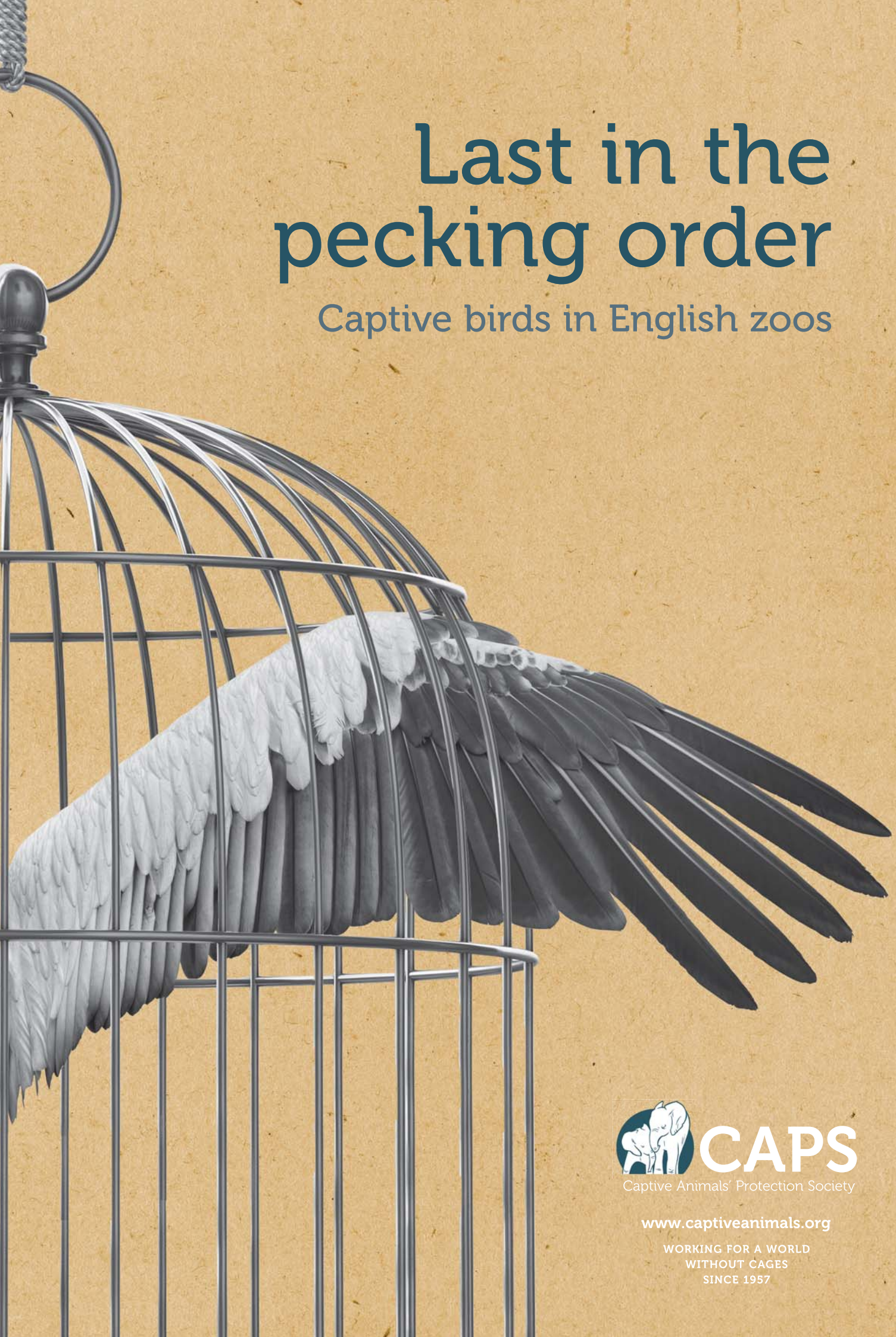
Last in the pecking order

Captive birds in English zoos



CAPS
Captive Animals' Protection Society

www.captiveanimals.org

WORKING FOR A WORLD
WITHOUT CAGES
SINCE 1957

Last in the pecking order

Captive birds in English zoos

This report interprets and summarises the main findings of an investigation researched and written by Craig Redmond on behalf of the Captive Animals' Protection Society. The full report, including a comprehensive outline of methodology and detailed analysis of data entitled *'Birds in Zoos in England: An Assessment of Welfare, Conservation and Education'*, Redmond, C., 2013 can be found by visiting **www.captiveanimals.org/birds**

Craig Redmond is an independent animal rights consultant who was previously CAPS' Campaigns Director, having worked for the charity for over a decade. He has extensive knowledge of the zoo industry and has co-ordinated previous investigations and research projects into UK zoos. In addition, he has several years' active involvement in programmes to protect migratory birds from illegal hunting across the Mediterranean.

CAPS
Captive Animals' Protection Society

PO Box 540, Salford, M5 0DS, UK

Phone: +44 (0)845 330 3911 (local-call rate)
or +44 (0)161 869 0020

E-mail: info@captiveanimals.org
Websites: www.captiveanimals.org
www.irishcircuses.org

The Captive Animals' Protection Society (CAPS) is a UK-based charity leading the campaign to end the use of animals in entertainment.

Through a combination of undercover investigations, research, campaigns, political lobbying and education, CAPS aims to stop the exploitation of animals in entertainment, particularly in zoos, circuses and the exotic pet trade.

The charity's evidence-based campaigns and strong ethical basis ensure we can make a significant difference to the lives of animals in ending their exploitation.

Working for a world without cages, CAPS encourages a more compassionate attitude and relationship between humans and other animals.

The Captive Animals' Protection Society is a registered charity and receives no government funding.

Introduction

Ruppells Griffon Vulture, tethered

© C. Redmond

When it comes to consideration and discussion of the welfare and ethics of keeping animals captive in zoos, it is perhaps fair to say that the majority of time, resource and effort has gone towards understanding the needs of captive mammals. In-depth research has sought to ascertain to what extent those needs are met, if indeed if they ever can be, in a captive environment. Iconic species such as elephants, dolphins and great apes, for example, have been subject to much scrutiny and research. Some animals, such as dolphins, are deemed to have such specialised needs that they are no longer held in UK zoos and there is increasing agreement that elephants should follow suit due their inherent unsuitability for life in captivity. Great ape enclosures, and particularly those for gorillas, have millions of pounds spent on them in zoos worldwide. The arrival of pandas at any zoo seems fit to trigger something akin to hysteria with extraordinary levels of interest, investment and publicity leading to every aspect of the bears' lives being placed under uncomfortably close scrutiny. Both pro-captivity and anti-captivity commentators have assessed, investigated, explored and drawn conclusions on the divisive issues of welfare, conservation, education, rights and ethics in relation to captive mammals. However, despite decades of debate on mammal species in captivity, the welfare of birds in zoos has, until now, been a relatively neglected issue.

In an attempt to redress the balance, CAPS commissioned a study in order to provide some evidence on growing areas of concern in this area of animal welfare, such as the restriction on birds' abilities to fly through management practices of zoos (i.e. pinioning and tethering). Welfare, conservation and education were the main areas to be addressed in the study.

The study commissioned was not designed to provide a detailed or scientific overview of all bird zoos around the UK and, indeed, only considered a relatively small sample. The purpose of the work was to consider areas for further research, identify practices of significant concern and conduct a preliminary examination of the potential welfare and ethical issues that are most prevalent for birds kept in captivity.

Methodology

A random sampling of licensed zoos in England provided a list of 20 zoos for which analysis on a number of factors was conducted in order to provide a greater understanding of issues.

Full details of research methodology employed can be found in the full study report and is summarised as follows:

1. Literature review and discussion with various experts relating to the key welfare issues facing birds in zoos identified key research areas.

2. Visits to 20 randomly sampled zoos housing birds taken from the 2011 Defra list of zoos operating in England were carried out in order to facilitate collection of data.

3. Information including animal stock lists, inspection reports and correspondence obtained from local authorities under the Freedom of Information Act 2000 relating to zoos sampled as well as information provided on zoos' websites was analysed.

4. All information was brought together to develop discussion and draw conclusions.

The big picture

Carried out over a period of six months from 2012-2013, the research uncovered a number of serious welfare concerns for birds held in zoos. These concerns range from worryingly high mortality rates, inadequate and inappropriate enclosures, as well as lack of environmental enrichment to encourage and promote natural behaviour. The most serious welfare issue uncovered during the study relates to that of flight restriction for captive birds. This flight restriction regularly results in partial amputation of wings (known as pinioning) for thousands of birds in English zoos. Birds of prey spend long periods tethered by their legs, rarely being able to fly and being kept in tiny 'mews' style enclosures for the majority of their lives.

In addition to these fundamental welfare problems, it was found that conservation claims relating to captive birds were highly questionable and educational messages surrounding the keeping of birds in zoos were found lacking. In many cases, the educational messages were wholly inadequate, sometimes false and often damaging from either ethical or conservation perspectives.

More than a quarter of all birds died in two zoos

Bird deaths

Species' mortality in captivity is expected to differ from that in the wild (Kohler *et al*, 2006). Captive animals should benefit from veterinary care, a lack of predators, and a regular supply of food. However, they may also suffer from poor adaptation to captivity or to a zoo's climate, the spread of infections caused by close confinement to others, and, for some species, higher levels of obesity.

Animal stock lists for zoos provide minimal information on births and deaths and the study's analysis combined all species of birds at each zoo rather than carrying out a species-by-species analysis. Each species will have differing levels of life expectancy which have not been accounted for in this instance. (Kohler *et al*, 2006) note that "authoritative accounts of survivorship and length of life exist for very few species" and that "imprecision of age assignment are important hurdles to the accurate mapping of survival".

For a fuller study of mortality, access would be required to the stud books or other zoo-held databases for avian species for more information than is provided by stock list data. These data can then be used to construct life tables, such as those in studies of mortality in other animals in zoos (e.g. Clubb & Mason, 2002; Kohler *et al*, 2006).

With the above points in mind, our study found that, for the 15 zoos for which data was provided, an average of almost 16% of birds die over a one year period – a total of 860 birds.

Two zoos had no deaths recorded on their stock lists; 11 zoos had mortality rates higher than 5%; five had a mortality higher than 10%. Shockingly, more than one quarter of all birds died in two zoos, with a third zoo showing only a very slightly improved mortality rate.

It is difficult to make too many generalisations about mortality rates for a wide range of avian species for the reasons outlined previously, however, some mortality rates here are higher than expected by vets consulted during this study.

To put these statistics into an understandable comparison, we can compare with one of the most controversial methods of farming animals for food: broiler chickens. These chickens are factory farmed for their meat and selective breeding forces them to grow too fast so that millions "suffer from painful lameness due to abnormal skeletal development or bone disease, so that many have difficulty in walking or even standing" (Turner, Garcés & Smith, 2005).

One of the major criticisms of this method of breeding chickens is the high mortality rate: between 4% and 5% die before reaching the slaughterhouse (Department of Primary Industries, 2013; VIVA, 2013). Average mortality in the zoos studied in this report is more than three times this figure.

Mortality rates for intensively reared rabbits is, according to the European Food Safety Authority's Panel on Animal Health and

Key findings

- Mortality rates for birds in sampled zoos were found to be an average of 15.99% with two zoos seeing more than a quarter of all the birds held there die in one 12 month period.

- More than half of the 81 enclosures assessed in detail by the study author and a bird behaviourist were overcrowded (54%) and not environmentally varied (62%). The majority lacked enrichment (91%), appropriate substrate (63%) or species-appropriate features (87%). Even perches were lacking in number (in 78% of enclosures). 82% of enclosures did not have appropriate bathing or swimming facilities.

- The majority of enclosures (68%) fail to meet minimum recommended sizes that would allow birds to take several wingflaps or strides.

- Flight restrictions of varying kinds are probably the biggest welfare problem facing birds in zoos, yet they are also one of the least discussed. These restrictions include surgical mutilations (e.g. pinioning) which permanently disable a bird and prevent them from ever flying again, mainly used on waterfowl, storks, cranes and flamingos.

- In sampled zoos which tether birds of prey, up to half of all birds were restricted in this way. Zoos claim such birds are flown every day but this study shows this to be highly unlikely and even when birds are flown in displays it is just for a few minutes. Smaller owl species, which are widely seen as unsuited to this type of restraint, were seen to be tethered at some zoos visited. 62% of birds in zoos which tethered were not provided with shelter and water.

- Overall, 63% of all birds in zoos that use flight restriction methods were either pinioned, wing clipped or tethered – over 2,600 birds in total in the sample of 20 zoos used in this study.

- Zoos are failing in terms of conservation and there is little information published by the individual zoos to show what, if anything they do to serve conservation. Over 80% of the individual birds in the sampled zoos are not of threatened species and there appears to be minimal involvement in co-ordinated breeding programmes and even less in actually reintroducing species to their natural habitats.

- Likewise, education standards were poor. 12% of signs on enclosures did not identify the species correctly and over half (58%) of zoo websites did not give detailed information about their birds.

- Presentations and talks provide the opportunity to really educate an audience about a particular species, their behaviours, biology and habitats, as well as the threats they face in the wild and what people can do to support conservation efforts. Yet, less than a third of zoos offer either a presentation or a talk involving/about birds and none gave any detailed information on conservation despite sometimes directly discussing threatened species.

- Finally, the ethics of zoos is discussed, with it being seen as infringing on the basic needs of animals to confine them for the purposes for which they are kept in zoos.

Welfare (EFSA, 2005), "considerably higher than in other farmed animal species due to enteric and respiratory infections, and reproductive problems". They report that "on the most successful intensive closed cycle farms... mortality levels can be as high as 25-30%".

So, it would appear that mortality rates for birds in some zoos are as high as those for farmed rabbits, on which the EFSA Scientific Panel concluded: "Because of very high morbidity and mortality rates reported, Rabbit housing, management and hygiene systems should be reviewed urgently so as to significantly reduce them".

Looking at inspection reports for zoos with an above 10% mortality rate, no inspector (either local authority or DEFRA) questions these statistics. One theory for these deaths not being highlighted is that inspectors take little notice of stock lists and would not be aware of large numbers of deaths unless they were informed by the zoo.

The Handbook of DEFRA's Zoos Expert Committee provides an example of an animal welfare audit which includes a weekly review of mortality and morbidity (incidents of disease / ill health) and a quarterly outside audit of mortality (DEFRA, 2012d). The Handbook also recommends that the results of welfare audits on issues such as mortality should be reviewed by zoo inspectors. It is not known how many zoos follow these recommendations and they have not been referred to in inspection reports for the sampled zoos.

Inadequate enclosures, poor environmental enrichment

In the same way that it is not appropriate to provide different species of mammals with the same type of enclosure, so different species of birds require various types of enclosures and furnishings. Each enclosure should be designed for a species-specific purpose.

"Ideally, animals can choose their exposure to sunlight, wind and rain. An animal exhibit should have shelters, perches, vegetation and water bodies to provide various microclimates. Depending on the animal's natural behaviours, the exhibit should also provide a variety of substrates and natural objects. The appropriateness of artificial objects depends on the theme and the intended message of the exhibit. Changing and exchanging objects and exhibit elements allows exploration in a confined space which is a fundamental animal behaviour. Exhibit design should allow such changes." (Fiby, 2008)

It is claimed that, to meet the welfare needs of an animal in captivity, the complexity of an enclosure needs to be combined with an appropriate size to ensure that natural behaviours can be expressed rather than restricted. Those behaviours required to limit stress, such as distancing and comforting behaviours, are seen to be particularly important (Hosey, Melfi and Pankhurst, 2009).

Bird behaviourist, Greg Glendell, made the following general comment on the enclosures examined during this study:

"Standards vary between zoos and there are still many zoos whose whole practice is clearly unprofessional. Such places have filthy, unkempt enclosures. Staff appear to have little knowledge for the birds in their care. Birds are frequently bored and appear listless, habituated to apathy which is instigated by poor husbandry".

Provision of space

Most species of birds fly, and flying is part of their daily activities. Despite this aviaries are not sufficiently large enough to allow anything more than very short periods of flight; flights of a few seconds only. Some aviaries are too small to encourage any flight at all. Birds will not be able to get adequate exercise and maintain fitness unless they can fly for reasonable periods throughout the day. The majority of enclosures examined in this study failed to provide birds with adequate space.

Lack of environmental enrichment

Enclosures are often poorly furnished, lacking a range of substrates and perches suitable for the species housed. Some stereotypical behaviours were seen. Being kept in such barren conditions can be highly stressful to birds. The animals should be provided with facilities which attempt to replicate the environments they are adapted to in the wild, but frequently, enclosures fail to provide this.

Wire mesh used

There are health and welfare issues associated with the type of covering used to clad the birds' aviaries. The mesh used should ensure the birds within are confined safely so that risks of injuries to them are minimised. The mesh should also ensure other wild animals cannot enter the aviaries, eat the occupants' food, harm them, be harmed by them, or exchange diseases between occupants and wild birds and other animals.

It is common to see large holed mesh used in many aviaries. This allows a range of wild animals including rats and squirrels to freely enter. Other species, including many wild birds and predatory mammals such as stoats can also enter. Birds should never be housed in flights whose mesh size is so large that the birds can poke their head through it; this poses a serious risk of death should birds fly in panic and hit the wire.

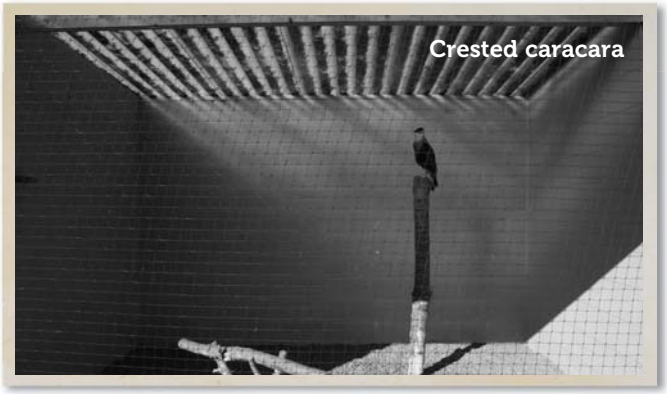
Most enclosures examined in the study had mesh that was inappropriate for the birds held or the type of aviary.

Enclosure size

Given the large number of enclosures and wide variety of species in the 20 zoos visited, a simple method of assessing whether enclosures provided adequate space was required.

Studies of enclosure size for mammals in zoos have often relied on comparing enclosures to the

© C. Redmond



© C. Redmond

species' home range in the wild (e.g. Casamitjana, 2003; Clubb & Mason, 2003). The fact that so many avian species migrate each autumn makes such a comparison more difficult in this instance. The Global Federation of Animal Sanctuaries (GFAS) was founded in 2007 by a number of animal protection organisations which recognised "the need for global animal-specific standards and operational standards for sanctuaries" (GFAS, 2012). GFAS documents aid sanctuaries in meeting the highest standards of welfare for animals in their care. One such document is 'Standards for Animal Care of Arboreal/Perching Birds' (GFAS, 2011), which covers parrots, finches, canaries, corvids, hornbills, woodpeckers and miscellaneous passerine species.

It recognises that enclosure size will vary greatly, dependent on the species, but provides a useful general formula:

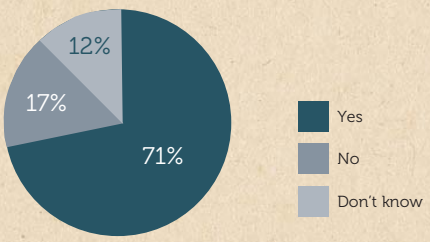
"In order to allow each bird to take several wingflaps or strides, minimum enclosure length should equal ten times the wingspan or stride of the largest bird(s) housed." These standards were arrived at by a consensus of various avian sanctuary directors.

Whilst long debate could be had about whether 'several wingflaps or strides' really does provide adequate space for any bird in captivity, these are likely to be the highest standards currently available with regard to space for captive birds and so the GFAS formula was used during this study as a 'rule of thumb'.

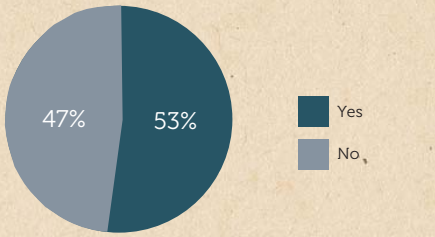
It was found that majority of enclosures in this study fail to meet minimum recommended sizes that would allow birds to take several wingflaps or strides.

Analysis of enclosure adequacy

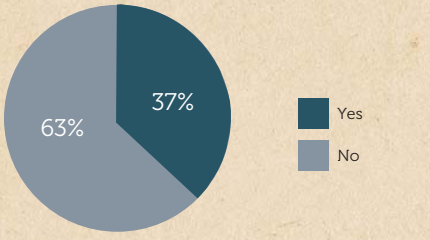
Do the birds have access to clean water for drinking at all times?



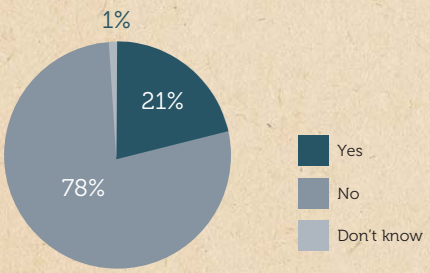
Is the enclosure large enough to permit the bird to express its full repertoire of normal locomotive movements?



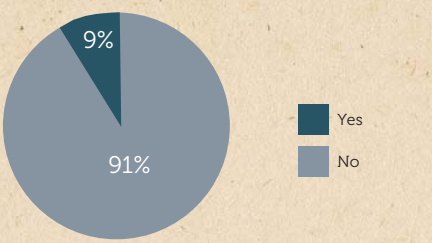
Is the enclosure environmentally varied?



Are sufficient number of perches provided for all birds



Are there any behavioural or occupational enrichment items or techniques present in the enclosure?



Amputations, tethering and wing clipping. Rendering birds flightless in zoos

It may come as a surprise to many people that huge numbers of birds in zoos have their ability to fly deliberately restricted. It is this practice of rendering birds flightless in order to keep them in captivity which, in our view, presents the most serious welfare and ethical concerns found during the study.

The three most common flight restriction techniques for keeping birds in captivity (both by zoos and private keepers), other than keeping them in a confined enclosure, are pinioning, wing/feather clipping and tethering.

- Pinioning involves the surgical removal of the metacarpals, which permanently prevents flight.
- Feather clipping involves cutting the primaries along the wing coverts on one wing. It is temporary and needs to be repeated as the feathers grow back.
- Tethering involves tying birds of prey to a perch.

Pinioning

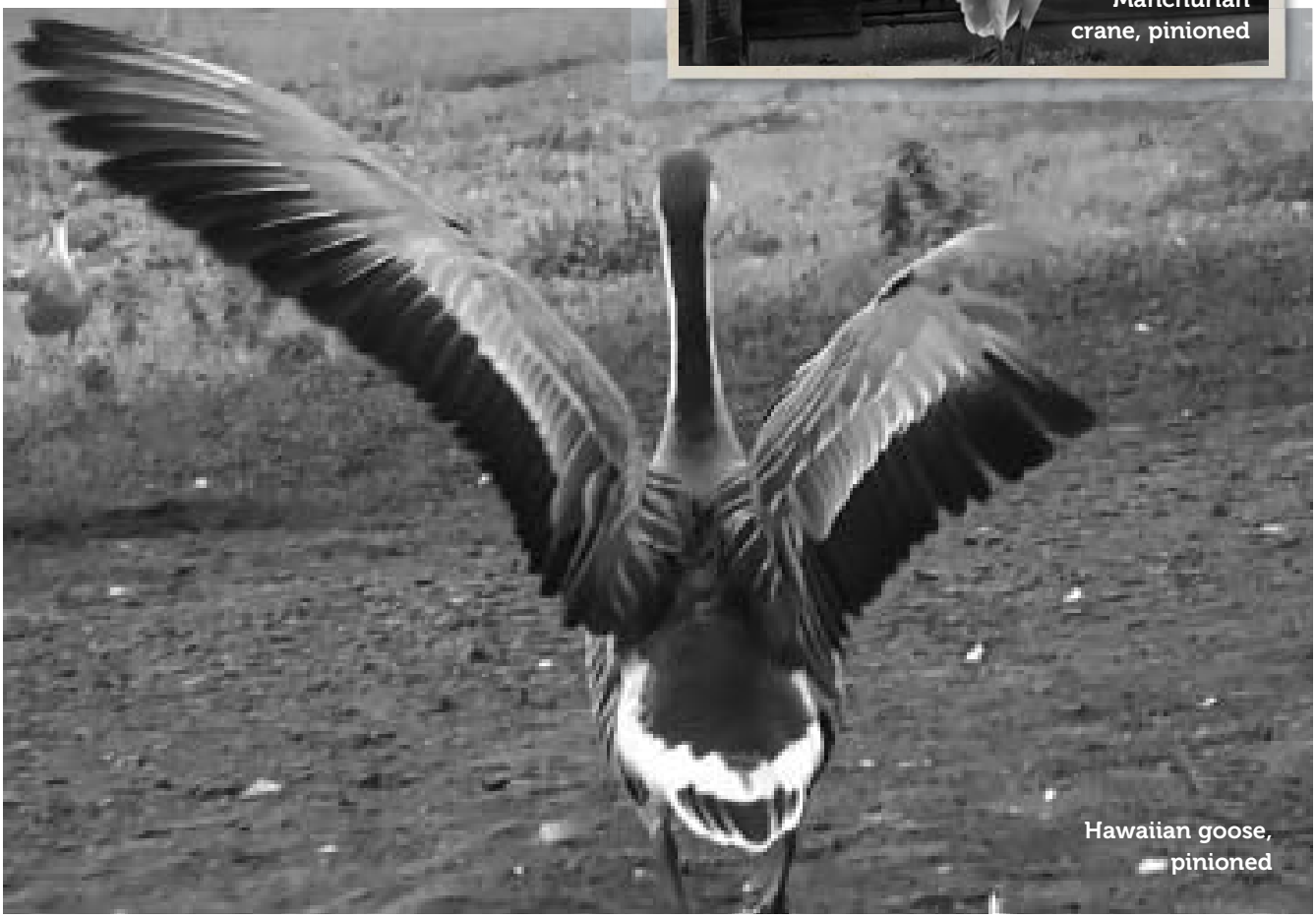
"The process of pinioning involves the cutting of one wing at the carpel joint, thereby removing the basis from which the primary feathers grow. This makes the bird permanently incapable of flight because it is lopsided" (Rees, 2011).

Put simply, a few days after birth, birds have part of one wing cut off with sharp scissors. This procedure is known as a 'mutilation' under the law. Pinioning is illegal if carried out on farmed birds but is legal for birds kept in zoos. Pinioned birds will never fly.

Birds of the following orders, kept in open enclosures, and who would likely fly off if their flight was not restricted, are most commonly pinioned:

Anseriformes: Waterfowl (ducks, geese, swans)
Ciconiiformes: Herons, storks and relatives
Gruiformes: Cranes, rails and relatives
Pelecaniformes: Pelicans and relatives
Phoenicopteriformes: Flamingos

Manchurian crane, pinioned



Hawaiian goose, pinioned

The Wildfowl & Wetlands Trust, a conservation charity which operates nature reserves, some of which have zoo licences, admits to pinioning all of their captive wildfowl and flamingos. In order to gauge minimum numbers of individuals affected by this practice we looked outside of the study sample and analysed the most recently available animal stock lists for the five Wildfowl & Wetlands Trust centres which hold zoo licences in England. We found 5,663 individual birds pinioned in these five centres alone. Exact numbers of birds subjected to the permanently disabling mutilation in all of the 200+ zoos currently operating in England have not been established to date and further research is required in order to ascertain this figure.

Justifications for pinioning

Conservation

Zoos often point to captive breeding programmes as beneficial to species conservation, arguing that they are creating a 'reserve' population which can be released into the wild at a later date. In spite of these claims, evidence has shown that pinioned flamingos, for example, have little breeding success. The Vice Director of Odense Zoo, Denmark admitted that his zoo had "never successfully bred the [pinioned] flamingos, even though [it] had more than 50 individuals."

These reproductive problems do not appear to be limited to a few anecdotal cases as, according to the American Zoo Association (AZA), "it has been shown that reproduction is severely hindered by pinioning due to the male's difficulty in balancing himself during copulation. Full-wing flamingos have better balance, whereas pinioned male greater flamingos more regularly fall off when mating". Flamingos are not the only species whose reproductive capacities are adversely affected by pinioning. Pinioned male cranes have also been observed to have difficulties keeping their balance when mating. (Sawyer, 1997)

Even if breeding were successful it would appear that the vast majority of pinioned birds are not even threatened in the wild; a revelation which casts further doubt on any suggestion that this practice can be justified under the auspices of conservation. In fact, analysis of all pinioned birds in the five Wildfowl and Wetland Centres with zoo licences in England shows that a huge 86% of pinioned individuals belong to species which are not threatened in the wild. This represents 4,849 birds in these five zoos alone. If this is indicative of the practice across zoos in England, it is likely that thousands more birds have suffered partial amputation of limbs for no apparent conservation purpose.

Finally, and perhaps most obviously, it is difficult for zoos to make any claims that birds are being kept for conservation purposes when it is clear that a bird who cannot fly is a bird who will never be released into the wild. Pinioned birds are often, quite literally 'sitting ducks' - they simply would not survive outside of captivity.

Conservation claims, it would seem, offer no justification for pinioning.

Welfare

A common excuse given by zoos for pinioning is that it allows birds to be kept in large, open enclosures rather than in smaller, confined aviaries. One industry consultant suggested: "The difference between pinioning and not pinioning is the difference between access to, and the relative freedom, of several acres of an islet spotted lake or confinement to an aviary pond." (Dickinson, 2011). This statement makes the somewhat contradictory suggestion that the amputations are carried out for the bird's own welfare benefit.

Whilst birds having access to large open enclosures may be pleasing to zoo visitors who are impressed with the space and apparent freedom that the birds are provided, meaningful use can hardly be made of any environment by an animal whose most important locomotive adaptation (flight), has been permanently removed.

In addition, to suggest that the only alternatives to large open enclosures are small confined aviaries is misleading, at best. The real issue is not one of zoos being forced to choose between the lesser of two evils in the form of either large open top enclosures (and pinioned birds) or cramped aviaries, but rather a reluctance on the part of the zoo industry to invest in closed enclosures of sufficient size to allow flight.

As with conservation then, it would seem that claims that pinioning is carried out for welfare purposes are wholly unconvincing.

Legal requirements

One of the most common arguments presented in favour of pinioning relies on the fact that it is against the law in the UK to allow non-native species to escape into the wild and that to do so is an offence under the Wildlife and Countryside Act 1981.

It was this point which was put forward by the RSPB during the passage of the Animal Welfare Bill and was the reason provided by zoo staff when the practice was queried during the course of the study. The argument is that the outlawing of pinioning would result in the potential for accidental release of non-native wildlife. This, it is maintained, could have a damaging impact on the local environment and native species.

During formal considerations in 2004 on whether or not pinioning should be permitted, it seemed that this factor was also a concern within Government. The Head of Policy for the Animal Welfare Bill, Henry Hoppe, suggested at the time: "On the issue such as pinioning, we also have to consider not only the welfare of the bird but also the possible impact on society if you do not pinion, and, in the case of pinioning, there is the risk of non-native species being released…".

Whilst these arguments appear to have some substance in that the potential introduction of invasive species is a genuine conservation concern, it does not explain why amputation is deemed a solution for birds and yet not for any of the other hundreds of species of animals held captive in zoos around the country. Zoos have a responsibility to ensure that none of the animals held by them escape into the local environment but it is only with bird species that amputation of limbs is suggested as the way in which to achieve this.

This point is made concisely by Bjarne Klausen, Vice Director of Odense Zoo, who said: "It is only with

birds that we, as a community, have accepted mutilation of an animal to keep it in captivity."

So, whilst the concern for release of invasive species is an important consideration, it is hard to accept that mutilation is the best solution.

Entertainment

The CEO of the Wildfowl & Wetlands Trust, Martin Spray's frank explanation presented to Parliament during the passage of the Animal Welfare Bill appears to be based on little more than the entertainment value of getting up close to wildlife, saying:

"The issue of pinioning with regards to the Wildfowl & Wetlands Trust is that we want to actually bring people close to birds close to wildlife, particularly young children". (sic)

Animals in their thousands suffering the partial amputation of a limb in order to allow us to get up close to wildlife seems a high price to pay to simply satisfy curiosity.

Tradition

Finally, the approach employed by the British and Irish Association of Zoos and Aquariums (then known as the Federation of Zoological Gardens of Great Britain and Ireland) during the same lobbying process to see pinioning remain legal as referred to above was simply that the procedure was a "routine management practice". It would seem that there was an element of tradition that was considered important by the zoo community and which, in and of itself, should be considered as a reason to maintain the practice.

It would seem that the various arguments put forward to explain pinioning do little to justify the practice.

Wing clipping

Unlike pinioning, wing clipping is a non-permanent method of restricting a bird's ability to fly and involves cutting the primary feathers (usually just of one wing) and is most commonly used on parrots. Advantages over permanent restrictions include reducing stress to birds, avoiding surgical risks such as pain and tissue damage and minimising cost (Zhang *et al*, 2011).

This procedure needs to be repeated each time the bird moults and regrows the primary feathers. In most birds this is once a year. Some species of birds, such as some ducks, moult two or three times a year, although cranes only moult every other year (Startup, 1967). A major reason given by zoos for wing clipping not being used on some species, particularly waterfowl, is that catching the birds to carry out the procedure would be complicated and cause additional stress. Zoos claim that the stress caused by the capture necessitated by wing clipping is too damaging to the welfare of these birds to be acceptable. As outlined above, though, the most common alternative to wing clipping employed is the permanently disabling procedure of pinioning.

Wing clipping was the flight restriction least evidenced during visits to the 20 sampled zoos with only one bird seen to have been wing clipped (a Grey crowned crane, *Balearica regulorum*).

It is likely that more birds had been wing clipped but this difficult to observe unless birds open their wings at the time the enclosures were being monitored.

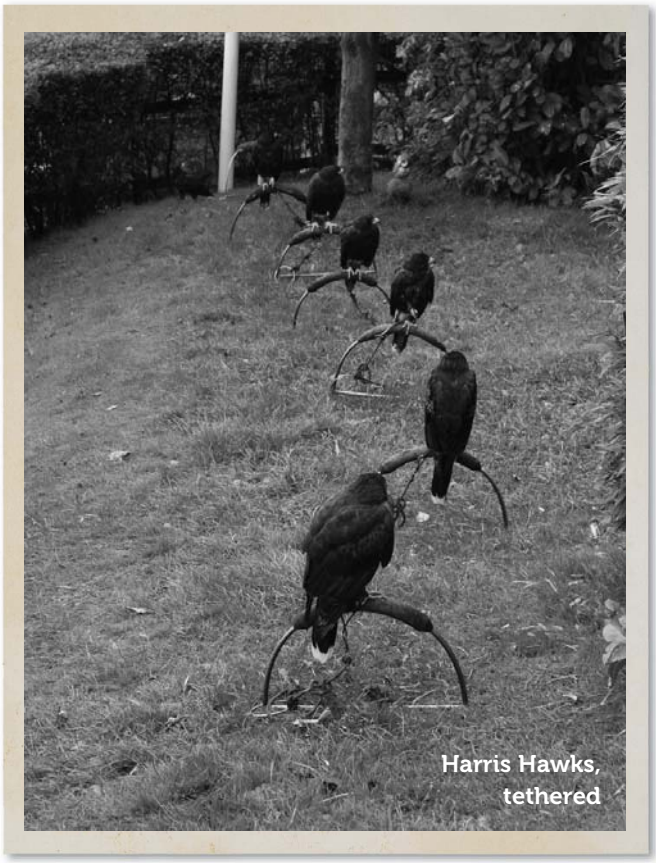
Tethering

Just as pinioning is seen as a common management method for captive waterfowl, so tethering to a perch is commonly used with birds of prey. Birds of prey are tethered to provide a closer display of the birds for zoo visitors and/or as a method of managing birds for flying them in free-flight programmes. Due to welfare and safety issues with keeping birds of prey in aviaries, free-flying programmes which employ the management technique of tethering are one of the only ways in which captive birds of prey are currently permitted any meaningful experience of flight. It should be noted, however, that the study found that not all birds who are tethered appear to be flown regularly.

What is tethering?

Tethering involves the attachment of thin leather straps (jesses) and leather anklets around the legs of the bird, connected to a leash which is then attached to a stationary perch. The method should allow the bird to move off and onto the perch (onto the ground) and give access to a bath pan. Tethered birds should be able to preen, eat, bathe and extend their wings (IAATE, 2008) but leashes "should not be too long as forces placed on the birds legs from bating [trying to fly off] can cause damage if the length is not correct" (Hawk Board, 2011).

Although birds should be allowed to freely move off and onto the perch, it is crucial to keep an adequate distance between each bird (at least the



Harris Hawks, tethered

Peregrine-Lanner in traditional mews style housing

sum of twice the wingspan of each bird), to prevent them attacking and injuring, or even killing, each other. Equally, consideration needs to be given to which species to tether next to each other to reduce stress and intimidation.

Some type of shelter from heat or inclement weather needs to also be provided (Fox & Chick, 2007); (Cromie and Nicholls 1995) consider this to be "perhaps the most fundamental design feature". Safe access to water for bathing is also required (which helps clean the feathers and regulate temperature).

In England, government zoo licensing guidance (DEFRA, 2012a) states that "owls and vultures, particularly the New World vultures should not be kept tethered" as "they can easily be trained to fly from pens and this is the preferred way to house them". Despite this, two zoos of the 20 visited for this study tethered owls.

Housing of tethered birds

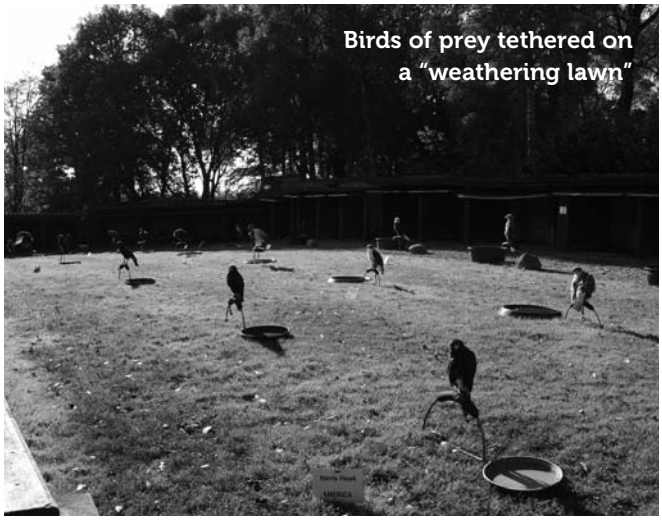
Although some birds of prey are housed in traditional aviaries, those used for flying displays and who spend large parts of the day tethered outdoors are usually housed in mews. In addition to the difficulties of catching birds in larger aviaries, birds can injure themselves (break feathers and injure feet, wings and beaks) by hanging on the wire of the enclosure (Martin, 2012) or by colliding with the mesh.

There are two types of mews: traditional mews and free-loft. The former usually has partitioned spaces to separate tethered birds and they will spend the day tethered outdoors. Free-loft mews provide more space and birds can fly free within the chamber, however housing raptors in free-lofting mews can result in similar problems to traditional aviaries, with birds becoming nervous or aggressive and difficult to catch and handle (Martin, 2012).

The confined nature of traditional mews and the welfare concerns of free-loft mews therefore present additional concerns with regard to the lives of birds subjected to tethering.

Training

The process of training birds to fly from the fist is known as 'manning' and involves withholding food from the bird until they accept it on the fist. Manning has been described as an "indisputably stressful time for a raptor" with the bird "subjected to bouts of acute fear" which can predispose them to stress-related diseases such as aspergillosis (Cromie & Nicholls 1995).



Birds of prey tethered on a "weathering lawn"

One of the UK's foremost bird of prey trainers has said (Parry-Jones, 1994): "Training birds is a very traumatic experience for the bird". She recommends that on day one of training, the bird is only allowed food when she feeds from the fist; if she doesn't then the food is put back in the bag and the bird returned to her perch. "By the third, fourth or fifth day she should feed", although Parry-Jones had a bird go ten days before she fed.

Flying

Whereas pinioning of waterfowl or flamingos may go unnoticed by most zoo visitors, tethering is clear for all to see. One zoo visited had a sign on an area for tethered birds, aiming to provide an explanation for this flight restriction: "This may be a sight that causes concern to some guests. Weather permitting all our birds of prey are flown daily. Although schooled to return it is the birds choice whether to return or not."

> "Training birds is a very traumatic experience for the bird".
>
> *Jemima Parry Jones, Bird of Prey specialist*

DEFRA states that tethered birds "must be flown at least four times a week" and must not "be tethered permanently. All birds should be given the opportunity to fly or move around freely during part of the year" (although it does not clarify what is meant by 'part of the year'). The Hawk Board states that tethered birds "must be flown free on a daily basis (weather permitting)" (Hawk Board, 2011).

The Hawk Board also recommends that "diurnal (day flying) birds of prey should not be tethered except when flown daily, in genuine training or under veterinary treatment" (Fox & Chick, 2007). Zoos which tether birds generally claim that all the birds are flown daily. However, this is not usually the case. It may well be that the zoo flies some birds every day, but that is different to every bird being flown every day. Given that 25% of all the birds seen in the sampled zoos that employed the practice were tethered, representing over 100 birds, it is highly unlikely that they are all flown daily.

This concern was corroborated by a falconer at one zoo, who informed the study author that there were 43 birds in total and they were flown "in rotation", which meant that only a small number were flown each day. She admitted that given the poor weather (cold and wet), birds were not flown daily and as a result some were gaining too much weight. Bird of prey's weight should be monitored daily and if too heavy they cannot be flown; reducing weight too much can kill a bird (Parry-Jones, 1994). This creates a vicious circle whereby birds not flown lose further opportunity to fly by putting on weight and being deemed unsuitable to fly. During the displays seen during this study, birds were flown for an average of 5 minutes 41 seconds each.

Tradition for tradition's sake?

The keeping of birds of prey in mews housing, tethering them and training to fly from a falconer's hand has a long tradition in both this country and others around the world. There are, however, few other animals held in captivity that are kept in such unnatural confinement for so much of their lives as birds of prey. Despite our understanding of the needs of animals having developed and evolved, particularly over the last few decades, the practices and even the equipment used in relation to falconry remain the same as those employed over a century ago. It would appear that the practice of tethering and the associated keeping of birds of prey in captivity are influenced strongly by tradition, rather than by modern understanding of welfare and ethics.


Flying display

(Cromie and Nicholls, 1995) make the point that "further research needs to be carried out into the physiological effects of tethering. Systems for reducing the problems of tethering need to be devised or introduced more widely with appropriate education. Management techniques require further development with emphasis on allowing flying birds to be kept loose".

Summary of flight restrictions in zoos

Flight restrictions of varying kinds are probably the biggest welfare problem facing birds in zoos, yet they are also one of the least discussed. These restrictions include surgical mutilations (mostly pinioning) which permanently disable a bird and prevent them from ever flying; such a severe alteration of a bird's natural behaviour would probably be seen as unacceptable for any other species held in captivity.

Pinioning is mainly used on wildfowl, storks, cranes and flamingos, with two of the sampled zoos mutilating all of their captive wildfowl and flamingos. Whilst there is some opposition to it from within the zoo industry, this appears to be fairly limited. Indeed, in the UK several organisations representing captive collections of birds campaigned strongly to prevent the practice from being prohibited under the Animal Welfare Act. Although there are welfare risks involved in keeping some full-winged species in roofed enclosures (e.g. injuries caused by flying into mesh), this is not a barrier to seeking other alternatives. Zoos are willing to spend millions of pounds on enclosures which they believe (but others would reject) provide improved conditions for 'characteristic megafauna' but few are willing to do the same for birds.

Tethering of birds of prey is a visible restriction yet seems to raise fewer concerns from zoo visitors. As with pinioning, there seems to be little internal debate about the ethics of this restraint. In sampled zoos which used this restraint method, up to half of all birds at individual zoos were tethered. Zoos claim such birds are flown every day but this has been shown to be highly unlikely and even when birds are flown in displays it is just for a few minutes. Smaller owl species, which are widely seen as unsuited to this restraint, were seen to be tethered at some zoos visited.

Common methods of housing and training birds of prey involve some level of distress or cruelty, such as manning and 62% of birds in zoos which tethered birds were not even provided with shelter and water.

Overall, 63% of all birds in zoos that use flight restriction methods were either pinioned, wing clipped or tethered, over 2,600 birds in total in the sample of 20 zoos studied. When we include the five Wildfowl & Wetlands Trust centres with zoo licenses in England then we found 5,663 birds pinioned in these fives zoos alone.

Conservation

Conservation is stated to be the *raison d'etre* of the modern zoo. Coupled with education, claims of conservation contribution have become something of a mantra of the zoo industry in recent years, despite the fact that a Government commissioned study confirmed that "concerns remain, however, with regard to the lack of available evidence about the effectiveness of these [conservation and education] projects" (ADAS 2010).

For many animals, captive breeding is pointed to as one of the main conservation contributions that zoos make. According to BIAZA, zoos "play a vital role in conservation work, including breeding and managing species that are in danger of extinction in the wild" (BIAZA 2013). However, despite these claims, a large proportion of animals held captive in zoos do not belong to species that are threatened in the wild. The study suggests that this is certainly the case with regard to captive birds.

Analysis of the available animal stock lists for the zoos sampled as part of the study found that 82.21% of the 4,762 individuals included in the lists belonged to species that were not threatened in the wild. When considered in this way, it is difficult to see what possible contribution to conservation efforts is made by holding these thousands of birds captive.

Reintroductions

In addition to captive breeding, reintroduction of animals to the wild is something which zoos claim as a reason for their continued existence. Indeed, it is an oft-held belief that the purpose of breeding programmes is just this – that animals will, one day be released. This argument is often accepted at face value by zoo visitors, despite the vast majority of animals bred in zoos never being released to the wild. Very little evidence was found of zoos in the sample taking part in reintroduction programmes, with only two of the 17 zoos with a website or which produced printed materials making reference to reintroducing captive-bred animals.

The two that do mention reintroduction offer a misleading picture. Both make reference to the Hawaiian goose, or nene (Branta sandvicensis), and captive breeding and reintroduction of the species. Both zoos are part of the same chain and although one of the guidebooks gives vague reference to its involvement in the reintroduction, the other notes that it was a third zoo in the chain that was responsible for the breeding (which took place in the 1950s) and reintroduction (in the 1960s). It should be remembered that, due to the fact that such a high percentage of birds in the zoos studied have been subjected to pinioning, there is no possible opportunity for those birds to be released to the wild.

One further zoo is identified in inspection reports as being involved in reintroduction programmes for birds but the programme does not involve the birds kept and bred in the zoo itself. As such, the purpose of keeping and breeding captive birds appears to hold little purpose in the support of release and repopulation programmes.

IUCN Red List	Number of Species	Number of individual birds
Not Evaluated	54	416
Least Concern	285	2943
Near Threatened	32	291
Vulnerable	34	554
Endangered	19	169
Critically Endangered	8	130
Extinct in the Wild	1	4
Unclear from stocklist	7	43
Crossbreed	5	15
Domestic	5	197
Total numbers	**450**	**4762**

Scops owl display

Education

Education is considered to be one of the core objectives of zoos (DEFRA, 2012d) and a zoo's contribution to education is expected to be proportionate to the size and type of zoo.

Zoos are required, as a basic minimum standard, to have a written education strategy, an active education programme, facilities for education purposes (usually a room of some kind) and accurate information about the species exhibited (DEFRA, 2012a). Education should be aimed at all visitors, not just children, and both the formal (e.g. school visits) and non-formal (e.g. other visitors) sectors. Where possible, educational material should be linked to the National Curriculum (DEFRA, 2012d).

The study looked at the role the sampled zoos play in educating their visitors and revealed a mix of good and bad practices.

Most visitors will probably rely entirely on the information signs that should be clear on each enclosure for all of their information about the particular species. The vast majority (91.55%) of enclosures examined had signs, which is to be expected, but that leaves 8.45% that didn't; immediately it means that the visitor is unable to access information. 12% of signs did not identify the species correctly, which is perhaps worse than providing no information at all. The provision of biological data and conservation status scored poorly too.

Provision of basic information about the species on display was apparent across the board: in printed materials available to visitors, presentations and talks. All of these are the ways in which visitors should be accessing information about the birds. Over half (58%) of zoo websites did not give detailed information about their birds.

Presentations and talks provide the perfect opportunity to really educate an audience about a particular species, their behaviours, biology and habitats, as well as the threats they face in the wild and what people can do to support conservation efforts. Yet, less than a third of zoos offer either a presentation or a talk about birds at all.

Seven presentations, involving a total of 24 birds or groups of birds, were observed, but not a single one gave any detailed information on conservation or even explained why they had these species at the zoo. Only 12.5% of these presentations met educational standards at a level that should be provided by enclosure signs (which should be seen as minimal). DEFRA's guide to the provisions of the Zoo Licensing Act state that animal presentations "sould raise awareness in relation to conservation of biodiversity"; clearly, the zoos visited are failing to do so.

The talks on offer did not fare much better. Only one of the four provided an adequate level of information and only one zoo tried to explain why it kept these species in captivity, explaining that penguins were kept in order to breed them and send them to other zoos worldwide. Despite the fact that three of the four species discussed during the talks were threatened in the wild, no mention of this was made and an opportunity to educate on conservation threats was missed entirely.

It seems from the study that educating visitors in any meaningful way about the birds that are held captive is not a priority for the zoos.

Educating visitors in any meaningful way about birds is not a priority for zoos

The ethics of keeping birds in zoos

Discussion of animal ethics is a necessary part of any examination of the captivity of animals. This report raises important issues surrounding the confinement of wild animals in zoos: welfare issues such as flight restriction and restraint, poor living conditions, as well as limited conservation and education values.

We have seen that as far as captive management of birds is concerned, flight restrictions has supporters and opponents: pinioning, wing clipping and tethering restrict the free movement of birds to varying extents but, it is argued, the former allows waterfowl and others to have more space than a roofed enclosure would and the latter allows birds of prey to be more easily flown. Which is more ethical? If birds can only be kept in captivity if they are subjected to management methods that can cause physical pain, distress or result in a mutilation that permanently prevents them from flying, is it acceptable to confine them in captivity at all?

As for zoos' conservation and education claims, they have been strongly refuted by former zoo director David Hancocks:

"This point has concerned me for many years. I believe that the loud trumpeting of zoos about their role in conservation – which is in truth marginal, and mostly technical in nature – is, for the sake merely of zoo promotion, resulting in misguided and complacent attitudes among the general public.

Zoos have managed to convince many people that the only important wildlife species are the typical zoo species, despite these being just a speck of the life forms that exist on the planet, and have then persuaded many of their visitors that the zoos' efforts to breed these species means they will be saved from extinction. It is a disgraceful con-trick. And, I fear, a great disservice to conservation. I know, too, that the exaggerated and noisy clamouring by zoos for centre stage attention in the conservation field is deeply resented by conservation biologists who are working in the wild, actually saving wildlife and wild habitats." (Hancocks, 2010)

Although domestic species are not uncommon in zoos, most birds are of wild species, even if born in captivity for generations. Domestication – adaption by humans to captivity through genetic and developmental changes – has been described as still in its infancy for psittacines (parrots), for example: "they still share natural behaviour and response thresholds with their wild counterparts and should be considered wild animals" (Kalmar, Janssens, & Moons, 2010).

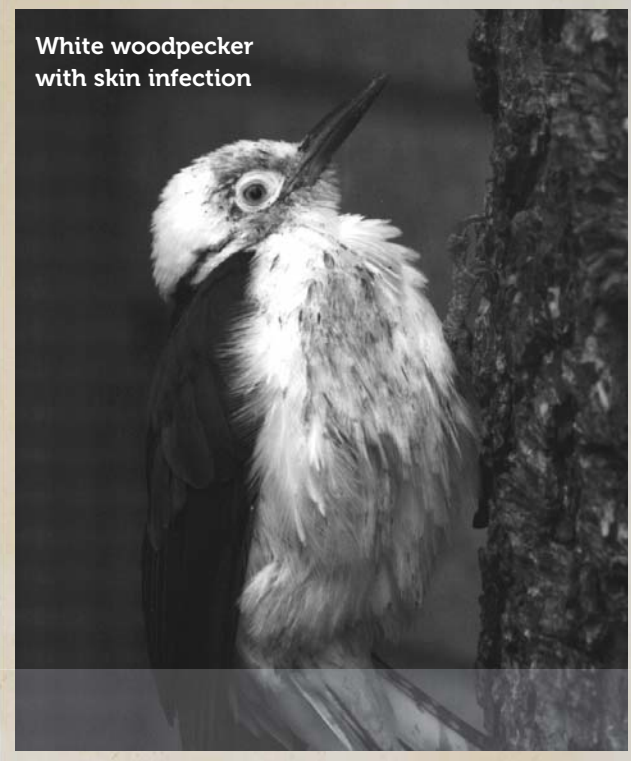
Whilst 'intelligence' should not be the only factor in deciding the fate of captive birds, it is clear that several species (at least) do display sophisticated cognitive abilities, particularly psittacines and corvids (crow family), including tool use, episodic memory, the ability to predict the behaviour of conspecifics (Prior, Schwarz & Gu, 2008) and complex problem solving (Anderson, 2010). A 2008 study reported the first example of self-recognition in a non-mammalian species – in magpies (Prior, Schwarz & Gu, 2008). Social learning – in this instance, birds learning from each other that particular individual humans were dangerous – has been reported in crows. Such learning can evolve over time to become culture (Cornell, Marzluff & Pecoraro, 2012).

Martial eagle, tethered

In addition, birds, like many species across the animal kingdom, display a range of emotions; although like reptiles and fish they lack expressive faces which can make it harder to interpret their feelings (Bekoff, 2007). In 1872 Charles Darwin wrote about how animals, including birds, feel emotions including happiness, sorrow and jealousy, and can display deceit and a sense of humour (Anderson, 2010).

In their natural habitats, birds face infinite challenges, both positive and negative. The 'wild' is a dangerous place, even without the additional pressures of habitat destruction, poaching and global warming caused by humans. Birds face the daily challenges of avoiding being prey (or the challenge of being a predator), of finding a mate, defending a territory or flying thousands of miles on annual migrations (where they often have to also avoid hunters).

Rose, Parsons and Farinato (2009), in a discussion of mortality rates in captive and wild-living cetaceans, in a question which is as relevant to birds, ask: "What replaces, with equal impact, predators, food shortages, storms, ship strikes, fishing gear entanglement, and other causes of death in the wild once a marine mammal is in captivity? One obvious culprit is a degree and form of stress that is uniquely suffered by confined animals".



White woodpecker with skin infection

Kestrel with injury to face

However, this does not make captivity a better alternative, despite the comments of many in the zoo industry. Food and veterinary care may be provided by zoos, leading one zoo scientist to claim that "for some species, the zoo trumps the wild" (Stern, 2008), but wild animals are uniquely adapted to their own environment and occupy specialised places in their ecosystems, and those places are not zoos. Considering captivity to be the best option for wild animals is akin to giving up on conservation and stepping aside to allow the continued destruction of global habitats.

Increasingly, animals are being recognised as sentient beings with their own emotions and desires and people are awakening to the realisation that using them for our amusement denies the value and rights of those individuals (Redmond, 2009; 2010).

In terms of animal ethics, zoos infringe on the basic needs of animals in order to benefit the secondary desires (amusement) of humans. Any ethic concerning animals should start with regard to the animal herself: her cognitive capacities, interests and needs. A basic step towards a meaningful ethic would require an end to using animals for our entertainment.

According to Randy Malamud, Professor of English at Georgia State University and author of Reading Zoos:

"I think that what people see inside the zoo cage is a symbol of our power to capture and control other aspects of the world. They see what was once a marvellous, vibrant, sentient creature, full of instincts and emotions and passions and life-force, reduced to a spectacle, a prisoner, a trophy of our conquest of the natural world. They see a celebration of the human power to displace and reconfigure an animal's life for our own amusement and supposed edification." (Malamud, 2009)

Malamud has written (2009) about how seeing an animal in a zoo, out of context and out of her own environment, means that we really cannot experience that animal. This is a view shared by environmental author Derrick Jensen (2007), who says of zoos:

"We learn that you can remove a creature from her habitat and still have a creature. We see a sea lion in a concrete pool and believe that we're still seeing a sea lion. But we are not. […] A sea lion is her habitat. She is the school of fish she chases. She is the water. She is the cold wind blowing over the ocean. […] She is the process of being a sea lion in place.

We could, and should, say the same for every other creature, whether wolverine, gibbon, macaw or elephant. I have a friend who […] ecstatically reported to me one time that he saw a wolverine. I could have responded, 'Big deal. I've seen plenty in zoos. They look like big weasels.' But I have never seen a wolverine in the wild, which means I have never seen a wolverine."

Moluccan Cockatoo

© C. Redmond

Suggestions for future research

The aim of the commissioned study was to provide an overview of the situation for birds held in zoos in England: their welfare and what, if any, conservation and education benefits occur. From the brief review (looking at just 20 zoos in detail) a number of areas for future research can be highlighted:

- Given the issues identified within such a small sample, it would be beneficial to conduct similar research to consider a larger representative sample of zoos as well as those in other parts of the UK (as this study looks at England only).
- Valuable research could be carried out to consider specific categories of zoos in greater depth to see if highlighted problems are specific to some types of zoological collections, e.g. Bird of prey centres or other specialist avian collections such as waterfowl.
- Mortality of birds in sampled zoos over a one year period were briefly looked at in this study and this is an area of high importance for future research, particularly as it appears to be poorly monitored by the zoo licensing regime. More detailed sources of data, such as stud books for avian species, should be obtained, with a species-by-species analysis as well as mortality for birds under one year old (first year mortality rates are expected to be higher (e.g. see Murn and Hunt, 2008). Further data needs collecting to ascertain the reasons for higher levels of mortality and to provide comparison between years and species to see if some species are prone to higher mortality rates than others, possibly as a result of welfare problems in zoos.
- More in-depth study of flight restriction methods and potential physical and behavioural harm caused to the birds. Cromie and Nicholls (1995) noted that "further research needs to be carried out into the physiological effects of tethering. Systems for reducing the problems of tethering need to be devised or introduced more widely with appropriate education. Management techniques require further development with emphasis on allowing flying birds to be kept loose".

> "What people see inside the zoo cage is a symbol of our power to capture and control".
>
> *Prof. Randy Malamud,*
> *Georgia state University*

Conclusion

The Captive Animals' Protection Society believes that holding animals captive in zoos is unethical from an animal rights perspective and thus rejects the keeping of birds, and indeed any animal in zoos based on this fundamental principle.

However, putting the issue of animal rights to one side, the findings of the study reveal significant animal welfare problems caused by the confinement of birds in zoos. Most important are factors relating to restraint and restriction, primarily pinioning and tethering. Surgically mutilating birds to permanently deprive them of the ability to fly, or tethering (tying) them to a perch for hours at a time – or even for days, weeks or months – cannot be seen as practices to be continued and it is suggested that these practices should be opposed in the strongest terms.

The 'one size fits all' approach to enclosures, whereby birds are housed in enclosures of a uniform nature, regardless of their species-specific needs, had been observed by the study author in over a decade of monitoring conditions in zoos, but have been confirmed by the analysis conducted here. The lack of a varied environment, pond or species-appropriate features all reveal a lack of thought put into what birds require to express normal behaviours, which is not only a requirement of zoo licensing legislation but should be a basic desire of any zoo.

Many of the enclosures seen during the visits to twenty randomly sampled zoos left a haunting impression. The approach to housing birds in the zoos studied speaks volumes as to the zoos' attitudes towards the individuals in their care, birds they claim to display as 'ambassadors for their species'.

Some welfare issues are not so clear to the average visitor, but this does not diminish their importance. Most visitors to a zoo with large numbers of waterfowl who have had half of one of their wings cut off (pinioned) may never even notice. They may enjoy a day watching birds who they think are experiencing the freedom of lakes and extensive grassed areas, oblivious to the mutilation. However, when aware of it and specifically looking for effects of pinioning, the flapping and stumbling of the birds is clear. When first clearly observed on a large bird such as a crane, the visual nature of pinioning is a shock.

Tethering is a practice which cannot be hidden from public view, but it is claimed that these birds are flown daily so this is not great a restriction. Yet this study shows that this is not always the case and even when birds are flown it may only be for a few minutes.

Mortality rates are also not known by visitors, and this research reveals they may not be noticed by too many zoo inspectors either. Despite this, annual death rates appear higher than would be expected, particularly as zoos are meant to protect birds from the usual causes of death such as illness, starvation or predation.

Ask most people their opinion on the role of zoos and conservation is likely to be the number one point. What role do zoos exactly play in conserving avian species? Over 80% of the individual birds in the sampled zoos are not of threatened species. There appears to be minimal involvement in co-ordinated breeding programmes and even less in actually reintroducing species to their natural habitats.

We have already seen how poor welfare leads to a negative educational perspective for visitors. But what of 'traditional' forms of education? 12% of enclosure signs did not even correctly identify the species held and printed materials and websites, where they existed, largely failed to provide much information either.

Presentations and talks provide the ideal opportunity to present a whole package to the visitor: discussion of welfare, educational messages about the species and information about the threats they face and what each individual person can do to make positive changes. Yet sadly these opportunities appear lost. Not one of the 24 individual presentations observed gave any detailed information on conservation; no presentations or talks adequately explained why the zoos kept the species they did, even if they were endangered.

If zoos were providing high standards of animal welfare, were educating visitors about the biology or natural habitats of the birds they confined, or seriously conducting conservation programmes that protected natural habitats and reintroduced threatened species, then their activities would match the level of the grand claims they make. However, this study shows that they are failing to do this. Even if they were, it does not negate the ethical objections to keeping thousands of wild birds on display to serve the requirement of an inquisitive public to be entertained.

The study raises a number of important questions, some of them (such as flight restrictions) rarely previously seen as a topic of debate. It is clear from the work carried out to date that there is a need for further research, but now is the time to start encouraging a more open debate about the future of zoos and an effective and compassionate alternative for conservation.

References

ADAS, 2012. Review of Zoos' Conservation and Education Contribution www.archive.defra.gov.uk/wildlife-pets/zoos/documents/review-zoos-conservation.pdf Accessed 20.2.2013

Anderson, P.K. 2010. Human-Bird Interactions. In: (Eds) Duncan, I.J.H., Hawkins, P. The Welfare of Domestic Fowl and Other Captive Birds. Springer, 2010

Bekoff, M. 2007. The Emotional Lives of Animals. New World Library, 2007

BIAZA, 2013. Good zoos and aquariums Accessed 20.2.2013

Casamitjana, J. 2003. Enclosure Size in Captive Wild Mammals. A comparison between UK zoological collections and the wild. The Captive Animal's Protection Society, 2003. http://www.captiveanimals.org/wp-content/uploads/2011/02/Enclosure-size.pdf

Clubb, R. and Mason, G. 2002. A review of the welfare of zoo elephants in Europe. Royal Society for the Protection of Animals, 2002

Clubb, R. and Mason, G. 2003. Captivity effects on wide-ranging carnivores. Nature, 425, 473-474. 2003

Cornell, H., Marzluff, J., & Pecoraro, S. 2012. Social learning spreads knowledge about dangerous humans among American crows. Proceedings of the Royal Society B, 279, 499-508

Cromie, R., and Nicholls, M. 1995. The welfare and conservation aspects of keeping birds of prey in captivity. A report to the RSPCA by Drs Ruth Cromie and Mike Nicholls. Royal Society for the Prevention of Cruelty to Animals, 1995

DEFRA, 2012a. Secretary of State's Standards of Modern Zoo Practice. Department for Environment, Food and Rural Affairs, 2012. http://www.defra.gov.uk/publications/files/standards-of-zoo-practice.pdf

DEFRA, 2012d. Zoos Expert Committee Handbook. Department for Environment, Food and Rural Affairs, November 2012. http://www.defra.gov.uk/publications/2012/11/21/zoo-expert-committee-handbook-pb13815/

Department of Primary Industries, 2013. Chicken Meat Production. Department of Primary Industries, Victoria, Australia. http://www.dpi.vic.gov.au/agriculture/animals-and-livestock/Poultry/poultry-management/chicken-production. Accessed 26.1.13

Dickinson, P. 2011. An opinion on to pinion or not to pinion. 8 July 2011. http://peterdickinson.hubpages.com/hub/An-opinion-on-to-pinion-or-not-to-pinion. Accessed 26.11.12

EFSA. 2005. The Impact of the Current Housing and Husbandry Systems on the Health and Welfare of Farmed Domestic Rabbits. European Food Safety Authority – Panel on Animal Health and Welfare, 2005

Fiby, M. 2008. Trends in Zoo Design - Changing Needs in Keeping Wild Animals for a Visiting Audience. Topos, The International Review of Landscape Architecture and Urban Design, Number 62, 2008

Fox, N.C. and Chick, J. 2007. Falconry in the United Kingdom: An audit of the current position prepared by the Hawk Board. Hawk Board Publications, 2007

GFAS, 2011. Standards for Animal Care of Arboreal/Perching Birds. Global Federation of Animal Sanctuaries, April 2011

GFAS, 2012. About GFAS. Global Federation of Animal Sanctuaries. http://www.sanctuaryfederation.org/gfas/about-gfas/ Accessed 12.12.12

Hancocks, D. 2010. Interview. Release, Summer 2010. Captive Animals' Protection Society

Hawk Board. 2011. Welfare Guidelines for Nocturnal and Diurnal Birds of Prey. The Hawk Board

Hosey, G., Melfi, V. and Pankhurst, S. 2009. Zoo animals: behaviour, management, and welfare. Oxford University Press, 2009

IAATE, 2008. Position statement: tethering birds. The International Association of Avian Trainers and Educators, 2008

The IUCN (International Union for the Conservation of Nature) maintains the Red List of Threatened Species. This "is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species" (IUCN, 2012).

Jensen, D. 2007. Thought to exist in the wild: Awakening from the nightmare of zoos. NVU, 2007

Kalmar, I.D, Janssens, G.P.J & Moons, C.P.H. 2010. Guidelines and Ethical Considerations for Housing and Management of Psittacine Birds Used in Research. ILAR Journal, Volume 51, Number 4 2010. pp.409-423. Institute for Laboratory Animal Research

Kohler, I.V., Preston, S.H. & Bingaman Lackey, L. 2006. Comparative mortality levels among selected species of captive animals. Demographic Research, Vol. 15, Article 14, pp. 413-434, 2006

Malamud, R. 2009. Interview. Release, Summer 2009. Captive Animals' Protection Society

Martin, S. 2012. To Jess or Not To Jess, That is the Question. Steve Martin, Natural Encounters, Inc. http://www.naturalencounters.com/documents/JessesArticle.pdf. Accessed 5.12.12

Murn, C. & Hunt, S. 2008. An assessment of two methods used to release red kites (Milvus milvus). Avian Biology Research, 1 (2), 2008, pp53-57

Parry-Jones, M. 1994. Training Birds of Prey. David & Charles, 1994

Prior, H., Schwarz, A. & Gu, O. 2008. Mirror-Induced Behavior in the Magpie (Pica pica): Evidence of Self-Recognition, PLoS Biology, 6, 8, 1642-1650

Redmond, C. 2009. The Ethics of Animal Captivity: Circuses, Rodeos and Zoos. In: (Ed) Bekoff, M. The Encyclopedia of Animal Rights and Animal Welfare. Greenwood, 2009 and Redmond, C. 2010. Zoos: Failing animals, conservation and education. Critical Society, Issue 4, Autumn 2010, pp24-34

Rees, P.A. 2011. An Introduction to Zoo Biology and Management. Wiley-Blackwell, 2011

Rose, N.A., Parsons. E.C.M. & Farinato, R. 2009. The Case Against Marine Mammals in Captivity, 4th edition. The Humane Society of the United States and the World Society for the Protection of Animals, 2009

Sawyer, R.C.J. 1997. Twenty five years at Cobham. Avicultural Magazine Vol. 103 No. 2 (1997)

Startup, C. 1967. The Clipping and Pinioning of Wings. J. small Anim. Pmact. Vol. 8, 1967, pp. 401 to 403

Stern, A. 2008. Animals fare better in zoos as experts learn more. Reuters, May 30 2008. http://uk.reuters.com/article/scienceNews/idUKN30448011200805307rpc=401&feedType=RSS&feedName=scienceNews&rpc=401

Turner, J., Garcés, L. and Smith, W. 2005. The Welfare of Broiler Chickens in the European Union. Compassion in World Farming Trust, 2005

VIVA, 2013. A Recipe for Disaster. Vegetarian's International Voice for Animals. http://www.viva.org.uk/campaigns/chickens/broilerfactsheet.htm. Accessed 26.1.13

Zhang, S.L., Yang, S.H., Li, B., Xu, Y.C., Ma, J.H., Xu, J.F., Zhang, X.G. 2011. An Alternate and Reversible Method for Flight Restraint of Cranes. Zoo Biology 30: 342–348 (2011)

Design: www.designsolutions.me.uk

Yes! I'd like to support CAPS!

Please fill in this form and return. You can call us if you would prefer to pay securely over the phone **+44 (0)845 330 3911** or **+44 (0)161 869 0020** (Monday-Friday 9am-5pm) or visit **www.captiveanimals.org/donate** to pay via a secure payment site.

Name _____

Address _____

_____

_____ Postcode _____

Telephone _____

E-mail _____

I'd like to join CAPS

- ☐ £24 Standard Membership (UK)
- ☐ £30/€38 Standard Membership (Overseas)
- ☐ £18 E-Membership

I would like to make a donation instead

☐ I would like to make a donation to CAPS to the value of

_____ (please enter) ☐ British Pounds ☐ Euros

Gift Aid Declaration (UK only)

☐ Please tick to include Gift Aid at no extra cost to you

I am a UK taxpayer and want any donations that I have made in the last 4 years and all future donations, until I notify otherwise, treated as Gift Aid donations (You must pay an amount of Income/Capital Gains Tax equal to the tax we reclaim on your donations, currently 25p in the £1)

Method of payment

☐ I would like to pay by **standing order** (please fill in the details below):

To the Manager of _____

Bank/Building Society _____

Bank **FULL** address _____

_____

Please pay Captive Animals' Protection Society the sum of £ _____

from my account each **month/year** (please select) Commencing on

__ / __ / ____ until further notice.

Account number _____ Sort Code __ - __ - __

Signature _____ Date __ / __ / ____

☐ I would like to pay by **credit/debit card** (please fill in details below)

Please debit my Visa/Mastercard/Maestro Card for the following amount:

_____ ☐ British Pounds ☐ Euros

Card number _____

Expiry Date __ / __ / ____ Valid From __ / __ / ____

Issue Number _____ 3-digit code _____

Signature _____ Date __ / __ / ____

☐ I enclose a **cheque/postal order** payable to **Captive Animals' Protection Society** for £ _____ (UK only)

Please return this form to:

CAPS, PO Box 540, Salford, M5 0DS, UK **Many thanks**

CAPS

Captive Animals' Protection Society

PO Box 540, Salford, M5 0DS, UK

Phone: +44 (0)845 330 3911 (local-call rate)
or +44 (0)161 869 0020

E-mail: info@captiveanimals.org

Websites: www.captiveanimals.org
www.irishcircuses.org