2005

Role of private owners in the conservation of exotic species

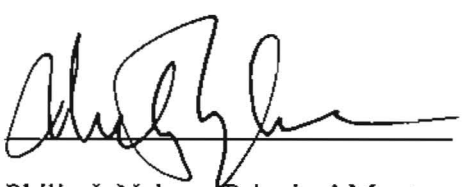
Jessica L. Beetz
Colby College

THE ROLE OF PRIVATE OWNERS IN THE CONSERVATION OF EXOTIC SPECIES

JESSICA L. BEETZ
COLBY COLLEGE
2005

A thesis submitted to the Environmental Studies Program
in partial fulfillment of the requirements
for graduation with

Honors
in
Environmental Studies



Philip J. Nyhus , Principal Mentor

Russell Cole, Second Reader

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This study examines the private ownership of exotic species, a topic very relevant to conservation that has long been ignored in the public sphere of policy and discussion. The private ownership of exotic specics is a multifaeeted issue that affects not only conservation, but also the domestic industry, world tradc and edueation. The volume of trade in live animals is remarkably high and growing, making studies that investigate the implications of this trade on the endangered and threatened speeies even more pressing.

This thesis investigates whether or not animal species held in captivity by private owners benefit conservation of their greater wild populations. A population of animals can also exist solely in eaptivity, allowing for its eontinued existence, but in this study I am not considering the existence of captive populations alone, without connection to the existence of the spccics in the wild, for example through reintroduction plans, as conservation initiatives.

Through a series of interviews that I conducted mainly via telephone and email over the course of the 2004-2005 academic year, I gathered responses from experts who I queried about the growing trend of private ownership. The respondents answered at least six specific questions. I also used data and information from the American Zoo and Aquarium Association (AZA), and other written and internet sources, to better understand the dynamic issue of private ownership of exotic species.

Several recommendations and conclusions resulted from my research on this topie:

- More research needs to be done to investigate the implications of the huge volume in the live exotic pet trade and of private ownership. Private owners can be responsible and reliable participants in conservation programs, or they can perpetuate unsustainable trade and exploitation.

- Regardless of who the owners are of exotic species, the trade that is implicitly involved in ownership of live exotics has a negative effect on conservation. Better management of exotie pets in the US needs to begin with looking at trade and developing poliey. I suggest that we take a closer look at the people that compose the private ownership sector and use fcderal policy to try to limit ownership to animal species that can be sustainably raised and to owners who can adequately care for them. A tax on exotie pets could perhaps encourage more sustainable trade through economics.
- I suggest that groups that work towards conservation of animals in the wild, like many NGOs, the AZA, and numerous government programs, consider the possibility of involving the private ownership sector in conservation work.
- I hypothesized in the beginning of this project that private owners, those owners who are not affiliated with the AZA, American Sanctuary Association (ASA) or federal and state government, would have little positive impact on the conservation of exotic specics in thc wild. This hypothesis was not supported by my findings, and in particular for the most popular taxa of exotic terrestrial pets: birds, reptiles and amphibians, private owners may provide critical assistance to the conservation of select species.
- In the end there is no clear-cut answer as to whether or not private ownership is good or bad for conservation, it can be both. All private owners should not be lumped under one umbrella. While there are many highly trained and speeializcd owners and breeders of exotic species who want to, and often do participate in eonservation, there are also many othcr exotic animal owners who eannot provide

adequately for the care of their animals and knowingly and unknowingly facilitate their continued exploitation.

INTRODUCTION

The volume of global trade in wildlife is enormous, with an annual turnover estimated at billions of dollars, and hundreds of millions of individual plants and animals being traded[1]. Habitat destruction is probably the biggest factor in the extinction of species, but the danger that it poses towards wild animals and plants is compounded by the desire for ownership of animals and animal products among private individuals. Wildlife exploitation is directly connected to the economic market and the poaching and smuggling of animals and plants is driven by the prices in consumer countries [2].

Demand for live exotic pets in the US continues to increase, making the United States the largest importer, exporter and re-exporter of exotic animals in world[3]. TRAFFIC, an international organization established by the World Wildlife Fund and World Conservation Union to monitor the trade in plants and animals, meats, hides and other animal products, estimates the entire trade at tens of billions of dollars a year[4]. Interpol, the international criminal police organization, estimates that the illegal trade is around $12 billion a year, second only to drugs, though it threatens thousands more species per year[4].

The implications of trade are magnified by the large volume of trade that already exists and continues to grow, making it increasingly important that we examine the implications of trade both for the animals and for conservation. While clearly research exists related to the magnitude of the wildlife trade, very little research has explored the

role of these exotic animal owners and their impacts on conservation, especially their possible positive impacts on conservation.

My hypothesis at the beginning of this project was that private owners do not participate in the conservation of exotic species. The results of this study do not support my initial hypothesis and this thesis focuses on where and how private owners do partieipate in conservation. Exotic speeies in this thesis refers especially to species that are not traditionally domesticated, often non-native species. Some exotics may be captive bred, but even if bred in captivity, they remain wild animals if they have not been intensively and selectively bred for life with humans, unlike domestic pets like many dogs, cats, hamsters and guinea pigs. Some collectors actually declare that they are attracted to exotic pets because the animals are wild and unusual, unspoiled by domestieation [4].

In this thesis I define private owners as owners of exotic species who are not affiliated with government agencies, or American Zoo and Aquarium Association (AZA), or American Sanctuary Association (ASA) aceredited or affiliated facilities or programs. Many exotic animal breeders and owners may not consider their animals "pets", perhaps beeause of a negative connotation they have with the word.

Conservation is often loosely defined, and in the context of this thesis I define it as aetions that benefit the wild population of a species. Specifically in this thesis a private owner may participate in conservation through one or more of the following: education of the public or scientific community about the species, participation of any kind in structured reintroduction plans, making or soliciting signifieant donations towards

protection of the species in its wild habitat, participation or collaboration in an AZA Species Survival Plan (SSP), or any other formal species survival and protection plans.

Legislation History

With the rising volume of international wildlife trade in the years following WWII, the need for some type of regulation did not go unnoticed by the international community, or the United States. In 1963 the World Conservation Union (IUCN) called for an international convention on the regulation of trade in rare or threatened wildlife[5]. Following the 1972 United Nations Stockholm Conference came the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The stipulations outlined at the convention, which was held in Washington D.C., entered into force after the tenth country signed and ratified the agreement on July 1, 1975. Currently 167 countries are members of CITES, which works through trade bans and permitting systems to protect the 33,000 CITES listed endangered or threatened species of wild flora and fauna from the exploitation and extinction associated with international trade[6].

In the United States, the Endangered Species Act is the primary legislation governing species listed as endangered and threatened. The Act regulates the trade and possession of 1,856 species that are listed as endangered and threatened under the Act[7]. Under the Act, The US Fish and Wildlife Service (FWS) is charged with enforcement and is responsible for the permitting of activities related to all terrestrial listed species.

The Animal Welfare Act also has implications for the ownership of exotic species, but even if fully enforced, it only applies to animals in the custody of U.S. Department of Agriculture (USDA) permit holders, i.e., research facilities, dealers, exhibitors, and operators of auctions. In 2004 there were approximately 5,700 licensed

breeders, dealers and exhibitors of exotic animals in the US[8]. Unfortunately, this law provides protection to only a fraction of exotic animals, and not to those kept strictly as private pets.

Under the Lacey Act, it is a violation of Federal law to import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce any wildlife, including fish, that was taken, transported, possessed, or sold in violation of any state or foreign law, or taken or possessed in violation of other federal law or Indian tribal law. In late 2003 Congress as an amendment to the Lacey Act also passed the "Captive Wildlife Safety Act", which bans the interstate shipment of several species including tigers, lions and bears for the pet trade.

The federal government also adopted the Wild Bird Conservation Act in 1992, a more specific and sophisticated law and currently the only one of this type. The Wild Bird Conservation Act prohibits the import of almost all exotic birds for the pet trade including many popular parrot species. The only imports allowed come from countries with approved management and conservation programs, or approved captive breeding facilities. A 30 day quarantine of all exotic birds at government approved stations is also required to import exotic birds into the US in order to screen for health problems and to protect native birds and poultry from diseases[9].

There have been several other attempts at enacting federal legislation related to exotic species but so far these bills have not been passed. The most notorious example is the Shambala Act of 2000 which was introduced to require non-transferable permits issued by the Secretary of Agriculture for private owners who own or breed several types of exotic animals including tigers and wolves. The Shambala Act, along with the Exotic

Animal Protection Act 1999, which also was not passed, proposed standards for wild animal housing and eare and it would have restricted the import and export of covered animals.

At the state and local level, laws and ordinances governing exotic pets vary widely. As of 2001 there are twelve states that ban the private possession of exotic animals, speeifically meaning that they prohibit possession of at least large cats, wolves, bears, non-human primates, and dangerous reptiles (Alaska, Califomia, Colorado, Georgia, Hawaii, Massachusetts, New Hampshire, New Mexico, Tennessee, Utah, Vermont and Wyoming). Seven states have a partial ban prohibiting the possession of some exotic animals (Connecticut, Florida, Illinois, Maryland, Michigan, Nebraska, and Virginia), and 15 states require licensing or permitting (Arizona, Delaware, Indiana, Maine, Mississippi, Montana, New Jersey, New York, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, and Texas)[10].

The legislation surrounding the topic of exotie species has always been contested both by environmentalists and animal rights groups as well as private owners. Private owner groups for the most part resist the increasing trend towards legislation because they fear that their animals, or the market for their animals, will be taken away.

THE SCOPE OF PRIVATE OWNERSHIP

The private ownership of exotie species is of growing interest to the conservation community beeause of the implications of the massive trade in live animals and the inereasing popularity of having these exotic species as pets. In part due to the innovations in the live pet industry, the availability of information, and the lifestyle changes brought on by the 21st century, thc live pet industry has expanded dramatically and is continuing

to grow. A survey in 2002 by the American Pet Products Manufacturers Association found that 62% of households in the US own a pet, including 17.3 million birds and 9 million reptiles[11,12]. There are also an unknown number of wild mammals in private ownership, including tigers, lions, wolves and primates[4,13].

The numbers of exotic species in trade is enormous though exact figures are difficult to estimate because of the high amount of illegal trade. For example, experts in aviculture feel that the official CITES reported figures greatly underestimate the numbers of birds extracted from the wild for the pet trade, and that the number of birds is probably two to four times the number reported to CITES[14]. This would suggest that 1,600,000 to 3,200,000 birds have been harvested annually from wild populations for the live bird industry in the 1990's. Many of these birds never even reach the market because they die from stress en route or shortly after their removal from the nest[14]. This is not to say that all animals in the pet trade are illegally harvested, in the US that is certainly not the case. However it is certain that obtaining rare and exotic animals has become increasingly easier, and their origins may or may not be in question.

The internet is perhaps the most readily accessible venue for animal sales and a quick search brings up a wide variety of animals for sale including primates like baboons, chimpanzees, red-handed tamarins, and smaller monkeys; a number of large and small wild cats including: tigers, leopards, lions, jaguars, ocelots, servals, and caracals; many other well known mammals: wolves, black bears, three- toed sloths, wallabies, foxes, raccoons, skunks, not to mention a plethora of reptiles, birds, tropical reef fish, insects and amphibians. Though humans have long kept wild animals as pets, the trend has increased dramatically in the past few decades[12].

Aside from the internet, a number of other factors are also making the ownership of exotic species more appealing, and making the animals themselves more available. Captive breeding and the associated breeding technology have increased over the last decade making some species, like the popular green iguana, cheaper and more available[15]. Advancements have also been made in animal care, giving private owners and pet stores more knowledge of how to better sustain exotic pets so that they are more healthy, live longer and are cheaper to maintain[15]. Reptiles in particular have become more practical and much more popular exotic pets as a result of these improvements in husbandry. The twentieth century has also brought life style changes that make having a large high maintenance pet less practical. Smaller pets like birds, reptiles and amphibians have therefore become the most popular exotic pets, and as a result of this newly broadening market these smaller pets also have owners who are least experience with their caretaking[11,12].

PROBLEMS WITH THE PRIVATE OWNERSHIP OF EXOTIC SPECIES

Though the large volume of exotic animals in captivity may lead to many possible benefits of private ownership, it is also important to discuss the drawbacks. There are many problems with the private ownership of exotic animals and I have broken them down into the following four categories: danger to the environment, danger to humans, danger to the animals themselves, and the dangers of trade.

Danger to The Environment

Not only does the removal of animals from their natural habitat threaten the removed species itself, it can also cause shock waves that reverberate throughout the ecosystem, even creating trophic level cascades. Trophic level cascades occur when the

impact of one species is removed and that change indirectly causes the destruction of another. "So many animals are in the trade and so many are lost," said Mr. Picón of the Fish and Wildlife Service, "that people don't realize when they buy an exotic pet they are taking the rain forest and putting it in a coffin"[9]. In 2002, 6% of birds and 20% of reptiles owned as pets in the US were obtained by being caught or found in the wild[11]. This includes 36% of all pet turtles, making up an estimated 1,500,000 individual turtles or tortoises that are removed from the wild in the US each year[11].

Exotic animals can also threaten the environment not only with their removal but with their introduction. Thousands of fish, reptiles, amphibians, mammals and birds kept as exotic pets have escaped and hundreds have actually established in the countries where they were taken, creating breeding populations often to the detriment of native species and ecosystems. The red-eared slider turtle, for example, one of the most popular American pet reptiles, is banned in the European Union and South Africa as an invasive species[4,16].

Live exotic species can bring in parasites and pathogens that can devastate livestock, native wildlife and humans, and many scientists contend that government surveillance and quarantine procedures for most imports are inadequate [4,16]. Examples abound of intentionally or accidentally imported exotic species that have introduced new pathogens (e.g., rats introducing *Yersinia pestis*, the etiologic agent of plague, to the western United States). In March 2000, the United States Department of Agriculture was forced to ban imports of three African tortoise species because they host a tick species which in turn carries heartwater disease, a bacterial ailment unknown in America but dangerous to livestock[4,16]. The prairie dog-associated monkeypox outbreak is another

example, which highlights the speed with which exotic rodent species, transported worldwide, can bring virulent pathogens to jump species that may even be transmitted to humans. Some infected animals act only as vectors making them silent carriers of disease until a new host species is found.

Danger to Humans

Disease is one way that exotic pets both small and large can effect both the environment and humans, but there are also many other threats posed by the ownership of exotic pets. From large pets like tigers attacking small children, to reptiles introducing salmonella into a household, the dangers are various. While few statistics have been compiled on injuries and fatalities from exotic pets. Those that exist indicate a potentially sizable problem. For example, between 1998 and 2001 alone there were 59 incidents in which people were seriously injured or killed by captive tigers[13]. The number of fatalities and illnesses associated with captive reptiles is also strikingly high with 20 fatalities and 90,000 illnesses a year. By comparison, fatal attacks on humans among the nation's 55 million dogs average 12 a year[4].

Sometimes these injuries and deaths result from bites or constriction by snakes, but usually they are associated with salmonella, which is endemic in the gut of reptiles and can be spread when people touch the animals or places they have been. In 1999, responding to an upsurge in cases of reptile-associated salmonellosis, the Centers for Disease Control and Prevention (CDC) issued a public advisory warning that 93,000 people each year contract salmonellosis from contact with reptiles and amphibians. The CDC recommends that children, pregnant women, and persons with compromised immune systems avoid all contact with reptiles and amphibians[15].

Danger to The Animals Themselves

Not only can the harvest of exotic species and subsequent release threaten the environment, and humans, often the animals themselves are put in jeopardy from the time they are captured. It has been estimated that 90% of exotic pets are dead within the first two years of captivity[15]. Experts calculate that the mortality rate can reach 60% to 70% for some birds and reptiles, and 80% to 90% for reef fish[4]. Animals are put under high stress during transport, and in addition exotic speeies have very complicated and specific needs that are difficult and expensive for private owners to provide. Also when exotic pets become sick proper care is difficult to find because many local veterinarians are not familiar with treatments and diseases that may effect them [16].

Dangers of Trade

Perhaps the least obvious and the most dangerous part of exotic pet ownership is trade. The trade in exotic pets leads to the preponderance of the other dangers discussed above and also may lead inevitably to the destruction and exploitation of these exotic animals. While the sale and trading of live birds remains highly regulated in the United States, through the Wild Bird Conservation Act, and through CITES, the live reptile and amphibian trade is largely unregulated, with comparatively few species listed on CITES[12]. Though there is not yet enough information available to determine the whether or not the Wild Bird Conservation Act has had a positive effect wild bird populations, it almost certainly will not make the situation worse[14].

Until more recently, most reptiles found in trade had been collected from the wild[12]. The incentives for the market were high beeause of large profit margins, and low transport costs making livc trade in reptiles a lucrative business. Today while captive breeding of reptiles is increasing, it is debatable whether or not the increase in captive

breeding is good news for wild populations. TRAFFIC, the world's leader in the enforcement of international trade regulations for wild animals and plants, claims that while "Captive bred specimens are more desirable for the average pet keeper but are often the most costly to purchase. Hence, the supply from the wild will always find a market"[12].

While some people argue that captive breeding relieves the pressure from wild populations, others studies show that trade even with captive breeding programs maintains the demand for species and remains as a pressure on wild populations[4,14]. Though captive breeding exists for many species, the high mortality of captive birds necessitates the continuing import of live specimens. As a result each year millions of birds are captured alive for the pet trade and removed from the wild in developing countries in Latin America, Africa and Asia[14]. However, when demand remains for a species that is not bred in captivity, their wild populations are obviously even more likely to suffer from capture and interruption.

TRAFFIC takes the strongest stand against specialist collectors who search out rare and unique species. TRAFFIC claims that these private owners of exotic species are "a significant and dangerous" threat to wild populations because they "often specialize in particular groups of species such as types of parrots, frogs, snakes or lizards, with a view to collecting the broadest range of species and particularly the rarest" [12]. It has also been suggested that some animals become more desirable to collectors as they become rarer and more expensive[4]. This demand for rare species promotes the illegal collection and smuggling of endangered animals from the wild.

It is estimated that the trade in exotic pets affected 50 imperiled parrot species, 32 of them traded legally[4]. The pet species known as the spix maeaw from Brazil is now believed extinct in the wild while the Hyacinth and blue macaws and red- crowned Amazons are considered at great risk from the pet trade[14]. This pressure exists despite the fact that the Wild Bird Conservation Act makes it very difficult to import bird species from the wild in the United States.

Today, roughly 17,000 parrots are imported into the United States each year; roughly 3,600 of these are taken from the wild. While trade poses a serious threat to parrot species, 70% of the 4.8 million birds traded worldwide between 1991 to 1996, representing 519 species, were non threatened finches[14]. However, captive breeding is major souree of individuals for only a relatively few bird species, and for most other birds though they may not make up the bulk of the trade, the majority of individuals in trade come directly from wild sources, either trapped as free-flying adults or taken as nestlings[14].

Reptiles and amphibians are the other two types of pets that are most popular, and though the exotic pet trade claims fewer turtles than the food market, the pet trade has devastated a number of species including all four tortoise species from Madagascar, the pancake tortoise of Kenya and Tanzania, and the Egyptian tortoise [4]. There are multiple trade pressures on the estimated 6,000 species of reptiles that exist in five different groups: turtles and tortoises (order *Testudines*), tuataras (order *Rhynchocephalia*), lizards (order *Sauria*), snakes (order *Serpentes*), and crocodilians (order *Crocodylia*)[9]. Reptiles are widely traded live as pets and for their parts, and there are approximately 300 reptile species listed as threatened in the 2002 IUCN Red Book of Threatened Animals[9]. More

than half of the listed reptile species are turtles and tortoises, with snakes and lizards making up most of the rest.

The United States is one of the world's largest consumers of reptiles, which account for more than $2.5 million in imports per year. In 2001 alone, the United States legally imported just under 2 million live reptiles. Of these, over 500,000 were green iguanas (*Iguana iguana*) mostly raised on ranches in Central and South America[15]. Other species commonly found in the pet trade include the boa constrictor (*Boa constrictor*), ball python (*Python regius*), panther chameleon (*Chameleo pardalis*), and red-footed tortoises (*Geochelone carbonaria*)[15].

The debate over the costs and benefits of trade in exotic species is not a new one and cannot be answered simply. Captive breeding clearly does not always protect animals in the wild as demonstrated in the bird trade, but it remains unclear as to whether on not it could protect other taxonomic groups. Also perhaps trade regulations like those included in the Wild Bird Conservation Act, when enforced, will be able to pick up where captive breeding is unable to provide protection. It is also possible that inevitably some species will continue to be exploited until they become extinct because of the high prices given by collectors of rare species, but one fact that is certain; unregulated trade will almost certainly cause exploitation.

THE BENEFITS OF PRIVATE OWNERSHIP

Though there are a number of dangers associated with private ownership, the purpose of this thesis is to explore the possible benefits of private ownership. Through a series of approximately 20 interviews which I conducted mainly via telephone and email over the course of the 2004-2005 academic year, I gathered responses to the growing

trend of private ownership from a variety of experts on the subject. Interviewees ranged from the Zoo curators and directors of European Association of Zoos and Aquaria (EAZA) facilities, AZA Species Survival Plan (SSP) Coordinators, Taxon Advisory Group (TAG) coordinators and ASA certified sanctuary directors, to Academic PhD's, veterinarians, professional breeders, representatives of NGO's, and directors of private ownership advocacy groups.

Interviewees answered at least six specific questions and using information and examples they provided, data and information from the American Zoo and Aquarium Association (AZA), and a number of other written and internet sources I developed a better understanding of the dynamic issue of private ownership.

I hypothesized in the beginning of this project that private owners would have little positive impact on the conservation of exotic species in the wild, and that proved to be untrue.

Who is Involved

Discussing the benefits of private ownership is quite difficult, because the category of "private owners" is vast and varied. While there are several organizations that claim to represent large portions of private owners, for example the Pet Industry Joint Advisory Council, even these groups represent only a portion of the larger body of private owners. Private ownership is difficult to define because it can mean many things, for example the Ringling Circus is a private owner, and so is the child that owns a pet turtle.

Zoos and sanctuaries that are accredited either by the ASA and the AZA or other non-US equivalent organizations are not considered private owners in this thesis.

However it must be noted that this criteria leaves thousands of roadside zoos and unaccredited sanctuaries to be considered private owners. Government programs and facilities are also not considered private in this thesis. These groups are not considered part of the private ownership sector because they have unique missions and standards of certification.

Private owners for the most part are individuals who keep animals for profit or pleasure, usually on a small scale. These owners include professional breeders, experts, and average pet owners. The broadness of the private ownership sector makes data inherently difficult to obtain. There are very few unifying organizations for private owners and those that do exist usually are geared towards owners who own only specific species or taxa of animals.

Background

While I was researching the conservation benefits of private ownership it quickly became apparent that significant divisions in thinking exist over the valuation of private ownership, and many people have very strong opinions on the subject. In particular, there is a division especially between private owners and large non-private institutions like the AZA.

Several private ownership advocacy groups fear for their right to keep exotic species as pets, especially the more dangerous animals like large cats and wolves. These ownership advocacy groups tend to have firm stances that it is their constitutional right to have these species as pets (Phoenix Exotics). Conservation organizations like WWF and The Humane Society on the other hand strongly oppose the possession of exotic pets because they see the exotic pet trade as detrimental to humans, animals and the

environment. The AZA and several other organizations seem to fall somewhere in the middle and are unsure of exactly where they stand. While outwardly it appears that the AZA is leaning towards opposing all private ownership, within the AZA there are many people who support private ownership for specific animals. Large corporate animal holders like the Ringling Brothers cireus seem to fall occupy their own territory beeause while they are not zoos or sanctuaries, they are certainly not small scale private animal owners either, rather they are large for profit organizations.

What Animals Benefit

To determine the benefits of the private ownership of exotie pets I asked eaeh interviewee if they eould give me any examples of specifie private owners and speeies whose wild populations had benefited from private ownership. As was to be expected, this question produeed heated replies on both sides of the private ownership issue, but eontrary to my initial hypothesis and earlier findings, many individuals who I expected would be opponents of private ownership eould give examples of instances in whieh speeies benefited. For example, interviewees who are strongly involved in the AZA, a group that seems to be a general anti-private ownership sentiment, were among those who gave the most positive responses.

In all, 15 out of 19 interviewees that answered this question agreed that private ownership could benefit conservation and gave examples of many speeies that have been helped as a result of private ownership. Of the other four responses, two were resounding no's and two responses could not be eonsidered as yes's or no's.

While I was able to obtain many examples where private ownership has benefited species, there is much more to the issue. For example, on the side of whether or not

private owners should own exotic pets like elephants and lions, it seems to be a general consensus among the non-private sector that private owners are not usually in a position where they can care adequately for these animals and that the private ownership of these charismatic exotie species often exists for financial exploitation and very rarely has the best interests of the animal in mind.

On the other hand, many private owners particularly of large cats, which are probably the most popular large exotic pet, argue vehemently that animal rights are of paramount concern to them and say that if owners can provide for the animals adequately, they should be allowed to keep them. The Ringling Brothers circus again provides another interesting matter of scale to this argument because they are also a private owner, but they have the scope and capital to provide their Asian Elephants with at state of the art facility that is superior to that of many zoos. Ringling Brothers in fact has a higher success rate with the eaptive breeding of their elephant populations than all AZA facilities and may be better able to fund their elephant program.

The non-private ownership community generally opposes the private ownership of large mammals, but birds, reptiles and amphibians are often given as examples of animals that may stand to benefit from private ownership, and this remained true for the most part in my research. I was often directed to examples of birds, reptiles and amphibians that had been help by private ownership though also a large number of examples were also of large grazing mammals protected by ranch owners mostly in Africa.

Both AZA and private owners agree that zoos have limited capacities for specimens and in order to finance their programs they need to display animals that

visitors want to see. Large charismatic animals like tigers, pandas and gorillas bring visitors into the zoo and gate fees create much needed revenue while non charismatic species, shy or nocturnal species for example, are seldom considered viable investments for zoos.

It was agreed generally by the respondents that bird, reptile, and amphibian species, especially those which are non-charismatic may be protected under private ownership because zoos do not have the funds and space to care for them in captivity. However, the ownership alone of a non-charismatic species may keep it alive in captivity but because of the risks associated with captive exotic species it is my opinion that the costs of ownership without benefit for animals in the wild outweigh the benefits.

How They Benefit

Conservation and Reintroduction Plans

Perhaps the most significant way in which a private owner might use his or her animal ownership to benefit the conservation of the wild population would be to become involved in a formal reintroduction plan. The formal AZA reintroduction plans are mostly part of SSPs or Species Survival Plans designed to manage threatened or endangered species, though the IUCN and the US Fish and Wildlife Service also have their own reintroduction criteria.

The respondents gave multiple examples of private owners who participate in AZA SSPs, and in reintroduction plans. Within the AZA there is currently a great deal of debate over the issue of whether or not private owners should be allowed to participate in SSPs. Concern over the genetic viability of specimens, and the commitment of private owners to the mission of SSPs is particularly at issue. Based on this dialogue I received a variety of responses that indicated that the animals of private owners were used in some

SSPs, recorded in some official Studbooks to keep track of their genetic lineage, and taken into account by some TAGs, which consist of experts responsible for making recommendations for AZA institutions regarding similar groups of animals (taxa). On the other hand for some species private owners are not involved in these processes.

TAG and SSP coordinators also provided a few explanations for why the information and specimens provided by private owners are not always of use to them in their conservation plans. If the captive species is bred for the pet trade and its genetics become inbred or impure, participation in a reintroduction plan could be detrimental to the wild population. It is for this reason that private captive populations of large cats will never be used for the purposes of reintroduction. Their unknown genetic makeup makes them more of a liability than an asset in the breeding of stock for reintroduction. Having expert knowledge of pedigree especially for smaller exotic species would be especially difficult for a private owner to verify or maintain making it unlikely that the average private owner or breeder could ever participate in reintroductions. Also breeding for the pet trade often does not select for natural traits. For example color mutations are often selected for in private breeding, and would be useless in a reintroduction.

Interestingly in Europe this debate over the involvement of private owners in the European equivalent to SSPs does not seem to exist and private owners participate in many reintroduction programs there. Richard Gibson, the curator of Herpetology for the Zoological Society of London said, "I dare say there are many examples in Europe" and cited the breeding of the Mallorcan midwife toad *Alytes muletensis*, natterjack toad *Bufo calamita*, sand lizard *Lacerta agilis* for release as examples. He also noted that unlike in the US, in Europe private owners are often the studbook keepers, not just participants.

Education and Donation

There are also other ways that private owners could benefit the conservation of species, if not as directly. A private owner could for example, use a captive animal to educate the public about the species and the need to protect its wild habitat, or publish work on breeding habits and other important care and husbandry information about the species. Examples of private owners participating in this kind of work are much easier to come by, with care guides being published by private owners quite often, and some of the most successful breeding programs for species existing in captivity rather than in zoo populations. Also, however, in interviews it repeatedly surfaced that many private breeders, often those who are most successful in breeding rare or "difficult" species, do not share their information because of competition and profit that can be made by selling the offspring of these species.

While it appears to be much more common to private owners to participate in education than it was for them to participate in reintroduction plans, the benefits for conservation may also be more doubtful. Some owners for example participate in education that benefits conservation in a meaningful way using their knowledge and expertise to better inform the scientific community about unknown behaviors of the animals. However TRAFFIC reports and CITES data indicate that rare animal collectors, a group that perhaps poses one of the greatest threats to endangered and threatened species "are under the self-illusion that they are acting in the interests of science or conservation by studying or attempting to breed species they have collected or had smuggled from the wild" [12]. Aside from these collectors, who generally are not financially motivated to have their collections, there are numerous other examples of

moneymaking attempts that use the guise of "education" as an attempt to legitimize their ownership and exploitation of rare exotics.

Using an animal for display as a means of education is not always illegitimate and could benefit conservation if for example it encourages people to donate money to preserve the animal's wild habitat. For example, if seeing a panda at the zoo makes zoo goers want to donate money towards the conservation of the panda, then its display benefits conservation. However if the animal is displayed in such a way that it makes people what to have the animal as a pet, then it may apply more pressure to wild populations. The costs and dangers of captivity for exotic species are high and in the case of education it seems that they need to be weighed against the benefits.

RECOMMENDATIONS AND CONCLUSIONS

Recommendations

It still remains to be seen whether the conservation benefits of private ownership that I discovered through my research outweigh the incredible costs. It is more than possible that they do, but in order to make a qualified estimate significant amounts of data would need to be created for estimating the percentage of owners that participate in conservation, and how they participate. Even if this information was available comparing the costs and benefits involves the valuation of nature which is always difficult to quantify because dollar values are hard to set on natural systems.

Even if valuation is not possible, it is important to look at who's involved in these conservation plans and investigate what portion of the private ownership sector these owners fall into. Are they mostly breeders, collectors or average pet owners, and what types of animals do they own? Understanding this information would allow for a better understanding of why some owners do and others do not participate. Do private owners

not participate in conservation because they lack the opportunity, information and means to be involved or because of a lack of intention and motivation?

While many questions remain to be answered, what is clear is that more research needs to be done to investigate the implications of the huge volume in the live exotic pet trade and of private ownership. Private owners can be responsible and reliable participants in conservation programs, or they can perpetuate unsustainable trade and exploitation.

I suggest that we take a closer look at the people that compose the private ownership sector and use federal policy to try to limit ownership to those owners who can responsibly and adequately care for these animals. I also suggest that groups that work towards conservation of animals in the wild, like NGOs, the AZA and government programs, consider the possibility of involving the private ownership sector in conservation work.

In my opinion AZA should allow SSP and TAG coordinators to distinguish for themselves between helpful professional private owners and breeders who's participation would benefit the conservation of a species or taxa and other private owners. I would also suggest that we first further investigate the European model and ask why and how the EAZA and other similar organizations have been able to successfully deal with the issue of private owner involvement. EAZA groups involve capable educated private owners in species survival, why can't their US counterparts?

When creating Federal or AZA policy it is paramount that we not try to lump all private owners together, as I did at the onset of this project. The issue of private ownership cannot be answered simply because private ownership itself is not simple.

Within the greater seope of private ownership there are many subgroups including for example breeders, collectors, for profit owners, and pet owners. This variation creates challenges to any rule or policy that eould be formed to address private ownership in general, because private ownership eannot be so broadly generalized.

The trade of live animals for the pet market is the single largest threat to the conservation of exotic species. The other associated dangers of exotie species ownership could be managed through the management of trade. Trade is driven by market pressure and any attempt to regulate the exotic ownership of exotic pets in my opinion should focus on both trade and market pressure, beeause they are inexorably linked.

I recognize that curbing the trade in exotic speeies is a particularly unfavorable option among the many people employed by this market, and as a possible solution rather than limiting trade across the board I would recommend a plan based primarily on digression in both the origin and species we export and import along with education, and regulation perhaps in the form of a tax. This digression-tax plan is designed particularly with the US market in mind but could be expanded and obviously would be more effective if it was enacted by other importing nations as well.

I suggest a digression specifically that would involve the careful management and promotion of species for the exotic pet market that ean be easily bred or farmed without the constant need for wild importation. Careful investigation needs to be done into which specific speeies would be ideally suited for these eonditions, and for the market (for example low maintenance speeies). To prompt this kind of investment in sustainable species ranching I suggest a regulation that would make the investment in alternative sources of pets profitable. Regulations could come in many forms but a carefully

researched escalating tax applied in importing nations would force both importing and exporting nations to look for alternatives, and give them time to establish alternative channels without collapsing the market.

Exporting nations should capitalize on their ownership of desirable exotic pet species and make the sustainable captive breeding of them a priority. They would be at a competitive advantage because they can naturally provide the ideal breeding conditions for these of exotic animals, and rather than lose export revenue created by both legal and illegal trade they could legitimize it. The legitimizing of the trade may also raise profit margins by allowing trade to go through legitimate channels rather than smuggling.

Importing nations also need to participate in the digression because their markets are the driving forces behind the pet trade. Education, regulation and economics play crucial roles in this change, making it desirable both to consumers and providers. Making the import of unsustainably raised species more costly through a tax would curb demand for unsustainable exotics and by providing adequate substitutes at lower cost, the pet industry would not be forced to suffer the financial burden and would switch to the cheaper and more sustainably raised alternatives. A simultaneous education campaign aimed at the public and initiated by retailers, NGOs or the government, could increase popularity and awareness for the need to buy sustainably raised pets.

The farm-raised exotics would obviously seem more costly to raise than wild caught individuals, but the excess costs of raising them could be mitigated by their increased survival in transport (due to better selection of hardier species), and also they would be less costly when the opportunity eost of hunting for specimens in the wild is taken into account. Ideally it would also be cheaper to import the sustainably raised

individuals for a number of reasons, for example they would not have to be smuggled. Because the higher profit margin on the farmed exotic pets, industry would promote and favor their sale. Jobs in specific sectors of the pet market will no doubt still be lost, but others may be created on both sides of the supply chain by careful planning and management on the part of importing and exporting nations.

This plan would still involve a need for some sort of monitoring system to insure that the farming and ranching of speeies was in fact sustainable, perhaps an accreditation system similar to that involved in the Wild Bird Conservation Act. In addition the amount of the private ownership sector that would be effected by this type of digression plan would vary vastly depending several factors including exactly what species or taxa were targeted by the tax. I envision this digression type scheme working best for small popular pets like reptiles and amphibians. It could also likely be effective in the regulation of birds, but the Wild Bird Conservation Act may be shown to provide enough protection through these channels already, espeeially if similar acts were in place in other importing nations.

The digression-tax scheme would hopefully be effective in redirecting the general demand in the pet industry towards more sustainable pets, but it would also allow for a separation between thc millions of average pet owners and the much smaller number of professional owners who have dedicated their lives and work to these species, because it would allow those who are truly dedicated to simply pay the tax, therefore decreasing but not eliminating their sector of the market.

The trade in large mammals including wolves, primates and large cats would not likely be affected by the digression-tax scheme because these animals are generally not

sold in the retail market, and legal trade across national and state borders is extremely limited. Unlike the trade in smaller exotie species, these large animals are mostly captive bred, necessitating a different approach in regulation. What I would suggest to limit the trade of these larger mammal species is a federal policy that creates a stricter permitting system. The system should eliminate all but the competent and dedicated private owners.

Both the permitting system and the digression-tax scheme would not curtail the rights of any citizens to have exotic species as pets. They would digress or decrease demand in some cases but they would also increase the chances that exotic pet owners will be prepared to adequately provide for their animal, increasing both the safety of the owner and the pet. In this way owners who are serious and dedicated to the rearing of exotic species could continue to participate in conservation while the less beneficial pet market would be diverted to more sustainable less dangerous pets.

Conclusions

My research does not support my original hypothesis that private owners were not involved in the conservation of exotic species. Especially non-charismatic species that are often left out of zoo collection may benefit from private ownership and these often include members of the most popular taxa of exotic terrestrial pets: birds, reptiles and amphibians.

Regardless of who the owners are of exotic species, the trade that is implicitly involved in ownership of live exotics has a negative effect on conservation. Better management of exotic pets in the US needs to begin with looking at trade and developing policies to address it. In the end there is no clear-cut answer as to whether or not private ownership is good or bad for conservation, it can be both. Private ownership is a terrible

threat and an untapped resource, and thus it needs to be both regulated and further explored.

WORKS CITED

1. TRAFFIC. What is Wildlife Trade www.traffic.org Accessed 11/2/04. (2004).
2. Winjnstekers, W. *The Evolution of CITES* (CITES Secretariat, Geneva, 2001).
3. in *16* (1992).
4. Derr, M. in *New York Times* http://www.macalester.edu/~psych/whathap/diaries/diariess02/jana/animals.html (New York, 2002).
5. Glennon, M. H. & Stewart, A. L. in *Engaging Countries: Strengthening Compliance with International Environmental Accords* (eds. Weiss, E. B. & Jacobson, H. K.) 173-214 (The MIT Press, Cambridge, 1998).
6. CITES Web page. Convention on International Trade in Endangered Species of Wild Fauna and Flora. *http://cites.org/* **Accessed 11/1/04** (2004).
7. US Fish and Wildlife Service. Species Information. *http://endangered.fws.gov/wildlife.html=Species* **Accessed 5/8/05** (2005).
8. APHIS. APHIS Programs. *http://www.aphis.usda.gov/programs/programs.html* **Accessed: 5/14/05** (2004).
9. WWF. FAQ's. *http://www.worldwildlife.org/trade/faqs_parrot.cfm* **Accessed 4/5/05.**
10. Animal Protection Institute (API). The dangers of keeping exotic "pets." *http://www.api4animals.org/308.htm* **Accessed 5/8/05** (2001).
11. American Pet Products Manufacturers Association (APPMA). 298 (2003).
12. TRAFFIC. The Pet Trade. *http://www.traffic.org/25/wild4_4.htm* **Accessed 4/6/05** (2005).
13. Nyhus, P. J., Tilson, R. L. & Tomlinson J.L. Dangerous Animals in Captivity: Ex Situ Tiger Conflict and Implications for Private Ownership of Exotic Animals. *Zoo Biology* **22**, 573-586 (2003).
14. Beissinger, S. R. in *Conservation of Exploited Species* (ed. J. D. Reynolds, G. M. M., Kent H. Redford, John G. Robinson) (Cambridge University Press, 2001).
15. The Humane Society. Live Reptile Trade and A Hazardous Trade. *http://www.hsus.org/wildlife/issues_facing_wildlife/wildlife_trade/live_reptile_trade/* **Accessed 4/5/05.**
16. The Humane Society. Captive Exotics and Wild Animals as Pets. *http://www.hsus.org/wildlife/issues_facing_wildlife/captive_exotics_and_wild_animals_as_pets/* **Accessed 4/5/05.**