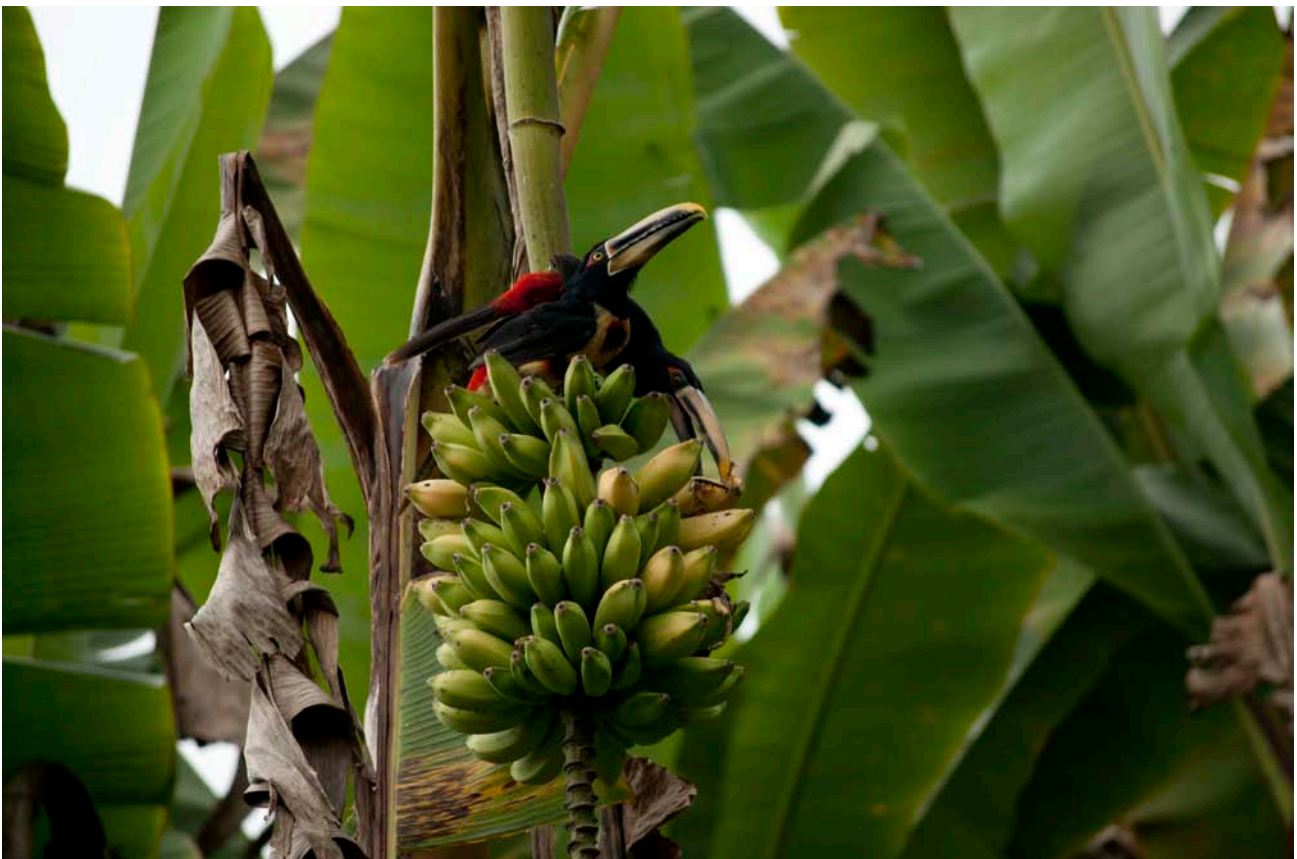


Wings behind bars

Ethical and biological considerations about keeping birds in zoos



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Literature thesis for the Master Environmental Biology, track Behavioural Ecology, Utrecht University (UU)

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July-August 2012

Photo cover: Two Pale-mandibled Aracari's (*Pteroglossus erythrogyius*) in Mindo, Ecuador.
Photo by José Luis Paucar Pillajo

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Abstract

Keeping birds in zoos raises the ethical question if it is justified to do so. In this thesis I focus on the central question: *Under which conditions is it ethically justified to keep birds in zoos?* I discuss three possible answers to this question. It is justified if 1) Welfare is guaranteed and birds act as ‘ambassadors’ to raise money for conservation projects. 2) In the case of endangered species to use them for captive breeding. Welfare must be guaranteed. 3) It is never justified.

First, in this thesis I explored whether the welfare condition is fulfilled in zoos. Birds may experience reduced welfare in captivity, for example they can develop stereotypic behaviour. Species differ in how well they adapt to captivity. Little is known about the welfare of zoo birds, but some problems with reproduction, diseases and effects of visitors on birds in zoos are present.

Second, this thesis discusses whether zoos really make contributions to conservation. Zoos claim to be ‘arks’ for endangered species, but in reality they breed little of those bird species. Further, captive breeding programs have several problems. In contrast, zoos make sufficient efforts to contribute to *in situ* conservation, but expenses should still be higher.

To investigate whether it is ever justified to keep birds in zoos, the concept of freedom is explored. Three different freedoms can be distinguished which can be violated by captivity: the freedom of movement, action and of autonomy. I argue that humans can restrict birds’ autonomy and freedom of action to some extent. Corvids and parrots may be exceptions, because they could be considered as ‘autonomous agents’. The restriction of the freedom of movement is more problematic, since it is difficult to determine if birds would experience better welfare in the wild than in captivity.

To investigate condition 2, I explored whether it is ethically justified to ‘sacrifice’ individuals (by putting them in captivity) for conserving species. It is justified to keep birds in captivity to save their *own* species, as long as they can reproduce themselves, since animals have interests in the passing on of their genes. It is more difficult to justify the keeping of birds in zoos as ‘ambassador’ for *other* species, since the animal has no direct interest in the continuing of other species (condition 1).

In conclusion, I argue that it is not true to state that it is never justified to keep birds in zoos. Even though breeding endangered species is justified, it leads to many problems and is not often carried out. Keeping birds as ‘ambassadors’ is not justified. However, it is not clear whether the welfare of zoo birds is really worse compared to the wild and thus if they are being ‘sacrificed’. Improvements are recommended: zoos should abolish animal species that adapt badly to captivity and they should keep less species, they should focus more on small animals and on education about the connectivity between animals and the natural world, thereby providing more activities (workshops, movies, lectures) for the public.

Chapter 1 Introduction

Although the name ‘zoo’ is not that old, the earliest collections of wild animals date back to 4000 years ago and were the property of pharaohs and kings in ancient Egypt and Mesopotamia (Hosey *et al.* 2009). Later, the ancient Greek and Chinese emperors also had these collections that were called ‘menageries’. With animals their collection of animals such as lions, elephants and giraffes, the royalties wanted to show their power and wealth. The Romans kept also many wild animals, but they used them for public entertainment in the gladiatorial arena’s, where the animals had to fight with humans and with other animals and where they were killed. The Romans slaughtered so many animals in these shows, that it is believed that they caused the extinction of some species, such as the hippopotamus in former Nubia and the lion in Mesopotamia. In the Middle Ages, some kings in Europe, Asia and South America had menageries. Over time they became very popular and at the end of the 16th century, almost all royalties in Europe had a private collection of animals. In the 18th century, zoos changed in the audience they received. With the new public interest in natural history, scientific societies set up zoos, which became public spaces and important places to study animals. The Jardin des Plantes in Paris, unlike its name, and London Zoo are examples. In the first real zoos the animals were kept in cages, but later on some famous architects designed parklike landscapes where people could see animals without bars. In contrast, the early 20th century in zoos is known by its illuster name ‘the Disinfectant Era’ because of the sterile, easy-to-clean cages without any enrichment. In the second half of the 20th century zoos changed; they became more specialized and the exhibits became more naturalistic with more emphasis on ecosystems and landscapes. Due to critics from animal welfare organizations, animal rights advocates and also from inside, good zoos also began to take really seriously the welfare of their animals and their contribution to conservation and education. However, even though zoos have improved a lot in the last decades, there is an ongoing debate in society about their legitimacy, which is part of a broader public discussion about animal welfare and how to treat animals.

To reach the goals of conservation and education, a lot of zoos have joined each other and nowadays every continent has its own zoo organisation. In Europe this is the EAZA (European Association for Zoos and Aquariums) and in the Netherlands the NVD (Nederlandse Vereniging van Dierentuinen). Zoos accredited by these organizations claim to be societally relevant and answer moral criteria, which is reflected in the mission of the EAZA for example:

“EAZA’s mission is to facilitate co-operation within the European zoo and aquarium community with the aim of furthering its professional quality in keeping animals and presenting them for the education of the public, and of contributing to scientific research and to the conservation of global biodiversity. It will achieve these aims through stimulation, facilitation and co-ordination of the community’s efforts in education, conservation and scientific research, through the enhancement of co-operation with all relevant organisations and through influencing relevant legislation within the EU”.

The fact that the EAZA has these goals mentioned explicitly in its mission statement already reflects its need to legitimize itself (and thus its zoos). Zoos accredited by the NVD or EAZA have high standards of welfare and work together, for example in breeding programs and campaigns. That does not mean that (small) zoos that are not members of the NVD are ‘bad’ zoos that keep their animals in miserable conditions: all Dutch zoos are subjects to rules, but they probably lay less emphasis on conservation and do not participate in breeding programs (M. Marseille, NVD & EAZA, pers. comm.).

Most of the public debate around zoos focuses on mammals like primates, elephants and carnivores, which have always been more popular and are considered intelligent. Zoos also keep many bird species and these animals are a neglected group in that discussion. This lack of attention to birds in zoos could be explained if birds would have a lower level of cognition than mammals; people often care more about the welfare of intelligent animals. However, birds contain some very intelligent and well known groups such as the parrots and the corvids. Corvids and parrots seem to be cognitively superior to other birds and in some cases even to apes (Emery 2004). They share some characteristics with apes that could explain their intelligence: they have large forebrains, they live in complex social groups and have a long development period before becoming independent. Moreover, they show the same highly variable and innovative feeding techniques as apes, probably due to their shared evolutionary history in the highly unstable climatic and environmental unstable Miocene and Pliocene (Emery 2006). Corvids are able to make tools and use insight in applying them, show signs of transitive inference and they appear to have episodic memory, imagination, theory of mind and prospection (future thinking) (Emery & Clayton 2004). Parrots are more famous for their ability to use symbols to communicate, to classify objects as ‘same’ or ‘different’ and to understand numerical concepts (Pepperberg 2006). Keas (Figure 1) are able to solve problems and show insight in tasks such as string pulling to obtain food (Huber & Gajdon 2006). Although parrots and corvids seem to be the Einsteins of the bird world, also in other bird taxa higher cognitive abilities have been observed (although often with a lower performance than parrots and corvids), such as tool use, insight, object permanence (tracking of a hidden object), discrimination of complex visual stimuli and transitive inference (Buttler & Coterill 2006, Emery 2006). This, in addition to similarities between mammalian and avian brains, suggests strongly that birds have consciousness and that birds have the same level of cognition as mammals (Buttler & Coterill 2006).



Figure 1. The Kea (*Nestor notabilis*), an omnivorous parrot from New Zealand, is a very bold, innovative and curious bird that shows insight in solving problems.
Source: Wikipedia.

Keeping (intelligent) birds in zoos raises ethical questions. One of the most fundamental problems is the question whether it is ethically justified to keep birds in zoos. In this thesis I aim elaborate on this problem. In order to focus the discussion, the central question of this thesis is: *Under which conditions is it ethically justified to keep birds in zoos?* In order to investigate this question, I will discuss and evaluate three possible answers that can be given to this central question: the first answer states that it is justified to keep endangered birds in zoos for conservation of the species through captive breeding. The second answer states that it is justified to keep birds in zoos to act as ‘ambassadors’ to raise money for conservation projects. In both cases, welfare of the birds has to be guaranteed. Last, I will shortly discuss the answer that it is never justified to keep birds in zoos.

To answer my central question, I will investigate in chapter 2 what is meant by welfare and how the welfare status of birds in zoos is. To be able to check whether zoos indeed do what they claim to do, I will investigate in chapter 3 their contribution to the conservation of species (both captive breeding and support of projects). In chapter 4 and 5, I will focus on ethical aspects of keeping wild animals in captivity and on the question whether it is permissible to ‘sacrifice’ individual animals for the survival of their own or other species. In chapter 6 I will answer my central question and discuss the future of zoos.

To be clear about what is meant with a zoo in this thesis, the following definition will be used: a zoo is a professionally managed zoological institution accredited by the EAZA and NVD and having a collection of living animals used for conservation, scientific studies, public education and public display (Hosey *et al.* 2009).

Chapter 2 Welfare of birds in zoos

Welfare is a hot topic among scientists, philosophers and in society, but why should we care about animal welfare? The arguments philosophers have for including animals in the moral community (Bovenkerk & Meijboom *in press*) differ between ethical theories: according to the utilitarian Peter Singer, the only criterion for inclusion of animals is the capacity to suffer and feel pleasure which makes that they have interests in avoiding suffering and feeling pleasure (Singer 1975). Birds are animals that have sentience and consciousness (Buttler & Cotterill 2006), which qualifies them in the view of the utilitarians for membership of the moral community. According to the deontologist Tom Regan, organisms deserve moral attention if they are ‘subjects of a life’: they must have capacities such as self-awareness, memory and a perception of future (Regan 1983, Bovenkerk & Meijboom *in press*). The criterion ‘subjects of a life’ includes mammals of 1 year and older. Given their high cognitive abilities described in the introduction, birds probably are also ‘subjects of a life’. Birds are thus included in the moral community both for deontologists and utilitarians and therefore we should care about their welfare. However, there are different concerns we can have about animal welfare (Heeger & Brom 2001): concerns about the animal *feeling well* (they can react adequately to pain and stress and feel pleasure), concerns about the animal *functioning well* (normal growth, reproduction, health) and concerns about the animal *living naturally* (through development and use of their natural adaptations and behaviour, Fraser 1999).

While philosophers and ethicists traditionally have studied why we should care about animal welfare, scientists have tried to measure it. In the last years science and philosophy have come together. First, measuring welfare is not free of moral values (Fraser 1999, Bovenkerk & Meijboom *in press*, Ohl & Van der Staay 2011). Second, scientists must be able to measure the characteristics an animal must have, according to ethicists and philosophers, for being morally relevant (Bovenkerk & Meijboom *in press*).

Therefore, it is important to get a better understanding of the concepts and scientific views on animal welfare. In a concept of animal welfare, what we know of and how we look at animals come together. An often used concept of welfare is ‘the 5 freedoms’ (Farm Animal Welfare Council 1993): freedom from hunger and thirst, freedom from discomfort, freedom from pain, injury or disease, freedom to express species-specific behaviour and the freedom for fear and distress. The 5 freedoms currently are being criticized, for example by Ohl & Van der Staay (2011) in that they emphasize mainly the absence of negative states and not the presence of positive states. In addition, it is not always directly bad to feel hunger or discomfort, but it becomes bad if an animal cannot do anything to relieve himself (for example by seeking food or shelter). Ohl & Van der Staay suggest the following concept of animal welfare:

An individual is in positive welfare when it has the freedom to react adequately to pain, discomfort, hunger, stress and to conduct normal behavioural patterns that allow him to adapt to the demands of the environment and enable it to reach a state which is experienced as positive.

This concept will be used throughout this thesis.

Now that we have a good concept of welfare, we can have a look at how to measure it. Apparently, there are a lot of indicators of welfare, and the best option is to combine them (Hill & Broom 2009). Problems with reproduction, growth, health, pain, the immune system and longevity indicate that the animal is experiencing stress; it cannot react adequately to stressors and therefore cannot reach a state that is experienced as positive (Mason 2010, Wiepkema & Koolhaas 1993). The presence of 'positive behaviours' such as play behaviour, can indicate that the animal is feeling well and is able to adapt to the demands of the environment (Yeates & Main 2008). However, play behaviour does not always tell something about a bird's welfare. Play behaviour is most common in juveniles and varies between orders of birds: it seems to be correlated with an increased forebrain (Ortega & Bekoff 1987). Social play (playing with another living object) seems to occur more in birds with altricial young.

Another important behavioural measure of welfare that is often used is the presence of stereotypic behaviour. These behavioural patterns, which consist of monotone, repeated behaviours, may develop when an animal is not able to perform species-specific behaviours for a long time (Jensen & Toates 1993). The animal therefore experiences stress, which goes along with a high level of stress hormones, especially cortisol (Wiepkema & Koolhaas 1993). To reduce the stress the animal develops stereotypies, which are associated with the production of opioids; drugs related to the reward system in the brain (Wiepkema & Koolhaas 1993). However, individual animals differ in how they react to and cope with their environment. It may occur that animals that do not show stereotypic behaviours (but instead hide or are very inactive) have lower welfare than animals with stereotypic behaviour. This is because stereotypic behaviours are associated with the release of opioids, which have a calming effect (Mason 2010, Wiepkema & Koolhaas 1993). Stereotypies can also persist, even if the welfare has already improved (Wiepkema & Koolhaas 1993). Species-specific behaviours and stereotypic behaviours can be related to the last part of the welfare concept: *an animal is in good welfare when it has the freedom to conduct normal behavioural patterns that allow him to adapt to the demands of the environment and enable it to reach a state which is experienced as positive.*

When birds cannot adapt adequately to their captive environment and are not able to perform species-specific behaviours which allow them to reach a state that they perceive as positive, they may also develop stereotypic behaviours. The size of the cage in which they are kept is an important factor in the development of route-tracing (hopping the same route over and over; Keiper 1969, Asher *et al.* 2009). Cage shape also plays a role in stereotypy development, especially in smaller cages (Asher *et al.* 2009). However, in studies performed with other animals, the complexity of the cage, which means that the cage gives opportunities to perform species-specific behaviours, was more important than the size (Hosey *et al.* 2009). The absence of natural foraging opportunities in birds also leads to stereotypies, such as spot picking in canaries (Keiper 1969). In Amazon Parrots, an enriched environment with foraging and physical opportunities ('toys') prevented stereotypic behaviour in Amazon parrots (Meehan *et al.* 2002, Meehan *et al.* 2003). This was also the case when they were housed with conspecifics, since parrots, and many birds, are social animals (Meehan *et al.* 2003). Rearing birds in an isolated and barren environment leads to a non-normal developed brain, which can cause stereotypic behaviours (Mason 2010). For example, Hawaiian crows reared in isolation showed normal sexual behaviour, but impaired social behaviour: males were aggressive to

females on the nest, causing her to leave it (Harvey *et al.* 2002). The authors suggest that the opportunity for play behaviour in early life may be important for the crows to develop normal social behaviour; it is shown that corvids show extensive social play (Diamond & Bond 2003). Probably different factors may interact in stereotypy development, as in the case of feather damaging behaviour in parrot species: cage size, complexity of the environment, isolation and early-life history all play a role (van Zeeland *et al.* 2009).

Before, I mentioned that animals differ in the way they cope with the circumstances in captivity. Not only do individual animals cope differently, but also species react differently to captivity, even closely related species (Mason 2010). Cockatoos, macaws and African Grey parrots (Figure 2) adapt badly to captivity, because feather plucking is common in those species (van Zeeland *et al.* 2009, Mason 2010, Seibert 2006). In contrast, other psittacines like lorises and budgerigars seldom develop that behaviour and also breed easily in captivity (Mason 2010, Seibert 2006). The relation between the mortality rate of raptors kept in captivity compared to that of their wild conspecifics varies; in Kestrels it is lower but in Sparrow Hawks it is the same as in the wild (Mason 2010). The behaviour which wild populations of different species show when confronted with humans, maybe also a measure for suitability of keeping in zoos. For example, in their natural habitat, Humboldt penguins (Figure 3) show a high heart rate in response to humans and seem not to habituate to their presence (Ellenberg *et al.* 2006), whereas Magellanic penguins habituate rapidly to people (Walker *et al.* 2006). Mason (2010) hypothesizes that the differences in adaptation to captivity might be caused by the distinction between generalists (species without a strong preference for a certain habitat, food or temperature etc.) and specialists (species with a strong preference for a certain habitat etc.). Generalist species, which are flexible in their behaviour, might adapt better to captivity, as well as bold and non-migratory species. On the other hand, generalist species often also are very explorative and this can cause boredom in captivity. Species with a moderately flexible behaviour therefore might be best suited to captivity. However, this hypothesis has to be tested further.



Figure 2. African Grey Parrots (*Psittacus erithacus*), popular as pets, are susceptible to feather plucking.
Source: www.birdtricks.com

We have seen that captivity in general can lead to welfare problems in birds and that species differ in their adaptability to captivity. Now we focus on birds in zoos again. Good welfare in zoos is important for all animals, but especially for endangered species, because it can

enhance reproduction (Mason *et al.* 2007). It is also important to prevent stereotypes, if you want to study the behaviour of a certain species and extrapolate this knowledge to wild populations (Mason *et al.* 2007). Stereotypic behaviours are much more frequently observed in captive than in wild animals (Cooper & Nicol 1996). But what do we know about the welfare of birds in zoos? Some zoo critics, and most zoo professionals, think that zoos can provide animals the same, or maybe even better levels of welfare than the wild, otherwise zoos would not exist (Wuichet & Norton 1995). Is this true? Mason *et al.* (2007) indicate that in general in zoos, 75% of felids and 10% of primates show abnormal behaviour, but no data for birds is available. Just a few studies have focused on the evaluation of bird welfare in zoos. Some problems occur in zoos that are not present in the wild. For example, colony breeders, such as Humboldt penguins and flamingos, breed less well in zoos, due to small groups (Blay & Coté 2000, Hosey *et al.* 2009). Humboldt penguins in captivity are also more susceptible to a fungus infection, which was not present in a wild population (Smith *et al.* 2008, Alvarez-Perez *et al.* 2010). Another problem, which only exists in the keeping of birds, is that they can fly away. The NVD states in its ethical code (2010) that feather clipping, the cutting of the primary flight feathers (Hesterman *et al.* 2001), is only applied when there is an urgent need. Pinioning, the amputation of a part of the wing bone below the *alula* (Hesterman *et al.* 2001), is being discouraged. Moreover, feather clipping and pinioning are often not necessary anymore, because more and more birds in zoos are kept in large aviaries (M. Marseille, pers. comm.).

In zoos, next to the ‘normal’ problems of captivity, another factor is present: visitors. Animals can respond to humans in various ways: they can be afraid of them, see them as a symbiont (a ‘partner’), a prey, an enemy, a conspecific or as neutral (Hosey *et al.* 2009). Sometimes humans can even act as enrichment, like in the case of a male Long-billed Corella (Nimon & Dalziel 1992). In the presence of visitors, Humboldt penguins spent more time swimming submerged, less time swimming at the surface and less time resting (Davey 2007). Greater Rheas did not respond strongly to visitors; they only walked more alert and defecated/urinated less in the presence of humans (Azevedo *et al.* 2009). In these cases it is not very clear how the animal perceive their human visitors.

In conclusion, captivity can lead to problems in behaviour and reproduction in birds, which indicates that birds may not have the whole freedom to conduct normal behavioural patterns and achieve good welfare. However, it is not clear how many birds in zoos are affected by these problems and how severe they are. Therefore, much more research is needed about bird welfare in zoos. Since we saw that birds are intelligent, conscious animals, there is an increased risk that they are experiencing more welfare problems than we might know.

My opinion is that zoo life is not perfect for animals, but zoos are still making efforts to improve. Life in the wild is neither perfect and is ‘hard’, think of diseases, predators, accidents. Most humans prefer a comfortable modern house and society instead of living in the wilderness. However, we still need ‘typical human’ behaviours like social contact, innovation and playing. Further, we like to ‘work for our food’. This could be the same for animals. We think that for people and dogs it is not good to live on the street, even though that is what we could define as ‘wild’ in a modern life. ‘Street life’ is hard, we can hear people say; there are many dangers, there is more competition, the weather can be very cold or hot. We want poor people still living in primitive conditions to have a house and electricity.

Nevertheless, we see animals very romantically, as wild creatures roaming free in nature. Why should that be better for animals if we think it is not best for humans? We can think an animal is a better animal when it is wild and free, but is that also better for the animal itself (Cochrane 2009)? I do not say there are no problems in zoos, or that living in a cage is the same as living in a comfortable house, which we can leave whenever we want, I am just discussing the romantic view people have of animals and the assumption that they think they know what is best for them. Animals in captivity have certainly more freedom to react adequately to pain, hunger and discomfort than in the wild: when they have a disease, they will be treated rapidly by a veterinarian; when they have hunger or thirst, they just have to wait feeding time; when it rains, they can go inside. They do not have to be afraid of predators. When housed in a complex environment, they may also experience the freedom to conduct normal behavioural patterns which enable them to reach a positive state. However, it is this last freedom that often is so difficult to satisfy.



Figure 3. Humboldt penguins (*Spheniscus humboldti*) are prone to a fungus in captivity and habituate less to humans compared to their cousin the Magellanic penguin (*Spheniscus magellanicus*).

Source: Wikipedia

Chapter 3 Contribution of zoos to conservation

In this chapter I continue exploring the first and second condition of when it could be justified to keep wild birds in captivity: if the welfare of birds is guaranteed (chapter 2) and if the goal of keeping the animals is very useful, namely conservation by captive breeding and by supporting projects. Of course zoos also have other goals: entertainment and education, as is stated in the mission of the EAZA. To highlight them all goes beyond the scope of this thesis, therefore I focus on the goal of conservation. This goal could be divided in *ex situ* conservation, where animals participate in captive breeding programs in zoos with the possible goal of reintroduction programs, and *in situ* conservation, where zoos help to protect wild life and ecosystems by raising money or sharing expertise.

If we look at captive breeding in zoos, it can be stated that overall more than 50% of zoo populations is not viable on the long term. A population is not viable when it counts less than 200 individuals, its genetic diversity is less than 90% of the founder population (needed to maintain genetic diversity and prevent inbreeding) and the population is declining (Baker 2007). The viability of bird populations in EAZA zoos is questioned by Walter *et al.* (2009). One reason for the low viability is that the populations in zoos are small; for birds this is an average of 7.5 individuals per species per zoo (Stanley Price & Fa 2007). In the period 2002-2006, 22% of acquired birds in EAZA zoos belonging to eight families were wild-hatched. This could be even more because hatch type of 18% of acquired birds was unknown (Walter *et al.* 2009). In conclusion, it can be stated that populations in zoos are not self-sustainable.

If we look at captive breeding for conservation, we are especially interested in the populations of endangered bird species in zoos. So how much endangered bird species do zoos have? We see that the gross of bird species in NVD zoos is not endangered (see LC and NT in Table 1). However, the ‘endangered species’ (VU, EN and CR) participate more in breeding programs than the non-endangered species. According to Leader - Williams (2007), the number of endangered species in zoos in captive breeding programs is rising.

Table 1. Bird species in NVD zoos (the Netherlands) with their IUCN status in 2010. CR=Critical, EN=Endangered, VU=Vulnerable, NT=Near Threatened and LC=Least concern. The statuses in red are considered ‘endangered species’. The first column shows per IUCN status the percentage of species out of all bird species in NVD zoos. The second and third table show per IUCN status the percentage of species that participate in an European Endangered species Program (EEP) or an European Studbook (ESB). An EEP is for endangered species or species with a low number of individuals in zoos: it contains a studbook of all individuals in the zoos and reproduction of the species is highly coordinated between the EAZA members. ESB contains a studbook for the species, which eventually can participate in the future in an EEP (data with permission of M. Marseille, NVD).

| | Species | EEP | ESB |
|-----------|---------|-------|-------|
| CR | 1.4% | 57.1% | 14.3% |
| EN | 4.5% | 36.4% | 9.1% |
| VU | 7.8% | 15.8% | 23.7% |
| NT | 9.6% | 8.0% | 17.0% |
| LC | 76.6% | 0.8% | 4.5% |

Nevertheless, even if zoos would participate more in captive breeding of endangered species, would that really be a good contribution to conservation? I summarize some arguments: some say that breeding programs could be better carried out in the country of origin in specialized mono-species facilities (Snyder *et al.* 1996), though this is challenged by others (Gippoliti & Carpaneto 1997). Advocates of captive breeding state that they raise consciousness about endangered species (Loftin 1995), but Rahbek (1993) and Snyder *et al.* (1996) philosophize that captive breeding in zoos distracts people (and governments) from the real problem, namely the destruction of habitats. People might think that the problem of threatened species is already taken care of and there is no urgent need to help. As Loftin (1995, p. 167) said: “it creates the impression that omnipotent humans can cope with the global decrease in biological diversity through *in vitro* fertilization”. Captive breeding is also much more expensive than conservation *in situ* (Snyder *et al.* 1996). Further, like already mentioned, populations in zoos suffer from genetic and demographic problems, but also from space restrictions that do not allow them to hold sufficiently big populations (Baker 2007). In addition, endangered species are often difficult to breed; examples are the Kakapo and the Whooping Crane (Snyder *et al.* 1996). Zoos often manifestate themselves as ‘arks’ for endangered species: when habitat destruction and other problems are over, the species could be reintroduced. But what if the species could never be introduced again? Some say it is better to have the species in captivity than not having it at all. However, the species will undergo genetic changes in behaviour due to the captive environment, sometimes subspecies are crossed and thus the actual animal will be different than what was intended to preserve (Loftin 1995). Though, genetic changes caused by evolution always will occur and a species is never static, so you could argue that this is not a good argument. However, the question still remains whether it is worth preserving a species which can never go back to the wild.

That leads us to the issue of reintroduction programs. Do individuals from endangered species in zoos go back to the wild? The answer is that few zoos provide animals for reintroduction programs (Beck 1995, Stanley Price & Fa 2007). Yet, zoos are often involved in other ways in reintroduction programs: they can help in funding, administrative tasks or share their knowledge, for example about veterinarian care (Stanly Price & Fa 2007). Even though there are some succes stories in reintroductions like the Golden Lion Tamarin, California Condor, the Mauritius Kestrel and Guam Rail (Snyder *et al.* 1996), only 11% of programs is succesful (Snyder *et al.* 1996, Beck 1995). Loftin (1995) argues that the success story of the Golden Lion Tamarin was mainly due to the acquisition of habitat, not to the reintroduction. Problems with reintroductions include an unsuitable habitat, diseases, invasive species, unsustainable harvesting, climate change and altered behaviours caused by captivity (Stanley Price & Fa 2007, Mathews *et al.* 2005).

In conclusion, even though zoos claim that they are ‘arks’ for endangered species, they only contribute on a small scale to captive breeding and introduction. Though, as mentioned before, zoos can also contribute to *in situ* conservation, by donating money and sharing knowledge. Let’s take the NVD zoos (the Netherlands) as an example. Some zoos have their own fund. For example Vogelpark Avifauna in the Netherlands, a zoo with only birds, supports several projects concerning birds, for example the Mabula Ground Hornbill in South Africa and Hornbills in the Philippines. Avifauna sponsored the scientific study of flora and fauna in the Philippines, an education program for local people, a shelter for endangered

species and the head of bird care gave advices to local people (Masterplan Avifauna). The 15 NVD zoos also join the NVD fund called Stichting NVD Natuurbeschermingsfonds (NNBF); they pay every year a certain amount of money, based on visitor numbers (NNBF 2011). The fund also receives support from donations. In 2010 this fund donated 184.187 euros to 22 projects worldwide. Three of these projects had the goal of protecting a bird species and its ecosystem: the Black Vulture (*Aegypius monachus*) in Spain and France (11.000 euros), the Scarlet Ibis (*Eudocimus ruber*, Figure 4) and other waterbirds in Surinam (21.925 euros in 4 years) and two Hornbill species from the Philipines (*Aceros waldeni* and *Penelopides panini*; 32.520 euros in 6 years). All other projects were for mammals. The EAZA runs every year or every 2 years a campaign; the most recent is the campaign for South-East Asia in cooperation with the IUCN. Zoos can decide for themselves if they want to join the campaign and how they want to support it (M. Marseille, pers. comm.). For example, they can only raise awareness or they can raise money by selling merchandise. The EAZA Ape Campaign in 2010-2011 has raised 540.000 euros (M. Marseille, pers. comm.).



Figure 4. Scarlet Ibis (*Eudocinus ruber*), a species that participates in a project supported by the NNBF.
Source: Wikipedia

Gusset & Dick (2010) made an evaluation of WAZA (World Association of Zoos and Aquariums) supported projects. One sixth of all supported projects was dedicated to birds. The main contribution of zoos to these projects was in the form of money (48%) and most projects (59%) were not viable without the contribution of zoos. 63% of projects focused on species protection. The more money a project received, the more successful it was. Gusset & Dick conclude that most WAZA members are on their way to contribute significantly to conservation, but efforts must be intensified and the amount of money spend on in situ projects is still small, which limits the projects' efficiency. This is also supported by other studies. Some zoos spent a lot of money on conservation, but others not. For example, in 2000 the average percentage of money spent on conservation was only 0.1% for American zoos (Zimmerman & Wilkinson 2007). Only 34% of zoos in a global questionnaire had staff dedicated to conservation (Zimmerman & Wilkinson 2007).

Zoos can also join their forces for a special region; an example is the Madagascar Fauna Group (MFG), a coalition of Western zoos (Durrell *et al.* 2007). The MFG helped to modernize two zoos in Madagascar (one modernized succesful), established a protected rain forest and a reintroduction program for black and white ruffed lemurs in that forest. A new exhibition in Zoo Zürich, which consisted of building a Malagassy rainforest, led to the

establishment of collaboration between Zoo Zürich and Masoala National Park in Madagascar (Figure 5). The cooperation resulted in more attention for the Masoala National Park, which led to significantly more visitors from Switzerland visiting Madagascar, scientific research in the National Park and the support of community based conservation projects around the NP (Hatchwell & Rübell 2007).

Another argument for the contribution of zoos to conservation is the role they play in scientific studies: much of what we know of some wild species comes from research in zoos. Some new technologies for monitoring wild animals have been tested first in zoos. The knowledge zoos have in managing of small captive populations can also be applied *in situ*, where populations are often small due to habitat degradation and fragmentation. This leads to the need of actively managing populations in the wild (Hutchins *et al.* 2003).

In conclusion, zoos do not contribute so much to *ex situ* conservation to call themselves ‘arks’. Considerable efforts are made to contribute to *in situ* conservation by various means, although birds are under represented in the supported projects compared to (only) mammals. Though, there is still a long way to go: Leader – Williams *et al.* (2007) state that a great deal of the zoos within the Federation of Zoological Gardens for Great Britain and Ireland were not fulfilling the mission of promote education, public awareness, research and *in situ* conservation.



Figure 5. Masoala National Park in Eastern Madagascar benefits from cooperation with Zoo Zürich in Switzerland.

Source: www.news.mongabay.com

Chapter 4 Animal liberty

In this chapter I will examine the different arguments for and against keeping wild birds in captivity. In the pleas against zoos, two kinds of arguments are often brought forward: some people say that they are against zoos because the animals' welfare is impaired. We already looked at this argument in chapter 2. Others say, and this is called 'the authenticity criterion' (Wuichet and Norton 1995, p. 239) that 'there is inherent value in the state of wildness; no amount of caring for an animal can compensate for the freedom and authenticity of experience lost when the animal is removed from its habitat'. Tom Regan (1995) uses a similar argument. He states that an animal can only be kept in captivity if it is in its best interest to do so, for example if it would be killed otherwise. In all other cases the animal is not treated with respect (because its liberty is not guaranteed) and thus zoos are not defensible, even as all other forms of animal husbandry. This argument applies to animals that are 'subjects of life'. However, it could be argued that keeping domestic animals in captivity leads to less moral problems than keeping wild animals in captivity. Men and animals are since ages part of a 'mixed community' (Midgley 1984). In the process of domestication we made a kind of 'pact' with domestic animals: we look after them and give them food and protection and in return they give us their flesh, eggs and liberty (Larrere & Larrere 2000, Norton 1995). We did not make such a pact with wild animals. Moreover, they are less adapted to the captive environment (Price 1984). Therefore, keeping them in captivity apparently leads to more moral problems than the keeping of domestic animals.

Let us now take flight restriction (feather clipping, pinioning, see figure 6) as an example to illustrate different views about animal liberty. A deontologist like Regan would probably be against flight restriction, because no matter what the advantages are for the zoo owner (the bird cannot fly away), for the animal (maybe it cannot fly, but it can walk freely around instead of being kept in a cage) or for other stakeholders, the principle of respect for the animal is being violated (it cannot fly anymore, it is not free). An utilitarian like Singer would take into account all interests of subjects that are able to suffer and feel pleasure and who are affected by the action, so in this case the birds, the zoo owners, zoo keepers and visitors. Then all interests of everyone affected by the action are considered and all interests are weighed equally. What are the interests of the different parties? For the zoo owner there is the advantage that he does not lose his bird. For the zookeepers it is an advantage that they do not have to care for the animal to fly away. For the visitors it may be an advantage that they can see the bird without bars. For the animal it is more problematic to define the advantage, because, does it have a greater interest in flying or in performing other behaviours? However, we already saw that flight restriction is advantageous for the zookeepers, the zoo owner as well as for the visitors. Since the best outcome is that which provides as many benefits as possible to as many stakeholders as possible, Singer would probably not reject flight restriction. However, in order to make a final moral evaluation, it would also be important to know for the utilitarian that there is another option, namely to keep the birds in a big aviary.



Figure 6. Feather clipping in a chicken. This procedure is painless and lasts until next moult.
Source: Wikipedia

Let's now return to the argument of an animal's freedom and wildness. Is it really an interest for a bird to be free? Can it never be happy and satisfied in captivity, even though all his needs and desires are met? There are different types of freedom which have to be separated in the case of wild animals in zoos (Meijboom 2012): First, the freedom of not living in a cage or small space, e.g the freedom of movement (as is the case with most dogs). Second, there is the freedom of action, which holds that an animal can choose where it goes and when, what it eats and so on (as is the case with most cats). Last, there is the freedom of autonomy, which states that humans have no influence at all on the lives of animals, as in the case of truly wild animals.

We start looking at arguments for the freedom of autonomy in wild and captive animals. Some people say that animals in the wild are not freer than in captivity, because they are constrained by 'pressures' such as natural predators, diseases (Leahy 1991), territories and migratory patterns (Maple *et al.*1995). In my view, this argument implies that humans are neither entirely free, because they are constrained by borders of countries, money and other humans. For example, the family in which a person grows up determines a great deal how someone starts his or her life. Another argument is that animals can never really be free (thus also not in the wild) because they are not self-conscious and therefore they cannot make choices or raise objections (Leahy 1991). However, we have already seen that birds probably do have consciousness (Buttler & Coterrill 2006). Moreover, Dale Jamieson (1995) asks himself, is self-consciousness always needed to make choices? Probably not. Further, people also make sometimes choices without being conscious of it.

Cochrane (2009) writes in his paper merely about the freedom of autonomy. He states that humans have an *intrinsic interest in liberty* because they are 'autonomous agents': they can reflect on their perceptions, their desires and they want to find out for themselves what is good for them (Cochrane 2009). If a person would have a pleasant life which fulfils his desires, but he is not free, people would nonetheless say it is not a good life. Consider a slave whose desire is to serve his master. Although he can fulfil his desire, he is not free, because his thoughts are influenced by his master and he cannot choose his own life. Cochrane argues that most animals have desires, but are not autonomous agents: some animals are conscious, but at the moment there is still no evidence for higher-order consciousness, such as reflection on desires and thoughts. Though, consciousness in animals is a much debated topic and there is still no consensus about what consciousness and awareness precisely mean and which level of consciousness certain animals have (Buttler & Cotterill 2006, Pepperberg & Lynn 2000,

Griffin & Speck 2004). Some state that a high level of cognition in animals correlates with a high level of consciousness (Buttler & Cotterill 2006), though that is argued by others (Pepperberg & Lynn 2000). The possibility of higher-order consciousness in birds, especially in parrots and corvids is not ruled out yet and therefore we might have to be careful in restricting them in their autonomy (Cochrane 2009).

I agree with Cochrane that humans have the capacity to reflect, and that they want to pursue their own life. Because of humans' higher cognitive capacities, there is also much more possible in a human's life than in an animal's life and consequently, he has to choose more: for example choosing a religion or not, choosing a study, a job and a place to live, doing a sport, going to the theatre or to the disco etcetera. Humans can reflect on the choices they make and how they see their future: they have dreams about what they want in life. This applies mainly to the rich people and you could say that poor people are not entirely free, but that is beyond the scope of this thesis. What I want to point out is that because of its lower cognitive capacities, an animal's life is much simpler. It has to make fewer decisions, probably has no dreams about the future and consequently, its life is less influenced by the restrictions of captivity. Therefore I do not think animals should have per se the freedom of autonomy, although we have to be cautious with keeping parrots and corvids in captivity. This is because they possibly have the capacities that are required to be called 'autonomous agents'.

Although I argued that most animals do not need to be autonomous, I think that for all animals it is good to have some opportunity to make their own choices (freedom of action). It gives animals more control over their environment, which reduces stress and enhances welfare (Wiepkema & Koolhaas 1993). Further, it gives the animal more dignity from a deontological point of view. An example is an animal that can hide for a dominant conspecific, which reduces fear and stress. Mate choice is also important, because it promotes successful reproduction (Price 1984). Giving animals the opportunity to choose is in accordance with the concept of animal welfare of Ohl & Van der Staaij (2011): the animals must have the freedom to *react* on their environment adequately, in other words, they must be given a choice.

When thinking of the freedom of movement, being locked in a house seems detrimental for our human welfare. An example is given in the Diary of Anne Frank. We drive crazy because in a house the tensions between persons become too high, we need 'fresh air', exploration, variation in daily life and movement. Is this the same for animals or has this to do with our consciousness and intelligence? Or do we need more space because our 'home range' is much larger than a house? Most animals will escape from their enclosure when given the chance; an example is the establishment of escaped Ring-necked parakeets (*Psittacula krameri*, figure 7) in Dutch cities.

Does this say something about their welfare and their need to be free? Apparently they prefer being free and wild over being locked up, although it does not seem likely that they are conscious of what it means to be in the wild or in captivity. It can also mean that their motivation to explore is very strong, and when they are in the wild, there is no way back for them. Nevertheless, it shows that in captivity an animal's need to explore is probably often not satisfied.

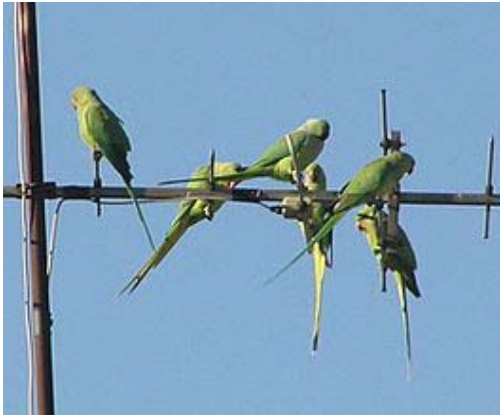


Figure 7. Ring-necked parakeets (*Psittacula krameri*) in a city. What does the escape of animals from captivity say about their welfare and their desires?
Source: Wikipedia.

Chapter 5 For the good of the species

In the last chapter I explored the concept of ‘liberty’ and examined what it meant for an individual animal. I did not draw a straight conclusion, but I noted some problems with the restriction of freedoms, especially the freedom of movement. I also stated that there are some problems with the welfare of birds in zoos, although not much is known about the topic. In this chapter I discuss whether the decision to ‘sacrifice’ the welfare and liberty of individuals is more easily justified when it is for a noble goal; namely the conservation of species. As we saw in chapter 3, the conservation goals of zoos can be achieved by captive breeding and by raising money/sharing knowledge for *in situ* projects.

In captive breeding, the interests of the (wild) individual and of the species often clash. For example, for the rescue of the California Condor, all surviving wild animals were caught and brought in captivity (Hutchins 2007, Meretsky *et al.* 2000). One could argue that the interests of the individuals (‘liberty’ for deontologists, ‘living a natural life’ for the proponents of the authenticity criterion or ‘not suffering’ for utilitarianists and animal welfare advocates) are violated here to some extent. A response to this objection is that although the interests of the individuals are violated, due to the captive breeding program the species was saved from extinction. Here we see that there is ambiguity in what is of the highest moral concern: the welfare or liberty of the individual captive wild animals or the survival of the species. Another example of the sacrifice of an individual for the good of the species is a captive animal that is being reintroduced in the wild and which experiences a lot of dangers and might even be killed.

To understand this ambiguity, we first have to consider the moral status of wild and domestic animals, since captive wild animals fall in between those two categories. As said before, some authors argue that we made a kind of pact with domestic animals, which implies that we have to care for the individual and give it food, shelter etcetera. (Midgley 1984, Larrere & Larrere 2000, Norton 1995). Wild animals in the wild are a different case, according to conservation ethicists. We respect their wildness and therefore we do not interfere in their lives (Norton 1995). Further, we have no contract with them and thus no moral obligations towards individuals. We treat them as a separate community, as part of natural processes; the (dynamic) natural systems are of the highest moral concern (Leopold 1949). Since organisms are connected with their abiotic environment there is no moral difference between organisms and non-living components of ecosystems. A concern for wild animals is focused on the conservation of species in this view, not on individuals, because species contribute to the wholeness of the natural system (Leopold 1949, Callicot 1988). Captive wild animals are in between domesticated and wild animals (Midgley 1983). The more we interfere in animals’ lives, the more obligations we have towards them. We therefore have obligations towards individual captive wild animals, but we also hope they can contribute to the continuation of ‘wild processes’, where the species is part of (Norton 1995).

In contrast to conservation ethicists, animal right advocates such as Regan always and only focus on the interests of individual animals. They think saving endangered species is important not because the species has high moral value, but because the individuals of those species have rights and have to be protected from dangers affecting them (Regan 1983). In the case of the California Condor (Figure 8), which was threatened because the birds ate carcasses

poisoned by lead (Meretsky *et al.* 2000), it was justified to bring the remaining individuals in captivity to protect them from this immediate danger (Regan 1995). However, they should not have been brought in captivity only for captive breeding purposes, because then they would be treated as a mean to save the species. In the animal rights versus conservation debate, the utilitarian Singer (1979) shares the view that individuals are of more concern than species: he states that ‘species as such are not conscious entities and so do not have interests above and beyond the interests of the individual animals that are members of the species’.



Figure 8. California Condor (*Gymnogyps californianus*) in San Diego Zoo. This species is part of a captive breeding program and has been successfully reintroduced in the wild.

Source: Wikipedia

If it were possible to save species without violating the individuals’ respect, there would be no problem for deontologists and conservation ethicists. Unfortunately, it is not always possible to respect the individuals’ interests in terms of liberty when conserving a species; sometimes it is too late to focus on the causes of the decline and captive breeding is the only option. Then, apparently the views of conservationist ethicists and animal right advocates will clash. However, if you look at the problem from another point of view, conservation of a species is also about individuals’ interests: the extinction of a species means that no future individuals of that species will ever live anymore. The lives of those future animals also have value (Attfield 1983). Moreover, the loss of one species may lead to the extinction of other species with which it is connected (Hutchins 1995). I can imagine that an utilitarian could also approve the sacrifice of individual animals if more future animals could be born by doing that: the ‘suffering’ of some animals in captivity then would be less than the ‘pleasure’ of many future generations, and thus it would be justified to keep animals in captivity for conservation of the species. Norton (1995) adds to this argument that animals in their struggle for life not only strive to survive, but also strive to reproduce; this implies that they have an interest in the continuation of the species. However, I think this argument is not completely valid, since animals probably do not ‘care’ about the perpetuation of the *species*, but about the perpetuation of their *own genes*: even bees that help to raise their sisters or birds that help at their parents nest do that to maximize the passing on of their own genes in future generations (Krebs & Davies 1993). Norton’s argument is thus only valid when the animal can *reproduce itself* and is not only used as ‘ambassador’ in a zoo to raise money for its species, or worse, for other species. Norton also comes up with the term ‘animal altruism’. He states that animals, unlike humans, cannot really voluntarily choose to sacrifice themselves for the species because they probably do not understand the abstraction and goal of conserving the

species and of sacrificing themselves. Moreover, they cannot speak and therefore they cannot show us that they eventually are willing to sacrifice themselves, as in the case of human 'heroes'. However, Norton says that even though animals lack the criteria of human heroes (voluntarily undergo pain, suffering, death), it is antropomorphic to think that therefore it is not justified to sacrifice them. It *is* justified because animals have interests in the perpetuation of the species (or their own genes), but only if measures are taken to diminish the individual's suffering or pain. These arguments connect to the 'hybrid view' Hutchins proposes (Hutchins 2007): individual animals have certain rights, for example the right not to suffer too much. If these rights are fulfilled, the interests of the species can be considered.

My own view about the theme is that individual animals are entitled to food, water, shelter and an appropriate environment that gives them the opportunity to perform species-specific behaviours. However, the lives of future generations also have moral value and animals have interest in the passing on of their genes. Further, I think that a species per se also has moral value: with the extinction of a species, a specific *telos* (introduced by the philosopher Rollins in the seventies; Rollins 2007) disappears: a specific life form, with unique adaptations formed by evolution and/or domestication (Fraser 1999). We humans have the obligation to care for nature because we are not the only ones that matter morally in this world; at least we have to try to prevent species extinctions by our behaviour. Because I think that in captive breeding of endangered species the interests of individuals and species do not necessarily clash, I conclude that it is justified to keep wild individuals of an endangered species in captivity for breeding purposes, provided that the welfare of that species is guaranteed sufficiently. Unluckily, this kind of conservation is not often applied in zoos and also goes along with several problems, as discussed before.

Besides serving as a genetic backup to save their own species, animals in captivity can also serve as an 'ambassador' for other species in a certain ecosystem. This means that they are 'used' to raise awareness and money for nature conservation. I do not find that argument very convincing since in that situation the animal does not reproduce itself and it has no interest in the continuation of another species. Norton (1995, p. 118) suggests that "a member of one species could be sacrificed for the well-being of another if that sacrifice can be justified as a necessary act to protect natural communities and the habitats that will make possible the perpetuation of all species". But as I argued, individual animals do not have an interest in continuation of their species, unless they can breed themselves. So it is difficult to justify from this point of view that for an example a Blue-and-yellow Macaw (*Ara ararauna*) is kept in a zoo and acts as an ambassador for the Amazon. By the money it raises indirectly because people watch him and pay for that, projects in the Amazon can be supported. However, the animal itself has no interest in protecting the Amazon for other species. In addition, his own species is not endangered (see Red List of Threatened Species of the IUCN), as is the case for most species in zoos, thus the argument of perpetuation of the species is neither valid. However, it could be argued that the species could become endangered when the logging in the Amazon is not stopped.

To justify this action we have to use a more utilitarian argument: weighing the 'suffering' of one individual of the Blue-and-yellow Macaw against the possible future lives of individuals of endangered species in the Amazon, the pleasure of visitors, the jobs of the employers and so on. However, it is difficult to tell how succesful the projects are that zoos

support and thus how much they really contribute to conservation of species and habitat. Therefore, I find the argument of animals keeping in zoos to act as ambassadors for other species or an ecosystem not convincing enough. Moreover, it is not necessary to keep animals in zoos to raise money for conservation.

Now that we have investigated all possible conditions under which the keeping of birds in zoos could be justified we have to draw conclusions. For example, in this chapter I assumed that keeping birds in zoos violates their interests (liberty, welfare) and thus I talked about the sacrifice of individual animals for the conservation of the species. However, now we have to consider, based on the previous chapters, if animals' rights are sufficiently violated or not to justify the keeping of birds in zoos.

Chapter 6 Discussion & Conclusion

The central question of this thesis is: *Under which conditions is it ethically justified to keep birds in zoos?* Three possibilities were proposed: First, if endangered bird species are kept in zoos for captive breeding programs it is justified. Second, it is justified if birds are used as ‘ambassadors’ to raise money for *in situ* projects. Bird welfare has to be guaranteed in both cases. Last, it is never justified to keep wild birds in zoos. In the previous chapters I explored the different conditions, considering arguments for and against.

In chapter 2, the welfare of birds in zoos was considered. I noted problems with birds in captivity: mainly stereotypes, but also reduced reproduction, susceptibility to disease and behaviour affected by visitors. This indicates that under certain circumstances captive birds are not able to react adequately to their environment and reach a state that is perceived as positive, but since only a few studies in peer-reviewed journals have focused on bird welfare in zoos there is a serious lack of knowledge on that subject. However, even though captivity leads to some welfare problems, I think we should not focus too much on the romantic idea of animals living a natural life (Musschenga 2001). Living in captivity also has benefits for animals. Many of the dangers that threaten them in the wild are not present in zoos. In addition, zoo animals always have a place to shelter, receive food everyday and so on. Though, I do not suggest that this alone guarantees that birds have good welfare in captivity. Therefore, it is necessary to evaluate bird welfare in zoos and also to investigate what birds ‘want’ in their environment (for example by performing choice tests). To compensate for the restrictions of captivity, zoos already make efforts to provide good welfare conditions. No legislation exists on husbandry standards for zoo animals, but the NVD has husbandry guidelines which indicate that an animal has to be housed with conspecifics, which food it has to be given etcetera (M. Marseille, pers. comm.). Further, zoos try to enrich their birds’ lives. Environmental enrichment is the best way to reduce stereotypes, although it is not successful in all cases and until now it never has reduced stereotypic behaviours with 100% (Mason *et al.* 2007). Examples of enrichment for birds in Dutch zoos are: keeping birds with conspecifics and in mixed-species exhibits, feeding live insects, keeping birds in an environment which gives opportunities to perform species-specific behaviours (which can include vegetation, sand, water, height differences) or feeding whole animals to raptors (Dierenpark Emmen, GaiaZOO, pers. comm.).

When looking at the conservation goals of zoos (chapter 3), I concluded that the idea of zoos as living arks is an illusion: zoos only keep a few endangered species. This is a pity, since I concluded in chapter 5 that it would be justified to keep individuals in captivity to sacrifice them for the species, as long as they can reproduce themselves (because animals have interests in passing their own genes on). Yet, captive breeding is confronted with many problems and should only be considered if there is really no other way to prevent the species from extinction (Loftin 1995). In contrast, zoos and zoo organisations make considerable efforts to contribute to *in situ* projects, although I think the term ‘NGO’ is not appropriate for zoos: in the first place, zoos were set up to entertain and educate people. A zoo is a company that needs to make money and which can be an attraction for a particular city or area. If it were not a company, there would not be 50 zoos in the Netherlands and no expensive new exhibitions would be built: instead the money would rather be spent on *in situ* conservation. I

think it is more appropriate to call zoos with a term from business ethics ‘socially responsible’ companies. Of course they need to gain money, but they do not use this money only for own interest; they also want to contribute to conservation. Nevertheless, if we want to justify the keeping of birds in zoos by referring to the contribution zoos make to conservation by supporting *in situ* projects, we are confronted with serious ethical problems. As we have seen, it is difficult to justify keeping animals in captivity by referring to their role as an ambassador (chapter 5) because animals probably do not have interests in the perpetuation of other species or even of their own species if they cannot reproduce themselves. It could be argued that we also have to care for the lives of future members of those other species, but in my view the link between the support zoos give to *in situ* projects and the survival of endangered species is too weak to justify the ‘sacrifice’ of individual animals for this goal.

However, we could ask ourselves, are birds in zoos really being ‘sacrificed’ for their own species or other species? Is their welfare a lot worse than in the wild? As concluded before, little is known about bird welfare in zoos. Further, as investigated in chapter 4, I do not see a problem in denying animals the freedom of autonomy or action (until a certain level), but I do with the restriction of the freedom of movement. If I look at my rabbits, or my birds in a cage, they look ‘happy’, although I never can really be sure about it. Though, one of my rabbits always tries to escape. Would he be better off in the wild, even though in his big cage he is protected from dangers we provide him with food everyday? There is too much uncertainty about birds’ welfare in captivity to answer the question if animals in zoos are being ‘sacrificed’. In addition, we can ask ourselves: can we ever give animals everything they need? Do their lives need to be *perfect*, while humans’ lives are neither perfect?

Let’s now turn back to the central question. Following my ethical reasoning, I reject the argument that it is never justified to keep birds in zoos because in general, birds do not need autonomy. Further, animals living a natural life is not of the highest moral concern. In addition, it is justified to keep endangered species in zoos for captive breeding if we provide individual animals good welfare. However, there are too many problems with captive breeding to consider this a useful conservation goal of zoos. In contrast, the ‘sacrifice’ of individual birds for support of *in situ* conservation is not justified, because the argument of animals being kept as ‘ambassadors’ for other species does not stand. However, there is too little knowledge about bird welfare in zoo environments to state that birds are ‘sacrificed’ in zoos and that they should not be kept to support *in situ* conservation projects, although it could be argued that it is also possible to raise money for conservation without keeping animals. Here the other purposes of zoos should be considered, namely education and entertainment, but that is beyond the scope of this thesis.

Personal reflections and recommendations

I started this thesis with the hope of getting straight-forward answers to the ethical questions I had about keeping birds (and animals in general) in zoos. I must concede that I still do not have a straight-forward answer (as I am never extreme in my opinions and thoughts that may be not very surprising). I admit I still have mixed feelings about zoos. On the one hand, I enjoy watching animals (in zoos) and as a biologist I want of course also to learn about them. On the other hand, I feel uncomfortable looking at all those animals in (large) cages. Is my intuition correct? Are animals suffering in a cage, or is that

anthropomorphic thinking? Further, I feel uncomfortable because zoos look like modern ‘asylums’ to me. We look at animals as we looked in the past at the mentally ill and people from other races. However, I am not sure if my feeling is right. I do not think animals feel the same when being watched, that they feel humiliated. Though, I do agree with Dale Jamieson (1995), that zoos possibly send a wrong message: that we humans dominate the world and therefore we can put animals in cages to entertain us.

In addition to their role in conservation, zoos claim to have a role in education of people. Although I doubt how much people really learn (and *want* to learn) about animals and ecosystems in zoos, or if zoos change people’s attitude towards nature (Marino *et al.* 2010, Balmford *et al.* 2007 and personal observations), I think zoos provide a good opportunity for people to get in touch with the wonderful world of animals and nature, just by watching them. As Robinson (1992, p. 349) says: “we have an urgent need for contacts with other living things. In an urbanized society, zoos, aquariums, parks and gardens may be the only remaining places where such contacts can be made for the majority of people”.

However, my opinion is that that zoos should think more carefully about which species they exhibit. For example, it is known that felids are prone to behavioural problems and thus it is better not to keep these species. In the case of birds, it should be considered to stop displaying intelligent parrots, corvids and species prone to welfare problems. For example, is it acceptable to keep birds such as vultures in captivity, which roam a large part of their lives on air flows? The species comparison method of Clubb & Mason (2004) could be useful for this: for example, stereotypic behaviour could be tested against certain traits such as home range and diet in order to predict which species will be affected most by captivity. I also think that it would be better to keep less species in one zoo, because sometimes you do not have the time in one day to visit all the species! Instead, zoos could provide more space to less species and also focus more on small animals like insects. An interesting example which I really liked was the ‘insect house’ in Artis Zoo, Amsterdam, the Netherlands. Why do zoos always focus on large, charismatic species that give more behavioural problems? I do not believe visitors will stop coming when the large mammals or the Aras are replaced by smaller, maybe even more interesting species. Another idea I support is to offer more opportunities for performing activities regarding nature and animals: workshops, presentations, movies etc. Some zoos already offer some interesting initiatives like courses, lectures and workshops. Artis zoo (in Amsterdam), even offers a chair ‘Culture, Landscape and Nature in cooperation with the University of Amsterdam. Vogelpark Avifauna also has some interesting interactive activities, like a bird demonstration in which a care taker talks about the specific bird species, and the ‘Lori Landing’, where visitors can feed sugar water to lorises, which land on your hand to eat (Figure 9). These interactive activities will stimulate people’s curiosity and make that they learn more than by just watching animals.

The focus of zoos on animals only, limits the opportunities for education, since in nature animals are connected with plants and the environment they live in. The BioPark, as Robinson (1992) proposes, I therefore find very interesting: it is a kind of Museum Park that combines all kind of animals and plants and shows the connectedness between the different components in the natural world, not only by showing living organisms, but also by using modern technology. It could also give insight in how animals perceive the world, based on findings in ethology and cognitive psychology.

Since birds are the subjects of this thesis I also strongly suggest that zoos pay more attention to birds in their educational programs, in the (viability of) their captive breeding programs, but also in the *in situ* conservation projects they support. Birds are beautiful and interesting animals and they are worth this attention.



Figure 9. Lori Landing and bird show in Vogelpark Avifauna, the Netherlands.

Source: www.avifauna.nl

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Acknowledgements

I would like to thank Dr. Franck Meijboom for giving me the opportunity to write this thesis and for supervising me. Thanks to my father, Bert Musschenga, for giving me additional advice and to Dr. Saskia Arndt for being second examiner. Mirko Marseille from the EAZA and the NVD helped me with useful information about NVD zoos and the bird species they keep. GaiaZOO and Dierenpark Emmen (the Netherlands) provided information about their bird species and about enrichment for birds in their zoos.