



The hidden cruelty behind
the global wildlife trade



About World Animal Protection

We are World Animal Protection. We're here to end animal cruelty and suffering. Forever. Putting animals first isn't just better for them, it's vital for our shared planet. It will take the combined power of people, companies, and governments to tackle the broken systems that cause animal suffering. Together, we can transform the lives of farmed and wild animals around the world.

World Animal Protection, Registered Charity 1081849, 3rd Floor, 86 - 90 Paul Street, London EC2A 4NE.

Contents

The hidden cruelty behind the global wildlife trade

Executive summary	04
1. Introduction	05
The scale of the trade	05
Measuring animal welfare	06
A new approach	06
2. Case studies: stories from the wildlife trade	07
The pet trade	08
Traditional medicine	12
Food	17
The fashion industry	20
Entertainment and tourism	23
3. Conclusion	30
4. Recommendations	31
5. References	32

Cover photo: Dead pangolins being displayed at a Bushmeat market in Kumasi, Ghana. Credit: World Animal Protection / One Touch Connections

Photo: Grey parrots caged for the pet trade. Although commercial trade of wild-caught grey parrots was banned in 2017, illegal trafficking continues, causing serious impacts on their welfare. Credit: World Animal Protection



Executive summary

The global commercial wildlife trade – both legal and illegal – is a huge and growing industry, inflicting severe and widespread suffering on billions of wild animals each year. Among the scientific community, there is increasing recognition of animal sentience across diverse species. Sentience is the capacity to experience positive and negative feelings, such as joy, pain or fear. Supporting this view, the Declaration of Consciousness¹, updated in 2024 in New York, has extended recognition of possible conscious experience from mammals and birds to all vertebrates and many invertebrates (from octopuses, to lobsters and insects).

Despite this, welfare concerns are often overlooked in trade practices. Research reveals consistent harm across all stages of both the legal and illegal wildlife trade – from wild capture or captive breeding, to transportation, holding, captivity and slaughter. This report examines the wide-ranging welfare impacts on 13 animal groups traded for pets, food, fashion, traditional medicine and entertainment.

While these case studies represent just a snapshot of the current situation, they exemplify the typical welfare challenges and potential negative outcomes that are present throughout the trade. Conditions that fail to protect the welfare of animals can be endured for minutes, days, or even lifetimes, including poor nutrition, hostile environments, poor health, and behavioural restrictions. These can result in acute and chronic pain, distress, fear, exhaustion and sickness, affecting millions of individual animals.

For example, in the pet trade, ball pythons, zebrafish and African grey parrots can endure distress and injury during breeding, capture and transportation. In traditional medicine, sharks and pangolins often suffer from slow and painful deaths, while Asian bears can endure considerable pain during bile collection. Many of these species are traded for multiple purposes in addition to medicine – for example, shark fins for soup, and pangolins for their meat – highlighting the overlapping pressures they face. Crickets and frogs farmed or wild-caught for food are kept in crowded conditions, which can spread disease, and are often subjected to inhumane slaughter methods, causing unnecessary suffering. In the fashion industry, crocodilians farmed for their skins can experience distress due to restricted movement and may experience excruciating pain during slaughter, while mink typically spend years in barren cages subjected to cruel treatment. For lions, elephants and dolphins used in entertainment and tourism, captivity deprives them of the close family bonds and social structures they depend on for their welfare.

This research shows that the recognition of animals as sentient beings is not reflected in how animals are treated in trade. In the short term, welfare-focused reforms can reduce suffering. However, in the long term, we need a systemic shift away from

the consumptive use of wild animals towards wildlife-friendly approaches that recognise animals as sentient beings with intrinsic value.

Stronger policies with effective enforcement, responsible business practices, and a change in consumer choices are urgently needed, to end the large-scale global exploitation of wild animals and to protect their welfare. The identification and uptake of wildlife-friendly alternatives will be crucial. For example, in wildlife tourism, responsible alternatives prioritise animal welfare by avoiding direct contact or performances. While in traditional medicine, there are already more than 50 herbal and synthetic alternatives to bear bile.

These changes will directly benefit the animals impacted by the trade, while also delivering broader positive impacts beyond animal welfare. Wildlife trade is a key driver of the biodiversity crisis – fuelling population declines and extinctions. It also poses significant risks to human health by facilitating the emergence and spread of zoonotic diseases. Therefore, implementing these changes will also enhance biodiversity and conservation, support public health, and stabilise the economies of local communities – all of which are currently harmed by the global commercial wildlife trade.

As an initial immediate step, formally recognising animal sentience in international policy fora, agreements, and legal instruments that influence wildlife trade – such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD) – could help strengthen trade regulations, inform assessments of welfare risks, and set a precedent for stronger legal protections. Recognising sentience means acknowledging that wild animals have their own experiences, needs and interest, and that we have both a moral and legal obligation to consider these in our interactions with them. While recognition is not a solution on its own, it provides a crucial foundation for policies and practices that can reduce suffering and better protect wildlife.



Photo: European mink grown on a fur farm in Lithuania. Unrestricted feeding during the growth season can lead to diarrhoea and injuries, while breeding females may be later subjected to 2-3 months of restricted feeding before mating. Credit: Algimantas Barzdzius / Shutterstock



Photo: Piles of shark fins. Despite international regulations under CITES, tens to hundreds of millions of sharks and rays continue to be killed each year to supply domestic and illegal markets. Credit: Paul Hilton / Earth Tree Images / HIDDEN / We Animals

1. Introduction

The global commercial wildlife trade is vast and growing, resulting in the physical and mental suffering of billions of animals. Despite increasing awareness of animal sentience across different taxonomic groups – from invertebrates like cephalopods (octopus, cuttlefish and squid) and decapod crustaceans (crab, shrimp and lobster), to all vertebrates, including mammals, birds, reptiles, amphibians and fish – there has been little research into the negative impacts of trade on animal welfare.

This report begins to address this gap in research by outlining the findings from two recent World Animal Protection commissioned research publications, which explore the negative experiences of individual animals in the commercial wildlife trade. These reports evaluate the welfare impacts of 13 animal species and groups traded globally for different purposes; ball pythons, zebrafish and African grey parrots (pet trade), sharks, pangolins and Asian bears (traditional medicine), crickets and frogs (food), crocodilians and mink (fashion), lions, elephants and dolphins (tourism).

The case studies were chosen to provide a broad overview of the welfare issues and experiences of animals traded for different purposes, and across different geographic regions. They were also selected based on the authors' expertise.

The scale of the trade

Wild animals are traded across multiple industries, including for the pet trade, food, fashion, traditional medicine, entertainment and tourism. The global commercial trade is a far-reaching and profit-driven enterprise, exploiting billions of wild animals every year for financial gain.

Monitoring deficits and the lack of databases for or non-CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)-listed species means that the exact numbers of animals traded worldwide is unknown. But recent estimates suggest there are more than 7,600 terrestrial vertebrate species and several thousand terrestrial invertebrate species legally traded^{2 3}. Between 2005 and 2014, nearly 54 million CITES listed individual wild vertebrates and 36.5 million invertebrates were reportedly exported worldwide^{4 5}. The actual number will be much higher as many more non-CITES-listed species are also traded in high numbers. For example, around 75% of 2,000 traded reptile species are not CITES-listed⁶.

This research comes as the commercial wildlife trade continues to grow, driven by the rising global demand for wild animals in many categories of their use. This is further enabled by the increasing influence of social media and online platforms that facilitate wildlife sales^{7 8}.

A new approach is needed

Mounting scientific evidence shows that animals are sentient – they can feel pain, pleasure, fear, and comfort. These experiences form the basis of an animal’s welfare state and therefore must be considered in any activity that affects them.

At present, international agreements governing wildlife trade focus primarily on population numbers and extinction risk, overlooking the lived experiences of individual animals caught up in trade. Yet welfare impacts occur along the trade chain, from wild capture or captive breeding, to transportation, holding, captivity and slaughter.

A fundamentally new approach is therefore required – one that moves beyond a narrow focus on species numbers and population-level impacts – to consider the lived experiences of individual animals.

Recognising that animals can feel both joy and suffering means acknowledging that their experiences matter. Whether it is the intense pain endured by bears during bile extraction, the crushing confinement of crocodiles farmed for fashion, or the profound grief experienced by elephants isolated from their herds, such suffering is never morally neutral – it is harm that demands moral justification.

Once we acknowledge that animals involved in the wildlife trade are sentient, the standard of what is acceptable changes and this can drive important improvements in animal welfare policy and practice. Animals can no longer be treated as commodities but as living beings whose welfare must be protected.

Recognising sentience has real-world implications: it allows regulators to assess not only the risk of extinction, but also the risk of suffering; it requires businesses to consider welfare across supply chains; and it helps the public see wildlife not as resources, but as individual beings capable of suffering. Research shows that when people understand that animals can suffer, their support for stronger protections rises sharply – a reminder that awareness is a critical first step toward meaningful policy change^{9 10 11}.

Assessing animal welfare impact

The commercial wildlife trade profoundly affects animals in different ways, with the extent and duration of suffering varying widely depending on several factors. For example, their biology, the trade purpose, the legal or regulatory status of their trade, and how long they are kept or remain alive¹². Largely unprotected by animal welfare legislation, billions of animals endure poor welfare, including extreme hunger and thirst, chronic stress, pain or fear.

To assess the welfare impacts in each case study, researchers reviewed the trade process from initial capture or breeding to eventual use or consumption, considering each stage from the animal’s perspective. This approach allowed identification of key welfare concerns at different points in the trade chain.

For each of the 13 case studies presented in this report, researchers assessed:

1. The welfare compromise experienced by the animals,
2. The duration of each phase of the trade, and
3. The estimated number of animals traded.

Researchers used the Five Domains Model¹³ to assess animal welfare impacts. The Five Domains Model of animal welfare assesses the animals’ mental experience (Domain 5) in accordance with their internal states and external influences across four physical domains (Nutrition, Environment, Health, and Behaviour). The Five Domains Model recognises that the emotional experience of an animal is the meaningful assessment of welfare, the severity of which is influenced by the physical conditions to which an animal is subjected.



Photo: A dolphin at a venue in Australia. Captive dolphins spend their lives in tiny concrete tanks, drastically limiting their ability to swim or dive compared with the wild.
Credit: World Animal Protection / Carol Slater

2. Case studies: stories from the wildlife trade

[Warning: these case studies contain graphic descriptions of animal suffering that some readers may find upsetting]

Welfare issues are widespread throughout every stage of the wildlife trade, from wild capture or captive breeding, to transportation, holding, captivity, harvesting and slaughter. Despite differences in species and use, our case studies show that animals experience harms that span all Five Domains.



Photo: Python hunters in Ghana, West Africa. Captured snakes are often packed in sacks and kept in overcrowded, hot, and unhygienic facilities with no veterinary care. Exported snakes may be transported in crowded bags for hours to weeks, with mortality rates up to 33%. Credit: World Animal Protection / Aaron Gekoski

The pet trade

Ball pythons captured and ranched for the pet trade



Ball pythons (*Python regius*) are one of the most highly traded reptiles in the world – around 100,000 live ball pythons are legally exported from West Africa every year for the pet trade^{14 15}. Over 90% of exported pythons are declared as “ranched” – where eggs, juveniles or pregnant females are collected from the wild to be reared in captivity and a portion of these released back into the wild – the remaining are captive-bred or wild-caught.

In the wild, ball pythons live in burrows, are primarily nocturnal and spend much of their time thermoregulating (maintaining a stable temperature), hunting small mammals, avoiding predators, and moving widely within their home ranges (from 20m to more than 1km²)^{16 17} to find mates and suitable shelter¹⁸. Recent research on younger animals also reveals they can be highly social, spending time in large groups¹⁹. Typical pet or trade environments cannot meet these natural behaviours, particularly their need to move widely and cluster in large groups.

For those taken from the wild, hunters typically dig pythons out of their burrows, which is likely stressful for the snakes and can cause physical injuries and mortality^{17 20}. Captured individuals are often restrained live in sacks with other snakes²¹, before being transferred to holding facilities, which are typically unhygienic, crowded and hot, and lack veterinary care and disease protocols²¹.

When ranched, some hatched juveniles and females who have laid eggs, are released back into the wild²². However, little attention is paid to where they originated from or whether the release site has a suitable habitat, leading to mortality and genetic pollution (the uncontrolled flow of genes into a wild population)^{16 21 23}.

The snakes for export are typically transported in bags in close confinement with other snakes or other animals on journeys lasting from hours to weeks²³. International transport is associated with hot, crowded conditions and high mortality rates – as high as 33% for reptiles in general²⁴. Ball pythons kept as pets – often in barren and inappropriate environments – may be subject to human interactions that negatively impact their welfare²⁵, with many people mistaking signs of stress and poor welfare as ‘normal’^{126 27 28}.



Photo: Zebrafish swimming in a crowded tank. The scale of the pet trade is unknown, but they are typically bred in crowded, barren tanks with no enrichment. Growing up without environmental complexity has been shown to impair cognitive development, with larvae exhibiting reduced learning. Credit: WUMANG / Shutterstock

The pet trade

Zebrafish captive-bred for the pet trade



Although the scale of the trade in pet zebrafish (*Danio rerio*) is unknown, more than five million are thought to be bred for research each year²⁹. They are typically bred in crowded, barren tanks with no enrichment, resulting in signs of boredom and stereotypical behaviours^{30 31}. Zebrafish can also suffer from increased stress, morbidity and mortality, and decreased social behaviours (eg. shoaling and following)– when exposed to poor water quality and water changes^{32 33}. Animals kept as pets may be repeatedly exposed to conditions resulting in negative welfare outcomes for days, months, or even years.

Transportation, for example from nursery and breeding sites to traders and consumers, exposes animals to many potentially stressful experiences like handling, unloading, confinement,

regrouping and unpredictable events, sounds, temperatures and movements^{34 35}. Zebrafish are typically transported in plastic bags with no filtration, sometimes for extended periods, which can cause prolonged increases in stress that may lead to increased rates of sickness and death³⁶.

In the wild, zebrafish live in shallow, slow-moving streams and flooded rice fields in South Asia³⁶, where they form stable social shoals³⁷ and spawn during monsoon season. Lacking this environmental complexity impairs cognitive development, with larvae reared in barren tanks showing reduced learning and lower activity³⁸.

Zebrafish in captivity are subject to a range of diseases, many of which cause pain and suffering^{39 40}. While precise mortality rates in trade are unknown, high mortality rates may be due to a keeper's lack of awareness and failure to seek veterinary care^{38 41}.



Photo: A pet African grey parrot in Scotland, United Kingdom. Mortality during the illegal trade is high - studies report 9-14% die between capture and transport. In captivity, many grey parrots engage in feather-plucking, a behavioural response linked to chronic stress. Credit: World Animal Protection / Jeremy Sutton-Hibbert

The pet trade

African grey parrots captured for the pet trade



African grey parrots (*Psittacus erithacus*) are traded for food, medicine and – most predominantly – the international pet trade⁴²⁴³. They are the most traded of all CITES-listed birds, with more than 1.3 million wild-caught grey parrots exported from 18 range states from 1975 to 2016⁴⁴⁴⁵. Despite being listed in Appendix I of CITES in 2017, which prevents wild-caught grey parrots from being traded commercially, illegal trafficking continues, resulting in considerable welfare implications⁴⁶.

In the wild, African grey parrots live in dense tropical forests and forest edges, where they routinely fly 10-20km each day between roosting and feeding sites to forage⁴⁶. They form lifelong monogamous pair bonds⁴⁷, and participate in large, highly communicative flocks with complex vocal learning⁴⁸.

Methods of trapping wild parrots range from taking chicks from nests in tree cavities to mass trapping using nets – where birds are chased into fishing nets – or glue traps, which trap birds' wings as they land to roost or feed⁴⁹. These trapping methods cause

extensive distress and suffering to the birds as a result of compromises to their physical health and nutrition, confined and injurious environments, and behavioural restrictions.

Mortality rates caused by trapping are difficult to quantify due to the different methods used, however estimates can range from 30-66%⁵⁰⁵¹⁵²⁵³. Additional deaths can occur immediately after trapping, with one study reporting 9-14% mortality among parrots transported between the forest to the trappers' homes⁴⁶. These deaths are often down to hunters taking chicks who are too young to survive on their own. However, the physical trauma of the capture, overcrowding, physiological stress, lack of food, water, and veterinary care also play a role⁴⁶.

Social media listings of African grey parrots also suggest basic animal welfare standards are frequently breached during transportation and in holding facilities, where they may be kept in overly crowded conditions with no perches and infrequent or no food and/or water⁴⁸.

Photo: A lure parrot kept by poachers. In the Democratic Republic of Congo, poachers may trap parrots using a gum made from tree sap. A 'lure' parrot is placed in a tree to attract wild flocks, which then get their feathers stuck by the gum and are unable to fly. Credit: World Animal Protection





Photo: In Indonesia, a Bull shark has had its fins removed for the shark fin trade. Sharks are caught and finned while alive, often hauled on board using poles and hooks. Many are thrown back into the sea, unable to swim, and die slowly from bleeding, asphyxiation, or becoming prey for other fish. Credit: Ethan Daniels / Shutterstock

Traditional medicine

Sharks wild-caught for the shark fin trade



In the wild, many shark species are wide-ranging apex predators that travel hundreds of kilometres across ocean habitats¹, playing a key role in maintaining healthy marine ecosystems by keeping prey populations under control⁵⁵.

International trade of almost all shark species traded for their fins has been regulated under CITES since 2019⁴⁴. However, conservative estimates suggest that due to domestic and illegal trade, around 63 to 273 million sharks and rays are killed each year⁵⁶.

Most sharks are caught using longlines⁵⁷ (a line of baited hooks), which can cause stress and tissue damage^{58 59}. For example,

juvenile tiger sharks, released after being caught on a longline, exhibited changes in behaviour indicative of stress and avoided returning to the site of capture⁶⁰. Once captured, sharks are hauled on board – sometimes by stabbing with a long pole or hook – to have their fins cut off without pain relief^{61 62}. During this process, which can last minutes, sharks are typically conscious and can experience considerable pain and distress^{63 61 64 65}.

De-finned sharks may then be thrown back into the sea alive, unable to swim because their fins have been removed, which leads to a slow and painful death through bleeding, asphyxiation, or becoming prey to other fish^{64 65 66}. Sharks must swim continuously to ventilate their gills and maintain buoyancy, so de-finning directly prevents these essential physiological functions, making survival impossible⁶⁷.



Photo: A bowl of pangolin scales - trafficked largely for traditional medicine in countries like China and Vietnam. These scales are deeply valued, despite consisting of keratin and having no scientifically proven medicinal effects. Credit: World Animal Protection

Traditional medicine

Pangolins trapped and killed for traditional medicine



Pangolins are often cited as the most heavily trafficked CITES-regulated mammal^{68 69 70 71}. Their scales are used in traditional medicine and have a high financial value⁷², while pangolin meat is considered a delicacy in some countries^{73 74}, and is believed by some to have healing properties^{75 76}. In 2019, around 195,000 pangolins were known to be trafficked, although as this is based on a portion of the illegal trade that is intercepted, it is likely an underestimate⁷⁵.

In the wild, pangolins are solitary, nocturnal foragers. They stretch out to dig and feed, and curl into a tight ball when threatened. Pangolins sleep in burrows, or hollow trees, and may travel several kilometres each night while foraging for ants and termites⁷⁷.

Capture methods for the trade include opportunistic hunting, tracking with dogs, digging, felling or burning trees, smoking out dens and setting traps. Escaping pangolins may be caught by

hand or spear^{78 79 80 81}. Individuals may sometimes be hunted for days and may experience distress, fear and pain throughout⁸².

Once caught, the pangolins are usually tightly tied in individual netting sacks before being killed or traded alive⁷⁹. There are also reports of pangolins being force-fed with cement and plaster to increase their body weight, and therefore their value⁷⁶. They are typically killed by blunt force or a cut on the head and boiled for scale removal. However, as these methods are unreliable, some animals may be alive when put in boiling water, causing excruciating pain⁷⁶.

For pangolins traded alive, transportation methods can cause prolonged suffering. Confiscated pangolins are often found tied tightly in their defensive balled position in net sacks, stacked upon each other. This denies them access to water and food, as well as the chance to move or even uncurl. Proximity to other animals can cause stress, and potentially pain if the animals are crushed or suffocated, while poor hygiene can cause infectious diseases and parasites. Those injured during hunting often get infections, resulting in the loss of limbs or fatal blood poisoning⁸³.

Photo: Hunters in India removing the scales of a pangolin. Pangolins are typically killed by blunt trauma or cutting to the head. Their scales are then removed by boiling, with some individuals reported to still be alive when boiling begins, causing extreme suffering. Credit: World Animal Protection





Photo: Asian black bear at a bile farm in Vietnam. Bile is extracted by inserting a tube into the abdomen and gallbladder, sometimes multiple times a day. The restraints and repeated procedures cause severe physical and psychological suffering, and the resulting wounds are highly prone to infection. Credit: World Animal Protection

Traditional medicine

Asian bears farmed for their bile



There are currently an estimated 17,000 Asiatic black bears (*Ursus thibetanus*), Malayan sun bears (*Helarctos malayanus*) and Eurasian brown bears (*Ursus arctos*) farmed for their bile across Southeast Asia and China^{84 85}. Bear farms are associated with numerous welfare concerns, including malnourishment, unhygienic conditions, stress-induced behaviours, infected wounds and inhumane treatment^{86 87 88 89}.

In the wild, these bear species are often solitary animals that spend much of their time roaming large home ranges (up to several hundred square kilometres) to forage for seasonally changing fruit, nuts, insects and small mammals^{90 91}. They climb trees, dig for roots and invertebrates, build dens for resting and hibernation (Eurasian brown bears), exchange in complex social interactions during mating, and form strong mother-cub bonds that last for years⁹².

Bears in captivity typically spend five to ten years – and sometimes up to 20 years – on farms in cages sometimes as small as 5m² that severely restrict their behaviour^{89 90}. To collect bile, tubes are surgically placed into the bear's abdomen and gallbladder, from which bile is syringed out up to six times a day⁹¹. Both the fitting of equipment and the collection can cause the bears pain, and the open wounds are susceptible to infection^{86 92 91}.

Farmed bears are typically kept dehydrated to aid bile collection^{92 90}, and may be starved for two to three days before⁹³. Farm workers often mutilate the bears – by breaking teeth or pulling out claws – to reduce the risk of injury to themselves⁹⁰. Poor husbandry practices on farms also means diseases and deaths are common^{88 94}.

Once bears are no longer productive, they can be left to starve or are killed for their paws or gallbladders⁹⁰. Rescued bears often have chronic health issues and injuries, such as abscesses, missing limbs and septicaemia^{95 88}, and show signs of severe mental compromise, including chronic repetitive and self-injurious behaviours⁹⁶.



Photo: Asian black bear in a cage in Vietnam. On bile farms, bears may spend 5-20 years confined in cages as small as 5m², causing chronic stress, muscle wasting, and severe behavioural frustration. Credit: World Animal Protection / One Touch Connections



Photo: Crickets at a farm in Indonesia. They are sold to several Javanese regions as animal feed or fried as snacks, a trend that has grown in popularity among tourists. Limited knowledge of humane slaughter is a concern, as methods used – such as boiling alive – are known to cause suffering in other invertebrates. Credit: Resha Juhari / We Animals

Food

Crickets killed for food and feed



Globally, insect farms are growing in size and number, driven by the demand for a range of commercial products, including cereal bars, flour, snacks and livestock feed⁹⁷. In 2020, 370 – 430 billion crickets (*Gryllidae*) were estimated to be sold or killed every year for the trade⁹⁸.

Despite the numbers, there is little understanding of the welfare implications of this trade on the animals involved^{99 100 101}. In the wild, field and house crickets are omnivorous foragers that explore varied environments, communicate acoustically¹⁰², establish hierarchies¹⁰³ and use temperature, light and humidity to regulate their development¹⁰⁴ and behaviour^{101 105}.

Growing research suggests crickets may also be sentient beings, capable of feeling pain and stress, as well as exhibiting cognitive abilities such as decision-making, learning, recognition and long-term memory^{106 107}.

Mistakes made while developing large-scale cricket farms have resulted in millions of cricket deaths^{108 109}. For example, crickets reared on waste suffer high premature mortality rates¹⁰⁹, where overcrowding helps to spread disease, compromises the environment and restricts their behaviour¹¹⁰. The lack of veterinary knowledge of insects impacts both their ability to survive, and their welfare¹¹¹.

The lack of knowledge regarding best practices for slaughter is also concerning¹¹², especially as some of the methods used, including boiling alive, are known to cause pain and suffering in other invertebrates, such as crustaceans¹¹³.



Photo: Frogs at a farm in Indonesia. Many are sent to local Chinese restaurants. During processing, frogs' legs may be removed while they are still conscious, either by cutting or by manual dismemberment. Credit: Chaikom / Shutterstock

Food

Frogs wild-caught for the frogs' leg meat trade



The commercial trade in frogs' legs is estimated to involve 81-200 million frogs (Anura) annually¹¹⁴. While most frogs are wild-caught¹¹⁵, large-scale commercial farming for the trade is also increasing^{116 117}. Frogs' legs are consumed globally, but demand is greatest in Western Europe¹¹⁷. The EU alone imported 40,700 tonnes of mainly wild but also farmed frogs' legs between 2011 and 2020¹¹⁸.

In the wild, most commonly traded species (eg. *Fejervarya*, *Hoplobatrachus*, *Lithobates*) are highly active, nocturnal predators that depend on clean, fresh water to forage, thermoregulate and maintain skin moisture¹¹⁸. They rely on jumping and swimming to escape when threatened, and require

vegetation or burrows for shelter and rest. Many species also engage in complex acoustic communication¹¹⁹ and seasonal breeding driven by rainfall and temperature.

Wild-caught frogs are typically processed within hours or days of capture, although live transport also occurs^{115 120}. Hunters usually use a three-headed spear or a net to capture wild frogs. Those caught with a spear can suffer a painful and often slow death¹²¹. Those captured with a net are kept alive in overcrowded bags, buckets or cages, with limited space, air and water – risking disease, suffocation and crushing^{115 122}.

Live frogs are transported in overcrowded conditions where they cannot engage in normal behaviours, such as feeding, moving or resting. Many frogs are dead on arrival at processing plants and cannot be exported. During processing, live frogs typically have their legs removed while conscious, either by cutting with scissors or a knife, or dismemberment by hand – all without pain relief¹¹⁸.



Photo: Bullfrogs at a farm in Indonesia. One of the most widely farmed frog species in Indonesia and globally, they are raised in small concrete enclosures that contrast sharply with their natural habitats of lakes, ponds, swamps, rivers, or bushy vegetation. Credit: Seb Alex / We Animals



Photo: Juvenile crocodiles during feeding time in communal ponds at a farm in Australia. These naturally territorial animals can become aggressive when crowded, yet saltwater crocodiles are typically kept in groups with limited space until about two years of age. Credit: World Animal Protection / Dean Sewell

The fashion industry

Crocodilians farmed for their skins



Crocodilians (*Crocodylidae*) have been commercially farmed for their skins – and meat as a by-product – since the 1970s¹²³. According to the International Union for the Conservation of Nature (IUCN) Crocodile Specialist Group, more than 1.5 million crocodilian skins are legally exported annually from around 30 countries¹²⁴ and 5,000 farms worldwide¹²³.

The saltwater crocodile is a popular species for farming and ranching in Australia, due to its large size and high-quality skin¹³¹. In the wild, saltwater crocodiles patrol large territories, engage in complex social interactions and displays, thermoregulate by sun basking and going in water, and show maternal care during nesting – behaviours that are entirely absent or severely restricted on crocodile farms^{128 125 126}.

Saltwater crocodiles are territorial and competitive by nature and can become aggressive when close to others – with dominant individuals guarding resources like water^{127 128 129}. Despite this, saltwater crocodiles are typically held in groups until around two

years of age, with limited space and access to water. Because they are predominantly farmed for their skin and to avoid imperfections on their belly, they are kept in individual pens for the final stage of production. This severely restricts their movement and ability to perform normal and motivated behaviours¹³⁰.

Captivity-related stressors – such as the thwarting of innate drives (eg. hunting, territorial patrolling, nesting or mating behaviours), overcrowding, social disruption, handling and restraint, noise, poor hygiene and poor diet – can lead to physiological and behavioural compromises. These could include immunosuppression, disease susceptibility, obesity, injuries and infections^{131 132 133 134} and result in subsequent negative mental experiences. Intensive rearing can also trigger disease outbreaks and death^{127 132 135}.

The IUCN Crocodile Specialist Group recommends brain destruction for slaughter¹³¹, however investigations in Australian farms have found some crocodiles may be “processed” while still alive^{136 137}. While this claim is disputed, it does not appear to be common practice for operators to ensure crocodiles are unconscious before processing, which may mean they experience excruciating pain and suffering^{138 139 140 141 142}.



Photo: Staff at a crocodile farm in Australia examine a salted crocodile skin before being sent to the tannery in Singapore. Prior to processing, crocodiles are kept in individual pens to protect the quality of their belly skin, severely limiting natural behaviour. Despite IUCN guidance that slaughter involves brain destruction, it has been reported that operators do not consistently confirm unconsciousness before processing, raising serious welfare concerns. Credit: World Animal Protection / Dean Sewell



Photo: Mink at a farm in Sweden, typically housed in barren wire cages with little enrichment. Abrupt weaning stresses both kits and mothers, causing the young to vocalise distress and display abnormal behaviours, and leaving the animals vulnerable to disease. Credit: Jo-Anne McArthur / Djurrattsalliansen / We Animals

The fashion industry

Mink farmed for their fur



The American mink (*Neogale vison*) is globally the most farmed fur-bearing species¹⁴³. Despite declines in the number of mink farmed globally, 17 million were still farmed in 2022¹⁴⁴.

Globally, minks are farmed in typically barren wire mesh cages, with minimal enrichment¹⁴⁵. While an American mink can grow to up to 54cm in body length (excluding the tail), a typical mink cage in Scandinavia is just 45cm high, 30cm wide and 90cm long – with even smaller cages outside of Europe¹⁴⁶.

In the wild, mink are semi-aquatic carnivores that establish territories spanning several kilometres. They hunt a variety of prey on land and in water, and den in hollow trees and underground burrows¹⁴⁷¹⁴⁸. They are highly active and show complex behaviours such as swimming, climbing, scent-marking and patrolling their territory¹⁴⁹¹⁵⁰. Breeding occurs once per year, and mothers care for kits until they are independent. In captivity, the relatively barren cages deny mink the chance to perform any of these natural behaviours. This commonly results in frustration and stress, shown by stereotypic

behaviour¹⁵¹¹⁵², such as scrabbling and pacing, fur chewing and tail biting¹⁵³¹⁵⁴. Bare cages, coupled with negative handling experiences can also increase fearfulness¹⁵⁵.

Food is unrestricted for mink during the growth season to yield large pelts, resulting in diarrhoea and injuries¹⁵⁹. Those selected for breeding are then typically subjected to 2-3 months of restricted feeding to decrease body weight before mating. This can lead to prolonged hunger, reduced reproduction performance and increased mortality¹⁵⁹.

Early and abrupt weaning is common on fur farms, known to cause stress to both kits and mothers¹⁵⁶. The early-weaned kits are not fully independent and vocalise distress calls when separated from their mothers¹⁵⁷, as well as displaying tail-biting and over-grooming¹⁵⁸.

Gassing with high concentrations of carbon dioxide (CO₂) or carbon monoxide (CO) is commonly used to kill mink¹⁵⁹. Carbon dioxide can cause extreme pain and distress prior to loss of consciousness¹⁶⁰¹⁶¹. Farmed mink are also susceptible to numerous contagious and zoonotic diseases¹⁶²¹⁶³.



Photo: A lion at an undisclosed venue in South Africa offering petting and interaction with big cats. Once too large for interactions, they are often sold for canned hunting, and their bones may later be used in traditional medicine. Credit: World Animal Protection

Entertainment and tourism

Lions farmed for tourist attractions



Commercial lion (*Panthera leo*) farming is a burgeoning industry in South Africa, with around 8,500 lions registered at around 350 facilities across the country^{164 165}. The lions are largely destined for the tourism industry, including cub petting, 'walking with lions' experiences, voluntourism (eg. when volunteers help at facilities by feeding cubs) and 'canned' hunting (when they are hunted in an enclosed space with no chance of escape), or to have their body parts sold as by-products used in traditional medicine^{166 167 168}.

In the wild, lions are social carnivores that live in prides of related females, their cubs and a group of males. They roam over large territories spanning several hundred kilometres, engage in coordinated hunting, maintain complex social hierarchies, and communicate by vocalising, scent-marking and body language. Cubs are well cared for by their mothers and the wider social group, and pride members work together to defend their territory. These natural behaviours – roaming, hunting, resting, social bonding, play and cub-rearing – are largely absent or severely restricted on lion farms, making farmed conditions profoundly incompatible with lions' biological and psychological needs^{169 170 171 172}.

In Thailand, the captive lion industry has also expanded dramatically in recent years, despite regulatory changes intended to curb it. The number of registered captive lions increased by 239% between 2018 and 2024. Lions can legally be kept in private homes and are increasingly used in cafés and in social media content, raising grave concerns for both animal welfare and public safety¹⁷³.

Lion farms are associated with poor welfare conditions, including inadequate diets, poor hygiene, and a lack of veterinary care resulting in sick, malnourished, and injured animals¹⁷⁴. There is also a major risk of increased disease outbreaks on lion farms, including zoonotic diseases¹⁷⁵. Lions are typically kept in small, barren and overcrowded enclosures, which can lead to aggression, severe injuries and deaths¹⁷⁶.

Intensive farming practices can result in inbreeding, low reproductivity, poor maternal acceptance, increased cub mortality and poor immune functioning¹⁷⁶. Cubs are often removed from lionesses before they are weaned, which can cause physiological and psychological stress¹⁷².

Cubs used for petting and lion walking are often subjected to unsupervised and forced handling by inexperienced humans, potentially causing fear and stress and impacting their development by ignoring their social needs and disturbing their natural behaviour¹⁷⁷. Excessive handling may also result in injuries and exacerbate their compromised immunity¹⁷⁶.

Lions used for 'walking with lion' experiences are forced to participate in daily interactions, often in high temperatures, which can cause stress and restrict their natural behaviours, particularly given that lions in the wild rest and sleep for 16 to 20 hours a day (the exact amount depends on temperature, food availability and pride activity). The lack of control and inability to express normal behaviours can lead to stereotyping such as pacing or head bobbing¹⁷⁸. When animals become too old, they may be sold for canned hunting or killed for the bone trade, both of which are associated with numerous welfare concerns¹⁷².



Photo: Undercover footage from 2018-2020 reveals the training of baby elephants for the tourism industry. Bullhooks, sticks, and nails are typically used to inflict pain during two daily sessions. Calves may be restrained in crush boxes or tied to fences, trees, or poles. This aversive training can cause long-term stress and learned helplessness. Credit: World Animal Protection

Entertainment and tourism

Elephants used for entertainment



Across South and Southeast Asia, there are an estimated 3,800 captive Asian elephants (*Elephas maximus*) kept in camps for tourists to ride and interact with, for example as part of washing experiences¹⁷⁹. Many are captive-bred or were captured from the wild¹⁸⁰, often coming into conflict with people¹⁸¹ ¹⁸², or were former logging elephants (previously used in the timber industry)¹⁸³.

Young calves are often separated from their mothers at two to four years old¹⁸⁴, causing considerable distress for the mother, who may be chained in place for up to two months to stop her from searching for her calf. Calves are often 'broken' by confining them and tying them with chains, sometimes preventing them from lying down. They are then prodded or hit into submission¹⁷⁶. This process causes intense pain, suffering and exhaustion for young animals already in a heightened state of fear and distress after being taken from their mother¹⁸⁵.

Elephants are often trained using punishment or aversion-based methods, such as a hook or sticks to scrape and apply pressure to sensitive points on their body. This can cause wounds, abrasions,

lacerations, ulcers and abscesses¹⁸⁶ ¹⁸⁷. Such aversive training has also been linked to long-term psychological harm¹⁸⁸ ¹⁸⁹.

In the wild, Asian elephants live in highly social, female-led family groups, maintaining long-term bonds. They may travel several kilometres each day across large home ranges to forage on a wide variety of vegetation, spending up to 18 hours feeding, exploring and problem-solving¹⁹⁰. Access to rivers and mud wallows is essential for thermoregulation, skin health and play, while calves remain closely attached to their mothers for many years, learning survival skills from them and wider family groups¹⁹¹ ¹⁹² ¹⁹³.

In captivity, elephants from different sources are typically housed together, given little opportunity to form the social bonds that are key to their natural matriarchal family structures. This can cause stress and lead to poorly adjusted animals¹⁹⁴ ¹⁹⁵.

Many captive elephants in South and Southeast Asia spend hours chained in one area and are prevented from performing behaviours such as foraging, bathing and social interactions¹⁸³. This can considerably impact their mental state¹⁹⁶. For example, elephants in temples in Southern India are often distressed, aggressive and prone to severe intestinal stress¹⁸³.

Photo: Tourists take rides on elephants in Thailand. When not interacting with tourists, elephants may be chained for hours, unable to forage, bathe, or socialise, which can seriously compromise their welfare. Credit: World Animal Protection





Photo: A captive dolphin at Marineland, Niagara Falls, Canada. Confinement can cause serious welfare problems, including behavioural abnormalities, self-harm, and even suicidal tendencies. Credit: World Animal Protection / Sasha Rink

Entertainment and tourism

Captive dolphins used as tourist attractions in marine parks



There are currently an estimated 3,000 dolphins and around 59 orcas in captivity around the world in sea parks and aquariums¹⁹⁷. Many are captive-bred, although wild capture still occurs using controversial 'drive hunts'¹⁹⁸.

Tens to hundreds of dolphins are estimated to be captured each year in Japan alone to be sold to marine parks¹⁹⁹. Wild capture causes acute stress and injury for dolphins due to prolonged chasing, herding, confinement and restraining, and the use of loud noise to disorientate the dolphins²⁰⁰. Mortality rates of captured cetaceans are thought to be six times higher than in the wild²⁰¹.

In the wild, dolphins are highly social, intelligent and wide-ranging – most species' home ranges exceed 100 km², travelling several kilometres each day while foraging²⁰². They engage in complex social interactions, forming long-term bonds, alliances and hunting groups. Dolphins rely on echolocation and vocalisations for communication, navigation and hunting, and they engage in play, problem solving, exploration, and tool use (eg. using sponges to protect their beaks while foraging on the seafloor). Many species

migrate for the best food and environmental conditions, and calves remain with their mothers for extended periods, learning essential survival and social skills^{203 204 205 206}.

Captive dolphins are typically kept in captivity for all or most of their lives²⁰⁷. They are held in small, concrete tanks – more than 200,000 times smaller than in the wild – or sea pens²⁰⁸, which severely restrict their ability to swim or dive freely.

Being held in confinement has considerable long-term impacts on dolphins' physical and psychological welfare²⁰⁹. This can result in early deaths and behavioural abnormalities, such as stereotypical behaviours (eg. repetitive circling, pattern swimming, surface bobbing, tooth rubbing, collisions with enclosure structures)^{210 211}, self-mutilation, self-inflicted trauma and excessive aggression^{212 213}. Even suicidal behaviour has been reported in captive dolphins^{214 215}.

Being required to perform for long periods can also lead to boredom, frustration and anxiety²¹⁶. There are a growing number of documented examples of orcas becoming dangerously aggressive towards humans – an indicator of stress. This includes pushing trainers into the water, biting, lunging and holding trainers underwater²¹⁷.

Psychological burden

Overall, across the 13 case studies, welfare compromises occur throughout the trade chain - during capture, rearing, transport, sale, holding, and captivity. These compromises result in a range of negative mental experiences, including thirst, hunger, discomfort, exhaustion, pain, sickness, trauma, frustration, boredom, stress, fear, anxiety, distress, and depression; all of which adversely affect animals' overall mental states.

Confiscations in the illegal wildlife trade

While not included in the case studies, we want to acknowledge the impacts that occur at other stages of the trade chain, including during confiscation.

Confiscating illegally traded animals is an established global strategy for disrupting and deterring trafficking. However, reports of malpractice, poor treatment and corruption is undermining welfare. Deaths are common, both from trauma experienced prior to seizure, and poor care afterwards.

Overwhelming numbers

Rescue centres do not have the resources to adequately manage the number of animals being held. For example, one facility in Rio de Janeiro admitting more than 10,000 animals annually, reported 600 deaths in just four months in 2021²¹⁸.

Severe overcrowding, insufficient housing and inadequate care risk the spread of disease and the mistreatment of animals. In Mexico, a sanctuary holding seized big cats was closed in 2022, after investigators found 190 animals suffering from poor welfare, including severe malnutrition, untreated wounds, and even cannibalism^{219 220}.

Corruption and abandonment


































The fate of seized animals is often uncertain. Many animals are euthanized due to trauma or a lack of space and resources. Others are released into inappropriate habitats and without proper follow up, jeopardising their welfare and wild populations.











Limited release options, high costs, and challenges in repatriating non-native species means most animals never return to the wild. While some live out their lives in well-managed sanctuaries, many are diverted back into the trade. For example, at Alipore Zoo in India, 321 rescued animals reportedly disappeared overnight, believed to have been sold to private zoos and collections^{221 222}.














Ending the trade

Limited protections, chronic underfunding and systemic corruption mean seizures often perpetuate harm rather than alleviate it. Efforts should focus on safely releasing animals into the wild (when feasible) and ensuring appropriate care while in custody. However, ultimately, the only way to end the suffering of billions of traded wild animals every year is to end the exploitation of animals for consumptive purposes.

Table 1: Summary of animal experiences across case studies, highlighting the similarity and prevalence of welfare issues regardless of species or trade purpose.

Nutrition	Pet trade		Traditional medicine			Luxury foods		Fashion	Entertainment				
													
No/ insufficient access to water/ food													
Capture	✓		✓	✓	✓	✓		✓				✓	✓
Captive-breeding					✓		✓			✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity					✓					✓	✓	✓	✓
Slaughter													
Environment	Pet trade		Traditional medicine			Luxury foods		Fashion	Entertainment				
													
Thermal extremes													
Capture	✓		✓	✓		✓		✓					✓
Captive-breeding	✓	✓			✓			✓			✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓			✓			✓			✓	✓	✓
Slaughter				✓				✓					
Prolonged close confinement													
Capture	✓					✓		✓					✓
Captive-breeding	✓	✓			✓		✓	✓		✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓			✓		✓	✓	✓	✓
Slaughter													
Unpredictable noises/ events													
Capture	✓			✓		✓		✓				✓	✓
Captive-breeding	✓	✓			✓		✓	✓		✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓
Slaughter				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barren environment/ lack of enrichment													
Capture	✓					✓		✓					✓
Captive-breeding	✓	✓			✓		✓	✓		✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓		✓	✓	✓	✓
Captivity	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓
Slaughter													
Health	Pet trade		Traditional medicine			Luxury foods		Fashion	Entertainment				
													
High risk of disease, injuries and/or inhumane death													
Capture	✓		✓	✓	✓	✓		✓				✓	✓
Captive-breeding	✓	✓			✓		✓	✓		✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓
Slaughter				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
High mortality rates													
Capture	✓		✓	✓	✓	✓		✓				✓	✓
Captive-breeding	✓	✓			✓		✓	✓		✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓
Slaughter													
Physiological stress													
Capture	✓		✓	✓	✓	✓		✓				✓	✓
Captive-breeding	✓	✓			✓		✓	✓		✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓
Slaughter				✓	✓		✓	✓	✓	✓	✓	✓	✓

Behavioural Interactions	Pet trade		Traditional medicine				Luxury foods		Fashion	Entertainment			
													
Significantly restricted behavioural repertoire													
Capture	✓		✓	✓		✓		✓					
Captive-breeding	✓	✓			✓		✓		✓	✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓
Slaughter													
Negative interactions with humans													
Capture	✓		✓	✓	✓	✓		✓				✓	✓
Captive-breeding	✓	✓			✓		✓		✓	✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓
Slaughter				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inappropriate/ lack of social opportunities													
Capture	✓	✓	✓	✓	✓	✓		✓					✓
Captive-breeding	✓				✓		✓		✓	✓	✓	✓	✓
Transportation		✓	✓			✓		✓					
Captivity	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓
Slaughter				✓									
Stereotypic behaviour													
Capture													
Captive-breeding	✓	✓			✓					✓	✓	✓	✓
Transportation	✓	✓											
Captivity	✓	✓	✓		✓					✓	✓	✓	✓
Slaughter													

Mental states	Pet trade		Traditional medicine				Luxury foods		Fashion	Entertainment			
													
Negative mental states inc. pain, fear and stress													
Capture	✓		✓	✓	✓	✓		✓				✓	✓
Captive-breeding	✓	✓			✓		✓		✓	✓	✓	✓	✓
Transportation	✓	✓	✓			✓		✓					✓
Captivity	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓
Slaughter				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

3. Conclusion

The 13 case studies highlighted in this report provide a snapshot of the welfare compromises experienced by billions of wild animals traded across the globe for pets, traditional medicine, food, fashion, and entertainment.

Individual animals involved in the commercial wildlife trade typically experience welfare compromises across all the Five Domains:

1. Poor nutrition, involving inappropriate or restricted food intake, starvation and severe deprivation of water.

2. Poor environments, such as thermal extremes, severe restriction and confinement.

3. Poor health, including the risk of disease, injury and a slow, inhumane death.

4. Behavioural issues, such as negative human interactions and permanent barren and highly confined environments with no freedom to make choices.

This can result in:

5. Negative mental states, including feelings of sickness, pain, exhaustion, discomfort, fear, hunger, thirst, stress, anxiety, trauma, distress, depression, boredom and frustration.

Despite the growing recognition of the intrinsic value and understanding of the sentience of wild animals, animal welfare is still frequently overlooked throughout the wildlife trade chain. A systemic shift is needed to align policy and legal frameworks with this growing body of evidence, including recent milestones such as the 2024 New York Declaration on Animal Consciousness, which extends recognition of sentience to all vertebrates. Such alignment is essential to support a transition away from consumptive wildlife use.

Formal recognition of sentience by relevant international policy fora, agreements and legal instruments such as CITES and the CBD could provide a concrete mechanism to integrate welfare considerations into trade decisions, guiding law, policy, and

assessments of welfare risks. Aligning these protections with broader sustainability goals can reinforce their impact, with co-benefits to biodiversity, public health, animal welfare and responsible trade practices.

This is a crucial step toward a broader goal of reducing and replacing the consumptive commercial use of wild animals altogether. Achieving this requires redirecting consumer demand away from animal products and experiences that exploit, harm or kill wild animals, toward non-consumptive, wildlife-friendly alternatives that do not involve wild animal commodification at all.

Reducing and redirecting demand towards non-consumptive use has wider benefits beyond animal welfare. For conservation, species threatened with extinction due partly to trade, would hugely benefit. Similarly, the advantages for public health are substantial, with the exploitation of wildlife being one of the dominant drivers of zoonotic disease transmission^{223 224 225}, and potentially leading to pandemics and severe negative impacts on people and economies^{226 227}.

Photo: Piles of expensive brown mink and sable fur skins at an auction exhibition. Minks are often killed with carbon dioxide or carbon monoxide, gases that cause pain, panic, and severe distress before they lose consciousness. Credit: Artem Bruk / Shutterstock



4. Recommendations

For governments and policymakers

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services' (IPBES) recent assessments on sustainable use²²⁸, biodiversity²²⁹ and invasive species²³⁰ emphasise the net negative impact of wildlife exploitation on biodiversity. The platform calls for a transformative shift in humanity's relationship with nature, including toward an ethics of care which recognises the agency and sentience of non-human entities, such as animals, plants and ecosystems²³¹.

Formally recognising animal sentience in international policy frameworks and agreements that influence wildlife trade – such as CITES and the CBD – would establish a stronger ethical and scientific foundation for action, ensuring that the capacity of animals to experience positive and negative states is explicitly considered in decision-making processes.

Implementing and enforcing actions which are consistent with animal sentience and welfare principles, such as transitioning away from commercial wildlife trade, would demonstrate meaningful progress towards valuing and living in harmony with nature. It would also enable countries to more effectively meet their national and international commitments on trade, biodiversity, and health. By tackling the root causes of harm and ending these poor welfare practices, countries can make more efficient use of resources to prevent negative downstream effects.

Embedding the principle of sentience in decisions made under frameworks such as CITES and the CBD would help ensure that welfare is considered alongside conservation. The interconnections between humans, animals, and the environment require a more holistic view of sustainability that also includes considerations of biodiversity, health, habitat destruction, and climate. Aligning sentience-based protections with global sustainability goals would multiply their impact: reducing animal suffering, safeguarding



biodiversity, strengthening biosecurity and reducing public health risks, and shifting global markets away from the exploitation of sentient wildlife.

To achieve this transformation, governments can take practical steps such as engaging with stakeholders across the wildlife trade chain to develop holistic solutions using the One Health approach – which recognises the interconnections between animals, humans, and the environment, implementing behaviour change initiatives to reduce consumer demand for wildlife products and exploitative wildlife tourism experiences²³², strengthening laws and law enforcement²³³, and supporting sustainable alternative livelihoods for those economically dependent on the wildlife trade²³⁴.

For traders and the private sector

Individuals involved in the commercial wildlife trade should be supported to transition towards alternative, sustainable livelihoods that do not involve animal suffering. At the same time, the wider private sector should shift towards wildlife-friendly business models.

A variety of wildlife-friendly alternatives are already available, for example tourist providers can offer responsibly-managed encounters with wild animals in their wild habitats that do not involve the deliberate killing or unethical exploitation of animals or direct interaction with tourists. For example, responsible whale and dolphin watching to ensure minimum disturbance and with no guarantee of sightings.

Increasing scientific research also points to the potential for replacing wild animal-origin traditional medicine ingredients with sustainably-sourced herbal or human synthetic alternatives²³⁵. Further, sustainably produced faux fur is widely accepted and actively promoted by the fashion industry as an alternative to real fur. At the time of writing there were more than 1,500 retailers listed on the 'Fur Free Retailers' site²³⁶.

Photo: Bear bile has been used in traditional Chinese medicine for thousands of years. Despite the availability of over 50 herbal alternatives and many affordable synthetic alternatives, bear bile is still in high demand. Credit: World Animal Protection

5. References

- ¹ Andrews, K.; Birch, J.; Sebo, J.; Allen, C.; Anokhin, K.; Barron, A.; Brown, C.; Burghardt, G.; ... et al. *The New York Declaration on Animal Consciousness*. New York University, 19 April 2024. Available online: <https://sites.google.com/nyu.edu/nydeclaration/declaration> (accessed 11 November 2025).
- ² Scheffers, B.R.; Oliveira, B.F.; Lamb, I.; Edwards, D.P. Global Wildlife Trade across the Tree of Life. *Science* **2019**, *366*, 71–76.
- ³ Fukushima, C.S.; Mammola, S.; Cardoso, P. Global Wildlife Trade Permeates the Tree of Life. *Biol. Conserv.* **2020**, *247*, 108503.
- ⁴ Marshall, B.M.; Strine, C.T.; Fukushima, C.S.; Cardoso, P.; Orr, M.C.; Hughes, A.C. Searching the Web Builds Fuller Picture of Arachnid Trade. *Commun. Biol.* **2022**, *5*, 448.
- ⁵ Harfoot, M.; Glaser, S.A.M.; Tittensor, D.P.; Britten, G.L.; McLardy, C.; Malsch, K.; Burgess, N.D. Unveiling the Patterns and Trends in 40 years of Global Trade in CITES-Listed Wildlife. *Biol. Conserv.* **2018**, *223*, 47–57.
- ⁶ Marshall, B.M.; Strine, C.; Hughes, A.C. Thousands of Reptile Species Threatened by Under-Regulated Global Trade. *Nat. Commun.* **2020**, *11*, 4738.
- ⁷ Davies, A.; D’Cruze, N.; Senni, C.; Martin, R.O. Inferring Patterns of Wildlife Trade through Monitoring Social Media: Shifting Dynamics of Trade in Wild-Sourced African Grey Parrots Following Major Regulatory Changes. *Glob. Ecol. Conserv.* **2022**, *33*, e01964.
- ⁸ Svensson, M.S.; Morcatty, T.Q.; Nijman, V.; Shepherd, C.R. The next Exotic Pet to Go viral\Is Social Media Causing an Increase in the Demand of Owning Bushbabies as Pets? *Hystrix Ital. J. Mammal.* **2022**, *33*, 51–57.
- ⁹ Phillips, N., Maréchal, L., Ventura, B., & Cooper, J. (2024). How do perceptions of zoo animal welfare influence public attitudes, experiences, and behavioral intentions? A mixed-methods systematic review. *Animal Behavior and Cognition*, *11*(4), 404–431.
- ¹⁰ Heather Browning & Walter Veit (2022) The sentience shift in animal research, *The New Bioethics*, *28*:4, 299-314.
- ¹¹ D’Silva, J., Dalton, H., Boyland, N. K., & Turner, J. (2024). Animal sentience: The science and its implications, with particular reference to farmed animals. *Animal Research and One Health*, *2*(2), 230–236.
- ¹² Baker, S.; Cain, R.; Kersteren, F.; Zommers, Z.; D’Cruze, N.; Macdonald, D. Rough Trade: Animal Welfare in the Global Wildlife Trade. *BioScience* **2013**, *63*, 928–938.
- ¹³ Mellor, D.; Reid, C.S.W. Concepts of Animal Well-Being and Predicting the Impact of Procedures on Experimental Animals. 1994. Available online: <https://www.wellbeingintlstudiesrepository.org/exprawel/7/> (accessed on 12 February 2022).
- ¹⁴ Harrington, L.A.; Green, J.; Muinde, P.; Macdonald, D.W.; Auliya, M.; D’Cruze, N. Snakes and Ladders: A Review of Ball Python Production in West Africa for the Global Pet Market. *Nat. Conserv.* **2020**, *41*, 1–24.
- ¹⁵ D’Cruze, N.; Harrington, L.A.; Assou, D.; Green, J.; Macdonald, D.W.; Ronfot, D.; Segniagbeto, G.H.; Auliya, M. Betting the Farm: A Review of Ball Python and Other Reptile Trade from Togo, West Africa. *Nat. Conserv.* **2020**, *40*, 65–91.
- ¹⁶ Vishnu CS, Marshall BM, Ramesh C, Thirumurugan V, Talukdar G, Das A. 2023. Home range ecology of Indian rock pythons (*Python molurus*) in Sathyamangalam and Mudumalai Tiger Reserves, Tamil Nadu, Sothern India. *Scientific Reports* *13*, 9749
- ¹⁷ Pearson D, Shine R, Williams A. 2009. Spatial ecology of a threatened python (*Morelia spilota imbricata*) and the effects of anthropogenic habitat change. *Austral Ecology*, *30*, 261-274.

- ¹⁸ Gorzula S, Nsiah WO, Oduro W. 1997. Survey of the status and management of the Royal Python (*Python regius*) in Ghana. Report to the Secretariat of the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES), Geneva, Switzerland.
- ¹⁹ Skinner, M.; Kumpan, T.; Miller, N. **2024**. Intense sociability in a “non-social” snake (*Python regius*). *Behavioral Ecology and Sociobiology*, *78*, 113.
- ²⁰ D’Cruze, N.; Harrington, L.A.; Assou, D.; Ronfot, D.; Macdonald, D.W.; Segniagbeto, G.H.; Auliya, M. Searching for Snakes: Ball Python Hunting in Southern Togo, West Africa. *Nat. Conserv.* **2020**, *38*, 13–36.
- ²¹ D’Cruze, N.; Bates, J.; Assou, D.; Ronfot, D.; Coulthard, E.; Segniagbeto, G.H.; Auliya, M.; Megson, D.; Rowntree, J. A Preliminary Assessment of Bacteria in “Ranched” Ball Pythons (*Python Regius*), Togo, West Africa. *Nat. Conserv.* **2020**, *39*, 73–86.
- ²² Green, J.; Coulthard, E.; Megson, D.; Norrey, J.; Norrey, L.; Rowntree, J.K.; Bates, J.; Dharpaul, B.; Auliya, M.; D’cruze, N. Blind Trading: A Literature Review of Research Addressing the Welfare of Ball Pythons in the Exotic Pet Trade. *Animals* **2020**, *10*, 193.
- ²³ D’Cruze, N.; Paterson, S.; Green, J.; Megson, D.; Warwick, C.; Coulthard, E.; Norrey, J.; Auliya, M.; Carder, G. Dropping the Ball? The Welfare of Ball Pythons Traded in the EU and North America. *Animals* **2020**, *10*, 413.
- ²⁴ Pohlin, F.; Hooijberg, E.H.; Meyer, L.C.R. Challenges to Animal Welfare during Transportation of Wild Mammals: A Review (1990–2020). *J. Zoo Wildl. Med.* **2021**, *52*, 1–13.
- ²⁵ Brashears, J.A.; Fokidis, H.B.; DeNardo, D.F. Fear-Based Aggression and Its Relationship to Corticosterone Responsiveness in Three Species of Python. *Gen. Comp. Endocrinol.* **2020**, *289*, 113374.
- ²⁶ Lambert, H.S.; Carder, G.; D’Cruze, N. Given the Cold Shoulder: A Review of the Scientific Literature for Evidence of Reptile Sentience. *Animals* **2019**, *9*, 821.
- ²⁷ Azevedo, A.; Guimarães, L.; Ferraz, J.; Whiting, M.; Magalhães, M.; Ana, S. Pet Reptiles—Are We Meeting Their Needs? *Animals* **2021**, *11*, 2964.
- ²⁸ Warwick, C. The Morality of the Reptile “Pet” Trade. *J. Anim. Ethics* **2014**, *4*, 74–94.
- ²⁹ Lidster, K.; Readman, G.D.; Prescott, M.J.; Owen, S.F. International Survey on the Use and Welfare of Zebrafish *Danio Rerio* in Research. *J. Fish Biol.* **2017**, *90*, 1891–1905.
- ³⁰ Collymore, C.; Tolwani, R.J.; Rasmussen, S. The Behavioral Effects of Single Housing and Environmental Enrichment on Adult Zebrafish (*Danio Rerio*). *J. Am. Assoc. Lab. Anim. Sci.* **2015**, *54*, 280–285.
- ³¹ Kistler, C.; Hegglin, D.; Würbel, H.; König, B. Preference for Structured Environment in Zebrafish (*Danio Rerio*) and Checker Barbs (*Puntius Oligolepis*). *Appl. Anim. Behav. Sci.* **2011**, *135*, 318–327.
- ³² Powell, C.; von Keyserlingk, M.A.G.; Franks, B. Tank Cleaning Temporarily Increases Stress and Decreases Affiliative Behavior in Zebrafish. *Appl. Anim. Behav. Sci.* **2021**, *242*, 105414.
- ³³ Ramsay, J.M.; Watral, V.; Schreck, C.B.; Kent, M.L. Husbandry Stress Exacerbates Mycobacterial Infections in Adult Zebrafish, *Danio Rerio* (Hamilton). *J. Fish Dis.* **2009**, *32*, 931–941.
- ³⁴ Sampaio, F.D.F.; Freire, C.A. An Overview of Stress Physiology of Fish Transport: Changes in Water Quality as a Function of Transport Duration. *Fish Fish.* **2016**, *17*, 1055–1072.
- ³⁵ Sneddon, L.U.; Wolfenden, D.C.C.; Thomson, J.S. Stress Management and Welfare. In *Fish Physiology*; Schreck, C., Tort, L., Farrel, A., Brauner, C., Eds.; Elsevier: Amsterdam, The Netherlands, 2016; Volume 35, pp. 463–539. ISBN 978-0-12-802728-8.
- ³⁶ Spence R, Gerlach G, Lawrence C, Smith C. 2007. The behaviour and ecology of the zebrafish, *Danio rerio*. *Biological Reviews*, *82*, 517-534.

- ³⁷ Velkey AJ, Koon CH, Danstrom IA, Wiens KM. 2022. Female zebrafish (*Danio rerio*) demonstrate stronger preference for established shoals over newly-formed shoals in the three-tank open-swim preference test. *PLoS One* 17: e0265703
- ³⁸ Santaca M, Gatto E, Dadda M, Bruzzone M, Maschio MD, Bisazza A. 2024. Exploring the importance of environmental complexity for newly hatched zebrafish. *Animals* 14: 1031
- ³⁹ Crim, M.J.M.; Riley, L.K. Viral diseases in zebrafish: What is known and unknown. *ILAR J.* **2012**, *53*, 135–143.
- ⁴⁰ Kent, M.L.; Sanders, J.L.; Spagnoli, S.; Al-Samarrie, C.E.; Murray, K.N. Review of Diseases and Health Management in Zebrafish *Danio Rerio* (Hamilton 1822) in Research Facilities. *J. Fish Dis.* **2020**, *43*, 637–650.
- ⁴¹ Walster, C.; Rasidi, E.; Saint-Erne, N.; Loh, R. The Welfare of Ornamental Fish in the Home Aquarium. *Companion Anim.* **2015**, *20*, 302–306.
- ⁴² Atoussi, S.; Bergin, D.; Razkallah, I.; Nijman, V.; Bara, M.; Bouslama, Z.; Houhamdi, M. The Trade in the Endangered African Grey Parrot *Psittacus erithacus* and the Timneh Parrot *Psittacus Timneh* in Algeria. *Ostrich* **2020**, *91*, 214–220.
- ⁴³ Assou, D.; Elwin, A.; Norrey, J.; Coulthard, E.; Megson, D.; Ronfot, D.; Auliya, M.; Segniagbeto, G.H.; Martin, R.O.; D’Cruze, N. Trade in African Grey Parrots for Belief-Based Use: Insights From West Africa’s Largest Traditional Medicine Market. *Front. Ecol. Evol.* **2021**, *9*, 612355.
- ⁴⁴ CITES. *Consideration of Proposals for Amendment of Appendices I and II—Proposal 4*; CITES: Johannesburg, South Africa, 2016; pp. 1–23.
- ⁴⁵ Martin, R.O.; Senni, C.; D’Cruze, N.C. Trade in Wild-Sourced African Grey Parrots: Insights via Social Media. *Glob. Ecol. Conserv.* **2018**, *15*, e00429.
- ⁴⁶ Tamungang SA, Takuo AJ, Tamueue B. 2001. Status, management and conservation of the African grey parrot *Psittacus erithacus*. International Union for Conservation of Nature.
- ⁴⁷ Krasheninnikova A, Brucks D, Blanc S, von Bayern AMP. 2019. Assessing African grey parrots' prosocial tendencies in a token choice paradigm. *Royal Society Open Science* 6: 190696
- ⁴⁸ Pepperberg, I. 2010. Vocal learning in Grey parrots: A brief review of perception, production, and cross-species comparisons. *Brain and Language*. 115: 81-91
- ⁴⁹ Valle, S.; Collar, N.J.; Harris, W.E.; Marsden, S.J. Trapping Method and Quota Observance Are Pivotal to Population Stability in a Harvested Parrot. *Biol. Conserv.* **2018**, *217*, 428–436.
- ⁵⁰ Tamungang, S.A. Challenges and Conservation Implications of the Parrot Trade in Cameroon. *Int. J. Biol. Chem. Sci.* **2016**, *10*, 1210.
- ⁵¹ Clemmons, J.R. *Status Survey of the African Grey Parrot [Psittacus erithacus Timneh] and Development of a Management Program in Guinea and Guinea-Bissau*; CITES: Geneva, Switzerland, 2002.
- ⁵² Fotso, R.; CITES. *Survey Status of the Distribution and Utilization of the Grey Parrot (Psittacus erithacus) in Cameroon*; Secrétariat CITES: Johannesburg, South Africa, 1998.
- ⁵³ McGowan, P. *Status, Management and Conservation of the African Grey Parrot Psittacus erithacus in Nigeria*; International Union for Conservation of Nature: Gland, Switzerland, 2001; pp. 1–50.
- ⁵⁴ Stevens JD, Bonfil R, Dulvy NK, Walker PA. 2000. The effects of fishing on sharks, rays and chimaeras (chondrichthyans), and the implications for marine ecosystems. *ICES Journal of Marine Science* 57: 476-494.
- ⁵⁵ Heithaus MR, Frid A, Wirsing AJ, Dill LM, Fourqurean JW, Burkholder D, Thomson J, Bejder L. 2007. State-dependent risk-taking by green sea turtles mediates top-down effects of tiger shark intimidation in a marine ecosystem. *Journal of Animal Ecology*, 76: 837-844.
- ⁵⁶ Worm, B., Davis, B., Kettner, L., et al. Global catches, exploitation rates, and rebuilding options for sharks. *Mar. Policy* 40, 194–204 (2013).

- ⁵⁷ Prasetyo, A.P.; McDevitt, A.D.; Murray, J.M.; Barry, J.; Agung, F.; Muttaqin, E.; Mariani, S. Disentangling the Shark and Ray Trade in Indonesia to Reconcile Conservation with Food Security. *bioRxiv* **2020**. bioRxiv: 2020.12.08.416214.
- ⁵⁸ Brooks, E.J.; Mandelman, J.W.; Sloman, K.A.; Liss, S.; Danylchuk, A.J.; Cooke, S.J.; Skomal, G.B.; Philipp, D.P.; Sims, D.W.; Suski, C.D. The Physiological Response of the Caribbean Reef Shark (*Carcharhinus perezi*) to Longline Capture. *Comp. Biochem. Physiol.—A Mol. Integr. Physiol.* **2012**, *162*, 94–100.
- ⁵⁹ Humborstad, O.B.; Breen, M.; Davis, M.W.; Løkkeborg, S.; Mangor-Jensen, A.; Midling, K.T.; Olsen, R.E. Survival and Recovery of Longline- and Pot-Caught Cod (*Gadus morhua*) for Use in Capture-Based Aquaculture (CBA). *Fish. Res.* **2016**, *174*, 103–108.
- ⁶⁰ Afonso, A.S.; Hazin, F.H.V. Post-Release Survival and Behavior and Exposure to Fisheries in Juvenile Tiger Sharks, *Galeocerdo cuvier*, from the South Atlantic. *J. Exp. Mar. Biol. Ecol.* **2014**, *454*, 55–62.
- ⁶¹ Brown, C.; Dorey, C. Pain and Emotion in Fishes—Fish Welfare Implications for Fisheries and Aquaculture. *Anim. Stud. J.* **2019**, *8*, 175–201.
- ⁶² Hutchinson, M.; Siders, Z.; Stahl, J.; Bigelow, K. *Quantitative Estimates of Post-Release Survival Rates of Sharks Captured in Pacific Tuna Longline Fisheries Reveal Handling and Discard Practices that Improve Survivorship*; Pacific Islands Fisheries Science Center: Honolulu, HI, USA, 2021; p. 61.
- ⁶³ Lambert, H.; Cornish, A.; Elwin, A.; D’cruze, N.; D’cruze, N. A Kettle of Fish: A Review of the Scientific Literature for Evidence of Fish Sentience. *Animals* **2022**, *12*, 1182.
- ⁶⁴ Cajjiga, R.M. Shark Finning Legislation and Shark Welfare. An Analysis of the Kristin Jacobs Ocean Conservation Act. *Derecho Anim. Forum Anim. Law Stud.* **2021**, *12*, 78–110.
- ⁶⁵ Iloulian, J. From Shark Finning to Shark Fishing: A Strategy for the U.S. & EU to Combat Shark Finning in China & Hong Kong. *Duke Environ. Law Policy Forum* **2017**, *27*, 345–364.
- ⁶⁶ Van Houtan, K.S.; Gagné, T.O.; Reygondeau, G.; Tanaka, K.R.; Palumbi, S.R.; Jorgensen, S.J. Coastal Sharks Supply the Global Shark Fin Trade: Sourcing Shark Fins. *Biol. Lett.* **2020**, *16*, 9–12.
- ⁶⁷ Lauder GV, Di Santo V. 2015. Swimming mechanics and energetics of elasmobranch fishes. *Fish Physiology* *34*, 219-253.
- ⁶⁸ D’Cruze, N.; Assou, D.; Coulthard, E.; Norrey, J.; Megson, D.; Macdonald, D.W.; Harrington, L.A.; Ronfot, D.; Segniagbeto, G.H.; Auliya, M. Snake Oil and Pangolin Scales: Insights into Wild Animal Use at “Marché Des Fétiches” Traditional Medicine Market, Togo. *Nat. Conserv.* **2020**, *39*, 45–71.
- ⁶⁹ Challender, D.; Baillie, J.E.M.; Waterman, C.; Shepherd, C.R. On Scaling up Pangolin Conservation. *TRAFFIC Bull.* **2016**, *28*, 19–21.
- ⁷⁰ Challender, D.; Waterman, C.; Baillir, J. *Scaling up Pangolin Conservation*; Zoological Society of London: London, UK, 2014; pp. 19–21.
- ⁷¹ Gaubert, P.; Antunes, A.; Meng, H.; Miao, L.; Peigné, S.; Justy, F.; Njiokou, F.; Dufour, S.; Danquah, E.; Alahakoon, J.; et al. The Complete Phylogeny of Pangolins: Scaling Up Resources for the Molecular Tracing of the Most Trafficked Mammals on Earth. *J. Hered.* **2018**, *109*, 347–359.
- ⁷² Moorhouse, T.P.; Coals, P.G.; D’Cruze, N.C.; Macdonald, D.W. Reduce or Redirect? Which Social Marketing Interventions Could Influence Demand for Traditional Medicines? *Biol. Conserv.* **2020**, *242*, 108391.
- ⁷³ Challender, D.W.S. Asian Pangolins: Increasing Affluence Driving Hunting Pressure. *TRAFFIC Bull.* **2011**, *23*, 92–93.
- ⁷⁴ Challender, D.W.; Harrop, S.R.; MacMillan, D.C. Understanding Markets to Conserve Trade-Threatened Species in CITES. *Biol. Conserv.* **2015**, *187*, 249–259.

- ⁷⁵ Challender, D.W.S.; Heinrich, S.; Shepherd, C.R.; Katsis, L.K.D. International Trade and Trafficking in Pangolins, 1900–2019. In *Pangolins: Science, Society and Conservation*; Challender, D.W.S., Nash, H., Waterman, C., Eds.; Academic Press: London, UK, 2020; pp. 259–276. ISBN 978-0-12-815507-3.
- ⁷⁶ D’Cruze, N.; Singh, B.; Mookerjee, A.; Harrington, L.A.; Macdonald, D.W. A Socio-Economic Survey of Pangolin Hunting in Assam, Northeast India. *Nat. Conserv.* **2018**, *30*, 83–105.
- ⁷⁷ Pietersen DW, McKechnie AE, Jansen R. 2014. Home range, habitat selection and activity patterns of an arid-zone population of Temminck's ground pangolins, *Smutsia temminckii*. *African Journal of Ecology*, *53*, 1-11.
- ⁷⁸ Bridgeland-Stephens, L. The Illegal Wildlife Trade: Through The Eyes of a One-Year-Old Pangolin (*Manis Javanica*). *Anim. Stud. J.* **2020**, *9*, 111–146.
- ⁷⁹ Chin, S.; Pantel, S. Pangolin Capture and Trade in Malaysia. In *Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia*; Pantel, S., Chin, S., Eds.; TRAFFIC Southeast Asia: Petaling Jaya, Malaysia, 2009; pp. 143–160.
- ⁸⁰ Newton, P.; Van Thai, N.; Robertson, S.; Bell, D. Pangolins in Peril: Using Local Hunters’ Knowledge to Conserve Elusive Species in Vietnam. *Endanger. Species Res.* **2008**, *6*, 41–53.
- ⁸¹ Simo, F.T.; Difouo, G.F.; Kekeunou, S.; Ichu, I.G.; Ingram, D.J.; Olson, D. Pangolin Hunting and Trafficking in the Forest–Savannah Transition Area of Cameroon. *Oryx* **2023**, *57*, 704–713.
- ⁸² Wanli, Y. Experts Face Hurdles in Observations of Habitats. *China Daily*, 9 November 2019.
- ⁸³ Clark, L.; Van Thai, N.; Quang Phuong, T. A Long Way from Home: The Health Status of Asian Pangolins Confiscated from the Illegal Wildlife Trade in Viet Nam. In *Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia*; Pantel, S., Chin, S., Eds.; TRAFFIC: Petaling Jaya, Malaysia, 2009; pp. 111–118.
- ⁸⁴ Garshelis, D.L., Pigeon, K., Hwang, M., Hsiu, Proctor, M., McShea, W.J., Fuller, A.K., Morin, D.J., 2022. The need to step-up monitoring of Asian bears. *Global Ecology and Conservation* *35*. <https://doi.org/10.1016/j.gecco.2022.e02087>
- ⁸⁵ Kalogeropoulou, S.K., Lloyd, E.J., Rauch, H., Redtenbacher, I., Häfner, M., Burgener, I.A., Painer-Gigler, J., 2022. Chronic cholecystitis: Diagnostic and therapeutic insights from formerly bilefarmed Asiatic black bears (*Ursus thibetanus*). *PLoS ONE* *17*, 1–15. <https://doi.org/10.1371/journal.pone.0264391>
- ⁸⁶ Bando, M.K.H., Nelson, O.L., Kogan, C., Sellon, R., Wiest, M., Bacon, H.J., Hunter-Ishikawa, M., Leadbeater, W., Yamazaki, K., Jin, Y., Komatsu, T., McGeachy, D., 2019. Metabolic derangements and reduced survival of bile-extracted Asiatic black bears (*Ursus thibetanus*). *BMC Veterinary Research* *15*, 1–16. <https://doi.org/10.1186/s12917-019-2006-6>
- ⁸⁷ Kikuchi, R., 2012. Captive Bears in Human-Animal Welfare Conflict: A Case Study of Bile Extraction on Asia’s Bear Farms. *Journal of Agricultural and Environmental Ethics* *25*, 55–77. <https://doi.org/10.1007/s10806-010-9290-2>
- ⁸⁸ Li, P.J., 2004. Rehabilitating rescued Chinese farm bears (*Ursus thibetanus*): Results, limitations, and implications. *Journal of Wildlife Rehabilitation* *27*, 4–15.
- ⁸⁹ Loeffler, I.K., Robinson, J., Cochrane, G., 2009. Compromised health and welfare of bears farmed for bile in China. *Animal Welfare* *18*, 225–235.
- ⁹⁰ Nakajima A, Koike S, Yamazaki K, Kozakai C, Nemoto Y, Masaki T, Kaji K. 2018. Feeding habits of Asian black bears (*Ursus thibetanus*) in relation to the abundance and timing of fruiting in 13 tree species. *Mammal Study*, *43*: 167-178.
- ⁹¹ Dahle B, Støen O-G, Swenson J.E. 2006. Factors influencing home-range size in subadult brown bears. *Journal of Mammalogy*, *87*: 859-865.
- ⁹² Fitz. 2025. Bonding behaviour of sister brown bears with different aged offspring. *Ursus*, *36e5*:1-8.

- ⁹³ Green, J., Schmidt-Burbach, J., Kukreja, K., Guillon, E., 2022. Bear with me: Understanding motivations for bear farming in Vietnam. *Frontiers in Conservation Science* 3, 1–12. <https://doi.org/10.3389/fcosc.2022.913263>
- ⁹⁴ Feng, Y., Siu, K., Wang, N., Ng, K.M., Tsao, S.W., Nagamatsu, T., Tong, Y., 2009. Bear bile: Dilemma of traditional medicinal use and animal protection. *Journal of Ethnobiology and Ethnomedicine* 5, 1–9. <https://doi.org/10.1186/1746-4269-5-2>
- ⁹⁵ Kaho Herkules Bando, M., Lynne Nelson, O., Acvim, D., Webster, N., Ecvdi, D., Ramsay, J.D., Acvp, D., Jane Bacon, H., Sellon, R., 2018. Aortic Aneurysm, Dissection, and Rupture in Six Bile-Farmed Bears. *Journal of Zoo and Wildlife Medicine* 49, 738–747.
- ⁹⁶ Vickery, S., Mason, G., 2004. Stereotypic behavior in Asiatic black and Malayan sun bears. *Zoo Biology* 23, 409–430. <https://doi.org/10.1002/zoo.20027>
- ⁹⁷ Reverberi, M. Edible Insects: Cricket Farming and Processing as an Emerging Market. *J. Insects Food Feed* **2020**, 6, 211–220.
- ⁹⁸ Rowe, A. Insects Raised for Food and Feed—Global Scale, Practices, and Policy—Rethink Priorities. Available online: <https://rethinkpriorities.org/publications/insects-raised-for-food-and-feed> (accessed on 24 February 2022).
- ⁹⁹ Lambert, H.; Elwin, A.; D’Cruze, N. Wouldn’t Hurt a Fly? A Review of Insect Cognition and Sentience in Relation to Their Use as Food and Feed. *Appl. Anim. Behav. Sci.* **2021**, 243, 105432.
- ¹⁰⁰ Barrett, M.; Chia, S.Y.; Fischer, B.; Tomberlin, J.K. Welfare Considerations for Farming Black Soldier Flies, *Hermetia Illucens* (Diptera: Stratiomyidae): A Model for the Insects as Food and Feed Industry. *J. Insects Food Feed* **2022**, 9, 119–148.
- ¹⁰¹ van Huis, A. Welfare of Farmed Insects. *J. Insects Food Feed* **2019**, 5, 573–584.
- ¹⁰² Schöneich s. 2020. Neuroethology of acoustic communication in field crickets - from signal generation to song recognition in an insect brain. *Progress in Neurobiology*. 194: 101882.
- ¹⁰³ Alexander RD. 1961. Aggressiveness, territoriality, and sexual behaviour in field crickets. *Behaviour*. 17: 130-223.
- ¹⁰⁴ Booth DT, Kiddell K. 2007. Temperature and the energetics of development in the house cricket (*Acheta domesticus*). *Journal of Insect Physiology*. 53: 950-953.
- ¹⁰⁵ Barrett M, Fischer B. 2023. Challenges in farmed insect welfare: Beyond the question of sentience. *Animal Welfare*. 32: e4.
- ¹⁰⁶ Rowe, E.; López, K.Y.R.; Robinson, K.M.; Baudier, K.M.; Barrett, M. Farmed Cricket (*Acheta Domesticus*, *Gryllus Assimilis*, and *Gryllobes Sigillatus*; Orthoptera) Welfare Considerations: Recommendations for Improving Global Practice. *J. Insects Food Feed* **2024**, 10, 1253–1311.
- ¹⁰⁷ Sherwin, C.M. Can Invertebrates Suffer? Or, How Robust Is Argument-by-Analogy? *Anim. Welf.* **2001**, 10, 103–118.
- ¹⁰⁸ Boppré, M.; Vane-Wright, R.I. Welfare Dilemmas Created by Keeping Insects in Captivity. In *The Welfare of Invertebrate Animals*; Springer: Cham, Switzerland, 2019; pp. 23–67.
- ¹⁰⁹ Lundy, M.E.; Parrella, M.P. Crickets Are Not a Free Lunch: Protein Capture from Scalable Organic Side-Streams via High-Density Populations of *Acheta Domesticus*. *PLoS ONE* **2015**, 10, e0118785.
- ¹¹⁰ Erens, J.; van Es, S.; Haverkort, F.; Kapsomenou, E.; Luijben, A. A Bug’s Life. In *Large-Scale Insect Rearing in Relation to Animal Welfare*; Wageningen University: Wageningen, The Netherlands, 2012; pp. 16–18.
- ¹¹¹ van Huis, A. Edible Insects and Research Needs. *J. Insects Food Feed* **2017**, 3, 3–5.
- ¹¹² van Huis, A. Insects as Food and Feed, a New Emerging Agricultural Sector: A Review. *J. Insects Food Feed*. **2020**, 6, 27–44.
- ¹¹³ Yue, S. The Welfare of Crustaceans at Slaughter. *Agribus. Rep.* **2008**, 2008, 5.

- ¹¹⁴ Auliya, M.; Altherr, S.; Nithart, C.; Hughes, A.; Bickford, D. Numerous Uncertainties in the Multifaceted Global Trade in Frogs' Legs with the EU as the Major Consumer. *Nat. Conserv.* **2023**, *51*, 71–135.
- ¹¹⁵ Altherr, S.; Auliya, M.; Nithart, C. *Deadly Dish: Role and Responsibility of the European Union in the International Frogs' Leg Trade*; Pro Wildlife and Robin des Bois: Munich, Germany; Paris, France, 2022; pp. 1–28.
- ¹¹⁶ Hughes, A.C. Wildlife Trade. *Curr. Biol.* **2021**, *31*, R1218–R1224.
- ¹¹⁷ Dodd, C.K.; Jennings, M.R. How to Raise a Bullfrog—The Literature on Frog Farming in North America 1 2. *Bibl. Herpetol.* **2021**, *15*, 77–100.
- ¹¹⁸ Raj, P., Dinesh, K. P., Das, A., Dutta, S. K., Kar, N. B., Mohapatra, P. P. (2018). Two new species of cricket frogs of the genus *Fejervarya* Bolkay, 1915 (Anura: Dicroglossidae) from the Peninsular India. *Records of the Zoological Survey of India*, 118 (1), 1-21.
- ¹¹⁹ Lalfakawmi C, Vanlalchhuana M, Lalrinsanga, Lalbiakzuala, Lalremsanga HT. 2019. The breeding biology of *Fejervarya limnocharis* complex, *F. multistriata* (Hallowell, 1861) in Mizoram, northeast India. *Science Vision*, 19: 134-143.
- ¹²⁰ Grano, M. The Asian Market of Frogs as Food for Humans during COVID-19. Risk and Consequences for Public Health. *Med. Pap.* **2020**, *6*, 77–87.
- ¹²¹ Kusriani, M.D.; Alford, R.A. Indonesia's Exports of Frogs' Legs. *TRAFFIC Bull.* **2006**, *21*, 13–24.
- ¹²² Gratwicke, B.; Evans, M.J.; Jenkins, P.T.; Kusriani, M.D.; Moore, R.D.; Sevin, J.; Wildt, D.E. Is the International Frog Legs Trade a Potential Vector for Deadly Amphibian Pathogens? *Front. Ecol. Environ.* **2010**, *8*, 438–442.
- ¹²³ Hewitt, L.; Small, A. Welfare of Farmed Crocodylians: Identification of Potential Animal-Based Measures Using Elicitation of Expert Opinion. *Animals* **2021**, *11*, 3450.
- ¹²⁴ IUCN Farming and the Crocodile Industry. Available online: <http://www.iucncsg.org/pages/Farming-and-the-Crocodile-Industry.html> (accessed on 13 March 2023).
- ¹²⁵ Delbosc NC, Boyer N, Mathevon N, Grimault N. 2025. Crocodile mothers' response to hatchling calls. *Animal Behaviour*. 220, 123040.
- ¹²⁶ Baker CJ, Frere CH, Franklin CE, Campbell HA, Irwin TR, Dwyer RG. 2023. Long-term tracking reveals a dynamic crocodylian social system. *Animal Behaviour*, 199: 59-78.
- ¹²⁷ Isberg, S.R. Farming Dinosaur Cousins: The Unique Welfare Challenges of Farming Crocodiles. *Breed. Focus* **2016**, 67–76.
- ¹²⁸ Brien, M.L.; Webb, G.J.; Lang, J.W.; McGuinness, K.A.; Christian, K.A. Born to Be Bad: Agonistic Behaviour in Hatchling Saltwater Crocodiles (*Crocodylus Porosus*). *Behaviour* **2013**, *150*, 737–762.
- ¹²⁹ Campbell, D.L.M.; Hewitt, L.; Lee, C.; Timmerhues, C.A.; Small, A.H. Behaviours of Farmed Saltwater Crocodiles (*Crocodylus porosus*) Housed Individually or in Groups. *Front. Vet. Sci.* **2024**, *11*, 1394198.
- ¹³⁰ Isberg, S.R.; Shilton, C.M. Stress in Farmed Saltwater Crocodiles (*Crocodylus Porosus*): No Difference between Individually- and Communally-Housed Animals. *SpringerPlus* **2013**, *2*, 381.
- ¹³¹ Gangloff, E.J.; Greenberg, N. Biology of Stress. In *Health and Welfare of Captive Reptiles*; Warwick, C., Arena, P.C., Burghardt, G.M., Eds.; Springer International Publishing: Cham, Switzerland, 2023; pp. 93–142. ISBN 978-3-030-86012-7.
- ¹³² Isberg, S.; Shilton, C.; Thomson, P. *Improving Australia's Crocodile Industry Productivity: Understanding Runtism and Survival*; Rural Industries Research and Development Corporation: Wagga, Australia, 2009.

- ¹³³ Lillywhite, H.B. Physiology and Functional Anatomy. In *Health and Welfare of Captive Reptiles*; Warwick, C., Arena, P.C., Burghardt, G.M., Eds.; Springer International Publishing: Cham, Switzerland, 2023; pp. 7–44. ISBN 978-3-030-86012-7.
- ¹³⁴ Warwick, C.; Arena, P.C.; Burghardt, G.M. (Eds.) *Health and Welfare of Captive Reptiles*; Springer International Publishing: Cham, Switzerland, 2023; ISBN 978-3-030-86011-0.
- ¹³⁵ Huchzermeyer, F.W. Diseases of Farmed Crocodiles and Ostriches. *OIE Rev. Sci. Tech.* **2002**, *21*, 265–276.
- ¹³⁶ Davis, B. Crocodiles in Vietnam Skinned Alive in Service of Fashion. Available online: <https://www.forbes.com/sites/davisbrett/2016/12/22/crocodiles-in-vietnam-skinned-alive-in-service-of-fashion/> (accessed on 7 February 2025).
- ¹³⁷ World Animal Protection Fashion Victims. *The Trade in Australian Saltwater Crocodile Skins*; World Animal Protection Fashion Victims: London, UK, 2021.
- ¹³⁸ Australian Government. *Code of Practice for the Humane Treatment of Wild and Farmed Australian Crocodiles—DCCEEW*; Endorsed by the Natural Resource Management Ministerial Council, Department of the Environment, Water, Heritage and the Arts; Australian Government: Canberra, Australia, 2009; p. 28.
- ¹³⁹ Expert Panel. *Analysis on Humane Killing Methods for Reptiles in the Skin Trade*; Swiss Federal Veterinary Office (FVO): Bern, Switzerland, 2013; p. 10.
- ¹⁴⁰ Hewitt, L.; Niemeyer, D.; Small, A. The Use of a Penetrative Captive Bolt Device during the Killing of Farmed Saltwater Crocodiles (*Crocodylus Porosus*). *J. Appl. Anim. Welf. Sci.* **2024**, *1*–15.
- ¹⁴¹ Warwick, C. Crocodilian Slaughter Methods, with Special Reference to Spinal Cord Severance. *Tex. J. Sci.* **1990**, *42*, 191–198.
- ¹⁴² WOA. Chapter 7.14 Killing of Reptiles for Their Skins, Meat and Other Products. In *OIE Terrestrial Animal Health Code*; Rue de Prony: Paris, France, 2019.
- ¹⁴³ Green, J., Schmidt-Burbach, J., Elwin, A., 2023. Taking stock of wildlife farming: A global perspective. *Global Ecology and Conservation* *43*, e02452. <https://doi.org/10.1016/j.gecco.2023.e02452>
- ¹⁴⁴ Fur Free Alliance, 2023. Global mink fur production halved in two years [WWW Document]. Latest News. URL <https://www.furfreealliance.com/global-mink-fur-production-halved-in-two-years/> (accessed 1.1.25).
- ¹⁴⁵ Warwick, C., Pilny, A., Steedman, C., Grant, R., 2023a. One health implications of fur farming. *Front. Anim. Sci.* *4*, 1249901. <https://doi.org/10.3389/fanim.2023.1249901>
- ¹⁴⁶ Finley, G., Mason, G., Pajor, E., Rouvinen-Watt, K., Rankin, K., 2012. Code of practice for the care and handling of mink: review of scientific research on priority issues. . National Farm Animal Care Council, Lacombe, AB, Canada.
- ¹⁴⁷ Kruska, D., Kruska, D., Schreiber, A., Schreiber, A., 1999. Comparative morphometrical and biochemical-genetic investigations in wild and ranch mink (*Mustela vison*: Carnivora: Mammalia). <http://katalog.pan.pl/webpac-bin/223bzbsPL/wgbroker.exe?new+access+top+search+open+NR+ee95400552>. <https://doi.org/10.4098/AT.arch.99-37>
- ¹⁴⁸ Macdonald, D., Harrington, L., Yamaguchi, N., Thom, M., 2015. Biology, ecology and reproduction of American mink *Neovison vison* on lowland farmland, in: *Wildlife Conservation on Farmland Volume 2: Conflict in the Countryside*. Oxford University Press, Oxford.
- ¹⁴⁹ Kornum AL, Röcklinsberg H, Gjerris M. 2023. The concept of behavioural needs in contemporary fur science: do we know what American mink (*Mustela vison*) really need? *Animal Welfare* *26*.
- ¹⁵⁰ Kizhina AG, Uzenbaeva LB, Ilyukha VA, Trapezova LI, Tyutyunnik NN, Trapezov OV. 2017. Selection for behavior and hemopoiesis in American mink (*Neovison vison*). *Journal of Veterinary Behavior*, *17*, 38-43.

- ¹⁵¹ Marsbøll, A., Henriksen, B., Hansen, B., Møller, S., 2019. Changes in the welfare of mink (*Neovison vison*) with date of assessment in the winter and growth periods have limited effects on the overall Welfur categorisation. *Anim. welf.* 28, 365–380. <https://doi.org/10.7120/09627286.28.3.365>
- ¹⁵² Mason, G.J., Cooper, J., Clarebrough, C., 2001. Frustrations of fur-farmed mink. *Nature* 410, 35–36. <https://doi.org/10.1038/35065157>
- ¹⁵³ Broom, D.M., Fraser, A.F., 2015. The welfare of animals kept for fur production., in: Broom, D.M., Fraser, A.F. (Eds.), *Domestic Animal Behaviour and Welfare*. CABI, UK, pp. 335–339. <https://doi.org/10.1079/9781780645391.0335>
- ¹⁵⁴ Polanco, A., Díez-León, M., Mason, G., 2018. Stereotypic behaviours are heterogeneous in their triggers and treatments in the American mink, *Neovison vison*, a model carnivore. *Animal Behaviour* 141, 105–114. <https://doi.org/10.1016/j.anbehav.2018.05.006>
- ¹⁵⁵ Bak, A.S., Malmkvist, J., 2020. Barren housing and negative handling decrease the exploratory approach in farmed mink. *Applied Animal Behaviour Science* 222, 104901. <https://doi.org/10.1016/j.applanim.2019.104901>
- ¹⁵⁶ Malmkvist, J., Sørensen, D.D., Larsen, T., Palme, R., Hansen, S.W., 2016. Weaning and separation stress: maternal motivation decreases with litter age and litter size in farmed mink. *Applied Animal Behaviour Science* 181, 152–159. <https://doi.org/10.1016/j.applanim.2016.05.028>
- ¹⁵⁷ Mason, G., 1994. The influence of weight, sex, birthdate and maternal age on the growth of weanling mink. *Journal of Zoology* 233, 203–214. <https://doi.org/10.1111/j.1469-7998.1994.tb08584.x>
- ¹⁵⁸ Mason, G.J., 1994. Tail-Biting in Mink (*Mustela Vison*) is Influenced by Age at Removal From the Mother. *Anim. welf.* 3, 305–311. <https://doi.org/10.1017/S0962728600017061>
- ¹⁵⁹ Korhonen, H.T.; Cizinauskas, S.; Jesernics, J. 2012. Electrophysiological study on CO and CO₂ euthanasia in mink (*Mustela vison*). *Annals of Animal Science*, 12(4), 597.
- ¹⁶⁰ Korhonen, H., Cizinauskas, S., Jesernics, J., Eskeli, P., 2012. Electrophysiological indices in mink (*Neovison vison*) during CO and CO₂ euthanasia. *Proceedings of the Xth International Scientific Congress in fur animal production*.
- ¹⁶¹ Raj, M., Mason, G., 1999. Reaction of farmed mink (*Mustela vison*) to argon-induced hypoxia. *Veterinary Record* 145, 736–737. <https://doi.org/10.1136/vr.145.25.736>
- ¹⁶² Fenollar, F., Mediannikov, O., Maurin, M., Devaux, C., Colson, P., Levasseur, A., Fournier, P.-E., Raoult, D., 2021. Mink, SARS-CoV-2, and the Human-Animal Interface. *Front. Microbiol.* 12, 663815. <https://doi.org/10.3389/fmicb.2021.663815>
- ¹⁶³ Rabalski, L., Kosinski, M., Smura, T., Aaltonen, K., Kant, R., Sironen, T., Szewczyk, B., Grzybek, M., 2021. Severe Acute Respiratory Syndrome Coronavirus 2 in Farmed Mink (*Neovison vison*), Poland. *Emerg. Infect. Dis.* 27, 2333–2339. <https://doi.org/10.3201/eid2709.210286>
- ¹⁶⁴ Green, J.; Jakins, C.; Asfaw, E.; Parker, A.; de Waal, L.; D’Cruze, N. Welfare Concerns Associated with Captive Lions (*Panthera Leo*) and the Implications for Commercial Lion Farms in South Africa. *Anim. Welf.* 2022, 31, 209–218.
- ¹⁶⁵ Van der Merwe, P.; Melville, S.; Jauntelle, E.; Andrea, S. The Economic Significance of Lion Breeding Operations in the South African Wildlife Industry. *Int. J. Biodivers. Conserv.* 2017, 9, 314–322.
- ¹⁶⁶ Coals, P.; Burnham, D.; Loveridge, A.; Macdonald, D.W.; ‘T Sas-Rolfes, M.; Williams, V.L.; Vucetich, J.A. The Ethics of Human–Animal Relationships and Public Discourse: A Case Study of Lions Bred for Their Bones. *Animals* 2019, 9, 52.
- ¹⁶⁷ Schroeder, R.A. Moving Targets: The ‘Canned’ Hunting of Captive-Bred Lions in South Africa. *Afr. Stud. Rev.* 2018, 61, 8–32.
- ¹⁶⁸ Williams, V.L.; Sas-Rolfes, M.J. Born Captive: A Survey of the Lion Breeding, Keeping and Hunting Industries in South Africa. *PLoS ONE* 2019, 14, e0217409.

- ¹⁶⁹ Packer C, Pusey AE. 1997. Divided we fall: Cooperation among lions. *Scientific American* 32-39.
- ¹⁷⁰ Loveridge AJ, Valeix M, Chapron G, Davidson Z, Mtare G, Macdonald DW. 2016. Conservation of large predator populations: demographic and spatial responses of African lions to the intensity of trophy hunting. *Biological Conservation* 201: 166-175.
- ¹⁷¹ Mosser, A., & Packer, C. (2009). Group territoriality and the benefits of sociality in the African lion. *Animal Behaviour*, 78(2), 359-370.
- ¹⁷² McComb K, Packer C, Pusey A. 1994. Roaring and numerical assessment in contests between groups of female lions, *Panthera leo*. *Animal Behaviour*. 47: 379-387.
- ¹⁷³ Fourage, A., Taylor, T., Wiek, E. *et al.* Increase in the number of captive lions in Thailand suggests ineffective legislation. *Discov Conserv* 2, 19 (2025).
- ¹⁷⁴ NSPCA. *Overview of Inspection to Lion Breeding Farms by the National Wildlife Protection Unit Inspectorate during the Period March 2016-June 2017*; National Society for Prevention of Cruelty to Animals (NSPCA): Alberton, South Africa, 2017.
- ¹⁷⁵ Green, J.; Jakins, C.; Asfaw, E.; Bruschi, N.; Parker, A.; de Waal, L.; D'cruze, N. African Lions and Zoonotic Diseases: Implications for Commercial Lion Farms in South Africa. *Animals* 2020, 10, 1692.
- ¹⁷⁶ Wilson, A.; Phillips, C.J.C. Identification and Evaluation of African Lion (*Panthera Leo*) Cub Welfare in Wildlife-interaction Tourism. *Animals* 2021, 11, 2748.
- ¹⁷⁷ Wilson, A.; Phillips, C.J.C. 2021. Identification and evaluation of African lion (*Panthera leo*) cub welfare in wildlife-interaction tourism. *Animals*, 11, 2748.
- ¹⁷⁸ Khan, B. N., Ahmad, R., Ali, Z., Mehmood, S., Raza, H., Azhar, M., & Zakir, A. (2018). Impact of different captive environmental conditions on behavior of African lions and their welfare at Lahore Zoo and Safari Zoo, Lahore. *Pakistan Journal of Zoology*, 50(2), 523-531.
- ¹⁷⁹ Schmidt Burbach, J.; Hartley-Backhouse, L. *Elephants Not Commodities-Taken for a Ride 2; Taken for a Ride*; World Animal Protection: London, UK, 2020; p. 80.
- ¹⁸⁰ Schmidt-Burbach, J. Taken for a Ride. The Conditions for Elephants Used in Tourism in Asia. 2017. Available online: <https://www.cabidigitallibrary.org/doi/pdf/10.5555/20193151766> (accessed on 1 January 2025).
- ¹⁸¹ Baskaran, N.; Varma, S.; Sar, C.K.; Sukumar, R. Current Status of Asian Elephants in India. *Gajah* 2011, 35, 47-54.
- ¹⁸² Lahdenperä, M.; Mar, K.U.; Courtiol, A.; Lummaa, V. Differences in Age-Specific Mortality between Wild-Caught and Captive-Born Asian Elephants. *Nat. Commun.* 2018, 9, 3023.
- ¹⁸³ How the Travel Industry Is Working to Improve the Welfare of Elephants in Tourism | ABTA. Available online: <https://www.abta.com/sustainability/animal-welfare/how-travel-industry-working-improve-welfare-elephants-tourism> (accessed on 20 March 2025).
- ¹⁸⁴ Crawley, J.A.H.; Lahdenperä, M.; Min Oo, Z.; Htut, W.; Nandar, H.; Lummaa, V. Taming Age Mortality in Semi-Captive Asian Elephants. *Sci. Rep.* 2020, 10, 1889.
- ¹⁸⁵ Kontogeorgopoulos, N. Wildlife Tourism in Semi-Captive Settings: A Case Study of Elephant Camps in Northern Thailand. *Curr. Issues Tour.* 2009, 12, 429-449.
- ¹⁸⁶ Warwick, C.; Pilny, A.; Steedman, C.; Grant, R. Elephant Tourism: An Analysis and Recommendations for Public Health, Safety, and Animal Welfare. *Int. J. One Health* 2023, 9, 49-66.

- ¹⁸⁷ Bansiddhi, P.; Brown, J.L.; Khonmee, J.; Norkaew, T.; Nganvongpanit, K.; Punyapornwithaya, V.; Angkawanish, T.; Somgird, C.; Thitaram, C. Management Factors Affecting Adrenal Glucocorticoid Activity of Tourist Camp Elephants in Thailand and Implications for Elephant Welfare. *PLoS ONE* **2019**, *14*, e0221537.
- ¹⁸⁸ Mason GJ, Veasey JS. 2010. How should the psychological well-being of zoo elephants be objectively investigated. *Zoo Biology*, *29*: 237-255.
- ¹⁸⁹ Fagen, A., Acharya, N., & Kaufman, G. E. (2014). *Positive Reinforcement Training for a Trunk Wash in Nepal's Working Elephants: Demonstrating Alternatives to Traditional Elephant Training Techniques*. *Journal of Applied Animal Welfare Science*, *17*(2), 83-97.
- ¹⁹⁰ Fernando, P., Wikramanayake, E. D., Janaka, H. K., Jayasinghe, L. K. A., Gunawardena, M., Kotagama, S. W., Weerakoon, D., & Pastorini, J. 2008. Ranging behavior of the Asian elephant in Sri Lanka. *Mammalian Biology* *73*(1): 2-13.
- ¹⁹¹ Nair, S., Balakrishnan, R., Seelamantula, C. S., & Sukumar, R. (2009). Vocalizations of wild Asian elephants (*Elephas maximus*): Structural classification and social context. *The Journal of the Acoustical Society of America*, *126*(5), 2768-2778.
- ¹⁹² Schulte, B. A. 2000. Social structure and helping behavior in captive elephants. *Zoo Biology* *19*:447-459.
- ¹⁹³ Jacobson, S. L., Dechanupong, J., Horpiencharoen, W., Yindee, M., & Plotnik, J. M. 2023. Innovating to solve a novel puzzle: wild Asian elephants vary in their ability to problem solve. *Animal Behaviour* *205*:227-239.
- ¹⁹⁴ Bradshaw, G.A.; Schore, A.N.; Brown, J.L.; Poole, J.H.; Moss, C.J. Elephant Breakdown. *Nature* **2005**, *433*, 807.
- ¹⁹⁵ Plotnik, J.M.; de Waal, F.B.M. Asian Elephants (*Elephas Maximus*) Reassure Others in Distress. *PeerJ* **2014**, *2*, e278.
- ¹⁹⁶ Baker, L.; Winkler, R. Asian Elephant Rescue, Rehabilitation and Rewilding. *Anim. Sentience* **2020**, *5*.
- ¹⁹⁷ Schmidt-Burbach, J., Hartley-Backhouse, L., 2020. Behind the smile. The multibillion-dollar dolphin entertainment industry. *World Animal Protection*.
- ¹⁹⁸ Vail, C.S., Reiss, D., Brakes, P., Butterworth, A., 2020. Potential Welfare Impacts of Chase and Capture of Small Cetaceans during Drive Hunts in Japan. *Journal of Applied Animal Welfare Science* *23*, 193-208. <https://doi.org/10.1080/10888705.2019.1574576>
- ¹⁹⁹ Daly, N., 2019. Orcas don't do well in captivity. Here's why. *National Geographic*.
- ²⁰⁰ Vail, C.S.; Reiss, D.; Brakes, P.; Butterworth, A. **2020**. Potential welfare impacts of chase and capture of small cetaceans during drive hunts in Japan. *Journal of Applied Animal Welfare Science*, *23*, 193-208. <https://doi.org/10.1080/10888705.2019.1574576>.
- ²⁰¹ Jiang, Y., Lück, M., Parsons, E.C.M., 2008. Public Awareness, Education, and Marine Mammals in Captivity. *Tourism Review International* *11*, 237-249. <https://doi.org/10.3727/154427207783948829>
- ²⁰² Gubbins, C. **2002**. Use of home ranges by resident bottlenose dolphins (*Tursiops truncatus*) in a South Carolina estuary. *Journal of Mammalogy*, *83*, 178-187.
- ²⁰³ Gubbins C. 2002. Use of home ranges by resident bottlenose dolphins (*Tursiops truncatus*) in a South Carolina Estuary. *Journal of Mammalogy*. *83*: 178-187.
- ²⁰⁴ Jacobs E, Wei C, Erbe C, Mann J. 2025. Cultural transmission of animal tool use driven by trade-offs: insights from sponge-using dolphins. *Royal Society Open Science*. *12*: 241900.
- ²⁰⁵ Pack AA, Herman LM. 2006. Dolphin social cognition and joint attention: our current understanding. *Aquatic Mammals* *32*: 443-460.
- ²⁰⁶ Eisenberg JF. 1986. Dolphin Behavior and Cognition: Evolutionary and Ecological Aspects *In Dolphin Cognition and Behavior*. Psychology Press.

- ²⁰⁷ Marino, L., 2018. The Marine Mammal Captivity Issue: Time for a Paradigm Shift. *The Palgrave Handbook of Practical Animal Ethics* 207–231. https://doi.org/10.1057/978-1-137-36671-9_13
- ²⁰⁸ Bruck, J.N., 2024. The Cetacean Sanctuary: A Sea of Unknowns. *Animals* 14, 335. <https://doi.org/10.3390/ani14020335>.
- ²⁰⁹ Marino, L. 2018. The marine mammal captivity issue: Time for a paradigm shift. In *The Palgrave Handbook of Practical Animal Ethics*; Palgrave Macmillan: London, UK; pp. 207–231. https://doi.org/10.1057/978-1-137-36671-9_13
- ²¹⁰ Sobel N, Supin AY, and Myslobodsky MS. 1994. Rotational swimming tendencies in the dolphin (*Tursiops truncatus*). *Behavioural Brain Research*, 65, 41-45.
- ²¹¹ Mason GJ. 1991, Stereotypies: A critical review. *Animal Behaviour*, 41, 1015-1037.
- ²¹² Anderson, R., Waayers, R., Knight, A., 2016. Orca behavior and subsequent aggression associated with oceanarium confinement. *Animals* 6, 1–16. <https://doi.org/10.3390/ani6080049>
- ²¹³ Marino, L., Frohoff, T., 2011. Towards a New Paradigm of Non-Captive Research on Cetacean Cognition. *PLoS ONE* 6, e24121. <https://doi.org/10.1371/journal.pone.0024121>.
- ²¹⁴ Nobel, J., 2010. Do Animals Commit Suicide? A Scientific Debate. *TIME*.
- ²¹⁵ Peña-Guzmán, D.M., 2017. Can nonhuman animals commit suicide? *Animal Sentience* 2, 1–25. <https://doi.org/10.51291/2377-7478.1201>.
- ²¹⁶ Marino, L., 2020. Large Brains in Small Tanks: Intelligence and Social Complexity as an Ethical Issue for Captive Dolphins and Whales, in: Johnson, L.S.M. (Ed.), *Neuroethics and Nonhuman Animals*. pp. 177–189.
- ²¹⁷ Anderson, R.; Waayers, R.; Knight, A. 2016. Orca behavior and subsequent aggression associated with oceanarium confinement. *Animals*, 6, 1–16. <https://doi.org/10.3390/ani6080049>
- ²¹⁸ Marques D. In Brazil's wildlife care centers, struggles and successes go unseen [Internet]. *Mongabay Environmental News*. 2021 [cited 2025 Jul 25]. Available from: <https://news.mongabay.com/2021/11/in-brazils-wildlife-care-centers-struggles-and-successes-go-unseen/>
- ²¹⁹ Animal Politico Staff. Black Jaguar-White Tiger: Abuse and death of felines reported in Ajusco sanctuary; Profepa is already verifying the area. *Animal Politico*. 2022 Jul 4;
- ²²⁰ Animal Politico Staff. Authorities negligent in Ajusco animal sanctuary case, alleges zoos association. *Animal Politico*. 2022 Jul 6.
- ²²¹ Ghanekar N. Facing space and resource crunch, North East states to build new shelters for seized wildlife [Internet]. *Mongabay-India*. 2023 [cited 2025 Jul 27]. Available from: <https://india.mongabay.com/2023/06/facing-space-and-resource-crunch-north-east-states-to-build-new-shelters-for-seized-wildlife/>
- ²²² Perinchery A, Bhattacharya A. Animals Go 'Missing' in West Bengal Zoos, Official Numbers Don't Tally [Internet]. *The Wire*. 2025 [cited 2025 Jul 27]. Available from: <https://thewire.in/government/animals-go-missing-in-west-bengal-zoos-official-numbers-dont-tally>
- ²²³ Jones, K.E.; Patel, N.G.; Levy, M.A.; Storeygard, A.; Balk, D.; Gittleman, J.L.; Daszak, P. Global Trends in Emerging Infectious Diseases. *Nature* 2008, 451, 990–993.
- ²²⁴ Can, Ö.E.; D'Cruze, N.; Macdonald, D.W. Dealing in Deadly Pathogens: Taking Stock of the Legal Trade in Live Wildlife and Potential Risks to Human Health. *Glob. Ecol. Conserv.* 2019, 17, e00515.
- ²²⁵ Petrovan, S.O.; Aldridge, D.C.; Bartlett, H.; Bladon, A.J.; Booth, H.; Broad, S.; Broom, D.M.; Burgess, N.D.; Cleaveland, S.; Cunningham, A.A.; et al. Post COVID-19: A Solution Scan of Options for Preventing Future Zoonotic Epidemics. *Biol. Rev. Camb. Philos. Soc.* 2021, 96, 2694–2715.

- ²²⁶ Karesh, W.B.; Cook, R.A.; Bennett, E.L.; Newcomb, J. Wildlife Trade and Global Disease Emergence. *Emerg. Infect. Dis.* **2005**, *11*, 1000–1002.
- ²²⁷ Chapman, B. Coronavirus Could Deliver \$8.8 Trillion Hit to Global Economy without Government Intervention, Bank Says. *The Independent*, 15 May 2020.
- ²²⁸ IPBES. *Summary for Policymakers of the Sustainable Use of Wild Species Assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)*; Fromentin, J., Emery, M., Donaldson, J., Danner, M., Hallosserie, A., Kieling, D., Balachander, G., Barron, E., Prasad, R., Gasalla, M., et al., Eds.; Intergovernmental Science, IPBES: Bonn, Germany, 2022.
- ²²⁹ Patrick.Tonissen “Escaping the Era of Pandemics” IPBES #PandemicsReport Now Available | IPBES Secretariat. Available online: <https://www.ipbes.net/pandemics-marquee>
- ²³⁰ Summary for Policymakers—Invasive Alien Species Assessment | IPBES Secretariat. Available online: <https://www.ipbes.net/document-library-catalogue/summary-policymakers-invasive-alien-species-assessment>
- ²³¹ IPBES. *Transformative Change Assessment’: Focus on the Underlying Causes of Biodiversity Crisis, Obstacles and Options for Just & Sustainable World. Strategies & Actions to Enable Fundamental System-Wide Reorganization; Science and Policy for People and Nature*; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services: Bonn, Germany, 2024.
- ²³² Moorhouse, T.P., Elwin, A., D’Cruze, N.C., 2024. Demand reduction campaigns could reduce the domestic trade in illegal wildlife in Peru. *Biological Conservation* *290*, 110458. <https://doi.org/10.1016/j.biocon.2024.110458>
- ²³³ Crudge, B., Nguyen, T., Cao, T.T., 2020. The challenges and conservation implications of bear bile farming in Viet Nam. *Oryx* *54*, 252–259. <https://doi.org/10.1017/S0030605317001752>
- ²³⁴ UNEP, 2024. Alternative Livelihoods A STAP background note.
- ²³⁵ Moorhouse, T.P.; Zhou, Z.M.; Shao, M.L.; Zhou, Y.; Elwin, A.; D’Cruze, N.C.; Macdonald, D.W. **2022**. Substitutes for wildlife-origin materials as described in China’s “TCM” research literature. *Global Ecology and Conservation*, *34*, e02042.
- ²³⁶ Fur Free Retailer, 2024. The Future of Fashion [WWW Document]. Fur Free Retailer. URL <https://furfreeretailer.com/> (accessed 6.13.24).

We are World Animal Protection.

We end the needless suffering of animals.

We influence decision makers to put animals on the global agenda.

We help the world see how important animals are to all of us.

We inspire people to change animals' lives for the better.

We move the world to protect animals.

World Animal Protection

 +44 (0)20 7239 0500

 info@worldanimalprotection.org

 W: worldanimalprotection.org

 [/world-animal-protection](https://www.linkedin.com/company/world-animal-protection)

 [/WorldAnimalProtectionInt](https://www.facebook.com/WorldAnimalProtectionInt)

 [/MoveTheWorld](https://twitter.com/MoveTheWorld)

 [/AnimalProtection](https://www.youtube.com/AnimalProtection)

 [/world_animal_protection_uk](https://www.instagram.com/world_animal_protection_uk)

 [/worldanimalprotection](https://www.tiktok.com/worldanimalprotection)

Copyright © World Animal Protection

11.25