the relationship between conservation and development. However, while the Mexican government admitted that serious environmental problems existed in the country, it was not yet ready to jettison its programme of rapid industrialization for a programme of sustainable development. Furthermore, the Mexican government was not yet ready to accept the position that development had to be accompanied by strict environmental protection. In contrast, Mexican conservationists embraced the concept of ecodevelopment because they believed it represented a viable strategy for protecting the land, while ensuring social justice (Simonian, 1999). Various civil groups also demanded a better quality of life, and several environmental groups were created during the 1970s, giving rise to a social movement with growing interest in environmental policies (Carabias & Provencio, 1994).

During President Echeverría's administration, the Ministry of Agriculture and Livestock, and the Ministry of Water Resources, were in charge of the exploitation and regulation of natural resources. However, these Ministries were mainly concerned with agricultural expansion, and did not seek to combine environmental protection and conservation of natural resources into a single programme for ecological maintenance. While President Echeverría did not strengthen Mexico's few existing conservation laws, he created scientific institutions such as the National Council for Science and Technology (*Consejo Nacional de Ciencia y Tecnología*, CONACYT) that paved the way for ecological research and the formation of conservation groups (Simonian, 1999).

Mexican foreign policy generally reflected the lack of national political conscience about conserving natural resources. However, two key international events took place during President Echeverría's administration (Rivera, 1992; Simonian, 1999; INE, 1999c). Mexico hosted crucial international events for the Biosphere Reserve Program in 1974, and the Memorandum of the First Meeting of the Mexico-US Committee for Wildlife Conservation was signed in 1975 (INE, 1999c). Nevertheless, the Mexican government did not even consider acceding to CITES when it was ratified by 21 nations in Washington, DC on March 3, 1973.

Subsequently, President Lopez-Portillo (1976-1982) found it inopportune to embrace more wide-ranging environmental measures. However, he instituted minor changes in environmental policy and administration, and introduced the idea of a coordinated environmental policy amongst different federal agencies through the Federal Organic Law of Public Administration (*Ley Orgánica de la Administración Pública Federal*, LOAPF). The Ministry of Public Health (*Secretaría de Salubridad y Asistencia*, SSA) was given the responsibility in 1977 of leading the nation's environmental policy including ecological conservation (Rivera, 1992). A year later, an inter-sectoral commission for environmental health was created (Simonian, 1999). No substantial initiatives were taken until 1982, when the Federal Law for Environmental Protection (*Ley Federal de Protección al Ambiente*) was enacted (Mumme *et al.*, 1988), which held the promise of greater government intervention on behalf of environmental protection (Simonian, 1999). Nevertheless, Mexican environmental policy still remained low on the administration's active policy agenda. Except for cross-referencing in planning documents, environmental policy was never mentioned in the President's major policy speeches, nor actively promoted at the national level (Mumme *et al.*, 1988).

The environmental measures undertaken by Presidents Echeverría and Lopez-Portillo, though not trivial, did little to halt Mexico's environmental decline (Simonian, 1999). Environmental policy was largely symbolic and prestige-oriented, aimed at international recognition, but lacking national capacity and any commitment to implementation. Indeed, a number of policy measures only responded to US pressures for ameliorative action along the US-Mexico border (Mumme *et al.*, 1988). Hence, Mexican environmental policy during the 1970s and early 1980s suffered several shortcomings (Carabias & Provencio, 1994):

- exclusion of the environment from any development strategy;
- segregation of regulations within legislation;
- low budgets for prevention and control of actions; and,
- lack of mechanisms to link environmental legislation and policies with judicial bodies and economic policies, respectively .

During his campaign, President De la Madrid (1982-1988), announced his intention to address Mexico's environmental ills (Poder Ejecutivo Federal, 1983; De la Madrid, 1984). For the first time in Mexican history, a presidential candidate made the environment a campaign issue (Rivera, 1992; Hogenboom, 1998; Simonian, 1999). His strategy for rectifying previous failures included three basic components (Mumme *et al.*, 1988):

- popular mobilization;
- strengthening environmental statutes; and,
- improved administration and regulation.

The first step was the creation of the Ministry of Urban Development and Ecology (*Secretaría de Desarrollo Urbano y Ecología,* SEDUE), potentially the most important environmental action taken by President De la Madrid. SEDUE promised to be an effective agency for dealing with environmental matters because it had ministerial status and it was granted jurisdiction over most conservation and environmental programmes. On paper, at least, SEDUE had the responsibility for designing and implementing the nation's environmental policy (Simonian, 1999). However, presented as Mexico's first environmental ministry and used by President De la Madrid to improve the government's environmental image domestically and abroad (Hogenboom, 1998), SEDUE was plagued by legal uncertainty, overlapping jurisdiction, low budgets, and a lack of monitoring and enforcement capability (Peritore, 1999).

President De la Madrid's commitment to environmental reform was a response to growing criticism of the policies of preceding administrations. His initiatives represented a substantial departure from past administrations, and introduced several innovations that contrast markedly with the Mexican government's historically unrestrained commitment to rapid industrialization (Mumme *et al.*, 1988). Environmental protection was no longer perceived as merely a health issue. Instead, it became linked to urban development, public works, and the use of natural resources. Therefore, the idea of ecodevelopment was at last adopted in an explicit manner (Hogenboom, 1998).

4.3.2 Emerging policies for wildlife: 1980s

In early 1980s, CITES was not discussed within political circles in Mexico, even though by 1981 there had already been three meetings of the Conference of the Parties to CITES. However, during the second half of 1982, two crucial events resulted in a better-defined policy towards international trade of endangered species:

- The First Mexican Meeting to review the then listings of species on Appendices I, II and III of CITES. The meeting resulted in the publication of a list of over 300 native vertebrate and invertebrate species considered endangered, and in the introduction of CITES into Mexico's political agenda. Government [and non government] agencies, institutes and universities participated in the review and agreed to treat the list as an official list (DGFS, 1982a; 1982b; Fuller & Swift, 1985); and,

- The issue of a regulation in 1982 by the Ministry of Agriculture and Water Resources (*Secretaría de Agricultura y Recursos Hidráulicos*, SARH) to control trade in certain species of wild flora and fauna. This regulation, named Basis for the Control and Regulation of Exports and Imports of Wild Flora and Fauna (*Bases para el Control y Regulación de Exportaciones e Importaciones de Flora y Fauna Silvestre y sus Productos Derivados*), was implemented by SEDUE, which was responsible for issuing wildlife export permits that CITES required for trade with non-parties. Before 1982, Mexico had already adopted different legal instruments to regulate national and international trade in wildlife. However, the 1982 Regulation clearly established a strict policy to totally close international borders to trade in native wildlife species, as well as for all endangered species of non-native fauna (Alcérreca & Rodríguez, 1984; Fuller & Swift, 1985; Fuller *et al.*, 1987).

Therefore, in theory SEDUE gained the power to control and monitor the traffic of wild fauna and flora (UNEP-CITES Secretariat, 1997). However, in practice administering and managing trade in wild flora and fauna was not an easy task for the public functionaries of SEDUE. A series of recurrent problems of diverse nature, but with a common pattern, became evident: the administrative centre in charge of flora was considered less important, with three staff, than the faunal centre, with 11 staff (Trejo 2000, Pers. comm.). Moreover, public officers did not perceive flora as a group of organisms that produced any profits relative to those produced by fauna (Barrios 2000, Pers. comm.).

This situation worsened when the floral and faunal administrative centres merged to create the General Directorate of Wild Flora and Fauna (*Dirección General de Flora y Fauna Silvestres*, DGFFS) at SEDUE. The administrative problems intensified because SARH was given responsibility for managing timber species, while DGFFS within SEDUE continued to manage non-timber species. This situation provoked conflicts between SEDUE and SARH because of the complication of accurately defining what comprises 'forestry' and what comprises 'flora'. Because the responsibilities of each institution were not clear, it was very difficult to define which institution should grant permits for different species (Trejo 2000, Pers. comm.). Within each institution, there were committees in charge of administration and management of natural resources but no communication between them (Barrios 2000, Pers. comm.).

In addition, the non-timber Terrestrial Flora Department of the DGFFS within SEDUE faced other limitations in its efforts to regulate and manage wild species. It had limited numbers of staff, which was illogical because there are many fewer species of trees in Mexico than of non-timber species. The National Inventory was unfinished, and so there were no floristic catalogues or identification manuals, while the existing inventories were based only in botanical gardens and botany departments of research institutions. DGFFS staff lacked adequate specialist knowledge or experience. With these limitations, staff mostly undertook only administrative activities, and lacked confidence to implement technical decisions (Barrios 2000, Pers. comm.).

By 1983, the only plant species protected by law were orchids and cacti, as a result of the 1940 Agreement that called for conservation of these forest resources. Although this was not an outright export ban, it allowed the export of plants by those given a permit for their collection and propagation, for which only those with adequate cultivation and propagation facilities were eligible. However, some confusion remained over the interpretation of this accord and over the proper export permit issuing authorities (Fuller & Swift, 1985; TRAFFIC USA, 1986; Fuller *et al.*, 1987; Trejo 2000, Pers. comm).

On a few isolated occasions, specialists from the academic community provided the Terrestrial Flora Department of DGFFS with recommendations to protect certain species of plants. Nevertheless, an official list of endangered species did not yet exist. Furthermore, public officers and academic specialists did not trust each other. The academics did not believe the research done by the government. Likewise, public officers ignored the infrequent opinions of specialists (Barrios 2000, Pers. comm.).

By April 1983, the fourth Conference of the Parties to CITES was taking place. However, no discussion had yet begun within Mexico about joining CITES. Instead, the Mexican government concentrated on reinforcing the bilateral links with its northern neighbour. The DGFFS within SEDUE and the USFWS signed the Agreement on Cooperation for the Conservation and Development of Wildlife in 1983 (INE, 1999c). This event was of particular relevance since one aspect of the agreement was to accomplish strict control of exports and imports of wild species through the reciprocal exchange of information.

The DGFFS first discussed and analysed the consequences of Mexico's probable accession to CITES in early 1984 (Alcérreca & Rodríguez, 1984). Although the study was never published, it concluded that Mexico should not accede to CITES at that time because the country did not have: 1) sufficient legal instruments to sustain the commitments inherent to the accession to such an important convention; 2) the minimum infrastructure needed to support the differential openness of borders implicit within CITES; 3) effective administrative mechanisms needed to regulate and control the international trade in wild species; 4) enough and efficient coordination between governmental offices to control trade permits; and, 5) a control and surveillance body with an action strategy capable of supporting the administration and legislation that a differential border openness implied.

The DGFFS also considered CITES a less important tool to control international trade in wildlife than the consolidation of bilateral agreements, in particular with the US. The DGFFS also concluded that an exhaustive internal consultation was needed over CITES, to encompass public and private agencies, and any institution or association concerned with the use and conservation of wild species. However, such a public specific forum was never convened.

CITES held its fifth Conference of the Parties in Buenos Aires, Argentina, in 1985. The policies of the DGFFS had come under international scrutiny because Mexico was one of the few Latin American countries not to have acceded to the Convention. Like El Salvador, Mexico had actively, though not publicly, considered ratification. In the meanwhile, Mexico continued its bilateral cooperation with the USFWS on wildlife enforcement (Bunting, 1985; Fuller & Swift, 1985; TRAFFIC USA, 1986).

The DGFFS within SEDUE also supported the development of another unpublished technical report in 1985 (Rodríguez, 1985). The report concluded that Mexico should first address its socio-economic, political, ecological, administrative and legal needs to comply with an international commitment as important as CITES. In particular, the report noted that Mexico should develop legislation that encompassed wildlife trade and addressed deficiencies in the 1952 Federal Hunting Law. The report was visionary because it discussed the need for a link between sustainable development and wildlife trade in Mexico. Although Mexico's exports and re-exports involved large amounts of wild specimens and derivate products, rural communities living among wildlife suffered from extreme poverty.

In 1986, some Mexican academics expressed their concern about the lack of effective regulation of wildlife trade in Mexico and voiced their opinions about Mexico's possible accession to CITES (Ramos, 1986; Pérez-Gil, 1986). Their main concerns were inadequate legislation, lack of enforcement and of control over illegal trade in endangered species, inconsistency of governmental programmes, lack of benefit to rural people living among wildlife, high profits for wildlife dealers, and lack of returns from dealers to Mexico's rural areas or to government. The academics recommended that Mexico should develop strategies for managing wildlife trade and put its own house in order before taking steps to ratify the Convention. Thus, the academics voiced similar opinions to those articulated internally by the DGFFS. However, these opinions did not become a matter of public debate in Mexico as the government did not publish the DGFFS reports and the academics only published their work abroad.

During 1986, voices outside the country, mainly in the US, also began to convey their concern over Mexico's lack of accession to CITES. One such voice (McVay, 1986), revealed that the Mexican Wildlife Directorate (DGFFS) was claiming that Mexico faced real danger in acceding to CITES. In theory, the Mexican legal system provided better controls over wildlife trade than any set of regulations emanating from CITES. Therefore, it was not necessary to accede to the Convention, since the Mexican administrative and legislative system regarding wildlife trade was stricter and more rigorous than CITES itself. This interpretation markedly contrasts with the internal position of the Mexican government. The DGFFS was of the opinion that Mexico was indeed interested in acceding to CITES, but that it was not yet ready to do so until it had made a series of internal administrative and legislative reforms. A further common concern in Mexico was that becoming a Party to CITES would create a financial responsibility that the country could not carry as the economy buckled under crises and foreign debt. Nevertheless, no thorough economic analysis had been undertaken of the costs and benefits of becoming a Party to CITES.

The apparent reluctance of the Mexican government to accede to CITES drew sharp protests abroad (Simonian, 1999). According to American officials (Rohter, 1987), Mexico's refusal to participate in the Convention made it difficult to control the large body of people and wildlife products moving back and forth across the border, and to prosecute wildlife smugglers. Likewise, Central American governments that had already acceded to the Convention also complained about Mexico's lack of involvement, because the import of species protected by the Convention was not always against Mexican law.

During 1987, towards the end of President De la Madrid's term of office, Mexico's position over CITES changed, to become more consistent both internally and abroad (Fuller *et al.*, 1987; Rohter, 1987). The Mexican government expressed a strong interest abroad in ratifying CITES, and set underway interagency negotiations to begin developing a legal framework for implementing the Convention. SEDUE started to work closely with the CITES Secretariat to develop wildlife trade control practices compatible with CITES, and also to request technical training in CITES procedures to strengthen its ability to enforce the Convention. Thus, although still not a Party, the Mexican government started to implement CITES measures such as seeking permits of origin. Mexican observers also attended the Sixth Conference of the Parties to CITES held in Ottawa, Canada, in July 1987 (Fuller *et al.*, 1987; Rivera, 1992; Cobián 1999, Pers. comm.).

The 1988 election was strongly contested and its results were controversial. When President Salinas came to office in December 1988, he sought to rectify his lack of political legitimacy, and the environment was one issue through which he attempted to win back popular support (Hogenboom, 1998). President Salinas' rhetoric indicated that he was committed to the cause of environmental protection. Apparently, he did not consider environmental protection to be an obstacle to development, nor did he appear to believe that industrialization and economic growth were "sacred cows". Instead, he professed to believe that the care of the environment was essential for the well being of all Mexicans[2] (Simonian, 1999).

Many SEDUE officials remained concerned about the future of environmental protection in Mexico, and strove to establish a legal framework that would make it difficult for President Salinas to disregard environmental issues. Their efforts culminated in the promulgation of Mexico's first comprehensive environmental law, the General Law on Ecological Balance and Environmental Protection in 1988 (*Ley General del Equilibrio Ecológica y la Protección al Ambiente*, LGEEPA) (DOF, 1988). The LGEEPA went beyond the limits of environmental pollution and took a more integrated and complex view over the environmental issues, compared with the preceding Federal Law for Environmental Protection. LGEEPA was enacted with the purpose of defining the environmental policy and regulation; preserving and restoring the environment; establishing environmental protection areas for flora and aquatic and wild fauna; promoting rational use of natural resources; preventing and controlling water, soil and air pollution and regulating the competence of the federal, state and municipal authorities regarding the environment. It also established sanctions for non-compliance, and opened fora to promote the participation of organized civil society in environmental policy. Article 3 of LGEEPA included "Rational Development" concept and defined it as the use of natural elements in the most efficient, socially useful manner and in a manner that tends to preserve them and the environment.[3] Without any doubt, the promulgation of LGEEPA represented the most dramatic improvement in environmental policy between 1983 and 1991 (Carabias & Provencio, 1994).

---

[2] In 1991 President Bush wrote: "The Government of Mexico knows it faces major environmental problems that threaten the health and well-being of millions of Mexicans". "Mexico and the United States are committed to a cooperative program that will encourage sustained economic growth and environmental protection in both countries. President Bush and President Salinas believe that the two are complementary and must be pursued together" (Bush, 1991: 1).
[3] Author's paraphrase of original in Spanish.

As for international wildlife trade, LGEEPA repealed the 1982 Regulation Basis for the Control and Regulation of Exports and Imports of Wild Flora and Fauna (LGEEPA Article 1 Transitory) while establishing the legal framework for combating illegal trade in wildlife species, protecting endangered species and regulating and controlling imports and exports of wild flora and fauna. In this manner, in order to protect wild species from trade, SEDUE had now the attribution of establishing, based on studies, partial or total bans for the import and export of native wildlife species (LGEPPA Articles 79, 80, 82, 85, 87).

At the start of his term of office, President Salinas established environmental policy through the National Development Plan 1989-1994 (*Plan Nacional de Desarrollo*, PND) and the National Programme for Environmental Protection 1990-1994. The PND included the protection and restoration of the environment as one of its top priorities, based on an improved legal framework created since the LGEEPA, and the full participation of Mexico in the institutions of international environmental law (Rivera, 1992). Based on the PND, the National Programme for Environmental Protection established specific actions, including the field of international law (Brañes, 2000). The National Program for Environmental Protection formulated the goal of harmonizing economic growth while also restoring environmental quality. However, the programme did not contain a new policy strategy, and continued to neglect important matters such as natural resources and ecosystems (Hogenboom, 1998), including the regulation and control of trade in endangered species.

In 1988, the responsibility for regulating and controlling imports and exports of wild species fell to the General Directorate for Ecological Conservation of Natural Resources (*Dirección General para la Conservación Ecológica de los Recursos Naturales*, DGCERN (SEDUE, 1988). Based on technical advice provided by the DGFFS, the DGCERN took charge of granting and denying authorizations for the import and export of wild species. At this time, the legal framework that sustained the control and regulation of exports and imports of species of wild flora and fauna comprised (SEDUE, 1988):

- Regulatory Law Article 131 of the Constitution;
- Federal Hunting Law (Articles 2, 3, 4, 24 and 25) of 1952;
- LOAPF (Article 37);
- LGEEPA (Articles 79, 80, 82, 85 and 87) of 1988;
- Federal Law of Rights (Articles 174-A and 238-A); and,
- Internal Regulations of SEDUE (Article 25).

Not yet being Party to CITES, Mexico's operational policy towards issues of wildlife trade was to observe the provisions and restrictions of the Convention (SEDUE, s/f; CONADE, 1990).

4.3.3 The process of acceding to CITES: 1989 – 1991

The process that would lead to Mexico becoming a Party to CITES accelerated in 1989, as a result of two factors: 1) President Salinas's focus on foreign policy; and, 2) increased pressure at home and abroad to sign the Convention. In the foreign policy arena, the Mexican government took a more positive view of the North American Free Trade Agreement (NAFTA) in 1989 (Salinas, 1989; Hogenboom, 1998). In relation to CITES, the Mexican government received many press notes and much private correspondence complaining that Mexico was not yet a Party, and was doing little to suppress the illegal trade in endangered species, or to halt the overexploitation of sea turtles (Sánchez & Chávez-Compean, 1987(?); Anders, 1989; Branigin, 1989; Steiner & McLamb, 1990; Bush, 1991; Iñigo-Elías & Ramos, 1991; Rivera, 1992; Liverman, 1993; Trejo 2000, Pers. comm.; Ortíz 2000, Pers. comm.).

When President Salinas came to office, therefore, he initiated the negotiations for Mexico to become a Party to the Convention (Mumme, 1995). However, the government authorities, notably the DGCERN within SEDUE, were not willing to accede until they had the enforcement infrastructure in place (De la Garza, 1992). As part of such preparation, Mexico received the support of the USFWS to run a training programme for officials in charge of staffing the nine ports of entry for wildlife (Anders, 1989). Furthermore, Mexico again participated as an observer at the Seventh Conference of the Parties held in Lausanne, Switzerland, in 1989 (Rivera, 1992; CITES Secretariat, 1989).

In February 1990, Presidents Bush and Salinas agreed to negotiate a free trade treaty (Peritore, 1999). As a result, Mexico's environmental policy came under scrutiny within and outside Mexico. President Salinas became more proactive, and two events characterized his policies regarding ecological conservation. Firstly, actions by US environmental organizations forced President Salinas to ban the capture of sea turtles. Secondly, President Salinas gave instructions to the Minister of SEDUE to take the necessary steps for Mexico to accede to CITES (CONADE, 1990; Bush, 1991; Salinas, 1990; De la Garza, 1992; INE 1994; Hogenboom, 1998; Simonian, 1999; INE, 1999c).

President Salinas' decision allowed public debate within Mexico over the implications for the country of acceding to CITES (Trejo 2000, Pers. comm.; Ortíz 2000, Pers. comm.). The DGCERN within SEDUE oversaw the process, and so the working sessions for fauna and flora were held separately, and the focus of the discussions was mainly directed towards fauna. As a result, the advantages and disadvantages of acceding to CITES were not fully analysed (Trejo 2000, Pers. comm.).

In early 1991, it became clear that environmental issues had to be incorporated in the NAFTA negotiations. Major environmental organizations in the US criticized free trade with Mexico because of its bad record in implementing environmental policy. In order to obtain the approval of Congress for greater authority in the NAFTA negotiations, President Bush announced in May 1991 (Bush, 1991) that the US negotiating team would seek to maintain US environmental laws, regulations and standards, and that the administration would make a review of US-Mexico environmental issues. From then on, the transnational NAFTA debate influenced Mexico's environmental policies. In this context, a major coup for President Salinas would be acceding to CITES, and showing Mexico's commitment to a number of other international environmental agreements (Hogenboom, 1998; INE, 1999c). While environmental groups had mobilised opinion in favour of CITES, the timing of the decree was heavily influenced by the increasing importance of NAFTA negotiations. For President Salinas, CITES was a low-cost option with high public visibility that portrayed his government as environmentally friendly (Mumme, 1992).

In June 1991, the Mexican Senate's United Commissions of Foreign Affairs, Second Section, and Urban Housing and Ecology (*Comisiones Unidas de Relaciones Exteriores, Segunda Sección, y de Asentamientos Humanos y Ecología*) were appointed to study the Text of the Convention and then to elaborate technical recommendations to Senate about its implementation in Mexico (Political Constitution of Mexico Article 76; SRE, 1991). Their recommendations later that month included a description of CITES Articles, and some observations on the general rules that Mexico would have to follow if it became a Party to CITES. The Mexican Senate's United Commissions commented that the Text of the Convention did not contravene the dispositions of the Political Constitution of Mexico, nor did it affect national sovereignty. On the contrary, the Text of the Convention reiterated the criterion of international cooperation, one of the governing principles of Mexico's foreign policy (Political Constitution of Mexico Article 89 Fraction X). However, the Mexican Senate's United Commissions did not analyse the actual implications for Mexico of implementing CITES, nor whether Mexico then had the capacity to implement CITES. Nevertheless, the members of the United Commissions solicited to the Honourable Assembly of the Senate to approve the CITES Decree Project, because CITES had the fundamental purpose of protecting endangered species of wild fauna and flora from international trade.

The Mexican Senate's United Commissions also clarified that Mexico had not sought to become a Party to CITES earlier, because it had not completed its catalogue of endangered species of wild fauna and flora. The United Commissions recognized the existence of three categories of species: 1) native endangered species of wild flora and fauna, for which it was necessary to adopt drastic measures of protection to recover their populations and habitat, as well as to establish trade regulations and controls both at national and international levels; 2) native species at risk which, although not currently endangered, could become so if international trade was not regulated; and 3) species that, although not at risk within the national territory, were endangered in other nations, and so also requiring the establishment of trade restrictions.

During a "Secret Session" on 18 June 1991 (SRE, 1991), the Senate considered resolution of the CITES Decree Project as obvious, and deemed that a "second reading" was unnecessary. The Senators then voted unanimously to approve the CITES Convention. The Decree Project was then turned to the Executive to institute final constitutional procedures. The CITES Decree was published in the DOF on 24 June 1991. President Salinas signed the treaty on 27 June 1991 and the Minister of SEDUE formalized before the government of the Swiss Confederation the entry of Mexico into the CITES Convention on 2 July 1991. Mexico became party to CITES on 30 September 1991 when it ratified the Convention (Miramontes *et al.*, 1993; CITES México, 1994; UNEP-CITES Secretariat, 1997; INE, 1999c; DOF 1992a). According to Articles 76 and 133 of the Political Constitution of Mexico, International Treaties like CITES, after made in accordance therewith by the President of the Republic with the approval of the Senate shall be Supreme law (DOF, 1992b).

One of the last requirements for Mexico to conclude the negotiation to accede to CITES was the publication by SEDUE of the first official document detailing requirements for the management of endangered species, known as the Technical Agreement CT-CERN-001-91. This Agreement detailed which species Mexico proposed listing on the CITES Appendices, based on their conservation status and on levels of control necessary to regulate international trade (Pérez-Gil *et al.*, 1996; Loa 1996, Pers. comm.; Ezcurra 1995, Pers. comm.). The Technical Agreement CT-CERN-001-91 represented the "catalogue of endangered species of wild fauna and flora" to which the United Commissions had referred as being necessary before Mexico could accede to CITES.

On December 6 1991, in compliance with Article IX of CITES, the Mexican government informed the CITES Secretariat that SEDUE had been designated as the Scientific and Management Authority to implement CITES in Mexico (CITES México, 1994). Furthermore, SEDUE was to coordinate its new role with SARH, the Ministry of Fisheries (*Secretaría de Pesca*, SEPESCA), Ministry of Trade and Industrial Promotion (*Secretaría de Comercio y Fomento Industrial*, SECOFI), Ministry of the Treasury and Public Credit (*Secretaría de Hacienda y Crédito Público*, SHCP), Office of the Attorney General (*Procuraduría Federal de la República*, PGR) and, the Ministry of National Security (*Secretaría de la Defensa Nacional*, SEDENA) (Rivera, 1992).

Positive comments were made abroad about Mexico's decision to accede to CITES (TRAFFIC USA, 1992). A press release from the Embassy of Mexico in Washington DC (Treviño *et al.*, 1991) noted that President Salinas' administration was taking further steps towards implementing a comprehensive environmental policy, and that it was also concerned with the preservation of the country's diverse and important natural resources. The press release also noted that, as a CITES observer, Mexico had traditionally complied with CITES provisions and that adherence to this multilateral instrument would further strengthen Mexico's efforts to conserve its species. The new CITES' General Secretary, the Bulgarian Isgrev Topkov, underlined the importance of Mexico's decision to accede to the Convention, because Mexico was by then the only nation within the American continent not to be a CITES Party (Rivera, 1992).

Although President Salinas decided that Mexico should accede to CITES, there was no thorough public consultation. This lack of public discussion within Mexico did little to encourage subsequent efforts to implement CITES, the accession to which was seen simply as a reaction to international pressure.

4.3.4 Early lack of understanding of CITES: 1992 – 1996

Once Mexico had acceded to CITES, national efforts to implement CITES were framed within President Salinas' institutional reform. This sought to consolidate administrative procedures, to build capacity, to develop law and, to reorganize institutions (Carabias & Provencio, 1994; Hogenboom, 1998).

One of the most significant actions taken by the government during 1992 was to create the National Commission for the Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*, CONABIO) through Presidential Decree. CONABIO had the responsibility to implement activities and research programmes on biodiversity, and to promote and coordinate the efforts of various environmental institutions and groups (INE, 1994; OECD, 1998).

Also, SEDUE was replaced by the Ministry of Social Development (*Secretaría de Desarrollo Social*, SEDESOL) through a Decree (DOF May 25 1992) that combined the administrative functions of urban affairs, ecology, the National Solidarity Programme (*Programa Nacional de Solidaridad*, PRONASOL) and the Institute for Indigenous Affairs (*Instituto Nacional Indigenista*, INI) into a single organization. The environmental tasks of SEDESOL were formally exercised through the National Ecology Commission (*Comisión Nacional de Ecología*, CONADE). Created in 1985, CONADE emerged as an administrative and decentralized body with technical and operative autonomy, and control and regulatory faculties. CONADE's environmental responsibilities were in turn executed by two agencies that were technically and administratively autonomous from SEDESOL: the National Institute of Ecology (*Instituto Nacional de Ecología*, INE) and the Office of the Attorney General for Protection of the Environment (*Procuraduría Federal para la Protección del Ambiente*, PROFEPA). The INE was responsible for formulating and implementing policy, while PROFEPA was responsible for enforcing this policy and penalizing non-compliance[4] (Carabias & Provencio, 1994; UNEP-CITES Secretariat, 1997; Hogenboom, 1998; Mumme, 1995). The INE, through the DGCERN, was appointed as the CITES Scientific and Management Authority (CITES Mexico, 1994).

To improve the control of traffic and illegal trade of wild species through customs, ports and markets, INE and PROFEPA placed emphasis and economic resources on hiring trained personnel (Mumme, 1995). However, most surveillance functions on the Mexico-US border were carried out by the US. Nevertheless, for Mexican officials, US actions were already

[4] In Mexico, penalties for the illegal commerce of CITES specimens have both criminal and civil implications. In civil terms, the offences are considered to be infractions, while in criminal terms they are considered felonies. The main difference between the two responsibilities is rooted in the body authorised to impose the penalty. For civil infractions the competent authority is PROFEPA, while the Federal Judicial Power (*Poder Judicial Federal*) handles criminal sanctions. In general, environmental regulations do not establish specific penalties for each infraction, but rather dedicate one of the chapters to the penalties applicable to violators of the law. The imposition of administrative penalties is separate from any others, whether civil or criminal (UNEP-CITES Secretariat, 1997).

bearing the fruit of Mexico having joined CITES (De la Garza, 1992). US achievements in confiscating specimens illegally shipped from Mexico could have been related to Mexico having joined CITES. Equally, they could have been the result of bilateral cooperation formalised through the earlier Mexico-US Joint Committee for the Conservation of Wild Flora and Fauna. Also, the USFWS furnished SEDESOL with annual records of imports and exports that showed the extent of known trade in wildlife between Mexico and the US, including of confiscations (FWS, 1993; Pérez-Gil, 2000; Trejo, 2000; Cobián 1999, Pers. comm.).

During 1993, Mexico mainly observed and complied with CITES provisions through the Technical Agreement CT-CERN-001-91, which had been converted into the structure of an Official Norm, named by INE as NOM-PA-CRN-001/93. However, the draft of the NOM-PA-CRN-001/93 lacked any endorsement of the accuracy of the risk categories assigned by specialists. Therefore, when the list was published, various groups from the academic sector, NGOs and government demanded a document that was supported by all experts. As a result, NOM-PA-CRN-001/93 was published for a three-month consultation period, during which the INE invited specialist discussion. The general purpose of this invitation was to obtain a document that included both correct common and scientific names, as well as proposed management measures that related clearly to the categories of risk. Through a series of meetings, specialists in botany and zoology, among other fields, prepared a more definitive version of the NOM-PA-CRN-001/93. This was significant because, for the first time in Mexico, a process of wider public participation had been brought to bear on compliance with CITES' provisions and on the protection of endangered species (Ezcurra 1995, Pers. comm.; Loa 1996, Pers. comm.).

The NOM-PA-CRN-001/93 was published in 1994 as an official document titled NOM-059-ECOL-1994 that had, as its main goal: 1) to offer a reference document on which appropriate administrative and operational decisions could be taken; 2) to impose appropriate legal restrictions; and, 3) to produce a legal impediment to the traffic, commerce and plunder of endangered species in Mexico. It served essentially as national legislation that could bring to justice those trading in endangered species, those altering their habitats, or those harming the species in any other way. This was an important instrument because the prior Technical Agreement CT-CERN-001-91 did not establish felonies for anyone wanting to capture wild specimens and sell them in the national market (Ezcurra 1995, Pers. comm.; Loa 1996, Pers. comm.).

Another event at the beginning of 1994 reinforced the involvement of Mexico in CITES. The DGCERN (INE) organized a Scientific-Technical Committee in which academic institutions and NGOs participated. The Committee was charged with evaluating the proposals to amend CITES Appendices and providing the Management Authority with technical support. In addition, it was responsible for periodically revising and updating the NOM-059-ECOL-1994 in concert with the Scientific Authority (CITES Mexico, 1994).

At this time, INE, as the CITES Management Authority, concentrated its efforts on simplifying the administrative procedures relating to the import and export of wild flora and fauna specimens, products and sub-products. Such procedures were simplified by using the "single counter" (*ventana única*), which by 1994 was already logging an average of 92 application forms per month. According to the government, this system provided a better tracking and control of the traffic of species protected by the NOM-059-ECOL-1994 and CITES Appendices (CITES Mexico, 1994; INE, 1994).

Rather than simply putting the administration in order, increasing staff numbers and issuing permits and certificates, the Mexican government also sought to consolidate a Mexican policy towards CITES. Public dialogues such as those that produced the NOM-059-ECOL-1994, or that supported the work of the Scientific-Technical Committee, were steps in the right direction. With support from specialists, the Mexican government needed to adopt a position on what it meant to be a Party to CITES. However, government officials were not yet prepared to contemplate such discussions, since it had only just been decided which Mexican species were at risk. Mexico was also just learning how to cope with CITES provisions, such as the issuing of CITES certificates and national permits for the import and export of specimens, products and sub-products of wild species included in the Convention. Furthermore, by 1994, the Mexican government had only participated as an official Party in one Conference of the Parties to CITES and was just preparing to attend the Ninth Conference of the Parties to CITES.

President Salinas was succeeded by President Zedillo in December 1994, one month after the Ninth Conference of the Parties to CITES. The PND 1995-2000 had focused attention on limiting ecological deterioration and laying the foundations for the transition towards sustainable development (Poder Ejecutivo Federal, 1995). In turn, the Environmental Programme 1995-2000 sought to lay the foundations for initiating a process of restoration and ecological recovery that could promote the economic and social development of Mexico through sustainable means (INE, 1999c).

By December 1994, the administrative structure for the environment had been substantially reorganized. The purpose of the reform was to centralize and facilitate the development of federal policies regarding the management of natural resources (Poder Ejecutivo Federal, 1995; Hoyt, 1996; SEMARNAP, 1996; INE, 1999c; INE, 2000b; 2000c). As a result, the Ministry of Environment, Natural Resources and Fishery (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca*, SEMARNAP) was created, and the previously separate functions of SARH and SEDESOL were merged. The creation of SEMARNAP allowed more coherent articulation of environmental policies and instruments, and the integration of productive sectors such as forestry and fishery that historically had been operating independently (Soberón, 1999). The INE was again given the responsibility of serving as the CITES Management and Scientific Authorities (UNEP-CITES Secretariat, 1997).

At this time, government evaluated its progress in counteracting illegal trade in wild species, using the number of CITES certificates and permits issued during a specific interlude (SEMARNAP, 1996; INE, 1999c). Optimistically, they thought that the issuance of more certificates and permits meant a reduction in illegal trade. Indeed, it might well have been that issuance of more CITES permits was encouraging legal trade. However, smuggling continued, but government could not state unequivocally that it was more successfully implementing the Convention. A more tangible accomplishment in counteracting the illegal trade in wild species was the government's record on *decomisos*[5]. "It is much more what we can expect from a successful implementation of CITES in Mexico than just responding to the certificate requests" (Pérez-Gil *et al.*, 1996).

Despite the Mexican government's reported achievements on implementing CITES provisions (SEMARNAP, 1996; INE, 1999c; INE, 2000b), some academics expressed rather different opinions during 1995 and 1996 (Jiménez-Peña, 1996; Pérez-Gil *et al.*, 1996). The academics' concerns arose because fulfilling the responsibilities of Mexico as a CITES Party fell to only a few people within government. Even though some of Mexico's internal procedures for the control and surveillance of international trade were stricter than CITES

[5] In Mexico, the judicial mechanism by which a specimen temporarily or definitively belongs to the State is called precautionary retention (*decomiso*). This measure can be performed administratively as the exclusive power of PROFEPA. In conformance with the procedures in the applicable laws, PROFEPA is empowered to retain any species, products or derivatives, as well as any equipment or instruments used in the commission of the crime. Except in criminal cases, when the presiding judge is to decide, specimens of retained wildlife species fall under the responsibility of SEMARNAP, which decides their final fate (e.g. captivity, reintroduction to the wild, return to the country of origin), taking into consideration Article 174 *bis* of LGEEPA and the international agreements signed by Mexico (UNEP-CITES Secretariat, 1997).

itself, the country had not responded adequately to its commitment as a Party to CITES because of inefficient coordination between governmental institutions, and the lack of any proper infrastructure and administrative mechanisms.

During 1992-1996, CITES was mostly perceived worldwide as a Convention that sought to protect wild species by banning trade. This perception was reflected in the NOM-059-ECOL-1994 in which Mexican specialists added many species to the list, including some that did not justify listing (Ezcurra 1995, Pers. comm.; Loa 1996, Pers. comm.). Hence, for officials and specialists, CITES "red lists" provided some reinforcement of Mexico's obligations.

However, all the measures taken during 1992-1996 were insufficient to achieve any common national goals among the government and academic institutions, because consensus over CITES was missing from the outset. Although emphasis was allegedly placed on institutional reorganization and implementing legislation between 1992 and 1996 (UNEP-CITES Secretariat, 1997; Soberón 1999; INE, 2000b), SEMARNAP reported in 1997 that Mexico still lacked sufficient trained personnel at the different points of entry and departure, which made it difficult to identify and control the traffic of specimens, products and sub-products. In addition, only a single institution, INE, was charged with the tasks of serving as both the CITES Management and Scientific Authorities (INE, 1997a).

At the end of 1996, LGEEPA was amended (DOF, 1996). The Amendment changed the stated purpose of LGEEPA, expanding the purpose of the Law and adding the concepts of "Sustainable Development" (Article 3 Fraction XI) and "Sustainable Use" (Article 3 Fraction III), which had not existed previously in the Law. Article 3 of LGEEPA, as amended, defined "Sustainable Use" as the use of natural resources for indefinite periods in a manner that respects the functional integrity and load capacity of the ecosystems of which those natural resources are a part.[6] The Amendment also added elements such as the preservation of biodiversity; establishment of control and security measures to guarantee compliance; more clearly established federal, state and local jurisdiction, among other elements.

[6] Author's paraphrase of original in Spanish: "*Aprovechamiento sustentable: La utilización de los recursos naturales en forma que se respete la integridad funcional y las capacidades de carga de los ecosistemas de los que forman parte dichos recursos, por periodos indefinidos*".

4.3.5 More effective implementation of CITES: 1997 – 2001

Once Mexico had attended the Tenth Conference of the Parties to CITES in 1997, a new and different era in CITES implementation was noticeable in Mexico. Two main events brought about this change. First, attitudes changed because Mexico brought forward significant proposals that, for the first time, were the subject of a public consultation before the COP (Reyes 2000, Pers. comm). Thus INE was no longer the only institution involved in analysing CITES proposals and defining Mexico's position before the COP, because other specialists and institutions were given the opportunity to participate.

Second, SEMARNAP published, based on the legal framework previously established by LGEEPA (1988, 1996), the Programme of Wildlife Conservation and Diversification of Rural Production for 1997-2000 in 1997 (INE, 1997a). The National Wildlife Programme had positive consequences for the implementation of CITES because its creation involved a more profound analysis of the role of Mexico in international wildlife trade, and the meaning of CITES for Mexico. For the first time, the programme established CITES-specific actions for Mexico (INE, 1997a).

According to the Wildlife Programme (INE, 1997a), CITES had experienced difficulty with Mexico over administrative procedures necessary to register Appendix I captive-breeding operations with commercial purposes. The Wildlife Programme also noted the paradoxical situation that the CITES Appendices, formulated to protect endangered species, were in fact being used by traffickers as catalogues to price species for the illegal market. However, the Wildlife Programme did not contain a self–critical analysis of the performance of Mexico since it had acceded to the Convention.

The Wildlife Programme established the following priority actions to develop CITES implementation in Mexico between 1997 and 2000 (INE, 1997a):

- To seek financing from CITES to develop rescue projects for endangered species;
- through the CITES Secretariat, to achieve a greater commitment from those Parties receiving illegal specimens from Mexico to lessen illegal trade and facilitate the return of confiscated shipments to Mexico;
- to consolidate the project to establish Important Bird Areas; and,
- to proceed with the registration of intensive and extensive captive breeding facilities to allow Mexico access to appropriate international markets.

The last of these priority actions reveals the change in attitude of the government towards CITES, and the role of Mexico in international wildlife trade. In particular, the last action made reference to the "System for the Conservation, Management and Sustainable Use of Wildlife" (SUMA): a response to the great commercial demand for wildlife and the need to protect widely dispersed species and habitats. Through SUMA, the 1997 Wildlife Programme established the general objectives for conserving Mexican biodiversity, while also generating opportunities for socio-economic diversification in the rural sector (Chapter 8). The SUMA aims at reconciling biodiversity protection, socio-economic development, and the use of wildlife as a renewable resource, emphasising participation by local people. Through the registry of the "Units for the Conservation, Management and Sustainable Use of Wildlife" (UMAS) before the Convention, the Mexican government published for the first time, a Mexican policy regarding wildlife trade and CITES, aimed at promoting the use of native wildlife based on sustainable criteria (OECD, 1998; SEMARNAP, 1998; Soberón, 1999; INE, 2000b).

During 1998 another event confirmed that the Mexican government was achieving clearer policies towards effective implementation of CITES. CONABIO developed a proposal about the operation of the CITES Scientific Authority in Mexico (Loa 1999, Pers. comm). The proposal was based on CITES Resolution Conf. 10.3, which recommends that "...all Parties designate Scientific Authorities independent from Management Authorities..." Thus CONABIO expressed interest in coordinating the functions of the CITES Scientific Authority in Mexico, noting (CONABIO, 1998b):

- the institution's infrastructure;
- its relationships with experts and scientific institutions throughout the country;
- the information contained in its databases; and,
- its capacity to support projects on specific taxa and in different regions.

The proposal accepted that separating the functions of the Management and Scientific Authorities in different institutions could (CONABIO, 1998b):

- facilitate a forum in which to establish criteria and guidelines based on scientific and technical standards;
- achieve complete participation in the proposals and decisions of the Convention; and,
- diminish the workload imposed by CITES on the single institution of INE through the DGVS.

CONABIO's proposal was, however, kept as an internal document that was never discussed publicly (Loa 1999, Pers. comm). It was unfortunate that CONABIO was not given this responsibility because the roles of the Scientific and Management Authorities were still ambiguously defined within the INE (Sánchez 1999, Pers. comm.). By 1998, INE had an Advisory Committee located in the Institute of Ecology A.C. to provide support for the Scientific Authority. Nevertheless, some specialists believed its functions were not implemented adequately (Cobián 1999, Pers. comm.; Pérez, 2002). It was necessary, for example, to improve the communication and coordination systems between INE and the Institute of Ecology A.C. The separation of the Scientific Authority from the INE could not occur without a political process of agreement between the Authorities involved, and a presentation of the proposal before the Senate (Ortíz 2000, Pers. comm.).

Even though CONABIO did not publicise its offer to assume the responsibility of the Scientific Authority, CONABIO's involvement with CITES increased. For example, CONABIO produced an Identification Guide for CITES Protected Wild Birds and Mammals of Commercial Importance in Mexico in late 1998, together with SEMARNAP, PROFEPA, INE and the CITES Scientific and Management Authorities. In coordination with CANTE A.C., CONABIO also produced the Identification Guide to Threatened Cacti of Mexico in 1998 (Glass, 1998; Sánchez *et al.*, 1998; TRAFFIC North America, 1999).

By 1999, SEMARNAP established a Committee whose terms of reference were to provide continuity and updating of every aspect of Mexico's commitment to CITES (SEMARNAP, 1999). CONABIO was a participant together with DGVS (INE), the National Institute of Fisheries (*Instituto Nacional de la Pesca*, INP), the Institute of Ecology A.C. and PROFEPA. Depending on the issue under consideration, the technical opinion produced by this Committee was also sent to the Ministry of Foreign Affairs (*Secretaría de Relaciones Exteriores*, SRE) or SECOFI, and also presented before civil society (NGOs) through the Sustainable Development Consultive Council. The fact that the DGVS, then still acting as both CITES Scientific and Management Authorities, now consulted CONABIO and the NGOs in order to take more accurate decisions was a definite step towards better implementation of CITES in Mexico (Cobián 1999, Pers. comm.; Barrios 2000, Pers. comm.). Nevertheless, it had taken eight years since Mexico had ratified CITES for such information to be shared, discussed and so enriched.

This institutional integration was definitely positive because the Committee gained confidence and self-reliance when stating Mexico's position before Conferences of the Parties and CITES Committees, instead of just attending to observe, listen, learn and defend. Thus, Mexico transformed itself into a more proactive, proponent country within the Convention (Ortiz 2000, Pers. comm.; Benítez & Feria 2002, Pers. comm.). For example, Mexico presented a paper in 1999 to the Plants Committee about the management and conservation of plants and seeds of Mexican cacti. Mexico also presented a proposal to the eleventh Conference of the Parties to CITES in April 2000 to transfer the populations of *Crocodylus moreletii* of Sian Ka'an, Quintana Roo, from Appendix I to Appendix II. Mexico's transformation was also noticed during the 16th Meeting of the Animals Committee and the 10th Meeting of the Plants Committee in December 2000, when Mexican delegates received applause from other delegates and NGOs who saw a more vocal Mexico expressing its opinion based on knowledge and common sense.

The integration of the CITES Committee within Mexico also brought a clearer understanding of when to take internal decisions about CITES (Ortíz 2000, Pers. comm.). For example, following COP 11, the Sub-Ministry of Environmental Felonies was integrated into the Mexican CITES system, in coordination with PROFEPA, to sensitise the PGR about the importance of combating illegal wildlife trade in Mexico (INE, 2000b). In view of the large size of the national territory and its complex characteristics, PROFEPA had difficulty in enforcing inspection policies.

By 2000, Mexico enacted a broad Wildlife Law (LGVS) that at long last replaced the Federal Hunting Law of 1952 (D.O.F, 2000a). Up until 2000, no specific law dealt with the protection and management of wildlife and biological diversity. The General Law on Wildlife regulates for the protection and conservation of wildlife and biodiversity. It was prepared in line with principles contained in the Convention for Biological Diversity (CBD). Mexico ratified the CBD in 1993. The issue of the preservation of wildlife was originally part of the exclusive jurisdiction of Federal government authorities. However, the current institutional arrangements under this Law also involved State and Municipal governments to varying degrees. This approach was taken to create an integrated and effective national mechanism for the governance of wildlife and biodiversity. This new law aimed to achieve the conservation of wildlife and its habitat through restoration, protection and sustainable use, while also promoting the welfare of Mexico's human population (INE, 2000a).

The LGVS established that CITES-listed species still remained subject to this Convention, and that the import and export of wild specimens, parts and derivatives still required authorization through SEMARNAT. The only exceptions were:

- biological material derived from properly registered scientific or museum collections destined for other scientific collections, with no intention to use them for commercial or biotechnology purposes;
- articles for personal use that do not exceed two pieces of the same product; and,
- hunting trophies for export that were adequately registered and accompanied by the proper documents attesting their legal origin.

The LGVS did not contain any more detailed specifications and analysis about its interface with CITES.

During 2000, the efforts of the DGVS were mainly directed towards: 1) issuing authorizations and certificates for the import and export of wild flora, fauna and fungi specimens, products and by-products; 2) registering the establishment and operation of UMAS; and, 3) registering national companies involved with tanning and taxidermy of wild national and exotic fauna (INE, 2000a). On the subject of inspection and surveillance, the DGVS said in the National Strategy for Wildlife (INE, 2000b) that, in spite of complications inherent in the operation of its inspection policies, PROFEPA had achieved important accomplishments at Federal level. These included seizures of plant and animal specimens, products and by-products resulting from the permanent surveillance and inspection of temporary and permanent public markets, ports, airports, borders, pet stores, zoological parks, botanical gardens, and circuses. Some other important measures came about at this time, including the modification of the NOM-059-ECOL-1994 and the settlement of the CITES Scientific Authority within CONABIO.

In the second half of 2000, NOM-059-ECOL-1994 was revised based on almost two years of work by scientific specialists and institutions, and re-issued for public consultation as PROY-NOM-059-ECOL-2000. In this revision, Mexican specialists used better-defined categories of risk and improved the quality of the lists through a mechanism that standardised technical opinions over the categorization of taxa (Sánchez 2001, Pers. comm.; DOF, 2002).

The PROY-NOM-059-ECOL-2000 highlighted the need to update available information on endangered species in Mexico, and to apply unified and coherent criteria to assign risk categories to all the known endangered species in Mexico. More than four years had passed since the NOM was last produced, and a positive development was to see specialists starting work again on its revaluation. Red lists require regular updating and it was also important to develop more rigorous evaluation methods to determine risk categories for endangered species in Mexico. Eventually, the project turned into an Official Norm on March 2002 when published in the DOF as NOM-059-ECOL-2001 (DOF, 2002).

During 2000, CONABIO finally took the responsibility as CITES Scientific Authority for Mexico. CONABIO now represents Mexico at the Plant and Animal Committees, and shares responsibility with the DGVS (SEMARNAT) of attending Conferences of the Parties to CITES and the CITES Standing Committee. The Institute of Ecology A.C. (IE) no longer has official advisory capacity for the Scientific Authority. Although the Agreement between the IE and INE had good intentions, in practice, interactions were few and did not last. Instead, CONABIO now plans to create a national database of all specialists who can be consulted to analyse the proposals to amend CITES Appendices (Benítez & Feria 2002, Pers. comm.).

Since CONABIO became the CITES Scientific Authority, it has taken on a leadership role in Mexico, supported by high level specialists who have improved Mexico's image under the Convention. CONABIO can call on scientific and technical representatives, and on specialists in flora, fungi, fauna, and nomenclature, who are selected based on their academic expertise, and on institutional and regional representation. A key contribution of CONABIO as CITES Scientific Authority lies in its interest to support research projects. Since October 2000, CONABIO has promoted improved interactions between agencies, academia, NGOs, private sector, and rural communities, which has helped to integrate useful technical databases to sustain Mexico's position before the Conference of the Parties and CITES Committees (Benítez & Feria 2002, Pers. comm.).

Nevertheless, when the Scientific Authority was separated from the DGVS, complications arose because of an unproductive relationship between CONABIO and the DGVS. As Management Authority, DGVS is reluctant to share CITES information with CONABIO, which cannot then fulfil its functions as Scientific Authority (Benítez & Feria 2002, Pers. comm.). An efficient channel of communication is vital between Scientific and Management Authorities if government wishes to optimise the new administrative arrangement. The irony is that for so many years the government was criticized for having the Management and

Scientific Authorities under the same roof in DGVS. Now that the Scientific Authority is separate and under CONABIO's umbrella, it would be regrettable if this worsened, rather than improved, CITES implementation in Mexico. CONABIO has sought to endorse professional collaboration with the DGVS. During the Seventeenth Meeting of the Animals Committee in 2001, CONABIO recommended that in the Mexican Delegation the Management Authority should be included because, even if in theory the Animal and Plant Committees consider only scientific matters, a political and enforcement component is always present.

While communication between CONABIO and the DGVS may not be excellent, both institutions are working towards the same CITES policy. CONABIO wishes to see species downlisted from Appendix I to Appendix II, in order to allow the commercial use of species, to involve local communities in using such resources sustainably, and to provide incentives for *in situ* conservation of habitats (Benítez & Feria 2002, Pers. comm.). These principles correspond to the UMAS system established by the DGVS through the National Wildlife Programme in 1997. Hence, in policy terms, there should be no reason why the Management and Scientific Authorities cannot continue to cooperate and work in unity.

4.4 Discussion

This chapter has shown that Mexico was slow to adopt environmental policies and, when it did so, they mainly related to issues of pollution. When Mexico did finally recognise wider environmental concerns, the prospect of acceding to CITES was not considered seriously because of existing laws that, in theory, banned all wildlife trade in native species. Nevertheless, there was considerable international concern that large volumes of illegal cross-border trade were occurring with the US. Therefore, when free trade negotiations were underway, Mexico responded to international pressure and acceded to CITES in 1991. However, it did so without fully weighing up the consequences of being a Party to the Convention. It is only now, some 12 years after acceding, that Mexico is beginning to understand its obligations and to play a full role in the workings of the Convention.

4.4.1 Emerging policies for wildlife: 1980s

During the 1980s, Mexico sought refuge behind the provisions of the 1982 Regulation, which aimed to close its borders to all trade in native species of wild fauna and flora. Nevertheless, in terms of negative conservation impacts, limitation or banning of trade can drive trade into the black market, with the lack of control, lack of information and monitoring, and substandard practices that this implies (Martin, 2000; Moyle, 2003; Leader-Williams, 2003;

Cooney, 2003). Hence, the banning of all trade, other than from captive breeding programmes, does not act as an incentive to conserve wild populations. Mexico could not control the illegal trade of wild species for a variety of reasons during the 1980s, one which was because incentives to conserve wild species were non-existent.

The philosophy underlying CITES was introduced to political circles in Mexico during the 1980s. The government certainly discussed whether or not Mexico should become a Party to CITES. However, Mexican officials were not able to concentrate methodically on this debate since the stated policy of the Mexican government was to ban all trade in wildlife. Nevertheless, controlling closed borders and monitoring the traffic in wild native species and endangered exotic fauna posed a considerable challenge for Mexican officials, because:

- Mexico was pressured by the US to better manage its border controls;
- there was little support from national specialists;
- there was no national 'red list'; and,
- there was no institutional co-ordination between different government departments.

Mexican officials, intent on solving these difficulties, could not allocate the time and resources to reflect on the possibility of Mexico becoming a Party to CITES, so they remained unprepared to consider the issue further.

By mid 1980s, the situation changed because the Mexican government came under pressure to adopt a position over CITES from the US and Central America, and from national specialists intent on seeking improvements in the country's efforts to manage its wildlife. Since the Mexican government did not reach an internal position towards CITES, but reacted to outside pressure, the statements about CITES made by Mexican officials between 1986 and 1987 were contradictory and confused.

When, towards the end of 1987, the Mexican government adopted a more consistent position en route for ratifying CITES, Mexican officials were faced, for the first time, with the need to acquire knowledge about CITES: the requirements of becoming a Party; the Text of the Convention; and, the implementation of national legislation. Unfortunately, the definitive decision taken by the Mexican government to accede to CITES in 1991 was not accompanied within the government by extensive analysis or debates from the Mexican officials. Instead, the decision to accede was taken as a bargaining chip to achieve another plank of foreign policy.

4.4.2 The process of acceding to CITES: 1989 – 1991

By 1987, NAFTA had not yet emerged on the political scene, but Mexico had already begun to study whether it should ratify the CITES Convention. It is not fully clear whether Mexico would have acceded to CITES without the context of NAFTA, because Mexico had already evaluated the possibility of acceding to CITES before the NAFTA era. Nonetheless, the process of ratifying the Convention was certainly accelerated by the NAFTA negotiation process.

When President Salinas took office on December 1988, his main foreign policy goal was to achieve a free trade agreement with the US and Canada. To achieve this, however, Mexico also needed to address certain policy gaps to gain internal support and most importantly, US political support. Mexico's environmental policies were at this time under scrutiny both internally and abroad. Therefore, President Salinas sought to improve Mexico's environmental policies. Acceding to CITES became part of a larger package of environmental obligations to which the Mexican government signed up in the early 1990s. The others included the signature of the Montreal Protocol, the Basel Convention and, the Agreement for Cooperation on Environmental Issues between Mexico and the Central American Commission for the Environment and Development. Hence, Mexico's accession to CITES was a by-product of NAFTA, as President Bush affirmed before the US Congress.

Unfortunately, when the initiative of the CITES Decree Project was presented by Mexico's Executive in 1991, it was not analysed comprehensively by the United Commissions of the Senate within it nor through public consultation. As a result, Mexico did not fully understand its specific responsibilities as a CITES Party, nor the opportunities and possibilities this opened up. This situation made it very difficult to implement the Convention effectively in the years to come.

4.4.3 Early lack of understanding of CITES: 1992 – 1996

Between 1992 and 1996, Mexico had no clear policy about its role within CITES. Mexico believed that CITES would largely solve the problems of conserving wild species, and through its ratification, Mexico would protect its national biodiversity from trade and resolve the problem of illegal trade. Indeed, many merely conceived CITES as a Convention to protect wild species. "There is a common misconception that CITES provides protection to species but protection can only be achieved by law enforcement agencies and citizens of range states" (Martin, 2000). Furthermore, the lax and inefficient workings of the INE and

PROFEPA observed by Mexican environmental organizations (Hogenboom, 1998) did not contribute to improvement in enforcement capacities and the control of wildlife trade.

Although Mexico could fully participate in the Conference of the Parties to CITES from 1992, Mexico initially took the position within CITES of not creating problems, following the consensus positions and learning from the COPs. For example, Mexico observed the great debates over species like elephants, whales and mahogany during the 1992, 1994 and 1997 COPs so as to learn about possible situations that Mexico could face in the future. Therefore, Mexico was basically defensive instead of proactive at COPs during this period.

Between 1992 and 1995, Mexico lacked the institutional capacity and resources to implement CITES effectively. The main CITES-related problems faced by Mexico were: constant changes in administrations; lack of a guiding philosophy for public administration; a lack of clarity and vision about Mexico's role in international wildlife trade; and, the lack of specialist input. For instance, academics had no clear role nor a clear understanding of what CITES actually meant for Mexico. Therefore, even less could be expected of the producers who were less informed than the specialists. In addition, the decision to place both Scientific and Management Authorities in the same institution was not wise, since it is not recommended to judge and be judged simultaneously.

The most significant event that took place in Mexico between 1992 and 1996 was the public discussion of NOM-PA-CRN-001/93 and its subsequent publication in 1994 as the official document NOM-059-ECOL-1994. Without doubt, this was the first step to help Mexico to realise its obligations under CITES, and to take a more proactive role in the workings of the Convention.

4.4.4 More effective implementation of CITES: 1997 – 2001

The period 1997 to 2001 saw greater internal coordination within Mexico between the different institutions involved with CITES: the INP, INE, SEMARNAT, NGOs, CONABIO and, academics. An improved legal and administrative structure was also gradually consolidated and Mexico improved its ability and willingness to speak out and gain a position within CITES. As Mofson (2000) explains "the regime-state relationship is not static, rather, the relationship is dynamic, and it develops over time as states learn to work within the system to advance their interests". Mexico has now learned about CITES, improved its policy towards international wildlife trade, and understood how better to use CITES to achieve its objectives.

Mexico has defined its national interests towards wildlife trade: to maintain protection over endangered species; to promote the use of native species under the UMAS; whilst allowing benefits to accrue to local communities. After five years as a CITES member, Mexico began to understand that CITES is a global system for controlling wildlife trade in which CITES' controls can be used as a mechanism to encourage the sustainable use of wildlife. Mexico has also learned that successful implementation of CITES should not only involve government officials and specialists, but also producers and consumers. Now CITES is considered by Mexican officers and specialists as a useful conservation tool, which lays the foundation upon which to establish policies for international trade of wild species.

Naturally, Mexico still faces CITES-related problems. For example, the illustrated CITES guides published in 1998 have not been distributed to all custom officers. Where they are available, their content is still limited to those species of greatest commercial importance in Mexico. The Mexican government needs to provide its law enforcement personnel with a more taxonomic, geographic and administrative training and references. Equally, guides to species of greatest commercial importance could be used by traffickers as catalogues to price species in the illegal market. Another concern is that the CITES Illustrated Guide, available on CONABIO's website, has been in continuous use but merely by foreign officers. An added CITES problem still present in Mexico is that the publication of the decisions taken at every Conference of the Parties to CITES is delayed in Mexico, so civil society is not well informed about what has been agreed at each Conference.

Having now established the manner in which Mexico came to accede to CITES in 1991, largely as a by-product of the NAFTA negotiations, and the learning process that Mexico has undergone since regarding CITES, the next chapter introduces the case study of wildlife trade in Mexico. As Mexico is considered a key player in the international trade in reptile skins and products (Chapter 2), I examine the Mexican market for reptile skins to further examine Mexico's implementation of its policies on wildlife trade.

Chapter 5

5 The Mexican Market for Reptile Skins: Manufacture and Distribution

5.1 Introduction

A channel of distribution is a group of individuals and organisations that direct the flow of products from producers to customers. Most, but not all, channels of distribution have marketing intermediaries. A marketing intermediary, or middleman, links producers to other middlemen, or to those who ultimately use the products (Dibb *et al.*, 2001). A channel of distribution is understood here as the structure established between a company and one or more intermediaries, through which a product or service is taken from its place of origin to the final consumer, according to the type of product and its final destination. The intermediaries may be agents, wholesalers, retailers, distributors, brokers, specialized wholesalers or jobbers, and importers, depending on the channel of distribution used for a particular product. Each intermediary who contributes to the arrival of a product at its final destination constitutes a stage within a particular channel of distribution (Bancomext, 1998).

An efficient system of commercialisation is of decisive importance for any country, whatever its circumstances, and at all stages of development (Littmann, 1975). Physical distribution is an important variable in a marketing strategy because it can decrease costs and increase customer satisfaction (Dibb *et al.*, 2001). As modern societies have grown and become more complex, distribution channels have also increased in complexity (Bancomext, 2000a).

The trade channels for leather goods vary somewhat from country to country but follow a basic general pattern. Central buying groups for large retail stores, and the buyers for major retail chains, tend to obtain most of their leather goods direct from suppliers, especially for items with a high turnover. Therefore, their requirements are for substantial volumes of goods. Importers buy in lower quantities and often purchase on behalf of small and medium-size retail outlets, although central buying groups also sometimes supply small retailers. Importers usually travel at least once a year on buying tours to the principal sources of supply. The largest importers often have offices abroad or employ the services of export agents in the major supplying countries. These countries assemble a wide range of articles from which the importers select during their buying tours; arrange the documentation and shipment; and check outgoing consignments. Major manufacturers in the target markets that conclude production agreements with low-cost suppliers also travel to supplying areas periodically. Likewise, they sometimes also work with local agents in the exporting countries (Sauer, 1993).

In Argentina's principal market for tegu (*Tupinambis* spp.) hides, for example, a *campesino* hunter in the Chaco may sell raw hides to a middleman who transports skins to collecting points in local towns. A buyer working for a major tannery will purchase skins from the middleman, and then truck them to the tannery for processing. A semi-finished hide ("in crust") may be sold by the exporting company. Finally, a pair of lizard shoes may sell in a US department store (TRAFFIC USA, 1986). The journey of any given wildlife product from the collector at source to the final consumer can involve a wide range of intermediaries (Roe *et al.*, 2002).

The international leather and footwear industry is not dominated by multinational companies, and is comprised mainly of small and medium companies. It largely remains a traditional industry that, generally, has not incorporated any industrial remodelling of its productive plant. Only a very small number of production units have incorporated high technology and modern business management. This has left the leather and footwear industries very exposed to marketing hardships compared with other manufacturers. The leather and footwear industries have dealt with this situation by concentrating in regions where both industries are linked in a producing chain, each one keeping to its own very strict specialization (Iglesias, 1998).

Developing country suppliers are increasingly strengthening their position in the major markets for leather products. An increasing share of the leather articles traded on the world market such as travel goods, handbags, briefcases and wallets is produced (although not necessarily designed) by developing countries; a trend that is expected to continue because of differential labour costs (Sauer, 1993). In general terms, the producers of industrialized countries use more mechanized methods of production, whereas in developing countries the industry depends rather on cheaper labor (ITC, 1970). With a requirement for much manual labour, its low cost gives developing countries a competitive advantage. Also, stricter ecological regulations have helped diminish the number of tanneries in most industrialized countries (with the exception of Italy[1]). Although ecological regulations are usually the same at both developing and industrialized countries, they are rarely followed in the former, which gives developing countries another competitive advantage in the leather market (EFTA, 2000).

[1] In Italy, the regions involving tanneries have developed depuration plants for the residual water in order to diminish the pressure of every company (EFTA, 2000).

Nevertheless, producers in developing countries must coordinate their responses to fashion trends. Since leather articles follow fashions, the interval between production and sale must be short and companies must keep up-to-date with the current trends. For instance, since no more than 5% at most of the global shoe trade is sold in producer countries, producers most be aware of trends in western markets to retain opportunities to export (EFTA, 2000).

Globally, the main leather producers are Italy and Korea (with 25% of the world-wide production), followed by Russia, China, India, Brazil, the US, Mexico and Argentina (EFTA, 2000). Mexico is one of the major footwear producing centres, holding the seventh position among the top footwear producers in the world, with a national production of around 210 million pairs of shoes annually. Mexico occupies the sixth position as provider of footwear to the US, after China, Indonesia, Brazil, Italy and Spain (Bancomext, 2002).

In Mexico, the commercial channels for the footwear industry are structured as follows: producer-distributor, distributor-wholesaler and chains of specialized and departmental stores. The main consuming centres are situated in the US and Western Europe, and will probably continue to represent the highest international demand for Mexican footwear. The US is the main destination for Mexican leather and footwear products. In 1998, for example, the US received 87% of Mexican leather and footwear exports with a value of US$848 million (Bancomext, 2000b). In 2000, 93% of Mexican footwear exports were made to countries that had free trade agreements with Mexico[2]. Among these, the US market took 82% of Mexican footwear exports or an average of 46 million pairs of shoes annually, followed by the Canadian market, which took 3.6%, with the remainder distributed between Latin American countries and the EU (Bancomext, 2002).

This chapter aims to compile and integrate the available information on the use of reptile skins in the Mexican leather industry to depict the character of Mexico as an importing, manufacturing, producing and distributing centre of reptile skins. The second aim is to assess, based on this compilation, the present status of knowledge on the theme.

In particular, in this chapter I seek to answer the following questions:

---

[2] Up until 1996, Mexico had five free-trade agreements: with Chile (1992); the United States and Canada (1994); the Group of Three (G-3) with Colombia and Venezuela (1995); Bolivia (1995) and Costa Rica (1995). In the period 1997-2001, Mexico concluded seven more Free Trade Agreements: with Nicaragua (1998); Chile (1998); Israel (2000); the European Union (2000); the "Northern Triangle" with Guatemala, Honduras and El Salvador (2001); the European Free Trade Association (EFTA) with Iceland, Norway, Liechtenstein and Switzerland (2001) and the Economic Complementarity Agreement with Uruguay (2001) (WTO, 2002).

- What are the main channels of legal distribution in Mexico for reptile skins and products from native and non-native species?
- What are the main channels of illegal distribution in Mexico for reptile skins and products from native species?
- How are the main channels of legal distribution in Mexico for reptile skins and products from native and non-native species structured?
- Which are the main reptile skin products manufactured and how are manufacturing centres structured?
- Which are the legal distribution channels for reptile skin products in these manufacturing centres?
- What is the main destination in the international market for reptile skin products manufactured in these centres?

5.2 Methodology

Research for this chapter was carried out through extensive bibliographic searches of government literature, and by a range of social science approaches. Most of the information regarding manufacture and distribution of reptile skins in Mexico was available from documents. However, semi-structured interviews were also undertaken throughout the study with key informants.

Extensive bibliographic research was undertaken in Mexico City (DF) during August-September 2001, regarding the use of reptile skins in the Mexican leather industry. The archives reviewed comprised the following:

- INE (SEMARNAP) publications and Library;
- El Colegio de Mexico (COLMEX) Library; and,
- Banco Mexicano de Comercio Exterior (Bancomext) Library.

This bibliographic search was supplemented by work undertaken in the Library and files of TRAFFIC North America (Washington DC) from February-March 2000, and by searching the computerized database of Johns Hopkins University and Library of Congress (Washington DC) from September-December 1999, February-August 2000 and January-March 2001.

Throughout this study, special and regular work sessions were held with Ramon Perez-Gil. (FAUNAM AC), Craig Hoover (TRAFFIC North America), and Raul Garcia Barrios (CRIM, UNAM), who were the main key informants in formulating the approach to the development of this chapter. In addition, the following key informants were also interviewed for this study:

- April 2001: Adrian Reuter, Programme Officer TRAFFIC Mexico.
- May 2001: Ernesto Badillo, Colegio de Postgraduados; Eleazar Loa, SEMARNAT.

All the information gathered in Mexico City and Washington DC, including books, reports, articles, unpublished reports, and interviews was compiled, classified, read, and arranged to construct this chapter. A series of flow diagrams were elaborated in order to portray the component parts of the main commercialisation and distribution channels for reptile skins within the Mexican leather industry. All the sources of information examined for this chapter, whether bibliographic or interview-based, are presented as references in the body of the chapter, and presented in full in the reference list.

5.3 Results

5.3.1 The leather and footwear sector

The Mexican leather, footwear and tannery industry is regarded as a high-priority sector within the national economy, its most significant division being footwear export (Bancomext, 1999a). The leather and footwear sector in Mexico represents 1.1% of the manufacturing GDP and generates more than 100,000 jobs throughout 4,000 registered establishments, of which 82% are micro companies, 17% are small and medium, and only 1% are large companies. Most of the companies of the Mexican leather and footwear sector are labour-intensive and are family owned. The Mexican leather industry may be characterised by micro and medium companies, with low volumes of production that function under the manufacture *(maquila)* scheme (Bancomext, 2002).

The participants in the Mexican footwear industry are skin suppliers, producers, retailers, and consumers. The tannery industry, supplies the producers with their main raw material: the skin. There are four manufacture stages according to the production, sales and technology employed, whether large, medium, small and micro companies (Barbosa, 1994). The process of footwear manufacture in Mexico is labour intensive, which creates advantages for the exporter who can compete with the same quality at a lower price, or else can subcontract. Through its comparative characteristics and advantages, Mexico enjoys business opportunities in leather footwear and leather products of average and high average price, since the quality of its products surpasses other competitors (Bancomext, 1999b). In addition, during the 1990s, Mexico experienced a change in the way that industrial protectionism under which its footwear industry had been operating. When Mexico joined the GATT, one of the first branches to be freed of fee barriers was the footwear industry. With it, this national industry has begun to compete with foreign producers, not only in its own internal market, but also in that of the US (Calleja, 1994).

The distribution channels for footwear in Mexico comprise boutiques, centres of purchase for retailers and/or wholesale, commerce or sale by catalogue, specialized commerce from other branches, specialized warehouses, importers, independent markets or supermarkets, retailers, and factory branches (Bancomext, 2000a).

In terms of geographic location, 50% of footwear production in Mexico is concentrated in León, Guanajuato; 19.5% in Guadalajara, Jalisco; 12% in the metropolitan area of Mexico City; and the rest in diverse States of the country (Bancomext, 2002). Guadalajara[3] specializes in women's shoes of high quality and design, while Leon specializes in the manufacture of men's shoes and boots. There are other important footwear companies throughout the country, such as Ciudad Juarez, Chihuahua; Mexico City, DF; San Mateo Atenco, Mexico; Merida-Ticul[4], Yucatan; and Monterrey[5], Nuevo Leon. The production that originates in Monterrey, Mexico, San Mateo Atenco, Merida-Ticul is not known for a particular speciality. However, Ciudad Juarez specializes in the making of excellent quality cowboy boots (Iglesias, 1998).

5.3.2 The use of reptile skins

Mexico is well known for making reptile skin products. The Mexican reptile skin-manufacturing sector mainly comprises shoe manufacturers, but also includes manufacturers of fine leather goods such as bags, belts, wallets, watchstraps, and other small leather goods.

---

[3] Although there are about thirty tanneries in the region of Guadalajara, Jalisco's leather footwear industry has a deficit surpassing 50%. The most important bottlenecks for the widening of this space include, on one hand, the specialization of productive units, which took very narrow and non-competitive market niches. The prices of these were in clear disadvantage against the foreign market, which could neither be reached with the required production volumes, nor the needed investments for the design and planning required by the type of commercialisation imposed by the opening in markets (Iglesias, 1998).

[4] In Mérida-Ticul, the workshops are dedicated to the manufacture of economic-type footwear (sandals, cloth and synthetic skin footwear), they have a familiar, nearly mechanized structure, are highly *artesanales* and exist thanks to an oversupply of manual labour, barely qualified and very underpaid. This space has lost its momentum in footwear production and presently stays as the region's shoemaking supply centre and footwear distributor for other zones of the country (Iglesias, 1998).

[5] Monterrey has stopped its growth in the footwear industry since it is hardly competitive in quality and price in comparison to other national regions (Iglesias, 1998).

The main reptile skin manufacturing, import and (re) export markets in Mexico are located in the cities of Leon, Guanajuato, and of Ciudad Juarez, Chihuahua (Figure 5.1). The vast majority of non-native reptile skins imported by Mexico are processed in Leon. The leather industry of Leon buys reptile skins from both native and non-native species and produces footwear and leather products, which are commercialized in the internal market through specific merchandising groups, but also in the foreign market through exports and re-exports (Figure 5.2). In contrast, the leather industry of Ciudad Juarez imports reptile skins from non-native species and produces footwear, mainly cowboy boots, which are re-exported as well as commercialized in the internal market (Iglesias, 1998) (Figure 5.2).

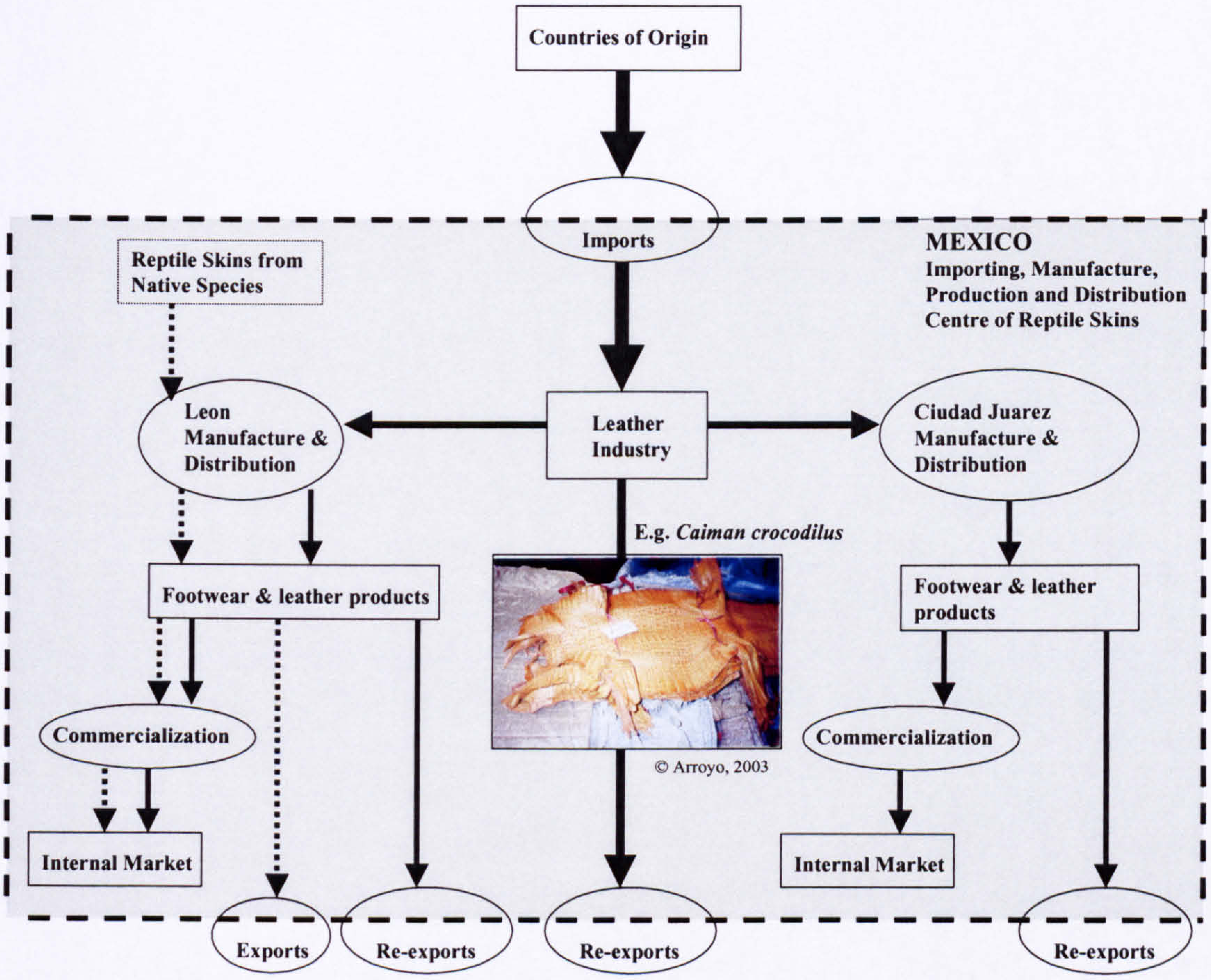
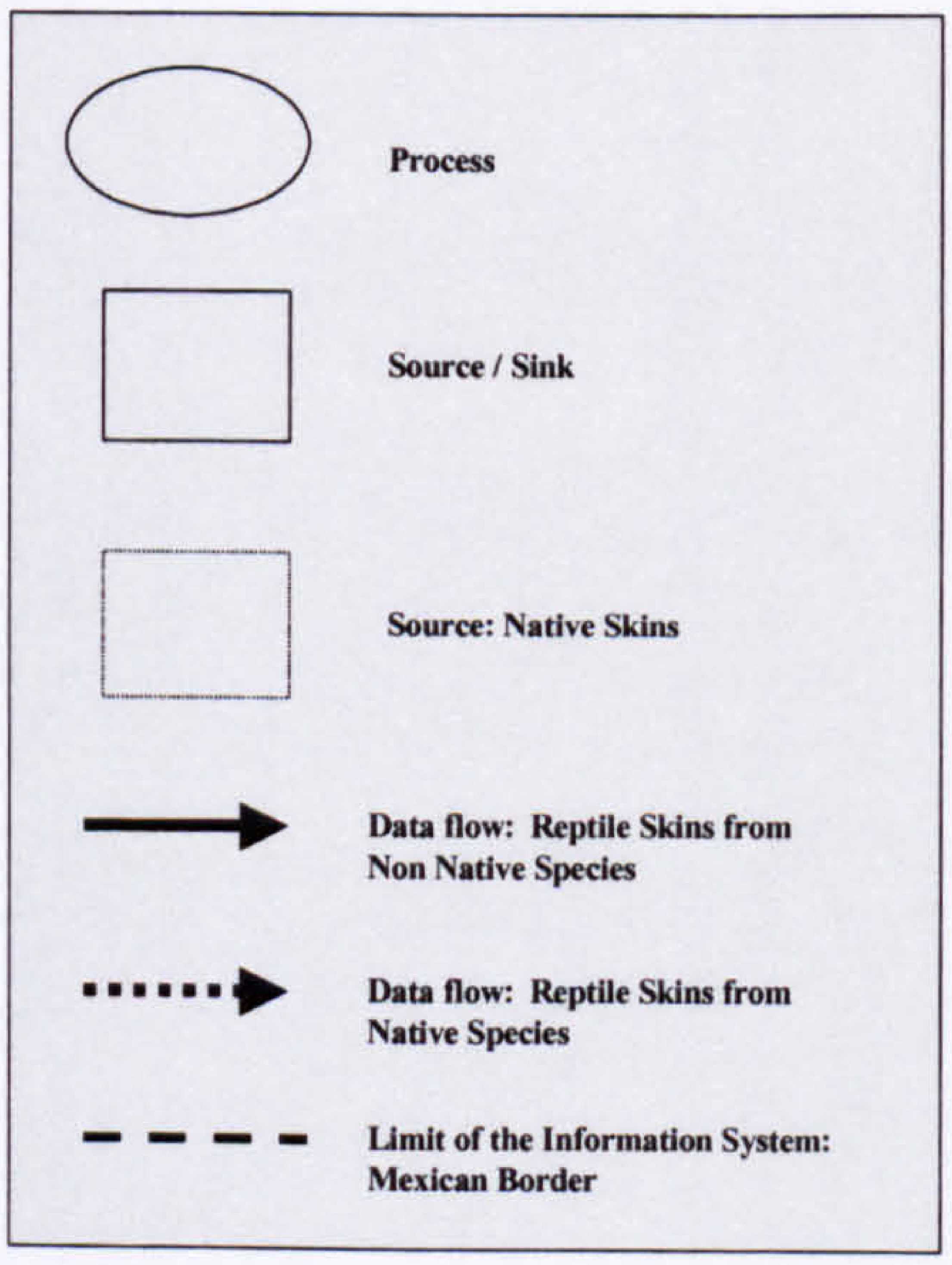


Figure 5.1 The Mexican Market for Reptile Skins: Manufacture and Distribution



Data Flow Diagram symbols

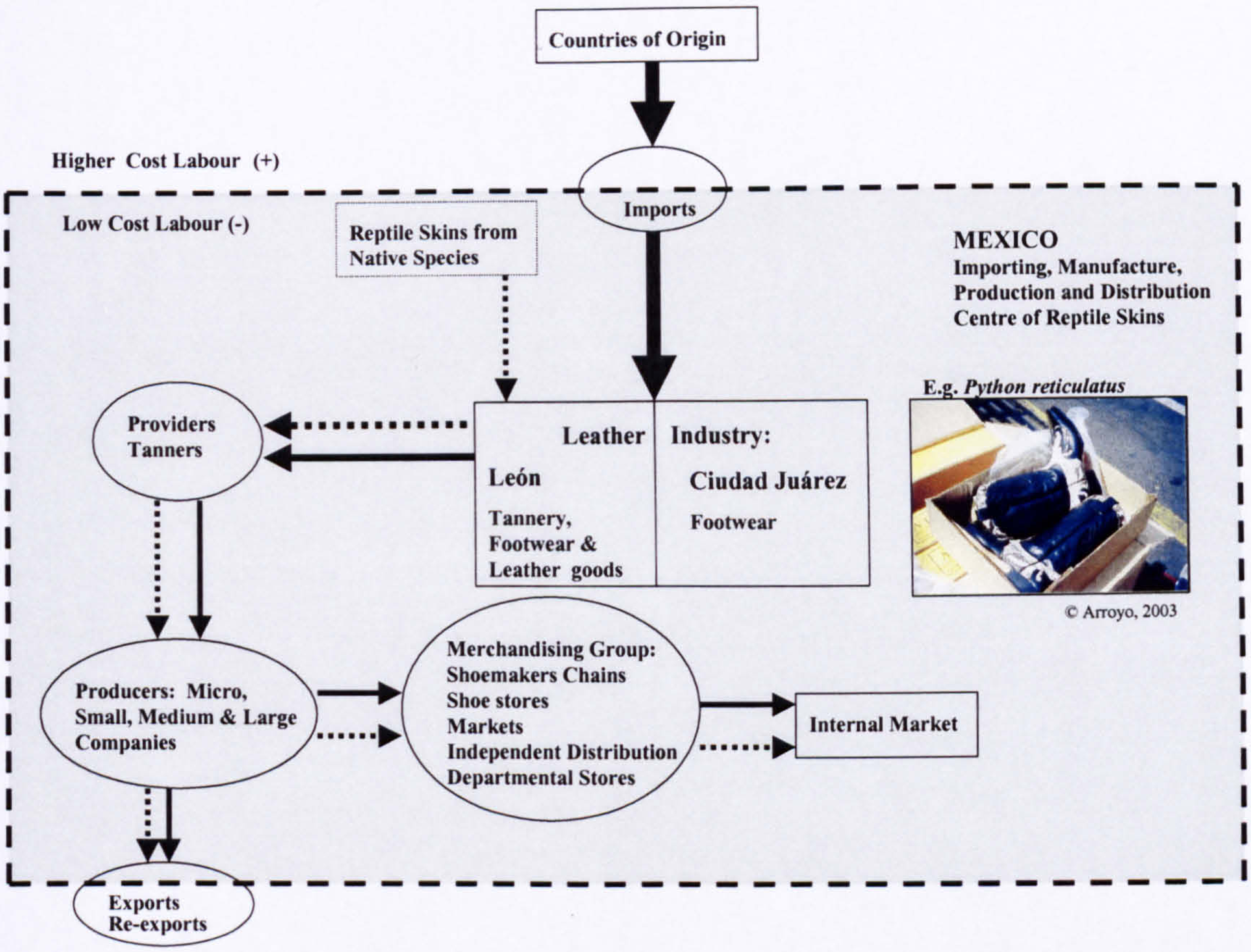
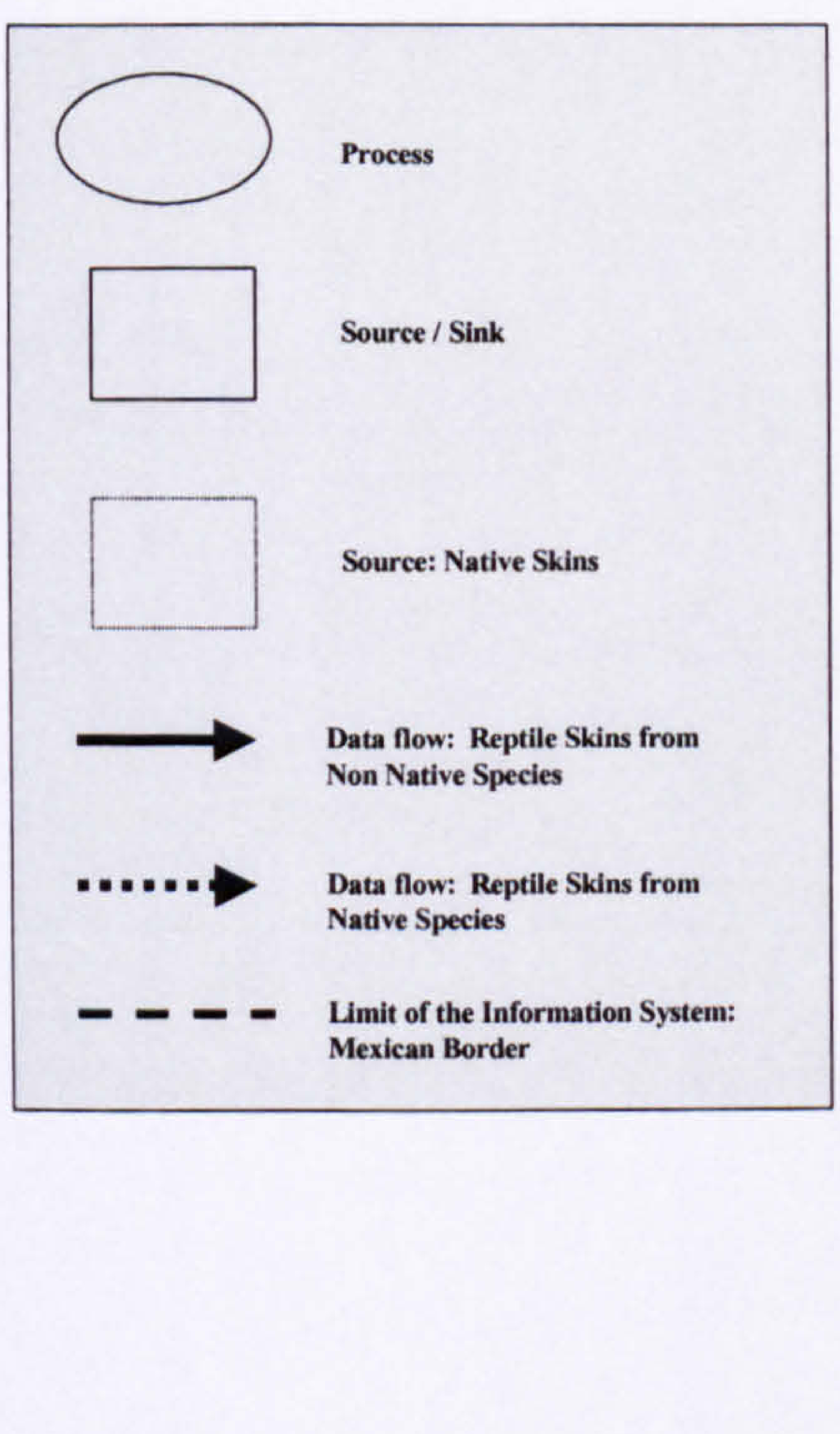


Figure 5.2 The Leather and Footwear Sector of Leon and Ciudad Juarez



Data Flow Diagram symbols

5.3.2.1 Non-native species

The Mexican leather industry imports significant amounts of non-native reptile skins from different species and particular countries of origin (Figure 5.3).

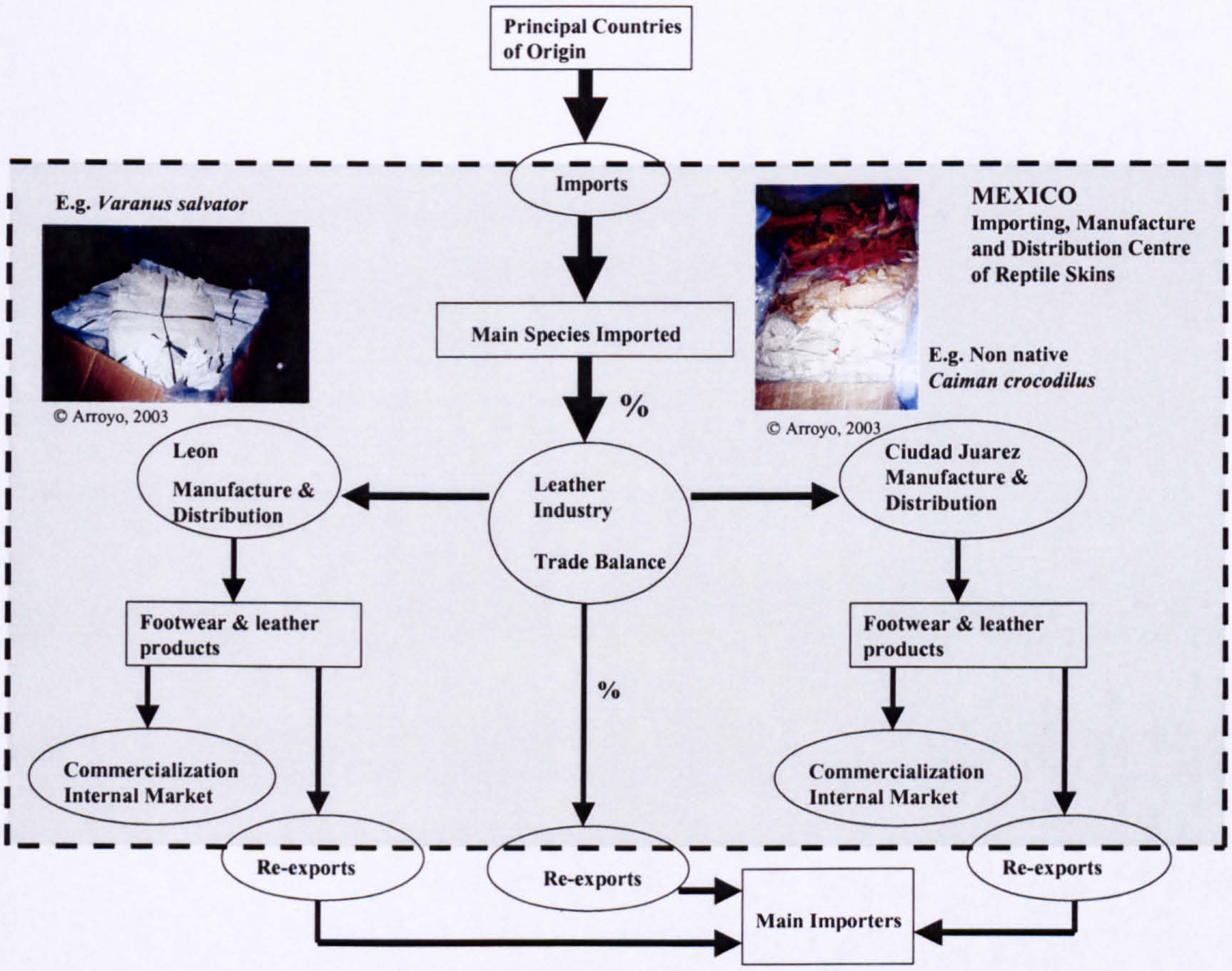
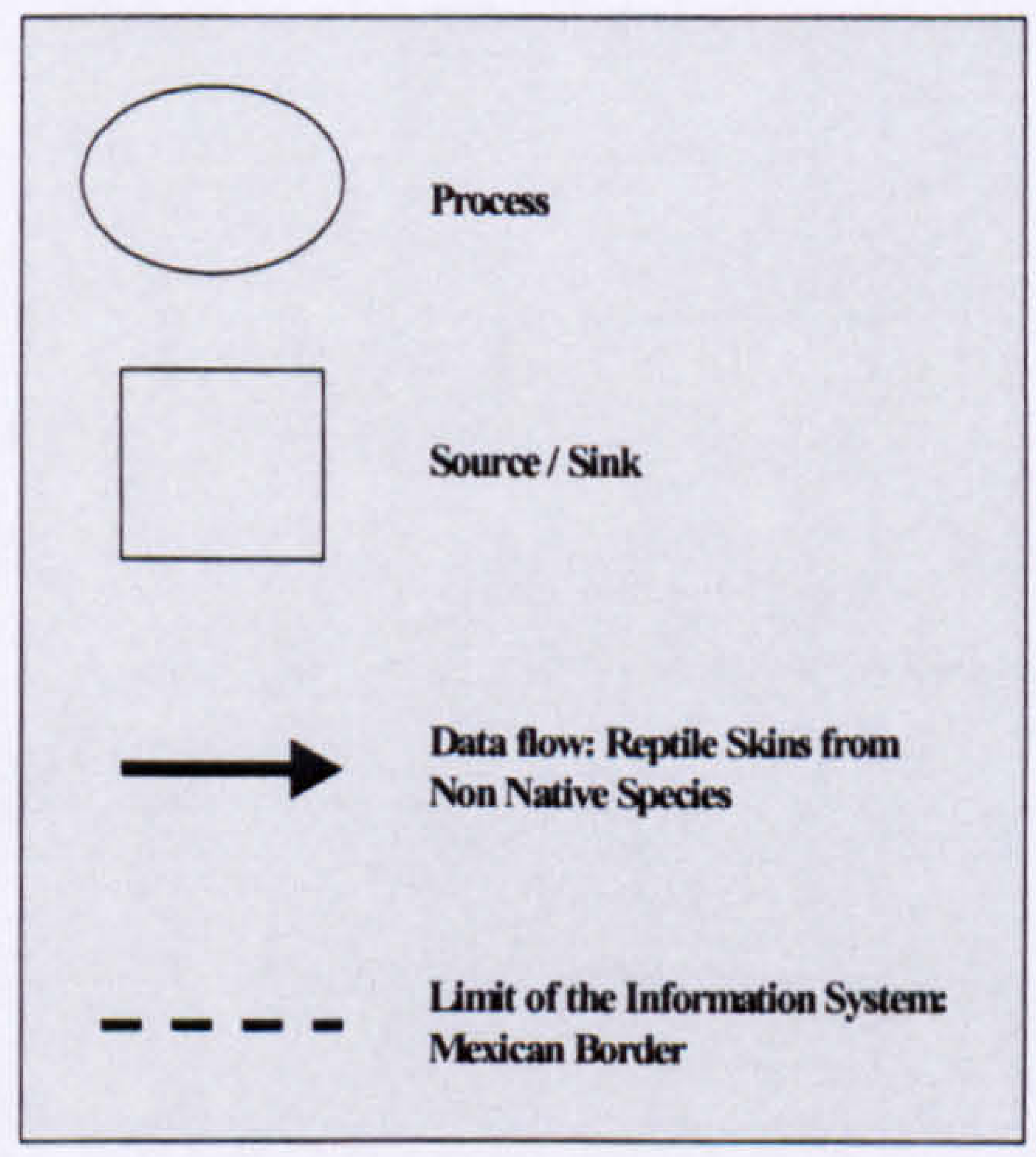


Figure 5.3 The Mexican Market for Reptile Skins: Non-native Species

A small proportion of the imported reptile skins are directly re-exported. However, a greatest proportion are used by the leather industries in Leon and Ciudad Juarez to produce footwear and leather products, which are then commercialised in the internal market or re-exported to particular countries (Figure 5.3). Section 6.3.2 analyses the main reptile species imported by Mexico. Section 6.3.7 analyses re-exports of skins and products and section 6.3.9 analyses the trade balance between imports and re-exports.



Data Flow Diagram symbols

5.3.2.2 Native species

Through the System of Units for Conservation, Management, and Sustainable Utilization of Wildlife (SUMA), the Mexican government is promoting the legal production and commercialisation of reptile skins from native species (Figure 5.4).

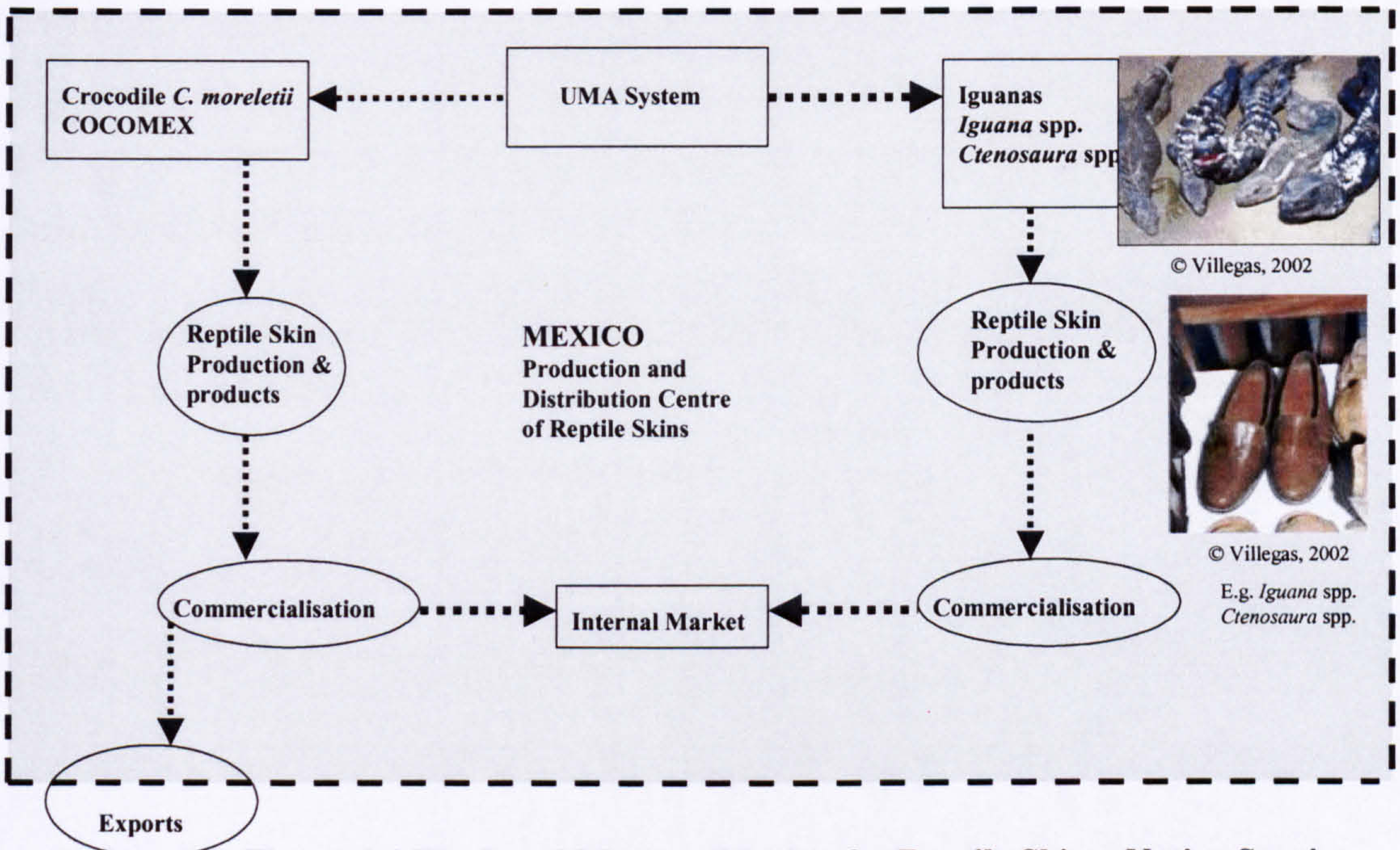
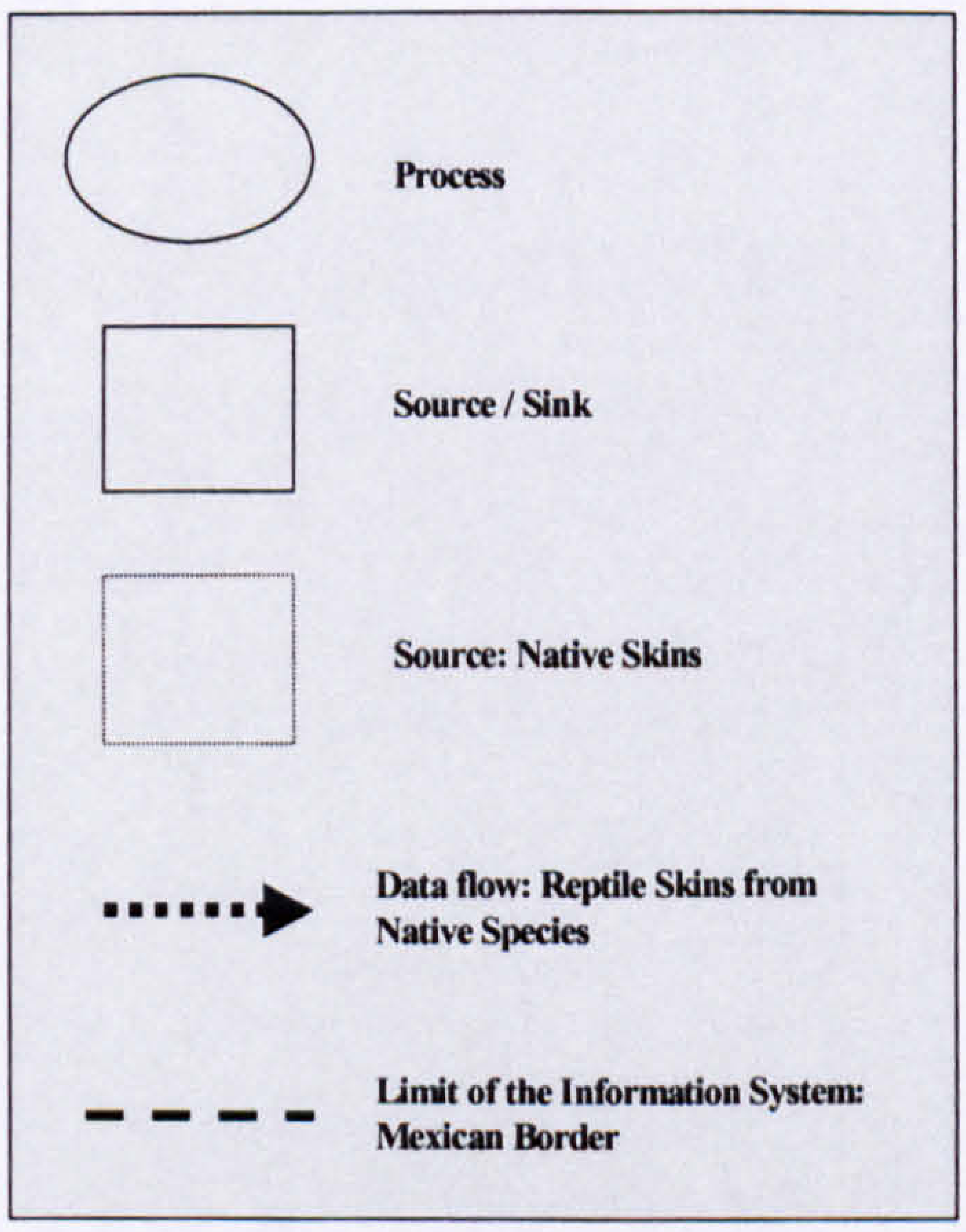


Figure 5.4 The Legal Mexican Market for Reptile Skins: Native Species

The SUMA is based principally on the recognition of local property rights and the creation of markets based on these rights (Belausteguigoitia, 1999). The main native species involved in the reptile skin production scheme within the UMA system are *Crocodylus moreletii* and iguanas (*Iguana* spp.). The UMAS that participate in the production of reptile skins commercialise their products mainly in the internal market but some do have a permit from the Mexican government to export their products (Figure 5.4). Sections 7.3.1 and 7.3.2 analyse the main native species involved in the legal market for reptile skins. Section 8.3.1 analyses the status of crocodiles and iguanas within the UMA system.



Data Flow Diagram symbols

There is considerable evidence that illegal trade, either through mis-declaration, under-declaration or non-declaration of shipments, is a widespread problem in the international reptile skin trade (Jenkins & Broad, 1994). Mexico is no exception and native species are distributed by specific actors through established routes in the internal market. Such illegal trade takes place in specific regions (Figure 5.5).

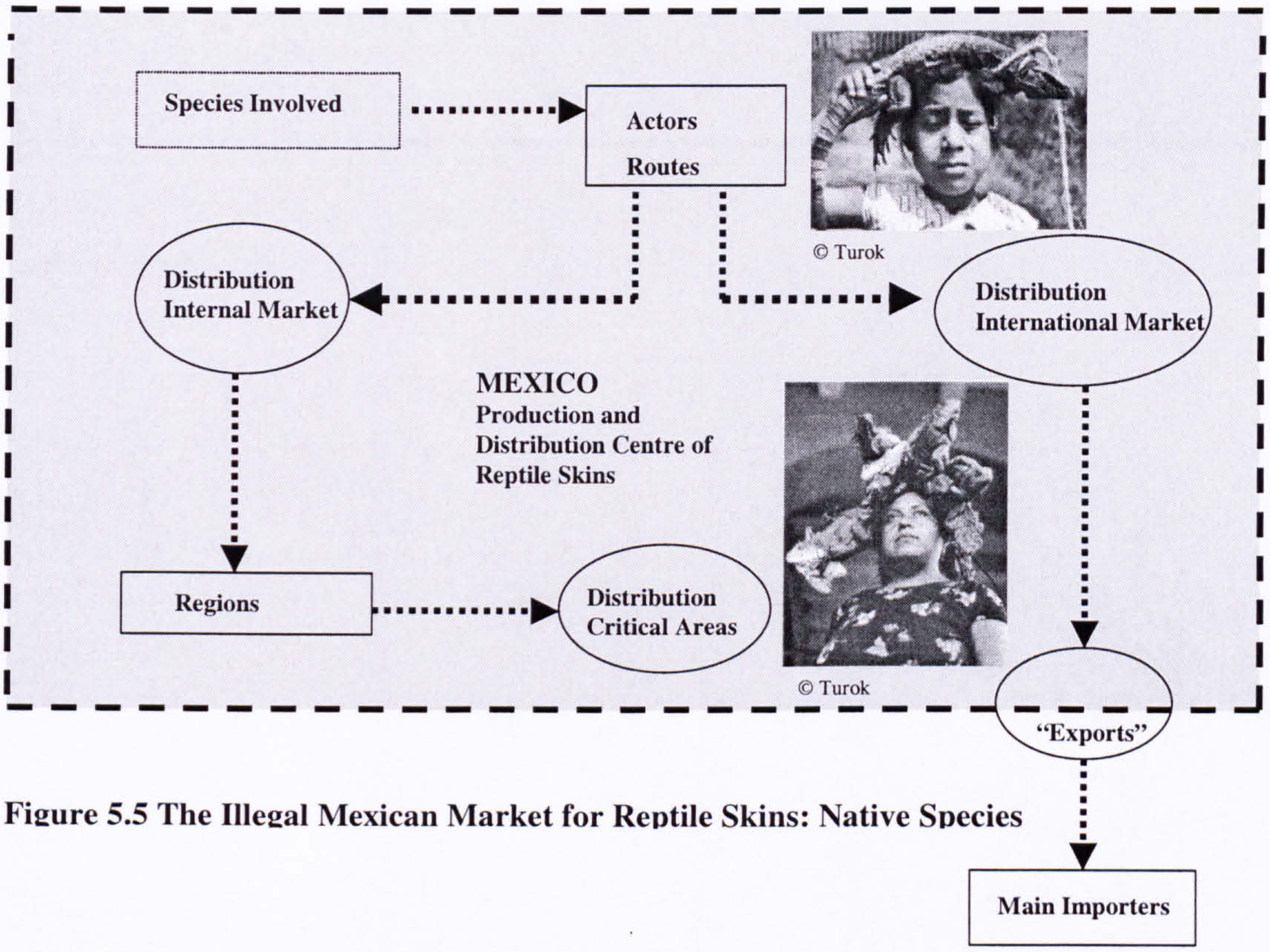
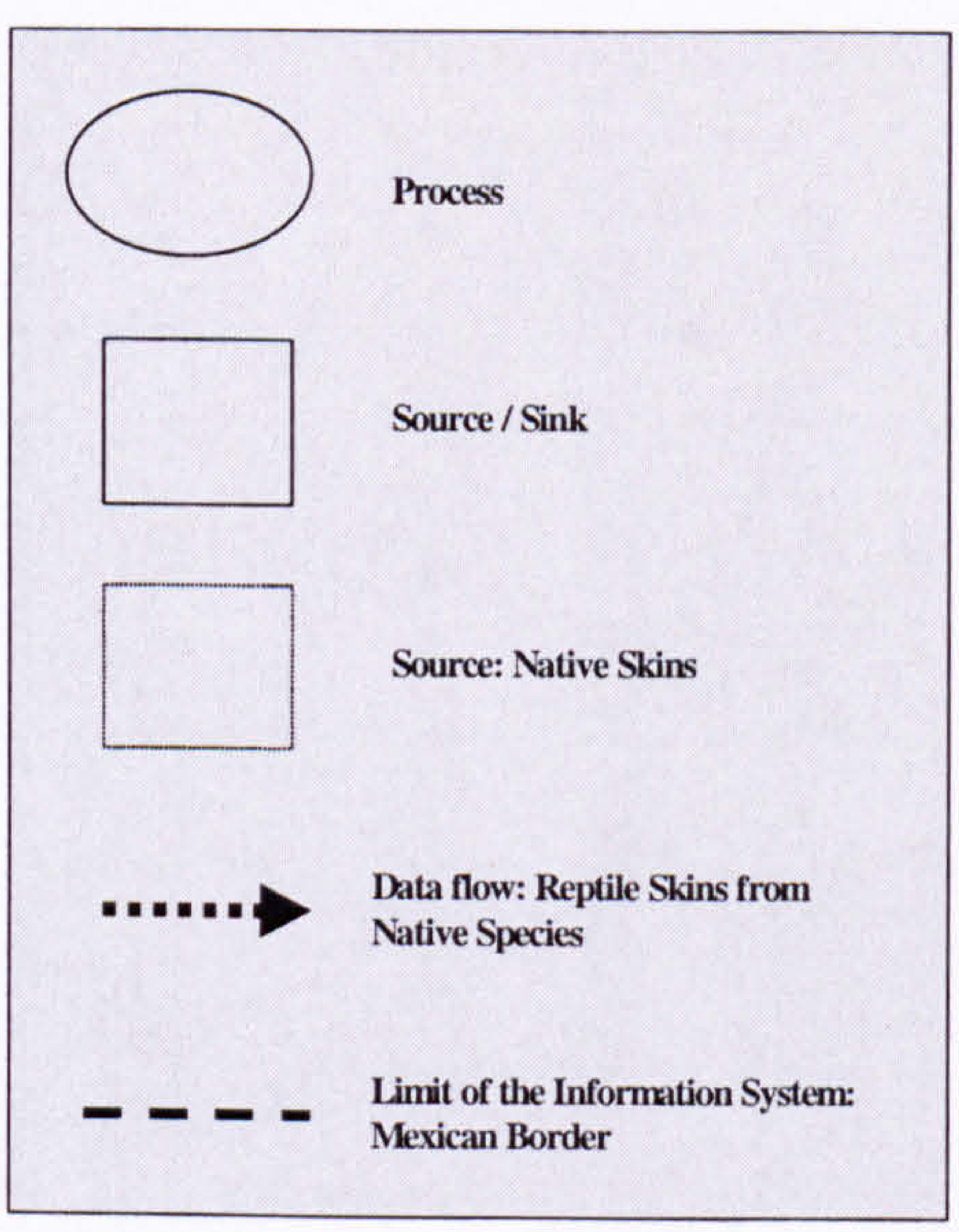


Figure 5.5 The Illegal Mexican Market for Reptile Skins: Native Species



Data Flow Diagram symbols

Section 9.3.1 analyses the main species involved in the illegal trade of reptile skins from native species. Section 9.3.2 analyses the main regions of illegal distribution of reptile skins from native species in the internal market. Section 9.3.3 examines the presence of reptile skins from native species in the international market.

5.3.3 The region of Leon, Guanajuato

The region of Leon, Guanajuato, is by far the most important footwear producer in Mexico. The region of Leon produces a great diversity of footwear, excels at making gentlemen's shoes of excellent quality (30.1%), women's shoes of excellent and average quality (24.9%) and cowboy boots of excellent quality (13.7%). Even though cowboy boots only make up a small proportion of the total volume of the footwear produced in the region, they continue to be the State's main product of export (Iglesias, 1998).

5.3.3.1 The cowboy boot sector

The region of Leon, Guanajuato, is the main reptile skin manufacturer centre in Mexico (Figure 5.6), most reptile skins are used in the cowboy boot sector (Iglesias, 1998). Many of the most popular and expensive boot styles incorporate non-native reptile leathers like python (*Python* spp.), tegu (*Tupinambis* spp.), caiman (*Caiman* spp.), water snake (*Achrochordus javanicus*), monitors (*Varanus* spp.), crocodiles (*Crocodylus* spp.), among others.

When compared with traditional cow head skin boots, boots of reptile skins require a different technique and style, besides attracting a different consumer market (Iglesias, 1998). In Leon, for example, around five million skins were tanned during 1985, of which 75% were of national origin and the rest imported, including reptile skins such as crocodile (Calleja, 1994). The market for crocodile skins is well established in Leon, the actors are well defined, and leather businessman and retailers are well aware of fashion and market trends (León 2001, Pers. comm.).

Raw materials used in the footwear industry of Leon for cutting and hacking during 1988, included exotic reptile skins from snake (e.g. *Acrochordus* spp., *Naja* spp.), lizard (*Varanus* spp.), and marine turtle (e.g. *Caretta caretta*) (Bazán, 1988). This use of exotic skins in cowboy boots requires specialized manual labour to carefully handle this type of material, which mostly arrives treated and finished (Plate 5.1; Plate 5.3), although boots often need to be reinforced with other skins, such as bovine or goat leather (Plate 5.2; Plate 5.4).

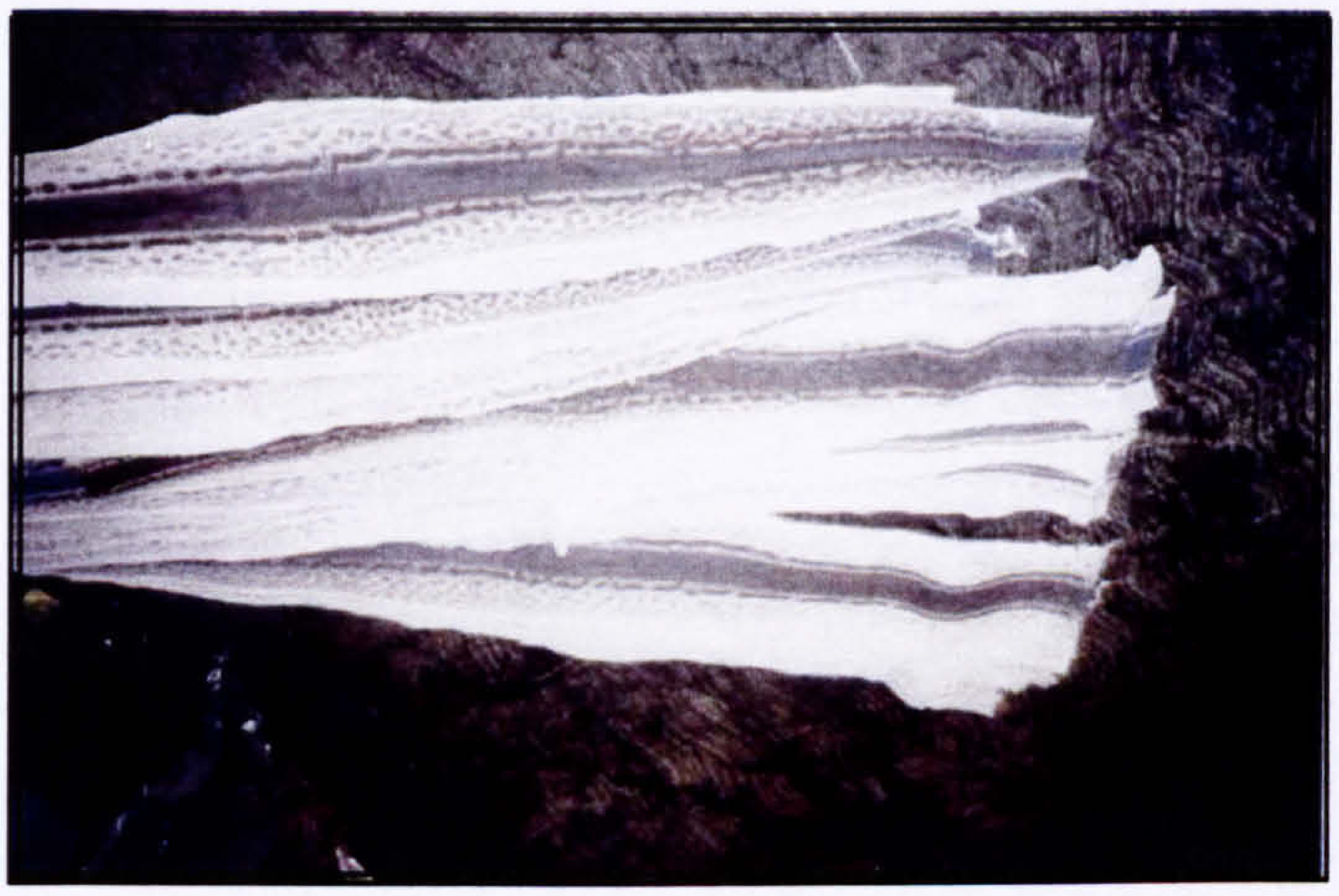


Plate 5.1 Import of water snake (*Acrochordus javanicus*) whole skins by Mexico
© Arroyo, 2003

Plate 5.2 Cowboy boots of water snake *Acrochordus javanicus* handcrafted in Mexico
© Alcala's, 2001

Plate 5.3 Imports of cobra (*Naja sputatrix*) whole skins by Mexico
© Arroyo, 2003

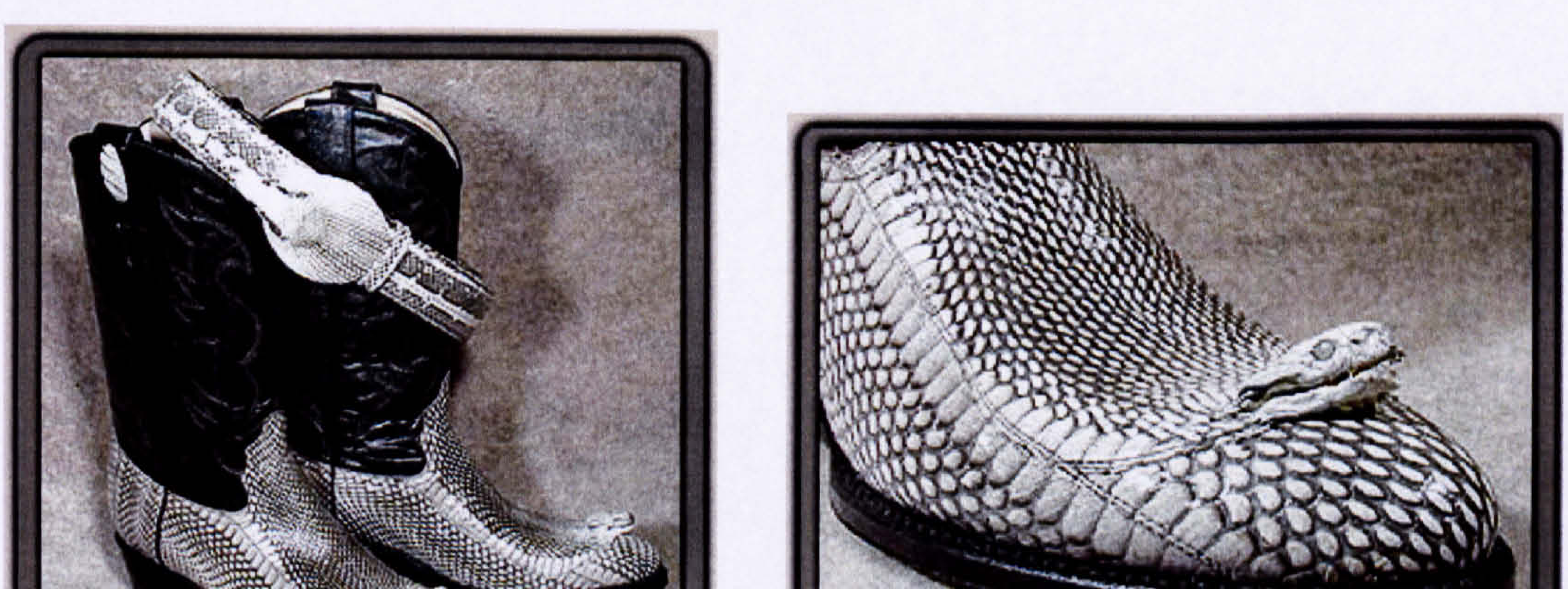


Plate 5.4 Cobra boot (*Naja* spp.*)* hand crafted in Mexico with actual cobra head on toe
© Alcala's, 2001

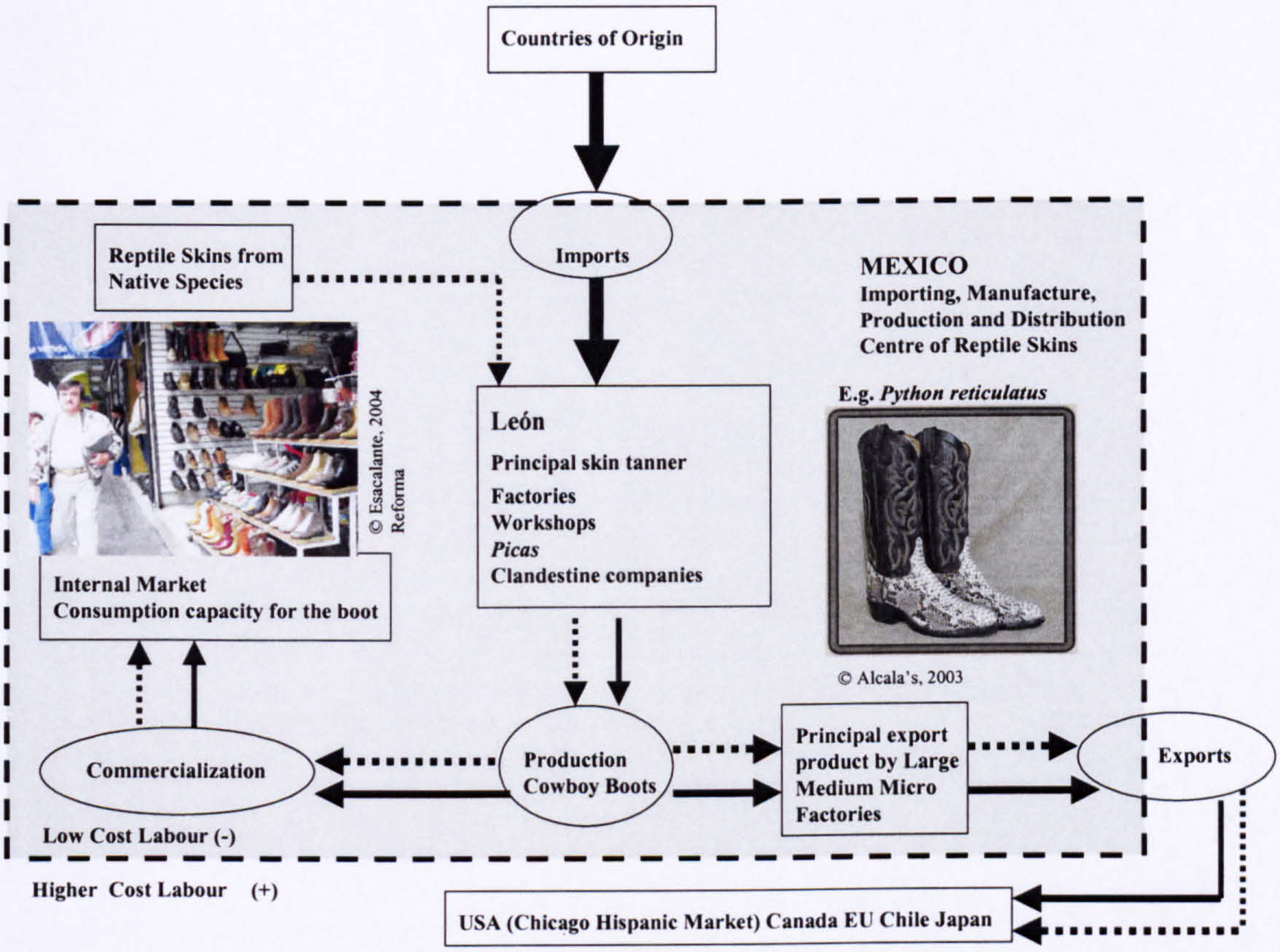
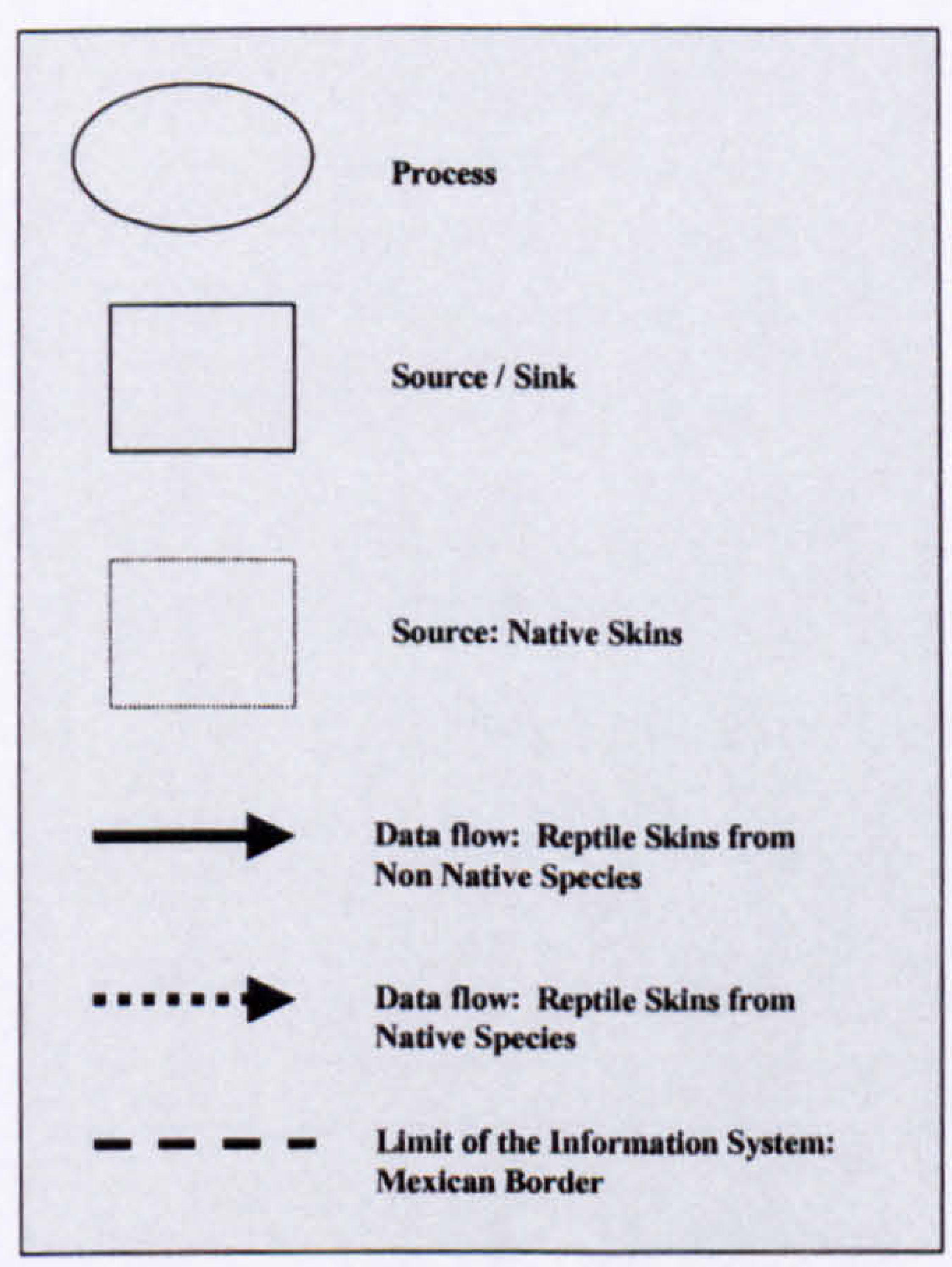


Figure 5.6 The Region of Leon: Reptile Skin Manufacturing and Distribution Centre

The making of boots in Leon is undertaken by businesses of different size. Boots, including cowboy boots, designer and *charro* boots, are produced by all kinds of businesses (Figure 5.6), all of which reach the external market to different degrees. The production destined for export by 56 micro companies is small (less than 1%), in comparison with the volumes sent by medium (33%) or large companies (43%), of which there are only six large boot-producing companies, all of which are exporters (Iglesias, 1998).



Data Flow Diagram symbols

In the region of Leon, there are ongoing developments in the design and quality of cowboy boots, which quickly reach European markets. Of the nearly 60,000 jobs generated in previous years by Leon's footwear industry, boot-making generates 8,000 jobs, 70% of which are distributed among medium and large companies (Iglesias, 1998).

Between 1988 and 1994, the exports of cowboy boots from Mexico grew faster than the rest of the footwear industry from less than 20% of production during 1988, to 55% in 1993. This increase occurred because boot exports reached European markets in 1989 and 1990, giving scope for increased production (Iglesias, 1998).

Those establishments, which produce boots for the internal market, mainly manufacture cheaper footwear, but also supply some important sectors of the market with fine and excellent boots (Figure 5.6). These boots cost far more the cheap model (Iglesias, 1998). During a survey conducted in October 2002 in the historical and tourist centre of Leon, the highest prices recorded for cowboy boots were for *Crocodylus* spp. and *Alligator* spp. (Table 5.1). In all cases, the sellers confirmed that it was possible to find the same products at lower prices between MX$300.0 – MX$600.0 in the informal markets of Leon, depending on the type and cut of skin.

Table 5.1. Prices of cowboy boots made with different reptile skins in León, Guanajuato (as of October 2002)

Type of Skin	Retailer Price MX$	Retailer Price US$
Python *Python reticulatus*	1,600.0	160.0
Tegu *Tupinambis* spp.	2,200.0	220.0
American Crocodile *Alligator mississipiensis*	2,900.0-4,500.0*	Between 290.0-450.0
Caiman Crocodylus fuscus	2,900.0-3,200.0*	Between 290.0-320.0
Crocodile *Crocodylus moreletii*	3,200.0-4,200.0*	Between 320.0-420.0
Marine turtle Cahuama *Caretta caretta***	850.0	85.0

* Depending on the cut: tale, belly or nape

** Price as of 2004 (Escalante, 2004b)

The region of Leon is also involved with US industries. Many Texas shoe and boot companies use the cheaper labour force in Mexico, and rely on Mexican manufacture at some, if not all, stages of boot production (Figure 5.6). For example, there are US companies that re-export leather to the manufacturing city of Leon, and re-import finished goods to the US. Others partially manufacture boots and shoes in the US, ship these to Mexico for finishing and ship them back to the US for packaging and distribution (Brautigam, 1986). In 1996, a pair of exotic leather boots retailed in the US market from US$700 to US$1,000 (TRAFFIC USA, 1996).

The metropolitan zone of Chicago shows steady demand for skin products, such as cowboy boots and or "western" cowboy items for example, in the Hispanic market of Chicago. There are specialized distributors, as well as identified points of sale for these products. In the specific case of cowboy boots, up to now, the demand for cowboy boots has been fulfilled mainly by companies located in Dallas, Texas, several of which also sub-hire processes in countries with a lower manual labour cost like Mexico (Bancomext, 1999b).

Even though the US continues to be the main driver of the reptile leather boot industry, this has given Leonese industrialists the chance to enter other markets, often through bridges established with numerous small and medium companies who have turned into specialized boot making factories for many years. From 1989-1993, countries such as Germany and France took the largest volumes of Mexican exports to Europe. During this same period, other countries like the Netherlands, Japan, and to a lesser extent Switzerland and Austria, completed the list of the main destinations for the export of Mexican boots, especially from Leon (Iglesias, 1998). Mexico also exports cowboy boots to Canada. During 1990-1993, for example, Mexico exported 9,471 pairs of cowboy boots to this country, with a value of 5,863 Canadian dollars (Bancomext, 1994).

5.3.3.2 Commercialisation of cowboy boots

The footwear industry of Leon is made up of factories, workshops, family firms (*picas*) and assembly plants. This should not be considered as independent footwear-producing units because they are interlinked at various stages of production. There is no reliable way to count and classify the establishments dedicated to footwear production in Leon. Each unit uses its own criteria; many companies operate clandestinely (Figure 5.6). Tanneries are found in Barrio Arriba; workshops and *picas* are found in Barrio El Coecillo (skin stands, pelt stores, assemblies and wholesalers); factories and workshops are found in Barrio San Miguel and San Juan de Dios; and large factories are located along the Leon-Silao Highway and the city of Leon. In addition, some factories, shoemakers and workshops are hidden and dispersed throughout the city, especially in poor neighbourhoods (Calleja, 1994).

In Mexico, there are few direct producer-to-consumer footwear sales, through stores established by the manufacturers themselves. Generally, footwear goes through one or more intermediaries before reaching the final consumer (Figure 5.6), which results in a price mark up for the end product of up to 200% (Calleja, 1994).

In Leon, for example, factories and wholesalers acquire merchandise to resell it. Furthermore, commercial establishments and shoemakers make retail sales to the general public and tourists (Figure 5.7). Another factor that has an effect on footwear commercialisation, and the emergence of a significant sector of factories and intermediaries, is that demand for footwear fluctuates throughout the year. Sales show peaks and troughs according to the rainy and holiday seasons, and the months of highest demand are March to May, and October and November (Calleja, 1994).

Commercialisation is one of the most significant factors determining the success or failure of footwear-producing companies. Each productive unit develops proper commercialisation channels, according to the quality of the shoe it produces, its financial standing and the seasonal fluctuations of product sales. In the specific case of Leon, most large and medium units also produce footwear of cheaper quality, aimed for middle-class and rural sectors of the population. Almost all family businesses or *picas* produce only cheap footwear. Only a small number of companies —not necessarily the largest— produce finer footwear, which is distributed through exclusive shoe stores, and is destined for the country's high-income class (Calleja, 1994).

The factories place their production in shoe stores directly through travelling salesman (Figure 5.7), who work by commission. Footwear producers have divided the Mexican Republic into different marketing areas, such as the North zone, Pacific zone, Central zone and Mexico City, of which the latter is the main consuming centre. The use of travelling salesman allows the factories to reduce the need for intermediaries (Calleja, 1994).

Workshops do not have travelling agents to successfully place their orders, so the owners themselves seek a market for their footwear. Options for local producers to sell their merchandise include wholesalers, retailers, foreign intermediaries, and countless shoe shops in the city (Figure 5.7). Shoemakers cannot market their goods in other cities because they do not use travelling salesman and the short periods can devote to commercialising their footwear directly (Calleja, 1994).

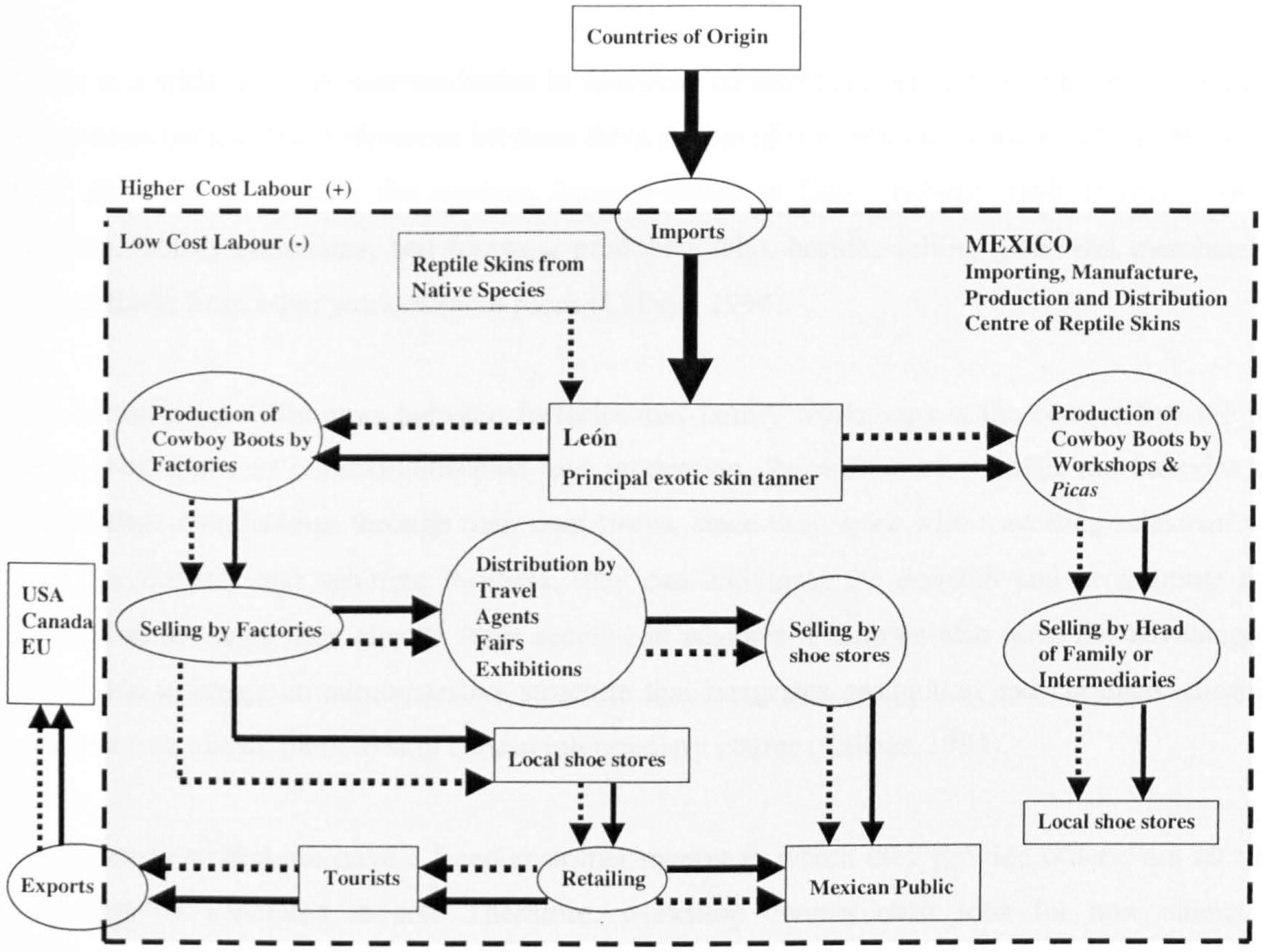
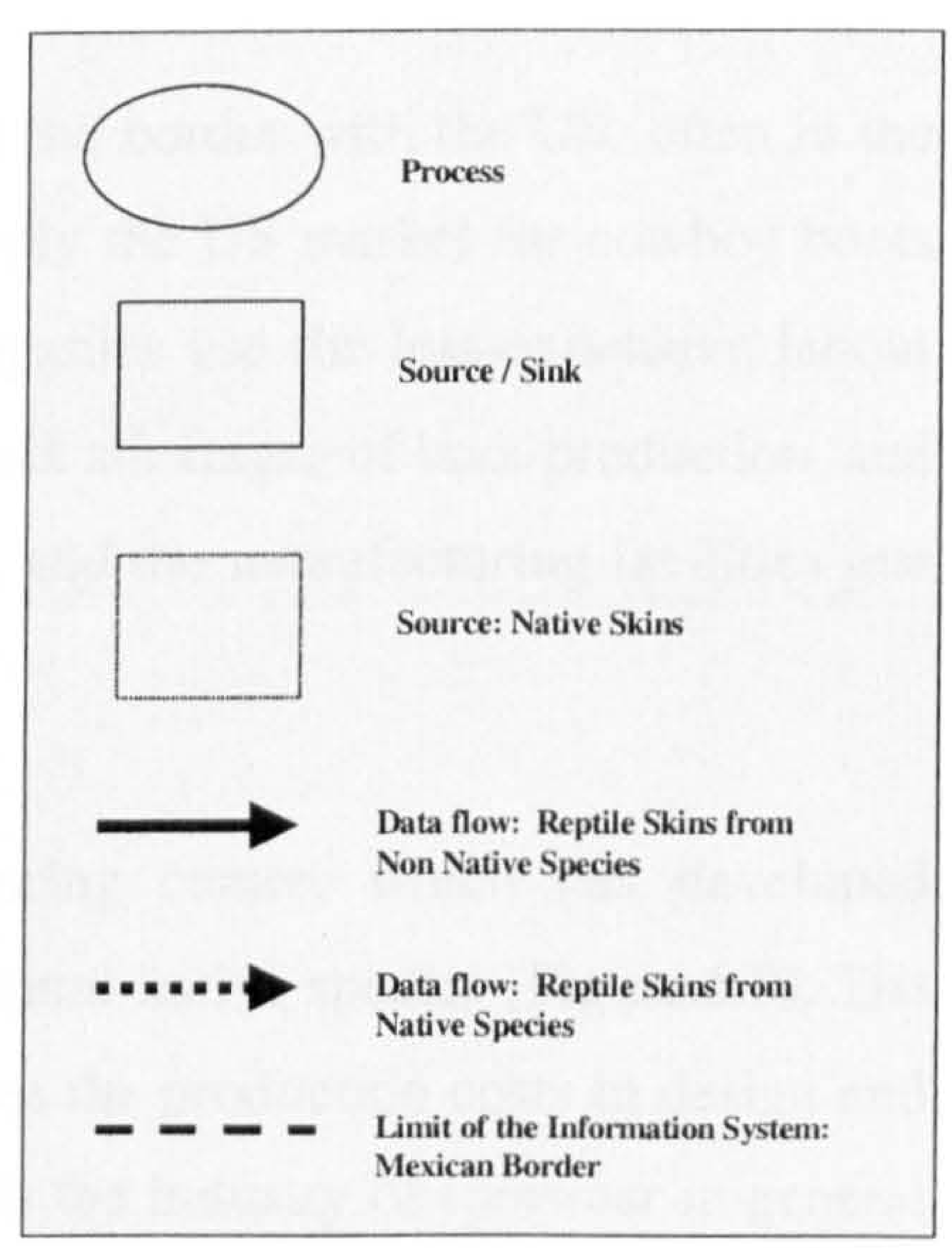


Figure 5.7 The Region of Leon: reptile skin manufacturing and distribution centre

Most family businesses (*picas*) depend on an intermediary. They have little financial standing, so they mainly try to achieve their sales in cash. Some *picas* do not sell to intermediaries, but instead where the head of the family itself sells directly to shoe stores throughout the city, and sometimes to other parts of the country (Figure 5.7). Each *pica* determines its alternatives for commercialising depending mostly on its levels of production, the time available to sell the merchandise, urgency of recovering investment, and sale time of the product (Calleja, 1994).



Data Flow Diagram symbols

There is a wide range of intermediaries in footwear commercialisation, from the small retailer to wider monopolies. The differences between them are based not only on capital handling, but also in their strategies to acquire the product. Intermediaries in Leon include small retailers, foreign retailers, factory merchants, and footwear producers who, besides selling their own merchandise, buy products from other workshops or *picas* (Calleja, 1994).

One of the main differences between factories and family workshops is the control that the first enjoy over footwear commercialisation and production. Regardless of whether the factories sell part of their merchandise through their own stores, since they work with travelling salesman who cross the country and generate business, they can anticipate the demand and programme their production for sales they already have secured in advance. Factories also have the advantage of being able to create an administrative structure that integrates production and commercialisation, which in turn allows them to skip certain intermediary chains (Calleja, 1994).

Even though workshops have a fixed customer market to which they provide orders, not all their production is generated to sell. Therefore, workshop owners must look for new clients by themselves. Since the smallest workshops and family businesses lack personnel to promote the sales, they have to limit their production, and leave factories and intermediaries to place their footwear in the national, rural and urban markets (Calleja, 1994).

5.3.4 Ciudad Juarez

Part of Mexico's exotic leather industry is concentrated along the border with the US, often in the form of US assembly plants (*maquiladoras*), primarily to supply the US market for cowboy boots (Rose, 1992). For example, many Texas shoe and boot companies use the less-expensive labour force in Mexico, relying on Mexican manufacture at some, if not all, stages of boot production, and have twin operations with their management based in the US, and the manufacturing facilities just over the border (Brautigam, 1986).

Ciudad Juarez, Chihuahua, is a very important manufacturing centre, which has developed specialized industry of making cowboy boots using skins from non-native species (Figure 5.8). The specialist production of cowboy boots in Ciudad Juarez reduces the production costs in design and variety, and represents a comparative advantage with respect to the industry of footwear in general (Iglesias, 1998).

5.3.4.1 The Case of Small and Medium Cowboy Boot Industrialists

In the 1920s, a few shoemakers from Guanajuato, Zacatecas and Aguascalientes represented the first nucleus of boot manufacturers in Ciudad Juarez. The US border encouraged this industry to grow, yet until the 1960s it still depended mainly on manual labour. Today the flourishing cowboy boot industry, which feeds an important part of the country's northern market, is sustained by small and medium-sized industrialists, either immigrants from the surrounding Chihuahua rural areas, or else descendants of old craftsmen, who based their business on an extended family. The cowboy boot industry was able to grow in the region because industrialists were able to incorporate suitable mechanization, mostly using machinery already rejected by the US, into production systems that attained international quality. The last big wave of workshops or micro-establishments were established in Ciudad Juarez at the end of the 1970s and today represent more than 60% of the small and medium boot making companies. Currently this border area holds more than three hundred assembly plants, located in different industrial parks (Iglesias, 1998).

Companies in Ciudad Juarez are mainly family businesses, which to a great extent maintain the original pattern of accumulation, although they use paid workers. All companies can control the quality of their products in each phase of production. The artisan use of manual labour has gradually been replaced by mechanization of certain stages of production. Nevertheless, very few of these companies have ever managed to incorporate state-of-the-art technology, the quality control or the production volume required to compete in the foreign market. Except for the large assembly plants of the region, where designers form part of the technical production teams, most companies in Ciudad Juarez copy the models from foreign or national producers, and design is undertaken by one of the company's owners (Iglesias, 1998).

Ciudad Juarez has about 80 companies including repair shops, mini workshops, small and medium companies, and large assembly plants. Nevertheless, some 35 companies contribute 90% of the production. Altogether, they provide employment to almost 2,000 workers with steady jobs, plus 500-600 workers that labour in small repair shops and assemblies. However, there is only a small multiplier effect because the basic raw material is not supplied *in situ*. Since Ciudad Juarez is a region without tanneries, the companies have to overcome material supply problems by means of border trade (Figure 5.8) so most of cowboy boots in the area are made with exotic skins (Iglesias, 1998; León 2001, Pers. comm.).

There are two large leather-manufacturing plants in Ciudad Juarez, which generate 400 jobs and produce volumes of more than 200,000 pairs of boots annually. At the other extreme, some 10 small assembly workshops produce totals of 600 pairs annually. Those industries that were first established 15 to 20 years ago, produce cowboy boots using reptile skins from non-native species, because they took advantage of the period when casual clothing favoured cowboy fashion footwear in the 1970s (Iglesias, 1998).

The scope of commercialisation channels in Ciudad Juarez extends differently for each company, through the opening of retail direct sales by means of the installation of different stores (Iglesias, 1998).

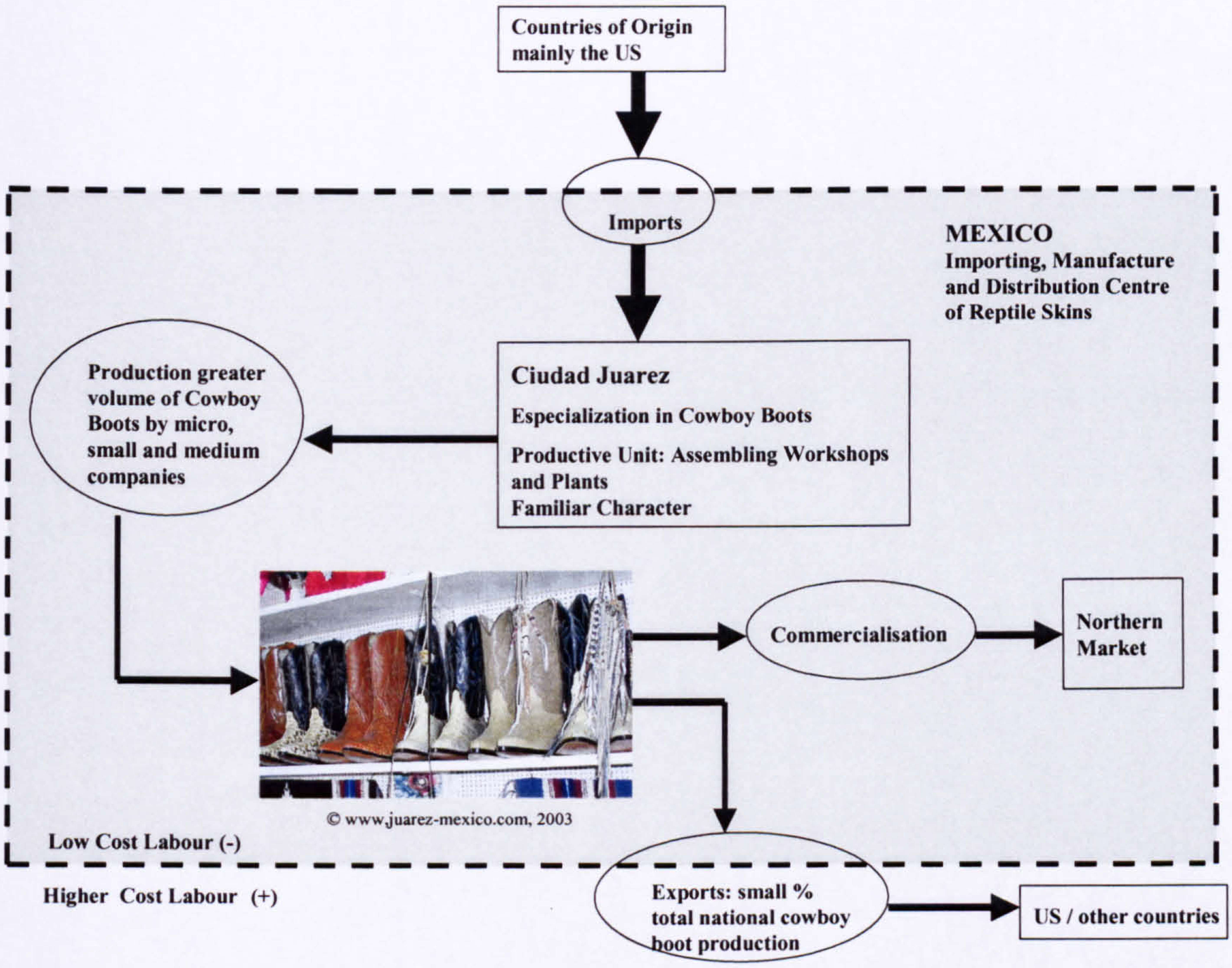
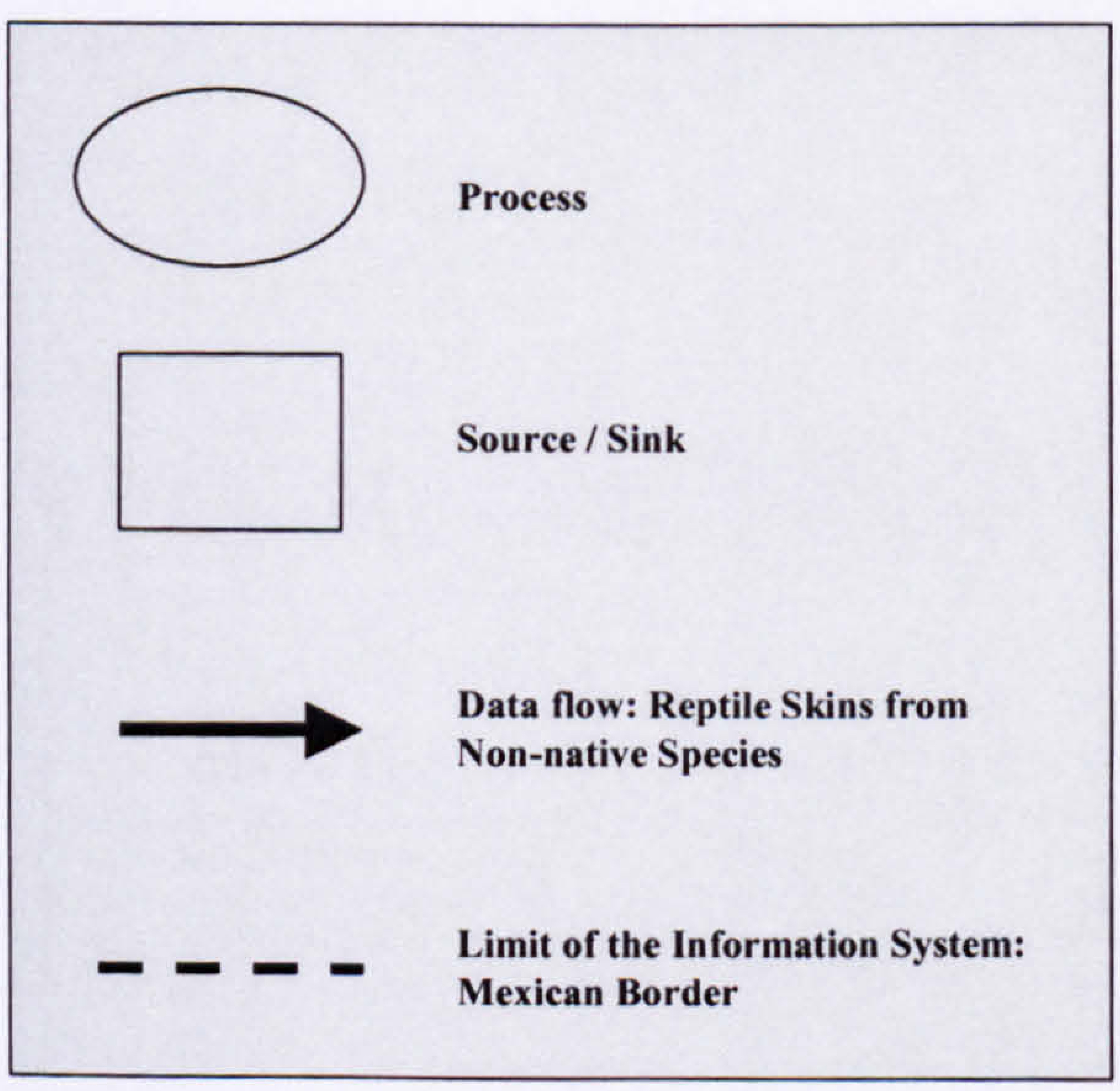


Figure 5.8 Ciudad Juarez: The case of small and medium cowboy boot industrialists



Data Flow Diagram symbols

5.4 Discussion

This chapter aimed to compile and integrate the available information on the use of reptile skins in the Mexican leather industry and to show the importance of Mexico as an importing, manufacture, production and distribution centre of reptile skins.

5.4.1 Mexico and its international trade in leather

An important feature of world trade over the past three decades has been the growing participation of developing countries. Many have rapidly shifted the composition of their exports from primary commodities to manufactured goods, which accounted for 70% of developing country exports at the end of the 1990s (UNCTD, 2002). This trend has been true for Mexico. In the early 1980s, Mexican exports depended almost exclusively on petroleum. Hydrocarbons, the foreign sales of which represented the main source of government revenue, were Mexico's main export product and accounted for 70% of the country's total exports in 1982. The pattern of exports has, however, radically changed. In 2001, 89% of Mexican exports were manufactured goods[6] (WTO, 2002). Labour-intensive manufacturing is particularly important in Mexico (UNCTD, 2002). The production of leather articles requires much manual labour and Mexico uses this comparative advantage to gain a competitive edge in this industry.

The high productivity of Asian countries such as China can cause problems. However, the Mexican leather and footwear sector has sought alternatives to continue as a significant source of employment and to successfully compete in international markets. The use of reptile skins from native and non-native species symbolizes a distinctive industry for the Mexican leather and footwear sector, in relation to other countries. The use of reptile skins in the manufacture of cowboy boots in Leon and Ciudad Juarez certainly distinguishes these products in both internal and foreign markets.

The leather and footwear industry of Leon is larger and more intricate than that of Ciudad Juarez (Figures 5.6, 5.7 and 5.8). The distribution channels in Leon are larger, and the diversity of products is superior. The region of Leon manufactures all kinds of leather products and footwear while Ciudad Juarez is a specialized boot-making centre. However, both regions share the feature that they both use reptile skins mainly for the production of cowboy boots. The only variation in this regard is that Leon uses both non-native and native species and Juarez only employs non-

[6] Mexico's manufactures have indeed recorded unprecedented growth since the mid-1980s. Between 1985 and 1993 they increased almost fourfold, from US$12.2 to US$44.5 billion, and more than doubled during 1994±1998 reaching US$110.4 billion in the last year (Tamayo-Flores, 2001).

native species for the manufacture of this type of footwear. Although Leon and Ciudad Juarez use different distribution paths to distribute cowboy boots (and leather products in the case of Leon), and have different target market segments within the country, both centres have the potential to export their products.

In terms of economic integration with other countries, Ciudad Juarez has the advantage of being a northern border city. Mexico committed to integrate into a regional economic block in 1994 through the NAFTA. Northern border States and their main cities have attracted much investment since the mid 1980s, as they were expected to be major beneficiaries of the economic integration with the US. Northern areas have been the greatest beneficiaries of economic integration in terms of absolute additional output and exports. Cities in northern states have shown superior performance because of proximity to the US market or because these areas host most of the traditional and high-tech *maquiladora* industries, which dominate Mexico's exports. Distance to markets also determines transportation and communication costs, which confers advantages to regions located closer to the centre of the enlarged potential market[7]. A role can also be assigned to the degree in which production is already oriented toward export markets at the outset of the integration. For a particular region, the greater the export-orientation of its productive base the greater its ability to benefit from the widening of the potential market (Tamayo-Flores, 2001).

The objectives of Mexican trade policy since 1998 have been to open up the economy yet further, to guarantee access to new markets and to create a favourable environment for investment. Bilateral free-trade agreements and Mexico's participation in a range of regional and multilateral trade fora, in particular the World Trade Organization (WTO), have played a major role in achieving these objectives. The export sector and foreign direct investment (FDI) have been the main sources of new jobs. The best jobs are those related to export activities. Sectors, which export 60% or more of their products, pay wages that are 39% higher than the rest of the economy, while *maquiladora* (in-bond assembly) plants pay 3.5 times the Mexican minimum wage. The trade agreements negotiated by Mexico have opened up markets for its exports and made the country more attractive to foreign investment (WTO, 2002).

In the specific case of reptile skin products such as cowboy boots, the Mexican Bank for Foreign Trade (*Banco Mexicano de Comercio Exterior*, Bancomext), has identified the main markets in

[7] Distance and centrality are only important either if infrastructure is markedly deficient and hence transport costs high or if communication costs are associated with distance (Tamayo-Flores, 2001).

North America that show demand for Mexican cowboy boots and leather products (Table 5.2). These markets represent interesting business opportunities for the Mexican exporter.

Table 5.2 Commercial Councils in North America

Cities	Mexican Products
Chicago	Leather products and cowboy boots
Dallas	Leather products and cowboy boots
Los Angeles	Cowboy boots
New York	Leather products
San Antonio	Cowboy boots
Montreal	Leather products

Source: Bancomext (2002)

Recently, new market niches for Mexican leather products have enlarged in the EC, where consumer trends indicate that Germany is the leading market, followed by the Netherlands, Belgium and the UK. In the EC, the main opportunities for exports of cowboy boots are Italy and France. In turn, in Latin America, the markets with highest commercial opportunities are: Guatemala, Costa Rica, Venezuela, Colombia, Cuba and Chile, mainly for inputs for the industry and finished footwear (Bancomext, 2002).

5.4.2 Present status of knowledge

Little information is available on the use of reptile skins in the Mexican leather and footwear sector. There is no formal or thorough study concerning only the use of reptile skins in Leon and Ciudad Juarez. What information is available has been generated through market studies undertaken by specialists in economics and social sciences. Since the market studies are produced by economic and social scientists, and the leather and footwear industry only constitute a small portion of Mexico's exports, the available information is insufficient to base conservation decisions. For conservationists it is important to know in detail:

- the specific distribution channels for reptile skins before they reach Leon and Ciudad Juarez, and are transformed into manufactured products;
- the distribution channel that the manufactured products follow until they reach the final consumer; and,
- the actual extent of use of reptile skins from native and non-native species in the leather and footwear industry.

If conservation biologists in Mexico are unable to determine distribution channels involving wild species, they should at least constantly gather the information provided by other academic sectors and relate this to real world research needs. In this case, the Mexican leather and footwear industry has used reptile skins for years as an input for manufacture processes, yet we still lack a comprehensive market study on the use of reptile skins by this industry. In addition to discern distribution channels, conservation biologists in Mexico should also be aware of market trends and trade policies. For instance, conservation biologists should pay attention to issues such as tariffs, custom procedures, standards, and regulatory improvement.

For example, Mexico has approximately 3,600 tariff headings grouped into 22 sectors, where footwear and leather and hides are two formal sectors. The recent policy on tariffs in Mexico has continued to open up its economy, both unilaterally and by way of regional agreements[8], which has helped to open markets to Mexican exports. Furthermore, Sectarian Promotion Programmes (PROSECs) have been implemented unilaterally as from 2001, with a view to making production inputs available for industrial production at globally competitive prices and stimulating productivity and technological change within enterprises. These programmes enable Mexican firms to import inputs for manufacturing products for both the export and the domestic market at minimum tariff rates and have also helped Mexican firms to retain a competitive edge in the light of the changes experienced by the *maquiladora* (in-bond) industry regime as from 2001 (WTO, 2002).

The far-reaching process of trade liberalization involving a range of trade agreements has in turn led to the implementation of a series of reforms to facilitate foreign trade. For example, a customs modernization programme, involving both investment in infrastructure and the automation of customs procedures, has been implemented in Mexico, which has resulted in a considerable reduction in clearance times in spite of an increase in the number and volume of transactions (WTO, 2002; Peterson, 1998).

Technical regulations and standards have also changed radically in Mexico. The Federal Law on Metrology and Standardization (LFMN) underwent major reform in May 1997, and touched on issues such as the harmonization, and updating of standards and conformity assessment. The Regulations for the LFMN were published on 14 January 1999 and cover, *inter alia*, the contents of, and process, for developing both official and voluntary Mexican standards, harmonization with international standards, mutual recognition agreements, the standards catalogue, regulations governing official marks and international standardization bodies. In 2001, with a view to enhancing transparency, the General Directorate of Standards established a legal framework for the

[8] Under the regional agreements entered into by Mexico, 94% of its total exports will enter global markets at duty-free rates as from 2003, which will have a positive effect on export performance, investment and economic growth (WTO, 2002).

creation and operations of National Committees for Standardization and the involvement of Mexican committees in international organizations (WTO, 2002).

Regulatory improvement has been also an integral part of the modernization and structural reform of the Mexican economy, and has reinforced the process of opening up the economy. For instance, in 2000, the Congress approved a set of reforms to the Federal Administrative Procedures Law (LFPA). One of these reforms was the creation of the Federal Regulatory Improvement Commission (COFEMER), a body with technical and operational autonomy and responsible for the regulatory improvement policy. In the period 2000-2001, COFEMER reviewed and improved more than 600 preliminary draft regulations (WTO, 2002).

Although many scientists in Mexico now recognize that it is necessary 1) to investigate human impacts on biological diversity and 2) to develop compromises between conservation priorities and human needs, the subject of wildlife trade has been poorly incorporated into the research models of Mexican conservation biologists working in the academic and governmental sectors. As a result, decisions on such matters often have to be made without detailed and comprehensive studies.

Trade in wildlife and its products understandably can make conservationists nervous (Caughley & Gunn, 1996). Why then are Mexican conservationists on the whole not worried? Why do Mexican conservationists not include trade in their research models? Although there are many conservation biologists in Mexico enthusiastically involved in wildlife management and sustainable development, the numbers of those studying, gaining field experience, developing new approaches, and outlining research needs on trade issues are still few in Mexico.

A likely explanation is that the National System of Researchers (*Sistema Nacional de Investigadores*, SNI) does not recognize the significance of research on wildlife trade, nor reward the development of projects on the subject. On the contrary, its policies may be discouraging researchers, because research on wildlife trade "lacks scientific value" and most specialists favour the production of publications on "accepted" topics in order to promote their academic careers. However, if conservation biologists in Mexico do not offer advice on trade issues, decisions on conservation questions will be made by someone with less training and in-depth knowledge of the needs of biological communities and endangered species. Studies of regional nature are hastily required to discern, systematically, the trends of wildlife trade in Mexico for both native and non-native species.

Chapter 6

6 The Use of Non-native Reptiles in the Mexican Leather Industry

6.1 Introduction

The trade in reptile skins for the leather market is one of the most important aspects of international trade in wildlife (Jenkins & Broad, 1994). Reptile skins account for the bulk of the trade in wild animal products, in terms of both volume and value (WCO-CITES, 2001). The trade in reptile skins is of considerable economic importance. Even though it is only a small part of the leather industry as a whole, the declared import value for reptile skins imported into the EC, Japan, and the US exceeded US$150 million per year in 1994, while the value added during the processing and manufacture into leather items was impossible to quantify accurately (Jenkins & Broad, 1994).

A survey in the early 1990s showed that at least 10 million reptiles are killed, processed and manufactured into products for the international reptile skin trade (Jenkins & Broad, 1994). All except a small proportion of these, comprising around 100,000 crocodilians, are taken directly from the wild and most are harvested in tropical or subtropical countries for which they produce an important source of income. Well over 40 species of reptile have been recorded in significant numbers in trade in the last decade. However, most (85%) of the international trade that is recorded to species level comprises only 11 species: one crocodilian (spectacled caiman *Caiman crocodilus*); four lizards (Argentine tegu *Tupinambis rufescens*; common tegu *T. nigropunctatus*; water monitor *Varanus salvator*; and, Nile monitor *V. niloticus*); and six snakes (oriental rat snake *Ptyas mucosus*; reticulated python *Python reticulatus*; dog-faced water snake *Cerberus rhynchops*; the Asiatic water snake *Homalopsis buccata*; and the wart snakes *Acrochordus granulatus* and *A. javanicus*) (Jenkins & Broad, 1994).

In terms of numbers of skins, around 60% of this trade originates in Asia, 35% in South and Central America and 5% in Africa (Jenkins & Broad, 1994). Each exporting country specializes in the production of certain articles or qualities of leather and offers different characteristics to the buyer (ITC, 1970). Three major markets, the EC, the US and Japan, account for between 75% and 85% of all net imports of reptile skins recorded under CITES. Other countries, which record notable imports, include Hong Kong, Taiwan and Mexico.

However, these three countries serve principally as manufacturing centres for products that will then be re-exported (Jenkins & Broad, 1994). One of the main entrepôt countries from the viewpoint of wholesale buyers of Western Europe is Italy, a fashion centre that produces diverse reptile skin articles. Another case is France, also a fashion centre that enjoys a firm position in the commerce of reptile skin items (ITC, 1970).

The US is undoubtedly the largest importing country of reptile skins and reptile skin products in the world. In 1989, for example, the US imported over 3.4 million whole skins, 865,000 partial skins, 25 million manufactured products, and about 188,000 other products and derivatives. The total declared import value of 30 million reptilian items in 1989 exceeded $475 million dollars, about 41% of the total declared value of all 1989 wildlife imports of $1.1 billion. In fact, these 30 million reptile skins or reptile skin products were found in almost one out of every three wildlife shipments that entered the US in that year. By volume and value, reptile skins and reptile skin products dominate US wildlife imports. The US is also a reptile producing country. In 1989 the US exported over 77,000 skins of American alligator (*Alligator mississippiensis*) and over 4 million live reptiles declared as US origin, as well as over 635,000 manufactured reptilian products (Gaski, 1992).

Over the seven year period of 1984-1990, the US imported nearly 17 million whole reptile skins with a total value of about US$340 million, or an average of 2.5 million skins valued at almost US$49 million, annually. Seventy three percent of these skins were of reptile taxa listed on the CITES Appendices. A little more than half of these skins were lizard skins, 38% were snake skins, about 3% were crocodilian skins, and less than 0.01% were turtle skins. The remaining 8% of the skins were not identified to any taxa. For the seven year period, 73% of the total trade was from the following five species: tegus (*Tupinambis* spp.), Asiatic rat snake (*Ptyas mucosus*), Asiatic water snake (*Homalopsis buccata*), reticulated python (*Python reticulatus*), and water monitor (*Varanus salvator*) (Gaski, 1992). Also, during 1984-1990, the US imported a total of 191 million reptile skin manufactured products or an average of about 27.3 million products annually. The total declared value of these products exceeded US$1.8 billion, or about US$257 million annually (Gaski, 1992; Jenkins & Broad, 1994).

Over 150 countries were reported to have exported or re-exported manufactured reptile skin products to the US during 1984-90. However, the trade was dominated by 15 countries (Table 6.1) with 82% of all manufactured products originating from four countries (Gaski, 1992; Jenkins & Broad, 1994). During the period 1990-1993, the US imported 1,474,355 sq m of reptile skins with a value of US$77,291 and exported 6,697,909 sq m of reptile skins with a value of US$14,345 (BTA, 1994).

Table 6.1 Major countries exporting/re-exporting* (>100 000 items/year) products manufactured with reptile skin to the US during 1984-1990**

Country	Average No. Items	Cumulative total of items
Hong Kong	9 841 872	68 893 106
Taiwan	6 233 949	43 637 640
Spain	2 564 093	17 948 671
Italy	2 517 633	17 623 431
Thailand	737 388	5 161 715
China	706 495	4 945 465
Philippines	528 675	3 700 725
Switzerland	506 259	3 543 882
Germany, FR	503 036	3 521 253
Canada	467 693	3 273 849
Austria	313 019	2 191 134
France	344 979	2 414 855
Indonesia	224 232	1 569 621
Argentina	215 877	1 511 136
Mexico	**119 837**	**838 856**

(Gaski, 1992; Jenkins & Broad, 1994)
* Includes both direct imports and imports from intermediary countries
** 1990 import data are incomplete

Mexico is among the major players in the world trade in reptile skins (Jenkins & Broad, 1994; Chapter 2; Table 6.1). Between 1980-1989, the trade in reptile skins, leather and leather goods, mainly from non-Mexican species like crocodile, caiman, caiman lizard, monitor lizard, tegu, and python, was the largest component of the US-Mexico commercial wildlife trade. US imports of skins and leather products from Mexico averaged more than US$14 million annually from 1987 to 1989, or an estimated 65-92% of the annual declared value of US imports of wildlife and products from Mexico. In turn, US exotic leather exports to Mexico averaged nearly US$3.6 million annually (Fleming, 1999). An analysis of USFWS international trade data in the early 1990s also showed that crocodiles, caimans, caiman lizards, monitor lizards, tegu lizards, boas, pythons, anacondas, rat snakes, water snakes and other species, which originated outside of Mexico, featured heavily in the US-Mexican trade (Rose, 1991).

Usually, reptile skins are imported by the US and subsequently re-exported to Mexico for the manufacture of cowboy boots, shoes, boots, wallets and other leather goods. For example, reptile skins arrive from Asia to Los Angeles, and then crossed the US-Mexico border to reach the assembly plants at Tijuana, Baja California, and Ciudad Juarez, Chihuahua. The finished products are finally sent back again to the US (Adalid, 1996).

The large demand for finished products in North America continues to drive the harvest and trade of some species, such as tegu lizards (Fleming, 1999). The US boot trade, for instance, has been a major factor driving the export of *Tupinambis teguixin* and *T. rufescens* from Argentina, Paraguay, Brazil and Bolivia, to the US, Canada, Hong Kong, Japan, Europe and Mexico (Hemley, 1984).

This chapter aims to examine the trade of reptile skins from non-native species in Mexico, discern the most important trade in terms of volume, and observe the trends in imports and re-exports of CITES-listed species.

In particular, in this chapter I seek to answer the following questions:

- Which species of reptile and in what quantities are they imported?
- Which countries supply these species of reptile?
- How have patterns of imports changed in relation to key events in Mexico, such as bans and accession to CITES?
- Which species and what quantities are re-exported?
- Which countries are the main consumers of these re-exports?
- How have patterns of re-exports changed in relation key events in Mexico?
- How do overall reported imports compare with overall reported re-exports for specific species?

6.2 Methodology

6.2.1 CITES trade data

This chapter uses data on volumes of various species and genera in trade stored in the CITES Trade Database held at the World Conservation Monitoring Centre in Cambridge, UK. The trade records compiled were for all Mexican imports and re-exports from 1980 to 2001 for the following non-native specific genera and species:

- *Varanus salvator*
- *Tupinambis* spp.
- *Python reticulatus*
- *Caiman* spp.
- *Varanus niloticus*
- *Alligator mississippiensis*
- Crocodylidae

One key problem with using data from the CITES Trade database occurs if important countries have not reported in certain years (Harris *et al.*, 2003). In order to determine whether there were any problems with incomplete annual reporting for the Mexican datasets presented in this study, the submission of annual reports by the major reptile skin exporting countries was reviewed (Harris *et al.*, 2003).

The trade data were selected from a comparative tabulation format, regardless of reported source or purpose. Microsoft Excel was used to sort and sum subsets of the data appropriately, and also to generate the graphic representations. All quantities traded were added together for all records where the following details were the same: species, the year in which the trade occurred, unit either number of skins, number of skin pieces or skin weight, term (description of specimens traded), country of export (where exports are reported), and country of import (where imports are reported). The terms used were: shoes, skins, skin pieces, leather items, watchstraps, belts, handbags, and wallets.

Data for similar terms and units were combined to facilitate comparison. The comparison was limited to those terms and/or units accounting for the greatest amount of trade. All calculations were performed separately on trade reported in units of number of skins, number of skin pieces and skin weight (kg), since terms reported in different units (e.g. m^2, kg, lb, number of skins, number of skin pieces, skin products) cannot be added together. Skins and skin pieces were summed separately, while all skin products such as wallets, shoes, belts and handbags were summed together, with the exception of garments and plates. In the case of shoe pairs, each shoe was regarded as a single skin product.

6.2.2 Correction factors for skin weights

The raw data from the CITES Trade Database was also modified in order to facilitate comparisons. Trade expressed in terms of pounds were converted to kilograms. A correction factor was also derived in order to express volumes of skin weights as volumes of whole skins (see also Jenkins & Broad, 1994). This correction factor was derived from weighting whole reptile skins from imported shipments arriving at the Mexico City International Airport between 1 June-15 July 2003. It was not possible to weigh skins individually, because they were shipped in batches. Therefore I recorded the numbers of skins and the total weights for each batch, and from summing the total numbers of skins from, and the total weights of, all batches, I calculated the average weight per skin (Table 6.2).

Table 6.2. Average weight per skin from reptile species used to convert skin weight (kg) into numbers of whole skins

Order	Species	Number of whole skins weighed	Total weight of skins (kg)	Average weight per skin (kg)
Lizards	*Varanus salvator*	654	50.97	0.07
	Tupinambis spp.	92	6.51	0.07
Snakes	*Python reticulatus*	105	28.29	0.26
Crocodilians	*Caiman crocodilus fuscus*	5,440	3,574.40	0.65
	Crocodylidae	131	193.50	1.47

6.2.3 Graphical presentation of data

The full range of data available from the CITES Trade Database was too large to represent all fields graphically. Hence, only the most important fields were selected for graphical illustration in relation to the question under consideration. The fields most often selected comprised the numbers of whole skins, skin pieces and skin products, because these predominate over all other traded volumes. The proportions of imports and re-exports of different species were contrasted by using pie charts. Annual changes in the volumes of species imported and re-exported are shown with scattergrams and bar charts. This allowed traded volumes and trends for different groups to be assessed individually, as well as compared between groups. Stacked bar plots were also used to facilitate the comparisons of relative and absolute trade volumes. "Event arrows" were added to mark specific events, such as trade restrictions, that came into effect at given times, in order to help with interpretation of the results. Differences in the countries of origin were contrasted by using pie charts.

6.3 Results

CITES annual reporting on trade transactions by the Parties is often complete for any given year (Harris *et al.*, 2003). From 1991-1998, most of the major reptile skin exporting countries that supplied Mexico submitted their annual reports (Table 6.3). This allows confidence in the following results that seek to interpret trade patterns in reptile skins imported to Mexico.

Table 6.3 Checklist of annual report submission by the top 11 exporters from 1991-2001 (As of August 2003)

Species	Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Varanus salvator	Indonesia											
	Malaysia											
Tupinambis spp.	Argentina											
	Paraguay											■
Caiman spp.	Colombia											
Python reticulatus	Indonesia											
	Thailand											
Varanus niloticus	Sudan			■					■		■	■
	Chad							■	■			
A. mississippiensis	USA											
Crocodylidae	Zimbabwe											
	South Africa											

Source: CITES Secretariat (2003)

■ Report Not Submitted

□ Report Submitted

6.3.1 Total reptile skin imports 1980-2001

From 1980 to 2001, Mexico imported nearly 9 million reptile skin items (Table 6.4). These derived from various non-native species of lizard, snake and crocodilian. Numbers of whole skin imports totalled some 5.5 million items (Table 6.4) and were predominantly of lizards, *Varanus salvator* and *Tupinambis* spp., with lesser numbers of crocodilians, *Caiman* spp., and of snakes, *Python reticulatus* (Figure 6.1a). Numbers of skin pieces imports totalled some 3.1 million items (Table 6.4), and also were predominantly of lizards, *Tupinambis* spp. and *Varanus salvator*, with greater representation of snakes, *Python reticulatus*, and less representation of crocodilians, *Caiman* spp. and *Alligator mississippiensis* (Figure 6.1b). Weights of whole skins and skin pieces totalled some 27,000 kg (Table 6.4). In contrast to records of skin numbers, skin weights were predominantly for crocodilians, *Caiman* spp. and *Alligator mississippiensis* (Figure 6.1c).

Table 6.4 Mexican imports of reptile skins from non-native species 1980-2001

Species	Number of Whole Skins	Number of Skin Pieces[1]	Skin weight (kg)
Varanus salvator	2,181,208	310,617	1,735
Tupinambis spp.	1,760,926	1,591,977	7,236
Caiman spp.	791,701	103,382	12,265
Python reticulatus	580,337	1,003,513	4,793
Varanus niloticus	99,878	-	-
Alligator mississippiensis	59,308	103,013	1,325
Crocodylidae	43,635	4,354	35
Total	**5,516,993**	**3,116,856**	**27,389**

Source: UNEP-WCMC Trade Database

[1] Skin pieces imported by Mexico comprise both raw and tanned cuts (Gonzâlez, 2000).

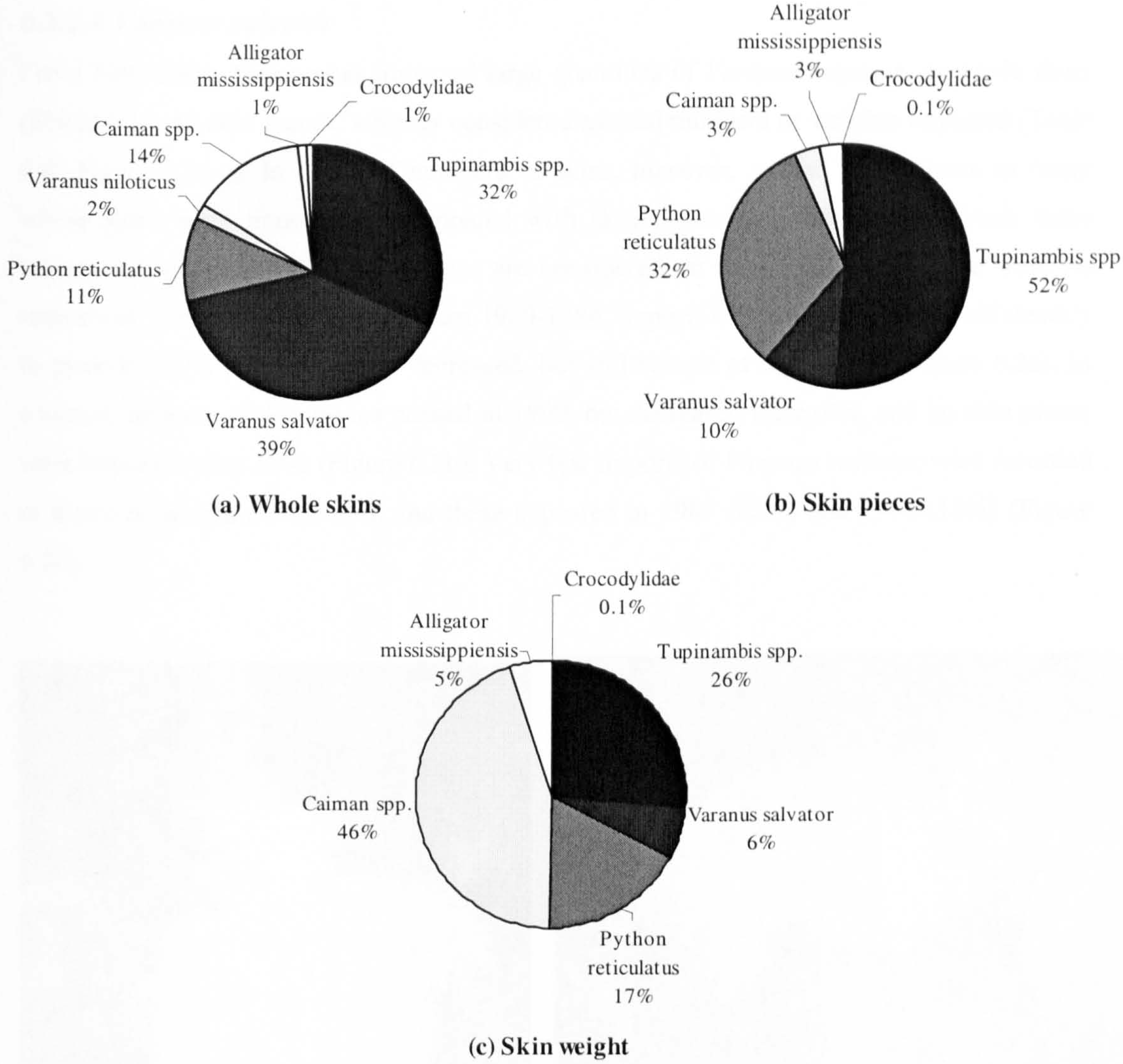


Figure 6.1 Imports of reptile skins by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.2 Reptile skin imports by individual species

6.3.2.1 *Varanus salvator*

From 1980-2001, Mexico has imported large quantities of *Varanus salvator*, as whole skins (Plates 6.1) and skin pieces, whether considered as total numbers or weights imported (Table 6.4; Figure 6.2a-c). In terms of numbers of skins, however, around seven times as many whole skins were imported as compared with skin pieces over this period. When these imports of whole skins or skin pieces are considered on an annual basis, there were no imports of *Varanus salvator* skins from 1980-1984. Imports of whole skins increased steadily to peak in 1997, and have since decreased, but still remain at high levels (Figure 6.2a). In contrast, imports of skin pieces peaked in 1990, but decreased thereafter, and no skin pieces were imported after 1995 (Figure 6.2b). Very few imports of *Varanus salvator* were recorded in terms of weight (Table 6.4), and these appeared in 1987 (82%) and 1996 (18%) (Figure 6.2c).

Plate 6.1 Imports of finished *Varanus salvator* whole skins by Mexico
© Arroyo, 2003

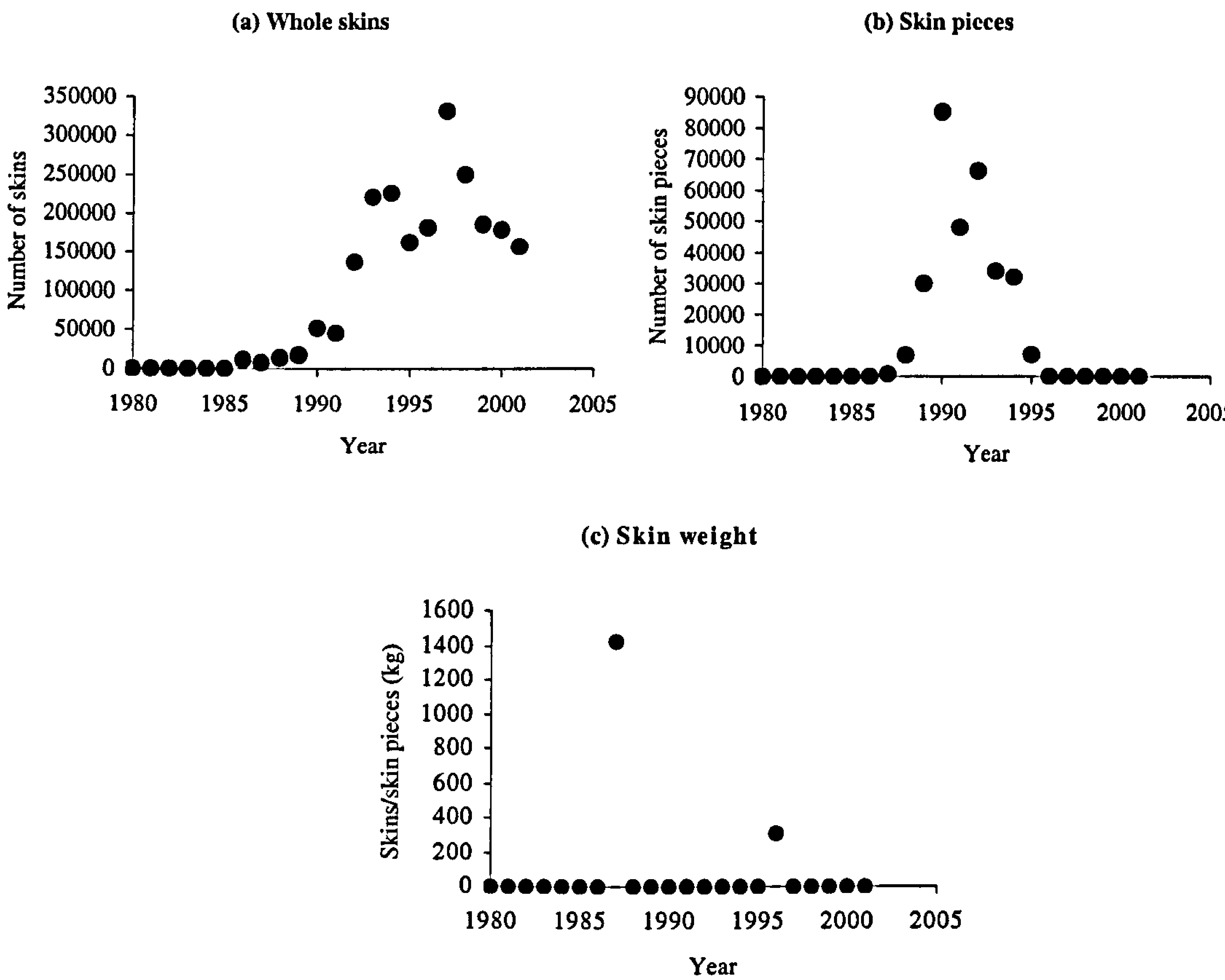


Figure 6.2 Imports of *Varanus salvator* by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.2.2 *Tupinambis* spp.

From 1980-2001, Mexico has also imported large quantities of *Tupinambis* spp., as whole skins and skin pieces, whether considered as total numbers or weights imported (Table 6.4; Figure 6.3a-c). In terms of numbers of skins, approximately equal numbers of whole skins and skin pieces have been imported over this period. When these imports of whole skins or skin pieces are considered on an annual basis, imports of *Tupinambis* spp. skins have tended to increase from the early 1980s to peak in the mid 1990s, but to have decreased from the mid 1990s to very low levels in the late 1990s and early 2000s (Figure 6.3a-c). Mexico also imported 156,761 skin products of *Tupinambis* spp. from 1980-2001, of which most (81%) imports were in the single year of 1995.

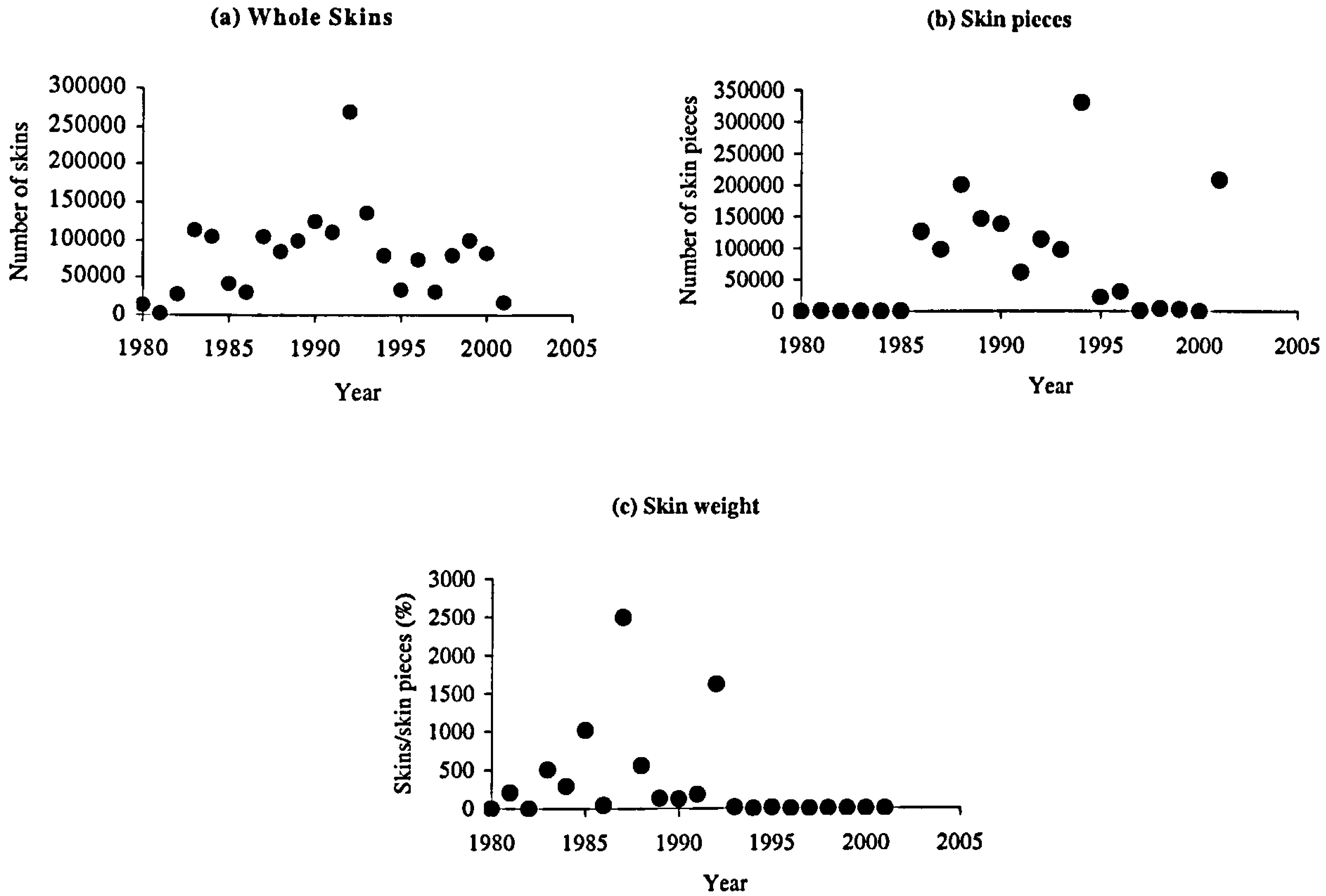


Figure 6.3 Imports of *Tupinambis* spp. by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.2.3 *Caiman* spp.

From 1980-2001, Mexico has imported large quantities of *Caiman spp* (Plates 6.2, 6.3), whether considered as whole skins, skin pieces or skin weights (Table 6.4; Figure 6.4a-c). In terms of numbers of skins, around seven times as many whole skins were imported as compared with skin pieces over this period. However, there were no imports of *Caiman spp.* skins during the 1980s. Imports of whole skins increased steadily from the mid 1990s to peak in early 2000s (Figure 6.4a). Imports of skin pieces rose in the mid 1990s to peak in 1997, and have since decreased, but still remain at high levels (Figure 6.4b). Weights of whole skins and skin pieces of *Caiman spp.* totalled some 12,000 kg from 1980-2001 (Table 6.4), of which most (98%) were imported during 1989-1992. Mexico also imported 26,130 skin products of *Caiman spp.* from 1980-2001 of which most (94%) appeared during the 1990s (Figure 6.4c).

Plate 6.2 Imports of finished *Caiman* spp. whole skins by Mexico © Arroyo, 2003

Plate 6.3 Imports of salted *Caiman* spp. whole skins by Mexico
© Arroyo, 2003

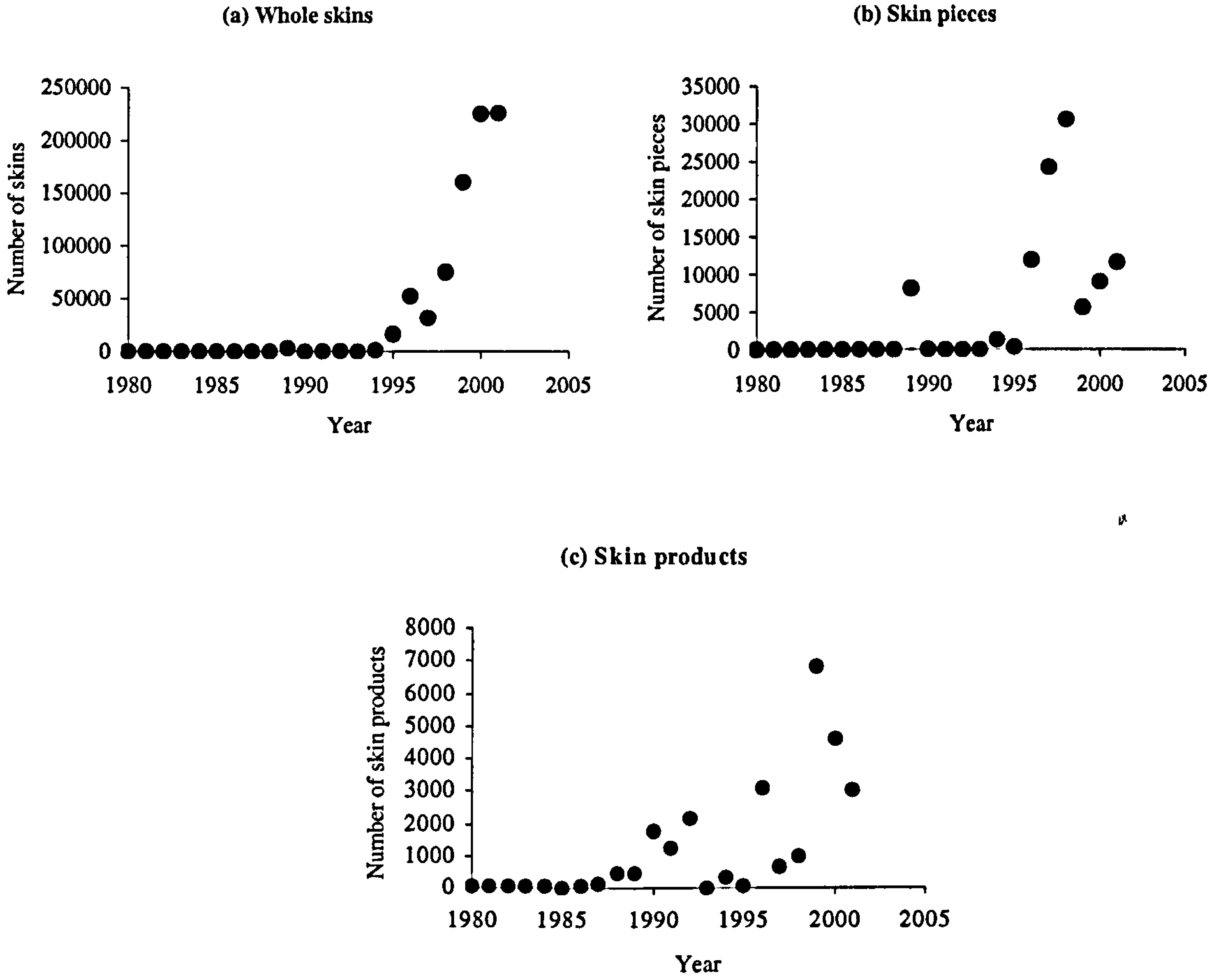


Figure 6.4 Imports of *Caiman* spp. by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.2.4 *Python reticulatus*

From 1980-2001, Mexico has imported large quantities of *Python reticulatus*, whether considered as whole skins (Plate 6.4), skin pieces or skin weights (Table 6.4; Figure 6.5a-c). In terms of numbers of skins, approximately twice the numbers of skin pieces were imported as compared with whole skins over this period. There were no imports of *Python reticulatus* skins in the early 1980s. Imports of whole skins tended to increase from the mid 1980s to peak in the mid 1990s, but have since decreased although still remaining at high levels (Figure 6.5a). In contrast, imports of skin pieces peaked in the early 1990s, but have since decreased to very low levels in the late 1990s (Figure 6.5b). Few imports of *Python reticulatus* were recorded in terms of weight (Table 6.4), of which most (83%) appeared during the 1980s (Figure 6.5c).

Plate 6.4 Imports of finished *Python reticulatus* skins by Mexico
© Arroyo, 2003

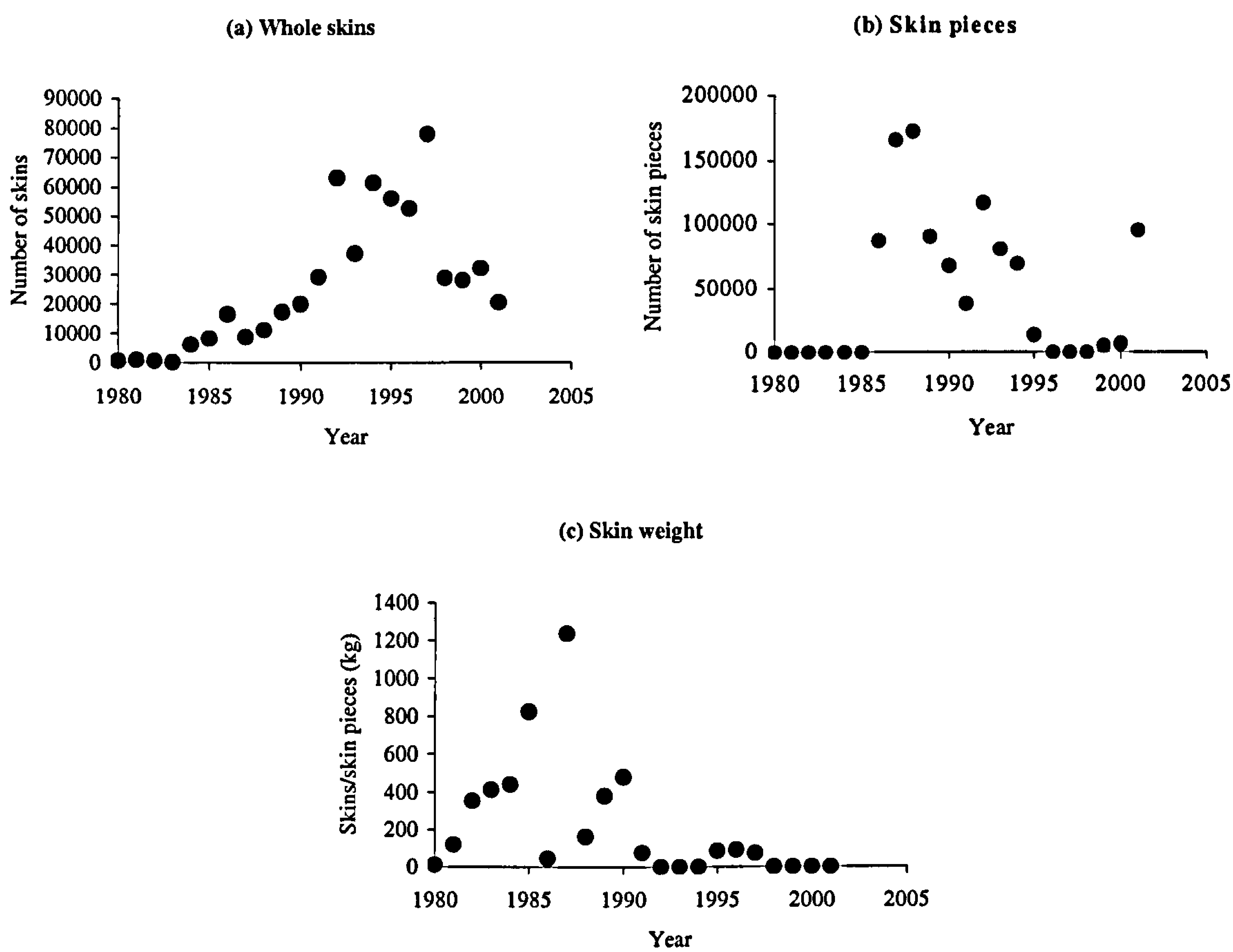


Figure 6.5 Imports of *Python reticulatus* by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.2.5 *Varanus niloticus*

In contrast to other lizards, Mexico has imported smaller quantities of *Varanus niloticus* as whole skins from 1980-2001 (Table 6.4; Figure 6.6). Most of the imports of *Varanus niloticus* skins (92%) appeared during the 1990s (Figure 6.6). Imports of whole skins tended to increase from the early 1990s to peak in the late 1990s, but have since decreased although still remaining at significant levels (Figure 6.6).

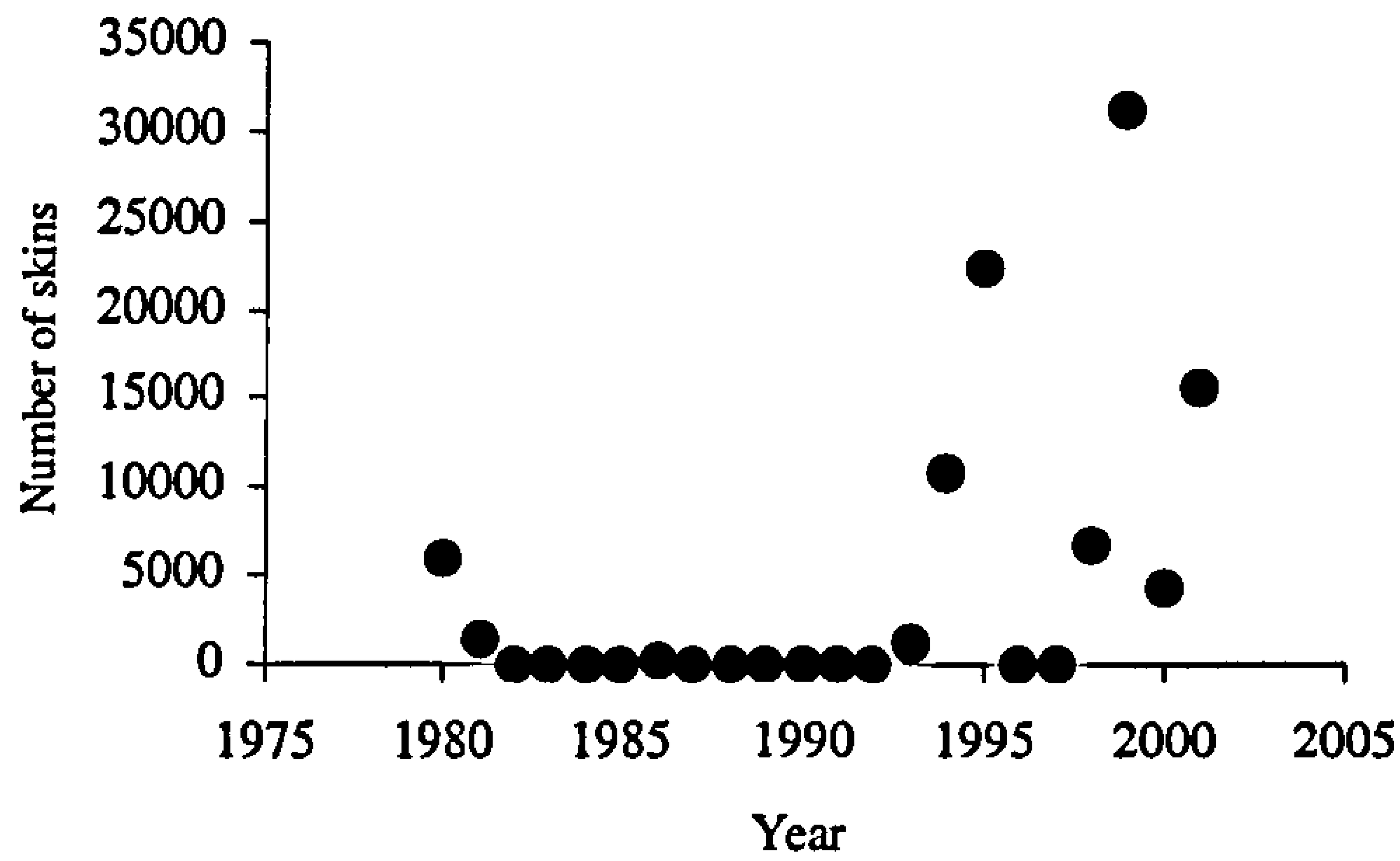


Figure 6.6 Imports of *Varanus niloticus* whole skins by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.2.6 *Alligator mississippiensis*

From 1980-2001, Mexico has imported small quantities of *Alligator mississippiensis*, whether considered as whole skins, skin pieces or skin weights (Table 6.4; Figure 6.7a-c). In terms of numbers of skins, approximately twice the numbers of skin pieces were imported as compared with whole skins over this period. Imports of whole *Alligator mississippiensis* skins have tended to increase from the early 1990s to peak in the late 1990s, but have since decreased, although still remaining at high levels (Figure 6.7a-b). Very few imports of *Alligator mississippiensis* were recorded in terms of weight (Table 6.4), and these appeared in 1987 (28%) and 1997 (47%) (Figure 6.7c). Mexico also imported 21,317 skin products of *Alligator mississippiensis* from 1980-2001, of which most (92%) were imported during 1999-2001.

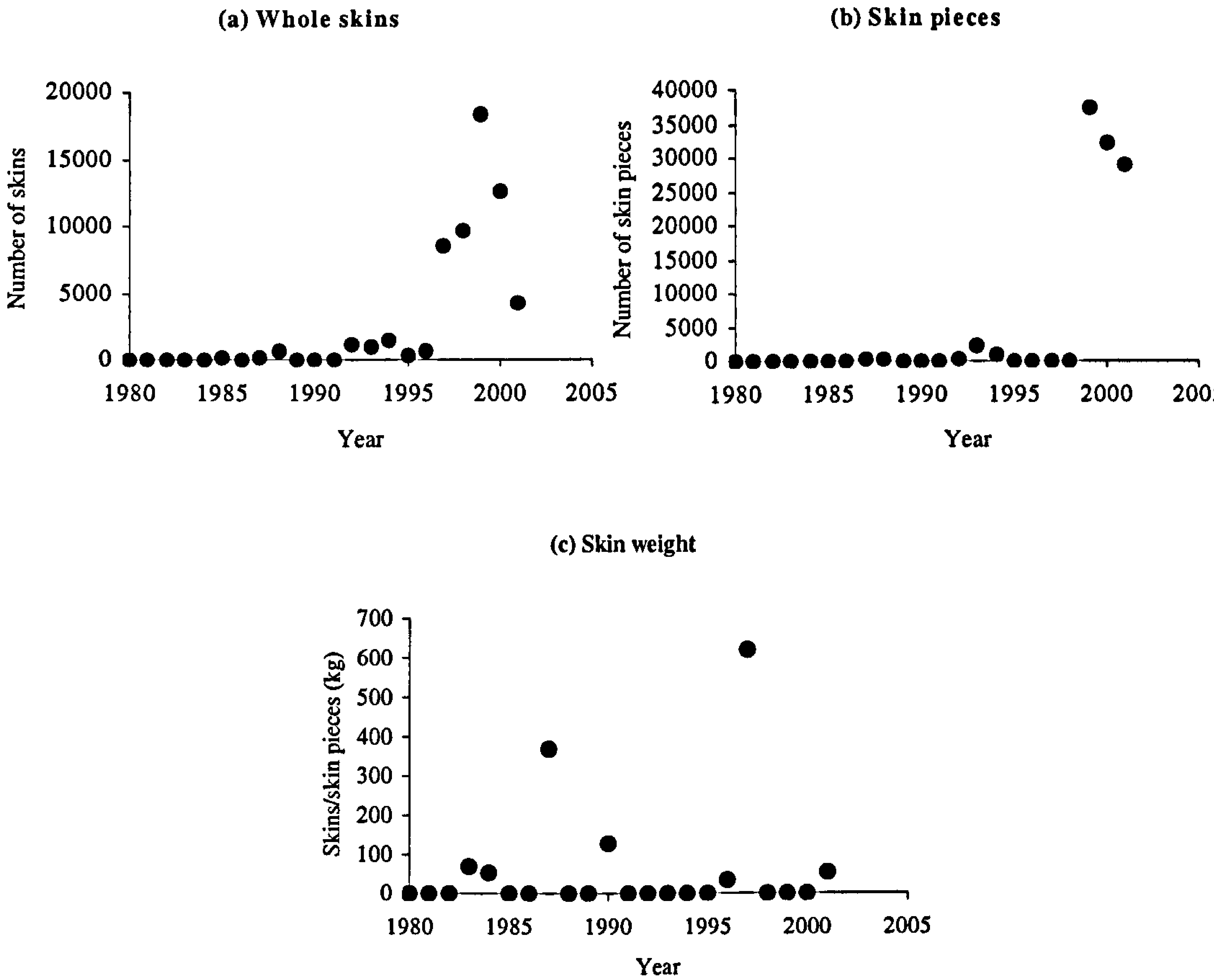


Figure 6.7 Imports of *Alligator mississippiensis* by Mexico 1980-2001 (UNEP-WCMC Trade Data)

6.3.2.7 Crocodylidae

From 1980-2001, Mexico has imported small quantities of Crocodylidae, whether considered as whole skins, skin pieces or skin weights (Table 6.4; Figure 6.8 a-b). In terms of numbers of skins, however, around ten times as many whole skins were imported as compared with skin pieces over this period. When these imports of whole skins or skin pieces are considered on an annual basis, there were few imports of Crocodylidae skins during the 1980s and early 1990s, but then have tended to increase from the mid 1990s (Figure 6.8a-b). Very few imports of Crocodylidae were recorded in terms of weight (Table 6.4), of which most were in 1988 (80%).

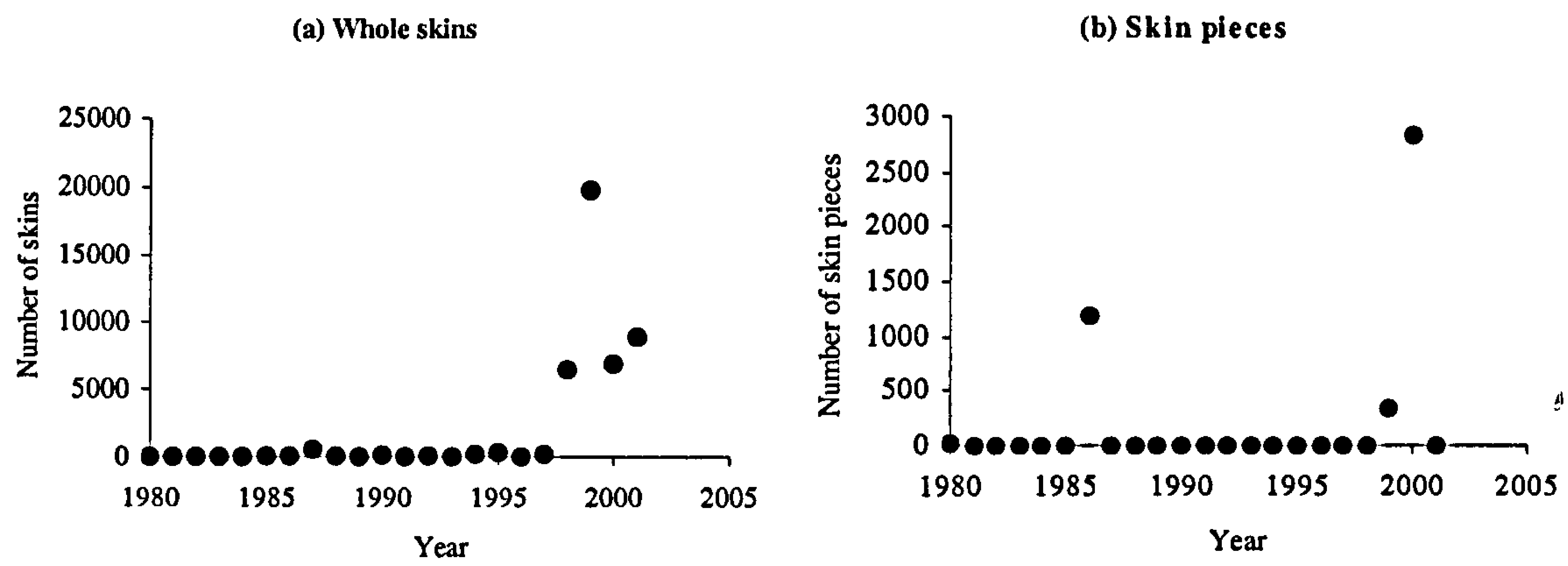


Figure 6.8 Imports of Crocodylidae by Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.3 Total reptile skin imports by year

From 1980 to the early 1990s, Mexico imported increasing quantities of reptile skins (Figure 6.9 a-c). The numbers of whole reptile skins imported has continued to rise and remained at high levels throughout the 1990s and into the early 2000s (Figure 6.9a). In contrast, the numbers of skin pieces imported tended to decrease from the mid 1990s, apart from in 2001 (Figure 6.9b). Records of skin imports in terms of weight also decreased, but from the early 1990s and with no exceptional years (Figure 6.9c). In terms of species, *Tupinambis* spp. made up the majority of Mexico's reptile skin imports during the 1980s, whether considered in absolute or proportional terms (Figure 6.9 a-c; Figure 6.10 a-c). In proportional terms, numbers of skin pieces and skin weight (kg) came also to be dominated by *Python reticulatus* during the 1980s (Figure 6.10b,c). From the early 1990s, the numbers of whole skin imports came to be dominated by *Varanus salvator*, whether considered in absolute or proportional terms (Figure 6.9a; Figure 6.10a).

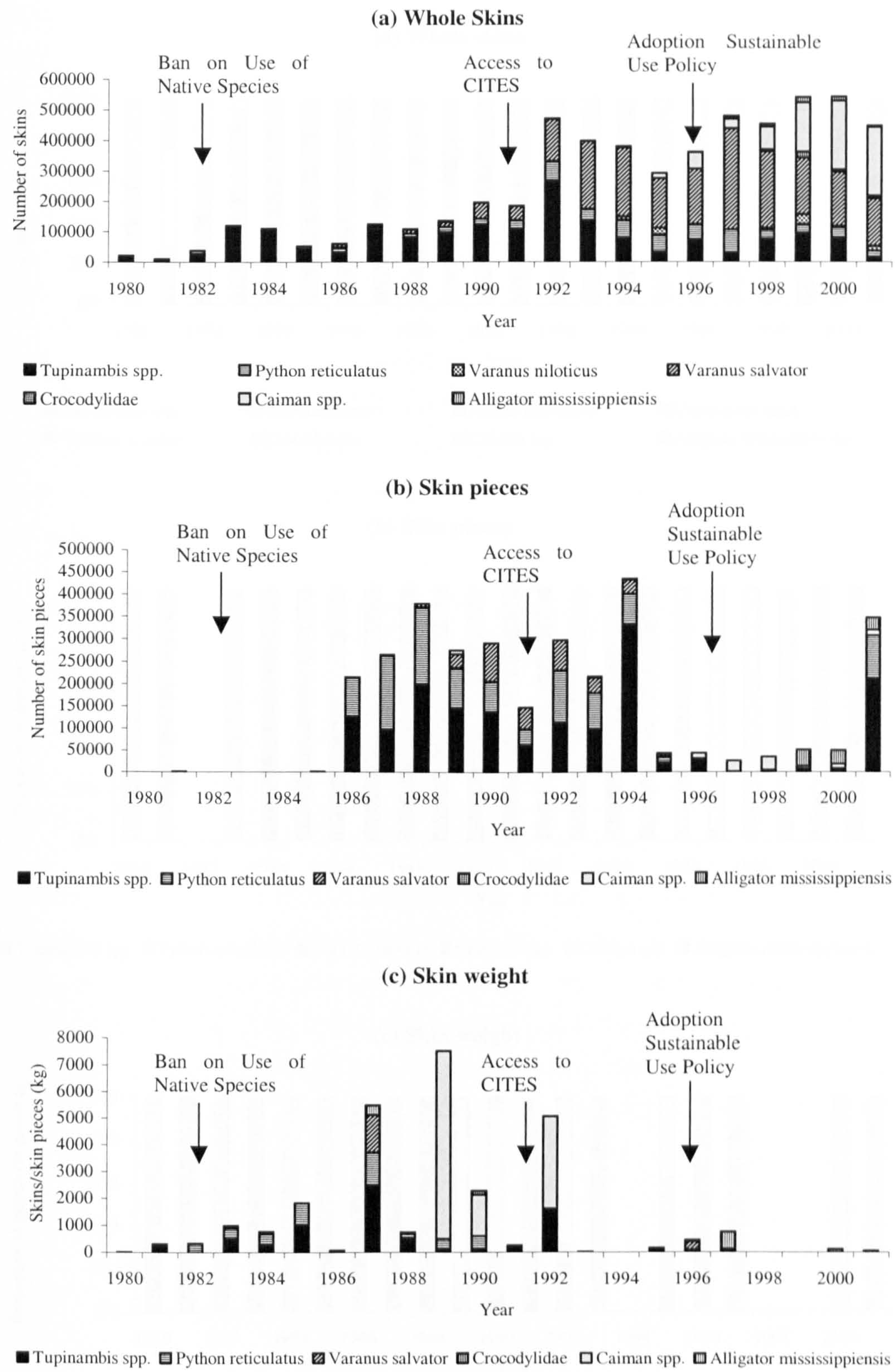


Figure 6.9 Imports of reptile skins by Mexico 1980-2001
(UNEP-WCMC Trade Data)

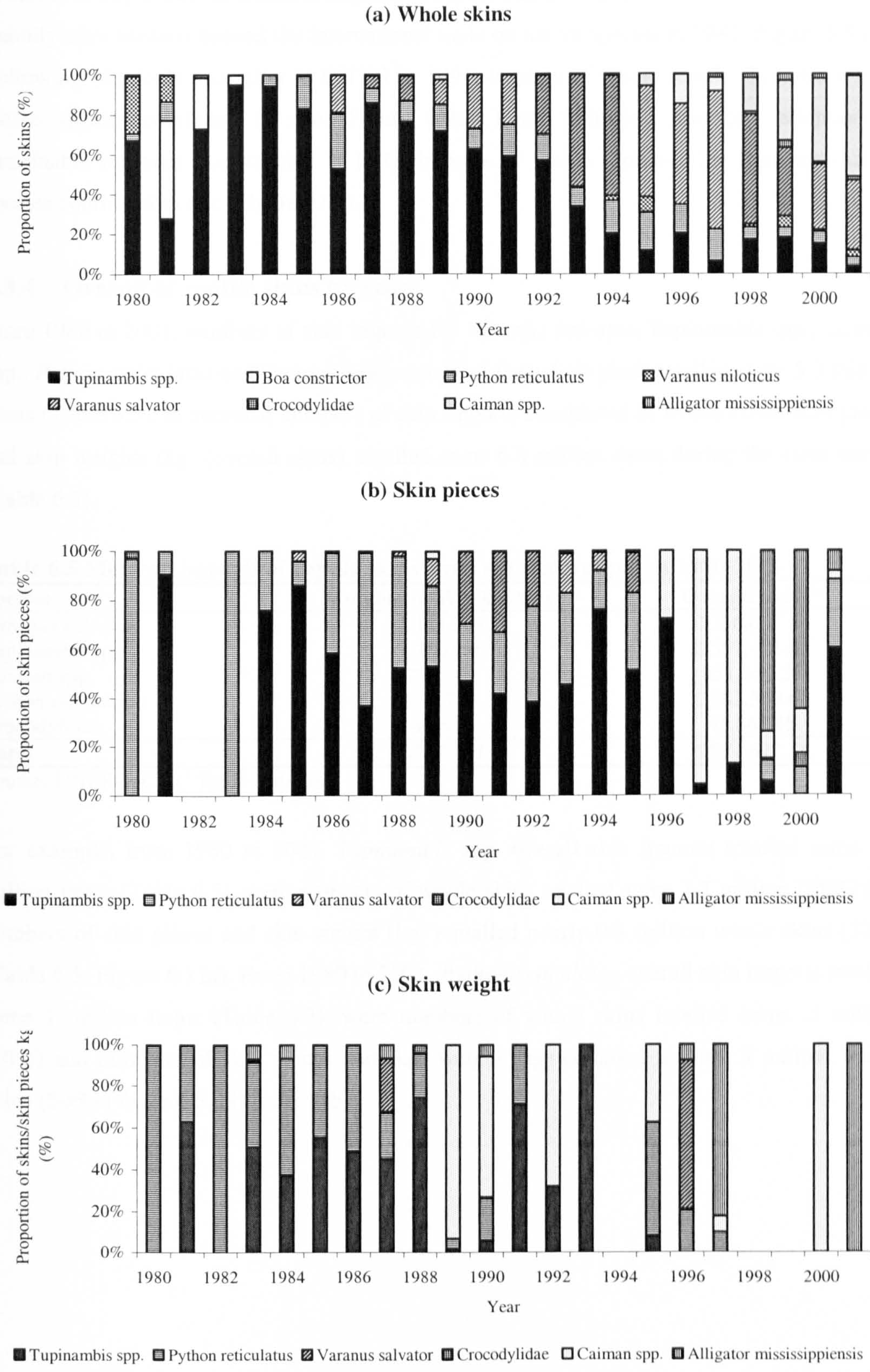


Figure 6.10 Imports of reptile skins by Mexico 1980-2001
(UNEP-WCMC Trade Data)

In terms of key events in Mexico, imports of reptile skins from non-native species increased steadily after Mexico banned the international trade on native species in 1982 (Figure 6.9a-c). Following Mexico's accession to CITES in 1991, imports of whole reptile skins from non-native species continued to rise (Figure 6.9a). Even following Mexico's adoption of sustainable resource use policies in 1997, imports of whole reptile skins from non-native species continued to rise (Figure 6.9a).

6.3.4 Overall of reptile skins by year

From 1980 to 2001, numbers of skin imports for *Varanus salvator*, *Tupinambis* spp., *Caiman* spp., *Python reticulatus* and Crocodylidae considered as whole skins totalled some 5.3 million items (Table 6.5). In contrast, numbers of skin imports considered as whole skins, skin pieces and skin weights (kg) (overall skins), totalled some 6.8 million items during the same period (Table 6.5).

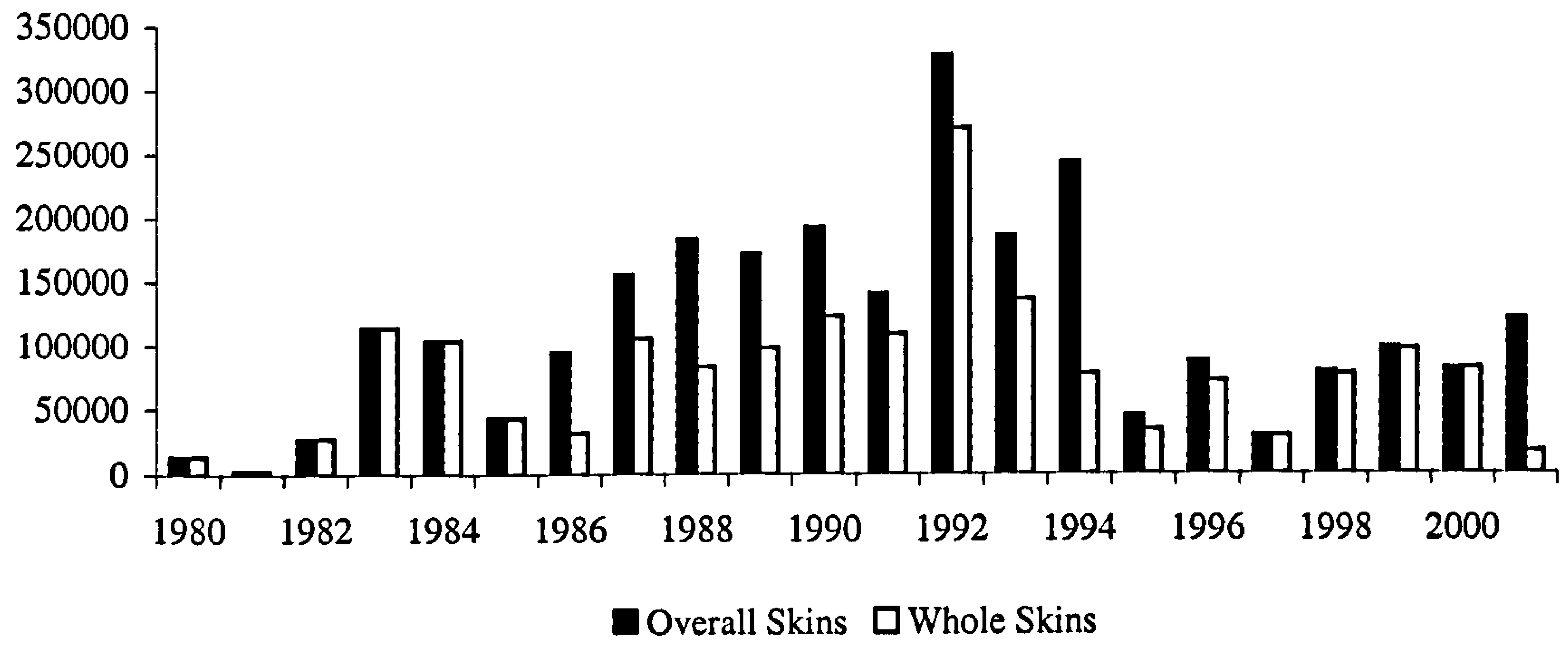
Table 6.5 Mexican imports of reptile skins from non-native species 1980-2001

Species	Number of Whole Skins	Overall Skins*
Varanus salvator	2,181,208	2,336,638.88
Tupinambis spp.	1,760,926	2,557,421.02
Caiman spp.	791,701	851,364.25
Python reticulatus	580,337	1,083,339.68
Crocodylidae	43,635	45,863.45
Total	**5,357,807**	**6,874,627.28**

Source: UNEP-WCMC Trade Database

For example, from 1980 to 2001, *Tupinambis* spp. overall skin imports totalled some 2.5 million items (Table 6.5), were numbers of whole skins totalled some 1.7 million (68%) and numbers of skin pieces and skin weight (kg) equalled nearly 0.8 million whole skins (32%) (Table 6.5, Figure 6.11a). From 1980 to 2001, *Python reticulatus* overall skin imports totalled some 1 million items (Table 6.3), were numbers of whole skins totalled some .5 million (50%) and numbers of skin pieces and skin weight (kg) equalled around .5 million whole skins (50%) (Table 6.5, Figure 6.11b).

(a) *Tupinambis* spp.



(b) *Python reticulatus*

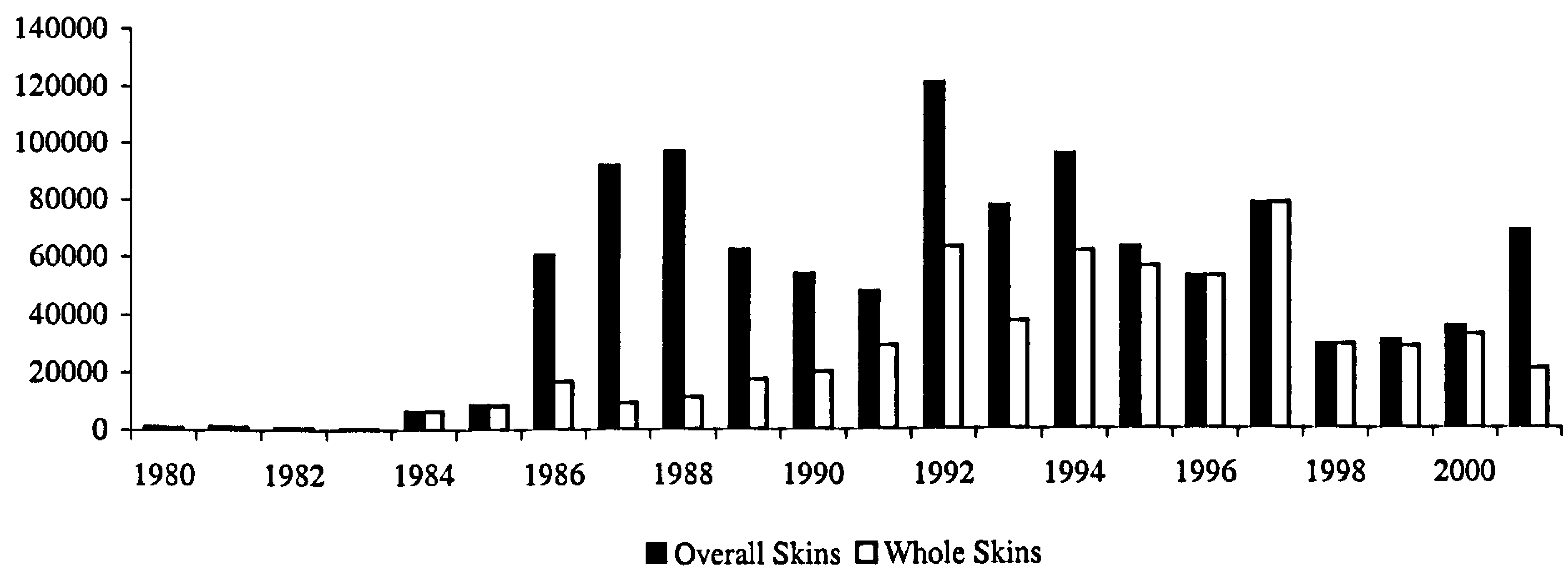


Figure 6.11 Comparison between reptile overall skin and whole skin imports by Mexico 1980-2001 (UNEP-WCMC Trade Data)

6.3.5 Main Countries of Origin

6.3.5.1 *Varanus salvator*

The main countries of origin for the import of 2.3 million *Varanus salvator* whole skins during 1980-2001 (Table 6.4) were Indonesia with nearly 1.6 million skins declared as exported, and Malaysia with 0.4 million declared exports (Figure 6.12a).

6.3.5.2 *Tupinambis* spp.

The main countries of origin for the import of 2.4 million *Tupinambis* spp. whole skins during 1980-2001 (Table 6.4) were Argentina, with nearly 2 million skins declared as exported, and Paraguay with 0.3 million declared exports (Figure 6.12b).

6.3.5.3 *Caiman* spp.

From 1980-2001, Mexico imported around 0.8 million of *Caiman* spp. whole skins (Table 6.4), of which nearly 0.42 million were reported as unknown origin. The main countries of origin were Colombia, with nearly 0.32 million skins declared as exported, and Brazil with 0.036 million declared exports (Figure 6.12c).

6.3.5.4 *Python reticulatus*

The main countries of origin for the import of 1 million *Python reticulatus* whole skins during 1980-2001 (Table 6.4) were Indonesia with nearly 0.5 million skins declared as exported, Thailand with 0.1 million skins, and Malaysia with 0.1 million declared exports (Figure 6.12d).

6.3.5.5 *Varanus niloticus*

The main countries of origin for the import of 0.1 million *Varanus niloticus* whole skins during 1980-2001 (Table 6.4) were Sudan with nearly 0.06 million skins declared as exported, and Chad with 0.04 million declared exports (Figure 6.12e).

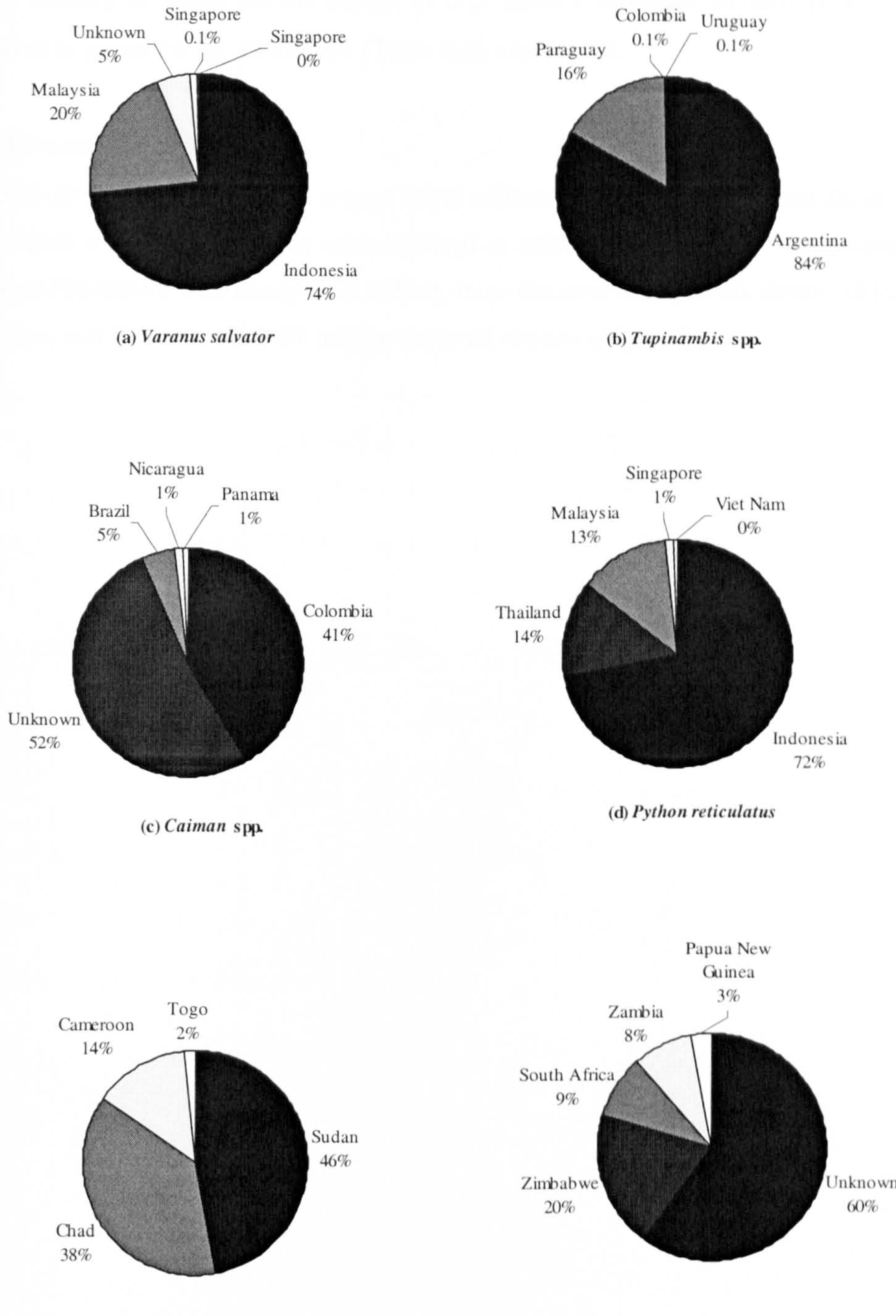


Figure 6.12 Countries of origin for imports of reptile skins by Mexico 1980-2001
(UNEP-WCMC CITES Trade Database)

6.3.5.6 *Alligator mississippiensis*

The only country of origin for the import of 0.11 million *Alligator mississippiensis* whole skins and skin pieces during 1980-2001 (Table 6.4) was the US.

6.3.5.7 Crocodylidae

From 1980-2001, Mexico imported around 0.045 million of Crocodylidae whole skins (Table 6.4), of which nearly 0.025 million were reported as unknown origin. The main countries of origin were Zimbabwe with nearly 0.08 million skins declared as exported, South Africa with 0.03 million, and Zambia with 0.03 million declared exports (Figure 6.12f).

6.3.6 Total reptile skin re-exports 1980-2001

From 1980 to 2001, Mexico re-exported nearly 2 million reptile skin items (Table 6.6). These derived from various non-native species of lizard, snake and crocodilian. Numbers of whole skin re-exports totalled some 352,500 items (Table 6.6) and were predominantly of lizards, *Varanus salvator* and *Tupinambis* spp., with lesser numbers of crocodilians, *Caiman* spp., and of snakes, *Python reticulatus* (Figure 6.13a). Numbers of skin pieces re-exports totalled some 636,500 items (Table 6.6), and also were predominantly of lizards, *Tupinambis* spp., with greater representation of snakes, *Python reticulatus*, and lesser representation of crocodilians, *Caiman* spp. (Figure 6.13b). Weights of whole skins and skin pieces totalled some 4,500 kg (Table 6.6), and were predominantly of lizards, *Tupinambis* spp., with greater representation of crocodilians, *Caiman* spp., and lesser representation of snakes, *Python reticulatus* (Figure 6.13c). Numbers of skin products re-exported totalled nearly 1 million reptile skin items (Table 6.6). In contrast to records of skin numbers and skin weights, reptile products were predominantly of crocodilians, *Caiman* spp. and *Alligator mississippiensis* (Figure 6.13d).

Table 6.6 Mexican Re-exports of reptile skins and products 1980-2001

Species	Number of skins	Number of skin pieces	Skin weight (kg)	Number of skin products
Varanus salvator	167,923	19,235	-	64,214
Tupinambis spp.	86,271	455,703	2,142	76,171
Caiman spp.	52,021	56,918	1,767	530,788
Python reticulatus	31,769	86,689	306	170,997
Varanus niloticus	-	16,446	-	11,819
Alligator mississippiensis	13,993	727	185	79,548
Crocodylidae	513	711	75	31,622
Total	**352,490**	**636,429**	**4,475**	**965,159**

Source: UNEP-WCMC Trade Database

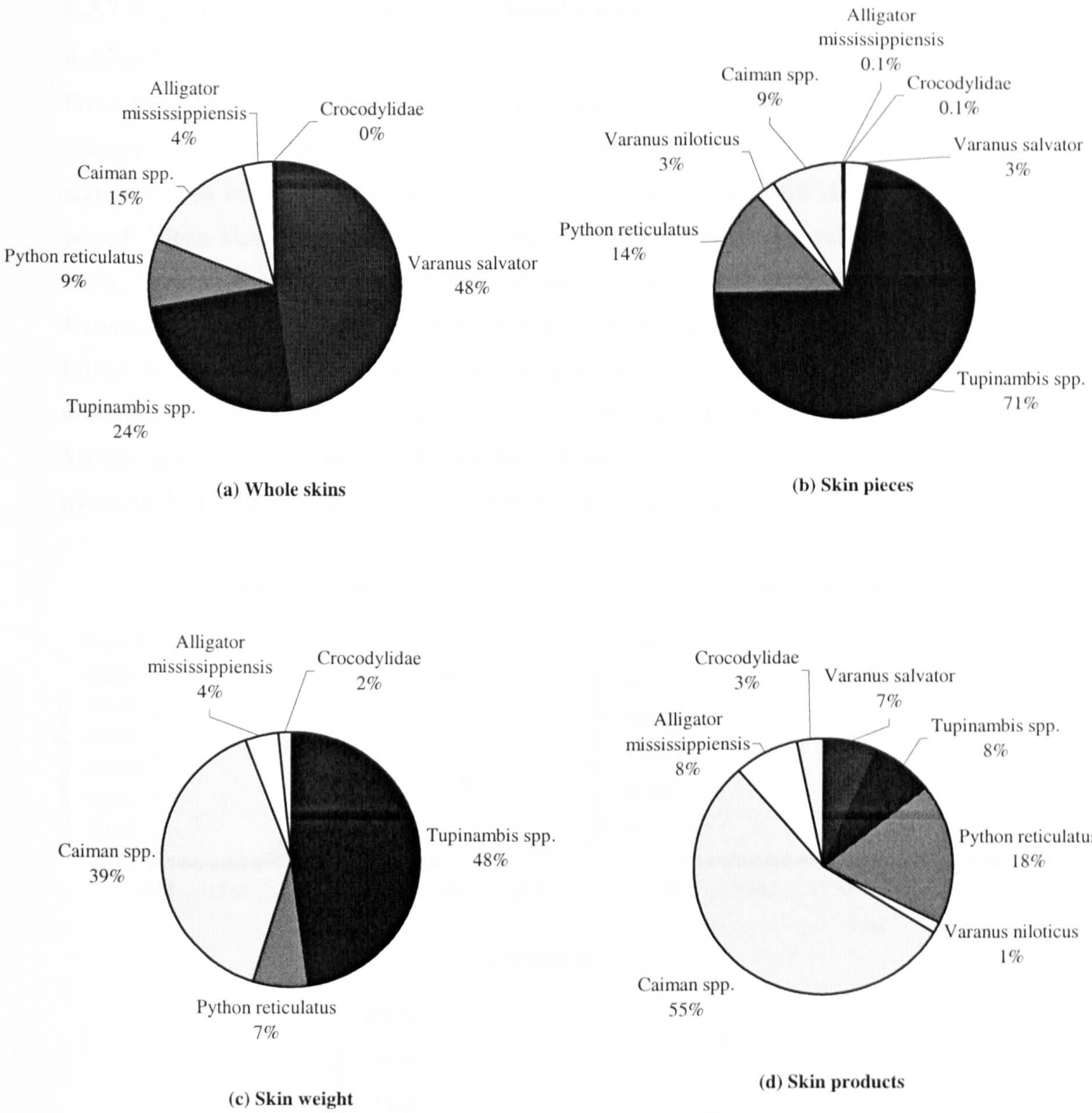


Figure 6.13 Re-exports of reptile skins and products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.7 Reptile skin re-exports by individual species

6.3.7.1 *Varanus salvator*

From 1980-2001, Mexico has re-exported large quantities of whole skins and skin pieces of *Varanus salvator* (Table 6.6; Figure 6.13a-c). In terms of numbers of skins, however, around eight times as many whole skins were re-exported as compared with skin pieces over this period. When these re-exports of whole skins or skin pieces are considered on an annual basis, there were no re-exports of *Varanus salvator* skins from 1980-1987. Re-exports of *Varanus salvator* whole skins tended to increase from the early 1990s to peak in 2000 (Figure 6.14a). In contrast, re-exports of *Varanus salvator* skin pieces peaked in the early 1990s, but decreased thereafter, and very few re-exports were recorded after 1994 (Figure 6.14b). Mexico also re-exported 64,214 skin products of *Varanus salvator* from 1980-2001, of which most (88.5%) were re-exported during 1998-2001 (Figure 6.14c).

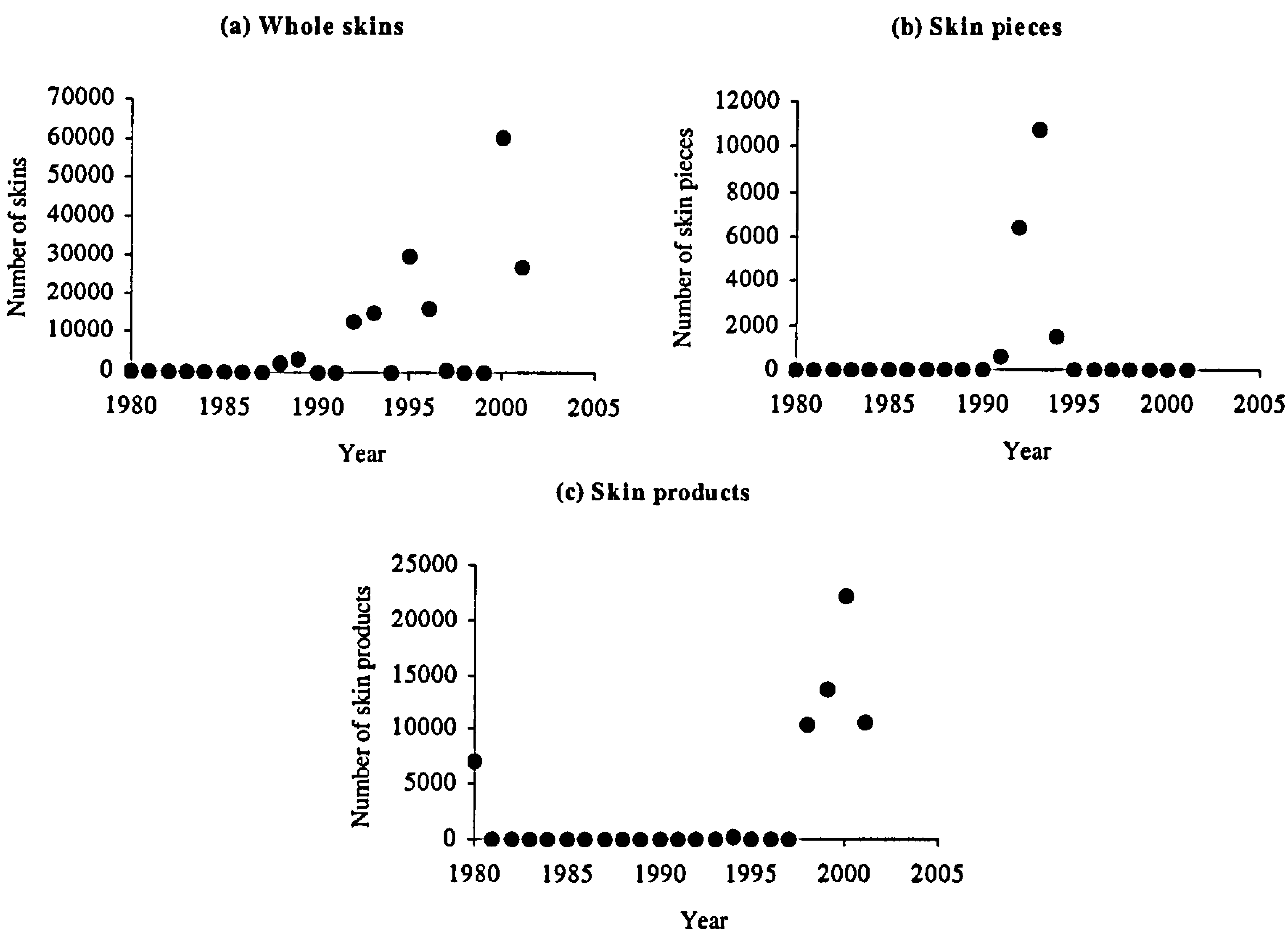


Figure 6.14 Re-exports of *Varanus salvator* from Mexico 1980-2001 (UNEP-WCMC Trade Data)

6.3.7.2 *Tupinambis* spp.

From 1980-2001, Mexico has also re-exported large quantities of whole skins and skin pieces of *Tupinambis* spp. (Table 6.6; Figure 6.13a-c). In terms of numbers of skins, however, around five times as many skin pieces were re-exported as compared with whole skins over this period. Re-exports of *Tupinambis* spp. whole skins tended to increase in the late 1980s, but to have decreased since the early 1990s (Figure 6.15a). In contrast, re-exports of *Tupinambis* spp. skin pieces tended to increase in the early 1990s to peak in the mid 1990s, but to have decreased from the mid 1990s to very low levels in the late 1990s (Figure 6.20b). Few skins of *Tupinambis* spp. were recorded in terms of weight (Table 6.6), and most (80%) were re-exported in 1988-1989 (Figure 6.15c). Mexico also re-exported 76,171 skin products of *Tupinambis* spp. from 1980-2001, of which most (91%) were re-exported from 1998-2001 (Figure 6.15d).

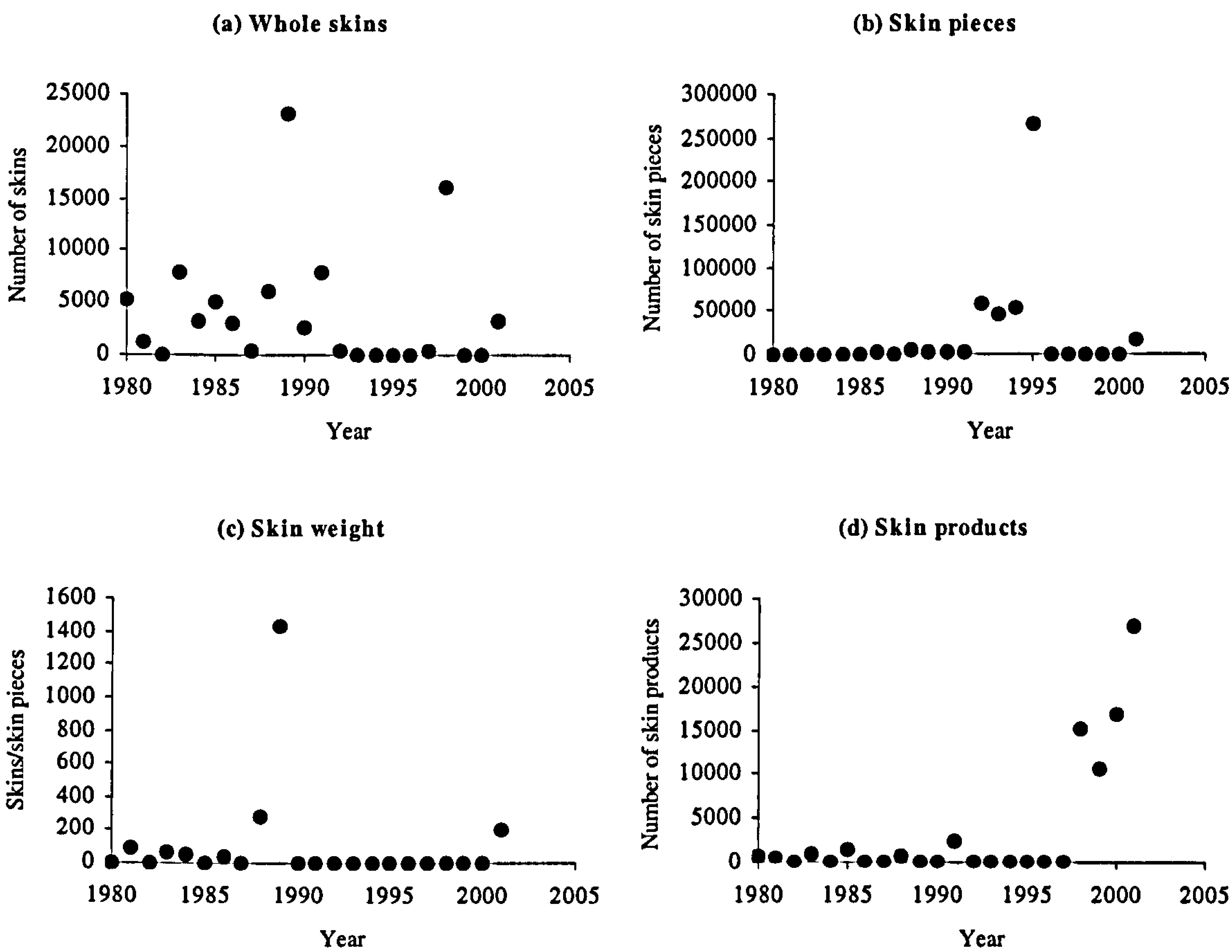


Figure 6.15 Re-exports of *Tupinambis* spp. from Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.7.3 *Caiman* spp.

From 1980-2001, Mexico has also re-exported whole skins and skin pieces of *Caiman* spp. (Table 6.6; Figure 6.13a-c). In terms of numbers of skins, similar numbers of whole skins and skin pieces were re-exported over this period. Most skins were re-exported during the 1990s (Figure 6.16a-b). In terms of skin weight, Mexico re-exported around 1.8 thousand kg of *Caiman* spp., of which most (98%) were in the single year of 1990. Mexico also re-exported around half million-skin products of *Caiman* spp., of which most (98%) were re-exported from 1998-2001 (Figure 6.16c).

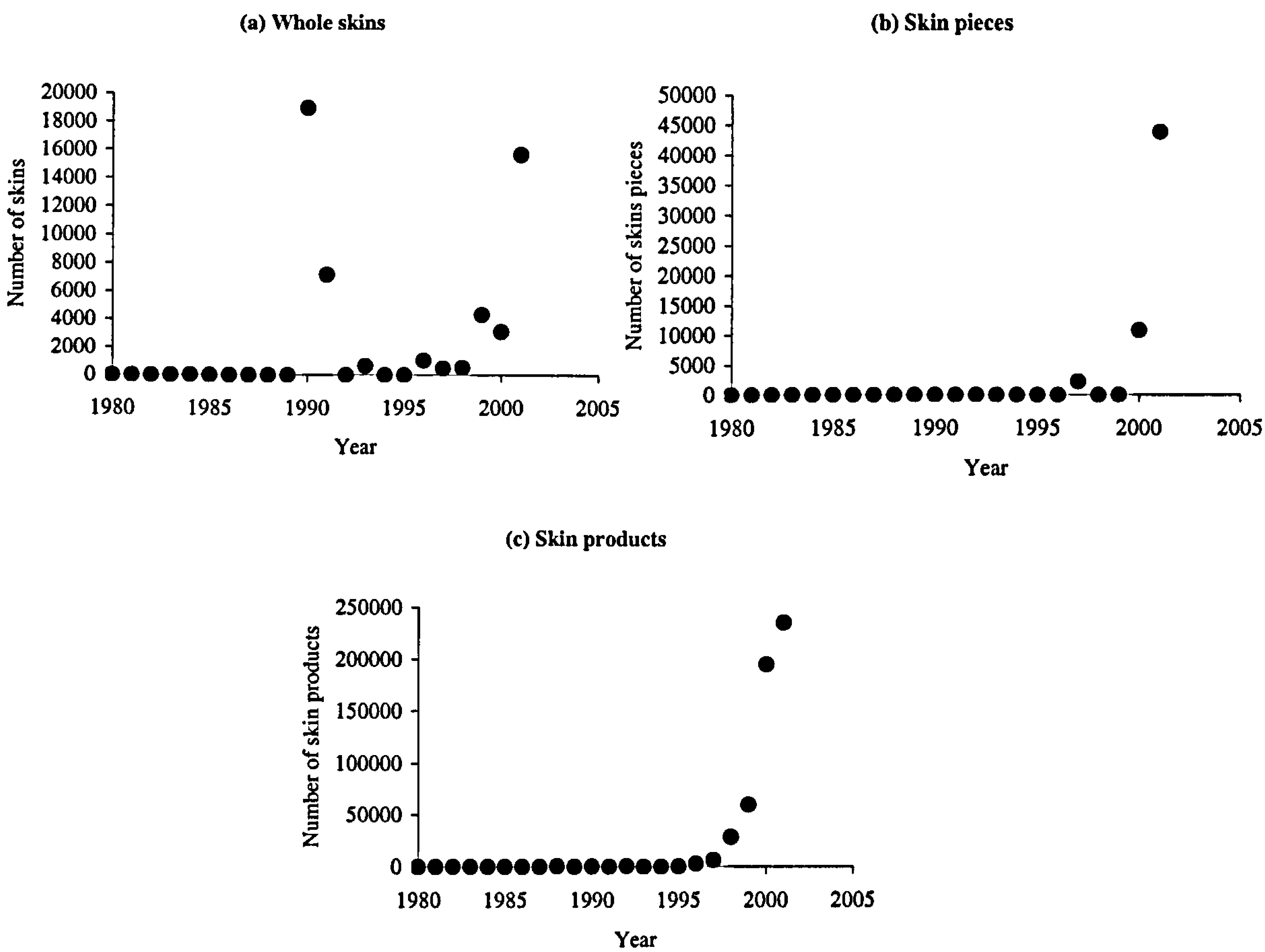


Figure 6.16 Re-exports of *Caiman* spp. from Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.7.4 *Python reticulatus*

From 1980-2001, Mexico has also re-exported many skins of *Python reticulatus* (Table 6.6; Figure 6.13a-c). In terms of numbers of skins, around three times as many skin pieces were re-exported as compared with whole skins over this period. Re-exports of *Python reticulatus* whole skins occurred throughout the mid 1980s and the 1990s (Figure 6.17a). In contrast, re-exports of *Python reticulatus* skin pieces tended to increase in the early 1990s, then decreased to very low levels in the late 1990s, but have abruptly increased in the early 2000s (Figure 6.17b). Very few re-exports of *Python reticulatus* were recorded in terms of weight (Table 6.6), with two peaks in 1984 (26.5%) and 2001 (23.5%) (Figure 6.17c). Mexico also re-exported 170,997 skin products of *Python reticulatus* from 1980-2001, of which most (99%) were from 1998-2001 (Figure 6.17d; Plates 6.5).

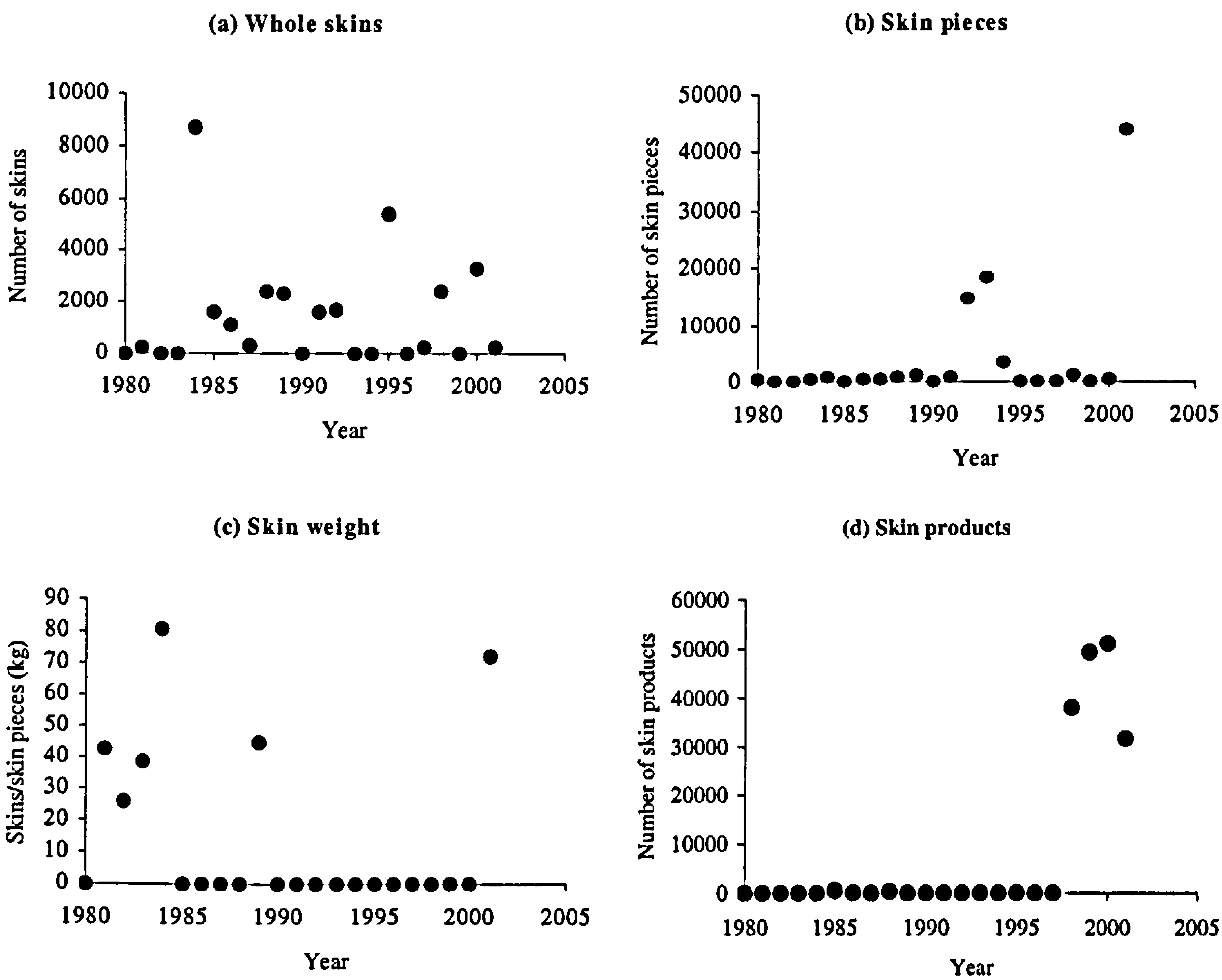


Figure 6.17 Re-exports of *Python reticulatus* from Mexico 1980-2001 (UNEP-WCMC Trade Data)

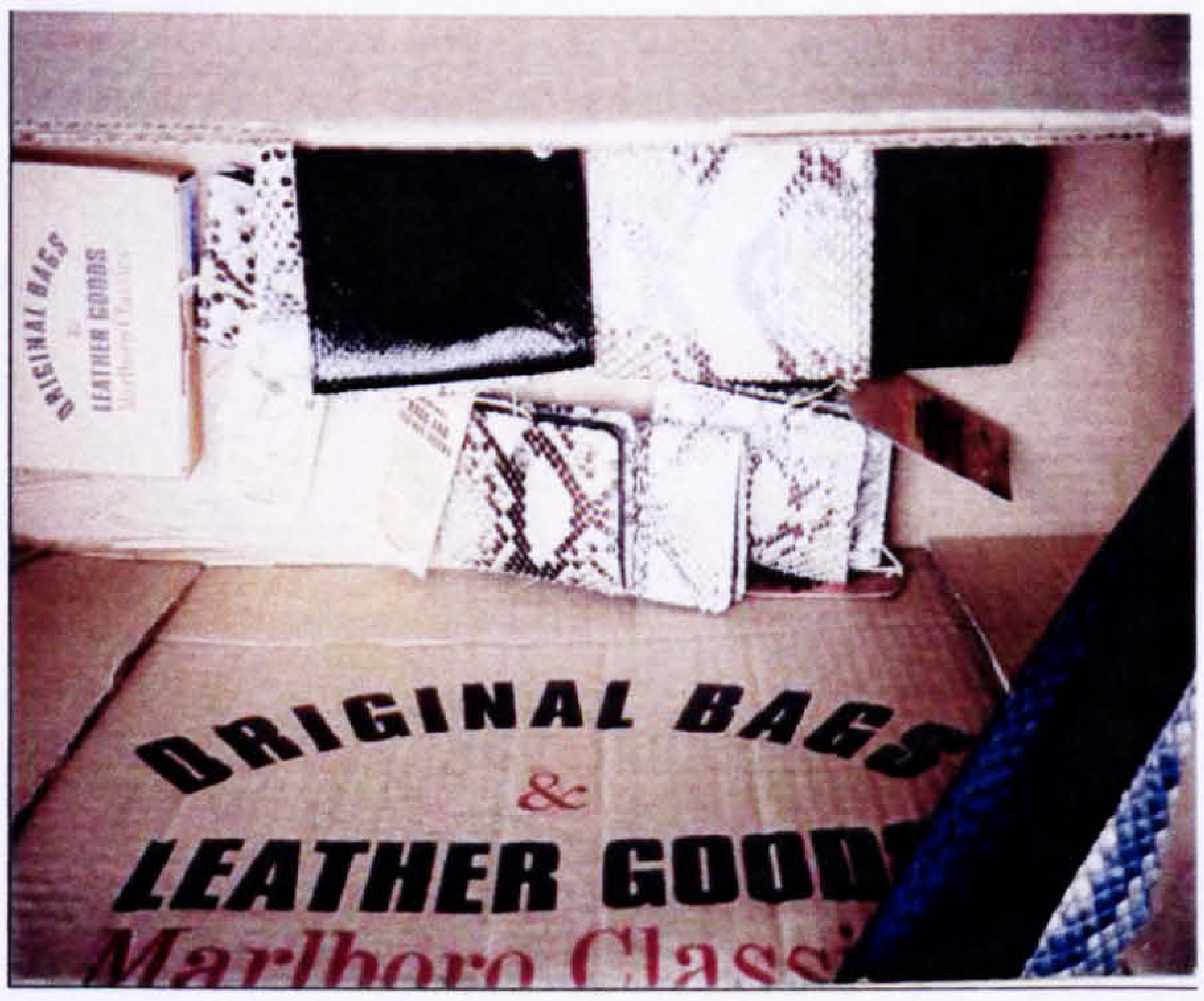


Plate 6.5 Re-exports of *Python reticulatus* skin products from Mexico
© Arroyo, 2003

6.3.7.5 *Varanus niloticus*

From 1980-2001, Mexico has re-exported only low quantities of *Varanus niloticus* (Table 6.6; Figure 6.13b). There were no re-exports of *Varanus niloticus* skin pieces from 1980-1993, and most re-exports occurred in 1994 and very few re-exports were recorded after 1997. Mexico also re-exported 11,819 skin products of *Varanus niloticus* from 1980-2001, of which most (41%) appeared in the single year of 1980 and during 1998-2001 (59%).

6.3.7.6 *Alligator mississippiensis*

From 1980-2001, Mexico has re-exported low quantities of *Alligator mississippiensis* (Table 6.6; Figure 6.13a-c). In terms of numbers of skins, however, around nineteen times as many whole skins were re-exported as compared with skin pieces over this period. Re-exports of *Alligator mississippiensis* skins have tended to increase from the mid 1990s to peak in the early 2000s (Figure 6.18a). However, Mexico also re-exported nearly 80,000 skin products of *Alligator mississippiensis* from 1980-2001, of which most (95%) appeared during 1997-2001 (Figure 6.18b).

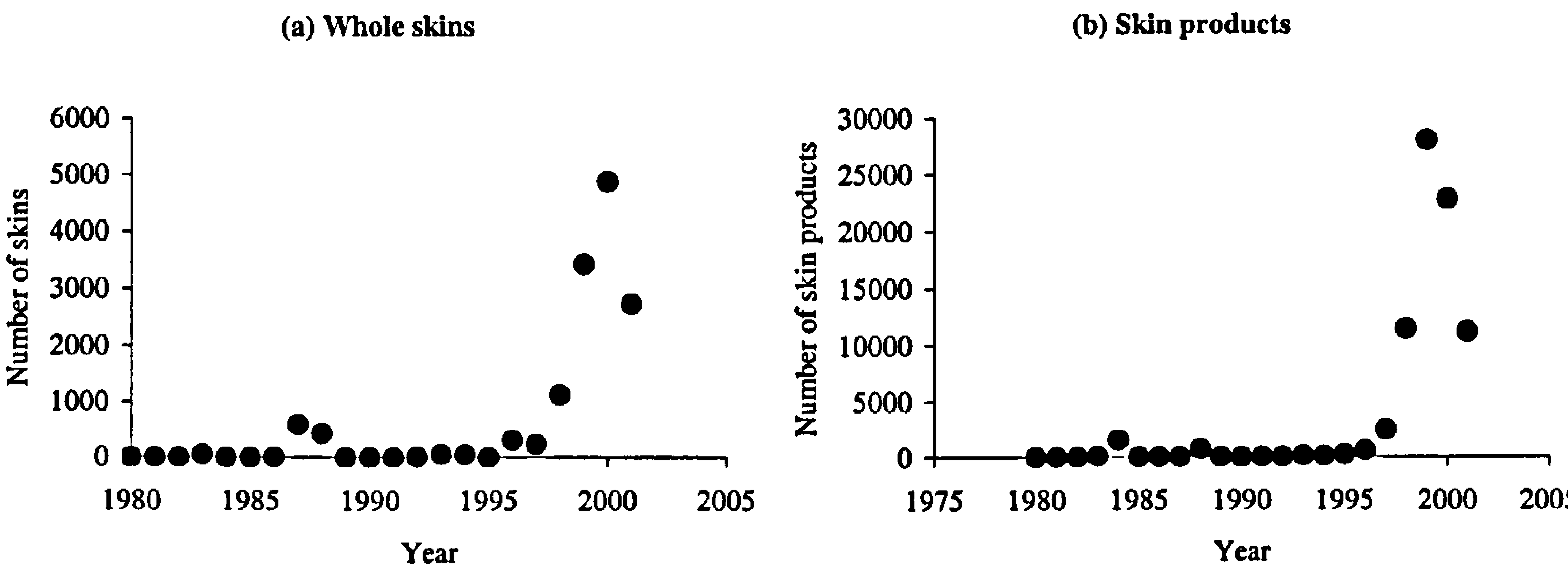


Figure 6.18 Re-exports of *Alligator mississippiensis* from Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.7.7 Crocodylidae

From 1980-2001, Mexico has re-exported very low quantities of Crocodylidae as whole skins and skin pieces (Table 6.6). However, Mexico also re-exported nearly 31,622 skin products of Crocodylidae from 1980-2001, of which most (95%) appeared during 1998-2001 (Figure 6.19).

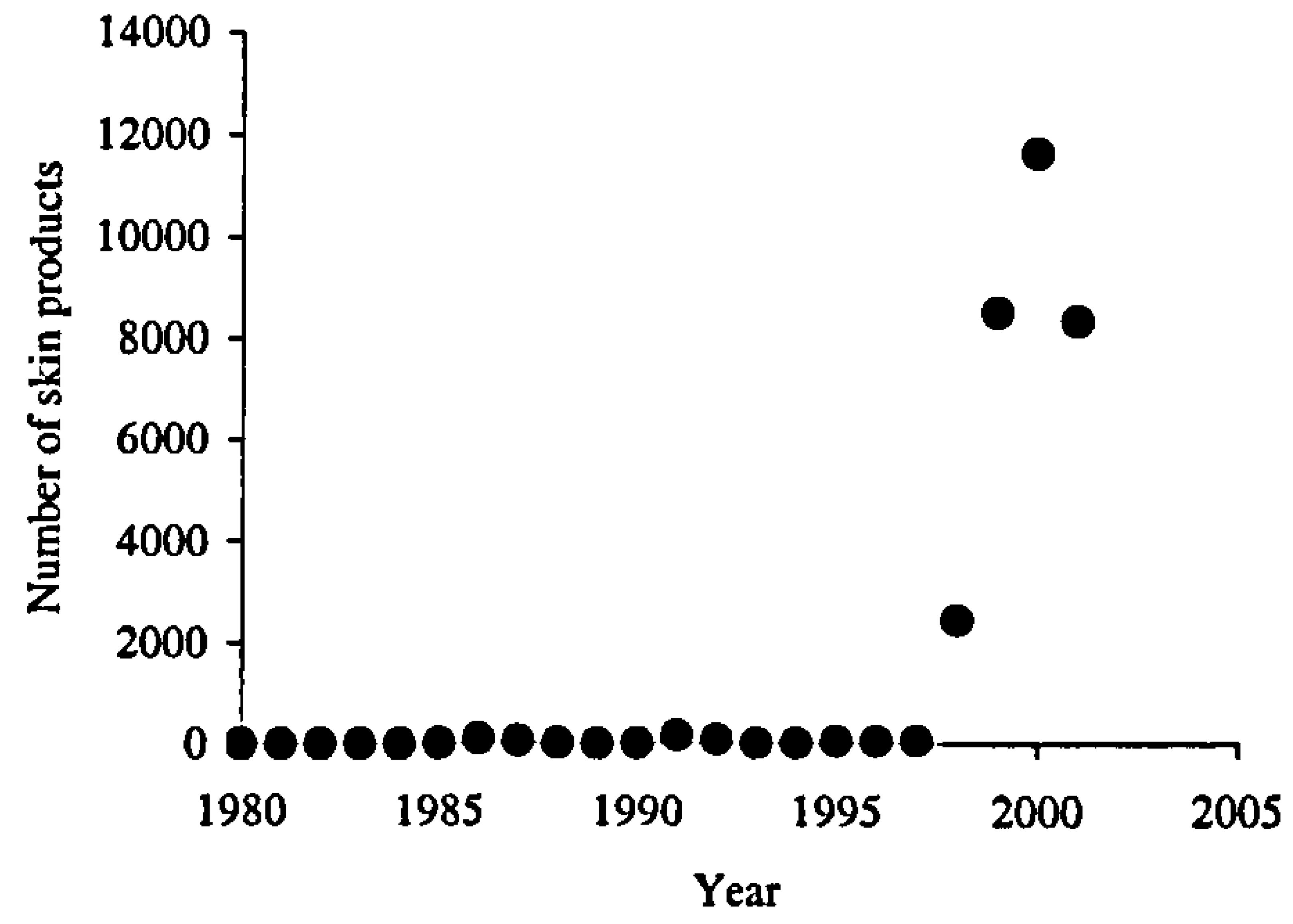


Figure 6.19 Re-exports of Crocodylidae skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

6.3.8 Total Reptile Skin Re-exports by year

From 1980 to the late 1990s, Mexico re-exported low quantities of whole reptile skins and of reptile skin pieces, whether considered as number or weights, but such re-exports as there were tended to increase from during 1988 onwards (Figure 6.20 a-c). The numbers of whole reptile skins re-exported remained at constant levels throughout the 1990s but tended to increase into the early 2000s (Figure 6.20a). In terms of species, *Tupinambis* spp. made up the majority of Mexico's reptile skin re-exports during the 1980s, whether considered in absolute or proportional terms (Figure 6.20 a-c; Figure 6.21 a-c). In proportional terms, numbers of skin pieces and skin weight (kg) came also to be dominated by *Python reticulatus* during the 1980s (Figure 6.21b,c). From the early 1990s, the numbers of whole skin re-exports came to be dominated by *Varanus salvator*, whether considered in absolute or proportional terms (Figure 6.20a; Figure 6.21a). In contrast, from the early 1990s, the numbers of skin pieces re-exported came to be dominated by *Tupinambis* spp., whether considered in absolute or proportional terms (Figure 6.20b; Figure 6.21b).

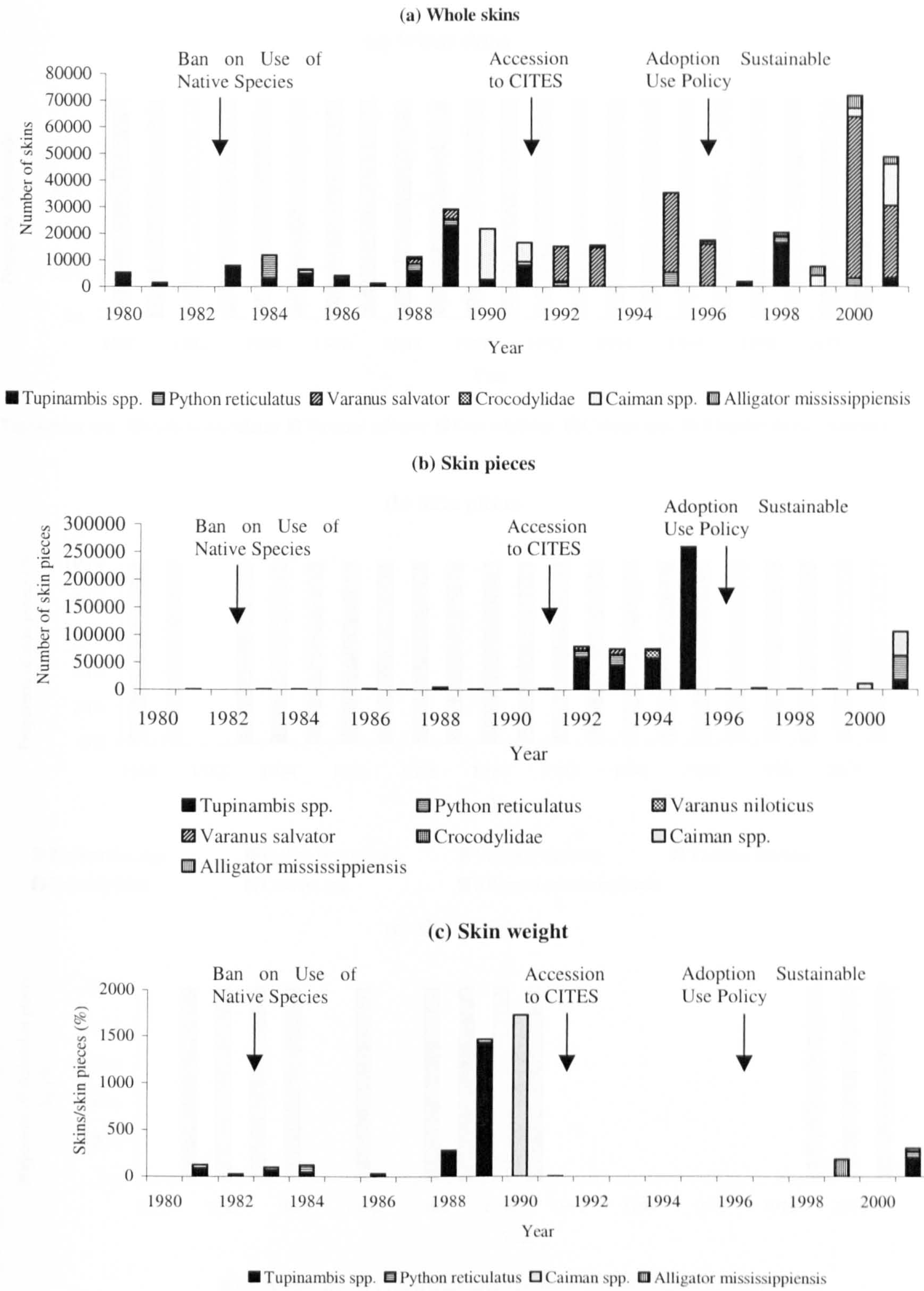
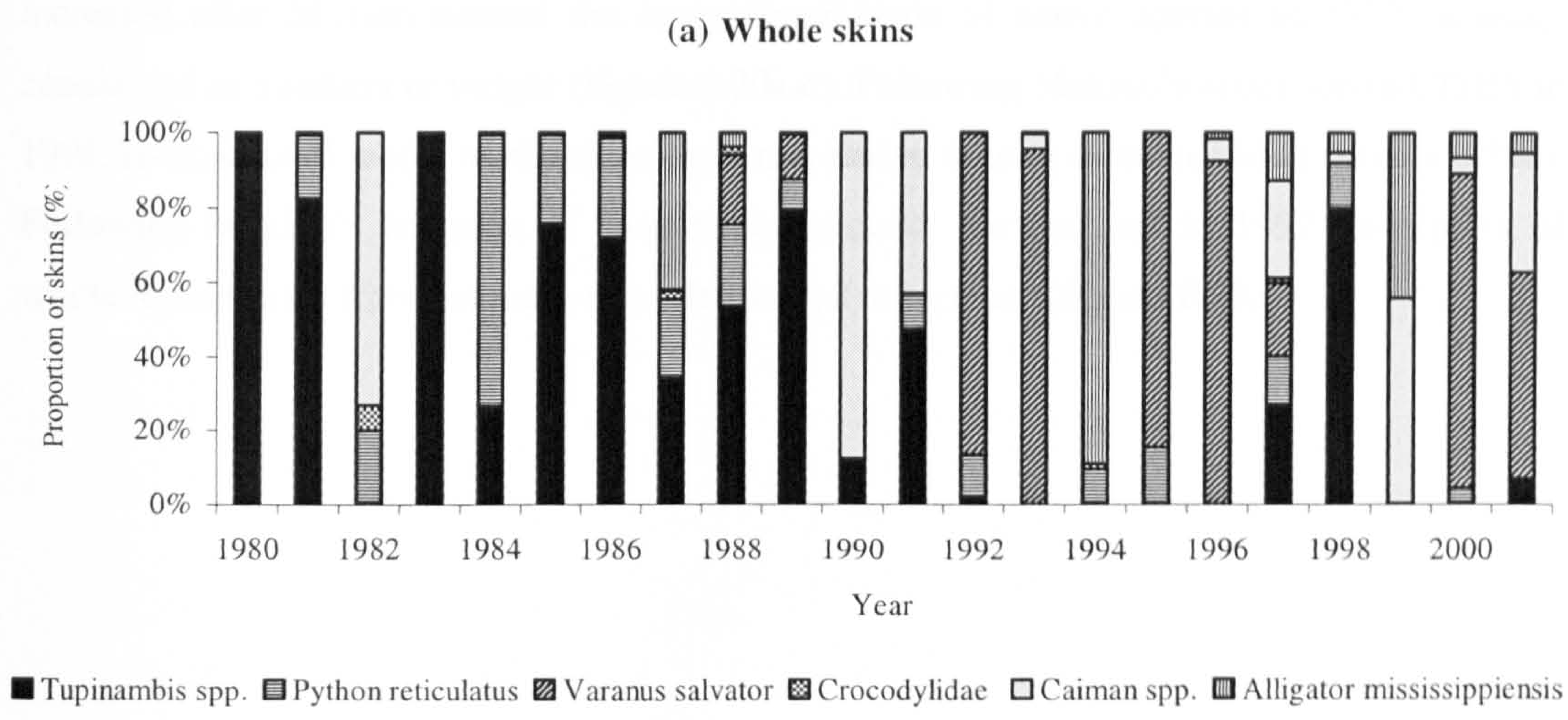
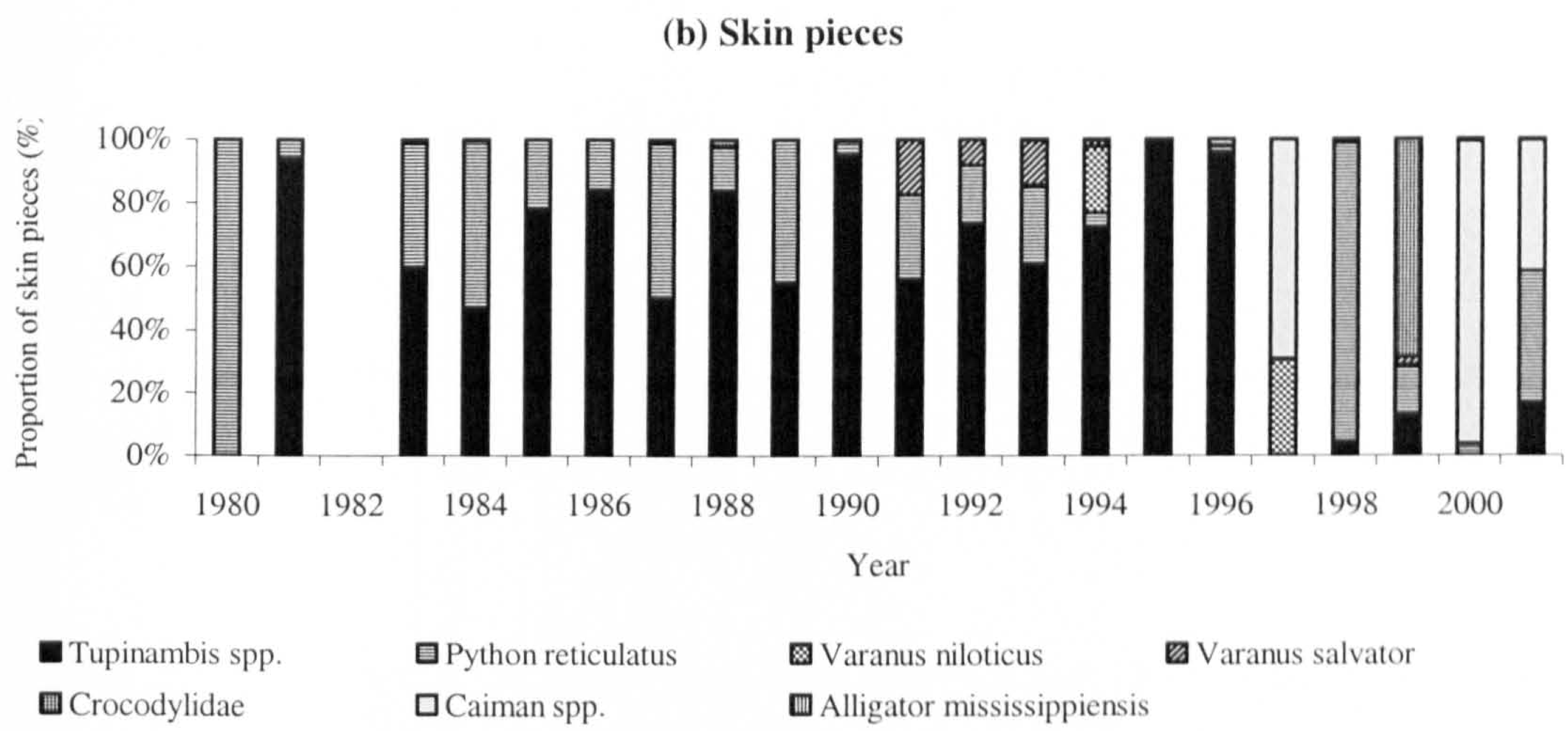


Figure 6.20 Re-exports of reptile skins from Mexico 1980-2001
(UNEP-WCMC Trade Data)





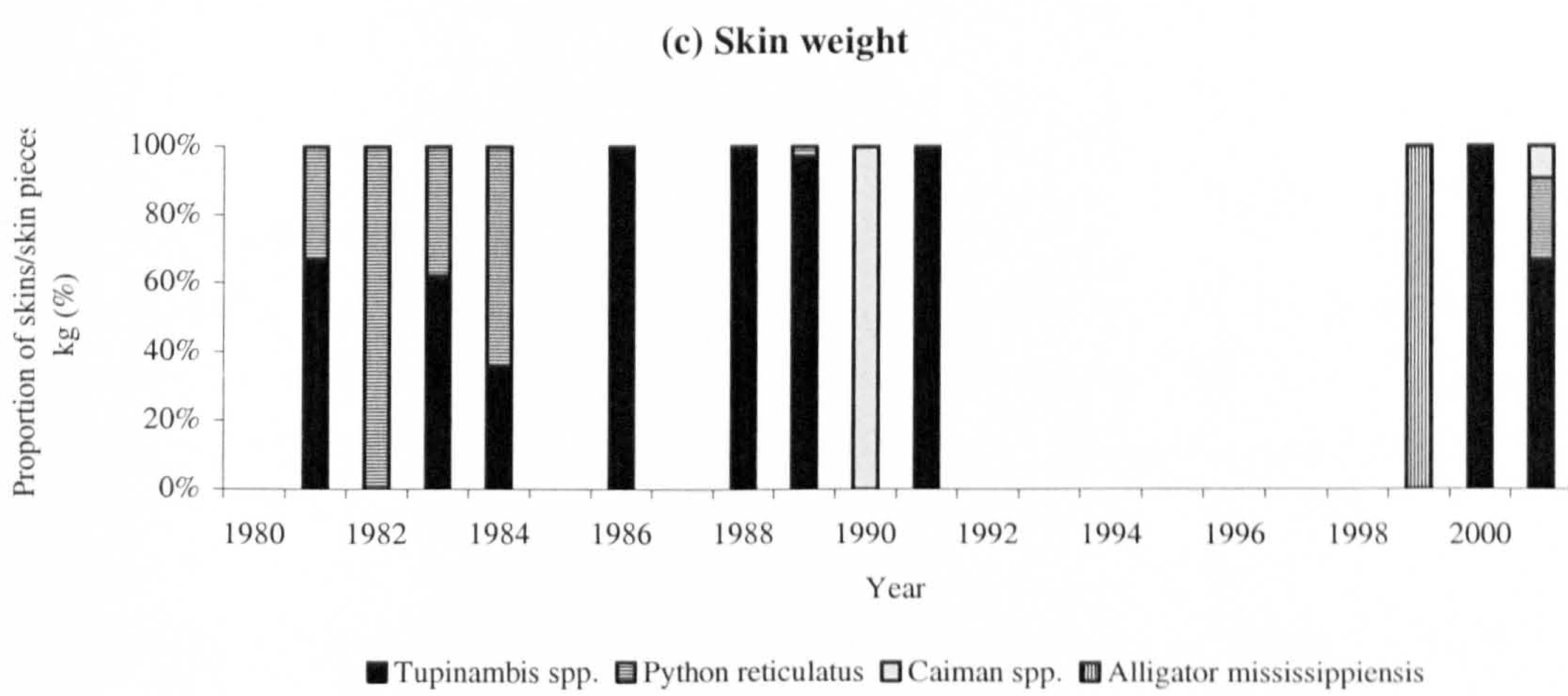


Figure 6.21 Re-exports of reptile skins from Mexico 1980-2001
(UNEP-WCMC Trade Database)

In terms of key events in Mexico, re-exports of reptile skins from non-native species increased after Mexico banned the international trade of native species in 1982, whether considered as numbers or weight (Figure 6.20a-c). Following Mexico's accession to CITES in 1991, re-exports of whole reptile skins from non-native species remained high (Figure 6.20a). Following Mexico's adoption of sustainable resource use policies in 1997, re-exports of whole reptile skins from non-native species tended to increase (Figure 6.20a).

6.3.9 Balance between reptile skin imports and re-exports

The trade balance of the leather sector in Mexico has been negative for the past 3 years due to an increase in the import of hides and skins, which increased from US$252 million in 1995 to US$819 million in 2000. For the footwear sector the effect is the opposite, the trade balance was positive during such period (Table 6.7) (Bancomext, 2002).

Table 6.7 Mexico's trade balance on leather, footwear, and marroquineria (US$ million)

Years	1997	1998	1999	2000
Leather				
Exports	941.7	973.8	980.8	1,065.7
Imports	992.4	1,172.5	1,221.0	1,414.4
Balance	-50.7	-198.6	-241.1	-348.7
Skins and Hides*				
Exports	191.6	227.9	236.5	279.0
Imports	562.6	674.3	742.6	818.9
Balance	-370.9	-446.4	-506.1	-539.9
Marroquineria				
Exports	280.4	302.1	317.9	381.7
Imports	281.8	336.2	316.9	405.3
Balance	-1.4	-34.1	1.0	-23.6
Footwear**				
Exports	469.7	443.8	426.4	405.0
Imports	148.0	162.0	162.4	190.2
Balance	321.7	281.9	264.0	214.8

Source: Bancomext (2002)
* Includes peletería
** Includes footwear parts

The Mexican trade balance for reptile skins and skin products from non-native species follows the same behaviour within the Mexican leather and footwear industry.

6.3.9.1 *Varanus salvator*

During 1980-2001, the overall trade balance between Mexican imports and re-exports of *Varanus salvator* skins was negative (Table 6.8). Reported imports for *Varanus salvator* whole skins and skin pieces exceeded re-exports throughout this period (Figure 6.22).

Table 6.8 Mexican trade balance 1980-2001: Imports vs. re-exports of *Varanus salvator*

Term	Imports	Re-exports	Balance
Whole skins	2,181,208	167,923	**-2,013,285**
Skin pieces	310,617	19,235	**-291,382**

Source: UNEP-WCMC Trade Data

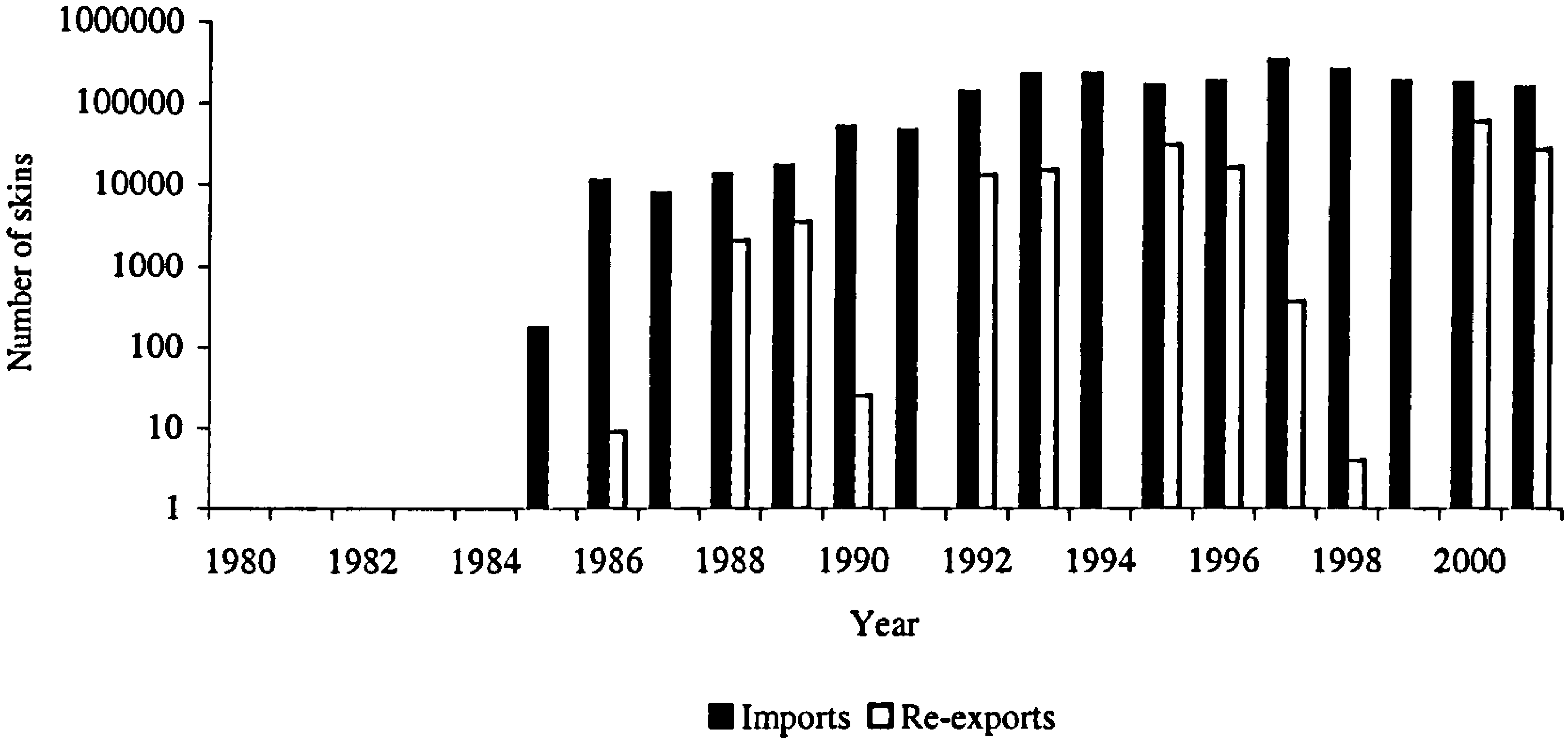


Figure 6.22 Comparison of Mexican imports and re-exports of *Varanus salvator* whole skins 1980-2001 (UNEP-WCMC Trade Data)

6.3.9.2 *Tupinambis* spp.

During 1980-2001, the overall trade balance between Mexican imports and re-exports of *Tupinambis* spp. skins was negative (Table 6.9). Reported imports for *Tupinambis* spp. whole skins (Figure 6.23), skin pieces and skin weight generally exceeded re-exports throughout this period.

Table 6.9 Mexican trade balance 1980-2001: Imports vs. re-exports of *Tupinambis* spp.

Term	Imports	Re-exports	Balance
Whole skins	1,760,926	86,271	**-1,674,655**
Skin pieces	1,591,977	455,703	**-1,136,274**
Skins/skin pieces (kg)	7,236	2,142	**-5,094**
Skin products	156,761	76,171	**-80,590**

Source: UNEP-WCMC Trade Data

Figure 6.23 Comparison of Mexican imports and re-exports of *Tupinambis* spp. whole skins 1980-2001 (UNEP-WCMC Trade Data)

6.3.9.3 *Caiman* spp.

During 1980-2001, the overall trade balance between Mexican imports and re-exports of *Caiman* spp. skins was negative (Table 6.10). Reported imports for *Caiman* spp. whole skins (Figure 6.24a), skin pieces and skin weights generally exceeded re-exports throughout this period. In contrast, during 1980-2001, the overall trade balance between skin products of *Caiman* spp. was positive (Table 6.10), reported re-exports for *Caiman* spp. skin products generally exceeded reported imports, especially during the late 1990s (Figure 6.24b).

Table 6.10 Mexican trade balance 1980-2001: Imports vs. re-exports of *Caiman* spp.

Term	Imports	Re-exports	Balance
Whole skins	791,701	52,021	**-739,680**
Skin pieces	103,382	56,918	**-46,464**
Skins/skin pieces (kg)	12,265	1,767	**-10,498**
Skin products	26,130	530,788	**504,658**

Source: UNEP-WCMC Trade Data

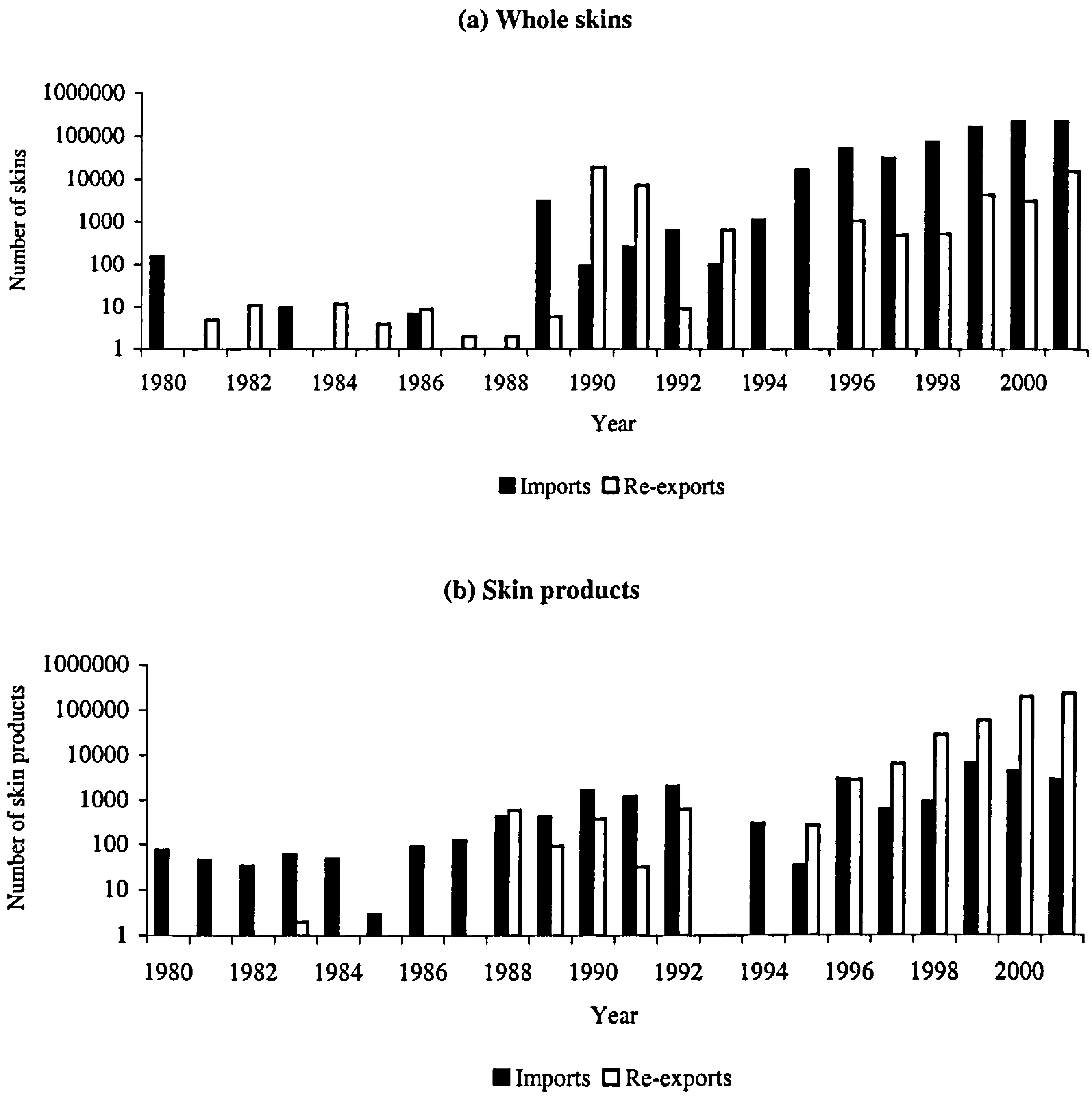


Figure 6.24 Comparison of Mexican imports and re-exports of *Caiman* spp. skins 1980-2001 (UNEP-WCMC Trade Data)

6.3.9.4 *Python reticulatus*

During 1980-2001, the overall trade balance between Mexican imports and re-exports of *Python reticulatus* skins was negative (Table 6.11). Reported imports for *Python reticulatus* whole skins (Figure 6.25), skin pieces and skin weight generally exceeded re-exports throughout this period.

Table 6.11 Mexican trade balance 1980-2001: Imports vs. re-exports of *Python reticulatus*

Term	Imports	Re-exports	Balance
Whole skins	580,337	31,769	**-548,568**
Skin pieces	1,003,513	86,689	**-916,824**
Skins/skin pieces (kg)	4,793	306	**-4,487**

Source: UNEP-WCMC Trade Data

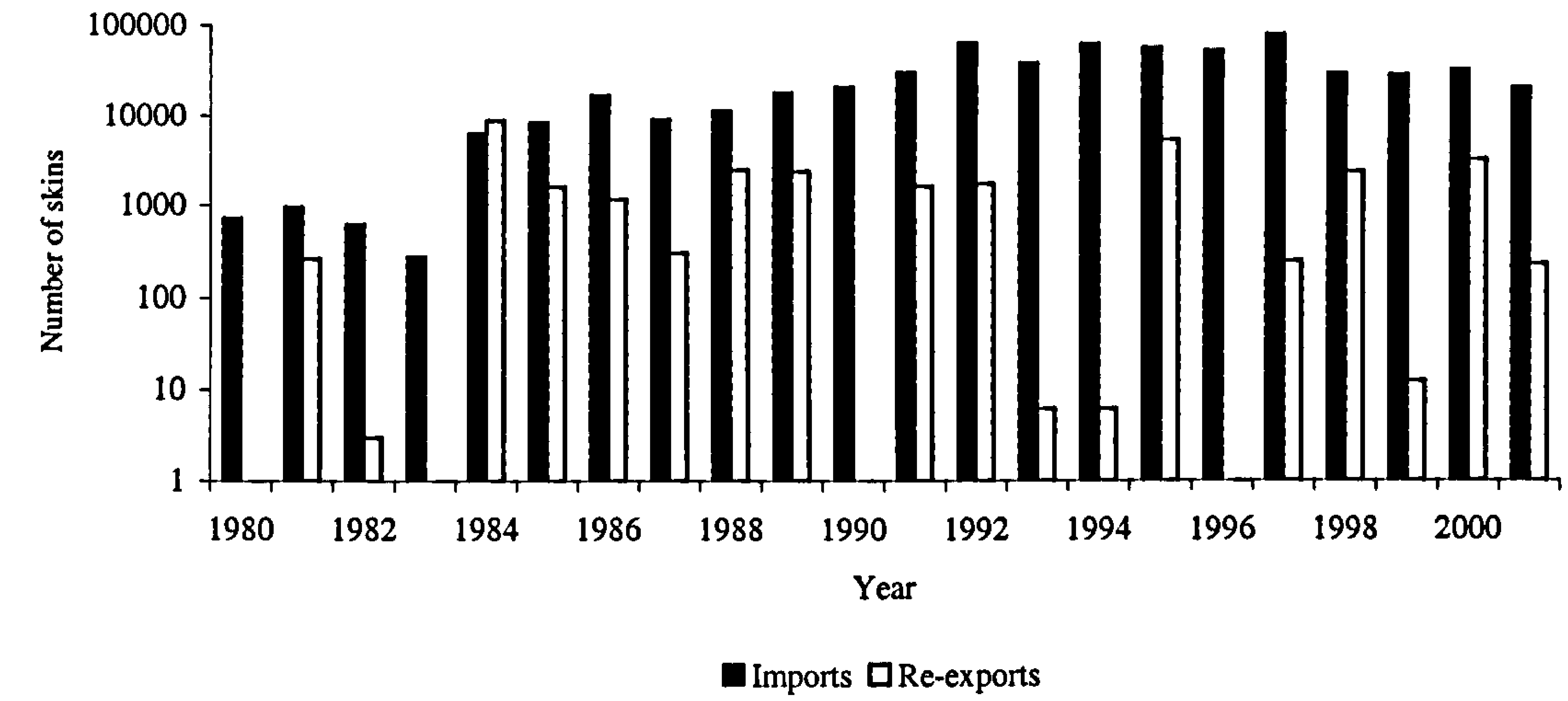


Figure 6.25 Comparison of Mexican imports and re-exports of *Python reticulatus* whole skins 1980-2001 (UNEP-WCMC Trade Data)

6.3.9.5 *Alligator mississippiensis*

During 1980-2001, the overall trade balance between Mexican imports and re-exports of *Alligator mississippiensis* skins was negative (Table 6.12). Reported imports for *Alligator mississippiensis* whole skins (Figure 6.26a), skin pieces and skin weight exceeded re-exports throughout this period. In contrast, during 1980-2001, the overall trade balance for skin products of *Alligator mississippiensis* was positive (Table 6.12), as reported re-exports for *Alligator mississippiensis* skin products exceeded reported imports during this period (Table 6.12; Figure 6.26b).

Table 6.12 Mexican trade balance 1980-2001: Imports vs. re-exports of *Alligator mississippiensis*

Term	Imports	Re-exports	Balance
Whole skins	59,308	13,993	**-45,315**
Skin pieces	103,013	727	**-102,286**
Skins/skin pieces (kg)	1,325	185	**-1,140**
Skin products	21,317	79,548	**58,231**

Source: UNEP-WCMC Trade Data

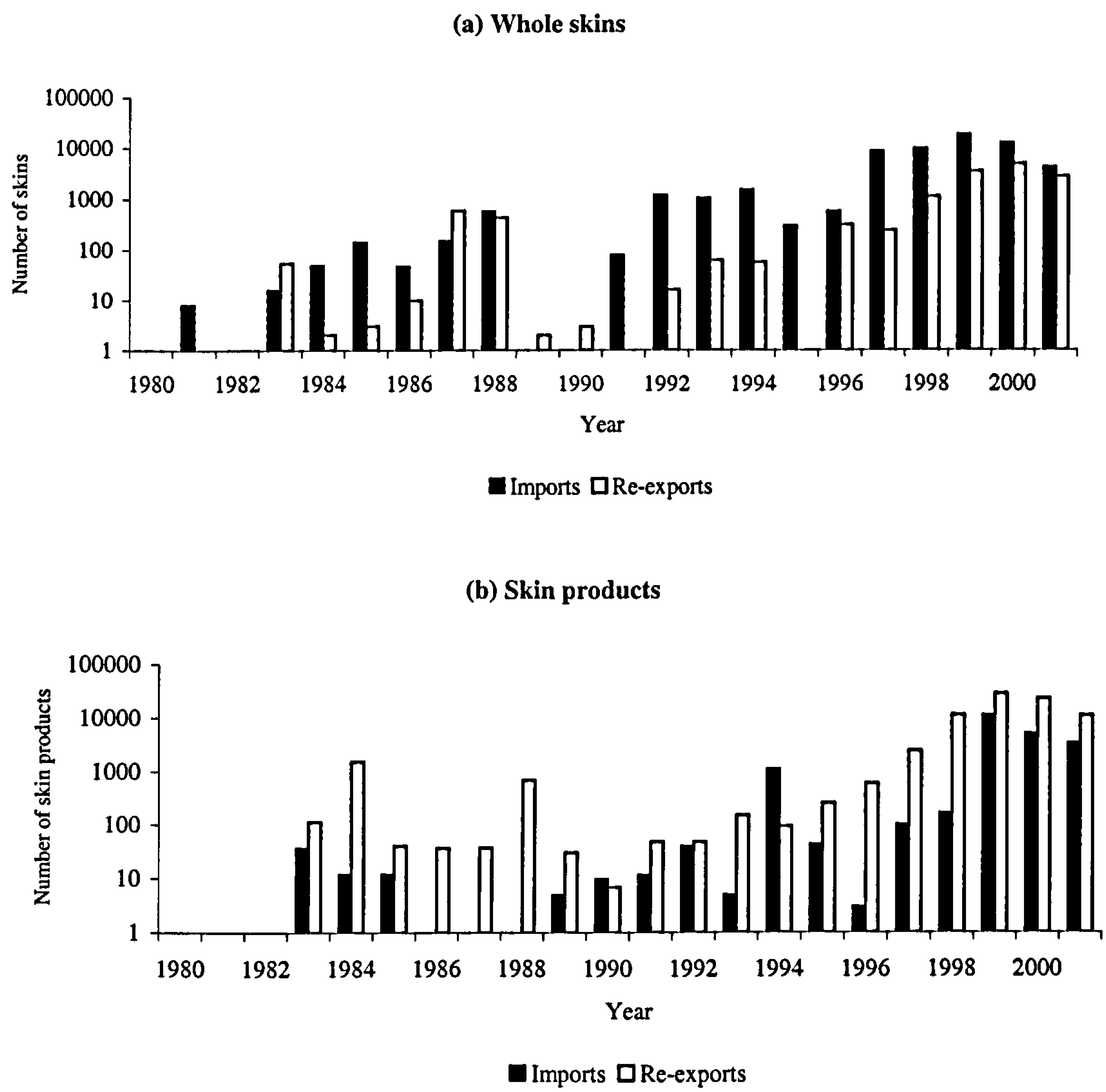


Figure 6.26 Comparison of Mexican imports and re-exports of *Alligator mississippiensis* skins 1980-2001 (UNEP-WCMC Trade Data)

6.3.9.6 Crocodylidae

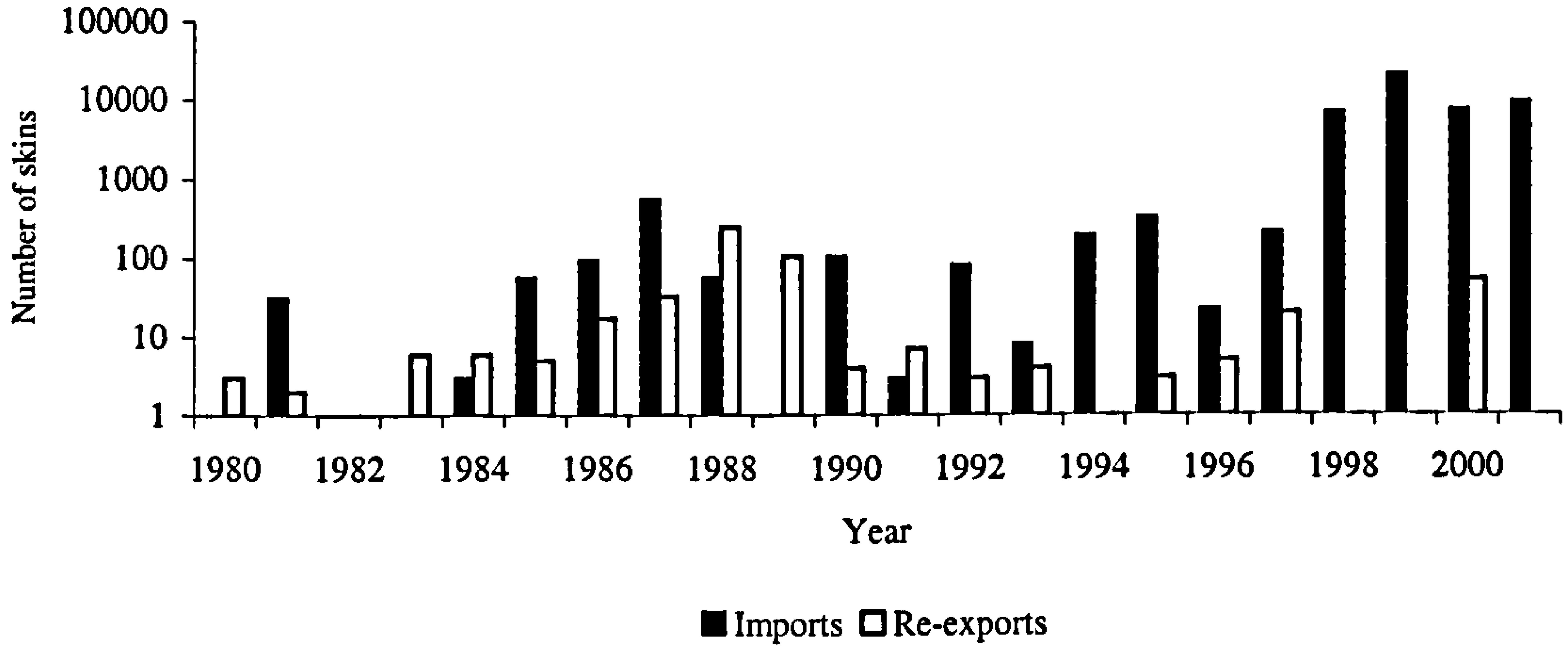
During 1980-2001, the overall trade balance between Mexican imports and re-exports of Crocodylidae skins considered in numbers was negative (Table 6.13). Reported imports for Crocodylidae whole skins (Figure 6.27a) and skin pieces exceeded re-exports throughout this period. In contrast, during 1980-2001, the overall trade balance for skin weight and skin products of Crocodylidae was positive (Table 6.13). Reported re-exports for Crocodylidae skin weight and skin products (Figure 6.27b) exceeded reported imports throughout this period.

Table 6.13 Mexican trade balance 1980-2001: Imports vs. re-exports of Crocodylidae

Term	Imports	Re-exports	Balance
Whole skins	43,635	513	**-43,122**
Skin pieces	4,354	711	**-3,643**
Skins/skin pieces (kg)	35	75	**40**
Skin products	225	31622	**31,397**

Source: UNEP-WCMC Trade Data

(a) Whole skins



(b) Skin products

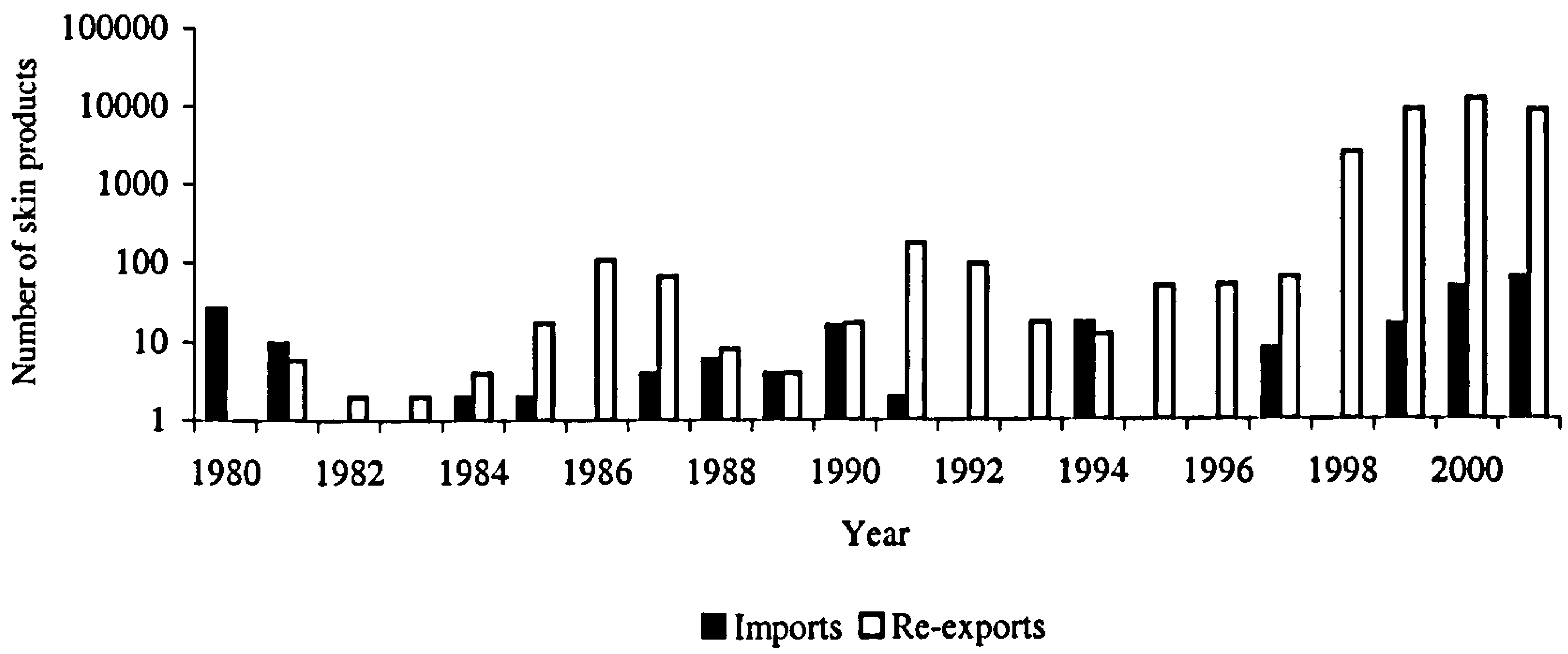


Figure 6.27 Comparison of Mexican imports and re-exports of Crocodylidae skins 1980-2001 (UNEP-WCMC Trade Data)

6.4 Discussion

This chapter has explored the trade in reptile skins and by-products from non-native species involving Mexico for the years 1980-2001. Examination of trade data reveals that Mexico plays an important role as an importer of reptile skins from non-native species and as a re-exporter of reptile skins and skin products.

6.4.1 Imports

The most numerous reptile skins in reported imports during 1980-2001 were from *Tupinambis* spp., *Varanus salvator* and *Python reticulatus.* The Mexican market for reptile skins has been a major factor driving the export of *Tupinambis* spp. from Argentina[1], and of *Varanus salvator* and *Python reticulatus* from Indonesia. Mexico imports these reptile skins mainly to produce and subsequently re-export cowboy boots mainly to the US.

Over the period 1980-2001, Mexico's total imports of reptile skins have increased steadily, and the largest numbers of reptile skins were reported during the late 1990s and early 2000s (Figure 6.9a). The observed trend was opposite to what was expected. Instead, it was expected that imports of reptile skins from non-native species would be higher after Mexico adopted the ban on use of native species, whereas imports would tend to decrease after Mexico adopted its policy to sustainably use native species. It is difficult to see how this trend will be reversed, since it seems very unlikely that the reptile skin markets will be satisfied only with domestic production of native species (Chapter 8).

Skins of particular species appear to be subject to changing demand in Mexico. For example, during the 1980s, whole skins of *Tupinambis* spp. were the most imported commodities but these were substituted for whole skins of *Varanus salvator* during the 1990s (Figure 6.10a). There must be several factors such as market trends and fashion driving Mexico's preferences over time (ITC, 1970). Unfortunately, consideration of socio-economic aspects of the trade cannot be answered with CITES data alone (Harris *et al.*, 2003).

---

[1] Since the 1970s, Argentina has been the main producer of tegus, exporting between mid 1970s and mid 1980s more than 1,250,000 skins to the US, as well as to Canada, Hong Kong, Japan, Europe and Mexico (Hemley, 1984).

Levels of trade were high when Mexican imports of whole reptile skins, skin pieces and skin weight were summed separately. From 1980 to 2001, numbers of whole skin imports totalled some 5.3 million items (Table 6.5). When a conversion factor was used to convert these categories to an approximate number of whole skins, the total number of whole skins animals imported by Mexico increased to nearly 6.9 million (Table 6.5). Therefore, the trade in reptile skins in the Mexican leather market is a very important issue for the international trade in wildlife.

Argentina (*Tupinambis* spp.) and Indonesia (*Varanus salvator* and *Python reticulatus*) were the major suppliers of reptile skins to Mexico (Figure 6.12). However, many (>50%) exports of *Caiman* spp. and *Crocodylus* spp. were recorded as of unknown origin (Figure 6.12). As Mexico is also a range State for these taxa, a more detailed investigation of this trade should be undertaken, as much trade in non-ranched or non-farmed crocodilian skins has been knowingly illegal for many years. Moreover, the long-term sustainability of the trade from the supply side remains an intractable issue in Mexico. To establish a link between the numbers of reptile skins traded in Mexico, and the status of wild populations from which they originate is extremely problematic. Little is known about the populations from which these harvests come or of details of the harvests. As an important consumer of species native to other countries, Mexico, together with the US and Canada, should assist in efforts to study the populations, harvest and trade of some of the main species affected by the North American demand (Fleming, 1999).

6.4.2 Re-exports

The most numerous reptile skins re-exported during 1980-2001 were from *Tupinambis* spp. and *Varanus salvator* (Table 6.6). In contrast, the most numerous reptile skin products re-exported during 1980-2001 were from *Caiman* spp. and *Varanus salvator* (Table 6.6). Equally, the prevalence of particular taxa re-exports over time varied depending on the term recorded. For example, re-exports of whole skins during 1980-2001 were dominated by *Varanus salvator*, whereas re-exports of skin pieces were dominated by *Tupinambis* spp. (Table 6.6).

The US market for reptile skins has been a major factor driving the re-export of reptile skins from Mexico. Mexican re-exports in terms of numbers of reptile skins were higher during the 1990s (Figure 6.20a,b). It was expected that numbers of reptile skins and skin products re-exported would tend to decrease after Mexico adopted a sustainable use policy. However, such a decrease may be offset by the opening of national markets and it seems very unlikely that the increasing demand in these markets will be satisfied exclusively by the limited domestic production (Chapter 8).

Significant levels of re-exports of *Caiman* spp. and Crocodylidae skin products were recorded during the 1990s. Since Mexico is also a range State for these taxa, a more detailed investigation of this trade should be undertaken in order to certify that the skin products re-exported by Mexico indeed have been manufactured with reptile skins from non-native species. This is particularly important, since most of the reptile skin imports by Mexico during 1980-2001 were recorded as being unknown origin (Figure 6.12).

6.4.3 Trade balance

Over the period 1980-2001, the overall trade balance between Mexican imports and re-exports of reptile skins, whether considered in numbers or weight, has been negative (Tables 6.8-6.13). The difference between both figures is the quantity of the particular items that Mexico is retaining for the national market. There is an incentive in Mexico to keep importing significant volumes of reptile skins to supply the leather and footwear industry, which uses these skins and manufactures skin products to supply domestic and foreign markets (Chapter 5). The dependence of manufacturing production in developing countries like Mexico on imported inputs like reptile skins is not a new phenomenon. International production sharing constitutes a particular form of input-output dynamics that tends to raise the direct import content of exports relative to value added. International production networks promote new patterns of trade, in that goods travel through several locations before reaching final consumers, and the total value of trade recorded in such products exceeds their added value by a considerable margin (UNCTD, 2002).

In Mexico, reptile skins are processed and manufactured into a wide variety of products. An important problem for government is the control of reptile skins between the import, manufacture and re-export processes. A tracking system for reptile skins and skin products is non-existent. CITES Certificates do specify in most cases numbers of skins and percentages of skins by size for every shipment. However, what happens to the skins within the Mexican leather and footwear industry remains unclear. How many products are made from each skin? Are the skin products really manufactured with non-native reptile skin imports or with non-regulated native species? In addition, analysis of manufactured products is much more problematic than analysis of trade in skins. There is inconsistency in the terms used to describe products. A "leather item" may refer to any product containing leather, and it is often very difficult to identify skins when only small pieces, often dyed, are used. Often a single item may be composed of several different types of leather. Even where reporting is reasonably accurate, it is usually very difficult to interpret the statistics, and particularly to relate the information to the number of animals used. Verifying that the production of the Mexican leather industry indeed corresponds to the imported skins remains a key challenge for the Mexican authorities. Marking systems are increasingly being used as an additional means to control and track trade, such as the universal tagging system for crocodile skins (Reeve, 2002). However, other reptile skins largely imported by Mexico (e.g. *Python reticulatus* and *Varanus salvator*), as well as all reptile skin products made in Mexico, are unmarked. Thus control and trade recording is dependent on permits and certificates alone.

Chapter 7

7 The Use of Native Reptiles in the Mexican Leather Industry

7.1 Introduction

Native species exploited by the leather industry mainly comprise crocodiles, iguanas, caimans and rattlesnakes. However, most of their commercial exploitation is illegal and, in some cases, not feasible due to depleted populations. Even though some species of reptiles are already at risk of extinction in Mexico, still remain important for the import and export businesses (SEMARNAP, 1997).

In Mexico, the skins of terrestrial vertebrates including reptiles have many uses. These may include traditional domestic uses such as the exhibition of skin rugs, ornamental pieces, blankets or linen, and seat coverings. They may also be used to supply both the national and foreign markets with commercial material for leather industry and crafts; leather fine articles and accessories; and the footwear industry (Pérez-Gil *et al.*, 1996).

There has been large-scale use of many Mexican species of reptile in the leather industry, as evidenced by the existence of several specific fees for the import and export of skins. The market of fine skins in Mexico changes constantly, and prices fluctuate against capture volumes and the estimated abundance in wild populations. The greater the rate of capture, the smaller becomes the remaining usable population, in turn causing an increase in its price (Pérez-Gil *et al.*, 1996).

An analysis by USFWS in the early 1990s showed that green iguanas, boas and rattlesnakes entered the US-Mexican trade. Several endangered species listed on CITES Appendix I and protected under the US Endangered Species Act occasionally entered trade from Mexico, including *Crocodylus acutus* and *C. moreletii* (Rose, 1991). Recently, the provisions of the *Ley de Impuesto General de Exportaciones* were modified, allowing the export of specimens, products and by-products of rattlesnakes (*Crotalus* spp.) and turtles *Geochelonias* spp. and *Trachemis* spp.; also of crocodiles and caimans *Crocodylus moreletii*, *C. acutus* and *Caiman crocodilus fuscus* (CONABIO, 1998).

Snakes and lizards feature heavily in the international trade in reptile skins. Many of the snake species are not listed in the CITES Appendices, so the potential impacts of trade on these have not been well documented. Rattlesnakes and other North American species in trade are largely unmanaged (Warwick, 1991), and the extent to which Mexican species are used is unknown (Fleming, 1999). The following Mexican species have been observed for sale in Mexico: Green Iguana (*Iguana iguana*), Crocodile (*Crocodylus* spp.), Morelet's Crocodile (*Crocodylus moreletii*), and Western Diamondback Rattlesnake (*Crotalus atrox*) (Table 7.1).

Table 7.1 Prices of Reptiles in Mexico

Species	Value MX$	Value US$
Crocodylus spp.	200	20
Iguana iguana	70	7
Crocodylus moreletii	200	20
Crotalus atrox	800	80

Modified from Fleming (1999)

This chapter aims to examine the trade of reptile skins and products from native species in Mexico, to determine the most important trade in terms of volume and the trends in exports, and to study the contrast between these exports and re-exports from non-native species.

In particular, in this chapter I seek to answer the following questions:

- Which native species and in what quantities are they exported?
- How have patterns of exports changed in relation to key events in Mexico, such as bans and accession to CITES?
- How do overall reported exports of native species compare with overall re-exports of non-native species?

7.2 Methodology

7.2.1 CITES trade data

This chapter uses data on volumes of various species and genera in trade stored in the CITES Trade Database held at the World Conservation Monitoring Centre in Cambridge, UK. The trade records compiled were for all Mexican exports from 1980 to 2001 for the following native specific genera and species:

- *Caiman* spp.
- *Crocodylus* spp.
- *Boa constrictor*
- *Iguana iguana*
- *Chelonia* spp.
- *Lepidochelys* spp.
- *Caretta caretta*
- *Eretmochelys imbricata*

The trade data were selected from a comparative tabulation format, regardless of reported source of purpose. Microsoft Excel was used to sort and sum subsets of the data appropriately, and also to generate the graphic representations. All quantities traded were added together for all records where the following details were the same: species, the year in which the trade occurred, unit either number of skins, number of skin pieces or skin weight, term (description of specimens traded), country of export (where exports are reported), and country of import (where imports are reported). The terms used were: shoes, skins, skin pieces, leather items, watchstraps, belts, handbags, and wallets.

Data for similar terms and units were combined to facilitate comparison. The comparison was limited to those terms and/or units accounting for the greatest amount of trade. All calculations were performed separately on trade reported in units of number of skins, number of skin pieces and weight (kg), since terms reported in different units (e.g. m^2, kg, lb, number of skins, number of skin pieces, skin products) cannot be added together. Skins and skin pieces were summed separately, while all skin products such as wallets, shoes, belts and handbags were summed together like skin products, with the exception of garments and plates. In the case of shoe pairs, each shoe was regarded as a single skin product.

CITES annual reporting on trade transactions by the Parties is often complete for any given year (Harris *et al.*, 2003). From 1980-2001, most of the reptile skins exported from Mexico were imported by the US (Section 7.3.1.4). The US submitted its annual reports from 1991-2001 (CITES Secretariat, 2003). This allows confidence in the following results that seek to interpret trade patterns in reptile skins exported from Mexico.

7.2.2 LEMIS trade data

This chapter uses data on volumes of various species and genera in trade stored in the LEMIS Trade Database (*Law Enforcement Management Information System*) held at the Fish and Wildlife Service in the US. The trade records compiled were for all imports to the US from 1995 to 1999 for the following native specific genera and species:

- *Caiman* spp.
- *Crotalus* spp.
- *Iguana* spp.
- *Crocodylus* spp.
- *Boa constrictor*

The trade data were selected from a comparative tabulation format, regardless of reported source of purpose. Microsoft Excel was used to sort and sum subsets of the data appropriately, and also to generate the graphic representations. All quantities traded were added together for all records where the following details were the same: species, the year in which the trade occurred, unit either number of skins, number of skin pieces or skin weight, and term (description of specimens traded). The terms used were: small products, large products, watchbands, shoes, and handbags.

Data for similar terms and units were combined to facilitate comparison. The comparison was limited to those terms and/or units accounting for the greatest amount of trade. All calculations were performed separately on trade reported in units of number of skins, number of skin pieces and skin weight (kg), since terms reported in different units (e.g. m^2, kg, lb, number of skins, number of skin pieces, skin products) cannot be added together. Skins and skin pieces were summed separately, while all skin products were summed together, with the exception of garments and plates. Each shoe was regarded as a single skin product.

7.2.3 Graphical presentation of data

The full range of data available from the CITES Trade Database and LEMIS Trade Database was too large to represent all fields graphically. Hence, only the most important fields were selected for graphical illustration in relation to the question under consideration. The fields most often selected comprised the numbers of whole skins, skin pieces and skin products, because these predominate over all other traded volumes. The proportions of exports of different species were contrasted by using pie charts. Annual changes in the volumes of species exported and re-exported are shown with scattergrams and bar charts. This allowed traded volumes and trends for different groups to be assessed individually, as well as compared between groups. Stacked bar plots were also used to facilitate the comparisons of relative and absolute trade volumes. "Event arrows" were added to mark specific events, such as trade restrictions, that came into effect at given times, in order to help with interpretation of the results.

7.3 Results

7.3.1 Exports based on CITES trade data 1980-2001

7.3.1.1 Total reptile skin exports

Mexico exports various of its native species of reptile, both as whole skins and as skin products (Table 7.2). From 1980 to 2001, most exports were from *Chelonia* spp., followed by *Caiman* spp. and *Crocodylus* spp. In terms of skin products, the most exported species were from *Chelonia* spp., followed by *Lepidochelys* spp., *Crocodylus* spp., *Boa constrictor*, *Caiman* spp., and *Iguana iguana* (Figure 7.1a,b).

Table 7.2 Mexican exports: reptile whole skins and skin products from native species 1980-2001

Species	Number of skins	Number of skin products
Chelonia spp.	28,405	24,447
Caiman spp.	1,304	1,808
Crocodylus spp.	301	2,331
Iguana iguana	21	754
Lepidochelys spp.	20	3,584
Boa constrictor	12	2,035
Caretta caretta	-	300
Eretmochelys imbricata	-	171
Total	**30,063**	**35,430**

Source: UNEP-WCMC CITES Trade Database

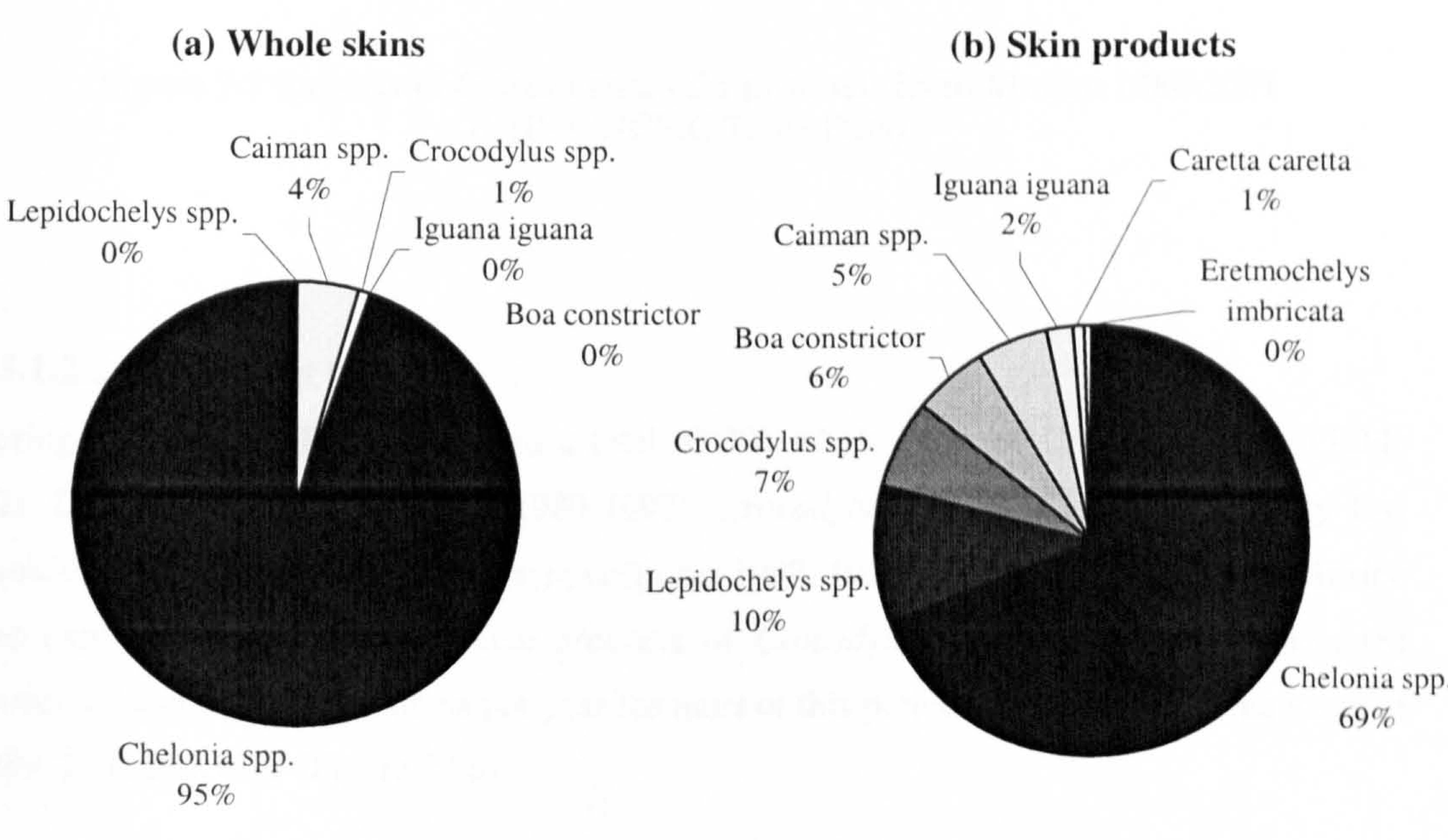


Figure 7.1 Exports of reptile skins from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2 Reptile skin exports by individual species

7.3.1.2.1 *Caiman* spp.

During 1980-2001, Mexico exported a total of 1,304 whole skins of *Caiman* spp. (Table 7.2), the vast majority in 1993. Mexico also exported a total of 1,808 skin products of *Caiman* spp. During most of the period 1980-1998, *Caiman* spp. products were exported in low quantities (< 100 skin products per year) excepting in 1989. However, trade increased in 1999 and has remained at high levels until 2001 (Figure 7.2).

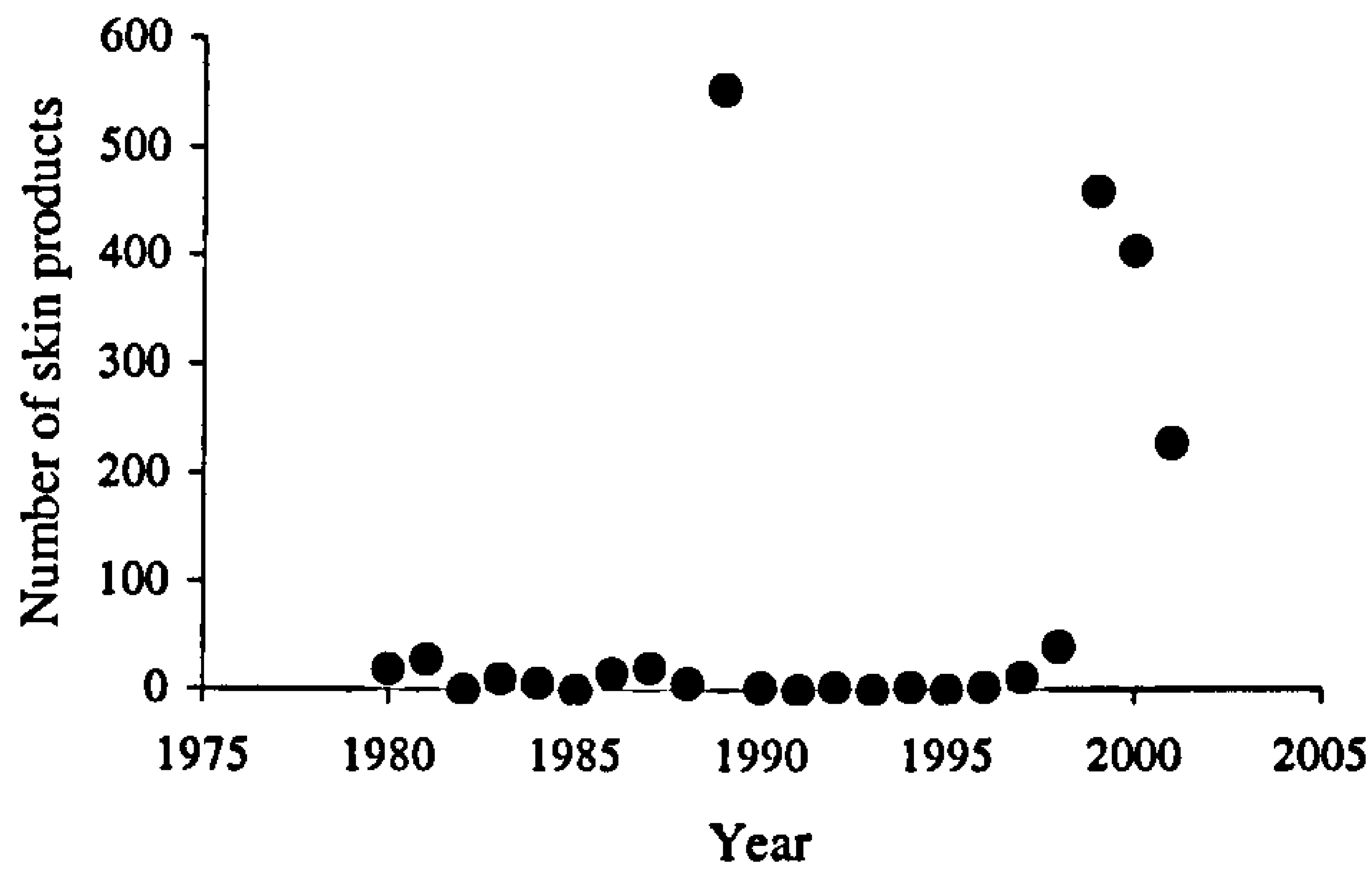


Figure 7.2 Exports of *Caiman* spp. skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.2 *Crocodylus* spp.

During 1980-2001, Mexico exported a total of 301 whole skins of *Crocodylus* spp. (Table 7.2). During most of the period (1980-1997), *Crocodylus* spp. was exported in very low quantities (< 10 whole skins per year) except for 1997, 1998 and 2001 (Figure 7.3a). Mexico also exported a total of 2,331 skin products of *Crocodylus* spp. Exports have fluctuated between 0 and 200 skin products per year for most of this period, excepting the three years of 1989, 1998 and 1999 (Figure 7.3b).

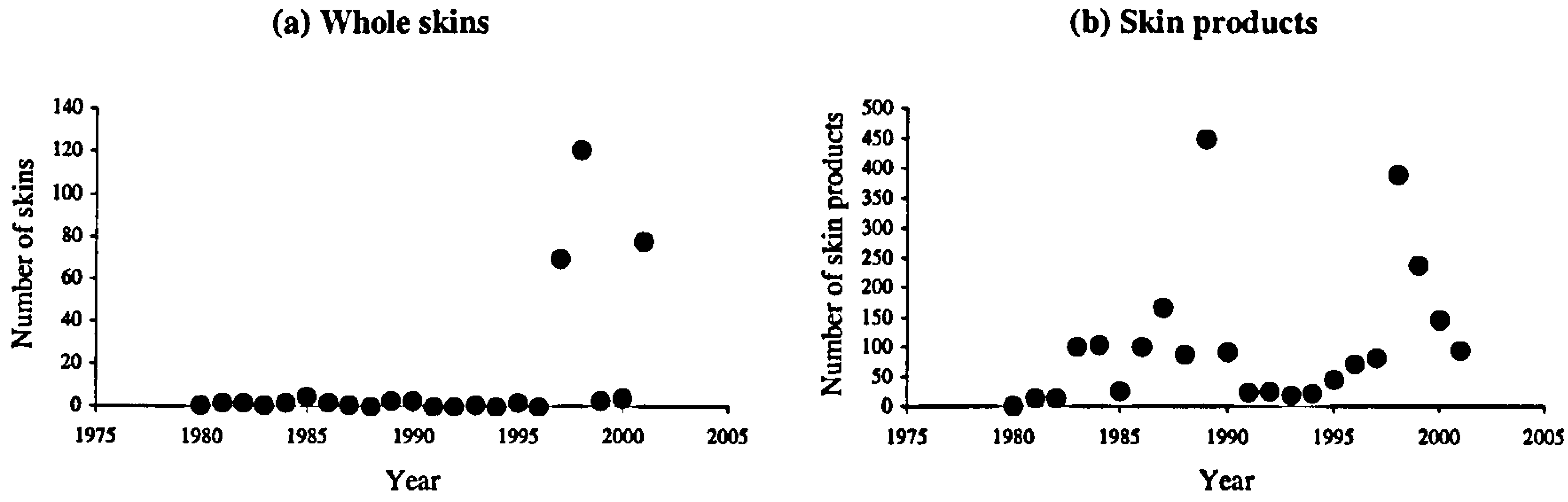


Figure 7.3 Exports of *Crocodylus* spp. from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.3 *Boa constrictor*

During 1980-2001, Mexico exported only 12 whole skins of *Boa constrictor*, but Mexico exported a total of 2,035 skin products (Table 7.2). Most exports were made at the beginning of this period, but trade has since declined and has remained close to zero (Figure 7.4).

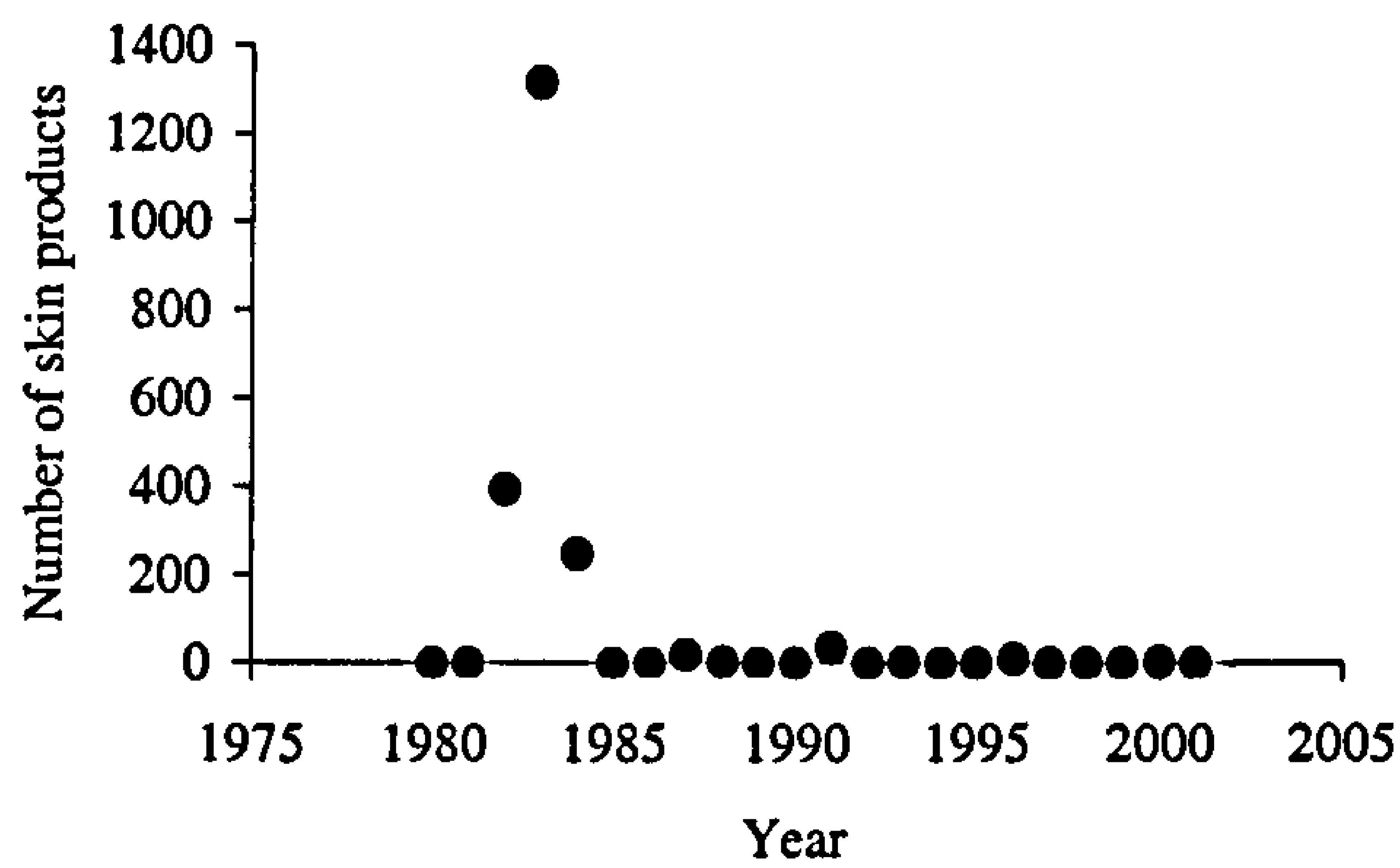


Figure 7.4 Exports of *Boa constrictor* skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.4 *Iguana iguana*

During 1980-2001, Mexico exported only 21 whole skins of *Iguana iguana*, but exported a total of 754 skin products (Table 7.2). Exports have fluctuated between 0 and 50 skin products per year for most of this period, excepting the three years of 1987, 1993 and 1996 (Figure 7.5).

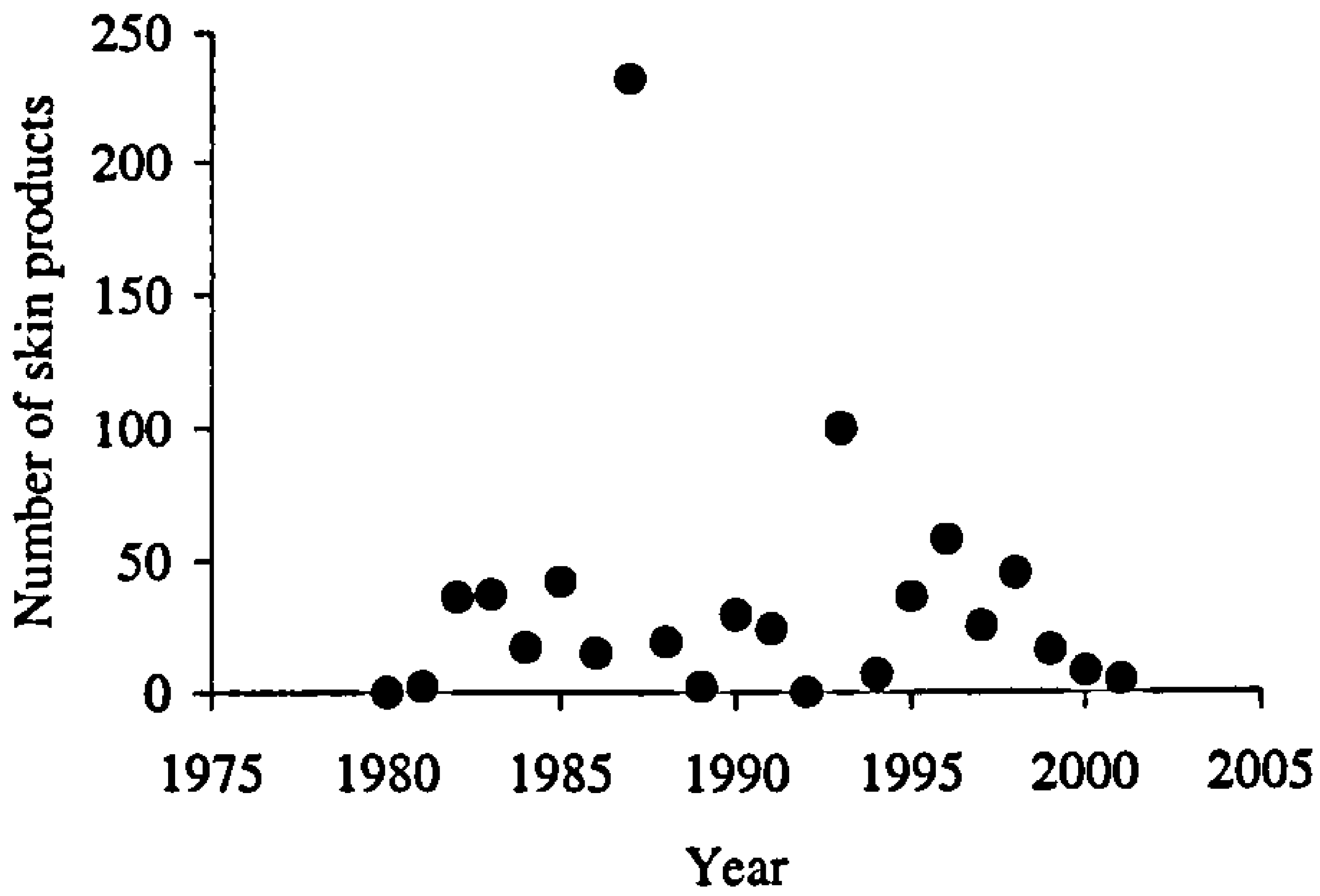


Figure 7.5 Exports of *Iguana iguana* skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.5 *Chelonia* spp.

During 1980-2001, Mexico exported a total of 28,405 whole skins of *Chelonia* spp. (Table 7.2). Most skins were exported at the beginning of this period and exports have declined abruptly since 1984 and have remained close to zero (Figure 7.6a). Mexico also exported a total of 24,447 skin products of *Chelonia* spp. Few *Chelonia* spp. products were exported at the beginning of the period, but exports increased steadily to peak in 1989, and have declined steadily since to reach low quantities in 2001 (Figure 7.6b).

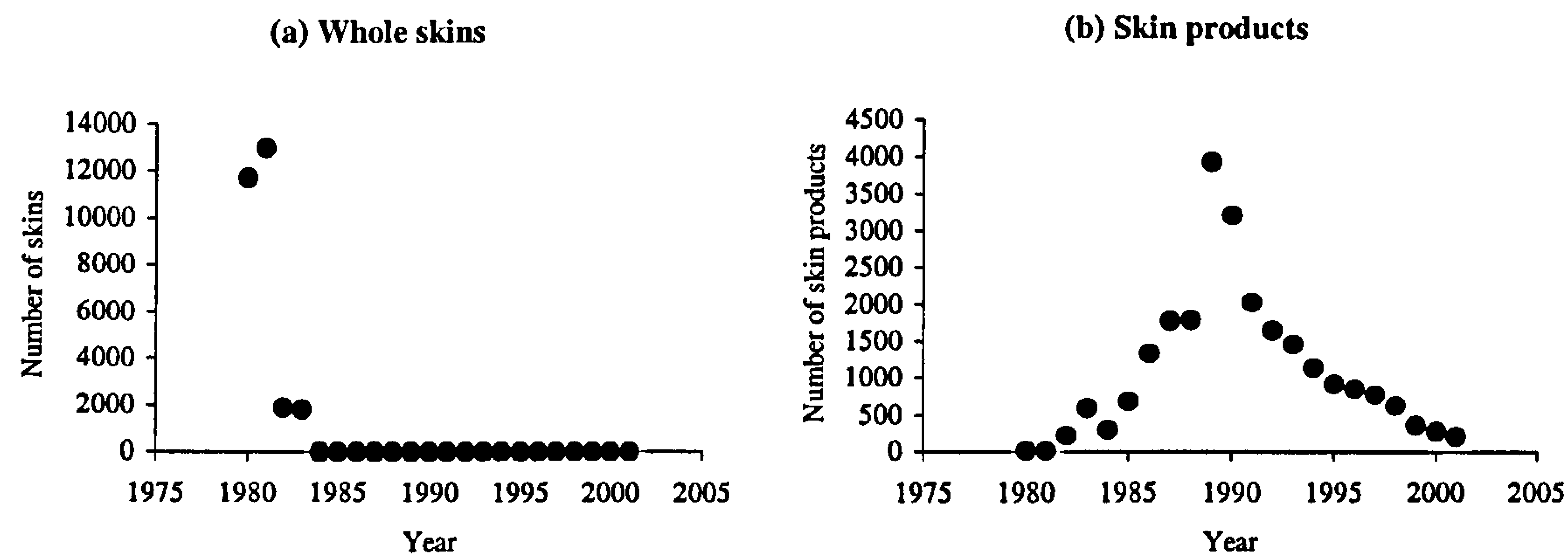


Figure 7.6 Exports of *Chelonia* spp. from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.6 *Lepidochelys* spp.

During 1980-2001, Mexico exported only 20 whole skins of *Lepidochelys* spp. (Table 7.2), all before 1988. Mexico also exported a total of 3,584 skin products of *Lepidochelys* spp. (Table 7.2). At the beginning of the period *Lepidochelys* spp. was exported in very low quantities (< 20 skin products per year), but exports increased from 1983 and peaked in 1989, after which exports have declined (Figure 7.7).

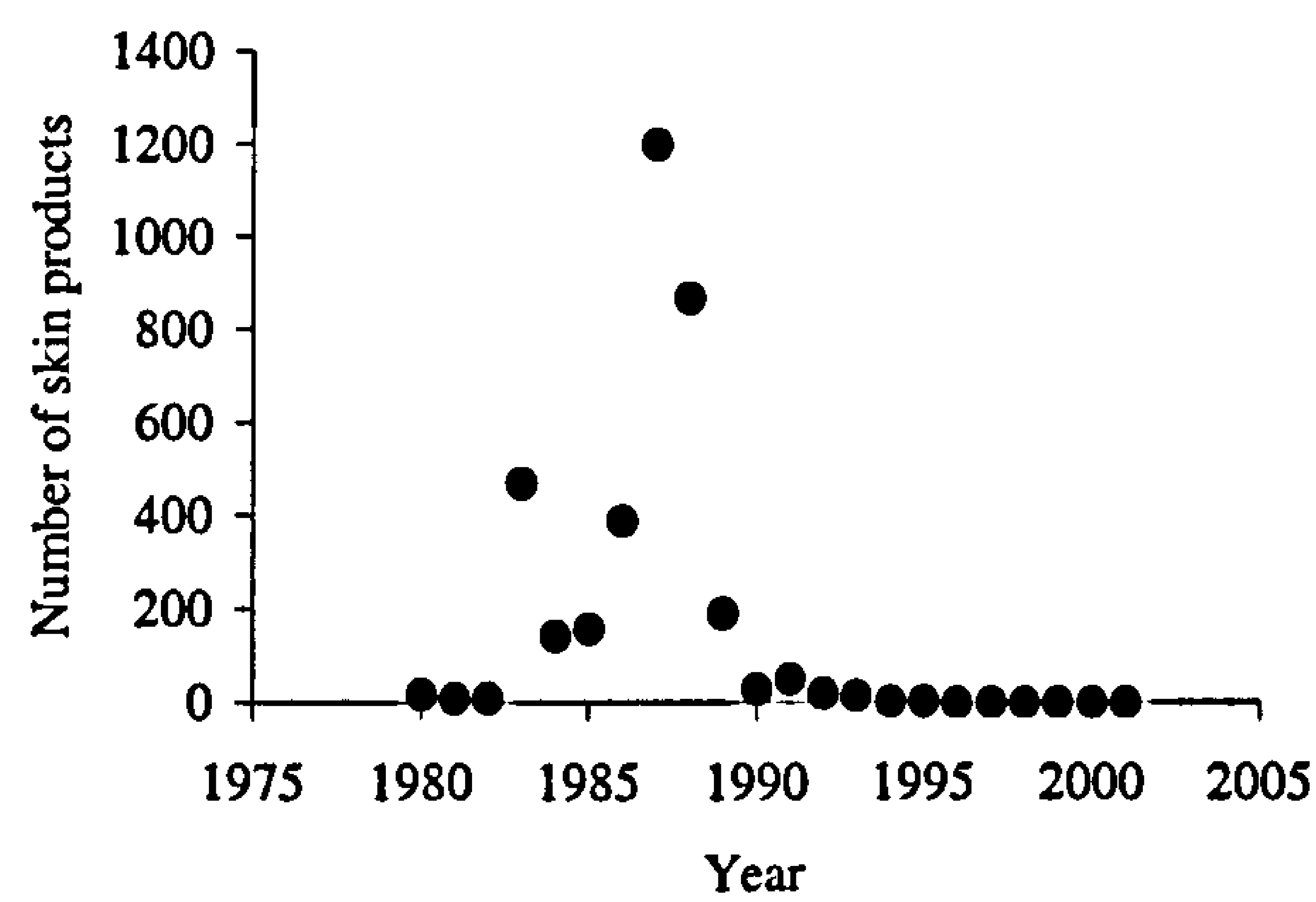


Figure 7.7 Exports of *Lepidochelys* spp. skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.7 *Caretta caretta*

During 1980-2001, Mexico exported a total of 300 skin products of *Caretta caretta* (Table 7.2). Exports were low (< 10 skin products per year) at the beginning of the period, but increased to peak in 1990, have since decreased to zero (Figure 7.8).

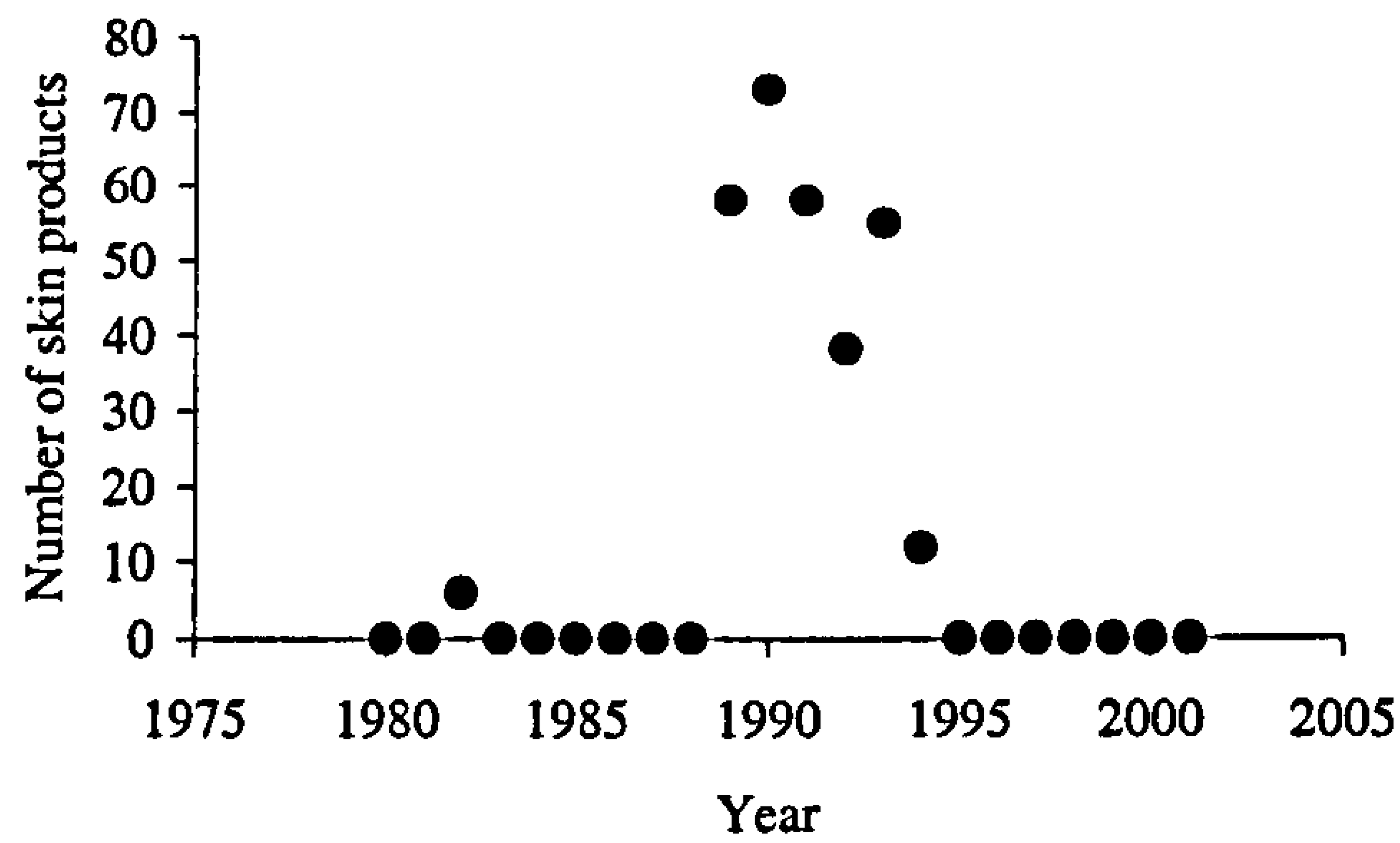


Figure 7.8 Exports of *Caretta caretta* skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.2.8 *Eretmochelys imbricata*

During 1980-2001, Mexico exported a total of 171 skin products of *Eretmochelys imbricata* (Table 7.2). Exports rose at the beginning of this period to peak in 1987, but exports have since decreased to zero (Figure 7.9).

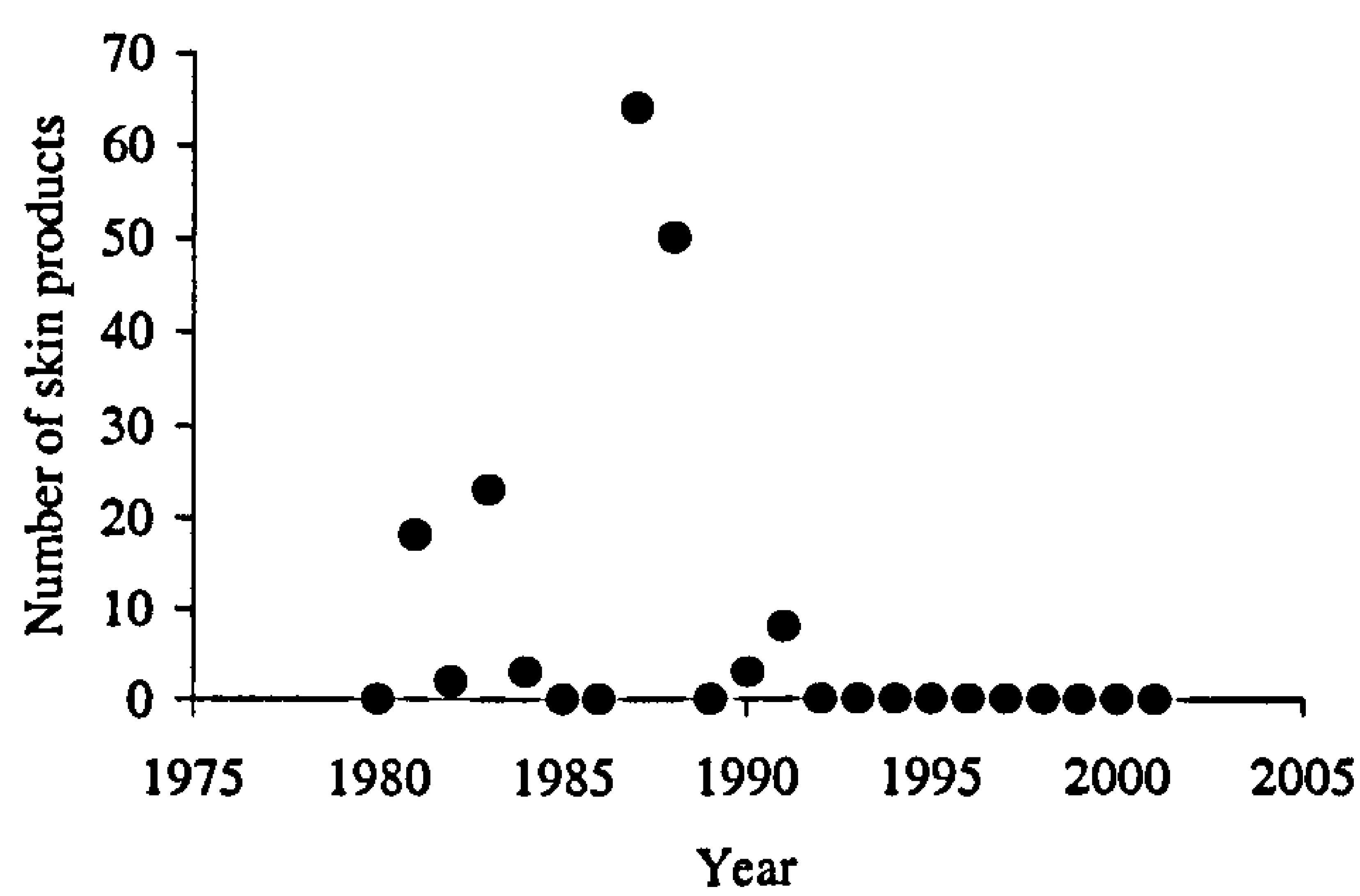
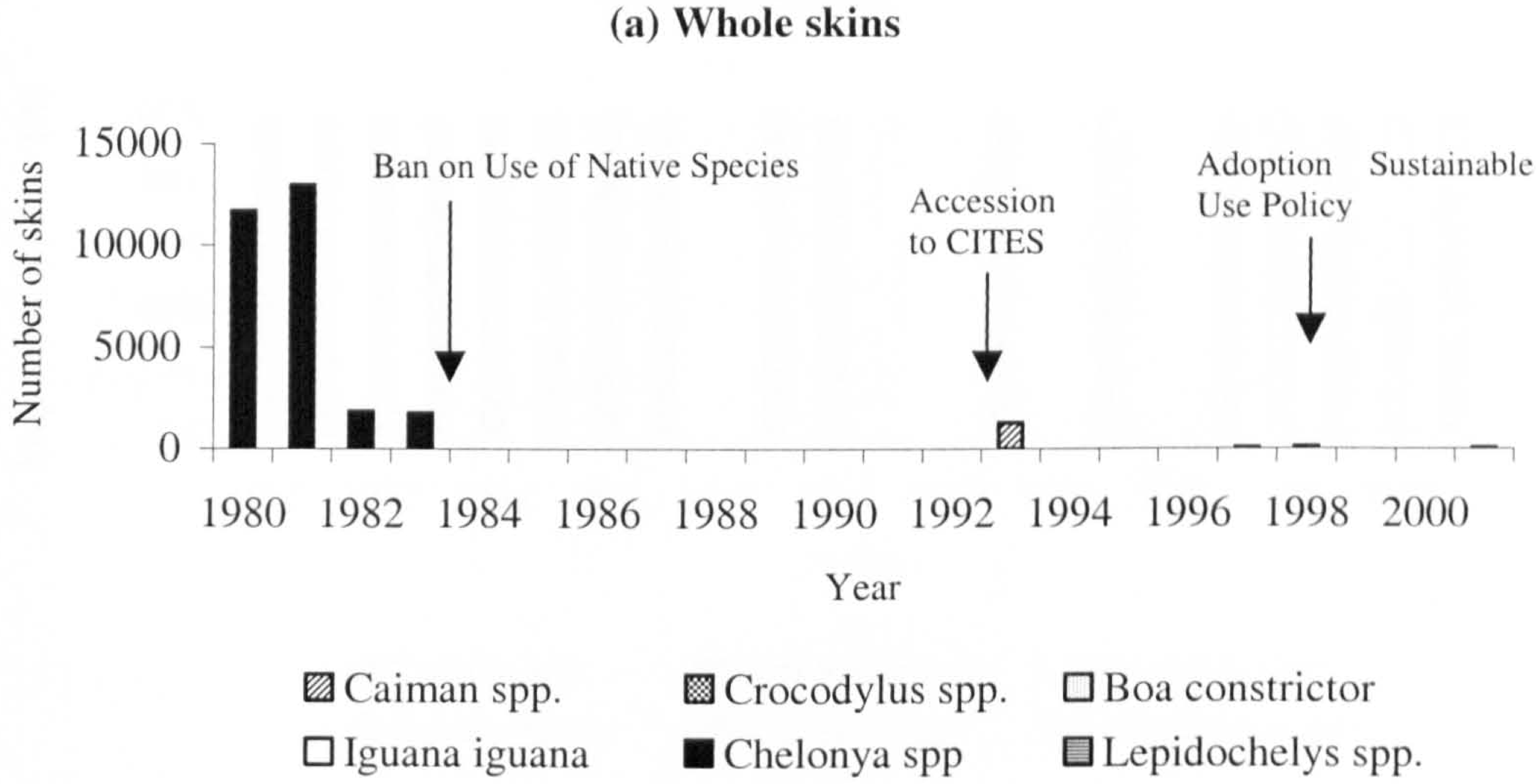


Figure 7.9 Exports of *Eretmochelys imbricata* skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

7.3.1.3 Total reptile skin exports by year

From 1980 to the early 2000s, Mexico exported decreasing quantities of whole reptile skins (Figure 7.10a). In contrast, numbers of skin products exported tended to increase from the mid 1980s to peak in 1989, after which exports declined steadily since to reach low quantities in 2001 (Figure 7.10b).



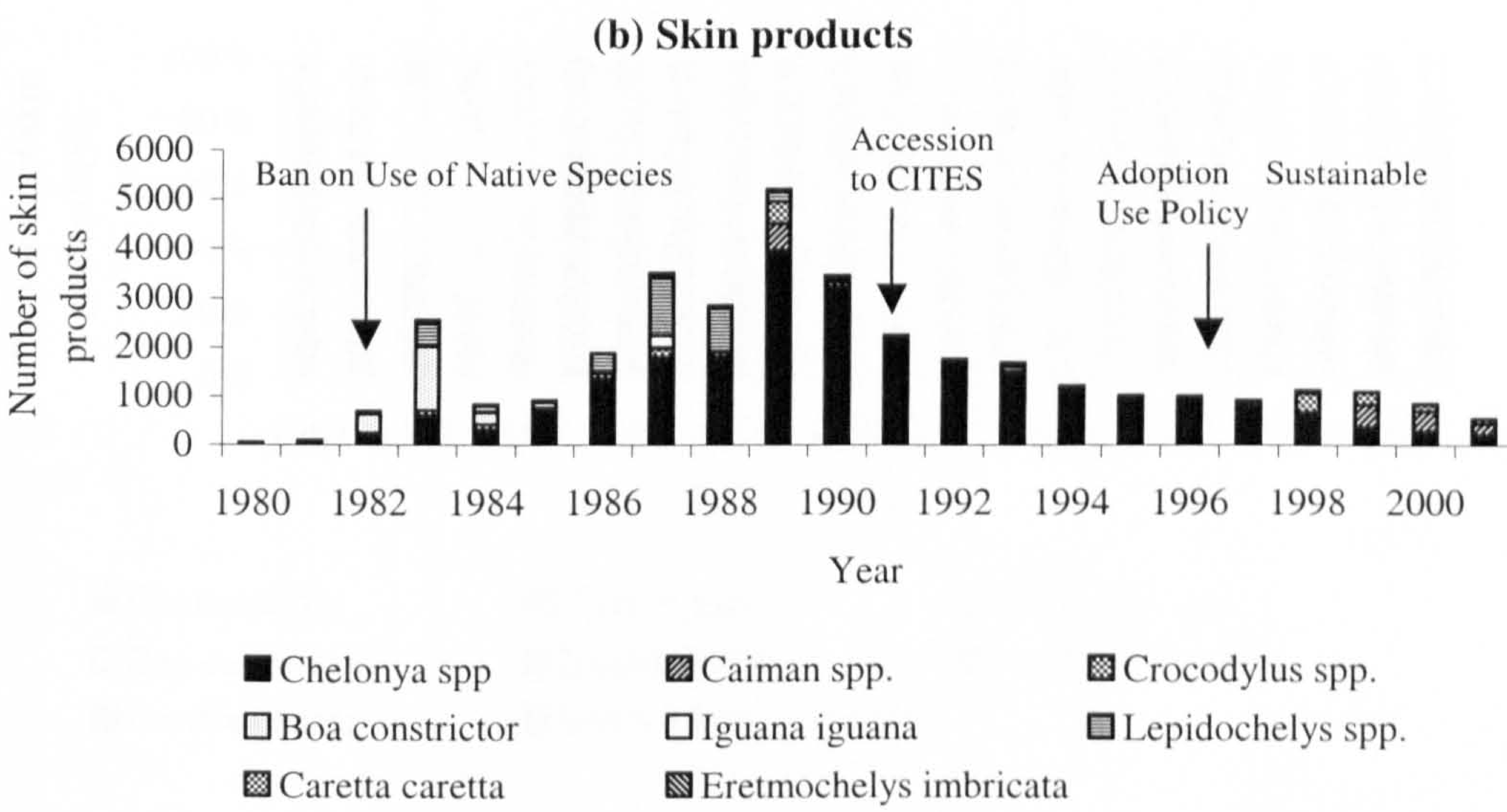


Figure 7.10 Exports of reptile skins by Mexico 1980-2001
(UNEP-WCMC Trade Data)

In terms of species, *Chelonia* spp. made up the majority of Mexico's reptile skin and skin product exports during the 1980s, whether considered in absolute or proportional terms (Figure 7.10a,b; Figure 7.11a,b). In proportional terms, whole skin exports came to be dominated by *Crocodylus* spp. from the early 1990s (Figure 7.11a). However, numbers of skin product exports were still dominated by *Chelonia* spp. in the early 1990s, whether considered in absolute or proportional terms (Figures 7.10b; 7.11b).

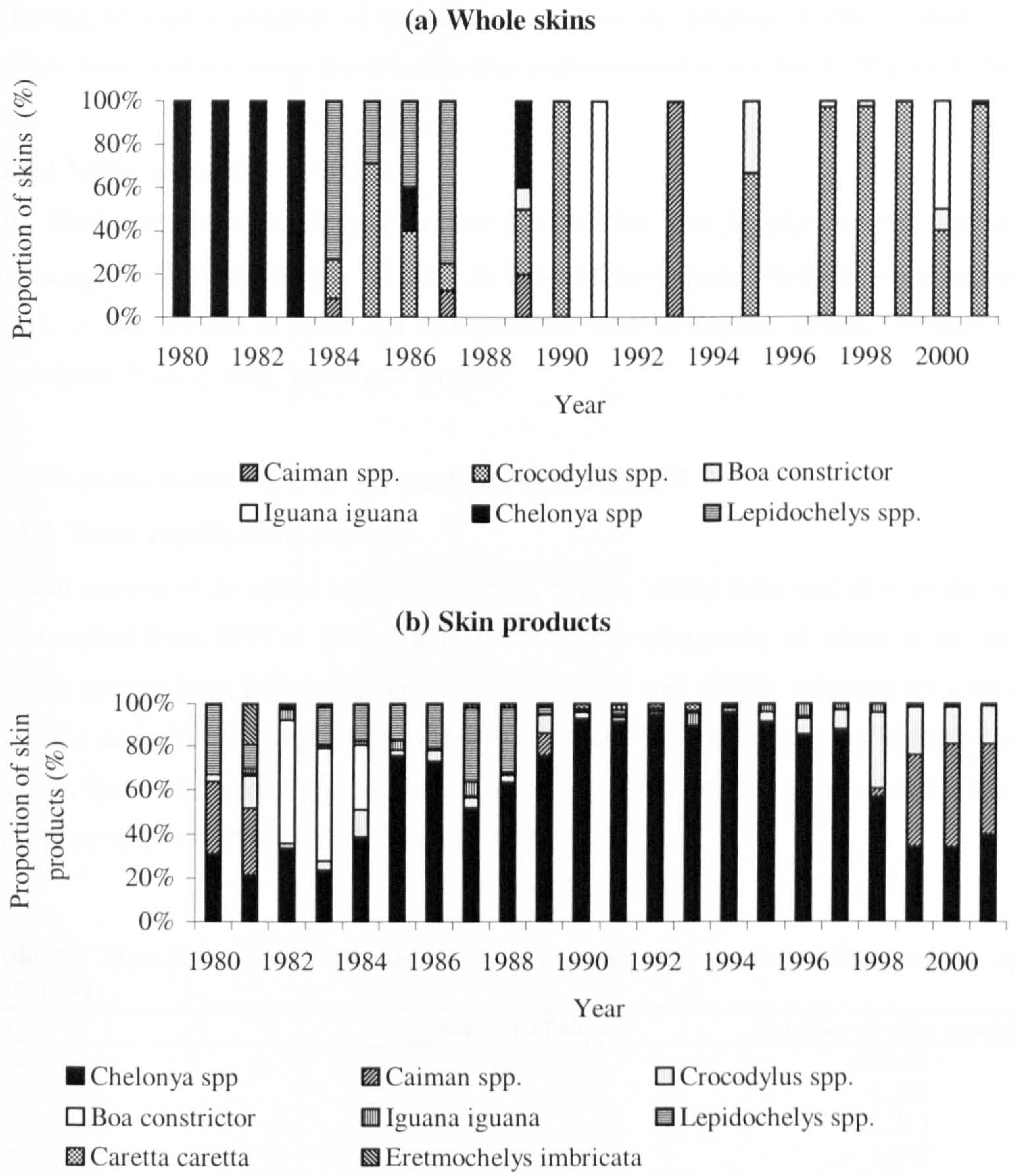


Figure 7.11 Exports of reptile skins by Mexico 1980-2001
(UNEP-WCMC Trade Data)

In terms of key events in Mexico, exports of whole reptile skins from native species decreased after Mexico banned the international trade on native species in 1982 (Figure 7.10a). Even following Mexico's accession to CITES in 1991 and Mexico's adoption of sustainable resource use policies in 1997, exports of whole reptile skins from native species remained at low levels (Figure 7.10a). In contrast, exports of skin products from native species increased steadily after Mexico banned the international trade on native species in 1982, but tended to decrease following Mexico's accession to CITES in 1991 (Figure 7.10b). Following Mexico's adoption of sustainable resource use policies in 1997, exports of skin products from native species decreased further and remained at low levels (Figure 7.10b).

7.3.1.4 Main countries of import

From 1980-2001, Mexico exported around 30,000 skins and 35,000 skin products from its various species of native reptile (Table 7.2). Most of the exports (90-95%) were imported by the US. A few imports of skins and skin products went to Canada, Brazil, Germany, Spain, Switzerland, France, Italy, Japan and Panama.

7.3.2 Exports based on LEMIS trade data 1995-1999

7.3.2.1 Total reptile skin exports

Mexican exports of its native species of reptile, both as whole skins and skin products, were also compiled from 1995 to 1999 (Table 7.3). In terms of quantity of whole skins, the most exported species from Mexico to the US were *Caiman* spp. (97%), followed by *Crocodylus* spp. (2%) and *Crotalus* spp. (1%) (Table 7.3; Figure 7.12a). In terms of quantity of skin products, the most exported species were *Caiman* spp. (90%), followed by *Crotalus* spp. (6%) and *Iguana iguana* (2%) (Table 7.3; Figure 7.12b).

Table 7.3 Mexican exports: reptile whole skins and skin products from native species 1995-1999

Species	Number of skins	Number of skin products
Caiman spp.	2,486	102,691
Crotalus spp.	29	6,794
Iguana iguana	2	2,271
Crocodylus spp.	52	1,449
Boa constrictor	2	592
Total	**2,571**	**113,797**

Source: USFWS LEMIS Trade Data

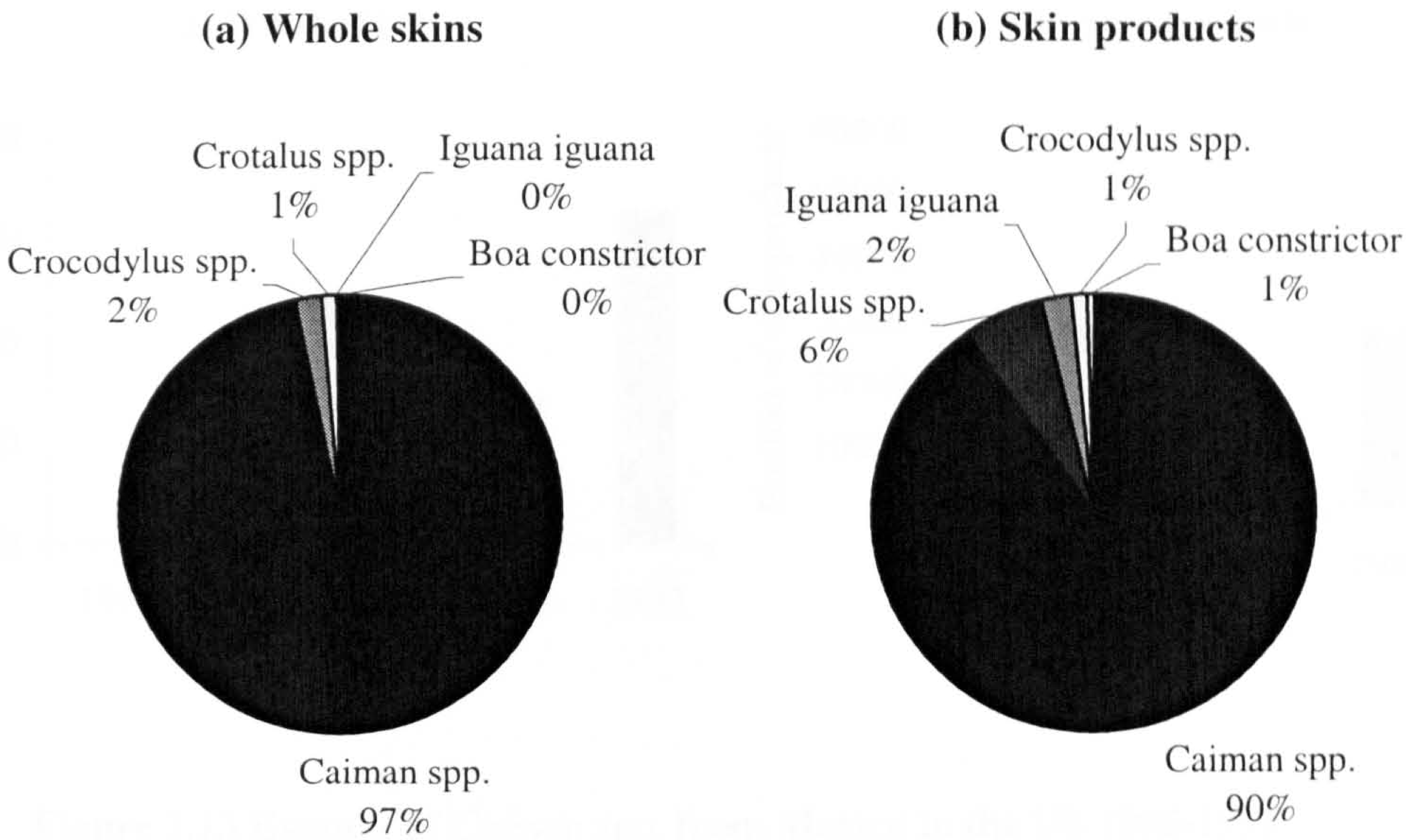


Figure 7.12 Exports of reptile skins from Mexico 1995-1999
(USFWS LEMIS Trade Data)

7.3.2.2 Reptile skin exports by individual species

7.3.2.2.1 *Caiman* spp.

During 1995-1999, Mexico exported a total of 2,486 whole skins of *Caiman* spp. to the US (Table 7.3), and 1,620 of these were in 1999 (Figure 7.13a). Mexico also exported a total of 102,691 skin products of *Caiman* spp. to the US (Table 7.3). The exports of *Caiman* spp. whole skins and skin products increased steadily from 1995-1999, but the numbers of skin products were considerably higher than numbers of whole skins during this period (Table 7.3; Figure 7.13a,b).

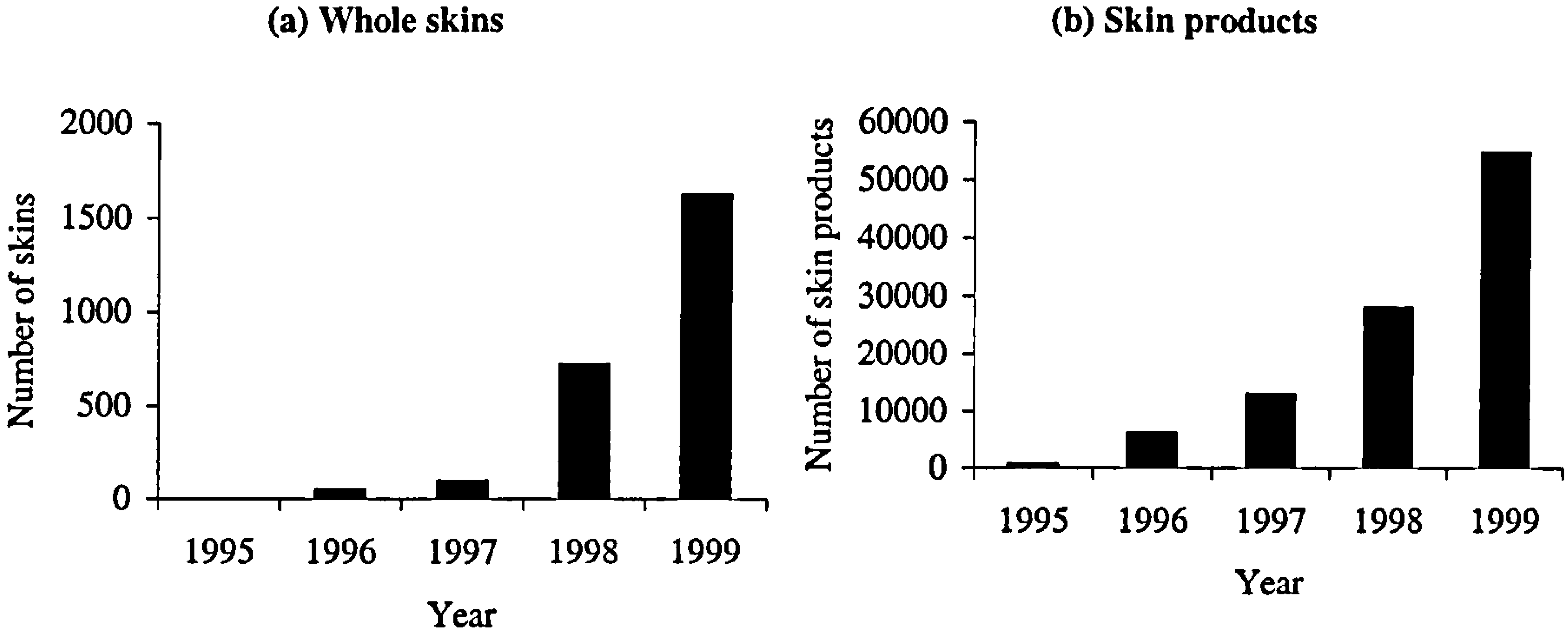


Figure 7.13 Exports of *Caiman* spp. from Mexico to the US 1995-1999
(US FWS LEMIS Trade Data)

7.3.2.2.2 *Crotalus* spp.

During 1995-1999, Mexico exported totals of only 29 whole skins to the US and 6,794 skin products of *Crotalus* spp. to the US (Table 7.3; Figure 7.14a,b). Exports of *Crotalus* spp. products changed little for most of this period excepting 1995 (Figure 7.14b).

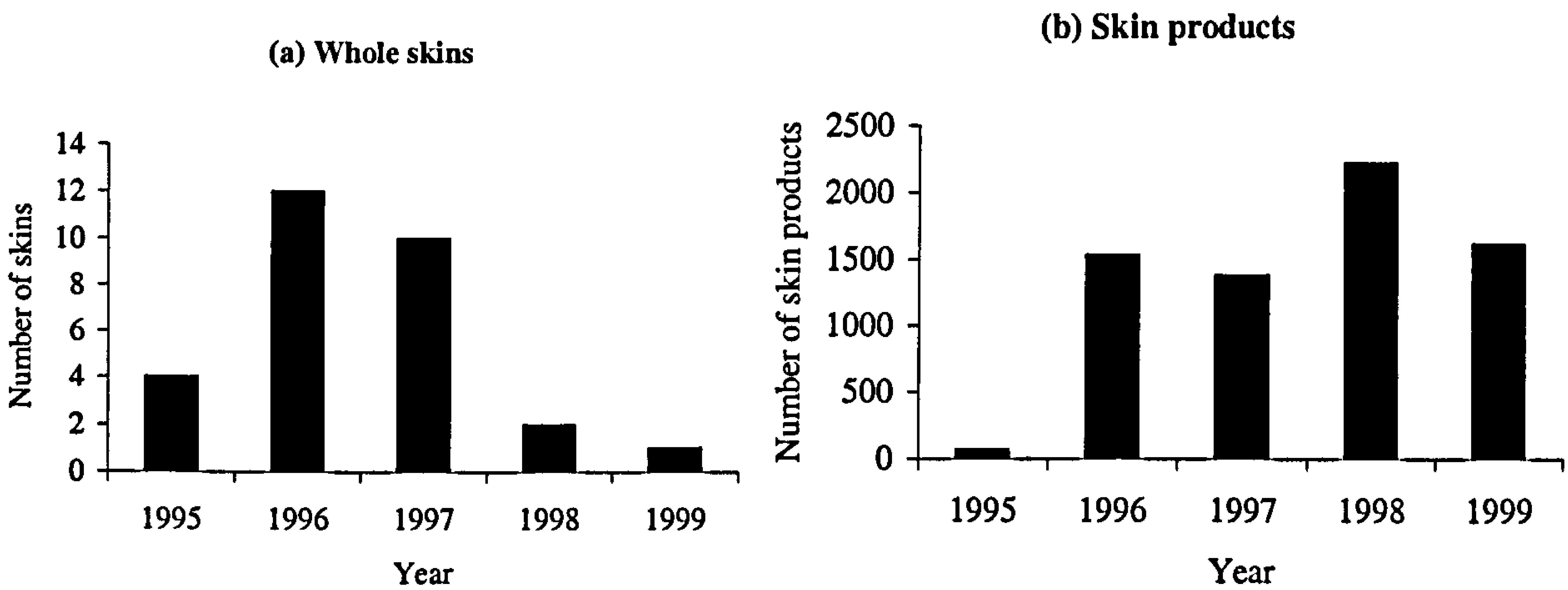


Figure 7.14 Exports of *Crotalus* spp. from Mexico to the US 1995-1999
(US FWS LEMIS Trade Data)

7.3.2.2.3 *Iguana* spp.

During 1995-1999, Mexico exported only 2 whole skins (Table 7.3) and 2,271 skin products of *Iguana* spp. to the US (Table 7.3). Most (1,973) of the latter were exported in 1995, after which exports declined (Figure 7.15).

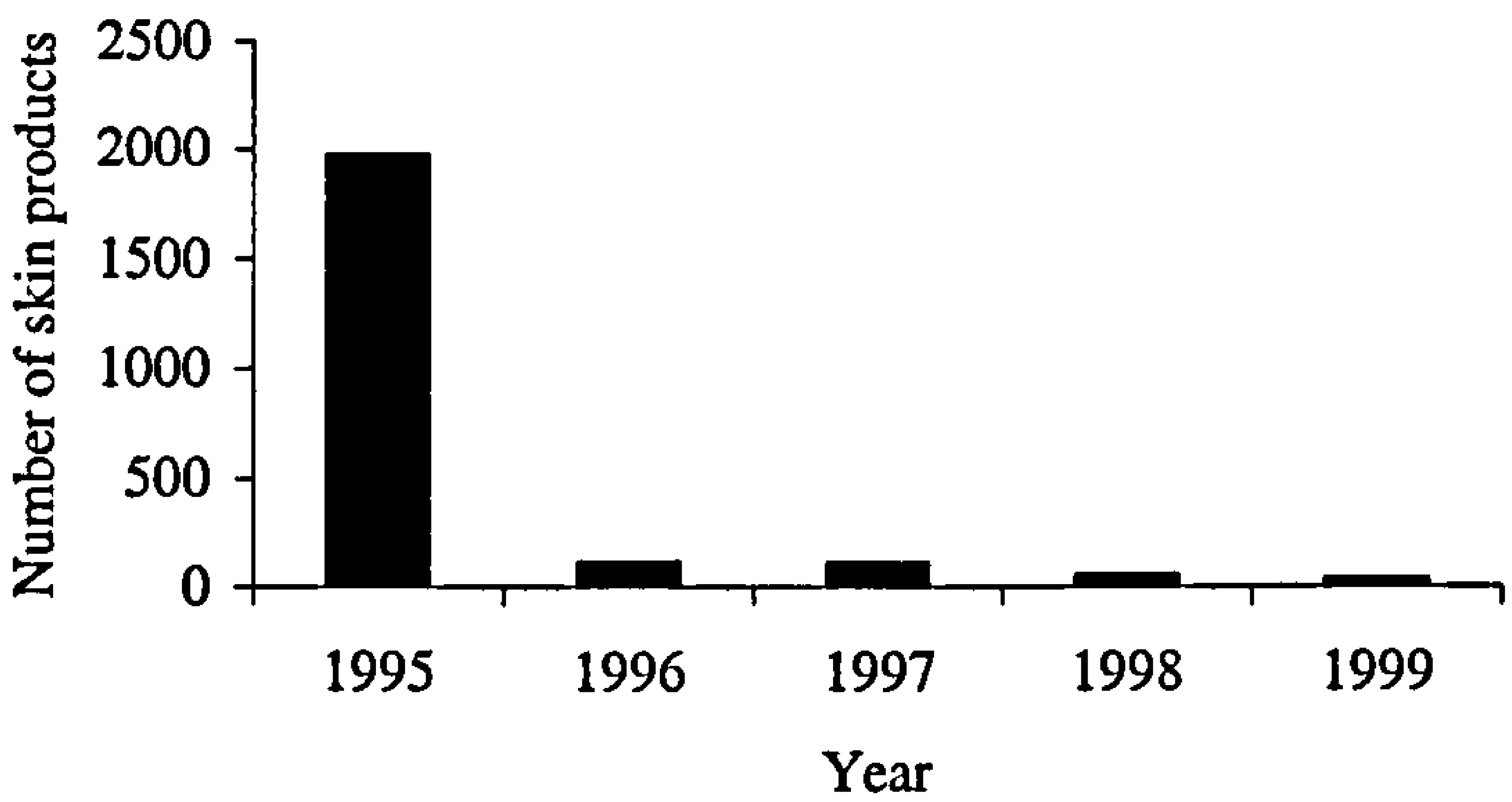


Figure 7.15 Exports of *Iguana* spp. skin products from Mexico to the US 1995-1999
(US FWS LEMIS Trade Data)

7.3.2.2.4 *Crocodylus* spp.

During 1995-1999, Mexico exported a total of only 52 whole skins of *Crocodylus* spp. to the US (Table 7.3), and most of these were exported in 1996. Mexico also exported a total of 1,449 skin products of *Crocodylus* spp. to the US (Table 7.3). Exports of *Crocodylus* spp. skin products increased steadily to peak in 1998, but declined in 1999 (Figure 7.16).

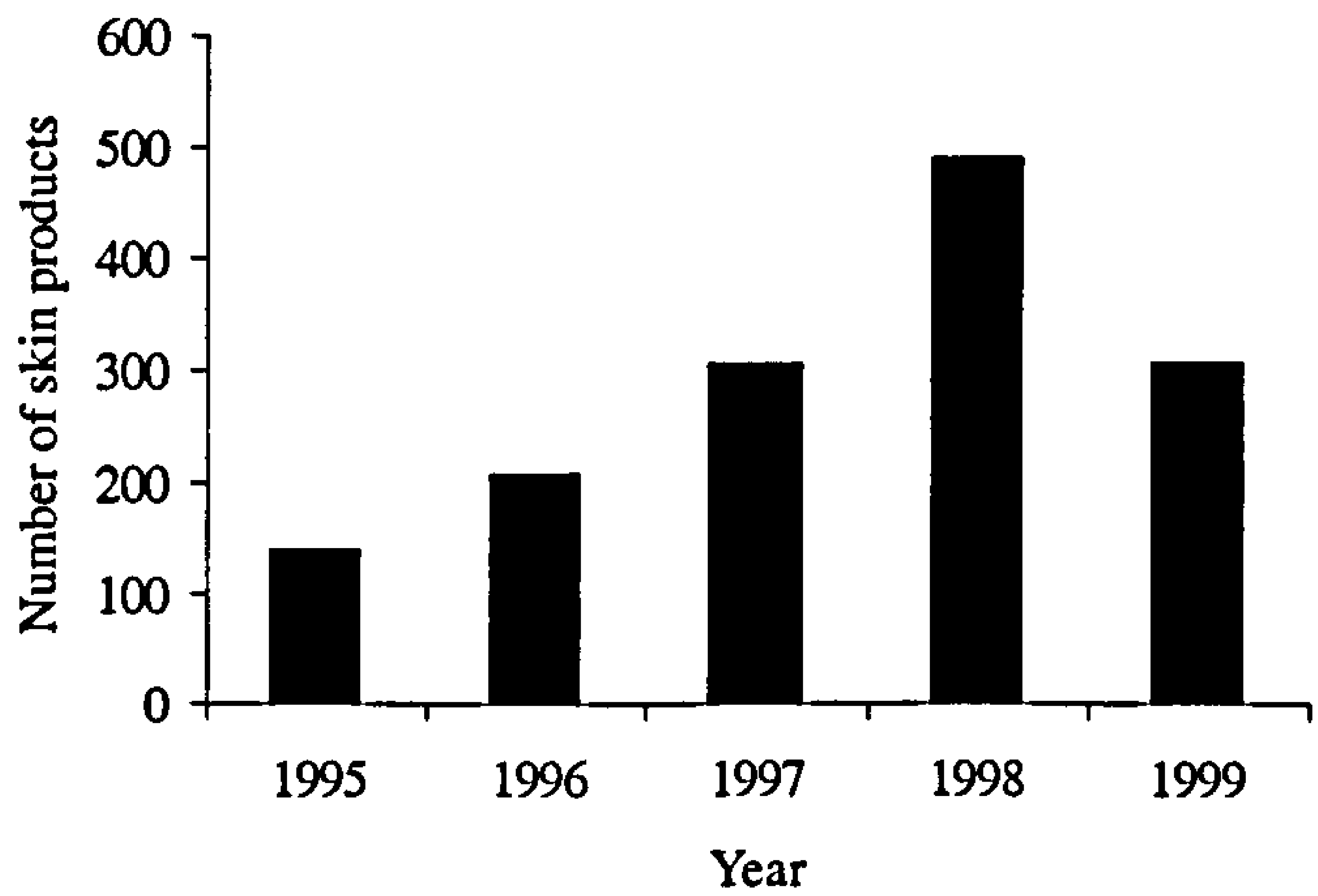


Figure 7.16 Exports of *Crocodylus* spp. skin products from Mexico to the US 1995-1999
(US FWS LEMIS Trade Data)

7.3.2.2.5 *Boa constrictor*

During 1995-1999, Mexico exported only 2 whole skins of *Boa constrictor* to the US (Table 7.3). Mexico also exported a total of 592 skin products of *Boa constrictor* (Table 7.3), and 465 of these were in 1999 (Figure 7.17).

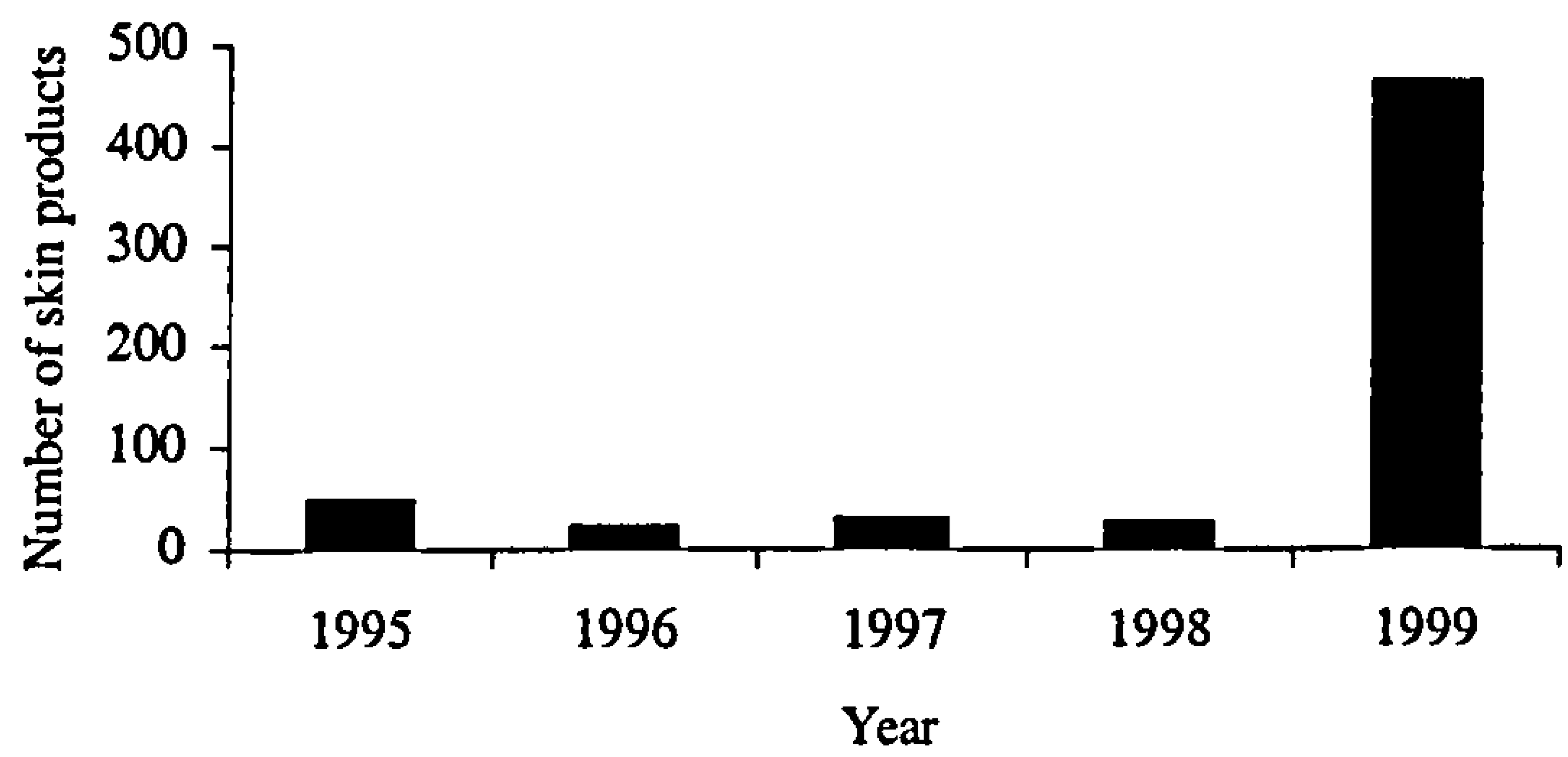


Figure 7.17 Exports of *Boa constrictor* skin products from Mexico to the US 1995-1999 (US FWS LEMIS Trade Data)

7.3.3 Comparison between CITES and LEMIS trade data

From 1995 to 1999, according to LEMIS, Mexico exported some 2,500 whole skins from various of its native species of reptile. In contrast, the WCMC reported 197 whole skins exported from Mexico to the US during this period (Table 7.4). From 1995 to 1999, according to LEMIS, Mexico exported some 105,000 skin products from various of its native species of reptile. In contrast, the WCMC reported 1,354 skin products exported from Mexico to the US during this period (Table 7.5).

Table 7.4 Mexican exports to the US: reptile whole skins from native species 1995-1999

Species	LEMIS	WCMC
Caiman spp.	2,486	0
Crocodylus spp.	52	196
Boa constrictor	2	1
Total	**2,540**	**197**

Sources: UNEP-WCMC CITES Trade Database; USFWS LEMIS Trade Data

Table 7.5 Mexican exports to the US: reptile skin products from native species 1995-1999

Species	LEMIS	WCMC
Caiman spp.	102,691	512
Crocodylus spp.	1,449	831
Boa constrictor	592	11
Total	**104,732**	**1,354**

Sources: UNEP-WCMC CITES Trade Database; USFWS LEMIS Trade Data

In terms of quantity of whole skins, the most stack contrast between LEMIS and the WCMC was for *Caiman* spp. (Table 7.4). During 1995-1999, LEMIS reported 2,486 whole skins exported from Mexico while the WCMC reported zero exports (Figure 7.18). Equally, in terms of quantity of skin products, the most stack contrast between LEMIS and the WCMC was for *Caiman* spp. (Table 7.5). During 1995-1999, LEMIS reported 102,691 skin products exported from Mexico while the WCMC reported only 512 skin products (Table 7.5). There were less stack contrasts for *Crocodylus* spp. and *Boa constrictor* skin products (Table 7.5).

7.3.4 Contrast between reptile skin exports and re-exports

From 1980 to 2001, CITES data suggested that Mexico exported around 1,600 whole skins from various of its native species of reptile. In contrast, Mexico re-exported around 338,500 whole skins from various non-native species of reptile (Table 7.6). Likewise, Mexico exported around 7,000 skin products from various of its native species of reptile from 1980 to 2001. In contrast, Mexico re-exported around 873,800 skin products from various non-native species of reptile (Table 7.7).

Table 7.6 Mexican exports and re-exports: reptile whole skins from native and non-native species 1980-2001

Taxa	Native Species	Non-native Species	Exports	Re-exports
Crocodilians	*Caiman* spp.		1,304	-
		Caiman spp.	-	52,021
	Crocodylus spp.	.	301	-
		Crocodylus spp.	-	513
Lizards	*Iguana iguana*		21	-
		Varanus salvator	-	167,923
		Tupinambis spp.	-	86,271
Snakes	*Boa constrictor*		12	-
		Python reticulatus	-	31,769
Total			**1,638**	**338,497**

Sources: UNEP-WCMC CITES Trade Database

Table 7.7 Mexican exports and re-exports: reptile skin products from native and non-native species 1980-2001

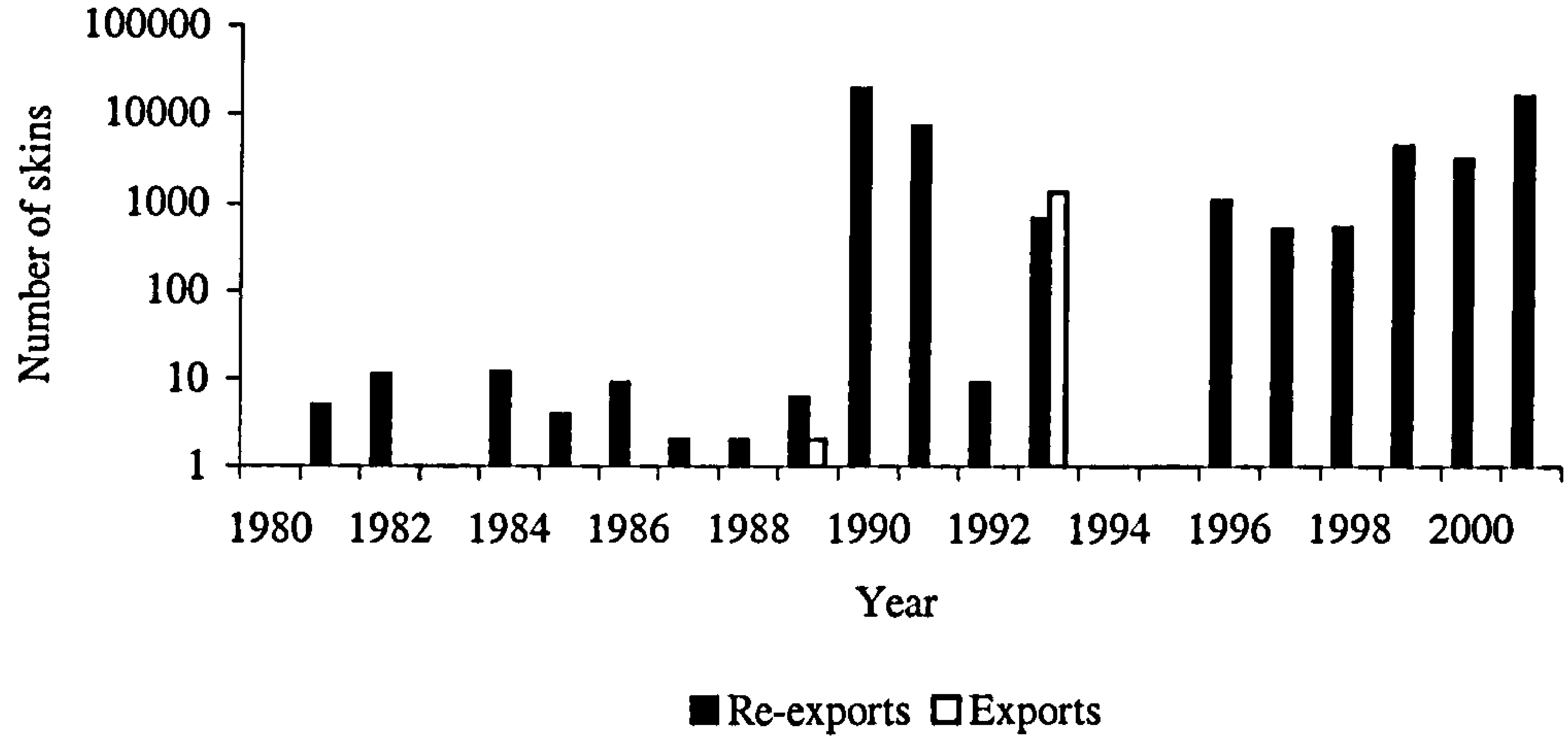
Taxa	Native Species	Non-native Species	Exports	Re-exports
Crocodilians	*Caiman* spp.		1,808	-
		Caiman spp.	-	530,788
	Crocodylus spp.	.	2,331	-
		Crocodylus spp.	-	31,622
Lizards	*Iguana iguana*		754	-
		Varanus salvator	-	64,214
		Tupinambis spp.	-	76,171
Snakes	*Boa constrictor*		2,035	-
		Python reticulatus	-	170,997
Total			**6,928**	**873,792**

Sources: UNEP-WCMC CITES Trade Database

7.3.4.1 Crocodilians

During 1980-2001, Mexico exported a total of 1,304 whole skins of native *Caiman* spp. In contrast, Mexico re-exported a total of 52,021 whole skins of non-native *Caiman* spp. (Table 7.6). Around 40 times as many whole skins of non-native *Caiman* spp. were re-exported compared with native *Caiman* spp. exported (Figure 7.18 a). Likewise, Mexico exported a total of 1,808 skin products of native *Caiman* spp. during 1980-2001. In contrast, Mexico re-exported a total of 530,788 skin products of non-native *Caiman* spp. (Table 7.7). Around 294 times as many skin products of non-native *Caiman* spp. were re-exported compared with native *Caiman* spp. exported (Figure 7.18 b).

(a) Whole skins



(b) Skin products

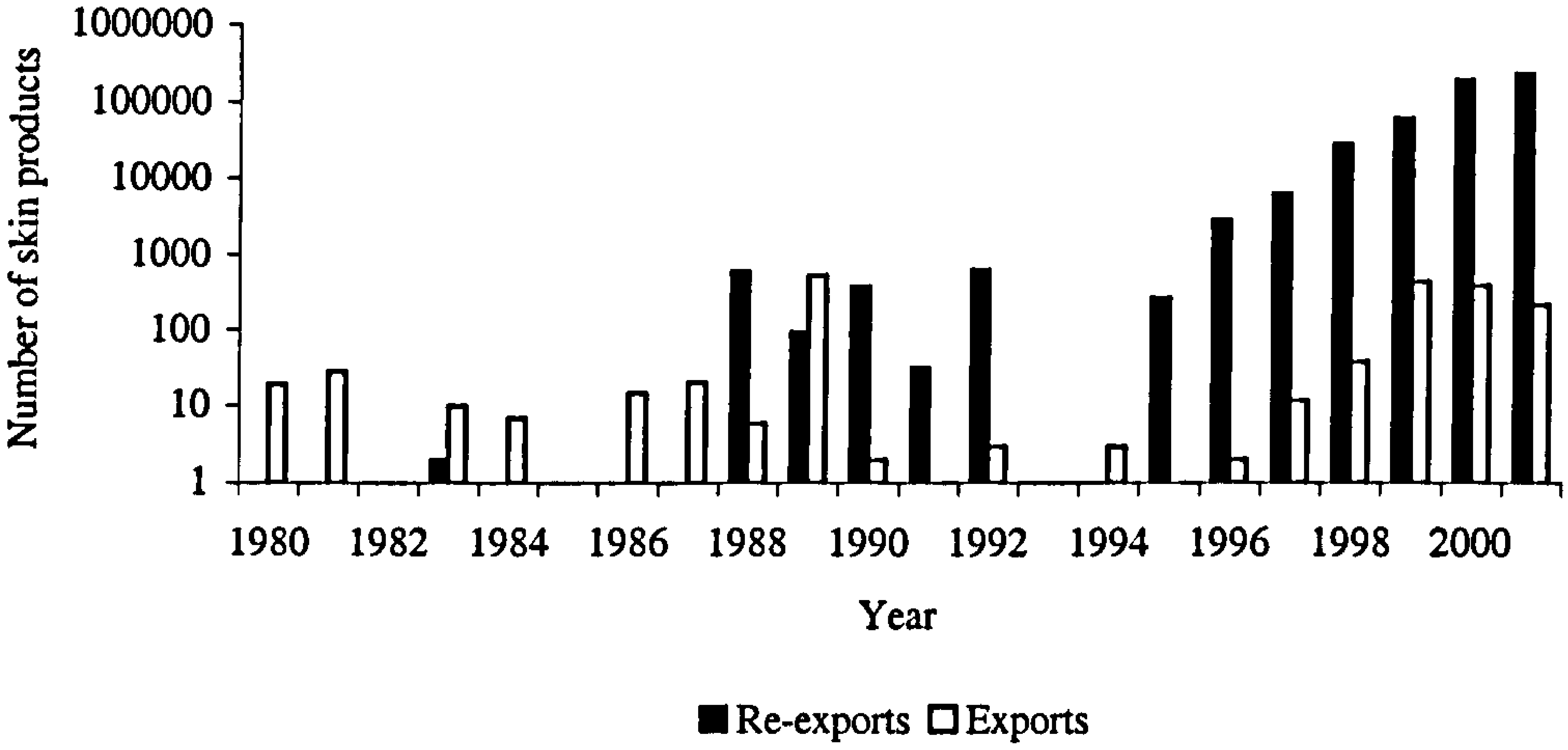


Figure 7.18 Comparison of Mexican reptile skin exports of native *Caiman* spp. and re-exports of non-native *Caiman* spp. 1980-2001 (UNEP-WCMC Trade Data)

During 1980-2001, Mexico exported a total of 2,331 skin products of native *Crocodylus* spp. In contrast, Mexico re-exported a total of 31,622 skin products of non-native *Crocodylus* spp. (Table 7.7). Around 14 times as many skin products of non-native *Crocodylus* spp. were re-exported compared with native *Crocodylus* spp. exported (Figure 7.19).

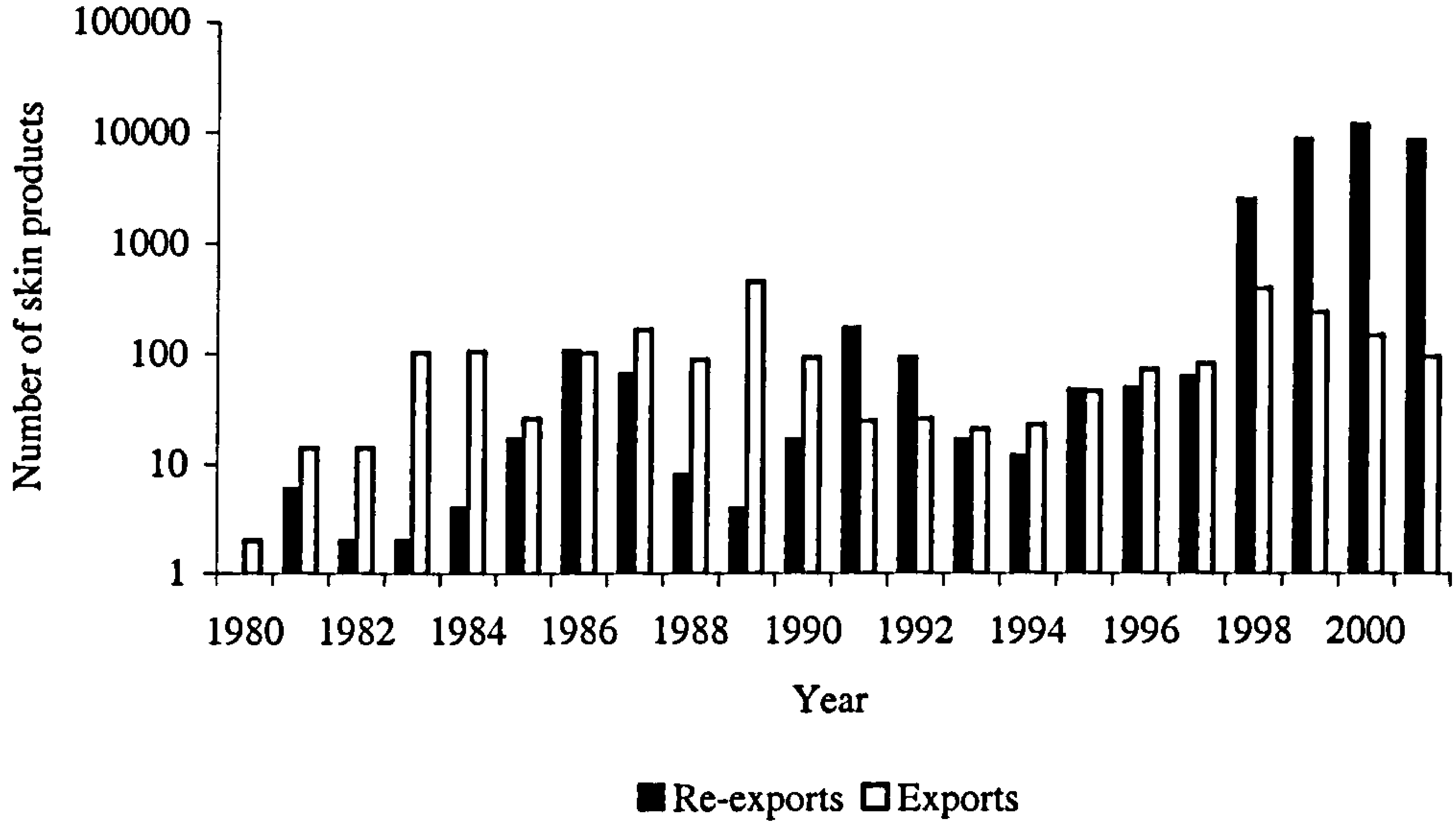
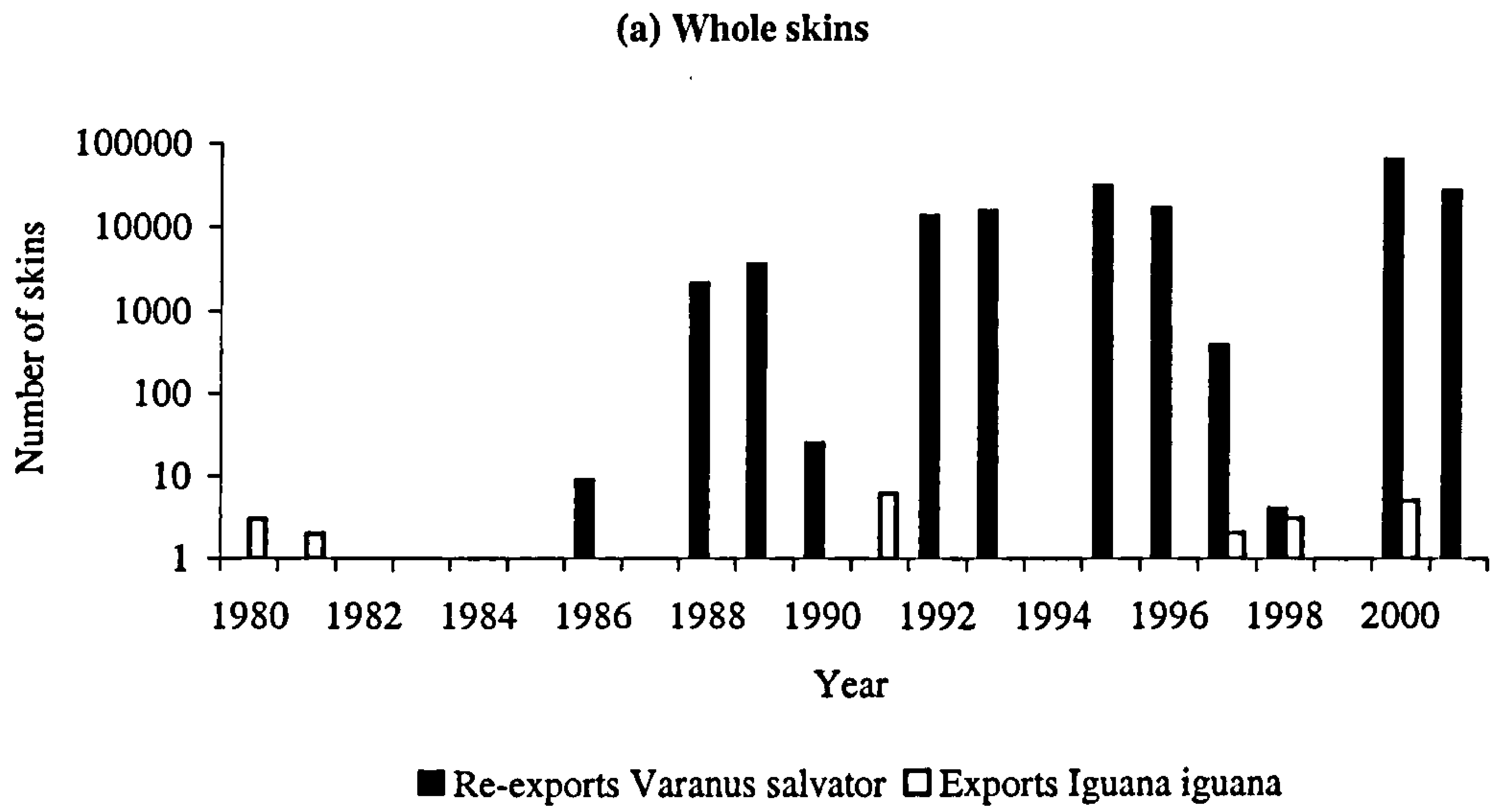


Figure 7.19 Comparison of exports of native *Crocodylus* spp. skin products and re-exports of non-native *Crocodylus* spp. skin products 1980-2001
(UNEP-WCMC Trade Data)

7.3.4.2 Lizards

During 1980-2001, Mexico exported only a total of 21 whole skins of native *Iguana iguana*. In contrast, Mexico re-exported a total of 167,923 whole skins of non-native *Varanus salvator* (Table 7.6). Around 8,000 times as many whole skins of non-native were re-exported as compared with whole skins exported over this period (Figure 7.20a). Likewise, Mexico exported a total of 754 skin products of native *Iguana iguana* during 1980-2001. In contrast, Mexico re-exported a total of 64,214 skin products of non-native *Varanus salvator* (Table 7.7). Around 85 times as many skin products of non-native *Varanus salvator* were re-exported as compared with native *Iguana iguana* exported (Figure 7.20b).



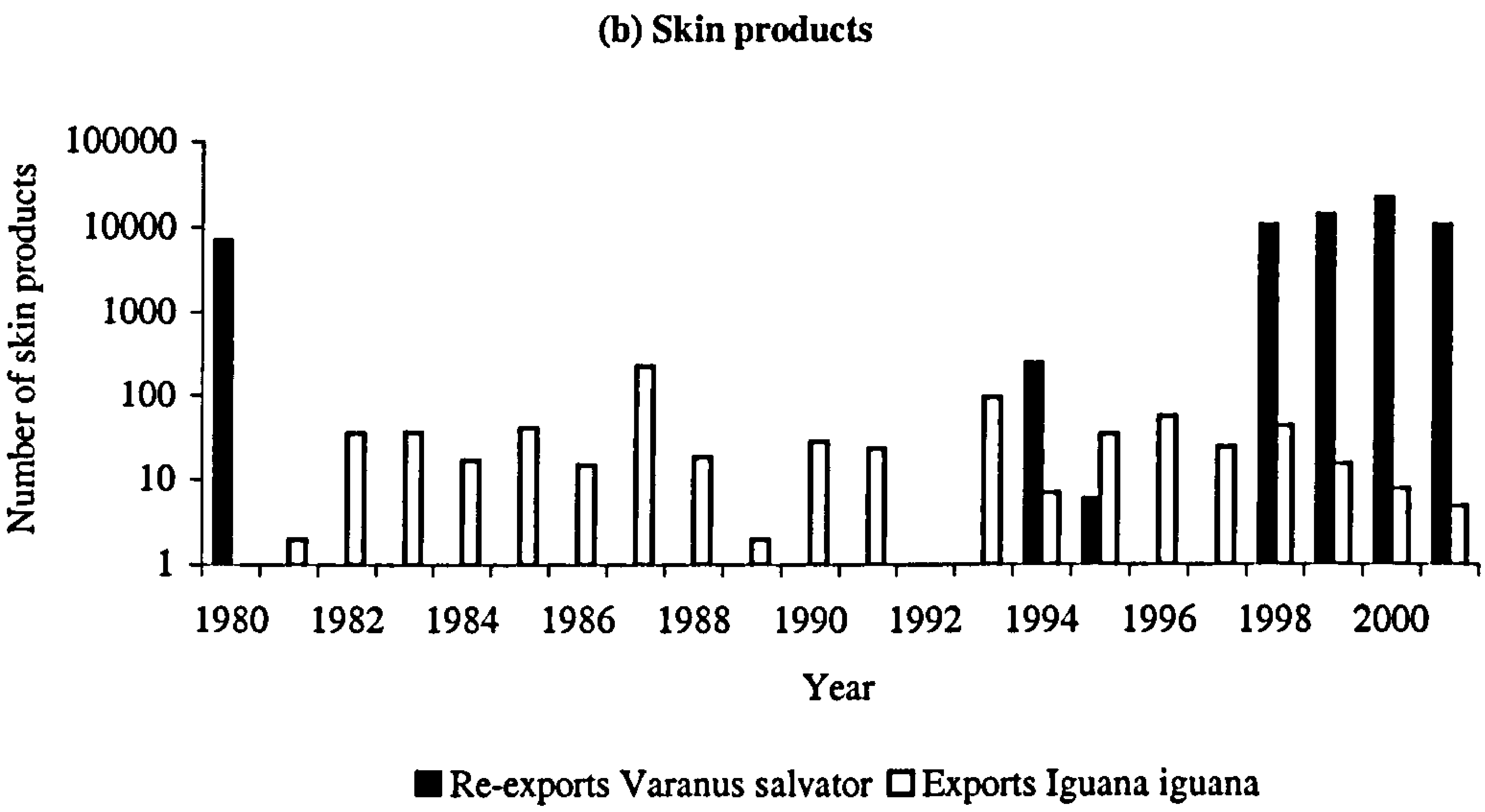
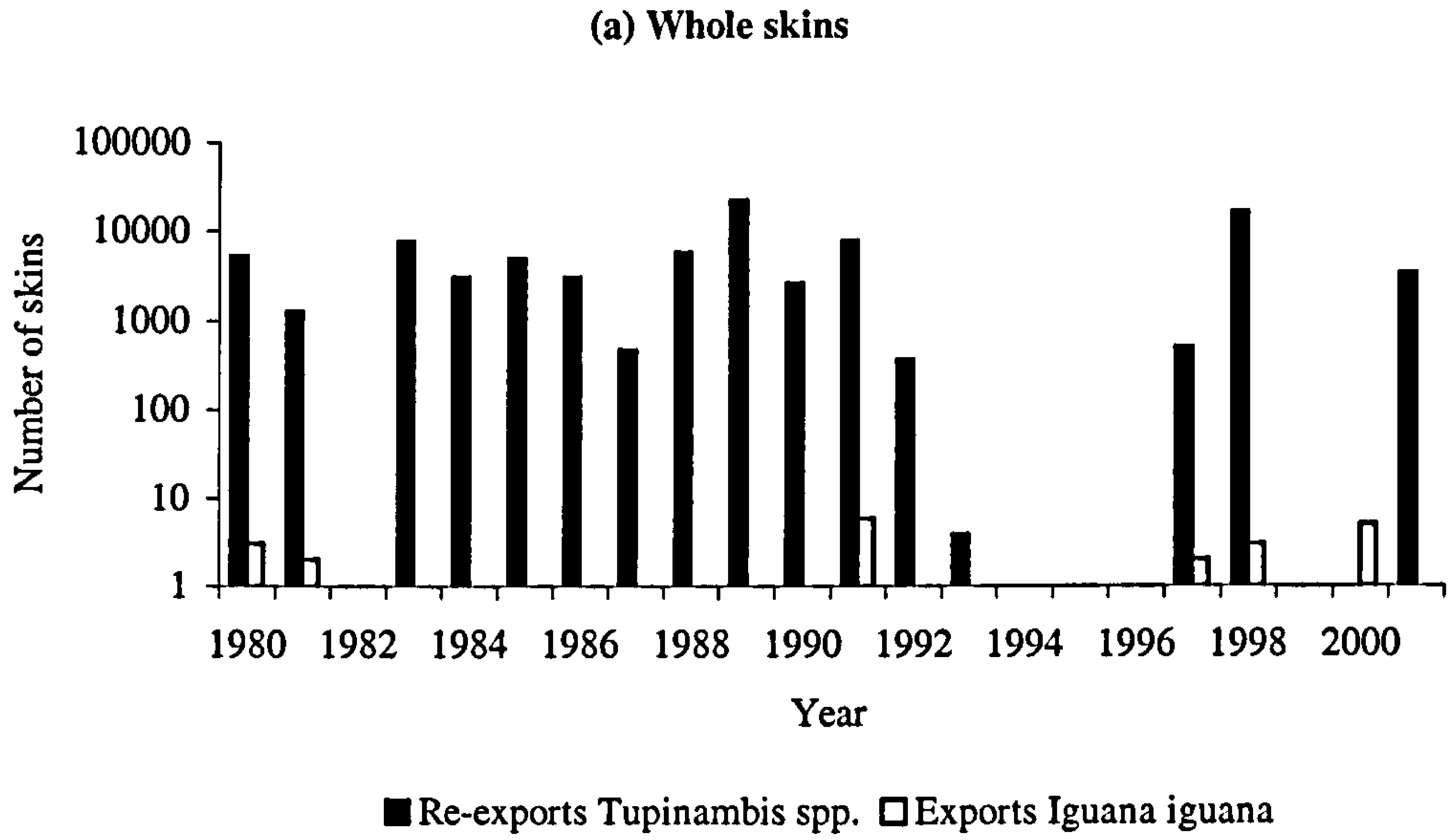


Figure 7.20 Comparison of Mexican reptile skin exports of native *Iguana iguana* and re-exports of non-native *Varanus salvator* 1980-2001 (UNEP-WCMC Trade Data)

During 1980-2001, Mexico exported a total of 21 whole skins of native *Iguana iguana*. In contrast, Mexico re-exported a total of 86,271 whole skins of non-native *Tupinambis* spp. (Table 7.6). Around 4,100 times as many whole skins of non-native *Tupinambis* spp. were re-exported compared with native *Iguana iguana* exported (Figure 7.21a). Likewise, Mexico exported a total of 754 skin products of native *Iguana iguana* during 1980-2001. In contrast, Mexico re-exported a total of 76,171 skin products of non-native *Tupinambis* spp. (Table 7.7). Around 100 times as many skin products of non-native *Tupinambis* spp. were re-exported compared with native *Iguana iguana* exported (Figure 7.21b).

7.3.4.3 Snakes

During 1980-2001, Mexico exported only a total of 12 whole skins of native *Boa constrictor.* In contrast, Mexico re-exported a total of 31,769 whole skins of non-native *Python reticulatus* (Table 7.6). Around 2,600 times as many whole skins of non-native *Python reticulatus* were re-exported compared with native *Boa constrictor* exported (Figure 7.22a). Likewise, Mexico exported a total of 2,035 skin products of native *Boa constrictor* during 1980-2001. In contrast, Mexico re-exported a total of 170,997 skin products of non-native *Python reticulatus* (Table 7.7). Around 84 times as many skin products of non-native *Python reticulatus* were re-exported compared with native *Boa constrictor* exported (Figure 7.22b)



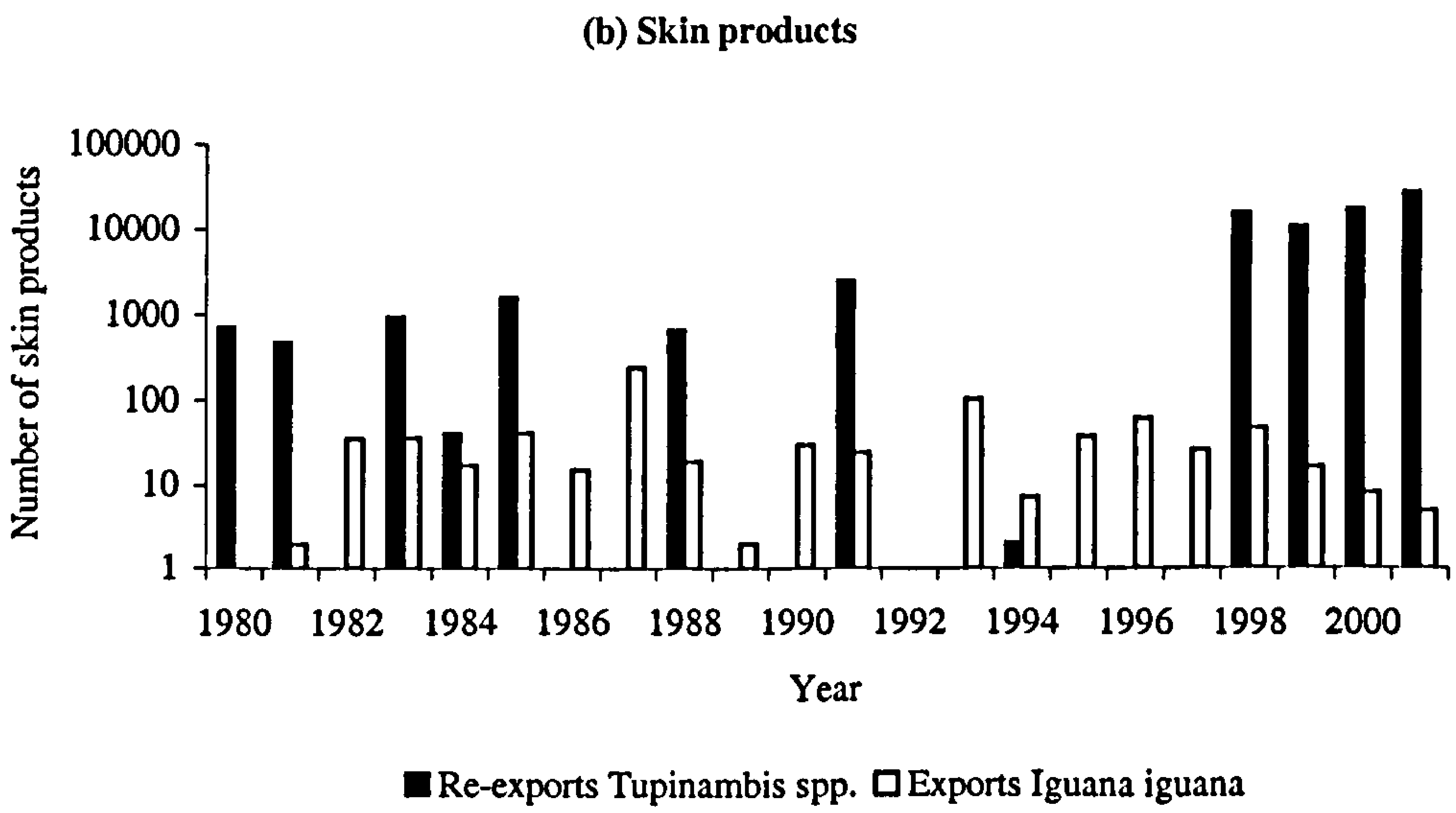


Figure 7.21 Comparison of Mexican reptile skin exports of native *Iguana iguana* and re-exports of non-native *Tupinambis* spp. 1980-2001 (UNEP-WCMC Trade Data)

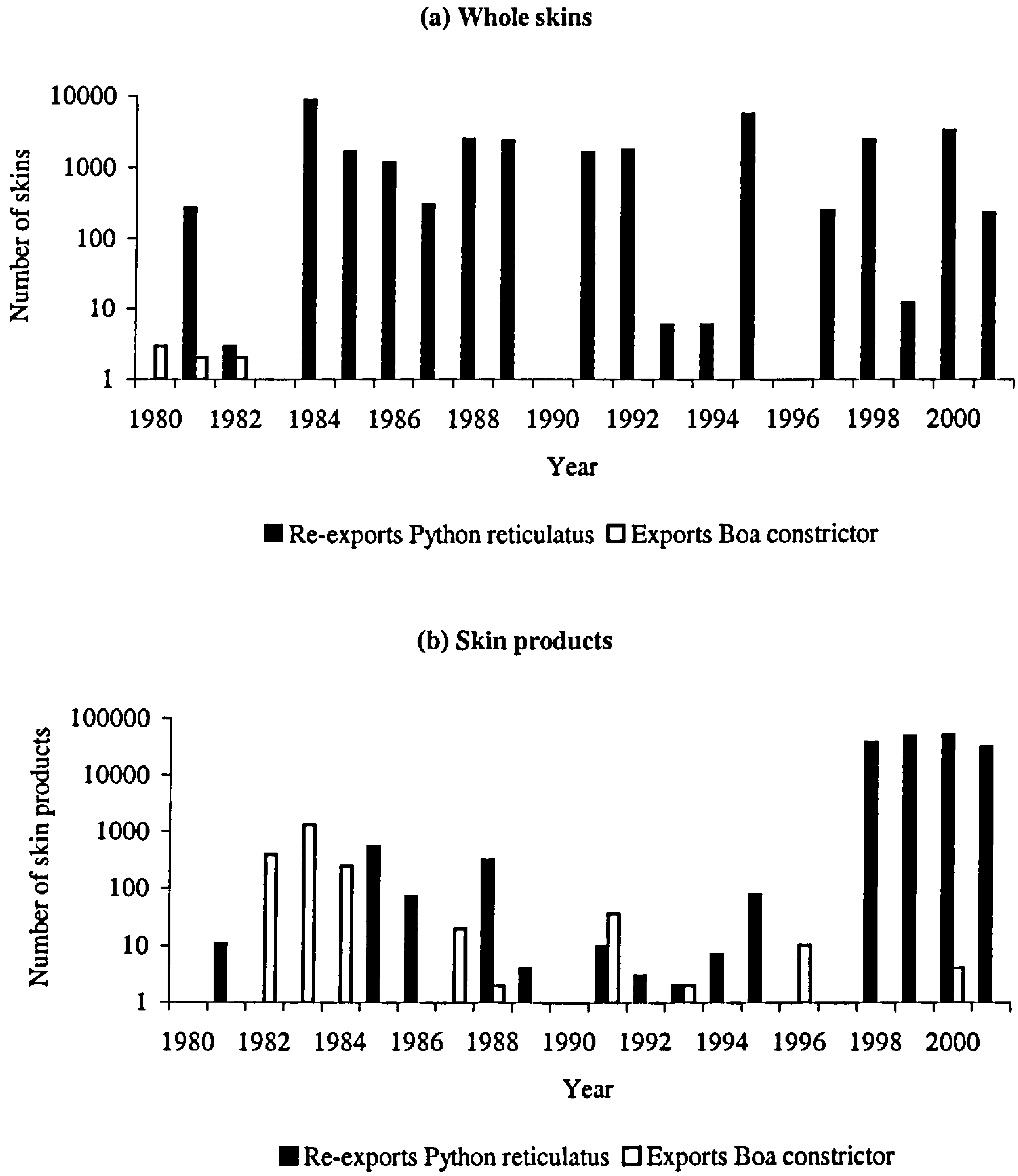


Figure 7.22 Comparison of Mexican reptile skin exports of native *Boa constrictor* and re-exports of non-native *Python reticulatus* 1980-2001 (UNEP-WCMC Trade Data)

7.4 Discussion

This chapter has explored the trade in reptile skins and skin products from native species for the years 1980-2001. Mexico has played a considerable role as an exporter of reptile skins and skin products from native species, as the examination of trade data reveals.

7.4.1 Exports

Over the period 1980-2001, the WCMC Trade Data showed that the most numerous reptile skins and skin products in reported exports were from *Chelonia* spp. (Table 7.2). The observed trends in numbers of skins was as expected since exports decreased after Mexico adopted the ban on use of native species in 1982 (Figure 7.10a). However, the observed trends in numbers of skin products was not the expected, because exports instead increased after the ban on the use of native species (Figure 7.10b), whereas the exports of reptile skin products instead decreased after Mexico adopted a sustainable use policy (Figure 7.10b).

Over the period 1980-2001, the WCMC Trade Data showed that Mexico exported very low quantities of *Crocodylus* spp., *Iguana iguana* and *Boa constrictor* skins (Table 7.2). This is not the ideal scenario for Mexico since the country has already adopted a sustainable use policy and UMAS are being promoted (Chapter 8). More reptile skins from native species like *Crocodylus* spp., *Iguana iguana* and *Boa constrictor* should be exported, for there is a sizeable market opportunity, as the import, re-export and current export data reveal.

Over the period 1980-2001, the WCMC Trade Data showed the expected trend for Mexican exports of marine turtle species, since exports decreased after Mexico adopted the ban on use of native species in 1982 (Figure 7.10a). However, after adopting the total ban on use of marine turtles and acceding to CITES in 1991, Mexico still exported significant amounts of marine turtle skin products during the 1990s, essentially of *Chelonia* spp. (Figure 7.10b). The high volumes of banned *Chelonia* spp. skin products exported by Mexico during the 1990s, compared with the better regulated numbers of *Caiman* spp. and *Crocodylus* spp. skin products exported over the same period is perplexing. There appears no correlation whatsoever between the ban, the sustainable use policy and the reported trade (Chapter 8).

Over the period 1995-1999, the LEMIS Trade Data showed that the most numerous reptile skins and skin products in reported exports to the US were from *Caiman* spp. (Table 7.3). In terms of numbers of skins and skin products, the observed trend was as expected, since Mexican exports of *Caiman* spp. increased after Mexico adopted a sustainable use policy (Figure 7.13). However, it would be better for Mexico in economic terms, if the numbers of

Caiman spp. exported decreased, given the value added to skin products. However, Mexico may be exporting *Caiman* spp. whole skins because of its lack of high quality tanneries of wildlife skins (Chapter 8).

Over the period 1995-1999, the LEMIS Trade Data showed that very few whole skins of *Crotalus* spp. were exported to the US (Table 7.3; Figure 7.14a). This was expected since the country does not have yet a formal skin production scheme for this species (Chapter 8). Nevertheless, Mexico exported significant amounts of *Crotalus* spp. skin products to the US during 1995-1999 (Table 7.3; Figure 7.14b), all specimens taken from the wild. This type of data should encourage CITES Scientific and Management Authorities in Mexico to undertake a thorough investigation on the source of specimens in trade, in order to assess the impact of trade on the survival of this species (Harris *et al.*, 2003).

7.4.2 Comparison between CITES and LEMIS trade data

From 1980 to 2001, numbers of reptile skin products reported by LEMIS as exported from Mexico to the US were considerably higher than numbers of reptile skin products reported by CITES over the same period (Table 7.5). This finding was not expected since the CITES Trade Database comprises annual reports from Parties to the Convention including the US, while the USFWS LEMIS Trade Database involves only US. Consequently, the numbers reported by CITES were expected to be at least equal to those reported by LEMIS but this is not the case, as numbers reported by LEMIS are much higher. Why do the CITES Trade Data and the LEMIS Trade Data differ? Is there a difference between the terms and descriptions used for skin products between these trade-recording systems? Is there insufficient and inaccurate reporting from Parties to CITES? Are records reported by the US Management Authority to CITES different from those stored at LEMIS databanks? Is it that the control standards when compiling data, statistics and reports differ between these trade recording systems? An examination of these questions to determine the reasons behind these differences would seem appropriate.

7.4.3 Contrast between reptile skin exports and re-exports

Many fewer reptile skins and skin products from native species were exported from Mexico than from non-native species re-exported from Mexico (Tables 7.6; 7.7). There is a clear imbalance between the potential market for reptile skins from native species and the actual market for reptile skins from non-native species. However, any future transition to a scenario where native species can fill the market will require collaboration between professionals and a higher level of mutual respect among different actors - academics, governmental institutions, NGOs and industrial and rural producers. The critical issue that remains to be addressed is the actual possibility of transforming the development model Mexico has pursued to a sustainable one. There is still much to accomplish on issues such as: the creation of the necessary human capacity for the technical surveillance of the UMAS, the regulatory legislation of this productive scheme and the consciousness-raising and information disclosure to the citizenship, in order to achieve a higher acceptance of the sustainable use concept (Soberón, 1999). The future of successful conservation lies in recognizing instances where trade can be beneficial to a species, and creating a mechanism that encourages sustainable use and legal trade, while discouraging unsustainable and illegal exploitation ('t Sas-Rolfes, 2000).

Chapter 8

8 The Legal Mexican Market for Reptile Skins: Native Species

8.1 Introduction

The National Institute of Ecology (INE) in Mexico published the Programme of Wildlife Conservation and Diversification of Rural Production 1997-2000 in 1997 (Chapter 4). The Programme planned to preserve and protect the biodiversity, ecosystems, and wildlife habitat; to decrease extinction of species; and to recover species at risk, while also generating opportunities for socio-economic diversification for the rural sector.

Protection programmes were included in the conservation programme for certain priority species of flora and fauna, including marine turtles and crocodiles. The programmes differ according to local circumstances and the needs of the species. Some consist mainly of monitoring, while others involve more extended protection or breeding in captivity. The Programme included guidelines on the use of instruments such as hunting regulations and import/export controls; the establishment of sanctuaries; and the "units for the conservation, management and sustainable use of wildlife" (UMAS) (OECD, 1998).

The UMAS were a significant part of the programme. These units conformed the "System for the conservation, management and sustainable use of wildlife", or SUMA. To be labelled as a unit in SUMA, an area needs to be clearly delimited and five steps are required: i) registration of the area, based on agreement with the landowner; ii) establishment of a management plan for the habitat and the wildlife population; iii) organization of monitoring of the habitat and relevant species; iv) control on the use of the wildlife; and v) certification of wildlife products. An assessment has to be made for each area for which this status is requested. Also special technical management committees are required, in which the local population and government, NGOs and academics participate (OECD, 1998).

This is a new approach for Mexico emphasising participation by local people (OECD, 1998). One of the characteristics of these Units is that the owners (*comuneros*, *ejidatarios* or small proprietors) must be convinced of the need to protect and manage the habitat and wildlife, while verifying that conservation is profitable in social, economic, and environmental terms, and that they can accede legally to those benefits when fulfilling the legal procedures established through specific techniques of management (INE, 2000b).

The approach established by the INE through the Wildlife Conservation Programme has arisen as real progress compared with the more rigid position where the use and conservation of the biodiversity were considered antagonistic positions (Soberón, 1999).

Three months after the close of CITES COP 11, the General Law for Wildlife (*Ley General de Vida Silvestre*, LGVS) was published in Mexico (D.O.F, 2000a). This law abrogated the Federal Hunting Law (1952) and established the organizational bases for the federal public administration, States and Municipalities regarding the conservation and sustainable use of wildlife and its habitat within the national territory. As for the species and populations at risk, the LGVS recognized the risk categories established by the NOM-059-ECOL-1994 (now the NOM-059-ECOL-2001). The LGVS created, through SEMARNAT, a National Advisory Council for the conservation and sustainable use of wildlife to generate opinions or recommendations related to the identification of species at risk; to identify priority species and populations; to develop recovery programmes; and, to detect critical habitats. The LGVS established that CITES listed species are subject to this Convention and the mentioned Law.

After Australia, Mexico is home to more species of reptiles than any other country in the world. However, little is known about domestic and international trade in Mexican reptiles. Therefore, a survey of uses and trade of Mexican fauna is needed to document the species in trade and the relevant characteristics of the markets, such as uses, domestic and international demand, trade volumes, etc. (Fleming, 1999).

This chapter aims to examine the legal production and commercialisation of reptile skins from native species under the SUMA scheme and compare Mexican policies on the use of marine turtles and crocodile species. In particular, in this chapter I seek to answer the following questions:

- Which species of reptiles are promoted under the SUMA scheme for skin production?
- To what extent do SUMA provide for the use of reptiles for skin production?
- How do UMAS with formal reptile skin production schemes operate and what are the main problems they face?
- What are the benefits derived for conservation and for rural producers from the UMAS with formal reptile skin production schemes?
- How do Mexican policies on the use of marine turtles compare with those of crocodilians?
- How have patterns of trade changed for marine turtles and crocodilians in relation to key events in Mexico?

8.2 Methodology

8.2.1 Data collection

Research for this chapter was carried out through extensive bibliographic searches of government literature, and by a range of social science approaches. Part of the information regarding the use of reptiles from native species under the SUMA scheme was available from documents. Also semi-structured interviews were undertaken throughout the study with Mexican government authorities and specialists (key informants) involved in the subject matter.

Extensive bibliographic research was undertaken regarding the use of reptiles from native species under the SUMA scheme. Such research was undertaken in Mexico City (DF) from April-August 2001, when the archives reviewed comprised the following:

- Instituto Nacional de Ecologia (INE)
- Pg7 Consultores A.C.
- CONABIO
- Banco de Comercio Exterior (Bancomext)
- TRAFFIC México
- COCOMEX (Culiacán, Sinaloa)

This bibliographic search was supplemented by individual semi-structured interviews with the following key informants:

- August 2001: Biologist Francisco Leon, UMA Cocodrilos Mexicanos S.A. de C.V. (COCOMEX) in Culiacan, Sinaloa.
- November 2001: Jose Maria Reyes, Dirección General de Vida Silvestre (SEMARNAT).
- May 2002: Tizoc Morales Salud, Dirección General de Vida Silvestre (SEMARNAT); Adela Macdonel Morales, Delegación Federal SEMARNAT Tabasco; Francisco Villegas Zurita, Centro de Conservación y Reproducción de Iguanas. Universidad del Mar, Oaxaca.

All the information gathered in Mexico City, Sinaloa and Tabasco, including books, reports, articles, unpublished reports, and interviews was compiled, classified, read, and arranged to construct this chapter. All the sources of information examined for this chapter, whether bibliographic or interview-based, are presented as references in the body of the chapter, and presented in full in the reference list.

8.2.2 Data analysis

The analysis of the World Conservation Monitoring Centre (WCMC) CITES Trade Database (Cambridge, UK) provided the basis for the assessment of trade in individual species detailed here. The data were used to determine the volume of trade and trends over a certain period of time of specific genus or species.

The trade records compiled from the WCMC CITES Trade Database were Excel Files for all Mexican exports from 1980 to 2001 for the following specific genus and species:

- *Chelonia* spp.
- *Lepidochelys* spp.
- *Caretta caretta*
- *Eretmochelys imbricata*
- *Crocodylus* spp.
- *Caiman* spp.

The trade data were selected from a comparative tabulation format, which was used for this review, regardless of reported source of purpose. Microsoft Excel was used to sort and sum subsets of the data appropriately and also to generate the graphic representations. All quantities traded were added together for all records where the following details were the same: species, the year in which the trade occurred, unit (number of skins, number of skin pieces and kg), term (description of specimens traded), country of export (where exports are reported), and country of import (where imports are reported). The terms used were: shoes, skins, skin pieces, leather items, watchstraps, belts, handbags, and wallets.

Data for similar terms and units were combined to facilitate comparison. The comparison was limited to those terms and/or units accounting for the greatest amount of trade. All calculations were performed separately on trade reported in units of number of skins, number of skin pieces and weight (kg), since terms reported in different units (e.g. m^2, kg, lb, number of skins, number of skin pieces, skin products) cannot be added together. Skins and skin pieces were summed separately and the rest of skin products like wallets, shoes, belts and handbags were summed together like skin products, except for garments and plates. In the case of shoe pairs, each shoe was regarded as a single skin product. The data was also modified in order to facilitate comparisons. Trade expressed in terms of pounds were converted to kilograms. However, this still left too many data categories to represent graphically for comparative purposes. In these cases, it was advantageous to select the terms most significant to the question at hand for graphical illustration (numbers of whole skins, skin pieces and skin products) because these dominate all other trade where volumes can be compared.

Proportions of exports among species were contrasted by using pie charts. The annual variation in the export volumes of species was illustrated using bar charts. This allowed trade volumes and trends for the groups to be assessed individually as well as compared. "Event arrows" were added to mark specific events, such as trade restrictions, coming into effect at a given time, which assisted with interpretation of the results.

8.3 Results

8.3.1 SUMA

The SUMA system purports to provide a regulatory framework for the commercial use of wildlife, reconciling socio-economic development through wildlife use with biodiversity protection.

According to the Mexican authorities, an UMA results from a land-use partnership between two parties: an "owner" of an undeveloped tract of land and a "user" who will utilize the land in a way that promotes environmental conservation and economic development. In theory, the land could be owned by a federal, state, *ejidal* (cooperative land owners), municipal, corporate, non-governmental, or private entity. The "user" could also be a federal, state, ejidal, municipal, corporate, non-governmental, or private entity (INE, 2000e).

The production of goods and services within the UMA could be for either national or international demand, but should be complementary to local traditional production activities such as agriculture, cattle raising, fishing and silviculture (INE, 2000e). The management plan should designate a portion of the revenues (derived from production on the UMA) to help cover the operational/management costs of the UMA. Another portion of the revenues are directly channelled to the owners of the property as compensation, and to those who manage and operate the UMA (INE, 2000f). The General Law of Wildlife (which authorizes the SUMA program) does not specify the required percentages, but it does state that there is a need for "equity" (DOF, 2000a).

The registration of an UMA is not a legally enforceable contract between the landowner and land user, but rather a register or voluntary agreement between the two parties. There are no temporal requisites for the length of the agreement, and either party can revoke the UMA at any time. The General Law of Wildlife is not clear as to how the UMA registration is different than a standard lease of the property, nor does it specify what incentives there are for participating in the UMA program rather than just leasing the land independently (DOF, 2000a).

There are five steps to establishing and operating an UMA: the registration process, creating a Management Plan, ensuring sustainable use, certifying production of goods and services, and ensuring participative vigilance. Each of these five steps is detailed below (INE, 2000e):

- **Registration.** Any property within the Mexican national territory, that is under anyone's ownership (private, *ejidal*, federal, state, municipal, or community) that (1) seeks to manage flora and fauna and (2) generates services or products derived from the sustainable use of the UMA species (consumptive or non-consumptive) can be the subject of an application to SEMARNAT be an UMA. There are extensive application forms that can be downloaded from SEMARNAT's website, as well as application guidelines to help applicants with the process.

- **Management Plan.** The site-specific Management Plan describes the conservation goals and management objectives of the UMA, as well as the daily basis of operation. The user may establish quotas for the use of species within the UMA, and include within the management plan the methods of extraction and/or collection of particular species that will ensure the sustainable use of the resource. This plan must be approved and registered with SEMARNAT. Once approval has been obtained for the site's Management Plan, the UMA "manager" is given the authority to enforce the policies that are spelled out in the plan, to ensure that the conservation goals and management objectives are obtained.

- **Sustainable Use.** The UMA participants should monitor the population and habitat of the all affected species to ensure sustainable use of the resources. It is hoped that the UMA program will provide new opportunities for economic development in rural areas, stimulate legal markets for wildlife goods and services, while helping to manage Mexico's natural resources.

- **Certification of Production.** Certification of the goods produced at UMAs allows consumers to know the origin and legality of the product, thus facilitating investment and exports while helping to reduce the black market. Each UMA is responsible for developing an appropriate method of certifying the quality and identity of products created on their land, such as through the use of labels, microchips, or tattoos.

- **Local Protection and Vigilance.** The success of the UMA program fundamentally depends on the participation of the diverse sectors of the local community for protection and vigilance, in conjunction with local authorities. The management plan of the UMA should establish efficient mechanisms for public participation.

As of July 2003, 5,116 units had been registered by SEMARNAT, which cover 184,000 sq km or 19.35% of the national territory (SEMARNAT, 2003).

Among reptiles, species that are included in UMAS comprise crocodiles (*Crocodylus moreletii, C. acutus*, and *Caiman crocodilus*) and iguanas (*Iguana iguana*). Five UMAS are legally authorized to produce and sell live animals, products and by-products of native reptiles within Mexico (INE statistics, 2001). These UMAS seek to commercialise crocodiles and caimans. Four are located in southeast Mexico, and one is based in the northwest. Three of these UMAS are legally authorized to export and commercialise crocodiles and caimans (Table 8.1). Commercialisation is allowed only from crocodile breeding stocks on legally established farms. The modes of production within these farms are captive breeding and / or ranching.

Table 8.1 Units for Conservation, Management, and Sustainable Utilization of Wildlife (UMAS) that are legally authorized to produce, sell and export reptile skin products and live animals

Name of the UMA	State	Licensed to Export	Species
El Palomo	Chiapas	Yes	*Caiman crocodilus chiapasus* *Crocodylus moreletii* *Crocodylus acutus*
Granja de Lagartos	Tabasco	No	*Crocodylus moreletii*
Cocodrilos Mexicanos (COCOMEX)	Sinaloa	Yes	*Alligator mississippiensis* *Crocodylus moreletii*
Industrias Moreletii	Tabasco	Yes	*Crocodylus moreletii*
CICEA	Tabasco	No	*Crocodylus moreletii* *Crocodylus acutus* *Caiman crocodilus fuscus*

Source: DGVS (2001)

Following CITES definitions, ranching is considered as the rearing in a controlled environment of specimens of eggs or young taken from the wild. Likewise, conditions under which specimens are regarded as bred in captivity are restricted to offspring born or otherwise produced in a controlled environment from parents that mated and produced eggs and young in a controlled environment. The stock for captive breeding must be established in a manner not detrimental to the survival of the species in the wild and must be maintained without augmentation from the wild, except for the occasional addition of animals from wild populations to prevent deleterious inbreeding.

8.3.1.1 Crocodile skins from UMA COCOMEX

There is a market in Mexico for crocodilian products, since these animals have thick and durable skins, and are in great demand in the international leather industry for the manufacture of shoes, purses, belts, portfolios and wallets. The skin of *Crocodylus moreletii* remains among the most used reptile species in Mexico.

Although most tanners prefer the skin of *Crocodylus porosus* (INE, 2000c), due to the size and properties of its skin, *C. moreletii* remains the most favoured species for ranching and captive breeding in Mexico. The skin of *C. moreletii* is one of finest in the world. Once tanned, this skin is recognizable by its texture, cuts, beauty and durability. The size of its scales is small, which allows for small, yet attractive and regular, panels to be obtained from large specimens.

Mexico has been registered by CITES to trade internationally in specimens, products and by-products of *Crocodylus moreletii* (CONABIO, 1998). One farm, Cocodrilos Mexicanos S.A. de C.V. (COCOMEX), is CITES registered to export captive bred *Crocodylus moreletii*. COCOMEX chose the skin of *C. moreletii* for having better conditions for commercialisation and because once treated gives a more beautiful appearance to the finished product (Leon 2001, Pers. comm.). The COCOMEX farm compares favourably with other CITES registered crocodile captive breeding facilities around the world (Ross, 1995).

COCOMEX is the first legally established Morelett's crocodile farm in Mexico. The farm is in the northwest of the country. It has four aqua terrariums called artificial lagoons with an earth-water ratio of 70:30, and is laid out with 800 fruit and ornamental trees that control the amount of sun and shade offered to the crocodiles, and which, during the summer, also offer thick foliage for females to form their nests (Plate 8.1). Currently, COCOMEX is the biggest and most advanced crocodile farm in Mexico, and the only one to have successfully entered the international market following the grant of the CITES certificate in June 1996. The operation of this crocodile farm has become a sustainable programme that protects the species from further offtake, while promoting the commercialisation of crocodiles (Leon 2001, Pers. comm.).

Plate 8.1 Aqua terrariums in COCOMEX
COCOMEX ©

The farm was extended into reserved land comprising 18-20 ha, of which 4 ha comprise the aquaterrariums, an infirmary, an incubator, 58 controlled environment houses (Plate 8.2) and an area of food preparation.

Plate 8.2 Controlled environment houses in COCOMEX
COCOMEX ©

COCOMEX supports and follows the mission of CITES. It recognizes that the international trade of crocodile products requires a change of attitude among the consumers, since commercialisation represents an incentive to sustainably use crocodilians. Thus all the products processed by COCOMEX have a certificate of origin that guarantees their legality to buyers, and also each skin is labelled with a serial number for identification. To export, COCOMEX solicits a CITES export permit from the Mexican authorities (DGVS). In the case of raw skin, COCOMEX also solicits a zoo-sanitary permit from SAGARPA, depending on the requirements imposed by the destination country. In the case of tanned skin, only the CITES export permit is required. In spite of this, it is important to clarify that COCOMEX is not only interested in conservation, but is also a business that currently employs 16 field personnel and 7 officers (Leon 2001, Pers. comm.).

COCOMEX handles meat, dissected heads, and oil. It also offers skins tanned in two cuts and of different colours: Horn back (Plate 8.3) and Belly Skin (Plate 8.4). The criteria applied for the classification of skins in regard to their integrity are: a) First quality, clean in all its extension (defects in the last third of the tail are not taken into account); b) Second quality, a maximum of three defects as long as they allow a minimum of 90% of use for cuts of eight to ten square decimetres; c) Third quality, more than three defects; and, d) Fourth quality or leftovers, those that do not fulfil the previous conditions (INE, 2000b). The quality offered by COCOMEX is 70% first quality and 30% cheaper product (COCOMEX, 2001).

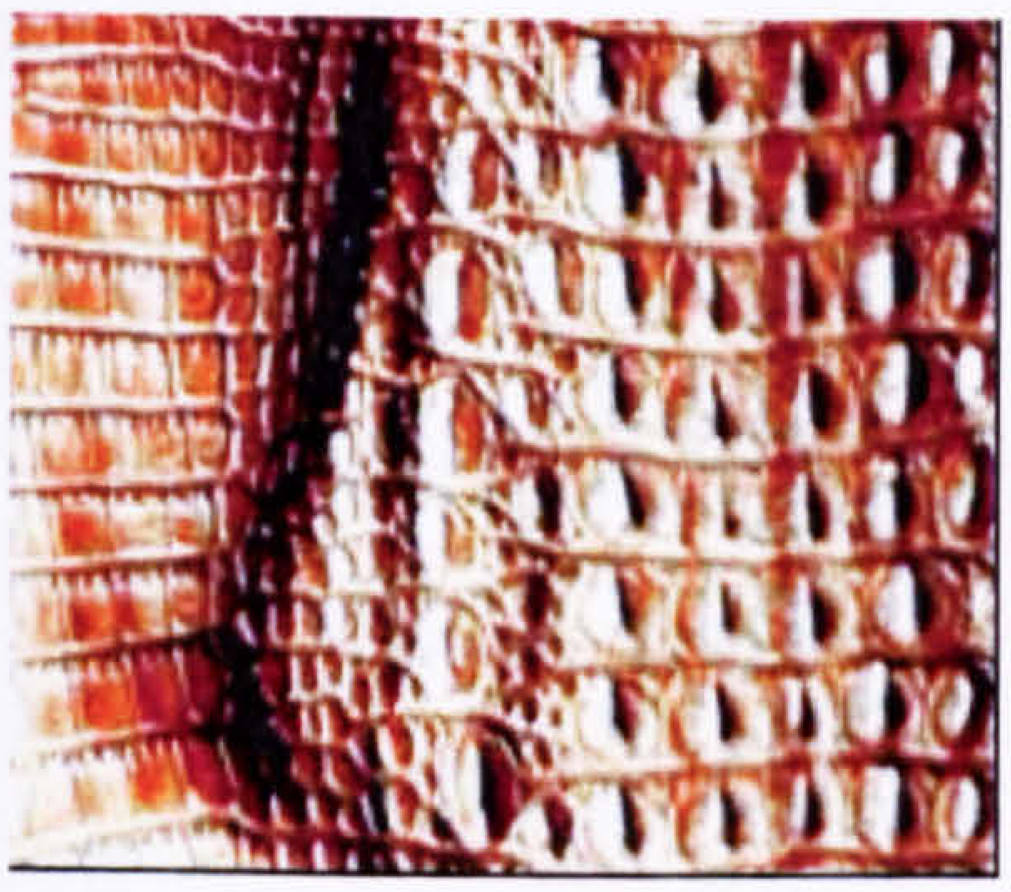


Plate 8.3 Horn Back Cut
COCOMEX ©

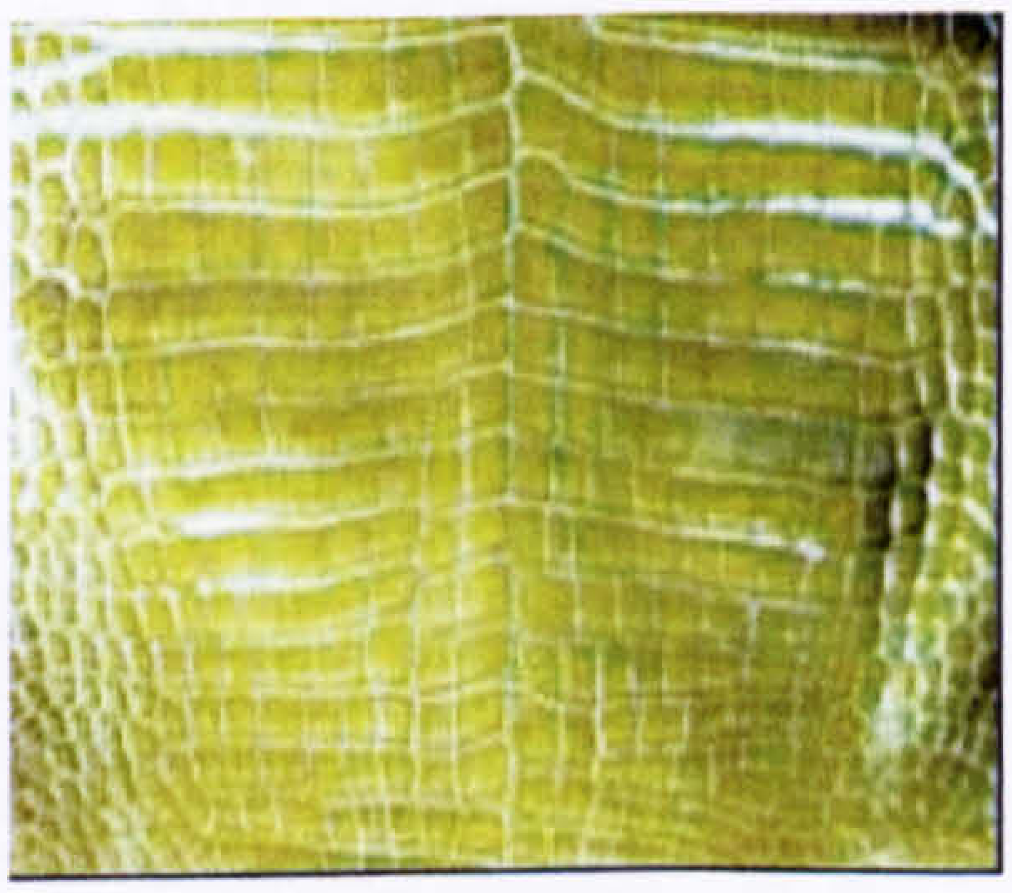


Plate 8.4 Belly Skin Cut
COCOMEX ©

COCOMEX offers the following skin sizes: 20-24cms, 25-29cms, 30-34cms, and 35-39cms. The preferred sizes for the market for both the horn back and belly skin cuts are 30-34cm and 35-39cm, and each size has a different price (León 2001, Pers. comm.) (Table 8.2). However, prices fluctuate during good and bad times, depending on market forces which define the price according to the supply and the demand from tanneries (León 2001, Pers. comm.).

Table 8.2 COCOMEX list of prices (US$) for *Crocodylus moreletii* skins in 2001

Sizes (cm)	20-24	25-29	30-34	35-39
Belly Skin	$3.20	$3.50	$3.80	$4.10
Horn Back	$2.00	$2.25	$2.50	$2.75
Belly Skin*	$4.50	$4.80	$5.10	$5.70
Horn Back*	$2.75	$2.80	$3.00	$3.20

Modified from COCOMEX (2001)
* Note: Tanned skins impose a 15% tax.

The production of skins in COCOMEX is a long and delicate process. There are 600 reproductive animals on the farm, with a ratio of one male to two females, and an average of 200-250 animals per aquaterrarium. Crocodiles gain sexual maturity after 5-6 years, but a female must reach 8 years to lay enough good-sized eggs. Courtship begins in April, mating takes place in May, and after 70 days, the female begins to lay eggs. Every season, up to 20 nests can be harvested in a single day. Each nest has approximately 40 eggs (Plate 8.5) (León 2001, Pers. comm.).

Plate 8.5 ***C. moreletii*** **nest at COCOMEX©**

Plate 8.6 ***C. moreletii*** **nest at COCOMEX©**

The incubator has a 25,000-egg capacity, where the eggs spend 68-70 days in complete silence. Some 13,000 crocodiles were incubated during 2001. Juveniles are born with an average length of 20-22 cm (Plate 8.6). Eight to ten percent of new born crocodiles take 2.5 times longer to grow. However, since they do eventually reach commercial size, they are kept anyway but under more primitive conditions, including providing food of lesser quality. The healing of all juveniles is reviewed after 15 days, and the faster growing juveniles are transported to controlled environment houses (Plates 8.2, 8.7), after each specimen has been marked with a metallic staple, including an identification (or serial) number. The farm holds a total of 58 controlled environment houses, each measuring 10m in diameter (Plate 8.2). The optimal temperature for development of crocodiles is 32.5ºC. Each controlled environment house lodges from 700 to 800 crocodiles (León 2001, Pers. comm.).

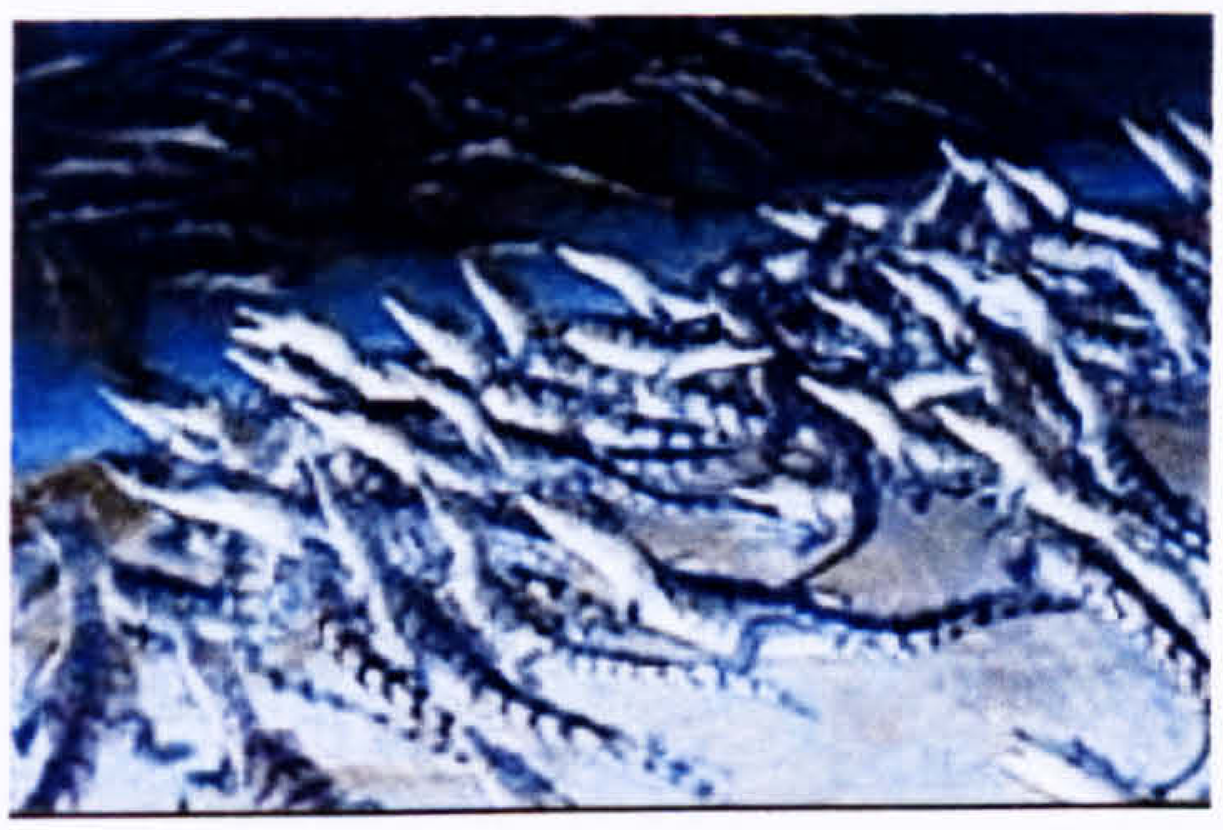


Plate 8.7 ***C. moreletii*** **controlled environment house at COCOMEX**
COCOMEX ©

During the growth and fattening process, crocodiles are fed with a paste rich in proteins, vitamins, minerals and fats, with treats such as fish flour, entrails, cow spleens, livers and blood flour. Mortality in the farm is 5% during the first year of life, 1% during the second year and practically nil from the third year on. A crocodile takes 24 to 40 months to reach the average size of 1.5m at which skins are in greatest demand. Twenty crocodiles are killed daily in a slaughterhouse that has the capacity to process up to 80 crocodiles daily. Once killed, crocodiles are left for 14 hours at 1-4ºC in a cold house. The next morning they are thawed, and the small meat pieces attached to the skin are washed away with a hydro-cleaner. Once sacrificed, the animals lose their serial number and each skin carries instead a plastic band with the company name, the registry before CITES and the serial number (Plate 8.8). Later they are packed and taken for the tanning process. After 30-40 days, the tanner sends the skins back to COCOMEX. It takes 1,330 days for a tanned skin to be ready for sale: 70 days maximum of incubation time, 40 more months for the specimen to reach its required size, about 30 days for the raw skins to leave the farm, and 30 days for tanning (León 2001, Pers. comm.).

Plate 8.8 Folded ***C. moreletii*** **skins at COCOMEX**
COCOMEX ©

After trying out different tanners throughout Mexico, COCOMEX considers the best tanner to be located in the State of Mexico. The staff of this tannery formerly worked in an old tannery in Mexico City called "Minerva" that was closed when the government prohibited the use of marine turtles which formed their main business. The current employees have an average of 25 years of experience in the tanning processes. However, relying on only one tanner is problematic because they must entirely depend on its turn around times and prices. Hence, COCOMEX have even been forced to order tannery tests abroad because of the lack of national tanners (Le6n 2001, Pers. comm.).

Once COCOMEX has the tanned skins, it sells 80% of them to wholesalers and 20% to retailers. The best months for selling skins are January to March. Sales later fall, and then rise again by August when Christmas sales close in. Sometimes, the company hires extra temporary workers, especially during the high sale season to work in the slaughterhouse and to clean the animals. In addition, COCOMEX makes sandals out of belly skin cut leftovers and is also trying to enter the cowboy boot and fine products market (Le6n 2001, Pers. comm.).

COCOMEX sells 4,000 to 5,000 skins of *C. moreletii* per year[1], only a small fraction of the 1 million skins handled annually in the international market. COCOMEX sells 70% of its production (97% tanned skin and 3% raw skin) to the internal Mexican market and exports the remaining 30% (97% raw skin and 3% tanned skin). It has taken COCOMEX several years to consolidate its client base and to place its skins in the market. At present, Japan is COCOMEX's main buyer of skins and meat. As the single producer of this species, COCOMEX must offer high quality and well priced skins, so that the Japanese consumers increasingly substitute their current skin preferences for C. *moreletii*. Hence, Japanese clients request 75%-80% of first-quality skins (or "immaculate skins"). In order to place these skins in the Japanese market, COCOMEX must keep their costs down in favour of higher earnings, in order to gain a position in the global market. In addition, COCOMEX sells dissected heads to Cyprus, skins to Italy (where they have 2-3 separate clients) and to France, skins and live animals to Germany, and live animals to Spain (Leon 2001, Pers. comm.).

[1] COCOMEX also handles *A. mississipiensis*, but presently has few specimens therefore the company is not producing skins of this species. The bred stock of *A. mississipiensis* arrived to COCOMEX from Florida, but later the US established a moratorium to avoid the exporting of this species so COCOMEX could no longer buy any specimens. Those specimens remaining in the farm (30-40) are used solely for attraction (Le6n 2001, Pers. comm.).

Unfortunately, *C. moreletii* products cannot enter the US market, since the species is listed as endangered on the Endangered Species Act (ESA). If COCOMEX could gain access to the US market, the company could operate to full capacity. COCOMEX has been fighting to reach this goal since 1996. However, the skin of *C. moreletii* is less well known globally than those of *C. niloticus, C. porosus*, caiman, and alligator. Hence, *C. moreletii* has to compete against these skins from these species, which are handled in significant volumes (León 2001, Pers. comm.). That the ESA forbids almost any type of commerce in species listed as Endangered seems paradoxical, since in the case of *C. moreletii* it blocks the use of resources in a model that is fully sustainable.

COCOMEX also faces other problems. Campaigns by environmentalist groups can affect the market. There is competition from cheaper synthetic skins and from the presence of low priced Colombian alligator *Caiman crocodilus fuscus* skins. Finally, importing countries can request a reconfirmation of authenticity to the Mexican Administrative Authority, which delays COCOMEX's administrative process (León 2001, Pers. comm.).

According to León (2001, Pers. comm.), although COCOMEX faces many problems, the farm offers paybacks in addition to earnings and employment: it contributes to the conservation of *C. moreletii* in Mexico by returning 10% of the annual production to repopulate areas where crocodiles face extinction, and by promoting the legal use of the species and environmental education to fight the illegal trade.[2]

8.3.1.2 Use of iguana skins in UMAS

Iguana iguana and *Ctenosaura pectinata* are protected in Mexico by the NOM-059-ECOL-2001 so their capture and commercial exploitation requires official authorization by the government through the DGVS (SEMARNAT).

In Mexico, the most important species of iguana in terms of cultural, religious, ecological and economic value are the black iguana *Ctenosaura pectinata* and the green iguana *Iguana iguana.* However, the green iguana is the most important saurian in Mexico in economic terms because it is used throughout its range. Handicrafts made from the skins of green iguanas form an important source of additional income, for example in the state of Tabasco. Iguana skins are usually tanned

---

[2] COCOMEX is linked to universities by means of research and informative programs. In fact, great part of the operation comes from research, which is reflected in productive parameters. For example, the Centre of Sciences of Sinaloa created a children's educative program denominated Knowing and Caring for the Crocodile, in which they explain the origin of the species to the children and also take them to visit the farm where they get in contact with crocodile juveniles and learn the skin production process (León 2001, Pers. comm.).

with tannins from the red mangrove, and a pair of iguana shoes are sold at MX$180.0 (US$18) (Villegas 2002, Pers. comm.).

Iguana skins are mainly commercialised in the southeast of the country, specifically in the states of Oaxaca, Chiapas, Guerrero and Campeche, where large numbers of iguanas are captured (Villegas & Vázquez, 2002). Green iguana skins are valued by leather companies in Leon, where they use them to produce shoes, wallets, belts, and purses. However, their use is mainly illegal, with specimens taken from the wild (Villegas 2002, Pers. comm.).

The production of black and green iguanas has increased considerably in Mexico, since 44 UMAS had been registered by 2002 and more than 300 people have been identified in their breeding, research and management (DGVS, 2002; Morales 2002, Pers. comm.). Nevertheless, none of these UMAS hold yet an international registry granted by CITES for the export of specimens, products and by-products.

Iguanas are produced within existing UMAS through captive breeding. The objective of these UMAS is to supply captive-bred animals for the benefit of local communities and individuals, and thereby reduce the illegal hunting of wild animals. Specimens are kept in captivity during some of the life cycle stages, generally during the hatching and first-year stages, and are later released in controlled and management areas (Villegas 2002, Pers. comm.). The main states that have UMA for iguana management are: Guerrero, Michoacán, Oaxaca and Morelos (Morales 2002, Pers. comm.).

Some of the problems faced by the producers of iguana specimens are: lack of training, illegal capture of wild specimens, as well as the import of green iguana juvenile specimens originating from countries like El Salvador and Nicaragua. During 2001, for instance, Mexican authorities authorized imports from Central America for 10,050 live specimens (Morales 2002, Pers. comm.). In addition, Mexico is at a disadvantage compared with El Salvador, since Mexican authorities push the producers to comply with all the requirements to regulate the use of iguanas, while El Salvador allows a simple invoice to commercialise the specimens much more cheaply (Villegas 2002, Pers. comm.).

Although Mexico already has 44 registered UMAS for iguana management, and the trend for registering UMAS increases over time, particularly since the First National Iguana Workshop held in 1998 (Morales 2002, Pers. comm.)[3], the legal use of iguana skin in Mexico is practically non-existent. None of these UMAs has achieved a formal production scheme with the purpose of producing iguana skins for successful commercialisation in the domestic market (Villegas 2002, Pers. comm. Morales 2002, Pers. comm.).

8.3.2 Contrast between marine turtles and crocodiles

8.3.2.1 Marine turtles

The Atlantic shores and waters of Mexico provide some of the world's most important habitats for marine turtles. Six of the world's seven marine turtle species occur in Mexico: the hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*), loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempi*), leatherback (*Dermochelys coriacea*), and olive ridley (*Lepidochelys olivacea*). Five of these species nest along the Atlantic coast, while the olive ridley is found on Mexico's Pacific coast. The nesting populations of Kemp's ridleys at Rancho Nuevo in Tamaulipas, and of hawksbills on the Yucatan Peninsula, are regionally and globally important (Fleming, 2001).

Mexico legislates complete protection of all life stages of marine turtles, thereby prohibiting any take and trade. All six species of Mexico's marine turtles are listed as "endangered" by national legislation. Each of these species is listed on the IUCN Red List as either Critically Endangered (hawksbill, Kemp's ridley, and leatherback turtles) or Endangered (green, loggerhead, and olive ridley). All of these species are listed on CITES Appendix I, which prohibits international commercial trade.

8.3.2.1.1 Historical importance

Marine turtles have long been used for their meat, eggs, oil, skin, shell, and viscera throughout Mexico. The offtake of marine turtles in Mexico in the 1960s and 1970s is reported to have been significantly greater than that allowed by their quota system. Illegal offtake in Tamaulipas, Veracruz, Tabasco, Campeche, Yucatán, and Quintana Roo targeted the green and loggerhead for

[3] The National Workshop on Management of Captive Iguanas has been organized for exchange of information and experiences to help find solutions to problems involving iguanas. Since 1997, specialists, researchers, academics, NGO representatives, breeders, and members of the general public meet annually to learn about the latest advances in research, conservation, regulations, and management techniques for the country's most important iguana species.

their meat and the hawksbill for its shell. Turtle eggs, oil, hide, and meat, as well as hawksbill shell handicrafts, were consumed locally, while stuffed juveniles or subadults and luxury hawksbill shell items were sold as tourist souvenirs. Illegal take and trade in Mexico continued in the 1990s (Fleming, 2001).

8.3.2.1.2 Bans

All species of marine turtles have been legally protected in Mexico since 1 June 1990, under an accord that banned the harvest, use, and trade of turtles and products. However, several bans had been established for certain turtle species and areas before 1990. A 1927 decree first prohibited the exploitation of marine turtle eggs and the destruction of nests in the country. Regulations on the harvest of marine turtles and trade in their products were adopted in the 1960s. In 1966, the collection and sale of marine turtle eggs were prohibited, and in 1968, the Ministry of Commerce developed further regulations for the harvest, use, and trade of marine turtles. A ban on the fishing of marine turtles entered into force in the middle of 1971 and remained in place until the end of 1972. The harvest of marine turtles on Mexico's Atlantic coast was prohibited in 1973. Also, in 1973, the Federal Law for the Promotion of Fisheries of 1972 allowed the harvest of certain marine turtles, but only for fisheries production cooperatives. The law required cooperatives to make full use of the catch through a contract with processing plants, and to take actions to enhance conservation of the turtle resource. Most permits were granted to harvest olive ridley turtles in the Pacific. Taking these various bans in combination, the harvest and exploitation of all marine turtles was prohibited from Mexico's Atlantic coast. The harvest and exploitation of leatherbacks was later banned from both coasts. Quotas, franchises, and closed seasons were established for the taking of olive ridley, loggerhead, hawksbill, and green (black) turtles on the Pacific coast. Separate bans closed the remaining fisheries for Pacific hawksbills in 1979, loggerheads in 1983, and green (black) turtles in the mid-1980s. The 1990 ban closed the Pacific olive ridley fishery (Fleming, 2001).

At present, violations of Mexican legislation protecting marine turtles have both criminal and civil implications. Civil offences are infractions and criminal offences are felonies. PROFEPA imposes penalties for civil infractions, and the Federal Judicial Power handles criminal sanctions (Fleming, 2001). At the international level, CITES and national trade restrictions on turtles on the pet trade have shifted market demand from one species to another, where similarly unsustainable levels of exploitation occur (Thorbjarnarson *et al.*, 2000).

8.3.2.1.3 Conservation status of species

The major threats facing marine turtles on the Atlantic coast of Mexico include loss or modification of habitat through beach construction and development for tourism; sand mining for use in construction; poaching of turtles and eggs; and the down-scaling of funding for conservation fieldwork (including the maintenance of marine turtle camps). Consequently, marine turtle management and conservation efforts in Mexico include the ban on harvest and trade, the requirement to use turtle excluder devices on commercial shrimp trawlers, research on turtles, patrol of nesting beaches, regional workshops for researchers, habitat conservation, education in schools, community outreach, contact with the media, and law enforcement (Fleming, 2001).

Mexico has experienced significant increases in nesting numbers of Kemp's ridleys and hawksbills, and slight increases in greens, during the last 20 years. Long-term monitoring, protection of beaches, and enforcement of the 1990 ban appear to be paying dividends for these species on the Atlantic coast (Fleming, 2001). There is much less exploitation of turtle meat and eggs along Mexico's Atlantic coast than on its Pacific coast, which is attributed to the large nesting aggregations of olive ridley turtles on Pacific beaches. On the Atlantic coast, the numbers of poached nests have steadily decreased over the years. Marine turtles and eggs are taken opportunistically for personal consumption for sale to family members or friends in the states of Campeche, Yucatán, and Quintana Roo. Marine turtle meat is sold occasionally in local markets to trusted customers only, and an active market reputedly exists for eggs in a few inland towns in Yucatan. INP officials report that eggs and meat are not widely available in markets on the Atlantic coast and that the quantity of all marine turtle products offered for sale has decreased significantly since the national ban entered into force in 1990 (Fleming, 2001).

8.3.3.1.4 Harvest and use

The current position regarding the exploitation of marine turtles in Mexico shows that no use is allowed. Nevertheless, trade in marine turtle products is ongoing (Table 8.3) and there are still cases in Mexico in which marine turtle products had been confiscated and/or persons charged with violations related to the take, possession, and/or trade of marine turtles. Hawksbill shell items are available in tourist markets in Yucatan and in airports. Tourists are likely to purchase and take these products illegally into other countries. More than 4,000 marine turtle products, the majority of which were leather boots from olive ridley turtles from the Pacific coast of Mexico, were confiscated at the US-Mexican border from 1990 through 1993 (Fleming, 2001).

Table 8.3 Exploitation of marine turtles in Mexico

	Are turtles legally harvested?	Are turtle eggs legally harvested or sold?	Is domestic sale of turtles/products allowed?	Are products available domestically?	Which products are available?	Are the products widespread
Eretmochelys imbricata	No	No	No	Yes	Eggs, meat, shell items	Extent unknown, but decreased in recent years
Chelonia mydas	No	No	No	Yes	Eggs, meat	No; extent has decreased in recent years
Caretta caretta	No	No	No	Yes	Eggs, meat	Apparently not
Dermochelys coriacea	No	No	No	Not on Atlantic Coast	None	No

Source: Fleming (2001)

Between 1995 and 1998, the following marine turtle products were confiscated by Mexican officials: 1,244 live turtles, 3,873 skins, 896 kilograms of meat, 1,407,653 eggs, 21 carapaces, and 5,240 shell products. These figures include products originating from the Pacific as well as the Atlantic coasts. During the same period, PROFEPA certified 3,822 vessels using Turtle Excluding Devices (TEDs). In 1996, authorities in Campeche arrested five fishermen for taking hawksbill turtles (one turtle each). In September 1997, PROFEPA raided a weekend flea market in Mexico city and seized more than 1,200 hawksbill shell items; the owner reported buying the shell in Campeche (Fleming, 2001).

8.3.2.1.5 Trade data

From 1980 to 2001, Mexico exported around 28,502 skin products from the following marine turtle species: *Chelonia* spp., *Lepidochelys* spp., *Caretta caretta*, and *Eretmochelys imbricata* (Table 7.2). During this period, the most exported species was *Chelonia* spp., followed by *Lepidochelys olivacea, Caretta caretta*, and *Eretmochelys imbricata* (Figure 8.1).

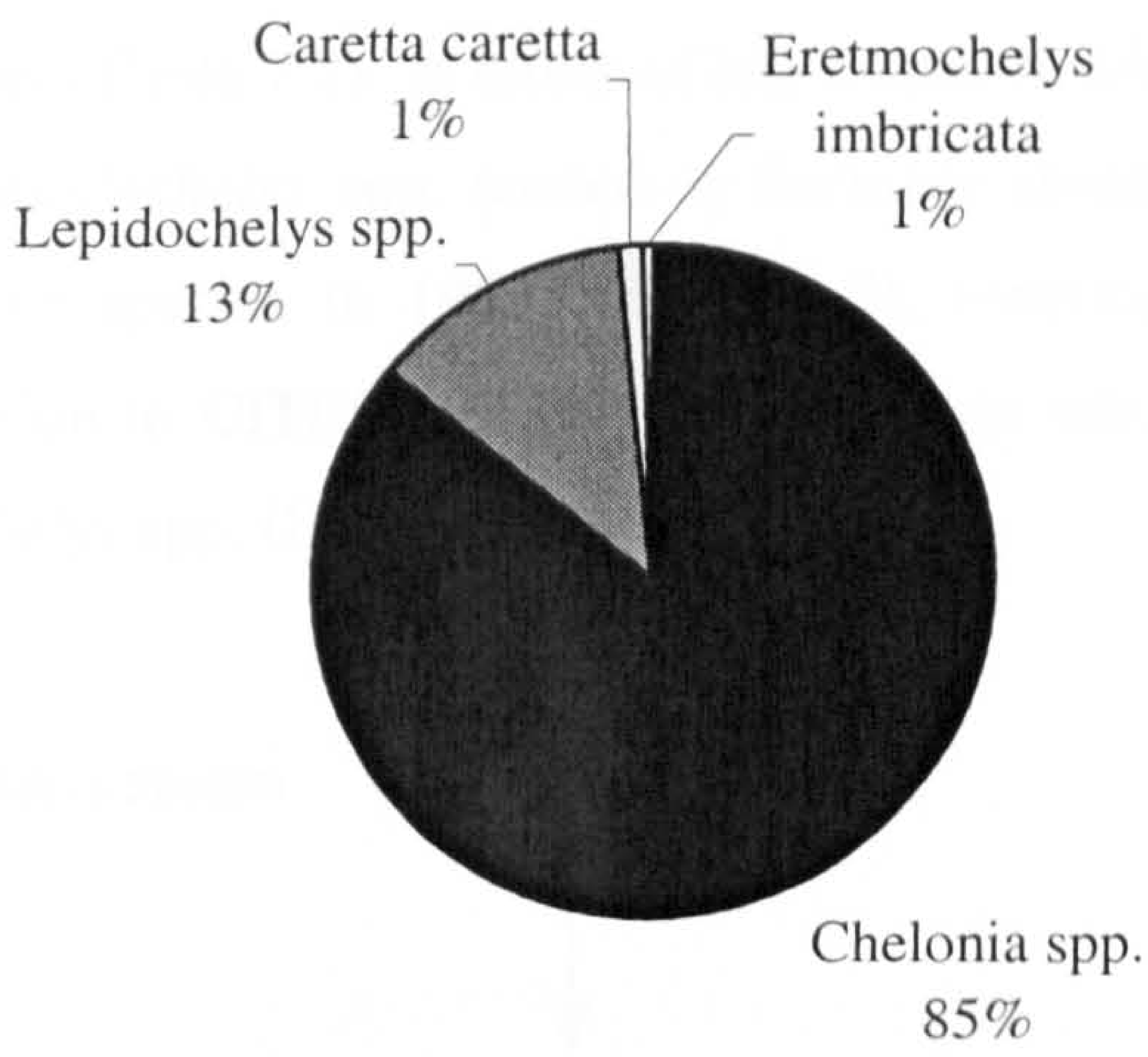


Figure 8.1 Exports of marine turtle skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

In terms of key events in Mexico, exports of skin products from marine turtles increased steadily after Mexico banned the international trade in native species in 1982, but tended to decrease following Mexico's total ban on marine turtles and accession to CITES in 1991 (Figure 8.2), remaining at low levels thereafter excepting for exports *Chelonia* spp. skin products (Figure 8.2).

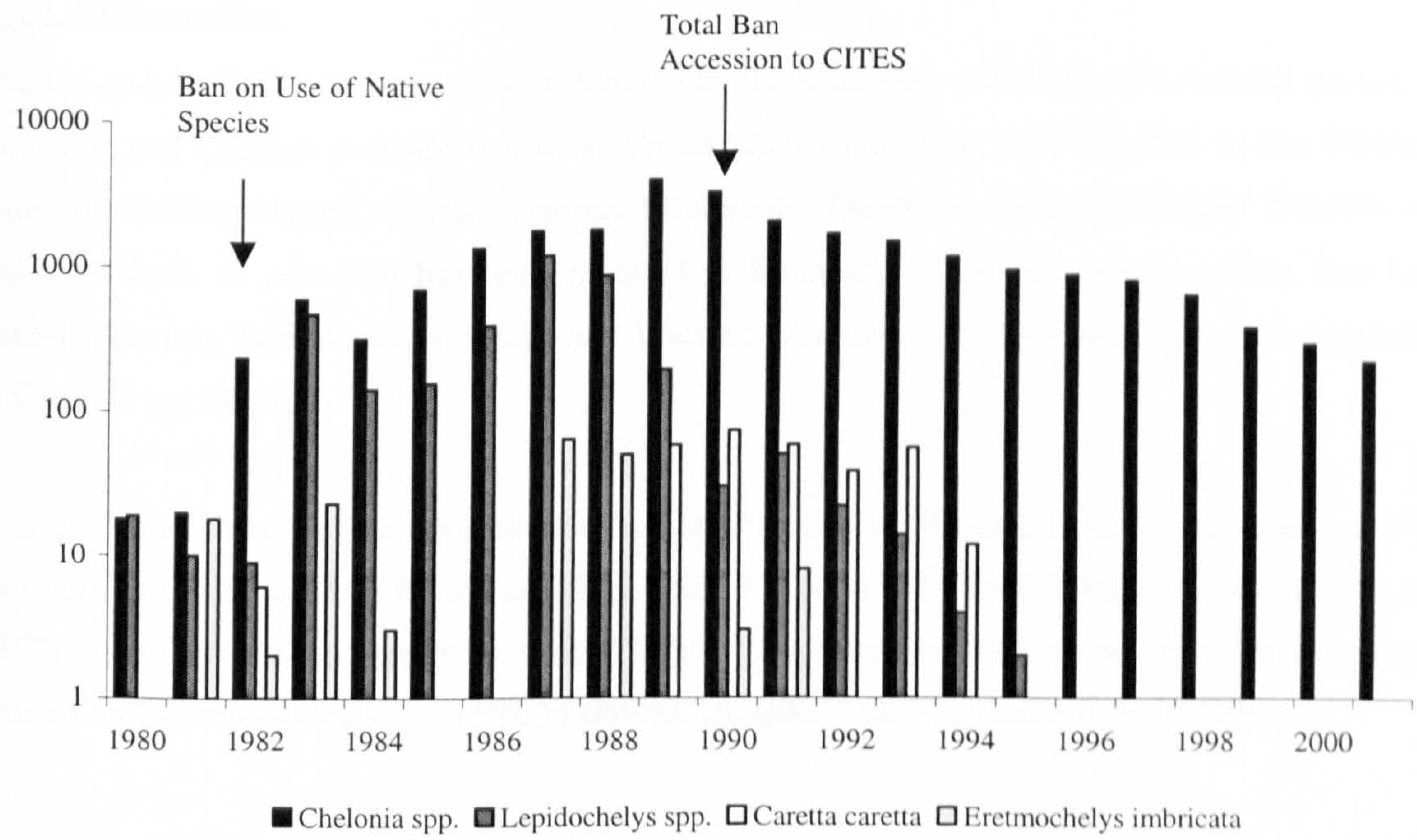


Figure 8.2 Exports of marine turtle skin products from Mexico 1980-2001
(UNEP-WCMC Trade Data)

From 1980 to 2001, Mexico exported around 28,405 whole skins from *Chelonia* spp. and 20 whole skins from *Lepidochelys* spp. (Table 7.2). In terms of key events in Mexico, exports of whole skins from *Chelonia* spp. and *Lepidochelys* spp. tended to decrease steadily after Mexico banned the international trade on native species in 1982 (Figure 8.3), remaining at low levels thereafter. Following Mexico's accession to CITES in 1991 there were no whole skin exports recorded for *Chelonia* spp. and *Lepidochelys* spp. (Figure 8.3).

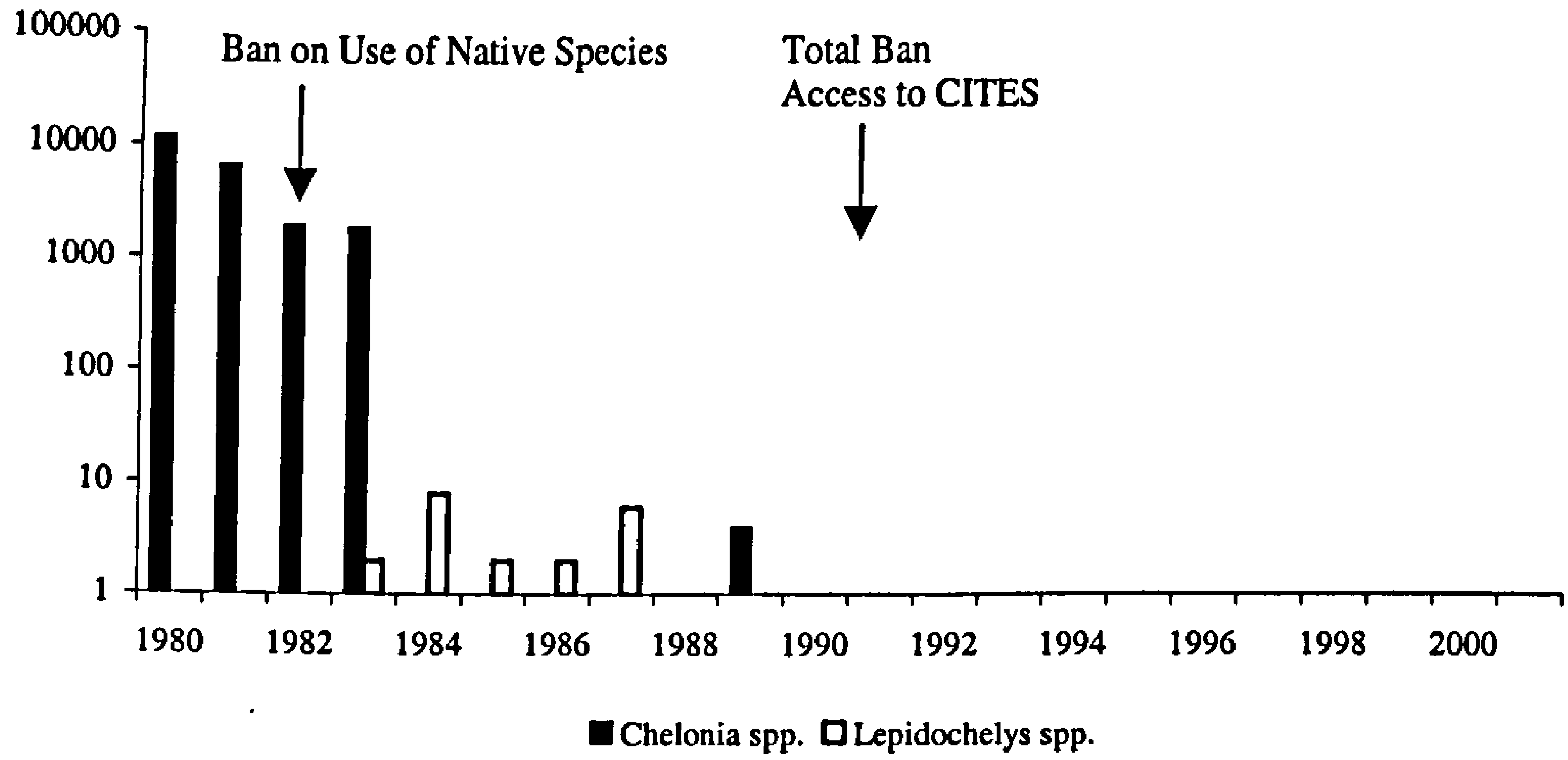


Figure 8.3 Exports of marine turtle whole skins from Mexico 1980-2001
(UNEP-WCMC Trade Data)

8.3.2.2 Crocodiles

The Crocodylia Order is represented in Mexico by three species, which are: *Crocodylus acutus*, *C. moreletii* and *Caiman crocodilus fuscus*. *Crocodylus acutus* has been reported in the Mexican states of Sinaloa, Nayarit, Jalisco, Colima, Michoacán, Guerrero, Oaxaca, Chiapas, Yucatán and Quintana Roo. *C. moreletii* has been reported in Campeche, Chiapas, Quintana Roo, San Luis Potosí, Tabasco, Tamaulipas, Veracruz and Yucatán. *Caiman crocodilus fuscus* has been registered in Chiapas and Oaxaca.

Mexico legislates complete protection of all stages of crocodilians. *Crocodylus acutus* and *C. moreletii* are listed as Rare by national legislation (NOM-059-ECOL-2000), as Vulnerable by the IUCN Red List and on Appendix I by CITES. *Caiman crocodilus fuscus* is listed as Special Protection by national legislation (NOM-059-ECOL-2000) and Appendix II by CITES.

8.3.2.2.1 Historical importance

There has been a relatively important economic activity in Mexico as a result of the exploitation of crocodile skins, especially for the inhabitants of Campeche, Colima, Chiapas, Jalisco, Nayarit, Guerrero, Oaxaca, Quintana Roo, Sinaloa, Tabasco, Tamaulipas, Veracruz and Yucatán. Since the end of the XIX century until 1970, Mexico was considered the primary exporter of crocodile skins to the US. However, these exports declined due to the loss of their populations caused by inefficient management, lack of regulation, scarce surveillance, and overexploitation.

8.3.2.2.2 Now farmed

In 1970, the Federal government of Mexico declared a total and permanent ban for the three crocodile species distributed in Mexico, a measure that ended the legal commercialization of crocodile skins. This prohibition motivated interested persons to request the Federal government to use permits again. Hence, the now extinct SEDUE promoted the establishment of intensive breeding units for crocodile species in the 1980s with commercial purposes in diverse regions of the country as an alternative to generate sources of employment and income. At the same time, they established the legal framework for surveillance, control and follow up of these initiatives in order to assure the proper use of the resource. Due to its characteristic size, skin and rate of growth, *Crocodylus moreletii* became the favored species in Mexico for management (CONABIO, 1998; INE, 2000c).

During the last two decades, attention towards crocodile and caiman species in Mexico has increased considerably, due to the interest of producers and conservationists in participating in protection actions and the urgent need for new options of economic development compatible with the sustainable use of these resources. In this way, Mexico has initiated a number of commercial farming operations (INE, 2000c).

Also, the Mexican government (SEMARNAT) has established coordinated efforts with federal, state, municipal and academic institutions, NGOs, private sectors, as well as with international instances, to design and implement the Project for the Conservation, Management and Sustainable Use of Crocodylia in Mexico (*Proyecto para la Conservación, Manejo y Aprovechamiento Sustentable de los Crocodylia en México*, CROMACROM) (INE, 2000c).

8.3.2.2.3 Conservation status of species

The three major threats facing crocodilians in Mexico are: habitat destruction and fragmentation, pollution and illegal trade. The destruction of habitat is one of the main factors affecting crocodilians in Mexico. Every year, a greater number of breeding areas like marshes, mangroves, rivers and estuaries are transformed. The activities related to the extraction of petroleum, for instance, have contributed to the fragmentation of coastal ecosystems in states like Tabasco, Campeche and Chiapas. Most agricultural, industrial and domestic wastes are discarded in the sea remaining for years in the coasts. Many of these polluting agents are accumulated in marshes and mangroves, affecting the development of crocodilian populations in Mexico. In addition, many rural communities practice the illegal capture of these species and there is also a great number of furtive hunters. These animals are being eliminated due to the value that their skins have in the market (INE, 2000c).

8.3.2.2.4 Harvest and use

Mexico is considered a producer of raw material for the leather and shoe industries, however, for the crocodilian skins Mexico is basically an assembler country since it imports large amounts of green, fresh and salted skins and exports products like boots, belts and wallets, in addition to a high percentage of finished and tanned skins. At present, Mexico is once again initiating the production of crocodile skins as a consequence of the high international demand for these products. In 1997, the Mexican government estimated that the country would produce 20,000 skins of *C. moreletii* during 1997-2000.

Since the accession to CITES (1991), Mexican authorities began to systematize information about imports of crocodile' skins for the national leather industry. The analysis of these statistics shows that the current trend in the use of these skins as raw material is on the rise, a fact that assures its tradable potential once its quality and price are competitive *vis a vis* the imported skins.

8.3.2.2.5 Trade data

From 1980 to 2001, Mexico exported around 1,304 whole skins from native *Caiman* spp. and 301 whole skins from native *Crocodylus* spp. (Table 7.2). In terms of key events in Mexico, exports of whole skins from *Crocodylus* spp. and *Caiman* spp. tended to remain low after Mexico banned the international trade on native species in 1982 and following Mexico's access to CITES in 1991 apart from in 1993 (*Caiman* spp.) (Figure 8.4), but tended to increase following Mexico's adoption of sustainable resource use policies in 1996 (*Crocodylus* spp.) (Figure 8.4).

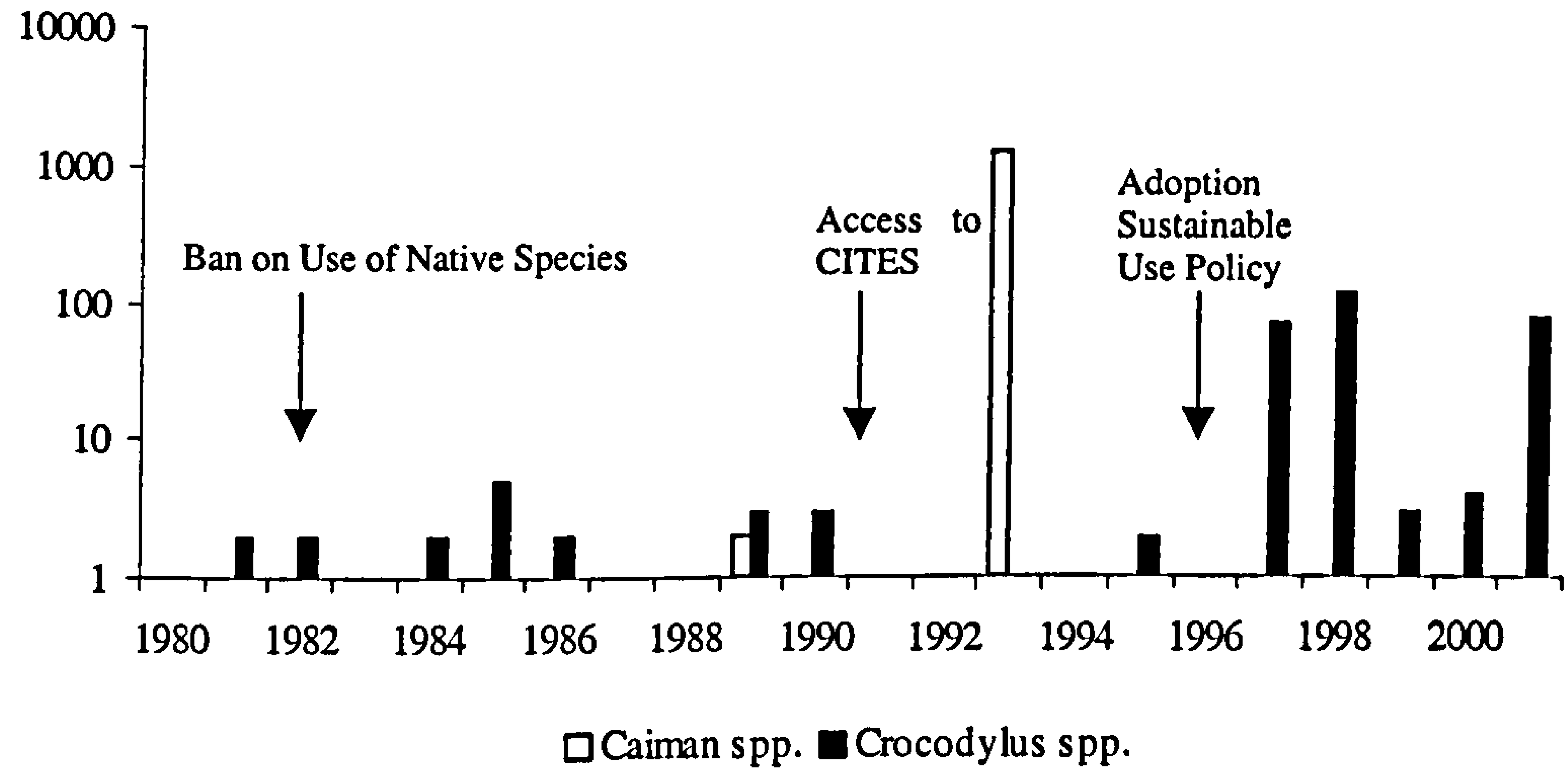


Figure 8.4 Mexican Exports of Reptile Skin Products 1996-1999
(UNEP-WCMC Trade Data)

From 1980 to 2001, Mexico exported around 2,331 skin products from native *Crocodylus* spp. and 1,808 skin products from native *Caiman* spp. (Table 7.2). In terms of key events in Mexico, exports of skin products from *Crocodylus* spp. and *Caiman* spp. tended to increase after Mexico banned the international trade on native species in 1982 with a peak in 1989, but tended to decrease following Mexico's access to CITES in 1991 (Figure 8.5). Following Mexico's adoption of sustainable resource use policies in 1996, exports of skin products from *Crocodylus* spp. and *Caiman* spp. tended to increase again (Figure 8.5).

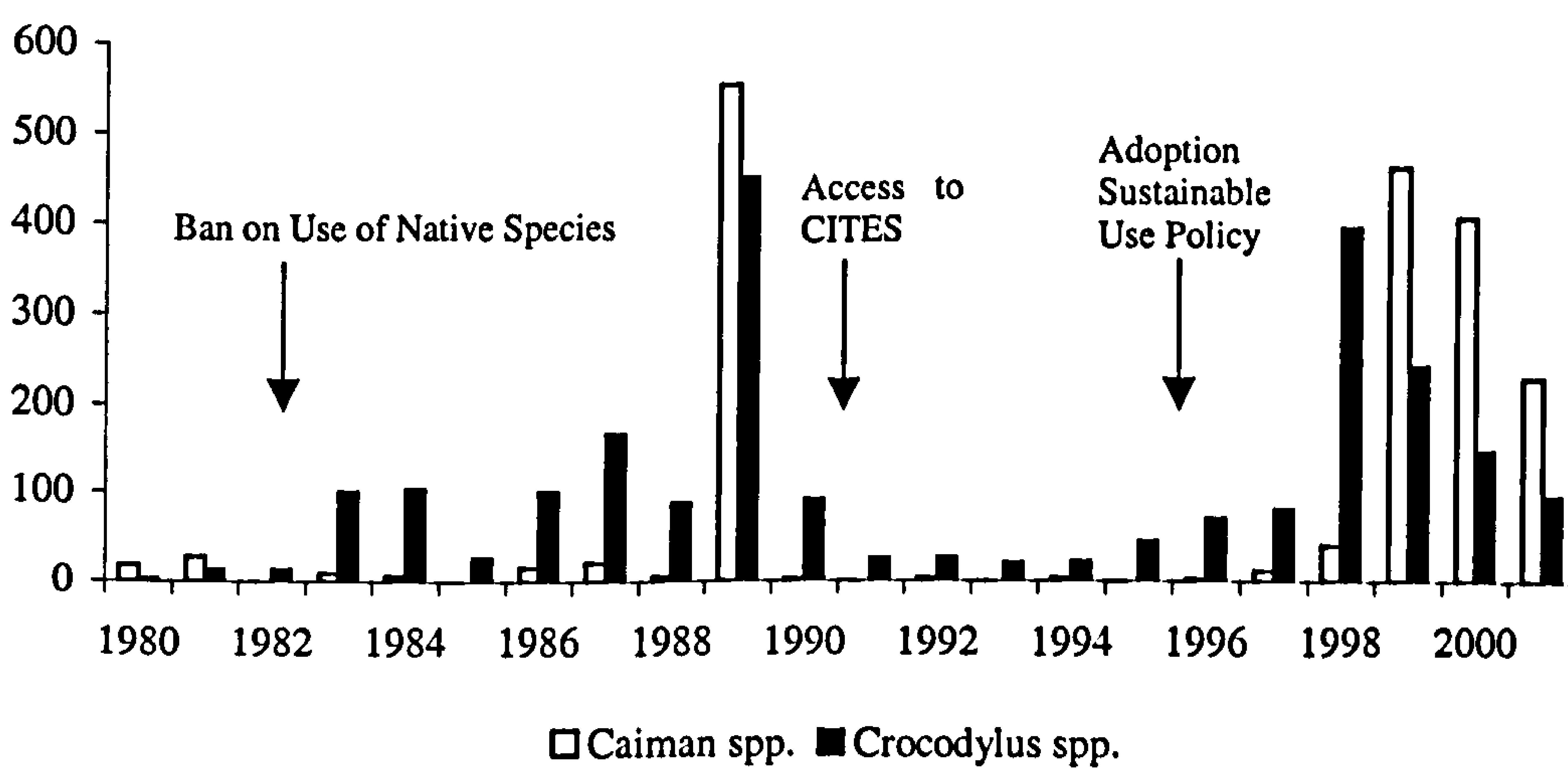


Figure 8.5 Mexican Exports of Reptile Skin Products 1996-1999
(UNEP-WCMC Trade Data)

8.4 Discussion

Since 1996, Mexico has implemented a promotion programme for wildlife conservation and sustainable use. Through this programme, the Mexican government recognized the value and advantage of managing native species, and aimed to involve different sectors of society, mainly the interests and needs of producers. This Programme present the continued loss of Mexico's habitats and species by proposing to the rural sector alternatives for productive diversification through the conservation and sustainable use of wildlife and its habitat (Ramírez, 1999). Hence, the wildlife programme is indeed an instrument with a bold approach and initiatives on the protection and use of wildlife, as radically different from what prevailed in Mexico for many decades. However, in the case of reptile skin production, what prevails in Mexico is an ongoing use of reptiles from non-native species while the few native species promoted through the SUMA (crocodilians and iguanas) are basically subject to captive breeding schemes, which though some presumably sustainable, do not consider habitat conservation.

8.4.1 SUMA

The federal SUMA program appears to be a governmental response to overcome the challenges found in previous models of wildlife management. At least in theory, UMAs offer the potential to many environmental and social benefits – they could be a vehicle for the protection of ecologically valuable land and the economic development of communities.

The UMAS are an innovative measure; an attempt to reconcile biodiversity conservation with socio-economic pressures such as commercial demand for wildlife in a country with widely dispersed rural communities and important living resources. By allowing the marketing of wildlife under certain conditions, this programme should help improve protection of threatened species. The system is designed to respect CITES and provides a procedure for certification of wildlife products (OECD, 1998). In this regard, the Mexican government (SEMARNAP, 1997; CONABIO, 1998) recognized in the late 1990s that Mexico was importing large quantities of reptile skins from non-native species instead of looking for alternatives to promote, through the UMAS, the use of reptile skins from native species such as:

- Boa (*Boa constrictor*)
- Nauyaca and Rattle Snake (*Botrops* spp. y *Crotalus* spp.)
- Iguana (*Iguana* spp. and *Ctenosaura* spp.)
- Crocodiles and Caiman (*Crocodylus acutus*, *C. moreletii* and *Caiman crocodylus fuscus*)

For example, the skins of native *Iguana* spp. could be the national substitutes for the imports of non-native *Varanus* spp. and/or *Tupinambis* spp.; native *C. moreletii* and *Caiman* spp. could substitute non-native *Caiman* spp.; and, native *Boa constrictor* could substitute non-native *Python reticulatus* (Morales, 2002). However, at present the promotion of reptile skin production practices through the SUMA is still incipient in Mexico. In the case of previously registered and operating reptile production schemes, the great challenge is to ensure that the economic benefits derived from production are routed toward conserving biodiversity and social and economic benefit for the local communities. Currently, the main reptile skin production systems are held by private owners for populations of captive species instead of promoting wild populations and their habitat. Hence, it has been suggested that the great expense involved in captive breeding programmes, and the fundamental limitations of these programmes in producing long-term conservation benefits should result in captive breeding being viewed as a last-resort recovery strategy. Captive breeding should not be a long-term conservation strategy and, when adopted as a recovery technique, should always be integrated with simultaneous efforts to maintain, augment, or re-establish wild populations (Snyder *et al.*, 1996; Balmford *et al.*, 1996).

8.4.1.1 Crocodiles

Crocodile conservation in Mexico is on the verge of a significant expansion. The Mexican government is building up a conservation infrastructure for the remaining populations of crocodilians. However, there are still challenges that need to be addressed. For instance, in most ecosystems where crocodilians are distributed, the value that these spaces have for breeding these animals is hardly considered. Nowadays, numerous areas where crocodilians breed and feed are still erroneously catalogued in Mexico as unproductive lands that need to be transformed (INE, 2000c).

Crocodylus moreletii is one of the most valuable crocodile species because of its leather quality. However, little research in Mexico has been applied to its management, particularly in restocking natural areas and conserving habitat. COCOMEX is indeed a breakthrough in the breeding, reproduction and commercialisation of *Crocodylus moreletii* in Mexico. However, better mechanisms need to be developed by Mexican authorities to guarantee that the efforts of UMAS like COCOMEX pay dividends for the conservation of the species. COCOMEX officially started its operations with a federal concession through which the company received around 300 crocodiles from Chacahua, Oaxaca; Villa Hermosa, Tabasco; Tampico, Tamaulipas, and Campeche, to commercialise the skin, meat and heads in the domestic and international markets. This concession established that COCOMEX had to return 10% of its annual production to repopulate areas where crocodiles are at risk. However, to date, not a single specimen has been returned to the wild since the Mexican government has not developed a protocol for deciding which areas are appropriate to liberate specimens. Meanwhile, COCOMEX fulfils its part of the deal with the Mexican government by means of economic support for research project (León 2001, Pers. comm.).

Another challenge faced by UMAS with potential promotion of crocodile skin production is the time it takes to make the farm operational. COCOMEX, for instance, had to wait between 3-4 years to recuperate the investment. Although the farm has been producing *Crocodylus moreletii* for 12 years, it had to go through a long period of development prior to achieving commercial transactions (León 2001, Pers. comm.). In addition, once a crocodile farm in Mexico reaches commercial operation, it faces the difficulties of breaking into international trade with small quantities of skins and with protectionist measures in force in some markets, like the closure of the lucrative US market by means of strict domestic legislation, which prevents the import into the US of products from *Crocodylus moreletii*. In this way, UMAS like COCOMEX that have focused their production on this species have to struggle to gain a position in other important but distant markets like Japan or to look into internal markets with increased economic importance and greater manufacturing capacity.

Another challenge faced by UMAS with potential reptile skin production is the struggle against illegal trade in reptile skins. For instance, Mexican authorities have undertaken surprise raids in tanneries of Leon, solicited by COCOMEX, to diminish the illegal trade in reptile skins. The sales of COCOMEX are directly affected by the existence of illegal trade, since illegal skins are sold cheaper than legal ones, which reduces the market of this company. In this regard, illegal trade has been partially reduced because of the diverse measures such as CITES permits and rings used to mark specimens. Despite these advances, however, illegal traffic continues (León 2001, Pers. comm.).

8.4.1.2 Iguanas

Currently, there is little legal use of iguana skins in Mexico. The producers that currently work at the UMAS with this species basically focus on conservation and environmental education and not in skin production.

Iguana producers in Mexico are just learning about what the government is promoting through the UMAS and what are the procedures for establishing one of these units. Although the Mexican government is promoting the establishment of UMAS for iguanas as an economic alternative for local communities, the presentations about UMAS by users and producers during the V National

Workshop for Captive Iguana Management (May 2002), dealt with protection, conservation and education issues rather than sustainable use, production and commercialization schemes.

The subject of international trade is not yet a relevant issue to discuss among iguana producers in Mexico. For example, they still ignore CITES, so the government cannot expect producers to gain a position in the international market if they ignore the regulations and mechanisms to undertake this endeavor legally.

Government, with support from the academic sector and the general public, has promoted National Workshops for Captive Iguana Management since 1995, and proposals have been emerging related to the integral management of iguanas in Mexico. An example was the proposal presented by the *Universidad Juárez Autónoma of Tabasco* during the V National Workshop for Captive Iguana Management (May 2002), which proposed the establishment of an UMA for green iguanas in the *camellones chontales* of Nacajuca, Tabasco. This proposal aimed to improve the socioeconomic conditions of an indigenous communitiy (*chontal*) through the rescue of traditional knowledge for producing handcrafts using the skin of iguanas, among other species. The *Universidad Juárez Autónoma of Tabasco* has also prepared other management proposals, which promote the commercialization of iguana skin (e.g. Villegas, 1998), but these are projects that have not been implemented yet.

The Mexican government is encouraging the producers to adopt schemes for the production of iguana skins in order to substitute for the imports of non-native reptiles. The government is concerned about the large amounts of imports from non-native iguanas and the lack of initiatives in Mexico for producing these skins using native species. However, iguana producers in Mexico need market studies because establishing an UMA is not sufficient if the skin products cannot find a place in the market. Market studies are needed to promote, on solid grounds, the substitution of imported skins for national skins and not only devote the efforts towards establishing UMAS in a methodical way. A question arises: is it really viable for iguana skins from native species to gain a position within the domestic and international markets?

At this moment, the legal production of iguanas in Mexico is practically non-existent, the country still imports large amounts of iguanas from Central America. The Mexican government has not yet developed a formal market study for the promotion of iguana skins. Nevertheless, it strongly promotes the development of UMAS across the country with the aim of achieving a legal use for iguana skins. In this regard, the only approach presented so far by the government is that indeed there is a potential market for the commercialization of iguana skins over the long term in Mexico and handicrafts in the medium and long terms (Morales, 2002) since to accomplish the production and commercialization of iguana skins an UMA needs at least five years (Macdonel, 2002).

Besides a market study, the promotion of iguana skin in Mexico requires good tanning. Furthermore, the dumping practices of Guatemala, Costa Rica, El Salvador and Belize must be overcome because they do not comply with national and international norms for the export of iguanas. Thus, many products from Central America are found in Mexico at very low prices that overwhelm the Mexican market. In contrast, the condition of national producers is critical because the Mexican government demands strict fulfillment of the legal requirements needed to commercialize the iguanas internally and abroad (CECOREI, 2000).

The development of UMAS in Mexico requires five conditions for iguana skin production:

- To achieve the certification of production;
- To reduce imports from countries with less stringent conditions;
- To give confidence to the consumer;
- To serve as a basis for exploration of foreign markets; and,
- To develop a programme of surveillance with comprehensive participation to also abate the illegal market.

Finally, as for crocodiles, the establishment of UMAS for iguana skin production should focus on habitat conservation issues and the social and economic benefits needed for local communities.

8.4.2 Contrast between marine turtles and crocodiles

The value of crocodilian skins, and the threat posed by international trade to many species since they were first commercialised on a large scale, has led to the development of sustainable management programmes in a number of countries[4]. There is an increasing interest in the breeding of crocodiles, and so countries like Mexico are encouraging this activity.

---

[4] Prior to the first CITES meeting in Washington, the trade in international crocodilian skins was unregulated. Crocodile farming followed the first CITES convention and started in Zimbabwe as early as 1963 where a policy was adopted to allow licensed crocodile farmers to collect a prescribed number of eggs from the wild and incubate them artificially for later slaughter and sale on the international market. This trend also took place in Papua New Guinea, Indonesia and the Southern States of the US. The late 1980s saw a dramatic increase in the number of crocodilian farms world wide with Africa and the US being the most progressive areas. By 1992, the US had over two hundred farmers and in excess of three hundred thousand eggs were collected in the 1991 nesting season. These expansion figures are seen in Africa where the question of technology might be inferior to that of the US. Zimbabwe alone increased from six traditional farmers to more than fifty farmers in 1991. Similar expansion took place in Sudan, Ethiopia, Kenya, Tanzania, Malawi, Mozambique, Zambia, Botswana, Madagascar, South Africa and Namibia (Jaarsveldt, 1992).

Crocodilians are probably the only species group once included in CITES Appendix I, which have demonstrably recovered in numbers from previous levels of overexploitation and which, as a result, have re-entered international trade (Smith & Marais, 1992). By 1969, all 23 species of crocodilians were endangered or depleted or decreasing in numbers. Today, at least one-third of crocodilians can sustain a regulated commercial harvest and only four species remain critically endangered (IUCN Action Plan). In many cases, international trade controls applied to crocodilians have been accompanied by well-managed ranching programmes. These CITES-approved programmes produce sustainable harvested hides for the international market, garnering the support of the reptile leather industry and governments while also helping to supplant illicit trade (TRAFFIC Dispatches, 1998). The commercial incentive provided by international trade in crocodile skins has been credited with having been partially responsible for engendering public acceptance for species which are otherwise often regarded as harmful or, at best, useless (Smith & Marais, 1992).

From the end of 19th century to 1970, Mexico was considered the main exporter of crocodile skins to the US. It was an economic activity of relative importance, mainly for inhabitants of the coastal states of Campeche, Colima, Chiapas, Jalisco, Nayarit, Guerrero, Oaxaca, Quintana Roo, Sinaloa, Tabasco, Tamaulipas, Veracruz and Yucatan (INE, 2000c). Nevertheless, like in other regions of the world, skin production declined as wild populations were lost due to mis-management, lack of regulation and monitoring, as a result of overexploitation. By 1970, the Mexican Federal Government declared a permanent and total ban on the harvest of the three species of native crocodiles (*Crocodylus acutus, C. moreletii* and *Caiman crocodilus fuscus*). Contrary to its objectives of protection and conservation, the promulgation of the ban fortified the chains of illegal use. In addition, the lack of surveillance seriously affected their habitat and the old beneficiaries of the legal use of the resource saw their interests affected, and indefinitely suspended their productive activities (INE, 1996).

Mexico contemplated how to recover its wild populations of crocodilians and the feasibility of developing economic activities to achieve this. Hence, the Mexican government developed the ideas behind the SUMA, which in turn is supported by international organisations such as IUCN and CITES (INE, 2000b). In this way, the Mexican government can focus on designing well-managed ranching programmes aimed at promoting the conservation and sustainable use of crocodilians, while also improving the habitat and the quality of life of the stakeholders who depend on the use of such resources.

It has been suggested, that there are major differences, however, in the biology of crocodiles and sea turtles that make captive rearing much more difficult in the latter. Sea turtles are migratory and nomadic, while crocodiles are relatively sedentary. Crocodiles mature faster, their young are hardier, they are easier to feed, and they have a broader range of diets than do juvenile sea turtles. The high cost of ranched sea turtle products is an important obstacle to the idea that ranching can be used to inhibit illegal over-exploitation. For any responsible ranching operation, the cost of raising a sea turtle to marketable size is very large. Ranched and farmed sea turtle products will always be expensive, and this will continue to provide an incentive to poachers, whose costs are negligible and who will benefit from the diffuse, uncontrollable local demand stimulated by legal, ranched products. There is currently no inexpensive, portable, reliable method for distinguishing ranched from poached products. Even if there were, laundering of illegal products as ranch-raised would be impossible to stop, at least at the local level. Free-trade blocks have the potential to simplify some enforcement, but they have also opened new, wide loopholes for violations of CITES regulations (Thorbjarnarson *et al.*, 2000).

It is equally obvious, that banning fisheries of marine turtles is not a sustainable solution either. For instance, the fisheries for marine turtles in Mexico have been either partially or totally prohibited during the past decades and these bans, combined with the lack of options of economic development and the permanent demand for marine turtle products, have resulted in the illegal capture of these species and increased prices of their products and by-products. Although the government does not have clear data on this activity, the skins of *Chelonia mydas, Caretta caretta, Eretmochelys imbricata* and *Lepidochelys olivacea* have remained highly priced in the leather industry, causing a significant loss in their populations. Over almost two decades (1965-1982), Mexico supplied the market skin that was used as substitute for crocodile skin, destined for the manufacture of diverse products like shoes, belts and wallets. At present, the use of marine turtles or processed parts is illegal, but a market of unknown magnitude still exists (INE, 2000c). During 1990-2001, for instance, Mexico exported around 14,000 sea turtle skin products, recorded in shipments seized by the US authorities and containing specimens taken from the wild (Table 8.4).

Table 8.4 "Exports" of Sea Turtle Skin products by Mexico 1980-2001

Species	1980-1989	1990-1997	Total
Chelonia spp.	10,781	13,666	24,447
Lepidochelys spp.	3,462	122	3,584
Eretmochelys imbricata	160	11	171
Caretta caretta	64	236	300
Total	**14,467**	**14,035**	**28,502**

Source: WCMC Trade Database

The data in Table 8.5 show that although Mexico has had a total ban on marine turtle fisheries in place since 1990, shipments leave the country. In fact, the number of shipments leaving the country could be much higher if the shipments that make their way across the US-Mexico border remain undetected. It is difficult to estimate the real extent of Mexican exports involving marine turtle products through seizures alone. However, many such transactions took place during the 1990s, placing continued pressure on turtle populations in Mexico, so that new ways need to be found to manage turtle populations more fruitfully.

Solutions to the over harvest of common resources are usually framed in two major contexts: governmental regulation of exploitation or privatisation (Freese, 1998). Both approaches can offer substantial pitfalls, including the failure to take local social institutions into consideration when designing management programmes and the assumption that privatisation will lead to sustainable management (Thorbjarnarson *et al.*, 2000). As in Mexico, instances of governmental regulation of turtle exploitation are usually limited to total prohibitions, which in many cases have been unforceable. Attempts by the Mexican government, to regulate the commercial harvest of olive ridleys by permitting the harvest of adults while protecting nesting beaches were a dismal failure. In turn, privatisation, for some, is a means of eliminating some of the perceived problems with common property resources, however, the managed harvest must have enough built-in controls to ensure that harvest levels are sustainable and that the benefits of the harvest accrue to a wider segment of society than a few in the private sector (Thorbjarnarson *et al.*, 2000).

Sustainable-use programmes involve a complex milieu of biological, economic, sociological, and political factors that need to be addressed for each individual case. Implementation of such a programme requires a multidisciplinary effort. For instance, programmes must be able to evaluate the potential levels of harvest in terms of economic benefits for the various programme stakeholders. Aside from generating economic incentives for local communities to protect turtles and turtle habitat, the programme should, ideally, generate revenues (through taxes and user fees) to the governmental entity responsible for programme oversight. These fees would be used to support the enforcement of programme regulations as well as monitoring of the programme to measure the effects of harvest on the turtle population. From a theoretical standpoint, sustainable harvest programmes of wild populations, and ranching programmes that invest in rearing individuals but still rely on wild stock to maintain the operation, can give direct economic justifications to maintaining wild populations (Thorbjarnarson *et al.*, 2000). In Mexico, the government is reviewing legislation that may again allow the exploitation of marine turtle eggs and other products. The current provisions appear to be open to interpretation to include harvest, consumption, and sale of products. There are no stipulations as to species, so presumably all marine turtles potentially could be exploited. Even government officials remain unclear as to how these provisions may be interpreted and whether the 1990 ban could be repealed (Fleming, 2001).

At present, the Mexican government recognizes that proper management, with the right regulations and the participation of stakeholders, are the basic foundations for systems of production that will promise sustainability through use and conservation. Through the SUMA, the Mexican government hopes that use of native species such as iguanas, crocodilians, caimans, and marine turtles will be of critical importance in searching for options to conserve biodiversity and habitat where these reptiles are distributed naturally.

Chapter 9

9 The Illegal Mexican Market for Reptile Skins: Native Species

9.1 Introduction

There is widespread evidence of extensive illegal international trade in reptile skins. The two main motivations for such trade are avoidance of fiscal controls and of conservation-related controls. A major incentive for illegally importing skins is the lower price that skins command in countries of origin. This enables finished skins imported illegally to be offered at a lower price than legally imported skins, and for tanneries to increase their profit margins considerably. Illegal trade may also be the only means by which particular commodities can be obtained, for example skins of completely protected species or skins of particular sizes. Uncovering illegal trade in importing countries is extremely difficult unless the skins in question show consistent variation, according to their geographical origin, thereby allowing their provenance to be determined (Jenkins & Broad, 1994).

In Mexico, illegal practices occur because of cultural problems, lack of education, and lack of alternative options for socio-economic development, as well as poor law enforcement and oversight, and constant increases in the demand for wildlife resources (SEMARNAP, 1997). Illegal wildlife trade takes place mainly through formal markets, informal markets, street traders, pet stores and veterinary centres. Traffic in species also occurs in circuses, laboratories, aquariums, zoos, collections and breeding places (Cantú & Sánchez, 2000).

This chapter aims to assemble available information in order to identify species and critical areas implicated in the illegal trade of reptile skins from native species in Mexico.

In particular, in this chapter I seek to answer the following questions:

- Which are the main native species traded illegally for their skins and skin products in Mexico?
- Are there critical areas where the illegal trade in reptile skins and products from native species is more detectable?
- Is there ongoing illegal cross-border trade in reptile skins and skin products from native species in Mexico and which native species are mainly involved?

- Which are the main sources and the main ports of exit and the destination(s) for the reptile skins and products from native species exported illegally from Mexico?
- Is there enough information available from seizures, reports and surveys to determine the scale of illegal trade for reptile skins and products in Mexico?

9.2 Methodology

Research for this chapter was carried out through extensive bibliographic searches of government and non-government literature, by semi-structured interviews, and by using the LEMIS Trade Database.

9.2.1 Bibliographic searches

Extensive bibliographic research was undertaken regarding the use of native species in the illegal Mexican market for reptile skins. Such research was undertaken in Mexico City (DF) from April-August 2001, when the archives reviewed comprised the following:

- Instituto Nacional de Ecologia (INE)
- Procuraduria Federal de Proteccion al Ambiente (PROFEPA)
- FAUNAM AC
- CONABIO
- TRAFFIC Mexico

This bibliographic search was supplemented by work undertaken in the Library and files of TRAFFIC North America (Washington DC) from September-December 1999.

All the information gathered in Mexico City and Washington DC, including books, reports, articles, and unpublished reports, was compiled, classified, read, and arranged to construct this chapter. All the bibliographic sources of information examined for this chapter are presented as references in the body of the chapter, and presented in full in the reference list.

9.2.2 Semi-structured interviews

Semi-structured interviews were undertaken throughout the study with key informants from among Mexican government authorities and specialists. The following key informants were interviewed for this study:

- April 2001: Adrian Reuter, Programme Officer TRAFFIC Mexico.
- August 2001: Biol. Francisco León, COCOMEX in Culiacán, Sinaloa.

- May 2002: Pedro Uriarte Gazcón, Manager IGUASIN. Culiacán, Sinaloa; Ezequiel Vidal de los Santos, Delegado Federal de SEMARNAT Tabasco; Gustavo A. Castañeda, PROFEPA Tabasco; Francisco Villegas Zurita, Centro de Conservación y Reproducción de Iguanas. Universidad del Mar, Oaxaca.

In addition, in February 2003, a visit was conducted to the informal footwear markets of Leon, Guanajuato, to observe the operation of sellers and peddlers offering shoes and cowboy boots made with reptile skins from native species.

All the information gathered in Mexico City, Sinaloa, Tabasco and, Leon, was compiled, classified and arranged to construct this chapter. All the interview-based sources of information examined for this chapter, are presented as references in the body of the chapter, and presented in full in the reference list.

9.2.3 LEMIS trade data

This chapter uses data on volumes of various species and genera in trade stored in the LEMIS Trade Database (*Law Enforcement Management Information System*) held at the Fish and Wildlife Service in the US. The trade records compiled were all imports to the US from Mexico 1995-1999 of the following native specific genera and species:

- *Caiman* spp.
- *Crotalus* spp.
- *Iguana* spp.
- *Crocodylus* spp.
- *Boa constrictor*

Microsoft Excel was used to sort and sum subsets of the data appropriately and also to generate the graphic representations. All quantities traded were added together for all records where the following details were the same: species, the year in which the trade occurred, wildlife description, source, action, and port of entry. The wildlife description used were: small products, large products, watchbands, shoes, and handbags. All calculations were performed together as skin products, except for garments and skins. Each shoe was regarded as a single skin product.

The full range of data available from the LEMIS Trade Database was too large to represent all fields graphically. Hence, only the most important fields were selected for graphical illustration in relation to the question under consideration. The fields selected comprised skin products, because these predominate over all other traded volumes. The proportions of exports of different species were contrasted by using pie charts. Annual changes in the volumes of species exported are shown with bar charts. This allowed trade volumes and trends for the groups to be assessed individually as well as compared between groups. Differences in the ports of entry into the US were contrasted by using pie charts. Bar charts were used to compare information on the source of specimens in trade.

9.3 Results

9.3.1 Species involved

At the group or genus level, skins and skin products from crocodiles (*Crocodylus* spp.), sea turtles (Chelonidae, *Caretta* spp., *Eretmochelys* spp., *Lepidochelys* spp.), caimans (*Caiman* spp.), iguanas (*Iguana* spp.), boas (*Boa constrictor*), and rattlesnakes (*Crotalus* spp.) form the majority of illegally traded reptile skins from Mexico.

Species traded illegally include: green iguana (*Iguana iguana*) and the Mexican spiny-tailed or black iguana (*Ctenosaura pectinata*), which are harvested locally in Mexico. Populations of *C. pectinata*, for instance, have disappeared or declined sharply in southern Mexico because of indiscriminate hunting and habitat destruction. Their skins are being sold illegally and the sale of handicraft products also represents an additional source of income (Villegas & Vázquez, 2001). Crocodilians (*Crocodylus* spp.) of commercial size, more than 1.5 meters in length, are also illegally traded for their skins (INE, 2000b) (Plate 9.1).

Plate 9.1 Seizure by PROFEPA of crocodile skins in Tabasco, Mexico
© Reforma

9.3.2 Internal market

Illegal trade in reptile skins and products takes place mainly through formal markets, informal markets and street traders or peddlers throughout Mexico. Species like iguanas (*Iguana Iguana*, *Ctenosaura pectinata* and *C. similis*) are illegally traded in five states of the Pacific coast (Oaxaca, Guerrero, Jalisco, Michoacán and Colima), where they appear in local markets (Villegas & Vázquez, 2002). The skin of marine turtle species (e.g. *Caretta caretta*) is sent from Tabasco, Campeche, Oaxaca and Guerrero to clandestine shoe producers of Leon, Guanajuato, and Ciudad Juárez, Chihuahua (Taniguchi, 2004). The sale of reptile skins and products has become an important livelihood activity for the arid and semiarid inhabitants of San Luis Potosí, Zacatecas and Coahuila, since the agro-climatic conditions found on the high plateau do not allow people from this region to meet all their livelihood needs from agricultural and livestock herding activities (La Jornada, 1996). Charco Cercado, on the Matehuala-Saltillo highway in San Luis Potosí, is a key distribution for illegal reptile skins (Cantú & Sánchez, 2000; Reuter 2002, Pers. comm.), while the city of León, Guanajuato, is a key manufacturing and distribution centre for illegal reptile skin products.

Although the illegal trade of reptile skins and skin products takes place throughout Mexico, some critical areas have been identified where the harvesting of species, tanning of skins, manufacturing of skin products, and distribution of skins and skin products is more evident (Table 9.1; Figure 9.1).

Table 9.1 Illegal Reptile Skin Trade

Illegal Reptile Skin Trade	Critical Areas
Tanneries	León, Guanajuato Jalpa de Méndez, Comalcalco and Tenosique, Tabasco
Manufacturing	León, Guanajuato Ciudad Juárez, Chihuahua La Chontalpa, Tabasco Culiacán and Rosario, Sinaloa Nautla, Veracruz
Distribution and Trade Centres	León, Guanajuato Ciudad Juárez, Chihuahua Chihuahuan Desert Ecoregion Zacatecas (e.g. Plateros) DF (e.g. Sonora, San Lázaro and Cárdenas markets)
Main Harvest Areas and Localities for Iguanas	Oaxaca (e.g. Istmo/Juchitán, Huatulco, Central Valleys, Tuxtepec) Guerrero Michoacán Colima Jalisco La Chontalpa and Centla, Tabasco
Main Harvest Areas for *Crotalus* spp.	Chihuahuan Desert Ecoregion Tamaulipas Nuevo León Zacatecas
Main Harvest Areas for Marine Turtles	*Chelonia agassizii*: Bahia de los Angeles, Baja California *Dermochelys coraicea* and *Lepidochelys olivacea*: Playa Ceuta, El Verde, Sinaloa; Playón de Mismaloya, Nayarit; Mexiquillo, Colola, Maruata, Michoacán; Tierra Colorada, Guerrero; Chacahua, Puerto Escondido, La Escobilla, Barra de la Cruz, Llano Grande, Morro de Ayutla, Oaxaca; Puerto Arista, La Encrucijada, Chiapas. *Eretmochelys imbricata*, *Chelonia mydas* and *Caretta caretta*: Mahahual, Xcacel-Xcacelito, Quintana Roo; Ría Lagartos, Yucatán; Isla Aguada, La Escollera, Campeche. *Lepidochelys kempi*: Rancho Nuevo, Tamaulipas.

9.3.2.1 Illegal trade in Chiapas

Caimans (*Caiman* spp.) and boas (*Boa constrictor*) are illegally traded for their skins in the state of Chiapas (Table 9.1; Figure 9.1). For example, acting on an anonymous tip, federal agents from PROFEPA raided a workshop in Tapachula, Chiapas, in July 2000, where they found the owner had neither documents nor evidence of legal origin of the skins in his possession. The agents seized skins, parts and pieces of about 40 caiman skins, one live caiman and manufactured products including belts, boots, and bags. Skins and materials of *Boa constrictor* were also seized. As a result of the lack of permits and the finds of illegal skins, the federal agents closed the facility (Muñiz, 2000).

9.3.2.2 Illegal trade in Oaxaca

Iguanas (*Iguana* spp. and *Ctenosaura* spp.) and marine turtles are often traded illegally in the state of Oaxaca (Table 9.1; Figure 9.1). The most important regions for the illegal use of iguanas are the Coast (Sta. Maria Huatulco), El Istmo (La Ventosa Juchitán), Central Valleys (Oaxaca de Juarez), and Tuxtepec (Figure 9.2), where spiny-tailed iguanas (*Ctenosaura* spp.) are particularly heavily harvested from November to April. Inspections for illegal trade are mainly carried out in transit vehicles in El Istmo (La Ventosa Juchitán). In contrast, inspections are mainly carried out in markets and local stores in the Central Valleys (Oaxaca de Juarez) and in Tuxtepec (De Los Ángeles, 2001).

Iguana hunters in Oaxaca commonly use trained dogs to scout out the lizards. A good "iguana dog" must not kill or eat its catch. Locals believe that they must cut the dog's ears and forcefully rub an iguana on its snout to eliminate this instinct. Therefore, many dogs are missing one or both ears in this region! The iguana hunter usually carries a slingshot (made of wood, a strip of leather, and two thick rubber bands) to fire stones, which can kill or cause considerable injury to the lizards. When an iguana detects the presence of a human and flees to its burrow, the dog follows and digs out the hiding lizard from the burrow complex. Once the iguana is captured, its legs are tied behind its back by completely pulling out a claw, still attached to a tendon, and inserting it into the tendon of a toe on the opposite leg. In addition, its snout is sewn shut with a strip of bark to keep it from biting during transport (Villegas & Vázquez, 2001).

Apparently, in the region of Tehuantepec, there are also indications of a band that harvests marine turtles in order to sell the skin to accomplices in León, Guanajuato, who in turn "launder" the skins through the selling of products like cowboy boots as legal merchandise (Taniguchi,2004).

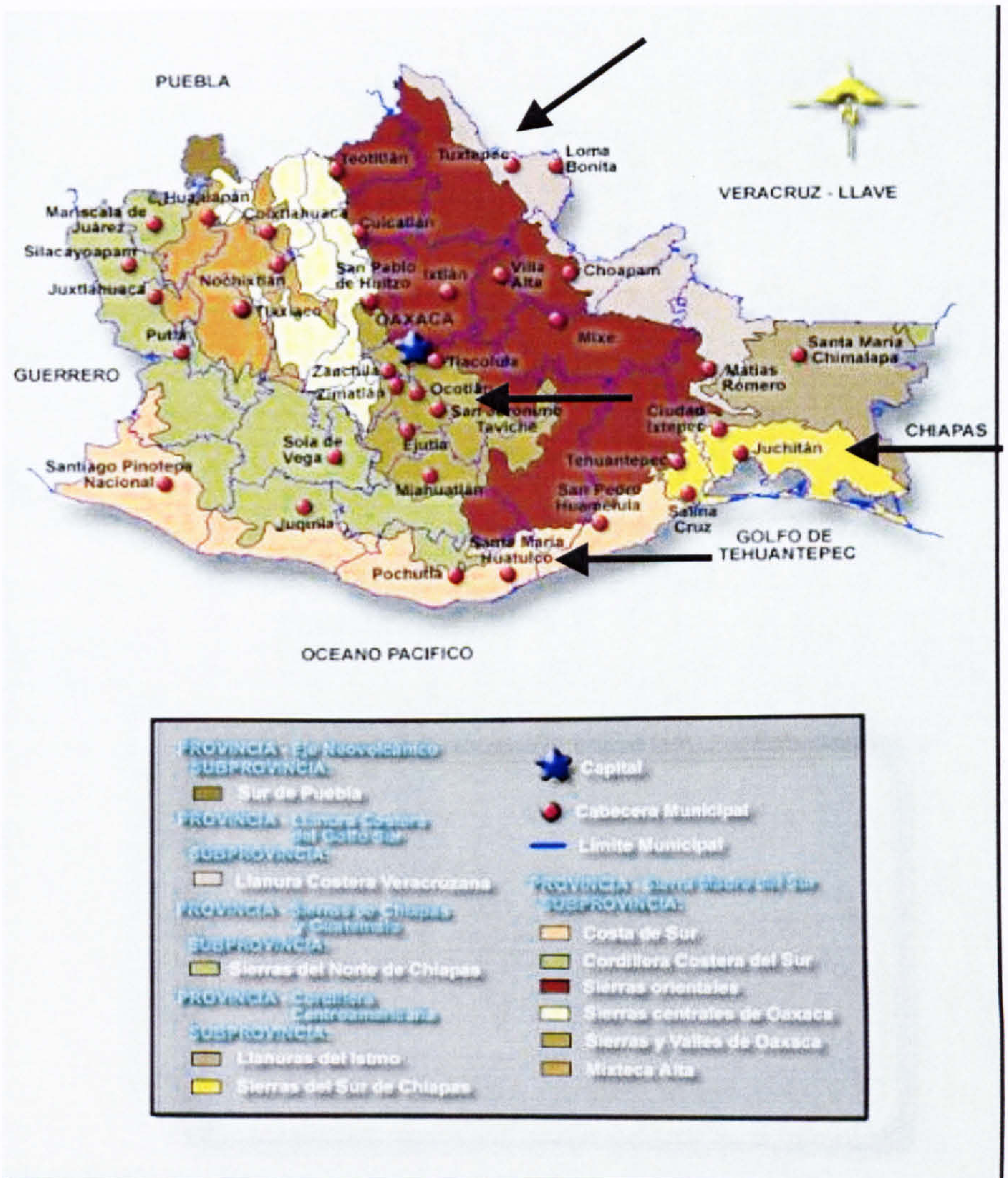


Figure 9.2 State of Oaxaca, Mexico
INEGI (2003)

9.3.2.3 Illegal trade in the Chihuahuan Desert Ecoregion

Illegal trade in the Chihuahuan Desert Ecoregion (Figure 9.3) is extensive and diversified and the primary demand is for reptile skins (Table 9.1; Figure 9.1). Rattlesnakes are the most commonly harvested species. Rattlesnakes are harvested for their skins, but they are also used for their rattles, meat, fat and venom (Fitzgerald *et al.*, in press), since selling all the parts separately provides a higher income to the dealers (Reuter 2001, Pers. comm.). Rattlesnakes are also used live by street peddlers and sold as pets. Since much of the trade is illegal, and harvest and trade are not reported, it is difficult to estimate the volume of rattlesnakes harvested and traded. However, PROFEPA estimate that 400 specimens of *Crotalus* spp. and

Sistrurus spp. are harvested every month in the Chihuahuan Desert. The snakes are available for 9 months, which results in a harvest of 3,600 snakes per year (Fitzgerald *et al.*, in press).

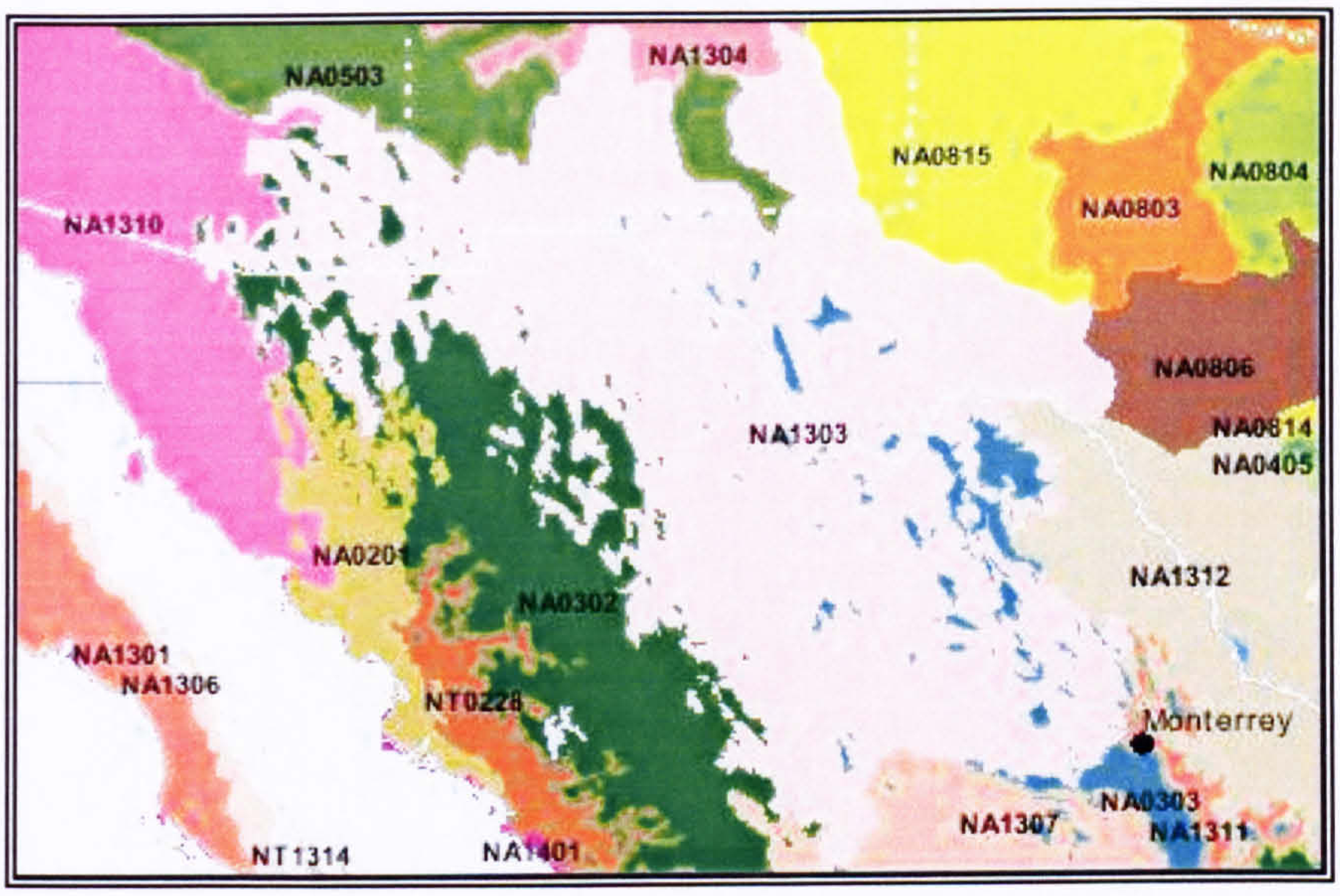


Figure 9.3 Chihuahuan Desert Ecoregion
Terrestrial Ecoregion of the World NA1303[1] (WWF, 2003)

Shipments of hundreds or even thousands of rattlesnake skins, as well as skins from other reptiles, travel via ground transportation to Leon, Guanajuato or Nautla, Veracruz where the skins are used to make boots and other products, which then are distributed to markets within and outside Mexico (Fitzgerald *et al.*, in press).

Five distribution and trade centres are particularly important for Chihuahuan Desert reptiles (Fitzgerald *et al.*, in press):

- Plateros Magical and Religious Centre, Zacatecas.
- Charco Cercado roadway, San Luis Potosi.
- Market of Sonora, DF
- Nuevo Mercado San Lazaro, DF
- Market Emilio Carranza, DF

[1] The Chihuahuan Desert stretches from the southeastern corner of Arizona across southern New Mexico and west Texas to the Edwards Plateau in the United States. It runs deep into central Mexico, including parts of the states of Chihuahua, northwest Coahuila, northeast Durango and several others. This Desert is bounded by the Sierra Madre Occidental to the west and the Sierra Madre Oriental to the east, extending as far south as San Luis Potosi and to disjunct islands of the Chihuahuan vegetation in the states of Queretaro and Hidalgo (WWF, 2003).

In the Plateros Magical and Religious Centre near Fresnillo, Zacatecas, rattlesnake skin cowboy boots and hides belonging to *Crotalus molossus*, *C. scutulatus*, *C. atrox*, *C. lepidus*, and *C. viridis* have been confiscated. However, there is no way to confirm that snakes were captured in the Chihuahuan Desert Ecoregion (Fitzgerald *et al.*, in press).

Charco Cercado is located in the municipality of Guadalcazar, situated northeast of the city of San Luis Potosi. The community of Charco Cercado has few other livelihood options and many families dedicate their lives to the illegal capture and selling of wild fauna. As a result, this community has become the largest centre for storing and selling of wild fauna in the country. Thus among a population of some 1084 residents, around 90 are devoted to illegal trade of wildlife.

Wildlife suppliers transport caught specimens to Charco Cercado where sellers offer the animals or act as intermediaries for those seaking a substantial number of specimens. There is a periodical trade of vehicles coming from Mexico City, León, and Guadalajara that remain in the area for one or two days until completing their load (Enciso, 1995). Salted skins (Plate 9.2) from rattlesnakes native to the region or illegally transported from Tamaulipas, Nuevo Leon and Zacatecas are offered hanging along the roadway in Charco Cercado (Plate 9.3) (Fitzgerald *et al*, in press). Along approximately 2km of road there are around 30 stands offering about 30 snakes each, mainly *Crotalus molossus* and *C. scutulatus* (Reuter 2001, Pers. comm.).

Plate 9.2 Salted rattlesnake skins in Charco Cercado, San Luis Potosí
© Adrián Reuter (TRAFFIC NA Mexico Officer)

Dealers arrive by vehicle from Mexico City and Leon, stay for one or two days in order to complete transactions and then leave. Regular costumers also come to the area and buy skins for use elsewhere in boot and belt making. Reptile species found in the Chihuahuan Desert Ecoregion are offered in the markets of Mexico City, which act as wildlife distribution centres (Fitzgerald *et al*, in press).

Plate 9.3 Drying rattlesnake skins in Charco Cercado Roadway
© Adrián Reuter (TRAFFIC NA Mexico Officer)

Rattlesnakes are the most common reptiles found in trade in the Chihuahuan Desert Ecoregion because of traditional beliefs about their healing capabilities, and the demand for skins and live as pets. Their natural populations have nearly been extirpated in some areas like in Plateros, Zacatecas. There is little information on national and international trade in reptiles from the Chihuahuan Desert Ecoregion. Basic biological information is scarce on most of these reptiles, making it difficult to evaluate the impact of harvest and trade on wild populations. In addition, they face other threats such as habitat loss, agriculture, and overgrazing. Though possible to legally trade in certain Mexican wildlife, particularly via the SUMA, there is little or no evidence or any legal trade in the Chihuahuan Desert reptile species over the last few years (Fitzgerald *et al*, In press).

9.3.2.4 Illegal trade in Sinaloa

In Sinaloa, there is illegal trade in products made with skin of *Heloderma horridum*, *H. suspectum*, *Bufo* spp., and *Crotalus basiluscus* (Table 9.1; Figure 9.1). The products that are made and sold illegally are mainly wallets, boots, and purses. These products are produced in rural communities around Culiacán, Sinaloa, mainly in the north of Culiacán and Chametla, Rosario (Figure 9.4) (Uriarte 2002, Pers. comm.).

Figure 9.4 Sinaloa, Mexico
INEGI (2003)

9.3.2.5 Illegal trade in Tabasco

In Tabasco, reptile skins that are traded illegally mainly derive from crocodiles (*Crocodylus* spp.), iguanas (*Iguana* spp.) and boas (*Boa constrictor*) (Table 9.1; Figure 9.1). The main region where illegal trade in reptile skins and products takes place is La Chontalpa (Figure 9.5) (Burelos, 1994). The most valued skins are those of crocodiles (*Crocodylus* spp). Almost all the trade of crocodile skins in Tabasco is illegal and has its final destination in the city of Leon, Guanajuato, mainly for the production of cowboy boots, shoes, purses, and wallets. It is very difficult to find such products in the state of Tabasco because they are mostly transported to the tanneries of León. Nevertheless, some parts of Tabasco support tannery businesses, namely Iquinuapa (Jalpa de Méndez), Tenosique and Comalcalco (Figure 9.5) (Vidal de los Santos 2002, Pers. comm.).

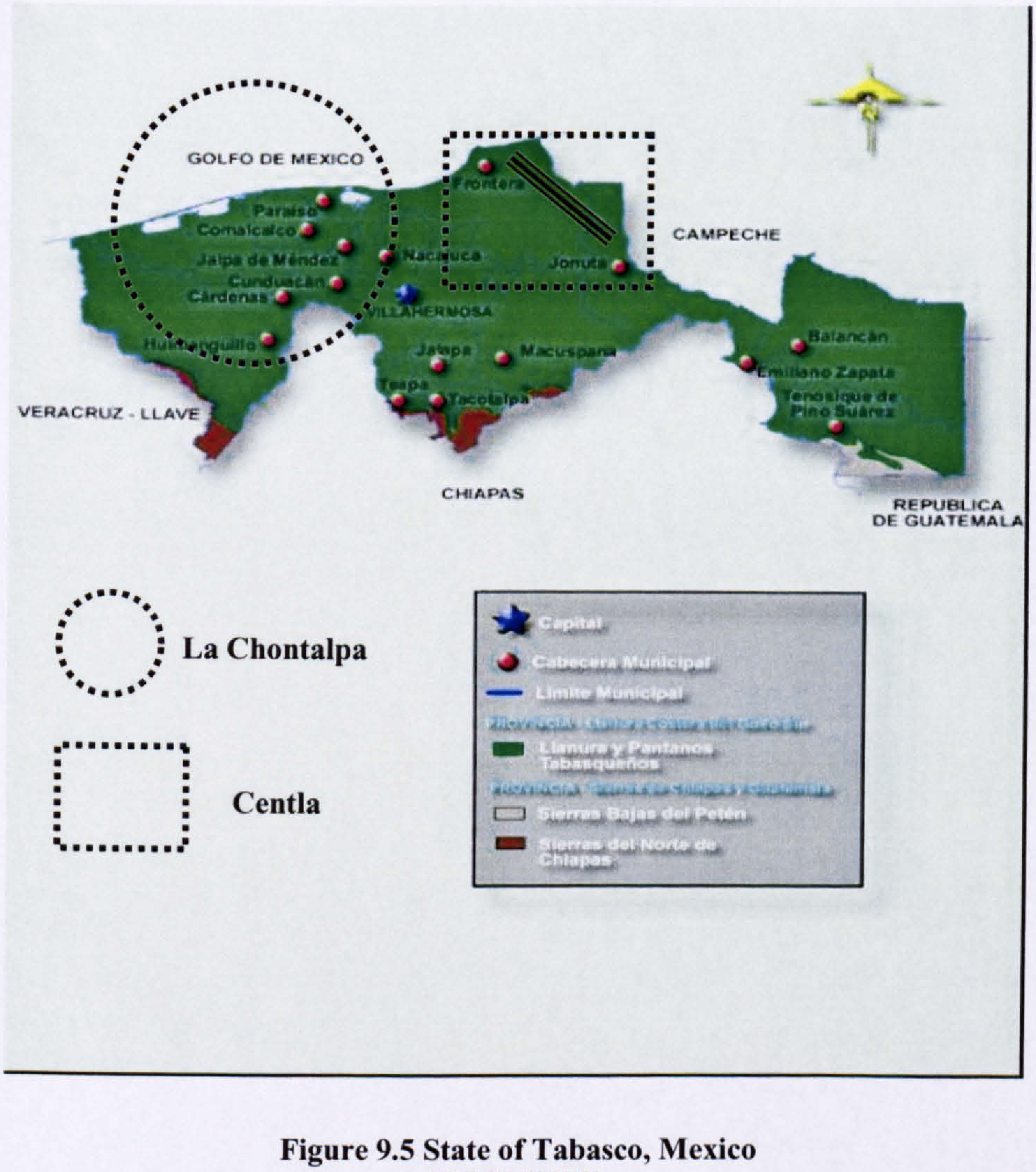


Figure 9.5 State of Tabasco, Mexico
INEGI (2003)

Inspections conducted of the illegal wildlife trade between 1990 and 1992 in Tabasco (Burelos, 1994) sampled 17 municipalities: Cárdenas, Centro, Comalcalco, Cunduacan, Huimanguillo, Jalpa de Méndez, Nacajuca, Paraíso, Centla, Balancan, Emiliano Zapata, Jalapa, Jonuta, Macuspana, Tacotalpa, Teapa, Tenosique (Figure 9.7). The inspections were conducted in leather workshops, commercial centres, formal and informal markets, bus stations, and private homes. During the inspections, 3696 wildlife products (e.g. wallets, purses, belts) and by-products were seized of which 3139 were products manufactured using reptile skins. Of the reptile skin products, most were of *Crocodylus moreletii* (49%), followed by *Boa constrictor* (34%) (Figure 9.6). Other species that are illegally traded in Tabasco are *Iguana iguana* (Figure 9.6) and *Ctenosaura pectinata.* One of the most important sites of Tabasco for collecting wild specimens of iguanas is the marshes of Centla (Figure 9.6) and such specimens are collected by burning the grasslands (Vidal de los Santos 2002, Pers. comm.).

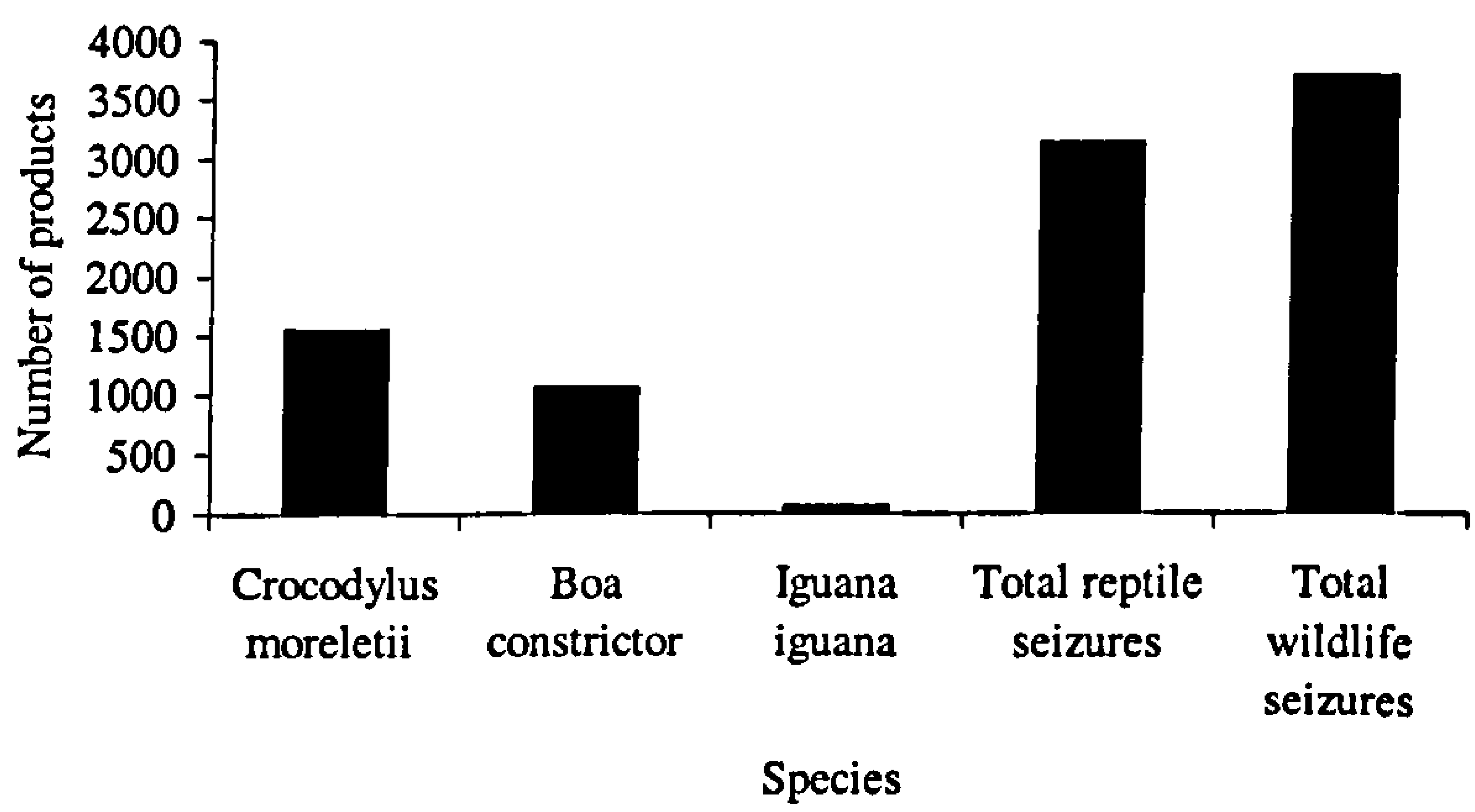


Figure 9.6 Seizures on Wildlife Products in Tabasco 1990-1992
(Burelos, 1994)

The main area where illegal trade of iguana takes place is the region of La Chontalpa (Jerónimo, 2002). The region of Chontalpa comprises seven municipalities of the western plain of the Tabasco state: Cárdenas, Comalcalco, Cunduacán, Huimanguillo, Jalpa de Méndez, Nacajuca y Paraíso (Figure 9.5).

The main demand for iguanas in Tabasco lies in local public markets such as in Paraiso and Comalcalco (Figure 9.5). From April 2001 to April 2002, for instance, 760 specimens were seized by PROFEPA in this area. Most seized specimens were found kept in bags and cardboard boxes. Of the seized specimens, an average of 30 to 35% die. Many of the specimens that survive are freed in the Natural Protected Areas of La Venta and Yumka.

Indeed, in Yumka there is a recovery programme for seized specimens (Jerónimo, 2002). Besides being sold illegally in the local markets of Tabasco, iguana skins also leave the state to be used also by the leather industry of Leon, Guanajuato (Villegas 2002, Pers. comm.).

The main inspection points used by PROFEPA are along the roads of Tabasco, mainly between Cárdenas and Coatzacoalcos. Points of inspection are: Jonuta (Figure 9.5) and Escárcega. In addition, PROFEPA makes inspections in markets and attends public denunciations (Castañeda 2002, Pers. comm.). For example, on the 19 March 2002, in the route that goes from Jonuta to Frontera (Figure 9.5), PROFEPA detected a passenger bus with yute bags and cardboard boxes containing a total of 400 iguanas, of which 170 died because of lack of space. The dealers generally travel across the roads at dawn to pass undetected. A further problem with the dealers in this area is that they are freed on bail free and then threaten the federal agents of PROFEPA (Jerónimo, 2002).

9.3.2.6 Illegal trade in Guanajuato

The city of León, Guanajuato, is a key-manufacturing centre of illegal reptile skins. In León, the main reptile skin products offered illegally are cowboy boots. These are sold around the central bus station. In this area, it is possible to buy cowboy boots of various cuts, designs and prices made with non-native and native species of reptile.

The main non-native species used illegally in Leon for the production of cowboy boots are tegus (*Tupinambis* spp.), monitor lizards (*Varanus* spp.) and python (*Python* spp.). The main native species used illegally are marine turtles (e.g. *Caretta caretta*), crocodiles (*Caiman* spp., *Crocodylus* spp.) and iguana (*Iguana iguana*). For instance, in early 2004, Mexican authorities (PGR) seized a consignment in a shoe workshop in León, which contained reptile skins of marine turtle *Caretta caretta* (314 skins), native crocodile *Crocodylus* spp. (125) and iguana *Iguana* spp. (600) (Plate 9.4) (Escalante, 2004a).

Plate 9.4 Seizure by Mexican Authorities of reptile skins in León, Guanajuato
Escalante, 2004a © Reforma

In most cases, illegal cowboy boots found in Leon are made from a mixture of skins, for example calf with reptile skin (e.g. tegu) or ostrich leg with reptile skin (e.g. monitor lizard). However, it is also possible to find cowboy boots made only with reptile skins (e.g. tegu or monitor lizard). Depending on the skin, cut and design, prices for illegal cowboy boots vary widely. A pair of boots made with iguana skin (*Iguana iguana*) can be found at MX$350 pesos (US$35), while a pair of boots made with caguama (*Caretta caretta*) can be found at MX$600-800 (US$60-80).

In the so called "*Zona Piel*" ("Skin Zone") of Leon, the main channel of distribution for selling illegal cowboy boots made with reptile skins are informal markets (Plate 9.5) and peddlers (Plate 9.6). In the case of informal markets, sellers have a stand displaying an array of cowboy boots of various styles and prices. However, if a potential buyer shows interest, they offer more "exotic" products stored elsewhere within walking-distance. Since peddlers do not have a stand to sell their products, they have just two or three pairs of cowboy boots to hand (Plates 9.7, 9.8). However, they can move throughout the streets and approach potential buyers (e.g. tourists) directly. If one shows an interest, peddlers also offer to show more "exotic" products kept in storage rooms. Sellers from informal markets and peddlers can work in coordination. In this way, peddlers can earn a commission by attracting the attention of tourists to their own products, and then inviting them to visit the stands of the sellers in informal markets.

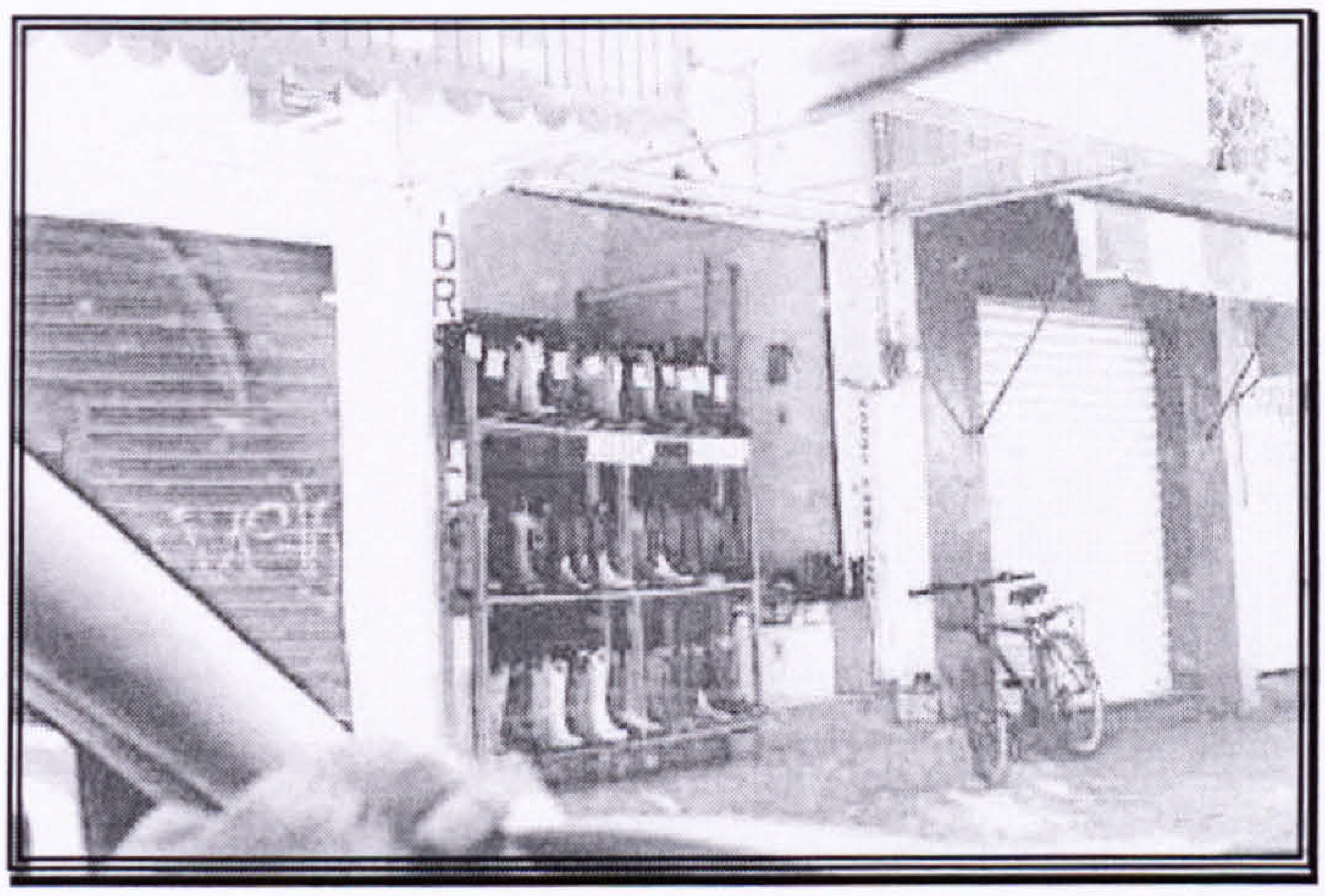


Plate 9.5 Cowboy Boot Informal Markets in León, Guanajuato

©Arroyo, 2003

Plate 9.6 Cowboy Boot Peddlers in León, Guanajuato

©Arroyo, 2003

Plate 9.7 Cowboy Boot Peddlers in León, Guanajuato
©Arroyo, 2003

Plate 9.8 Cowboy Boot Peddlers in León, Guanajuato
Escalante, 2004a © Reforma

The main streets of the "Skin Zone" in Leon, were street peddlers can be contacted are Hilario Medina, La Luz, Salina Cruz, Nuevo Vallarta, Españita, Pachuca, Iguala and Taxco. Also, on these streets informal stores like "David King Boots" (Iguala No. 221) and "Al-Rey" (Nuevo Vallarta No. 110 Stand 2) offering cowboy boots made with illegal reptile skins can be found (e.g. marine turtle *Caretta caretta*). In the case of marine turtle *Caretta caretta*, for instance, manufacturers in Leon apparently buy the skins from harvesters based in Guerrero, Oaxaca, Campeche, Yucatán and Tamaulipas, who consign the legs of this species for the leather industry. Manufacturers in Leon buy from these harvesters the front legs of the turtles at some

MX$250-270 (US$25-27) and the back legs at about MX$300-330 (US$30-33). It seems that the back legs are more expensive because manufacturers can obtain more skin from this part of the body. In addition to commercializing cowboy boots and other products made with illegal reptile skins, manufacturers of Leon send their products to other leather markets such as Baja California, Chihuahua, Nuevo Leon, Sonora and Tamaulipas (Escalante, 2004b).

9.3.3 International market

Cross-border trade in many regions is likely to circumvent CITES or other trade control measures such as customs controls, and therefore is not accounted for within either customs or CITES data (Roe *et al.*, 2002). This is true for the reptile skin trade in Mexico. To a larger extent than some other industries, the reptile skin industry in Mexico has been characterized by illegal activity, to avoid both fiscal and conservation-related controls (Fleming, 1999).

Native species that reach world markets illegally come from different regions and diverse ecosystems in Mexico. The main regions and markets where wild animal species are traded illegally have been circumscribed. It is estimated that 70% comes from the states of Tamaulipas, Coahuila, Nuevo León, Hidalgo, and Zacatecas and the remaining 30% from the municipalities Ciudad del Maíz, Rio Verde, Matehuala, Cedral, Vanegas, Guadalcázar, Santa María del Río, and the region of La Huasteca in San Luis Potosí. It is also known that Charco Cercado, Coatzacoalcos, Mérida, and the Sonoran and San Lázaro markets in the Distrito Federal are some of the most important wildlife storing centres in Mexico (Enciso, 1996; Escalante, 2004a, 2004b; Taniguchi, 2004; Guerrero, 2004).

In Mexico, the import and export of certain reptile skins is a very extensive, yet illicit industry. The illegal trade of skins in Mexico represents millions of dollars annually on the black market. The price of snakeskins and other reptilian products is directly related to the availability of the skins. If the skins are not available, the smugglers can ask and receive more money for them (Turner, 1992).

Tourists returning to the US and Canada from Mexico are often guilty of transporting reptile skin items from native species that are not legally exported. During 1980-1989, tourists returned to the US from Mexico with leather products such as cowboy boots, belts and handbags. During 1985-1989, a number of seized items appeared to have been imported from Mexico by Canadian tourists, which included sea turtle products, caiman, iguanas, turtles, and leather boots made from crocodilians and boas, among other species (Fleming, 1999).

During 1995-1999, the main native species involved in Mexican exports to the US which were refused clearance were Crocodylidae and *Caiman* spp., followed by *Crotalus* spp., *Iguana iguana*, and Boidae (Figures 9.7; 9.8). The main ports of entry into the US for these illegal Mexican exports were El Paso, Texas, followed by Laredo, Texas; Chicago, Illinois; Brownsville, Texas; Nogales, Arizona; and, Los Angeles, California (Figure 9.9).

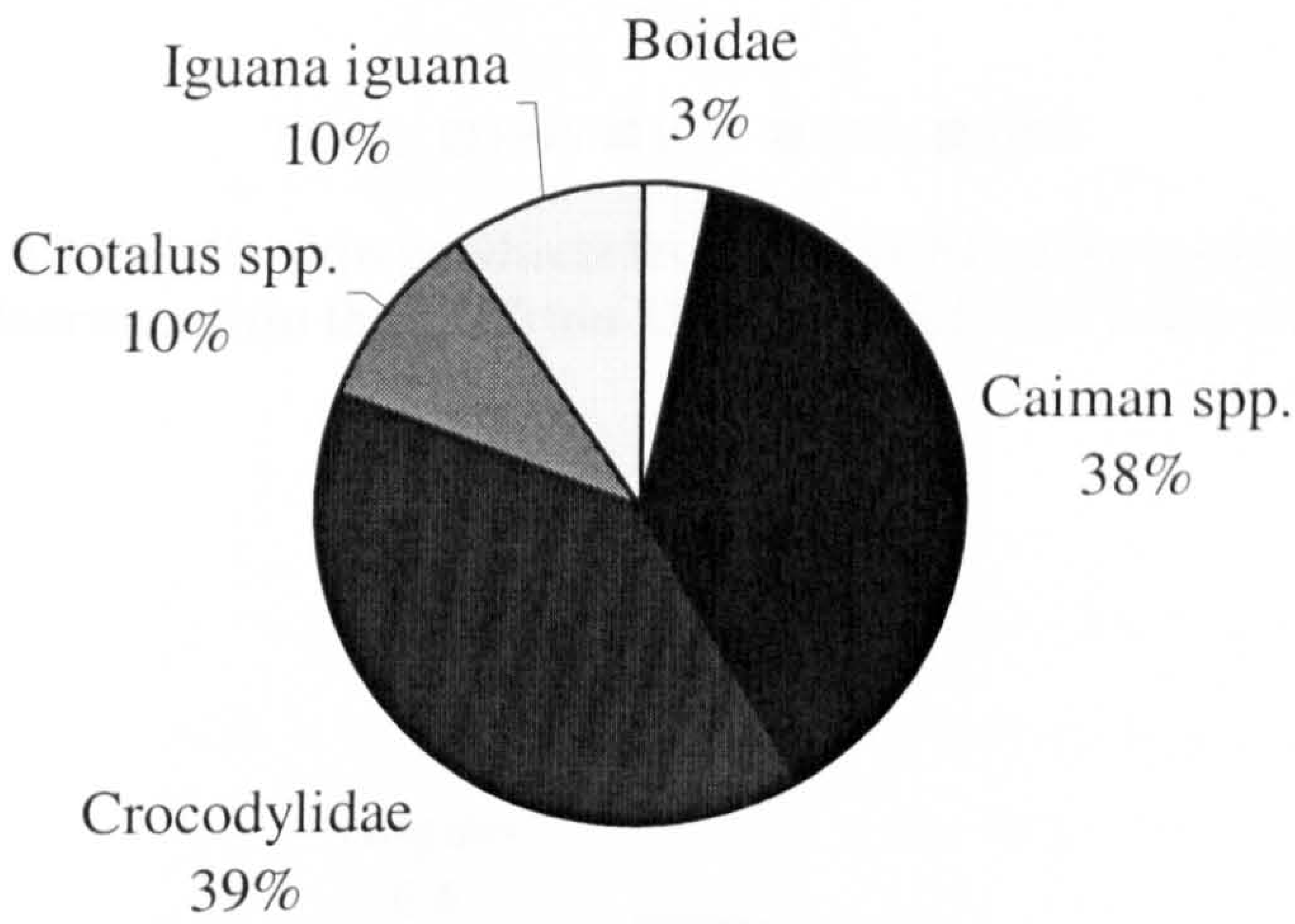


Figure 9.7 Reptile skin products from native Mexican species refused clearance into the US from 1996-1999 (LEMIS Trade Data)

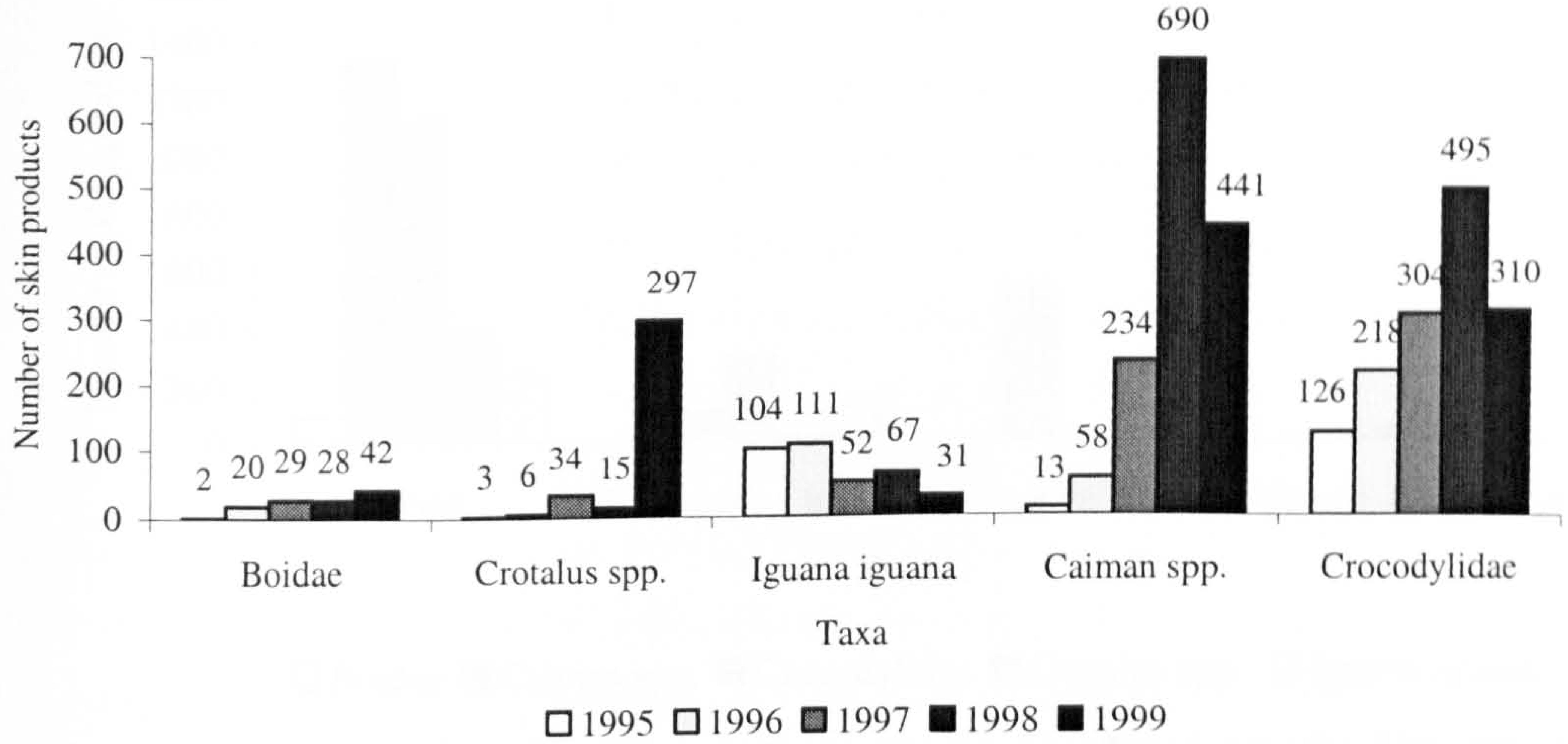


Figure 9.8 Reptile skin products from native Mexican species refused clearance into the US from 1996-1999 (LEMIS Trade Data)

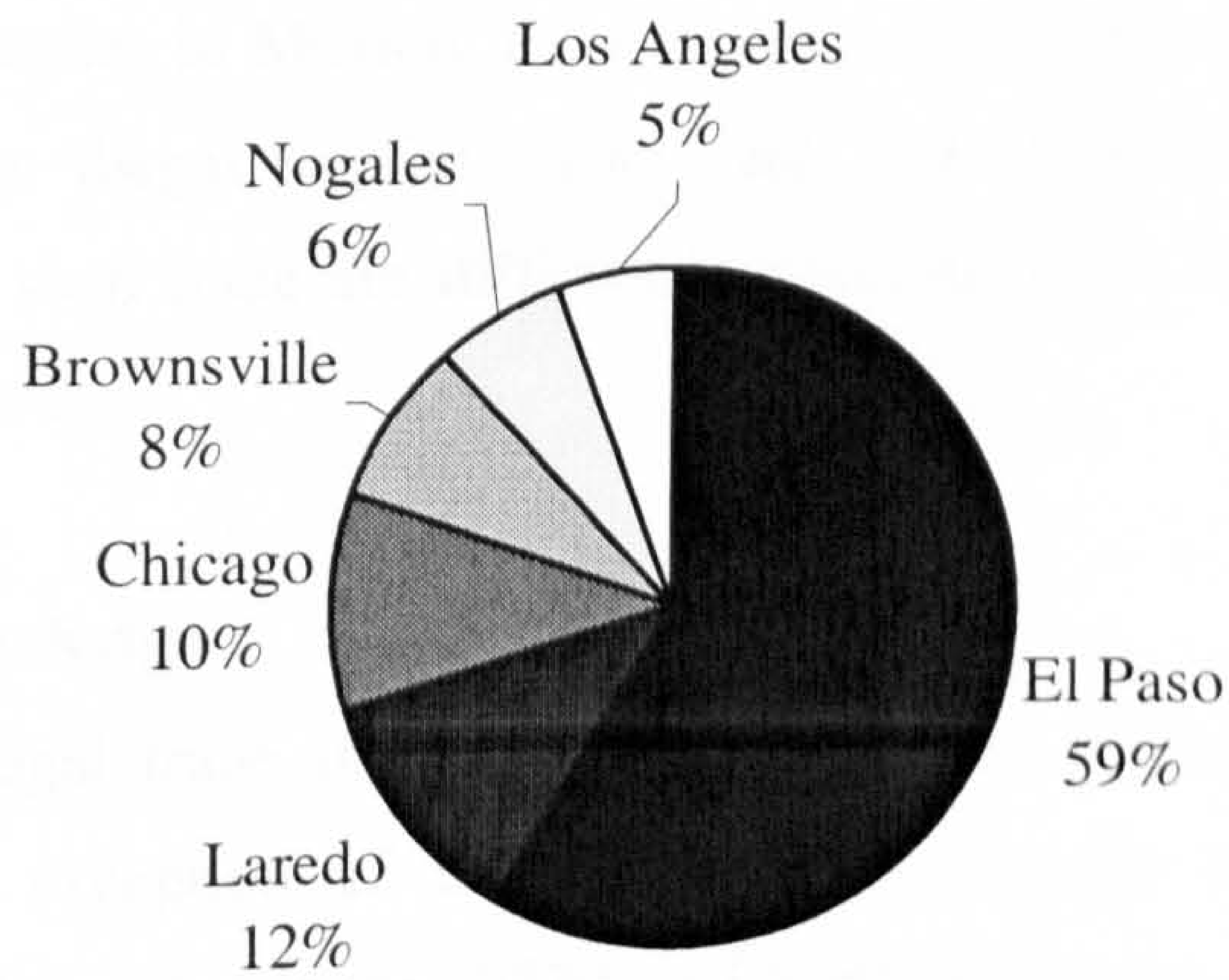


Figure 9.9 Main ports of entry into the US for exports of reptile skin products from Mexico refused clearance 1996-1999 (LEMIS trade Data)

During 1995-1999, all the illegal skin products exported by Mexico (*Caiman* spp., Crocodylidae, Boidae, *Crotalus* spp., and *Iguana iguana*) either showed Mexico as country of origin or stated that skins were of unknown origin. Most of the illegally exported reptile skin products were specimens taken from the wild (74%) (Figure 9.10).

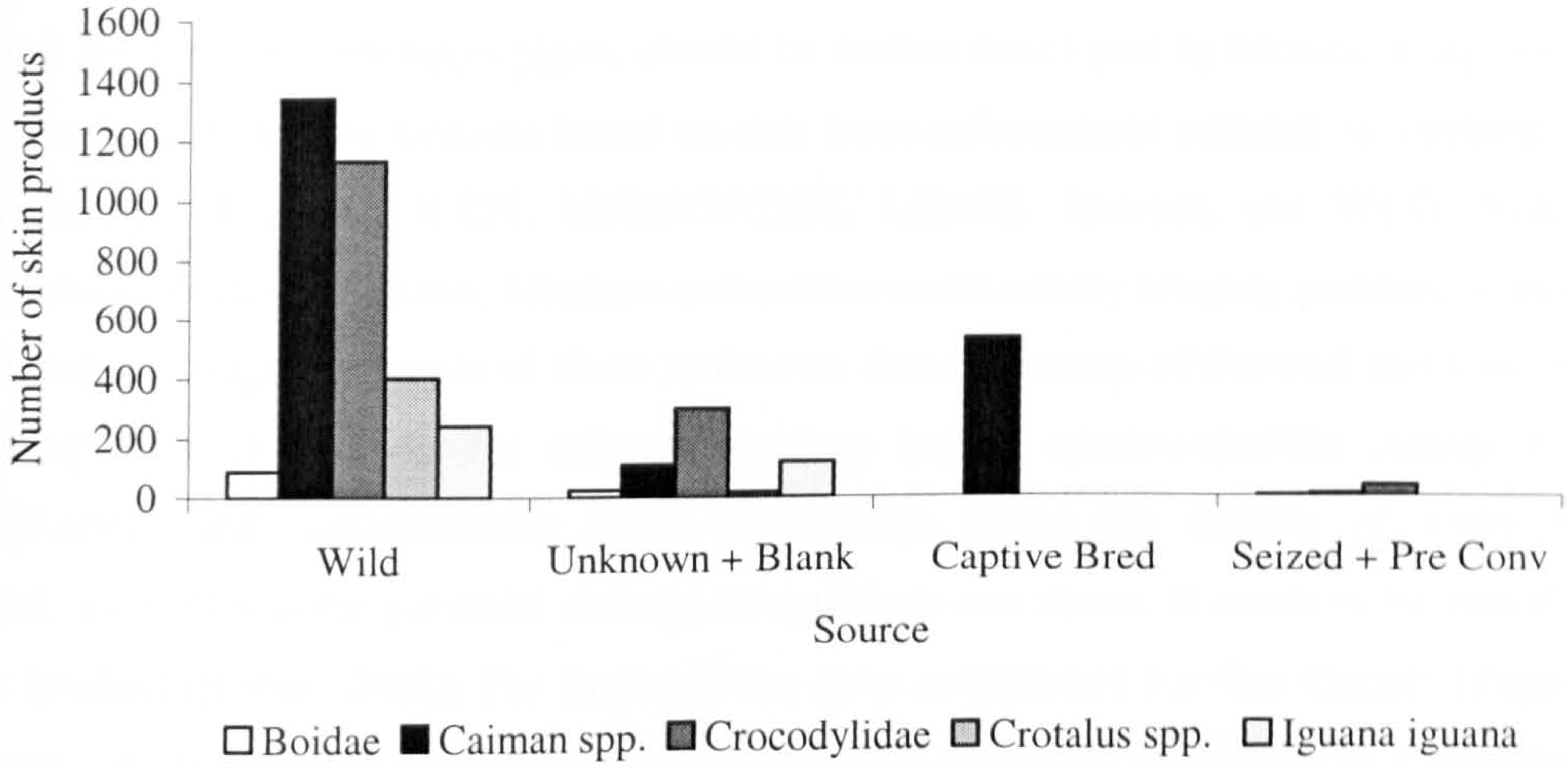


Figure 9.10 Source of reptile skin products exported by Mexico to the US with refused clearance 1996-1999 (LEMIS Trade Data)

9.4 Discussion

This chapter explored the available information on illegal trade in reptile skins and skin products from native species in Mexico. Examination of data reveals that Mexico is heavily involved in producing illegal reptile skins and skin products from native species. Nevertheless, levels of such trade are difficult to estimate since the information is limited, dispersed and hard to access.

9.4.1 Status of knowledge

By its very nature, illegal trade in reptile skins and skin products in Mexico is poorly documented, with the exception of information available for seized shipments that is sometimes reported in the media, in the CITES or LEMIS trade data or in government reports. Occasionally, information also becomes available from surveys undertaken by specialists and students. The existing reviews describe the illegal trade in reptile skins in Mexico for particular species (mainly iguanas, rattlesnakes and marine turtles) and regions mainly through the combination of qualitative data, inspections and seizures. Occasional reports and articles are developed by government (e.g. SEMARNAP, 1997; INE, 2000a; De Los Ángeles, 2001; Jerónimo, 2002); by non-governmental organizations (e.g. Fleming, 1999; Cantú & Sánchez, 2000; Fitzgerald *et al.*, in press); by specialists (Turner, 1992; Burelos, 1994; Villegas & Vázquez, 2001, 2002; Muñiz, 2000); and, by journalists (Enciso, 1995, 1996; La Jornada, 1996; Vega, 1998; Escalante, 2004a, 2004b; Taniguchi, 2004; Guerrero, 2004). However, most of the accounts available in Mexico on the illegal trade in reptile skins and products is available from personal sources through anecdotal information.

The approach of overlapping and portraying information to identify the main regions where illegal reptile skin trade takes place, should be further developed in Mexico using specialized geographic information systems based on data from enforcement authorities, customs, CITES Secretariat, TRAFFIC, IUCN, UNEP-WCMC, LEMIS, Interpol, the WCO, NGOs, and specialists. With this at hand, Mexican authorities could solidly identify problem issues on the sale and exchange by people of these resources; detect patterns of demand and consumption; develop research projects for selected species; launch species-specific management and monitoring; and, optimistically draw conclusions about the effects of trade in wild populations. Given the potential damage illegal trade can cause, it needs to be specified, not just implied (Reeve, 2002). For instance, the map constructed for this chapter (Figure 9.1), shows that even though wildlife trade has been often perceived in Mexico as a predominantly rural activity, the urban dimension should not be underestimated, large cities such as León, Guadalajara and Mexico play a central role as key distribution centers for reptile skin products.

9.4.2 International market

Over the period 1995-1999, exports from Mexico to the US reported by the LEMIS Trade Data illustrate many cases of consignments of reptile skin products from native species, which were refused clearance. In terms of total exports by year, the most numerous reptile skin products in such cases were from Crocodylidae and *Caiman* spp. mostly taken from the wild (Figures 9.7, 9.10). This finding lessens the more positive analysis in Chapter 7 (Section 7.4.1) regarding the observed trend in terms of increasing numbers of legally exported *Caiman* spp. skins and skin products over the same period, possibly as a result of Mexico's adoption of a sustainable use policy (Table 7.3; Figure 7.13).

A main problem is that recorded seizures do not give a clear picture of the extent of illegal exports from Mexico, nor the exact region of origin of the reptile species, let alone the impact of this trade on wild populations. Therefore, this compilation diagnosis should encourage Mexican Authorities and specialists to undertake cross-referencing between trade databases like LEMIS, which indicate that there are reptile skins and skin products from native species leaving the country illegally, and formal studies like the one developed by TRAFFIC North America in the Chihuahuan Desert (Fitzgerald *et al.*, in press). Such an approach would identify critical areas where there is evidence that the reptile trade is ongoing, significant and constitutes a major threat to at least some reptile species.

Chapter 10

10 Research Findings and Conclusions

The international trade in reptile skins involves the harvest and use of millions of skins every year (Jenkins & Broad, 1994). A diverse range of species is used in this trade, including members of the four reptile orders: Chelonia, Squamata, Crocodylia and Serpentes. Mexico is a key player in the international trade in reptile skins. Mexico functions as a collection and sorting centre of reptile skins and a prime manufacturer of reptile skin products for the leather and footwear industries. The US is by far the most important consumer of reptile skins and skin products exported and re-exported from Mexico. Mexico and the US share 1,950 miles of border and a Free Trade Agreement (NAFTA, since 1994). NAFTA forms the largest regional trade block in the world (Hogenboom, 1998). The region is an important decision-making centre, the policies of which can influence world trade patterns and may affect the status of wildlife populations. Mexico as a megadiverse country (Mittermeier *et al.*, 1997) has a great potential for contributing to the international discussion on forms of management, techniques of analysis, and regulatory frameworks for ecosystems and biological resources.

The international reptile skin trade is one of the most urgent, widespread and complex conservation challenges of our time. As with other equally pressing threats, like the wild meat crisis, efforts and lessons learnt on addressing the numerous problems of the international skin trade could well be the testing ground for many potentially valuable general approaches to conservation (Milner-Gulland & Bennett, 2003).

The present status of reptile species in Mexico is of serious concern (CONABIO, 2000; Hilton-Taylor, 2000). Mexico suffers from an active illegal trade in reptile skins, and little is known about the legal utilisation of reptile skins by the Mexican leather industry. The use of reptile skins from native species is practically non-existent and the rural communities in Mexico, located in the same areas where wild species are distributed, are at present still immersed in an extremely poor economy because use of these species is not commercialised. These were the main concerns in which this study was based.

10.1 CITES Implementation

This study has documented policies for wildlife trade regulation in Mexico during the 1980s and 1990s with special emphasis on the process of CITES implementation (Chapter 4). Mexico was slow to adopt environmental policies, but when Mexico did finally recognise wider environmental concerns, the prospect of acceding to CITES was not considered because of existing bans on all wildlife trade in native species. However, Mexico could not control the illegal trade of wild species during the 1980s.

Mexico acceded to CITES in 1991 mainly in response to international pressure. The process of ratifying was accelerated by the NAFTA negotiation process. However, this step was taken without clear analysis about the consequences of being a Party to the Convention. Between 1992 and 1996, Mexico had no clear policy about its role within CITES. Mexico believed that CITES would largely solve the problems of conserving wild species and counteracting illegal trade. Thus, Mexico was basically defensive instead of proactive at COPs during this period. The period from 1997 to 2001 saw an improved legal and administrative structure and a greater internal coordination between the different institutions involved with CITES, which encouraged Mexico to take up a more positive position within CITES. Mexico has now improved its policy towards international wildlife trade and has understood how to use CITES better in order to achieve its policies to sustainably use its wildlife.

10.2 Manufacture and Distribution Study

This study has examined the use of reptile skins in the Mexican leather industry. The vast majority of reptile skins imported by Mexico are processed in Leon, Guanajuato (Chapter 5). The leather industry of Leon buys reptile skins from native and non-native species and produces footwear and leather products, which are commercialized in the internal market through specific merchandising groups, but also in the foreign market through exports and re-exports. The Mexican reptile skin-manufacturing sector mainly comprises cowboy boot producers. The making of cowboy boots in Leon is undertaken by businesses of different size, which are interlinked at various stages of production. Some tanneries are also found in this city. Part of Mexico's leather industry is concentrated along the border with the US. Ciudad Juarez, Chihuahua, has developed a finely tuned expertise in the making of cowboy boots using reptile skins from non-native species (Chapter 5). The scope of commercialisation channels in Ciudad Juarez extends to the opening of direct retail sales. The specialised production of cowboy boots in Ciudad Juarez reduces the production costs in design and variety, and represents a comparative advantage with respect to the industry of footwear in general. However, cowboy boot production in Ciudad Juarez represents a small percentage of the total national output.

The leather and footwear industry of Leon is larger and more intricate than that of Ciudad Juarez (Chapter 5). Although Leon and Ciudad Juarez use different distribution paths to deliver cowboy boots, and have different target market segments within the country, both centres have the potential to export their products. Ciudad Juarez has the additional advantage of the proximity to the US market. Instead of utilising ordinary leather (e.g. bovine), the use of reptile skins in the manufacture of cowboy boots in Leon and Ciudad Juarez certainly distinguishes these products in both internal and foreign markets.

The information currently available on the use of reptile skins in the Mexican leather and footwear industries of Leon and Ciudad Juarez is still insufficient. For instance, it is necessary to know the specific distribution channels for reptile skins before they reach Leon and Ciudad Juarez. Also, the distribution channels that the manufactured products follow until they reach the final consumer; and, the actual extent of use of reptile skins from native and non-native species remains little known.

10.3 The Use of Non-Native Reptiles

This study has examined the trade of reptile skins and skin products from non-native species in Mexico, discerned the most important trade in terms of volume and observed the trends in imports and re-exports of particular taxa.

Mexico plays a considerable role as an importer of reptile skins from non-native species and as a re-exporter of reptile skins and skin products (Chapter 6). During the 1980s and 1990s, Mexico has increasingly imported numerous reptile skins of *Tupinambis* spp., *Varanus salvator* and *Python reticulatus*. The Mexican market for reptile skins has been a major factor driving the export of *Tupinambis* spp. from Argentina, and *Varanus salvator* and *Python reticulatus* from Indonesia. Reptile skins from non-native species are subject to changing demand in Mexico.

After Mexico adopted the ban on its use of native species in 1982, imports of non-native reptile skins increased. After Mexico adopted a sustainably policy to use native species, imports were even higher. In terms of the number of animals taken annually, the trade in reptile skins in the Mexican leather market is clearly a very important aspect for the international trade in reptiles. Furthermore, the long-term sustainability of the trade from the supply side remains an intractable issue in Mexico. Little is known about the populations from which harvests come. During the 1980s and 1990s, Mexico re-exported skin products mostly of *Caiman* spp. and *Varanus salvator*. Mexican re-exports in terms of numbers of reptile skins were higher during the 1990s, mostly of *Caiman* spp. and Crocodylidae.

The balance between Mexican imports and re-exports of reptile whole skins from non-native species during the 1980s and 1990s has been negative. Mexico still depends on imported reptile skins for its manufacturing production. Due to the aforementioned, there is an important problem in Mexico regarding the control of reptile skins between the processes of import, manufacture and re-export. Verifying that the production of the Mexican leather industry corresponds to the imported skins remains a key challenge for Mexican Authorities.

10.4 The Use of Native Reptiles

This study has examined the trade of reptile skins and skin products from native species in Mexico, and determined the most important trade in terms of volume and observed the trends in exports of particular taxa.

Mexico has played a substantial role as an exporter of reptile skins and skin products from native species (Chapter 7). The US is the main consumer country of reptile skins and skin products exported from Mexico. During the 1980s and 1990s, Mexico exported skin products mostly of marine turtles (*Chelonia* spp.). After Mexico adopted the ban on its use of native species in 1982, exports of reptile skins remained high. During the 1990s, skins and skin products exported by Mexico from species promoted by the SUMA (e.g. *Crocodylus* spp., *Iguana iguana* and *Boa constrictor*) were low in numbers. Ironically, Mexico exported significant amounts of banned marine turtle skin products from *Chelonia* spp. and *Crotalus* spp. from specimens taken from the wild. Mexico has exported considerably fewer numbers of reptile skins and skin products from native species than those re-exported from non-native species over the same period of 1980-2001.

Although Mexico implemented a programme for wildlife conservation and sustainable use, and has the potential to become a significant producer of native reptile skins (e.g. *Crocodylus* spp., *Caiman* spp., *Iguana* spp., and *Crotalus* spp.), Mexico still makes little legal use of skins from native species (Chapter 8). Instead, what prevails in Mexico are an ongoing legal use of non-native reptile species and an illegal use of native species. Contrary to its objectives of protection and conservation, the establishment of bans on species such as marine turtles has fortified the illegal distribution chains for native species. Mexico has also played a role as producer of illegal reptile skins and skin products from native species (Chapter 9). There are critical areas in Mexico where the illegal trade of reptile skins and skin products has taken place and where the harvesting of species, tanning of skins, manufacturing of skin products, and distribution of skins and skin products has been more evident.

There have been also many cases of consignments of reptile skin products from native species exported illegally from Mexico, mainly for species of Crocodylidae and *Caiman* spp.. However, levels on the illegal use of reptiles for the skin market in Mexico have been difficult to estimate since the information is extremely limited.

Chapter 11

11 Recommendations

Mexico has an important role in international wildlife trade, given the significance of the country as a biodiversity hotspot and as an importer, manufacturer, producer and distributor centre of reptile skins from non-native and native species. Mexico imports thousands of reptile skins from Asia, Africa and South America every year instead of looking for alternatives to promote the use of reptile skins from native species. Mexican reptile species are indeed used and people will continue to use them. Hence, there is an opportunity to promote use in such a fashion that can become a viable strategy to create positive incentives that motivate people to conserve wild living resources (Hutton & Leader-Williams, 2003). Sustainable use could positively encourage the trade of reptile skins in Mexico, which can become a valuable economic and social resource, rather than simply banning the use of such resources. Nonetheless, the possibility that sustainable harvesting of wildlife may not be economically competitive with alternative land uses sets an imperative. It is that such use should not be presented as the long-term *raison d'etre* for conservation as, if it does rest on economic competitiveness, the case for conservation vanishes as soon as a better economic option appears.[1] At best such harvests should not be presented as more than aids to conservation (Caughley & Gunn, 1996). Direct use of species cannot provide sufficient incentives to ensure the continued delivery of ecosystem services (Hutton & Leader-Williams, 2003).

11.1 Need for Market Studies

Before establishing mechanisms to manage markets for sustainability and before designing harvest strategies for sustainable off-take through the UMAS, Mexico should develop market studies to determine which species are at present subject to use and commercialization, as well as studies of the impact of such use on the viability of their wild populations. Understanding the status of trade in wildlife is very important in formulating management policies for wildlife trade and conservation (Yiming & Dianmo, 1998). Mexico needs to characterize the ongoing market of CITES-listed wildlife, products and by-products, while also taking into account those species listed under the NOM-059-ECOL-2001 but not listed in CITES Appendices. Mexico needs to determine the

[1] The logic behind the commercial production of domestic species for example, differs dramatically from the principles, practices and underlying rationale of sustainable production of wildlife (Pérez-Gil, 2003).

structure and extent of such markets by differentiating the use of every commodity, particularly of commodities with high commercial value and their corresponding distribution channels. What distribution channels do the commodities follow from its place of origin until they reach the final consumer? Are the intermediaries: agents, wholesalers, retailers, distributors, brokers, or importers? How many intermediaries constitute the distribution channel? In other words, what is the sequence in the commercialisation process? Some form of coordination is necessary among these series of events and activities, since the goods have to move in a particular order from the hands of the producers to those of the consumers: Is it a direct or an indirect commercialisation channel? Is it short or long? Is it local, municipal, regional, national or international? Discerning these interconnections should contribute to establishing proper guidelines for the commercial use of wild species in Mexico and also work against the difficulty still faced by Mexico to gather data so as to determine the status of wild species in trade. There is a real need to compile information from across the country on this matter in order to understand the patterns of use, the effects they have on wild populations, and how the sustainable use and intrinsic value of species can better be put to work as conservation tools. Furthermore, how to certify that both sustainable use and incentive-driven conservation (Hutton & Leader-Williams, 2003) become core elements of the conservation agenda of Mexico.

Analysis of the markets for the goods and services of biodiversity is very important. This is not to suggest that the value of biological resources should be reduced to mere merchandise, or objects of trade, or the opposite extreme of allowing uncontrolled commerce regardless of the uses to which resources will be put. Conservationists should aim for much more than this, as the significance of biological diversity as a commodity in the public interest becomes clearer day-by-day locally, nationally, and internationally. We are talking about the necessity of directing and regulating behaviours. A means of regulation that is steadily acquiring a growing importance is the use of economic incentives that employ market signals to induce the practice of restoration, conservation, and sustainable use of biodiversity and promote channelling of funds to such ends (Provencio, 1999). Also the emerging vision of promoting conservation as a competitive form of land use in other words driven by incentives of varied nature, that motivate people to conserve wild living resources (Hutton & Leader-Williams, 2003). There is no doubt that some instruments of resource economics can be applied to conserving a species: taxation policy, pricing policy, subsidies, and ownership of natural resources and harvesting rights can all be set to encourage protection of a species directly or to conserve its habitat (Caughley and Gunn, 1996).

11.2 Encouraging Sustainable Use within CITES

As a megadiverse country Mexico could influence CITES international regime by promoting the sustainable use of species and working to change the strategies of the Convention. By banning trade in high-value species, CITES denies range States and local communities a vital source of revenue that might be devoted to conservation. At present, CITES provides no direct avenue for communities to express themselves except through their governments nor does CITES currently encourage governments to develop policies that devolve use rights to local landholders. What CITES ought to do is to support both the devolution of tenure to local communities and a regulated trade in wildlife (Metcalfe, 2000). In this way, Mexican authorities through regional delegations, municipalities and local communities, should elaborate studies and define policies that promote the sustainable market of native reptile skins through combining solid scientific knowledge, strengthening of UMAS, land property arrangements, common pool resource benefit sharing schemes, use diversification, and law enforcement.

With potential to produce wildlife, Mexico should use CITES as a regulatory framework to support local communities in order to promote the sustainable use of species, but also as a means to participate in the global market with sustainable products. One might have to consider, though, that even if local communities do gain full proprietorship over wildlife, there is no guarantee that it will be in their interests to conserve wildlife. They might decide to mine the resource and invest the returns elsewhere. It will also depend on factors such as the price they receive for wildlife products and the return they could enjoy from alternative land uses (Dickson, 2000).

11.3 Mexico's role in CITES

As for Mexico's performance in CITES it is fair to say that the country has acquired a new image, reputation and acknowledgement at COPs and committees. Mexico now has a permanent presence in CITES discussions, and remains vocal and proactive (Pérez-Gil & Arroyo, 2003). Yet, much more could be done:

- The real challenge is not the administrative task of issuing the certificates or verifying the authenticity of those issued by partner authorities of other countries. Instead, it should be determined how to ascertain that legal commerce is not detrimental to species survival (Rosser & Haywood, 2002). Mexico still does not have the technical capacity nor the information needed to make non-detriment findings.
- The magnitude of historical harvest in Mexico is difficult to estimate because official figures are generally imprecise, fluctuate greatly and are missing altogether some years.
- Basic information on wildlife trade is seriously lacking. Trade statistics, as far as they do exist, should be handled with much greater thought by Mexican authorities.
- Officers at the customs should be trained to identify species in wildlife shipments and to understand better the information contained in the national legislation and CITES.
- The effective implementation of CITES in Mexico needs not only the active participation and commitment by the government but also the understanding and cooperation from producers, traders and consumers.
- Mexico should determine how to measure the success of its performance in CITES. The number of certificates issued, the number of visual inspections, the volume of confiscated specimens, products or by-products or even the number of people detained for felonies, mean very little if taken on their own as separate indicators.
- On the subject of re-export of reptile skins and skin products, it is important to pay great attention to the inspection since the traffic of skins can be used to legalize skin and obtain illicit benefits. For instance, a standard definition scale for weight units should be implemented. This trade demands greater monitoring and enforcement efforts due to the difficulty of identifying and tracking cut pieces and finished products.

- Through the Significant Trade Process, Mexico should seek the assistance of CITES (through its Animals Committee) in order to examine the trade on those species imported into Mexico in great numbers with a view to monitoring their conservation status and the sustainability of the off-take. [As has been mentioned earlier (Chapter 1), this process entails an assessment of the available trade data for Appendix II-listed animals in order to determine those taxa, which are possibly being traded in excessive quantities. The Significant Trade Process seeks, in cooperation with the Management Authorities of exporting countries, to identify and rectify Article IV implementation problems].
- Mexico needs to build its own capacity deploying experts in commerce, not just in species protection or population dynamics, in order to properly monitor wildlife trade and to fully implement CITES.

The implementation, enforcement, and internal organization of CITES within a single nation represents a significant challenge, especially when dealing with a developing country such as Mexico, which is a key player in international wildlife trade that ratified CITES only as a result of external and internal pressure. A series of internal discrepancies over Mexico's position about acceding were accompanied with a lack of public debate and, most notably by a lack of clear understanding on the obligations of the treaty. Internally, only a few specialists in Mexico had the appropriate understanding of CITES as an agreement to regulate at the international level trade in endangered species and to implement strategies for long-term sustainable use.

Before analysing the ability and actual commitment to implement the obligations of CITES in a particular country, it is important to take into account the circumstances under which a State accedes to become a member, since every single country has distinctive characteristics and is responsible for enforcing CITES decisions. The diversity of historical and political systems worldwide explains why the effectiveness of CITES varies from country to country, and no single uniform model fits for its implementation in all countries. Alongside the specific operational responsibilities that a given country acquires when it accedes to CITES, each country should adopt on the overall commitment towards the philosophy and vision of CITES. Hence the concerns of Mexico as a Party must go beyond Mexico's borders and consider how to promote the sustainable use of wildlife species elsewhere.

References

Adalid, T. 1996. *Las redes internacionales del tráfico de especies están intactas, acepta la Profepa.* CRÓNICA. http://www.unam.mx/cronica/1996/dic96/10dic96/med01.html

Agence France Presse. 1999. Mexican authorities seize smuggled exotic reptiles. *Agence France Presse.*

Alcérreca, A.C. & H. Rodríguez. 1984. *Análisis y opinión sobre la adhesión de los Estados Unidos Mexicanos, a la Convención sobre el Comercio Internacional de Especies de Flora y Fauna Silvestres en Peligro de Extinción (CITES).* SEDUE. Subsecretaria de Ecologia. Dirección General de Flora y Fauna Silvestres. Subdirección de Apoyo Técnico. Departamento de Políticas y Normas. Documento de Trabajo. México.

Anders. C. 1989. A Bird in the Cage. *Mexico Journal.* Vol. 11: 16-22.

Balmford, A. ***et al.*** 1996. Designing the Ark : Setting Priorities for Captive Breeding. *Conservation Biology* 10 (3): 719-727.

Balmford, A. ***et al.*** 2002. Economic Reasons for Conserving Wild Nature. *Science* 297(5583): 950-953.

Bancomext. 1994. *Canadá: Perfil de Bota Vaquera.* Bancomext. México. 6p.

Bancomext. 1999a. Requisitos para la Exportación de Calzado. *Negocios Internacionales Bancomext* 8(82): 26-31.

Bancomext. 1999b. *Programa de Actividades Promocionales en el Exterior 1999: Sector Cuero, Calzado y Marroquinería en el Mercado Norteamericano.* Bancomext. México. 13p.

Bancomext. 2000a. *Guía de Exportación Sectorial. Calzado.* Bancomext. México. 240p.

Bancomext. 2000b. *México Exporta: Cuero, Calzado y Marroquinería. Programa de Apoyo Integral Año 2000.* Bancomext. México. 51p.

Bancomext. 2001. *Bancomext: Importaciones Definitivas.* Bancomext. México.

Bancomext. 2002. *Cuero y Calzado.* www.Bancomext.com (19 Junio). Bancomext. México.

Barbosa, G.E.B. 1994. *La Industria del Calzado ante el Tratado de Libre Comercio.* Tesis de Licenciatura. Facultad de Economía. UNAM. México. 169p.

Barrios, M.A. 2000. Pers. comm. to I. Arroyo. Herbario Escuela de Ciencias Biologicas/Instituto Politécnico Nacional.

Bazán, L. 1988. *La Situación de los obreros del calzado en León, Guanajuato.* CIESAS. México 292p.

Benítez, H. & Y. Feria. 2002. Pers. comm. to I. Arroyo. CONABIO. México.

Belausteguigoitia, C.J. 1999. An Introduction to the Economic Aspects of Biodiversity. Pp: 23-33, In: *Economics of Biodiversity.* Compilation of the International Seminar on La Paz, BCS. Avila F. S. et al. (comps.). SEMARNAP. CONABIO. DFID. USAID. México. 502p.

Bowles, D. ***et al.*** 1994. *CITES enforcement not extinction.* EIA. UK. USA. 37p.

Branigin, W. 1989. Wildlife Trafficking in Mexico. Is Rising - and Deadly Mexico's Other Contraband-Wildlife. *The Washington Post.*

Brañes, R. 2000. *Manual de Derecho Ambiental Mexicano.* Ed. Fundación Mexicana para la Educación Ambiental. Fondo de Cultura Económica. México. 770p.

Brautigam, A. 1986a. Mexican Wildlife Trade: What do the Statistics Show?. *TRAFFIC USA* 6(4): 4,9.

Brautigam, A. 1986b. A Look at the U.S.-Mexican Exotic Leather Trade. *TRAFFIC USA.* 6(4): 10-11.

BTA. 1994. *The Market for Leather Accessories and Travelware.* BTA Inc. 404p.

Bulmer, M. & D.P. Warwick. 1983. *Social Research in Developing Countries. Surveys and Censuses in the Third World.* John Wiley & Sons Limited. 383p.

Bunting, B. 1985. Wildlife Trade Laws of Latin America. *TRAFFIC USA* 6.

Burelos, J.M.C. 1994. Inspección de la Fauna Silvestre en el Estado de Tabasco, México. Tesis de Licenciatura. División Académica de Ciencias Biológicas. Universidad Autónoma de Tabasco. Villahermosa, Tabasco. México. 114p.

Bush, G. 1991. *Response of the Administration to Issues Raised in Connection with the Negotiation of a North American Free Trade Agreement.* Transmitted to the Congress by the President. 15p.

Calleja, P.M.M. 1980. *Unidad Doméstica y Organización del Trabajo de la Industria del Calzado en León, Guanajuato.* Tesis de Licenciatura. Universidad Iberoamericana. México. 408p.

Calleja, P.M. 1994. *MicroIndustria. Principio y Soporte de la Gran Empresa. La producción de calzado en León, Guanajuato.* Universidad de Guadalajara. México. 266p.

Cantú, J.C. & M.E. Sánchez. 1994. *The Illegal Traffic of Wildlife in Mexico City.* Grupo de los Cien. Mexico, D.F. 5p. *In print.*

Cantú, J.C. & M.E. Sánchez. 1996. Illegal Trade of Mexican Parrots. *Naturaleza y Tráfico* 1(2): 10-20.

Cantú, C.J. & M.E. Sánchez. 2000. Tráfico de especies. Pp. 153-158, In: *Vida, Ambiente y Desarrollo en el Siglo XXI: Lecciones y Acciones.* Grupo Editorial Ibero América. México. 251p.

Carabias, J. 1999. Magistral Conference. Economic Valuation and Conservation of Biodiversity in Mexico Pp. 13-22, In: *Economics of Biodiversity.* Avila, F.S. (ed.). SEMARNAP. CONABIO. DFID. USAID. México. 502p.

Carabias, J. & E. Provencio. 1994. La Política Ambiental Mexicana Antes y Después de Río. Pp. 393-422, In: Glender, A. & V. Lichtinger (comps.). *La Diplomacia Ambiental. México y la Conferencia de las Naciones Unidas sobre Medio Ambiente y Desarrollo.* SRE/FCE. México.

Castañeda, A.G. 2002. Pers. comm. to I. Arroyo. PROFEPA Tabasco. México.

Castillo, A. 2000. Communication and Utilization of Science in Developing Countries. *Science Communication* 22(1): 46-72.

Castillo, A. & V.M. Toledo. 2000. Applying Ecology in the Third World: The Case of México. *BioScience* 50(1): 66-76.

Caughley, G. & A. Gunn. 1996. *Conservation Biology in Theory and Practice.* Blackwell Science. USA. 459p.

Ceballos, G. & O. Sanchez. 1994. *Wildlife Diversity and Conservation in Tropical America* Pp. 233-262, in: Tropical Ecosystems: a synthesis of Tropical Ecology and Conservation. Balakrishnan, S.W. Biè & R. Borgstrøm (eds.). Oxford & IBH Publishing Co. New Delhi.

CECOREI. 2000. III Taller Nacional sobre Manejo de Iguanas en Cautiverio. Acapulco, Guerrero. México. http://www.umar.mx/cecorei/taller.html

CITES/C&M. 1994. What is CITES? CITES/C&M 1 (1): 8-13.

CITES México. 1994. *2do Curso Nacional de Capacitación Intensiva sobre "La Administración CITES y su desarrollo en México".* Compendio Documental de México.

CITES Secretariat. 1989. *Proceedings of the Seventh Meeting of the Conference of the Parties.* CITES Secretariat. Lausanne, Switzerland.

CITES Secretariat. 2002. *Conference of the Parties.* http://www.cites.org

CITES Secretariat. 2003. *Text of the Convention, Member countries, National Reports.* http://www.cites.org

CITES World. 1998. Inter-linkages between CITES and other international treaties. *CITES World.* No. 1:6.

Cobián, M.A. 1999. Pers. comm. to I. Arroyo. DGVS. INE/SEMARNAP. México.

COCOMEX. 2001. *Cocodrilos Mexicanos S.A. de C.V.* COCOMEX. Culiacán, Sinaloa.

CONABIO. 1998a. *La Diversidad Biológica de México: Estudio de País.* CONABIO. México. 341p.

CONABIO. 1998b. *Propuesta para la formación y operación de la Autoridad Científica CITES en México.* Documento de Trabajo. México.

CONABIO. 2000. *Estrategia Nacional sobre Biodiversidad de México.* Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México. 103p.

CONABIO. 2002. El Pais. http://www.conabio.gob.mx (April 2002).

CONADE. 1990. *Informe de la Situación General en Materia de Equilibrio Ecológico y Protección al Ambiente 1989-1990.* CONADE. México.

Cooney, R. 2003. Conclusions: Looking Ahead – International Wildlife Trade Regulation and Enforcement Pp. 196-204, In: *The Trade in Wildlife. Regulation for Conservation.* Oldfield, S. (ed.). Earthscan. UK. 210p.

CSG. 1998. Trade. *CSG Newsletter.* 17(1): 13-14.

Challenger, A. 1998. *Utilizacion y Conservacion de los Ecosistemas Terrestres de Mexico. Pasado, Presente y Futuro.* CONABIO. Instituto de Biologia. Sierra Madre. Mexico. 847p.

Chivers, J.C. 2000. What's Really Short And Oh So Fashionable? *The New York Times* June 18.

De Klemm, C. 1993. *Guidelines for Legislation to Implement CITES.* IUCN. Gland, Switzerland and Cambridge, UK. 107p.

De la Garza, G.G. 1992. *Acciones de Comercio Exterior en México con Flora y Fauna Silvestres.* V Reunión Nacional de Empresas Altex 4-5 Junio de 1992. Documento de Trabajo. Subsecretaria de Ecología/Dirección General de Conservación Ecológica de los Recursos Naturales (SEDESOL). Guanajuato, Gto. México. 11p.

De la Madrid, H.M. 1984. *Programa Nacional de Ecología 1984-1988.* Secretaría de Programación y Presupuesto. México.

De los Angeles, P.C.C. 2001. *El aprovechamiento ilícito de iguanas en el estado de Oaxaca.* Cuarto Taller Nacional sobre Manejo de Iguanas en Cautiverio. Delegación Federal de la SEMARNAT en Oaxaca. Dirección General de Vida Silvestre. Puerto Ángel, Oax., México.

DGFS. 1982a. *Carta invitación a diversas reuniones sobre especies en peligro de extinción.* Dirección General de Fauna Silvestre. Subdirección de Organización y Promoción Faunística. SARH. México.

DGFS. 1982b. *Especies de Fauna en Peligro de Extinción en México. Primera Reunión para la Revisión de los Apéndices I, II y III de la Convención del Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestre (CITES).* IMCE. México, D.F. 22p.

DGFS. 1982c. *II Reunión de Evaluación Interna.* SARH/SAM. México, D.F. 111p.

DGVS. 2001. *Solicitud de información.* Subsecretaría de Gestión para la Protección Ambiental. Dirección General de Vida Silvestre. SEMARNAT. México.

DGVS. 2002. Quinto Taller Nacional sobre Manejo de Iguanas en Cautiverio. Villa Hermosa, Tabasco, mayo del 2002.

Diamond, J.M. 1989. Overview of recent extinctions Pp. 37-41, In: *Conservation for the Twenty-first Century.* Western, D. & M. Pearl (eds.). Oxford University Press. New York.

Díaz, D. E. P. 2001. Proyecto de Conservación, Manejo y Aprovechamiento de las Iguanas en México. Dirección de Gestión y Atención a Usuarios. Dirección General de Vida Silvestre, SEMARNAP. IV Taller Nacional de Manejo de Iguanas en Cautiverio. Puerto Angel, Oaxaca.

Dibb, S. *et al.* 2001. *Marketing Concepts and Strategies.* Fourth European Edition. Houghton Mifflin. Boston. New York. 876p.

Dickson, B. 2002. International Conservation Treaties, Poverty and Development: The Case of CITES. *Natural Resource Perspectives* 74: 1-4.

Dickson, B. 2003. What is the Goal of Regulating Wildlife Trade? Is Regulation a Good Way to Achieve this Goal? Pp. 23-32, In: *The Trade in Wildlife. Regulation for Conservation.* Oldifield, S. (ed.). Earthscan. UK. 210p.

Dietrich, P.U. 1989. *El comercio legal e ilegal de productos de fauna silvestre entre Mexico y Estados Unidos en los años 1984 a 1989.* Nuevo León, Mexico. 15p.

Dietrich, P.U. 1990. *La comercialización (legal e ilegal) de la fauna silvestre mexicana no cinegética al nivel internacional con especial énfasis hacia el intercambio con la comunidad Europea.* Mem. VIII Simp. Fauna Silvestre. Fac. Med., Vet. Y Zoot., UNAM. Mexico, D.F. 12p. *In print.*

DOF. 1988. *Ley General del Equilibrio Ecológico y la Protección al Ambiente.* Diario Oficial de la Federación 28 de enero. México.

DOF. 1991. *Decreto por el que se aprueba la Convención sobre el comercio internacional de especies amenazadas de fauna y flora silvestres,* adoptada en la ciudad de Washington D.C., el tres de marzo de mil novecientos setenta y tres. Diario Oficial de la Federación. México.

DOF. 1992a. *Decreto promulgatorio de la convención sobre el comercio internacional de especies amenazadas de fauna y flora silvestres.* Diario Oficial de la Federación. México.

DOF. 1992b. *Ley sobre la Celebración de Tratados.* Diario Oficial de la Federación 2 de enero. México.

DOF. 2000a. *Ley General de Vida Silvestre.* Diario Oficial de la Federación 3 de Julio. México.

DOF. 2000b. *PROY-NOM-059-ECOL-2000.* Diario Oficial de la Federación 8 de Septiembre. México.

DOF. 2002. *NOM-059-SEMARNAT-2001.* Protección ambiental - especies nativas de México de flora y fauna silvestres - categorías de riesgo y especificaciones para su inclusión, exclusión o cambio - lista de especies en riesgo.

Dobson, P.A. 1998. *Conservation and Biodiversity.* Scientific American Library. USA. 264p.

du Plessis, A.M. 2000. CITES and the Causes of Extinction, Pp. 13-25, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African. Resources Trust. UK. 202p.

EFE News Service. 1999. Mexico-US U.S. biologist arrested for trafficking in endangered species. *EFE News Service Inc.* U.S.

EFTA. 2000. *Anuario del Comercio Justo 1998-2000. Cuero y artículos de cuero.* http://www.eurosur.org/EFTA/2000/cuero.html#4

El Nacional. 1993. Persiste Depredación de la Tortuga Marina en Oaxaca: SEPESCA. *El Nacional* Agosto 27: 14.

Enciso, A. 1995. Charco Cercado: el tráfico de animales, único medio de vida. *La Jornada* Noviembre 27: 14.

Enciso, A. 1996. Mexico, uno de los abastecedores de especies en peligro de extinción. *La Jornada* Febrero 12: 22.

Epstein, J. 2000. Savage Capitalism. *Latin Trade January*: 50-52.

Escalante, J. 2004a. Dan golpe al trafico de pieles. *Reforma* 12 de marzo. México.

Escalante, J. 2004b. "Lleve botas a $850". *Reforma* 15 de enero. México.

Ezcurra, E. 1995. Pers. comm. to I. Arroyo, In: *Los Mamíferos Mexicanos en Riesgo de Extinción según la NOM-059-ECOL-1994: Bases para su Reevaluación.* Arroyo, I (1996). Tesis de Licenciatura. UNAM. México. 145p.

Fischer, M.L. & F.T. Campbell. 1990. U.S. Plant Imports from Mexico Jump in 1989. *TRAFFIC USA* 10(2): 7.

Fitzgerald, S. 1989. *International Wildlife Trade: Whose Business is it?.* WWF. Washington, DC. 459p.

Fitzgerald, A.L. *et al. Harvest of and Trade in Reptiles and Amphibians of the Chihuahuan Desert Ecoregion.* TRAFFIC North America. In press.

Fleming, H.E. 1999. *Exploring Linkages between Trade and Species Conservation in North America.* TRAFFIC North America. 161p.

Fleming, H.E. 2001. *Swimming Against the Tide: recent Surveys of Exploitation, Trade and Management of Marine Turtles in the Northern Caribbean.* TRAFFIC North America. Washington, D.C. 161p.

Freese, C. 1998. *Wild Species as Commodities.* Island Press. Washington, DC. 319p.

Fuller, D. 1985a. Mexican Trade Dilemma – Plants at Risk. *TRAFFIC USA* 6(2): 7-11.

Fuller, D. 1985b. U.S. Plant Imports from Latin America. *TRAFFIC USA* 6(1): 11-13.

Fuller, S.K. & B. Swift. 1985. *Latin American Wildlife Trade Laws 2nd ed.* TRAFFIC USA/WWF. Washington, D.C.

Fuller, S.K. *et al.* 1987. Wildlife Trade Law Implementation in Developing Countries: The Experience in Latin America. *Boston University International Law Journal* 5: 289-310.

FWS. 1993. *U.S. Fish and Wildlife Service Cooperative Programs With Mexico.* U.S.DOI/FWS. U.S.A. 33p.

García, A. 2000. Detectan tráfico de arácnidos. *Reforma.* www.reforma.com (July 10).

García C. A. 2001. Cocodrilos, eje de una industria. *Excélsior* 10-A.

Gaski, L.A. 1992. *The United States as Consumer and Regulator in the Reptile Skin Trade.* TRAFFIC USA. Washington, D.C. 46p.

Glass E. C. 1998. *Identification guide to threatened cacti of Mexico.* Cante A.C. CONABIO.

Gobbi, J. *et al.* 1996. *Parrot Smuggling Across the Texas-Mexico Border.* TRAFFIC USA. Washington, DC. 31p.

González, B.B. 2000. *Análisis del Comercio Internacional de Fauna Silvestre, Permisos, Certificados y Controles CITES en México y los Países que regularmente comercian con el.* Tesis de Maestría. Universidad Internacional de Andalucía. Andalucía, España. 102p.

Groombridge, B. 1992. *Global Biodiversity. Status of the Earth's living Resources.* WCMC/Chapman & Hall. London. 585p.

Guerrero, H. 2004. Ubica PROFEPA 22 playas de riesgo para tortugas. *Reforma* 13 de enero. México.

Hágsater, E. & V. Dumont (eds.). 1996. *Orchids: Status Survey and Conservation Action Plan.* Orchid Specialist Group. Species Survival Commission, IUCN. 153pp.

Harris, D. *et al.* 2003. *CITES Trade Data. An Under-Utilised Wildlife Resource.* A Report of the CITES Trade Data Analysis Project. IUCN/SSC Wildlife Trade Programme and TRAFFIC International. RBG Kew/UNEP-WCMC.

Heijnsbergen, V.P. 1997. *International Legal Protection of Wild Fauna and Flora.* IOS Press. Ohmsha. 261p.

Hemley, G. 1983. International Reptile Skin Trade Dependent on few species. *TRAFFIC USA* 5.

Hemley, G. 1984. World Trade in Tegu Skins. *TRAFFIC Bulletin* V. WTMU/IUCN.

Hemley, G. 1990. *Illegal Trade in Crocodilian Skins: Current Problem Areas.* UICN. Gland, Switzerland. 345p.

Hemley, G. 1994. *International Wildlife Trade. A CITES Sourcebook.* WWF/Island Press. Washington, D.C. 166p.

Hilton-Taylor, C. (compiler) 2000. *2000 IUCN Red List of Threatened Species.* IUCN, Gland, Switzerland and Cambridge, UK. xviii + 61pp. Downloaded on 24 May 2002.

Hilton-Taylor, C. (compiler) 2000. *2000 IUCN Red List of Threatened Species.* IUCN, Gland, Switzerland and Cambridge, UK. xviii + 61pp.

Hjarsen, T. 1999. Communication on illegal trade. *CITES World- Official Newsletter of the Parties* 3: 6.

Hoffer, A.J. ***et al.*** 1996. *Modern Systems Analysis and Design.* Benjamin/Cummings Publishing. USA. 896p.

Hogenboom, B.B. 1998. *Mexico and the NAFTA Environment Debate: The Transnational Politics of Economic Integration.* International Books. Netherland. 279p.

Hoover, C. 1998. *The U.S. Role in the International Live Reptile Trade: Amazon Tree Boas to Zululand Dwarf Chamaleons.* TRAFFIC North America. Washington, DC. 59p.

Hoover, C. 2003. Pers. comm. to I. Arroyo. TRAFFIC North America. Washington, DC.

Hoyt, E. 1996. Blueprint for Mexico's Environmental Programs Favors Resource Conservation Pp 443-446 In: *NAFTA and the Environment.* Rubin, J.S. & D.C. Alexander (eds.). Kluwer Law International. The Hague, The Netherlands. 606p.

Hutton, J. 2002. The contribution that well-managed international trade can make to species conservation Pp. 5-6, In: *Guidance for CITES Scientific Authorities: Checklist to assist in making non-detriment findings for Appendix II exports.* Rosser, A.R. & Haywood, M.J. (compilers). IUCN, Gland, Switzerland and Cambridge, UK. xi + 146p.

Hutton, J. & B. Dickson. 2000. Introduction Pp. xv-xx, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources Trust. UK. 202p.

Hutton, J. & N. Leader-Williams. 2003. Sustainable use and incentive-driven conservation: realigning human and conservation interests. *Oryx* 37: 215-226.

Huxley, C. 2000. CITES: The Vision, Pp. 3-12, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources Trust. UK. 202p.

Hykle, J.D. 1988. *An Evaluation of Canada's Implementation and Enforcement of CITES: the Convention on International Trade in Endangered Species of Wild Fauna and Flora.* Dalhousie University. Thesis: Master of Environmental Studies. Halifax, Nova Scotia. 258p.

Iglesias, E. 1998. *Las Industrias del Cuero y del Calzado en México.* Instituto de Investigaciones Economicas (IIE). UNAM. México. 277p.

INE. 1994. *Informe de la Situación General en Materia de Equilibrio Ecológico y Protección al Ambiente 1993-1994.* SEDESOL. México.

INE. 1996. Plan Nacional para la Conservación, Investigación, Manejo y Uso Sustentable de los Cocodrilos y el Caiman Pp. 53-58, In: *Crocodiles. Proceedings of the 13th Working Meeting of the Crocodile Specialist Group of the SSC.* UICN. Gland, Switzerland. 514p.

INE. 1997a. *Programa de Conservación de la vida silvestre y diversificación productiva en el sector rural.* SEMARNAP. Mexico, D.F. 207p.

INE. 1997b. *Avances en el Desarrollo de Indicadores para la Evaluación del Desempeño Ambiental en Mexico 1997.* SEMARNAP. Mexico, D.F.

INE. 1999a. *Cooperacion Internacional.* http://www.ine.gob.mx/dgra/ucci/coop_inter/index.htm (2 Septiembre).

INE. 1999b. *Tratados y Convenios Internacionales en Materia Ambiental signados por Mexico.* http://www.ine.gob.mx/dgra/ucci/coop_inter/convenio.htm. (Última actualización 13 de julio 1999). Mexico, D.F.

INE. 1999c. Programa de Medio Ambiente 1995-2000. Primer Informe de Avances, 1995 http://www.ine.gob.mx/presidencia/infor_institucion/primerinfo.html (8 de julio).

INE. 2000a. Illegal and Non-Regulated Practices/Flora and Fauna Species with Highest Demand in Illegal Commerce (1996). http://www.ine.gob.mx/dggia/indicadores/ingles/vsanp2_15.htm (March 30, 2000).

INE. 2000b. *Estrategia Nacional para la Vida Silvestre.* Logros y Retos para el Desarrollo Sustentable. INE/SEMARNAP. México. 212p.

INE. 2000c. *Proyecto para la Conservación, Manejo y Aprovechamiento Sustentable de los Crocodylia en México (COMACROM).* INE/SEMARNAP. México. 107p.

INE. 2000d. *Programa Nacional de Protección, Conservación, Investigación y Manejo de Tortugas Marinas.* INE/SEMARNAP. México. 106p.

INE. 2000e. *Desarrollo de UMAs, Sujeta a Manejo de Habitat y Poblaciones de Especies Silvestres.* Http://www.ine.gob.mx/dgvs/sumac.htm. INE/SEMARNAP. México.

INE. 2000f. *Que son las UMAs?* Informational brochure.

INE. 2003. *NORMA Oficial Mexicana NOM-059-ECOL-2001, Protección ambiental-Especies nativas de México de flora y fauna silvestres-Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio-Lista de especies en riesgo.* SEMARNAT.

INEGI. 1999. *Anuario Estadístico del Comercio Exterior de los Estados Unidos Mexicanos 1999.* Importación en miles de pesos Tomo I. INEGI. México.

INEGI. 2002. Instituto Nacional de Estadistica, Geografia e Informatica. http://www.inegi.gob.mx/territorio/ingles/fiterritorio.html.

Iñigo-Elías, E.E. 1986. Active Trade Threatens Mexican Avifauna. *TRAFFIC USA* 6(4): 6-7.

Iñigo-Elías, E.E. & M.A. Ramos. 1991. The Psittacine Trade in Mexico Pp. 380-392, In: Robinson, G.G. & K.H. Redford (eds.), *Neotropical Wildlife Use and Conservation.* The University of Chicago Press. Chicago.

ITC. 1970. *Los Principales Mercados de Artículos de Cuero en América del Norte y ciertos países de Europa Occidental.* UNCTAD-GATT. Ginebra. 305p.

IUCN. 1998. *Trade measures in International Environmental Agreements.* IUCN Report. 111p.

Jenkins, G.W.R. 2000. The Significant Trade Process: Making Appendix II Work, Pp. 47-56, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources. UK. 202p.

Jenkins, M. & S. Broad. 1994. *International Trade in Reptile Skins. A Review and Analysis of the Main Consumer Markets, 1983-91.* A TRAFFIC Network Report.TRAFFIC International. WWF. Cambridge, UK. 68p.

Jerónimo, J.L.J. 2002. *Aspectos legales de la especie Iguana iguana.* PROFEPA Tabasco. V Taller Nacional de Manejo de Iguanas en Cautiverio. Villa Hermosa, Tabasco. México.

Jiménez-Peña. 1996. Pers. comm. to Pérez-Gil. In: *Importancia económica de los vertebrados silvestres de México.* Pérez-Gil, R. et al. CONABIO. Pg7 Consultores. México. 170p.

King, W. F. 1978. The Wildlife Trade. Pp. 253-271, In: *Wildlife and America. Contributions to an Understanding of American Wildlife and its Conservation.* Brokaw, P.H. (ed.). Council on Environmental Quality. USA.

La Jornada. 1996. Aumentan robo, tráfico de especies y prostitución en las zonas áridas. *La Jornada.* Abril 9: 21.

Landa, R *et al.* 1997. Environmental Deterioration in Rural México: An Examination of the Concept. *Ecological Applications* 7(1): 316-329.

Lau, M.S.A. & D. S. Melville. 1994. *International Trade in Swiftlet Nests with Special Reference to Hong Kong*. TRAFFIC International. Cambridge, U.K. 35p.

Leader-Williams, N. 1992. *The World Trade in Rhino Horn: A Review.* TRAFFIC International. Cambridge, UK 40p.

Leader-Williams, N. 2002. When is International Trade in Wild Animals Detrimental to Survival: principles, avoidance and monitoring? Pp. 7-16, In: *Guidance for CITES Scientific Authorities: Checklist to assist in making non-detriment findings for Appendix II exports.* Rosser, A.R. & Haywood, M.J. (compilers). IUCN, Gland, Switzerland and Cambridge, UK. xi + 146p.

Leader-Williams, N. 2003. Regulation and Protection: Successes and Failures in Rhinoceros Conservation. *The Trade in Wildlife. Regulation for Conservation.* Oldfield, S. (ed.). Earthscan. UK. 210p.

LEMIS. 2000. *Law Enforcement Management Information System.* US Fish and Wildlife Service. US.

León, F. 1996. La Crianza de Cocodrilos en México: Cocodrilos Mexicanos S.A. De C.V., Pp. 355-358 In: *Crocodiles. Proceedings of the 13th Working Meeting of the Crocodile Specialist Group.* UICN. Gland, Switzerland. 514p.

León, F. 2001. Pers. Comm. to I. Arroyo. COCOMEX. Culiacán, Sinaloa. México.

Lieberman, S. 1997. The Ups and Downs of COP 10. *Endangered Species Bulletin* XXII (5): 8-12.

Littmann, L.E. 1975. *Apuntes sobre mercadeo agrícola.* Escuela Nacional de Agricultura. Chapingo, México.

Liverman, M.D. 1993. Environment and Security in Mexico, Pp. 211-233, In: *Mexico: In Search of Security.* Bagley, M.B. & Q.S.Aguayo (eds.). North-South Center. University of Miami. USA. 367p.

Loa, E. 1996. Pers. comm. to I. Arroyo. CONABIO. México.

Loa, E. 1999. Pers. comm. to I. Arroyo. CONABIO. México.

López, X.J. 2000. Decomisan cactáceas mexicanas. http://www.to2.com/desar/homepage.nsf/to2main?readform. (May 22, 2000)

Ludwiszewski, B.R. & P.E. Seley. 1996. "Green" Language in the NAFTA: Reconciling Free Trade and Environmental Protection Pp 1-23 In: *NAFTA and the Environment.* Rubin, J.S. & D.C. Alexander (eds.). Kluwer Law International. The Hague, The Netherlands. 606p.

Mace, G.M. & A. Balmford. 2000. Patterns and processes in contemporary mammalian extinction Pp. 27-52, In: *Priorities for the Conservation of Mammalian Diversity. Has the Panda had its day?* Entwistle, A. & N. Dunstone (eds.). Cambridge University Press. UK. 455p.

Macdonel, M.C.A. 2002. Pers. comm. to I. Arroyo. Delegación Federal de la SEMARNAT en Tabasco. México.

Macdonel, M.C.A. 2002. *Normatividad para el Establecimiento de Operación de una UMA.* Delegación Federal de la SEMARNAT en Tabasco. V Taller Nacional de Manejo de Iguanas en Cautiverio. Villa Hermosa, Tabasco. México.

Martin, R.B. 2000. When CITES Works and When it Does Not, Pp. 29-37, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources. UK. 202p.

Martínez, O.M. 2001. *La Verificación del Cumplimiento a la Legislación Ambiental que Regula el Aprovechamiento de Iguanas en México.* PROFEPA Oaxaca. IV Taller Nacional de Manejo de Iguanas en Cautiverio. Puerto Angel, Oaxaca.

Mast, R. & A. Brautigam. 1986. Mexico's Sea Turtles: Trade the Major Threat to Their Survival. *TRAFFIC USA* 6(4): 14-15.

McNeely, A.J. *et al.* 1990. *Conserving the World's Biological Diversity.* IUCN, WRI, CI, WWF-U.S. and the World Bank. Gland, Switzerland and Washington, D.C. 193p.

McVay, C. 1986. Spot Those Skins. *TRAFFIC USA* 6: 8-9.

Milner-Gulland & Mace, R. 1998. *Conservation of biological resources.* Oxford: Blackwell Science. 404 p.

Milner-Gulland, E.J. & Bennett E.L. 2003. Wild Meat: The Bigger Picture. *Trends in Ecology and Evolution* 18 (7): 351-357.

Miramontes *et al.* 1993. *Legislación Nacional y medidas más estrictas.* Secretaria CITES y la Dirección General de Aprovechamiento Ecológico de los Recursos Naturales. Seminario Ejecutivo sobre la Convención sobre el Comercio Internacional de Especies Amenazadas de Flora y Fauna Silvestres (CITES) en México. Conferencia Noviembre 25 de 1993. SEDESOL/INE. México.

Mittermeier *et al.* 1997. *Megadiversidad: Los Países Biológicamente más Ricos del Mundo.* México: Cementos Mexicanos.

Mofson, P. 2000. Zimbabwe and CITES: Influencing the International Regime Pp. 107-122, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources. UK. 202p.

Morales, T. 2002. *Situación Económica de las Iguanas en México.* Departamento de Aprovechamiento Intensivo de Fauna Silvestre. Dirección General de Vida Silvestre, SEMARNAT. V Taller Nacional de Manejo de Iguanas en Cautiverio. Villa Hermosa, Tabasco. México.

Morales, T. 2002. Pers. comm. to I. Arroyo. Subsecretaría de Gestión para la Protección Ambiental. Dirección General de Vida Silvestre. Departamento de Aprovechamiento Intensivo. SEMARNAT. México.

Moyle, B. 2003. Regulation, Conservation and Incentives. Pp. 41-51, In: *The Trade in Wildlife. Regulation for Conservation.* Oldfield, S. (ed.). Earthscan. UK. 210p.

Mulliken, T. & A. Barden. 2002. The Significance of Significant Trade. *TRAFFIC Bulletin.* 9 (2). TRAFFIC International.

Mulliken, T. & J.B. Thomsen. 1990. US Bird Trade: The Controversy Continues Although Imports Decline. *TRAFFIC USA* 10(3): 1-11.

Mumme, P.S. ***et al.*** 1988. Political Development and Environmental Policy in Mexico. *Latin American Research Review* XXIII (I): 7-34.

Mumme, P. S. 1992. System Maintenance and Environmental Reform in Mexico: Salinas' Preemptive Strategy. *Latin American Perspectives* 19 (1).

Mumme, P.S. 1995. Mexico´s New Environmental Policy: An Assessment Pp. 97-117 In: Mexico Faces the 21st Century. Schulz, E.D. & E.J. Williams (eds.). *Contributions in Latin American Studies* 5. Greenwood Press. London.

Muñiz, M. 2000. North America Mexico. Illegal Workshop Closed. *CSG Newsletter* 19(3): 12-13.

O'Connell, M. 1996. Legislation. Pp. 48-56, In: *Conservation Biology.* Spellerberg, F.I. (ed.). Longman. 242p.

OECD. 1997. *OECD Working Papers.* Experience with the Use of Trade Measures in the Convention on International Trade in Endangered Species (CITES). OECD. Paris. 68p.

OECD. 1998. *Environmental Performance Reviews.* OECD Publications. Paris, France. 217p.

OECD. 1999. *Trade Measures in Multilateral Environmental Agreements: Synthesis Report of Three Case Studies.* OECD. Paris, France. 46p.

Ortíz, L.M. 2000. Pers. comm. To I. Arroyo. Asuntos Internacionales. SEMARNAP. México.

Peña, A. & Neyra, G.L. 1998. Amenazas a la Biodiversidad Pp 158-181, In: *La Diversidad Biológica de Mexico: Estudio de País*. CONABIO. Mexico, D.F. 341p.

Pérez-Gil, S.R. 1986. What can Mexico do to solve wildlife trade problems? *TRAFFIC USA* 6: 7.

Pérez Gil, R. *et al.* 1996. *Importancia económica de los vertebrados silvestres de Mexico.* CONABIO, Pg7 Consultores. Mexico, D.F. 170p.

Pérez-Gil, R. 2000. *Extinción de especies: ¿listas rojas, qué son para cada quien?.* Segunda parte. http://www.to2.com (Enero 12).

Pérez-Gil, R. 2003. Pers. comm. to I. Arroyo. FAUNAM AC. Mexico.

Pérez-Gil, R. & I. Arroyo. 2003. *CITES Gap Analysis in Mexico*. Report to TRAFFIC North America. FAUNAM AC. Mexico.

Pérez, J.J. 1999. Pers. Comm. To I. Arroyo. Subdireccion de Cooperación Internacional Dirección. General de Vida Silvestre, INE. Mexico, D.F. Mexico.

Pérez, J.J. 2000. Pers. comm. to I. Arroyo. DGVS/INE. Mexico.

Pérez, J.J. 2002. Pers. comm. to I. Arroyo. Subdirector del Area de Protección de Flora y Fauna Yum Balam. Mexico.

Peritore, P.N. 1999. *Third World Environmentalism. Case Studies from the Global South.* University Press of Florida. Gainesville, USA. 328p.

Perran, R.J. 1998. *Crocodiles. Proceedings of the 14th Working Meeting of the Crocodile Specialist Group.* CSG. Singapore.

Peterson, B.S. 1998. Another Path to Customs Reform: Mexico's Second Inspection. *HIID Development Discussion Paper no. 632.* Harvard Institute for International Development. Harvard University.

Poder Ejecutivo Federal. 1983. *Plan Nacional de Desarrollo 1983-1988.* Poder Ejecutivo Federal. México.

Poder Ejecutivo Federal. 1995. *Plan Nacional de Desarrollo 1995-2000.* Poder Ejecutivo Federal. México.

Pole, C. & R. Lampard. 2002. *Practical Social Investigation. Qualitative and Quantitative Methods in Social Research.* Prentice Hall. UK. 322p.

PROARCA/CAPAS & CCAD. 1998. *Taller de Planificación Instalación de CITES.* PROARCA/CAPAS/CCAD. San Salvador.

Provencio, E. 1999. Prologue. Pp. xiii-xxi, In: *Economics of Biodiversity.* Avila, F.S. (ed.). CONABIO. SEMARNAP. DFID. USAID. Mexico. 502p.

Ramírez, R.D.V.F. 1999. Conservation, Management, and Sustainable Utilization of Wildlife. Pp. 341-357, In: *Economics of Biodiversity. Compilation of the International Seminar on La Paz, BCS.* Avila F. S. et al. (comps.). SEMARNAP. CONABIO. DFID. USAID. México. 502p.

Ramos, A.M. 1986. Mexico: Caught in a Labyrinth of Natural Resource Problems. *TRAFFIC USA* 6(4): 5,9.

Ramos, A.M. 1988. The Conservation of Biodiversity in Latin America: A Perspective. Pp 428-436, In: *Biodiversity.* Wilson, O.E. (ed.). National Academy Press. 521p.

Reeve, R. 2002. *Policing International Trade in Endagered Species. The CITES Treaty and Compliance.* Earthscan. 346p.

Restrepo, I. 1990. Y sigue el saqueo… ahora, de nuestra flora. *La Jornada* Agosto 20: 1,6.

Reuter, A. 2002. Pers. Comm. to I. Arroyo. TRAFFIC Mexico. México.

Reyes, J.M. 2000. Pers. comm. to I. Arroyo. DGVS/INE. Mexico.

Reyes, J.M. 2001. Pers. comm. to I. Arroyo. DGVS/SEMARNAT. Mexico.

Riquelme, F.E. 1996. Tráfico de Animales, Negocio más Redituable Después del de las Drogas. *Excélsior* Julio 14: 12, 29A.

Rivera, G.M.C. 1992. *Convención sobre el Comercio Internacional de Especies de Fauna y Flora Silvestre (CITES) y sus repercusiones jurídicas en México.* Tesis de Licenciatura. Facultad de Derecho, UNAM. México, D.F. 146p.

Robbins, S.C. 2000. *Mahogany Matters: The U.S. Market for Big-Leafed Mahogany And Its Implications For the Conservation Of the Species.* TRAFFIC North America. Washington, D.C. 58p.

Robinson, J.G. & E.L. Bennett. 2000. *Hunting for Sustainability in Tropical Forests.* Columbia University Press. New York. 582p.

Robson, C. 1993. *Real World Research. A Resource for Social Scientists and Practitioner-Researchers.* Blackwell. Oxford UK & Cambridge USA. 510p.

Rodríguez, U. H. 1985a. *Mexico, ante la Explotación Internacional de la Fauna Silvestre.* Ier. Simposio Internacional de Fauna Silvestre. SEDUE. Vol.II. Mexico, D.F. 849-860.

Rodríguez U. H. 1985b. *De la Explotación a la Continuidad de la Fauna Silvestre.* DGFFS, Dirección de Flora y Fauna Terrestre, SEDUE. Mexico, D.F. 151p.

Rodríguez, U. H. 1987. *Análisis del Sistema Mexicano de Control y Regulación del Aprovechamiento de las Cactáceas.* Facultad de Agrobiología Presidente Juárez. Universidad Michoacana de San Nicolás de Hidalgo. Uruapan, Michoacán. 47p.

Roe, D. ***et al.*** 2002. Making a Killing or Making a Living. Wildlife Trade, Trade Controls and Rural Livelihoods. *Biodiversity and Livelihoods Issues No. 6.* IIED. London, UK.

Roet, C.E., Mack, S.D. & N. Duplaix. 1981. *Psittacines Imported by the United States (October 1979 - June 1980).* Submitted for Publication in the Proceedings of the I.C.B.P. Parrot Workshop (St. Lucia April 15-19, 1980). Washington, DC. 66p.

Rohter, L. 1987. Mexico Becomes Hub for Wildlife Smugglers. *The New York Times*: 10-11.

Rose, D. 1991. *A North American Free Trade Agreement. The Impacts on Wildlife Trade.* TRAFFIC USA Washington, DC. 38p.

Rose, A.D. 1992. Free Trade and Wildlife Trade. *Conservation Biology* 6: 1.

Rose, D. 1992. The Sharks of Mexico: A Resource for All Seasons. *TRAFFIC USA* 11(4): 4-6.

Ross, P.J. 1995. North America: México. *CSG Newsletter* 14(4): 17-18.

Rosser, A. 1997. Report on CITES, the Tenth Conference of the Parties. *Species* 29: 25-28.

Rosser, A. & M. Haywood. 2002. *CITES: A Conservation Tool.* A Guide to Amending the Appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. IUCN/SSC. Cambridge, UK.

Salinas, D.G.C. 1989. *Plan Nacional de Desarrollo 1989-1994.* Secretaría de Programación y Presupuesto. México.

Salinas, D.G.C. 1990. *Segundo Informe de Gobierno 1990.* Anexo. Poder Ejecutivo Federal. México.

Samaniego, L.J. 1999. Introducción. Pp: 7-12, In: *Economics of Biodiversity.* Compilation of the International Seminar on La Paz, BCS. Avila F. S. et al. (comps.). SEMARNAP. CONABIO. DFID. USAID. México. 502p.

Sand, H.P. 1997. Whither CITES? The Evolution of a Treaty Regime in the Borderland of Trade and Environment. *EJIL* 8: 29-58.

Sánchez, M.E. 1999. *Palm Cockatoos seized in Mexico City Airport.* Electronic Notification to: cites-l@phoenix.wcmc.org.uk December 22. TEYELIZ, A.C. Mexico.

Sánchez, M. E. 1999. Pers. comm. to I. Arroyo. Teyeliz, A.C. México.

Sánchez, O. *et al.* 1998. *Guía de identificación para las aves y mamíferos silvestres de mayor comercio en México protegidos por la CITES.* Secretaría de Medio Ambiente, Recursos Naturales y Pesca / Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México.

Sánchez, O. 1998. Serpientes de México. *Biodiversitas* 4(21).

Sánchez, O. 2001. Pers. comm. to I. Arroyo. México.

Sánchez, C.V. & Chávez-Compean, L. 1987(?). *Importancia Económica y Conservación de los Mamíferos en México.* México. Pp.550-561.

Sand, H.P. 1997. Whither CITES? The Evolution of a Treaty Regime in the Borderland of Trade and Environment. *EJIL* 8: 29-58.

Sarukhán, J. & R. Dirzo. 2001. *Biodiversity-Rich Countries.* Encyclopaedia of Biodiversity Volume 1: 419-436. Academic Press.

Sauer, R. 1993. *Leather goods: attractive exports for developing countries.* International Trade FORUM.

SECOFI. 2000. *Comercio Total de Mexico.* SECOFI NAFTA Office. http://www.naftaworks.org/ March 30. Washington, DC.

SEDUE. 1988. *Importación y Exportación de ejemplares vivos, productos y subproductos de especies de flora y fauna silvestres y acuáticas.* Documento de Trabajo. México.

SEMARNAP. 1996. *Informe de Labores 1995-1996.* México.

SEMARNAP. 1997. *Programa de Conservación de la vida silvestre y diversificación productiva en el sector rural.* SEMARNAP. México. 207p.

SEMARNAP. 1998. *Informe de Labores 1997-1998.* México.

SEMARNAP. 1999. *Informe de Labores 1998-1999.* México.

SEMARNAT. 2003. Dirección General de Vida Silvestre. www.semarnat.gob.mx

Simonian, L. 1995. *Defending the Land of the Jaguar.* University of Texas Press. USA. 326p.

Simonian, L. 1999. *La Defensa de la Tierra del Jaguar. Una Historia de la Conservación en México.* CONABIO/SEMARNAP/IMERNAR. Mexico, D.F. 345p.

Smith G.A. & J. Marais (eds.). 1992. *Conservation and utilization of crocodile farming. Handbook on crocodile farming.* The Crocodilian Study Group of Southern Africa. 182p.

Snyder, R.F.N. ***et al.*** 1996. Limitations of Captive Breeding in Endangered Species Recovery. *Conservation Biology* 10 (2): 338-348.

Soberón, M. J. 1998. Introducción Pp. xvii-xviii, In: *La Diversidad Biológica de México, Estudio de País.* CONABIO. México, D.F. 341p.

Soberón, M.J. 1999. Epílogo Pp. 251-258 In: *La Defensa de la Tierra del Jaguar. Una Historia de la Conservacion en Mexico.* CONABIO, SEMARNAP, IMERNAR. Mexico, D.F. 345p.

SRE. 1991. *Aprobación del Proyecto de Decreto por el que se aprueba la Convención sobre el comercio internacional de especies amenazadas de flora y fauna silvestres (CITES).* Comisiones Unidas de Relaciones Exteriores, Segunda Sección y de Asentamientos Humanos y Ecología. Sesión Secreta 18 de Junio de 1991. México, DF.

Steiner, T. & L. McLamb. 1990. Shell Shock: Turtle Apocalypse on the Shore of Mexico. *Earth Island Journal International Environmental News*: 33-36.

Swanson, T. 1997. The Biodiversity Convention: A Meeting of the Minds? Pp 79-107, In: *Global Action for Biodiversity.* WWF/IUCN/Earthscan Publications Ltd. London. 191p.

Swanson, T. 2000. Developing CITES: Making The Convention Work for All of the Parties Pp. 134-152, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources. UK. 202p.

Tamayo-Flores, R. 2001. Mexico in the Context of the North American Integration : Major Regional Trends and Performance of Backward Regions. *J. Lat. Amer. Stud.* 33: 377±407. Cambridge University Press.

Taniguchi, H. 2004. Identifica PROFEPA rutas de productos de tortuga. *Reforma* 15 de enero. México.

Thompson, C.F. 1983. Mexican Cacti: A Case Study in Plant Trade Problems. *TRAFFIC USA* 5(1): 12.

Thomsen, B.J. & G. Hemley. 1987. Bird Trade...Bird Bans. *TRAFFIC USA* 7(2, 3): 1, 21-24.

Thomsen, B.J. & A. Brautigam. 1991. Sustainable Use of Neotropical Parrots Pp 359-379, In: Robinson, G.G. & K.H. Redford (eds.), *Neotropical Wildlife Use and Conservation.*The University of Chicago Press. Chicago.

Thorbjarnarson *et al.* 2000. Title of Chapter(s). In: *Turtle Conservation.* Klemens, W.M. (ed.). Smithsonian Institute. Washington. 334p.

TLC. 1993. *Tratado de Libre Comercio de América del Norte.* Texto Oficial. SECOFI/Grupo Editorial Miguel Ángel Porrúa. México. 1218p.

Toledo, V.M. & M.J. Ordoñez. 1993. The biodiversity scenario of Mexico: A review of terrestrial habitats Pp 757-777, In: Ramamorthy T.P. et al. (eds.). *The Biodiversity of Mexico: Origins and Distributions.* Oxford: Oxford University Press.

TRAFFIC Dispatches. 1998. CITES at 25: a milestone for one of the world's largest conservation treaties. *TRAFFIC Dispatches* April: 1-11.

TRAFFIC International. 1996. The Texas-Mexico border: a parrot smuggling point of serious concern. *TRAFFIC Dispatches*: 11.

TRAFFIC International. 1997. Seizures and Prosecutions: Americas. *TRAFFIC Bulletin* 16(3): 116.

TRAFFIC International. 1999. Seizures and Prosecutions: Americas. *TRAFFIC Bulletin* 17(3): 122.

TRAFFIC North America. 1998a. US-Mexico Border Smuggling Ring Smashed. *TRAFFIC North America* 1(3): 8-9.

TRAFFIC North America. 1998b. Validation Required for Mexican Imports and Exports. *TRAFFIC North America* 1 (1): 7.

TRAFFIC North America. 1999. Mexican I.D. Guides Published. *TRAFFIC North America* 2 (1): 15.

TRAFFIC USA. 1986a. Cactus Bust Yields Rare Specimens. *TRAFFIC USA* 7(1): 9.

TRAFFIC USA. 1986b. Legislation affecting Mexico's Wildlife Trade. *TRAFFIC USA* 6: 3.

TRAFFIC USA. 1988. Parrot Smuggler Sentenced. *TRAFFIC USA* 8(3): 7.

TRAFFIC USA. 1992. Mexico Accedes to CITES. While NAFTA could mean big changes in North American Wildlife Trade. *TRAFFIC USA* 11(2): 1-5.

TRAFFIC USA. 1994. Tarantula smuggler convicted. *TRAFFIC USA* 13(2): 9-10.

TRAFFIC USA. 1996. Fish Smuggler reeled in. *TRAFFIC USA* 15(2): 6.

TRAFFIC USA. 1997a. Summary Report on the 1997 CITES Conference. *TRAFFIC USA* 16: 2.

TRAFFIC USA. 1997b. Cacti under international trade threat. *TRAFFIC USA* 16 (1): 10-11.

TRAFFIC USA. 1997c. Orchids Seized at Mexico Airport. *TRAFFIC USA* 16(1): 10.

TRAFFIC. 2003. Moving Beyond Blame?A TRAFFIC Briefing Document to COP11 on Doc.11.20.1 http://www.traffic.org/cop11/newsroom/infractionsreport.html

Trejo, M. 2000. Pers. comm. to I. Arroyo. DGVS. INE/SEMARNAP. México.

Treviño, J. ***et al.*** 1991. *Mexico joins the Convention on International Trade in Endagered Species of Wild Fauna and Flora (CITES).* Embassy of Mexico. Press Release. Washington, D.C.

Tudor, J.D. & I.J. Tudor. 1997. *Systems Analysis and Design. A Comparison of Structured Methods.* MacMillan Press. UK. 300p.

Turner, L.S. 1992. Reptile Trade in Endangered Species from México. *TED Case Studies: An Online Journal* 2(1).

't Sas-Rolfes, M. 2000. Assessing CITES: Four Case Studies Pp. 69-87, In: *Endangered Species Threatened Convention. The Past, Present and Future of CITES.* Earthscan/African Resources. UK. 202p.

UNCTD. 2002. *Trade and Development Report 2002.* United Nations. New York and Geneva.

UNDP. 1996. Human Development Report. New York, In: Sarukhán & Dirzo, 2001. *Biodiversity-Rich Countries. Encyclopaedia of Biodiversity.* Volume 1: 419-436. Academic Press.

UNEP. 1995. *Global Biodiversity Assessment.* Cambridge University Press. 1140p.

UNEP-CITES Secretariat. 1997. *Analysis of Mexican Legislation. National Legislation Project.* United Nations Environment Program/CITES Secretariat. Geneva, Switzerland.

Uriarte, G.P. 2002. Pers. comm. to I. Arroyo. IGUASIN. Culiacán, Sinaloa. México.

Vázquez, A.S. *et al.* 2001. *Bases Legales para la Colecta Científica y el Aprovechamiento Sustentable de las Iguanas.* Unidad de Vida Silvestre de la SEMARNAT, Oaxaca. IV Taller Nacional de Manejo de Iguanas en Cautiverio. Puerto Angel, Oaxaca. México.

Vidal de los Santos, E. 2002. Pers. comm. to I. Arroyo. Delegado Federal de SEMARNAT en el Estado de Tabasco. México.

Villegas, Z.F. 2002. Pers. comm. to I. Arroyo. Centro de Conservación y Reproducción de Iguanas. Universidad del Mar, Oaxaca.

Villegas, Z. F. & P.D.B. Vázquez. 2001. The Black Iguana, Biology, research, and conservation of a species endemic to Mexico. *Reptilia The European Herp Magazine* 18: 34-38.

Villegas, Z.F. & P.D.B. Vázquez. 2002. *Problemática, Usos y Forma de Caza de las Iguanas: América Latina-México.* Centro de Conservación y Reproducción de Iguanas de la Universidad del Mar. Oaxaca, México.

Villena, A. 1999. Big Business: Smuggled Animals. *World Press Review* 46(9): 43.

Vincent, J.C.A. 1996. *The International Trade in Seahorses.* TRAFFIC International. Cambridge, U.K. 163p.

Vega, P. 1998. Eureka! Mascotas silvestres? *La Jornada.* http://www.jornada.unam.mx/1998/nov98/981123/cien-eureka.html

Vovides, A.P. 1986. Trade and Habitat Destruction Threaten Mexican Cycads. *TRAFFIC USA* 6(4): 13.

Warwick, P.D. 1983. On Methodological Integration in Social Research Pp. 275-297, In: *Social Research in Developing Countries. Surveys and Censuses in the Third World.* Bulmer, M. & D.P. Warwick. John Wiley & Sons Limited. 383p.

Warwick, C. *et al.* 1991. Rattlesnake collection drives – their implications for species and environmental conservation. *Oryx* 25(1): 39-42.

Wijnstekers, W. 2000. *The Evolution of CITES.* A reference to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. CITES Secretariat/IFAW. Switzerland. 512p.

WCMC. 1996. *WCMC CITES Trade Database. Output User's Guide.* WCMC. Cambridge, UK. 16p.

WCO-CITES. 2001. *The Customs: Wild Fauna and Flora.* http://www.wcoomd.org/ENF/CITES/BROCHE/MAINFR.HTM. 6 Junio 2001.

WTO. 2002. *Trade Policy Review: Mexico.* Report by the Government. World Trade Organization.

WWF. 1997. *Buyer Beware!.* WWF. Washington, DC.

WWF. 2003. *Terrestrial Ecoregions of the World.* www.wwf.org

Yiming, L. & L. Dianmo. 1998. The dynamics of trade in live wildlife across the Guangxi border between China and Vietnam during 1993-1996 and its control strategies. *Biodiversity and Conservation* 7: 895-914.

Young, R.T. 2000. CITES at 25: a new role. *World Conservation* 1: 9-10.