



Reptile leather

products & trade

facts and myths

Reptile leather

products & trade

facts and myths

Within the global leather industry, exotic reptile leather is a relatively small but precious component, long used by innovative designers and craftsmen to create a unique range of products coveted by society. A society increasingly aware of the need to sustain Nature, but often unfamiliar with the role reptile leathers are now playing in achieving that goal. Here, globally recognised experts, drawing on the latest scientific research as appropriate, address a series of facts and myths about reptile leather use and trade. A central focus is on the use of reptile leather by luxury brands, because this is the context within which questions are often raised. The goal is an educational one – an attempt to identify “facts”, which should underpin evidence-based decisions, and separate them from “myths”, at best half-truths, that confound and confuse the ability to make responsible decisions.

This information sheet is separated into quick and easy short answers, and corresponding longer and more in-depth answers for interested readers. Longer answers include links to relevant references and supporting scientific information. For a web version of this information please visit www.epicbiodiversity.com

About the Contributors

The compilers and contributors are scientists, university professors, wildlife managers, and professional veterinarians, all with internationally recognised credentials in the conservation, management, welfare and sustainable use of reptiles. Their cumulative professional experience spans more than 400 years.

Dr. Daniel Natusch;
reptile specialist, Macquarie University, Australia

Dr. Patrick Aust;
reptile specialist, Oxford University, UK

Dr. Dilys Roe;
sustainable use specialist, International Institute for Economic Development, UK; Chair IUCN SSC Sustainable Use and Livelihoods Specialist Group

Mr. Tomas Waller;
reptile specialist, Fundacion Biodiversidad, Argentina
Chair IUCN SSC Boa and Python Specialist Group

Ms. Christine Lippai;
crocodile specialist, Deputy Chair of IUCN SSC
Crocodile Specialist Group

Prof. Michael Archer;
sustainable use specialist, University of New South Wales, Australia

Prof. Mirza Kusriani;
reptile expert, IPB University, Indonesia

Prof. Grahame Webb;
reptile specialist, Charles Darwin University, Australia
Chair IUCN SSC Crocodile Specialist Group

Dr. Matthew Shirley;
crocodile specialist, Florida International University, USA

Mrs. Jessica Lyons;
reptile trade specialist, EPIC Biodiversity, Australia

Dr. Matthew Brien;
crocodile specialist, Queensland Department of Environment, Australia

Dr. Pablo Sirosky;
crocodile specialist, National Scientific and Technical Research Council, Argentina

Prof. Richard Shine;
reptile specialist, Macquarie University, Australia

Prof. Dale DeNardo;
reptile veterinarian, Arizona State University, USA

Dr. Patricio Miccucci;
reptile specialist, Fundacion Biodiversidad, Argentina

**Frequently
asked
questions**
short answers

facts



1) Is the use of reptiles by people a recent phenomenon?

No. People have been using reptiles as a source of food, material, and medicine for thousands of years.

2) Why are reptile skins considered exotic leathers?

Reptile skins typically include ornate and intricate textures and patterns that are not often seen in leathers derived from conventional livestock. By western standards they are sourced from non-native species native to tropical and 'exotic' locations.

3) Why does the luxury industry still use exotic leathers?

Exotic leathers are durable and versatile renewable materials. They are far superior to imitations and alternatives in terms of CO₂ emissions, ecological sustainability, and the benefits they deliver to rural communities.

4) Is using exotic leathers responsible?

Yes. Using exotic leathers confers substantial benefits to wildlife conservation, environmental sustainability, and rural livelihoods.

5) Are all harvested and farmed reptiles destined for the luxury industry?

No. The greatest proportion of the reptile trade comprises food and pharmaceutical sectors. Leather is often a co-product of these industries.

6) Is farming or harvesting reptiles hazardous for workers?

Farming and harvesting reptiles is no more hazardous than any comparable rural industry. It is true that several traded species (e.g., crocodiles, venomous snakes) are dangerous, but rigorous management and safety protocols mitigate associated risks.

7) Does farming or harvesting of reptiles increase risks of human disease?

No. Reptiles seldom transmit diseases to humans because of our vastly different physiologies (cold blooded versus warm blooded). Compared to warm-blooded animals like chickens or pigs, the threat they pose is minimal.

8) Should the luxury industry feel proud about their use of exotic leather?

Yes. Using exotic leather generates substantial benefits for wildlife and ecosystem conservation, environmental sustainability, and rural livelihoods.

9) Why not substitute exotic leather with faux or fake leather?

When compared to natural reptile leather, artificial exotic leathers are heavily processed, less sustainable and confer fewer benefits to social and environmental wellbeing.

10) Why do some animal rights groups insist fashion brands and retailers should stop using exotic leathers?

Some animal rights groups are fundamentally opposed to the use of animals for any purpose. Although extreme, their views are theirs to hold. However, the public should be aware that these groups commonly spread false and misleading information.



11) How is the reptile trade controlled?

Tiers of local, national and international laws control the reptile trade. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is the main body regulating international trade of wildlife, including farmed and wild harvested reptiles.

12) What is CITES and how does it regulate the trade in exotic leathers?

CITES is a United Nations Convention agreed between 198 countries known as Parties. CITES regulates international trade in wildlife through a system of permits, certificates and trade restrictions.

13) Are there certifications for exotic leather sourcing?

Yes. Several internationally recognised certifications and standards for ethical trade in exotic leathers exist.

14) Is there a significant amount of illegal trade in exotic leathers?

No. Some illegal trade has existed, but this represents a tiny fraction in terms of overall volume and today has no impact on the conservation outcomes of the trade.

15) Is there significant illegal capture and exportation of wild reptiles through legal breeding farms?

This has been a challenge for a few species in the past, but for the vast majority of trade it is not considered a significant conservation threat.

16) Can exotic leathers be traced back to their source?

Yes. Similar to the food industry, many sophisticated traceability systems now exist for trade in exotic leathers.

17) What does 'sustainability' mean in the reptile trade?

Sustainability means preserving optimal outcomes for biodiversity conservation, people and the environment, while ensuring impeccable welfare standards for traded reptiles.

18) Is the reptile trade sustainable?

Yes. The vast majority of the exotic leather trade in terms of species, volume, source, and purpose is legal, well-regulated and sustainable.

19) Are reptile farms sustainable?

Yes, reptile farming is highly sustainable. It is increasingly considered a 'green' start-up sector offering a diverse spectrum of innovative opportunities in sustainable food systems and climate change resilience.

20) Are wild harvests of reptiles sustainable?

Yes. Some reptile species are biologically and ecologically well-suited to sustained harvesting. Numerous scientific studies have proven that the wild harvesting of reptiles for exotic leather is sustainable.

**Frequently
asked
questions**
short answers

facts



21) How are reptiles killed, and is it humane?

Reptiles are killed by destruction of the brain, using a tool such as a bolt pistol. Brain destruction results in near-instantaneous death causing minimal pain or suffering. The World Organisation for Animal Health (OIE) has approved this method.

22) Does the reptile trade help local communities?

Yes. The trade benefits millions of people in Asia, Africa, and Latin America. It is a globally important source of food, material and livelihood throughout the tropics, just like traditional livestock in the temperate North.

23) What would be the impact if we banned the exotic reptile trade?

A ban on the use of exotic leather will have negative impacts, both on humans and on biodiversity conservation. The exotic reptile trade enables numerous synergies between people and nature, and these would be forced to give way to less sustainable alternatives.

24) What can be done to improve the reptile trade?

There are organisations and initiatives aimed at strengthening the resilience of the exotic leather trade by optimizing benefits for species, the environment, and people. Commercial entities participating in the exotic leather trade should involve themselves in these initiatives.

25) Is there any science supporting exotic leather trade and is it trustworthy?

Yes. There is a wealth of scientific evidence supporting the benefits and sustainability of the exotic leather trade. Scientific studies have been ongoing since the 1970s.

26) What is the best source of factual information?

The International Union for the Conservation of Nature (IUCN) should be the first port of call for assistance. It is the largest, oldest and most reputable source of factual information available, and will help you connect with the most reliable source of relevant knowledge.

**Frequently
asked
questions**
short answers

myths



Extremist animal rights organisations, opposed fundamentally to all uses of animals by people, depend financially on public subscription. They use standard strategies for advertising formally and through contrived media stories. They never acknowledge benefits of trade, and embellish negative associations whenever possible. The most common approach is to create or find an example of dubious treatment and imply that it characterises the industry as a whole. Such claims are fallacious and fabricated but nevertheless effective. They fall into the class of “myths”.

1) Is child labour used in the exotic leather trade?

No. There is no evidence of child labour in the exotic leather trade.

2) Are reptiles skinned alive?

No. Because they are cold-blooded, reptiles can continue to move for up to an hour after death, giving the impression that they are still alive.

3) Are snakes filled with water to kill them?

No. Water is used to help separate the skin from the carcass, and is only applied after the animal has been humanely killed.

4) Are reptiles only killed for their leather?

No. The greatest proportion of the reptile trade comprises the food and pharmaceutical sectors. Leather is often a co-product of these industries.

5) Are crocodiles kept in restrictive and overcrowded pens?

Like other livestock industries, the reptile industry is governed by strict laws and science-based regulations, and this includes stocking densities. Ironically, overcrowding invariably leads to poor quality skin and is therefore actively avoided as a commercial imperative.

6) Is it true that crocodilians are farmed in unclean water?

Water quality is managed by sophisticated water management regimes, much like the aquaculture industry, and exceeds water quality in the wild. It may not reach our swimming pool standards, but exceeds levels needed to maintain health and wellbeing, and is implemented to ensure the highest quality leather.

7) Is it true that species are being driven to extinction by trade?

No. Ironically, populations of species involved in trade are typically healthier than those that are not, usually because they have benefited from agricultural expansion (much like rodent pests) or because trade has provided incentives for their conservation.

8) Does trade in exotic leathers increase the risk of zoonotic diseases like COVID-19?

No. Reptiles seldom transmit diseases to humans because of our vastly different physiologies (cold blooded versus warm blooded). Within the context of global food and agricultural systems, reptiles are a natural barrier against the transmission of diseases like COVID-19.



1) Is the use of reptiles by people a recent phenomenon?

People and their ancestors have used leather for over 3 million years, whereas the most primitive woven cloths are relatively recent – less than 40,000 years old. Reptiles have been a human food from the earliest times of human evolution, and skins and organs have been used for various traditional, medicinal and practical purposes for thousands of years. These ancient uses are unchanged in some rural societies today. The use of reptiles for unique luxury products has occurred for hundreds of years, but particularly since the 19th century.

2) Why are reptile skins considered exotic leathers?

Among luxury brands, ‘exotic leathers’ are the cured skins of wild rather than domesticated animals, and they include animals such as crocodiles, alligators, caimans, lizards, and snakes, amongst many others. The scale patterns, texture and colours make them different and “exotic” raw materials. For many people in many parts of the world, it is sheep, goats and cattle that are unusual and “exotic”, as reptiles are the more stable and attainable food source.

3) Why does the luxury industry still use exotic leathers?

Implicit within exotic leather products is the perceived story associated with them. They are not derived from conventional farm animals, seen daily in the countryside, but rather they emanate from distant, exotic and mysterious locations. The raw materials are durable, have timeless natural perfection, and are designed to project the essence of elegance. This is their point of difference. A more compelling reason has been emerging over the last fifty years. The use of exotic reptile leather **offers opportunities** for consumers and companies alike to encourage, reward and incentivise activities mandated by the UN Sustainable Development Goals. Much trade in reptile products ultimately provides livelihood benefits for local people in remote areas, who are some of the world’s most vulnerable people. Their ability to trade is subject to establishing and maintaining conservation and management programs that ensure sustainable use. Economic incentives are provided to maintain wild places, rather than converting to sterile monocultures. Ultimately, these are choices individual consumers and corporations must make for themselves - nobody is forcing anyone to buy or produce products made from exotic leathers. But the large evidence-base indicates unequivocally that such linkages exist and are attainable.

4) Is using exotic leathers responsible?

People have been using animals since the **dawn of our species**. For many people in the tropics, where most reptiles reside, reptiles are common and are still viewed in much the same way as advanced agricultural societies view chicken, sheep and beef. Reptiles are a source of meat and leather – commonly derived from Nature, while conventional livestock is derived from relatively sterile, human-modified landscapes. From an ethical and moral perspective there are obvious challenges. Wild harvest versus factory farming. Natural habitats versus monocultures of grain production to feed livestock. Both extremes are linked to the death of animals, which is unacceptable to some people. But the benefits of land use practices supporting trade in exotic leathers are **overwhelmingly evident**, and **preferable to destructive land use** practices for alternative materials such as processed textiles.

5) Are all harvested and farmed reptiles destined for the luxury industry?

No. Reptiles have been an important source of food for people for **at least 12 000 years** (undoubtedly much longer). Reptiles continue to play an **important food security role** in many **tropical countries today**. Only a fraction of the reptiles harvested or farmed for food and leather are sold to the luxury industry. Speciality markets exist

Frequently asked questions long answers

facts



for reptile meat and medicinal products throughout the tropics, with reptile flesh considered a delicacy in Africa, Asia, and Latin America. Reptile-based cuisine is an increasingly popular novelty and health food. Crocodile, alligator, and snake meat are legal and widely available in the United States and Europe and can fetch up to **US\$100 per kilogram**.

6) Is farming or harvesting reptiles hazardous for workers?

There is always potential for health and safety hazards in any industry that works with live animals. A significant part of the reptile trade involves people working in close proximity to dangerous animals such as crocodiles, pythons, and venomous snakes. Worldwide, wild reptiles are responsible for well over **150 000 fatalities** per year, and the reptile trade can involve some atypical hazards. However, this fact is not lost on those who work in the trade, many of whom have deep and profound cultural links to reptiles. Handling live reptiles demands a high level of courage and skill. The reptile trade is uniquely placed to confer a sense of pride, honour, and cultural heritage. In fact, despite the risks, the unique social dimensions of the reptile trade probably have **significant positive impacts** on societal wellbeing. For example, harvesting and preparing reptile meat is popular among many marginalised indigenous communities, giving them an opportunity to express their culinary prowess and ethnic identity.

Ongoing improvements in work, health and safety within the reptile trade are increasingly linked to innovation and **science-based welfare guidelines**. Serious injuries in these sectors are rare, although they are not unheard of. For example, between 1999 and 2017, there were nine deaths in the USA relating to crocodiles and alligators; this includes attacks on the general human population by wild crocodilians, not just people working in the commercial industry. Venomous reptiles represent the greatest risk. High quality antivenom is now available in many places in Southeast Asia, and most reptile traders are well versed in modern snakebite treatment protocols. Venomous reptiles comprise a tiny fraction (approx. 0.5%) of the specimens harvested for the exotic leather market; trade in these species is restricted mostly to their meat, pharmaceutical products, and other traditional needs.

7) Does farming or harvesting of reptiles increase risks of human disease?

In terms of **disease transmission**, working with reptiles is considerably less hazardous than working with mammals or birds. Reptiles have a very different physiology compared to endothermic (warm-blooded) animals (and humans), and therefore seldom carry or transmit the same infectious agents. Viruses such as bird and swine flu, MERS, SARS, Ebola and COVID-19 are linked to endothermic ('warm-blooded') animals. The most dangerous disease **threat posed by reptiles** is probably bacterial salmonellosis, a common and curable food-borne disease that is also found in most domestic and livestock species.

8) Should the luxury industry feel proud about their use of exotic leather?

Yes. The industry is delivering tangible benefits to **people, species and habitats**, and in some cases these are considered a gold standard in sustainable fibre that contributes to the UN Sustainable Development Goals. The biological and ecological **efficiencies of reptiles** in terms of net energy inputs versus usable outputs suggest reptiles may outperform many comparable fibres/textiles and proteins. In energy sustainability terms, it is a simple case of solar-powered livestock vs petrochemical-powered livestock production.



9) Why not substitute exotic leather with faux or fake leather?

Human-created fibres dominate the fashion industry, and today, the environmental impacts of different textiles are attracting intense scrutiny. A cradle-to-gate material impact assessment tool by the Sustainable Apparel Coalition (SAC) measures the environmental sustainability impacts of different materials. The [Higg Materials Sustainability Index \(MSI\)](#) assigns high/low impact scores after assessing how a material is produced, and how much water, energy, and chemicals are used in the process. Preliminary application to exotic leathers suggests a [score of 30 or less](#) for many species. This is far [superior to synthetic](#) or plant-based textiles including exotic leather alternatives. Fake leathers typically utilise heavily processed alternative fibres that are resource intensive and environmentally harmful. Natural design processes such as evolution through natural selection are impeccable; they incorporate millions of years of research and development, countless design iterations, and uncompromising quality control through billions of individual survival trials. Exotic leathers are an unparalleled combination of energy efficiency, durability, functionality, biodegradability, and aesthetic diversity.

10) Why do some animal rights groups insist fashion brands and retailers should stop using exotic leathers?

Animal rights groups may express their views and opinions, like anyone. [Although sometimes extreme](#), their position on the use of exotic leather is theirs to hold. Any initiatives that ensure animal health and welfare in an effort to reduce suffering are welcomed. The exotic leather industry works immensely hard to improve conditions for all animals, and all reasonable and appropriate action (including banning trade from certain suppliers) is taken when evidence suggests suboptimal conditions for animals. However, what is unacceptable is the level of misinformation, distorted facts, and lies perpetuated by many animal rights groups. We all deserve to know the truth if we are to make informed decisions.

11) How is the reptile trade controlled?

Tiers of local, national and international laws control the reptile trade. Legislation differs among species and countries. Several species are listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and protected by national laws. Reptile farms are licenced and audited at the national level. Commercial processing facilities and wild harvests are regulated through a series of permissions, including permits and annual quotas. Levels of governmental enforcement vary geographically and temporally, but a number of specialist independent groups exist to oversee the industry and provide objective support and advice. For example:

- [The International Union for Conservation of Nature \(IUCN\) Crocodile Specialist Group \(CSG\)](#)
- [The IUCN Boa and Python Specialist Group \(BPSG\)](#)
- [The South East Asian Reptile Conservation Alliance \(SARCA\)](#)
- [The IUCN Sustainable Use and Livelihoods Specialist Group \(SULi\)](#)
- [International Crocodilian Farmers Association \(ICFA\)](#)

12) What is CITES and how does it regulate the trade in exotic leathers?

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. With a CITES export permit, the exporting state declares that specimens were lawfully acquired (legality), and that trade is not detrimental to the survival of the species in the wild (sustainability). Species listed in Appendix I are typically threatened by trade, and can only be commercially traded under

**Frequently
asked
questions**
long answers

facts



exceptional circumstances (e.g., if they are captive-bred). Trade does not threaten species listed in Appendix II of CITES, but trade must be monitored and managed to ensure it does not become a threat in the future. Despite what many people believe, listing species in Appendix II of CITES is a good thing; it ensures proper oversight and management of wildlife species and acts as a form of certification that trade is legal and sustainable.

13) Are there certifications for exotic leather sourcing?

Yes. Numerous certifications now apply to the sourcing and trade in reptile leathers. There are certifications for labour rights, working conditions, environmental management and discharge of waste products (e.g., [SA8000](#); [ISO 14001](#); [ZDHC](#)). Certification of crocodile and alligator farms is available through the [International Crocodile Farmers Associations \(ICFA\)](#) or independent third-party audited fashion corporation [certifications](#).

Luxury brands implement their own internal standards, which draw on an increasing number of external standards:

- [World Organisation for Animal Health \(OIE\) Standards on Use of Reptiles](#)
- [Swiss Expert Panel on Humane Killing of Reptiles](#)
- [International Union for Conservation of Nature \(IUCN\) Boa and Python Species Group \(BPSG\) Guidelines for python processing facilities](#)
- [IUCN BPSG Guidelines for python captive breeding and rearing facilities](#)
- [Welfare Principles for snakes and monitors in the Southeast Asian skin trade](#)

Multi-stakeholder initiatives have also been developed – such as the [Southeast Asian Reptile Conservation Alliance \(SARCA\)](#) – aimed at developing additional standards and certifications in the quest to achieve optimal sustainability within the reptile leather trade. All exotic leather users are encouraged to contribute actively to such initiatives.

14) Is there a significant amount of illegal trade in exotic leathers?

No. There is no large-scale illegal trade, nor organised criminal activity pursuing exotic leathers. Today the reptile skin trade has strong safeguards in place to prevent illegal trade. The main corridors of reptile skin trade are legal and have increasingly become associated with strong safeguards to prevent the legal trade being undermined by illegal trade. This has not always been the case, and in the past illegal trade was an issue for some species. Over the last five years, enormous efforts have been made to remove the incentives that encouraged illegal trade. Improving regulation, incentivising local people, and making legal trade easier have now all but eliminated illegal trade. To understand fully why supporting and improving legal trade prevents illegal trade, it is important to consider the truth about illegal trade:

(a) Much of the negative rhetoric about illegal trade is based on out-dated evidence. In recent years, significant work has been undertaken to prevent illegal trade and tangible progress has been made.

(b) In many parts of the world, reptiles are [dangerous predators](#). Reticulated pythons, for example, killed and ate 5 people in Indonesia alone between 2017 and 2020. And there is no need to highlight the risks [crocodiles](#) and [venomous snakes](#) pose to people. So living alongside these dangerous predators comes at a cost to people, who attribute negative values to them rather than positive ones. There are longstanding incentives to remove these species from the landscape, rather than conserve them or manage them sustainably. Anyone who loses a family member to a reptile will feel the same way.

**Frequently
asked
questions**
long answers

facts



(c) In many places, the livelihoods of local people have incorporated harvesting and using reptiles for food for thousands of years, and for trade for hundreds of years. It is engrained in both culture and tradition. Well-meaning national legislation often gets imposed without consultation and **without understanding** their lives and socio-economic needs.

(d) Foreign governments, trying to appease animal rights groups, pressure countries to lower their harvest quotas, despite evidence that harvesting is sustainable. Exceptionally common or problematic species continue to be harvested at past levels, which sometimes exceeds imposed quotas (resulting in illegal trade by default). Adaptive and locally-relevant management, using the best available research to increase reptile harvest quotas, has proved a far more effective way to **address illegal trade** and actively **prevent poaching**.

(e) Working alongside local people in a respectful and transparent manner, understanding their needs, and helping them to trade legally and sustainably has resulted in significant reductions in illegal trade.

(f) The luxury industry ultimately provides the financial incentives needed for responsible management based on sustainable use. It has contributed significantly towards minimising illegal trade.

15) Is there significant illegal capture and exportation of wild reptiles through breeding farms?

From time to time, significant laundering of wild reptiles into farms, in contravention of national laws, has been detected and acted upon by CITES: Colombia (caiman) and Madagascar (Nile crocodiles) are two examples. Low level laundering is always possible, as it is with domestic stock when opportunity presents. However, the ease of **breeding many species in captivity**, and the risks associated with incorporating wild-caught animals into a breeding colony (e.g., disease transfer to the captive population, legal penalties, and dilution of selected genetics), all act to discourage local laundering.

16) Can exotic leathers be traced back to their source?

Yes. There are **traceability systems** in place for many exotic leather supply chains, including snakes, lizards, and crocodiles. All crocodile leather in trade is legally tagged as part of the Universal Tagging System under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It is not a legal requirement to tag all lizard and snake leathers. However, many companies selling exotic leathers offer traceability of their leather using a variety of methods such as tags, barcodes, RFID chips, and block chain technology.

17) What does ‘sustainability’ mean in the reptile trade?

To sustain anything is to “keep it going over time”. If a business relies on captive production of reptiles, poor quality can jeopardize reproductive output and the quality of livestock for sale. In the same way, excessive wild harvests can reduce the size and harvest productivity of wild populations. Poor management practices may also have indirect and inferred impacts, such as illegal hunting, natural resource depletion, and compromised rural livelihoods. Research-based management tools for both captive reptile production systems and regulated wild harvests work towards aligning offtake volumes with healthy productivity rates, thereby protecting the viability of the populations. Management systems are also cognisant of broader environmental and socio-economic impacts and opportunities. Managers strive to develop and enhance synergies between biodiversity, healthy and productive ecosystems, and human needs. This is the **essence of sustainability** in the reptile trade.



18) Is the reptile trade sustainable?

Yes. The vast majority of the exotic leather trade in terms of species, volume, source, and purpose is legal, well regulated and sustainable. Sophisticated management systems govern legal harvest and trade in both farmed and wild-harvested reptile products. There are no conservation threats facing any of the commercially traded species, farmed or wild harvested, including those listed in Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Production systems are environmentally friendly and provide a valuable and resilient livelihood to some of the most disadvantaged communities on the planet.

19) Are reptile farms sustainable?

Reptile farming is considered a 'green' start-up sector offering a diverse spectrum of innovative opportunities in **sustainable agriculture** and climate change resilience. For example, many **production systems** require very little land or freshwater resources compared to conventional factory farms, and biological waste outputs, including CO₂ emissions, are much lower compared to equivalent warm-blooded livestock systems. A number of reptile production models are well suited to agro-ecology, vertical agriculture, and negating the impacts of extreme weather events, and have considerable potential to synergise reptile diversity with a variety of future food systems. In this regard, reptiles are the solar-powered equivalent of warm-blooded livestock like chickens or sheep.

20) Are wild harvests of reptiles sustainable?

Most commercially traded reptiles are no longer harvested from pristine natural environments. This is because the exponential growth of tropical agroforestry, rice cultivation, and other forms of agriculture has had **surprisingly positive impacts** on many wild reptile populations. Indeed, some reptile species are now so common that they are regarded as the ecological equivalent of rodent **pests**. Like rats, these reptiles exist at higher densities in human modified landscapes than in natural habitat, and, not surprisingly, it is these species that make up the bulk of the **reptile trade**. Traded reptiles have a number of key ecological traits in common: (1) a cryptic combination of camouflage and clandestine behaviour enables them to persist undetected in close proximity to people, (2) versatile and adaptable feeding habits that are well suited to capitalising on agriculture-related resources, such as crop pests, (3) rapid growth rates and life history strategies enabling explosive population growth, and (4) a significant percentage of their natural predators fail to thrive in human-modified habitats. The harvest of these reptiles is often carried out fortuitously by rural communities, and in this respect reptiles function as a valuable agricultural co-product. The reptile trade provides substantial direct and indirect benefits to millions of people throughout the tropics, including many from indigenous and marginalised rural communities.

In much the same way, many crocodile farms rely on egg collections ("ranching") from pristine wetland ecosystems. With a 2-3 month egg incubation time, this life stage has a very high probability of perishing due to flooding, overheating or predators. Some programs release up to 10 percent of grown hatchlings back to the wild, which exceeds what would survive naturally. Money to landowners from the sale of these eggs is the incentive for protecting both adults and the pristine wetland ecosystems they live in.



21) How are reptiles killed, and is it humane?

Yes, reptiles used for exotic leathers are killed humanely. This involves rapid destruction of the brain, using a tool such as a captive bolt pistol (used for mammals in the livestock industry), as advocated by animal care and ethics committees, experts, veterinarians, and the World Organisation for Animal Health (OIE). Some past methods for despatching reptiles no longer meet today's criteria for humane killing, and they are progressively being phased out. They were not used out of any a desire to hurt animals, but rather because approaches to killing animals are often steeped in culture, tradition and religion. Those methods were used because of differing cultural views and a lack of scientific knowledge on acceptable forms of euthanasia. These issues have been addressed by extensive education and capacity development programs and are largely a legacy issue.

22) Does the reptile trade help local communities?

Yes. The reptile trade benefits millions of people in tropical Africa, Asia, and Latin America. Consuming reptile meat is a cultural norm for many people in tropical countries, much like chicken or beef in the temperate North. It provides food and income for marginalised and remote communities. It supports a robust and resilient industry in rural areas where few other commercial activities are viable. The complex network of supply chains provides thousands of jobs in parts of the world where they are needed most. The exotic leather trade gives impoverished communities access to foreign currency income and commodity markets. It supports unique cultural traditions and ethnic heritage, providing socio-economic stability in fragile societies struggling to keep pace with global change. It provides locally relevant commercial frameworks for rural development, and is comparatively immune to many of the global challenges threatening conventional food systems, including infectious disease outbreaks and climate change. To say the trade does not help local communities is inaccurate, naïve, and potentially offensive to millions of people who simply have a differing worldview relative to other societies.

For example:

- In Indonesia, it is estimated that more than 150,000 people are involved in the harvest and trade in reticulated pythons (one of many species in trade).
- Trade in leather from Yacare Caimans from Bolivia has supported healthcare and food for the Tacana People, and other indigenous South American tribes, for over thirty years. It helped support effective management and protection of forest and wildlife on ancestral lands.
- In Australia, indigenous Aboriginals gain income from royalty payments for saltwater crocodile eggs collected from their lands. The income improves people's lives and motivates initiatives to protect wetland through combating invasive plants, and pest animals like feral wild pigs that have devastated freshwater turtle populations in the swamps.
- In Malaysia and Vietnam, a sustainable trade in pythons provides livelihood resilience for poor people in times of economic and environmental volatility (e.g., crop losses due to extreme weather events or livestock losses due to endemic bird flu outbreaks). The reptile trade allows people to continue earning an income to finance basic human needs, such as food, clothing, medicine, and education.
- In Kenya, crocodile ranching by Tana River communities provides income, skills, and community services for local people. In the Tana River area, people now value and conserve crocodiles, where they were once poisoned and killed in retaliation due to human-wildlife conflict.



23) What would be the impact if we banned the exotic reptile trade?

A ban or reduction in the use of exotic reptile leathers will have **negative impacts** on both humans and **biodiversity conservation**. If the reptile trade for exotic leathers was banned, no fewer and possibly more reptiles will be killed. Landowners are tolerating dangerous predators like crocodiles only because they are an economic asset. Take that away and they become pests. Other reptiles will continue to be harvested at a local level, for their meat and pharmaceutical value, even if the skins have no value. It just means local people earn less from the resource. In May 2020, the **ban on snake farming** in China associated with the COVID-19 fallout resulted in the closure of 20 000 snake farms with a loss of 53 000 jobs. If extrapolated throughout the industry – all species, countries, and sectors – the numbers of people adversely affected would be enormous, mostly in the poorest regions of the world. From a biodiversity conservation viewpoint, the loss of the exotic leather trade would undermine well-established conservation programs and local incentives to preserve reptiles and their habitats. Pro-poor, climate smart, and environmentally friendly livelihoods would be forced to give way to less sustainable alternatives, including slash-and-burn agriculture, rural-to-urban migration, and the poaching of threatened wildlife (e.g., tigers and pangolins). Ethnic minorities would lose a valuable livelihood opportunity. Without the luxury industry, the ability to leverage science-based improvements in the reptile trade would be severely diminished.

24) What can be done to improve the reptile trade?

Promoting symbiotic relationships between people and the natural world is critical for our personal wellbeing and the health of our planet. Enhancing and improving the mutualistic relationships that exist between reptiles, their natural habitats, and the exotic leather industry contribute directly and significantly to this goal. It is a proven means of human-wildlife coexistence that helps to combat the destructive forces of resource depletion and environmental degradation. The IUCN, national governments and others have been spearheading programs to achieve these goals since 1948. They have helped develop sophisticated sustainability structures informed by cutting-edge science and technology. The industry is going through a phase of rapid growth and transformation, and reptile leather may well emerge as one of the most sustainable materials available. Nevertheless, there is always room for improvement, and efforts to improve traceability, transparency, stakeholder involvement, and animal welfare standards are ongoing. The role of the general public is vital; their support through the purchase of certified and responsibly sourced reptile leather products helps drive many of these development initiatives.

Many luxury fashion groups have committed to prioritising biodiversity as part of their sourcing strategies. More than sixty corporations in the fashion sector have signed-up to the Fashion Pact. The **Fashion Pact** sets **six key targets for Biodiversity**, including:

1. Regenerative approaches to agriculture that restore soil and grasslands and optimize biodiversity on farms.
2. Eliminate the sourcing from intensive feed-lot based farming and supporting production systems that optimize the animals' time on natural pasture aligned with the adoption of animal welfare standards across the industry.
3. Supporting material and process innovations that have no negative impact on key species and ecosystems.
4. Ensuring that we do not contribute to the loss or degradation of natural forests.

**Frequently
asked
questions**
long answers

facts



5. Supporting actions throughout our supply chains that restore natural ecosystems and protect key species.
6. 'Wildlife friendly' approaches to agriculture, mining, and forestry that promote the conservation of key species.

Responsibly sourcing exotic leathers meet all six biodiversity targets set forth under this agreement.

25) Is there any science supporting exotic leather trade and is it trustworthy?

Yes. There is a large body of science underpinning the trade in exotic leathers. This includes science on the sustainability of harvests, animal welfare and livelihood analyses. The science used to inform the reptile trade has been undertaken by independent scientific institutions (e.g., universities), international development organisations (e.g., CITES, United Nations), intergovernmental and non-governmental organisations (e.g., IUCN, TRAFFIC), national governments, and industry. Publication of research results must go through a rigorous process of peer-review to be accepted by the scientific community and can be challenged at any time. Overall, there are hundreds of scientific studies supporting the benefits of the exotic leather industry spanning at least half a century.

26) What is the best source of factual information?

Science is the world's most powerful problem-solving tool, and it has been the guiding principle behind the development of a sustainable reptile trade. Organisations rooted in science are the best sources of factual information. [The International Union for the Conservation of Nature \(IUCN\)](#) should be the first port of call for assistance. It is the oldest, largest, and most reputable source of factual information available, and will help you to connect with the most reputable sources of current knowledge. It is an unfortunate reality that scientists rarely band together and engage in public relations exercises. Against this, anti-trade and animal rights extremist organisations are focused on popular opinion and mass appeal, which influences political opinion, and regularly promote biased viewpoints and pseudoscience - using sensationalism and 'shock & horror' stories to attract attention. Fake news and ignorance about the reptile trade are rife in the mainstream and social media. The goal of anti-trade and animal rights extremists is to shut the industry down, with the end justifying the means. Think, verify and evaluate - and if necessary consult with experts - is at least one mechanism for trying to separate fact from fiction.

Frequently asked questions long answers

myths



Extremist animal rights organisations, opposed fundamentally to all uses of animals by people, depend financially on public subscription. They use standard strategies for advertising formally and through contrived media stories. They never acknowledge benefits of trade, and embellish negative associations whenever possible. The most common approach is to create or find an example of dubious treatment and imply that it characterises the industry as a whole. Such claims are fallacious and fabricated but nevertheless effective. They fall into the class of “myths”.

1) Is child labour used in the exotic leather trade?

No. There is no evidence that child labour is a feature of the exotic leather industry. That said, the reptile industry is fundamentally pro- poor and sympathetic to the realities of impoverished communities. In other words, most upstream businesses working with reptiles are small-scale and family-owned. Teenagers do sometimes help parents and other family members if required. However, this does not prevent them from going to school, and is no different from more affluent children helping their parents feed backyard chickens or collect eggs.

2) Are reptiles skinned alive?

(a) Part I – the basic facts

No. We are unaware of any reptiles used for exotic leathers being skinned alive, irrespective of species or country. Yet “skinning alive” is a common myth, deliberately fabricated. Reptile muscle requires very little oxygen and can continue to function for up to an hour or more after death. If **processed** soon after death, muscle contractions continue to occur. Even dressed carcasses (i.e., after the head, skin, tail, and visceral tissue have been removed) can move for a considerable period of time. It makes graphic and disturbing footage, but the animal is 100% dead and cannot register or ‘feel’ pain.

(b) Are reptiles skinned alive? Part II – the physiology

Since the rise of the mammals 65 million years ago, energy efficiency has been one of the principal evolutionary tools that has allowed reptiles to co-exist alongside modern ‘high-performance’ birds and mammals. Ectothermic (cold-blooded) reptiles have a **very different anatomy and physiology** compared to endothermic (warm-blooded) animals. In particular, they have a much lower metabolic rate and a much **higher tolerance to hypoxia** (lack of oxygen in the tissue).

Like endothermic species, reptilian cells are eukaryotic and therefore contain mitochondria to convert sugars and oxygen to CO₂, water, heat, and energy (ATP). However, reptiles have the ability to radically suppress their metabolic rate and therefore ‘slow down’ this biochemical reaction. They have **evolved to tolerate** variable oxygen availability. Basal metabolic rates can be 90% lower than those of endotherms, and reptile cells can function on similarly low oxygen inputs. This enables reptile cells to survive the progressively hypoxic, and eventually anoxic, conditions following death much longer than endothermic cells.

Reptile cells are also chemically adapted to surviving hypoxia. Reptiles obtain much of their ATP from **anaerobic respiration**, much like an Olympic sprinter. They can be 95% anaerobic during strenuous activity, and their ability to increase anaerobic metabolism can be five times greater than their ability to increase aerobic metabolism. This is possible because reptile respiration is regulated by oxygen partial pressure and temperature, rather than CO₂ and pH, and sophisticated buffering systems enable them to tolerate the ionic and pH fluctuations that result from a large build-up of lactate, a major by-product of anaerobic metabolism.

**Frequently
asked
questions**
long answers

myths



In conclusion, reptile muscle tissue can continue to function after death far longer than similar bird or mammal muscle tissue. Reflex actions originating in the spinal cord can continue to send electrochemical signals to motor neurons long after death, and their uniquely adapted muscle cells can continue to enable muscle tissue to contract and relax in a coordinated fashion for an hour or more. Furthermore, **decentralised reflexive mechanisms** designed to cope with complex serpentine locomotive adaptations may exaggerate the amplitude of post-death movements.

Commercial reptile skin processing facilities **employ brain destruction** as the primary method of killing (i.e., complete destruction of the entire brain case and tissue therein). Death is near instantaneous, absolute, and therefore humane; it is milliseconds in duration, causing virtually no pain or suffering. Carcasses are processed a short time after death in order to maintain food hygiene standards and maximise product quality. Meat, skins, and organs are necessarily processed well before oxygen deprivation has fully eliminated tissue function, and this is what triggers the common misconception that reptiles are 'skinned alive'.

3) Are snakes filled with water to kill them?

No. This is a deliberate fabrication. After being **humanely killed** some snakes (particularly pythons) are filled with water. As the digestive tract expands, the tissue connecting the skin to the muscle tissue separates, making it easier to remove the skin from the snake and prevent damaging the meat, which is kept and sold for food. During this process the skin is also stretched, which helps to widen and lengthen the skins and shorten drying times.

4) Are reptiles only killed for their leather?

No. The entire carcass of reptiles used for exotic leather is utilised. Reptile meat is **highly nutritious**. It is high in protein (> 40%) and low in saturated fats (< 2%) and therefore qualifies as a 'superfood', much prized by chefs and athletes alike. Reptile meat is considered a gastronomic delicacy in many Asian, African, and Latin American countries, and a **novelty food** in some western countries. For many people it is a **cultural norm like chicken or pork**. Reptile skin is also prized as a delicacy, with restaurateurs increasingly competing with the leather industry for quality product. Reptile venom, blood, bones, heart, gall bladder and fat have pharmaceutical values, increasingly being recognised in the western world, and sophisticated processing facilities and international markets are emerging to capitalise on these by-products.

5) Are crocodiles kept in restrictive and overcrowded pens?

No. Crocodile pens are not overcrowded. However, in some cases we do consider that pen sizes are too small - similar to factory pig and poultry farming. Nevertheless, the industry is governed by strict internationally recognised guidelines and **standards**. Welfare protocols for crocodiles are developed in accordance with the species' physiological, behavioural, and welfare requirements. Stocking densities are typically well-below maximum carrying capacity simply because the industry relies on the sale of blemish-free leathers that are only achievable under low-density living conditions.

It is important to bear in mind that reptiles are poorly insulated, and therefore often **congregate together** to buffer against thermal and humidity flux (i.e., variations in micro-climate). Both wild and **captive reptiles** often choose to cluster together for comfort and security, similar to huddling behaviour in mammals. These natural behaviours may give the impression that conditions are overcrowded, but they are not a cause for concern.

**Frequently
asked
questions**
long answers

myths



Crocodilians at some facilities in developing countries may be maintained in suboptimal conditions. However, these animals are primarily raised for their meat, because their skin quality is too low for the luxury industry. Such farms have been videoed by animal rights extremists and claimed to supply luxury brands; today, this is untrue.

6) Is it true that crocodilians are farmed in unclean water?

No. Captive-reared hatchling crocodilians are highly susceptible to water-borne infectious diseases, and **near-perfect water quality** is important for their successful captive production. Rigorous cleaning regimes are now standard in most modern crocodilian production facilities. Large crocodilians have **powerful natural immune systems** and can maintain perfect health in lower water quality – but because skin quality can be compromised, water quality is improved.

It is also important to remember that healthy swamps, in which crocodilians live naturally, are often smelly swamps. Strong earthy smells may not be appealing to people, but are a sign of nutrient cycling and biological activity – an excellent indicator of ecosystem health. Communal pens in some farms are “naturalistic”, with similar water recycling systems as seen in the aquaculture industry. Natural style pens resemble the situation in the wild, where crocodiles naturally congregate in high densities, in relatively small water bodies, for the duration of dry season.

7) Is it true that species are being driven to extinction by trade?

No. The majority of reptile species used for exotic leather are listed as ‘Least Concern’ on the **IUCN Red List**. The exceptions to this rule are several species of crocodilian. However, these species are produced in closed-cycle captive production systems with no risk to wild populations. The reptile trade is celebrated by the world’s leading authorities on biodiversity conservation as a conservation success (e.g., **CITES, IUCN, WWF, TRAFFIC**). Numerous examples exist where the **market-based conservation** of commercially valuable reptiles has contributed directly to the preservation of threatened species. The spinoffs of such programs have cascading benefits for a wide range of wildlife species, habitats, and ecosystem services. The conservation benefits of the reptile trade are therefore **far-reaching and indisputable**. Perhaps counter intuitively, reptile species used by the luxury industries are now often those that have the most secure futures.

8) Does trade in exotic leathers increase the risk of zoonotic diseases like COVID-19?

No. Reptiles are ectothermic (cold-blooded) and have a **very different physiology** compared to humans (and other mammals). Zoonotic disease transmission between two species typically relies on mutually compatible ‘biological environments’ (e.g., warm-blooded animal to warm-blooded human). Reptiles have never been linked to any of the **World Health Organisation’s Top 10 Blueprint Diseases** (those most likely to cause a global pandemic). In the context of global food systems, reptiles represent a biological barrier – a valuable tool for minimising the impact of disease outbreaks in the agri-food sector. According to a European Union review of the **health risks** associated with reptiles in human food chains, the most significant threat they pose is *Salmonella* – a bacterial foodborne disease commonly found in most animals, including domestic pets. Most cases of salmonellosis are not life-threatening and resolve on their own without complications.

References and suggested further reading



Wildlife conservation

<https://www.peoplenotpoaching.org/project-conservation-and-sustainable-use-yellow-anaconda>

<https://www.peoplenotpoaching.org/crocodilian-management-lake-cunia-reserve>

<https://www.peoplenotpoaching.org/sustainable-wildlife-management-guyana>

<https://www.traffic.org/site/assets/files/9653/captive-crocodilian-production.pdf>

Management and trade

<https://www.businessoffashion.com/articles/opinion/op-ed-why-channels-exotic-skins-ban-is-wrong>

https://www.iucn.org/sites/dev/files/content/documents/2016/natusch_et_al_2016_sustainable_management_of_the_trade_in_reticulated_python_skins.pdf

<https://www.internationalcrocodilian.com/standard-development/>

<https://theconversation.com/coronavirus-why-a-blanket-ban-on-wildlife-trade-would-not-be-the-right-response-135746>

https://06d94708-52b2-4bed-a906-c09a2d1f971e.filesusr.com/ugd/67e045_1330cbd3fc1e42e5897442a87210b7e3.pdf

https://06d94708-52b2-4bed-a906-c09a2d1f971e.filesusr.com/ugd/67e045_ac4c8fa96ecb4de9a0e67d19d9354e1a.pdf

https://06d94708-52b2-4bed-a906-c09a2d1f971e.filesusr.com/ugd/67e045_b189910dcf5b4c42a771a8383092df1c.pdf

Sustainability

https://www.researchgate.net/publication/304709045_Asian_snake_farms_conservation_curse_or_sustainable_enterprise

<https://theconversation.com/banning-exotic-leather-in-fashion-hurts-snakes-and-crocodiles-in-the-long-run-114173>

<https://msi.higg.org/compare/193-13148>

https://www.researchgate.net/publication/277675169_Sustainable_Treatment_of_Aquaculture_Effluents-What_Can_We_Learn_from_the_Past_for_the_Future

<https://www.cambridge.org/core/journals/oryx/article/sustainable-use-and-incentivedriven-conservation-realigning-human-and-conservation-interests/5C8B0923D18E8FFBB39FA7DFA70F0B72>

<https://sustainabledevelopment.un.org/sdg15>

<https://www.journals.uchicago.edu/doi/abs/10.1086/283547>

Biology of reptiles including humane slaughter and biological risks

<https://www.jstor.org/stable/2460833?seq=1>

<https://www.wired.com/2005/08/antibiotics-from-crocodile-blood/>
<https://pubmed.ncbi.nlm.nih.gov/17037980/>

<https://www.avma.org/sites/default/files/2020-01/2020-Euthanasia-Final-1-17-20.pdf>

References and suggested further reading



https://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_reptiles.pdf

<https://theconversation.com/finally-snakebite-is-getting-more-attention-as-a-tropical-health-issue-131016>

<https://theconversation.com/snakes-make-good-food-banning-farms-wont-help-the-fight-against-coronavirus-133075>

<http://origin.who.int/blueprint/priority-diseases/en/>
<https://pubmed.ncbi.nlm.nih.gov/32215573/>

<https://pdfs.semanticscholar.org/618d/71714415ec9a367acf2b8b0807d2cb39c3e6.pdf>

<https://www.sciencedirect.com/science/article/abs/pii/S0168160509003341>

<https://www.efsa.europa.eu/en/press/news/071121>

<https://www.sciencedirect.com/science/article/pii/S0960982213001954>

https://www.researchgate.net/publication/277783858_Group_living_in_squamate_reptiles_a_review_of_evidence_for_stable_aggregations

<https://www.doc-developpement-durable.org/file/Elevages/Crocodiles/Diseases%20of%20farmed%20crocodiles%20and%20ostriches.pdf>

Human dimensions

https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/CITES_livelihoods_Fact_Sheet_2019_Australia_Crocodiles.pdf

https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/CITES_livelihoods_Fact_Sheet_2019_Kenay_Nile_Croc.pdf

http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/Trade%20in%20Python%20Skins_Viet%20Nam_Low-res.pdf

http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/Trade_Impact_Python_Skin_Trade_Malaysia_Low-res.pdf

<http://www.cifor.org/knowledge/publication/2331/>

<https://m.chinanews.com/wap/detail/zw/cj/2020/05-12/9182261.shtml>

<https://ipbes.net/policy-support/case-studies/incorporation-indigenous-local-knowledge-management-conservation-caiman>

<https://link.springer.com/article/10.1007/BF00055975>

<https://bioone.org/journals/african-journal-of-wildlife-research/volume-39/issue-1/056.039.0107/The-Impact-of-Nile-Crocodiles-on-Rural-Livelihoods-in-Northeastern/10.3957/056.039.0107.short>

References and suggested further reading



Reptiles as a source of food and pharmaceuticals

<https://link.springer.com/article/10.1007/BF00055974>

<https://uk.askmen.com/sports/foodcourt/why-crocodile-is-a-superfood.html>

<https://www.livescience.com/ancient-humans-ate-snakes.html>

<https://www.exoticmeatmarkets.com/>

<https://www.wired.com/2005/08/antibiotics-from-crocodile-blood/>

Useful sources of information

<http://www.iucncsg.org/>

<https://www.iucn.org/commissions/ssc-groups/amphibians-reptiles/boa-and-python>

<https://www.iucnredlist.org/>

<https://www.iucn.org/commissions/commission-environmental-economic-and-social-policy/our-work/sustainable-use-and-livelihoods>

<https://www.internationalcrocodilian.com/>

<https://www.bsr.org/en/collaboration/groups/southeast-asian-reptile-conservation-alliance-sarca>

https://www.panda.org/knowledge_hub/sustainable_development_goals/

<https://www.traffic.org/about-us/legal-wildlife-trade/>

<https://www.cites.org/>

<https://www.iucn.org/>

<https://www.epicbiodiversity.com/guidance-and-standards>

In the news

<https://www.standard.co.uk/news/world/peta-calls-on-dictionarycom-to-change-definition-of-animal-because-its-speciesist-a4267986.html>

<https://www.sciencealert.com/giant-pythons-keep-attacking-people-in-indonesia-and-humans-are-probably-to-blame>

Reptile leather
products & trade
facts and myths