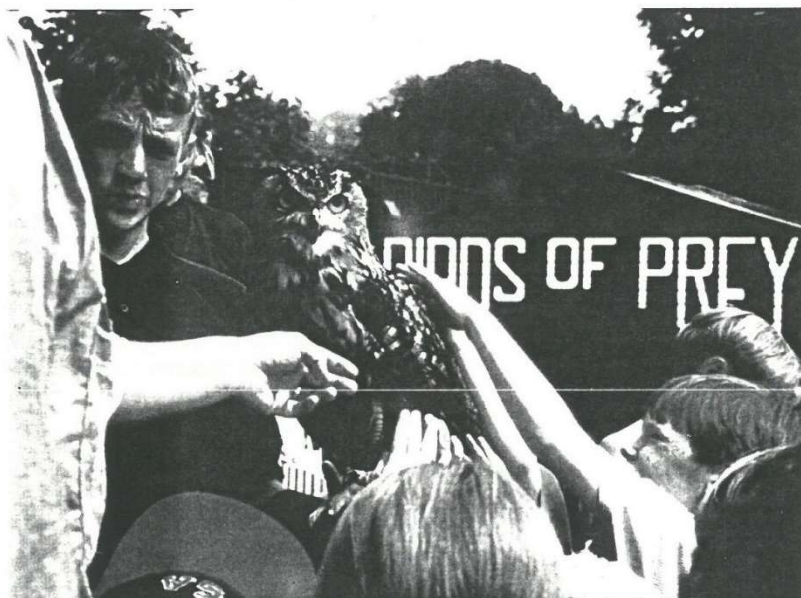


**THE WELFARE AND CONSERVATION
ASPECTS OF KEEPING BIRDS OF PREY
IN CAPTIVITY**



A Report to the RSPCA by:

Drs. Ruth Cromie and Mike Nicholls
The Durrell Institute of Conservation and Ecology
(DICE)
University of Kent
Canterbury
Kent CT2 7PD

October 1995

Front Cover

Plate 1.1: European Eagle Owl *Bubo bubo* under intense daily stroking pressure.

The problems:

- ◆ potentially stressful for the bird
- ◆ physically damaging the plumage by stripping oil
- ◆ a potential danger to the public
- ◆ what is the message for the public?

These issues are discussed further in Chapter 4

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(RSPCA Grant ref. W-15/92)

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SUMMARY

The research investigated both the welfare and conservation aspects of keeping birds of prey in captivity in the UK.

The success of private bird of prey breeders at creating a supply of captive bred raptors for sale has precipitated a rapid increase in the numbers of individuals involved in commercial or recreational raptor keeping. Captive birds of prey are used commercially for exhibition in public collections; flying displays at various public events; bird clearance or visiting educational schemes. Raptors are kept for non-commercial purposes for falconry, rehabilitation or mere recreational bird keeping.

Welfare

The research has compiled a comprehensive checklist of welfare criteria affecting raptors maintained in aviaries and those trained to fly at liberty. The checklist has been used subsequently to identify welfare standards of raptor keepers.

The research has disclosed much voiced concern over welfare standards. This concern was found to be warranted with a broad spectrum of welfare standards being maintained.

A review is made of relevant legislation with particular reference to the Wildlife and Countryside Act (1981), important changes to which have taken place recently. The long term effect of these changes has yet to be calculated. Currently, most raptor keeping is self-regulated with a minimal amount of accountability.

Questionnaire surveys of keepers, falconers, breeders and veterinary surgeons have provided an insight into the motivating factors and attitudes of those involved in raptor keeping. Theory and practice have, at times, been found to be at odds.

Raptor keeping involves complex husbandry, in particular when training birds to fly free. Therefore, competence on the part of the keeper is essential. The majority of raptor keepers felt that a level of proficiency should be acquired prior to keeping a bird. Training courses are widely available, although the quality of some has been questioned. Apprenticeship schemes for falconers have been created to improve competence.

Conservation

Assessments were made of the positive and negative impact of raptor keeping on conservation. Captive breeding conservation programmes were found to be an activity involving only a few key individuals and organisations. The potential for

further positive influence through conservation education and research has been highlighted as being, as yet, unfulfilled.

Falconry was found to be beneficial to conservation via techniques for reintroductions and rehabilitation with negative impacts on the environment via thefts of wild raptors. Escaped birds may ultimately pose a conservation problem if non-endemic populations become established, or pathogens or genes are introduced and integrated into wild populations. Impact on quarry species was considered to be negligible.

A number of recommendations have been put forward.

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GLOSSARY

◆ Definitions used Commonly Throughout the Report

Raptor: a bird of prey; a bird belonging to the Order Falconiformes or Strigiformes. The words 'bird of prey' and 'raptor' are used synonymously throughout the report.

Diurnal raptor: a raptor active by day; diurnal raptor is used to describe a bird belonging to the Order Falconiformes.

Nocturnal raptor: a raptor active by night; nocturnal raptor is used to describe a bird belonging to the Order Strigiformes even though some owls are active by day or are crepuscular.

Captive: maintained in captivity, even if e.g. the bird is allowed to fly at liberty.

Falconry: the sport of taking wild quarry in its natural state and habitat by means of trained birds of prey.

Falconer: one who carries out the sport of falconry; it is important to make the distinction between a falconer and a raptor keeper.

Raptor Keeper: one who keeps raptor(s) but does not *necessarily* partake in the sport of falconry i.e. hunting with trained birds of prey.

Hawk: in its true sense, is a bird belonging to the genus *Accipiter*, however, in falconry it is used as a term for an eagle, buzzard, hawk or falcon.

Hawk, to: is used in falconry to define the act of falconry i.e. to hunt with a trained bird.

Bird of Prey/Raptor Flying Display: a show given to the public which involves flying raptors at liberty. This is usually accompanied by a commentary.

Raptor Centre: a specialist zoo where only birds of prey are exhibited (occasionally these contain a small number of exhibits other than raptors); known popularly as 'falconry centres'.

Owl Centre: a raptor centre specializing in exhibiting owls.

Public Rehabilitation Centre: a raptor centre whose primary purpose is rehabilitation, however, non-rehabilitating birds may be exhibited also (most rehabilitation centres are not open to the public).

◆ Glossary of Specialist Words used in Raptor Keeping and Falconry

aylmeris: leather anklets fastened by an eyelet through which the jesses fit (see *jess* below).

bate, to: attempt to fly off either perch or fist to which a bird is restrained. This 'bating' may be away or toward an external stimulus e.g. bating away from a stimulus

eliciting fear in the bird, or bating toward a stimulus such as food.

bow perch: D or bow shaped perch, usually fixed into ground, to which the bird is tethered; usually used by broad and shortwinged hawks.

block: a cylindrical post-like perch fixed into the ground, to which the bird is tethered; usually used by falcons.

cadge: a portable wooden frame with padded edges to which falcons are tethered, used for transporting falcons.

cast, to: to disgorge a pellet which contains the indigestible parts of a meal e.g. fur, bones, feathers etc.

cere: the area of bare skin above the beak.

cope, to: to file or trim the beak and talons.

furniture: the accessories and paraphernalia attached to the bird's leg e.g. ring (not traditional), anklet, swivel, bells and so on.

hack, to: to allow a (usually young) bird to fly about at liberty until it is caught up to begin its training. During this time food would be provided at an outdoor feeding station.

hood: leather cap which fits closely over the head and essentially puts the bird in the dark which induces calmness. Most commonly used for falcons.

imprint, to: a complex set of behaviours which result in a neonate recognising that which feeds it as its parent; in the context of raptor keeping it is taken to mean recognizing humans as parents, *strictly this should be termed 'malimprinting'*. Thereafter, mate choice selection is usually with that recognised parent or species of parent.

imprint (noun): a bird recognizing humans as parents, sometimes characterised by the bird screaming whenever in sight of humans.

jesses: leather straps which are attached from the legs of the bird to allow the keeper to restrain it either on the fist or by attaching these via a swivel to a leash which is tied to a perch.

mews jesses: jesses with slits at the end through which the swivel passes.

flying/field jesses: slitless jesses used when the bird is flying free to reduce the risk of becoming tangled.

leash: a length of terylene, braided rope or leather which tethers the bird to a perch.

lure: a pad which is used to imitate a bird or mammal and hence entice a raptor to it. For longwings the lure is swung around to imitate avian prey. Other lures may imitate e.g. rabbits for the broadwings, which are dragged across the ground.

man, to: to 'tame' a bird by making it used to human company, involves getting the bird

used to: being tethered; sitting and feeding on the fist; and being carried.

mews: the place where birds are kept, loose or tethered, at night or in inclement conditions. Historically a building where a bird of prey was turned loose to 'mew' or moult.

screen perch: a horizontal post at chest height to which the bird is tethered. Below the post hangs relatively taught coarse woven fabric e.g. sack cloth or carpet, hence if the bird bates/falls off perch it *should* be able to climb back up again to the post. Now unfashionable, as birds may die hanging upside down.

slip: to release a bird from the fist in pursuit of quarry.

swivel: usually two metal rings connected by a fine bolt which allows rotation of the rings. The jesses are secured though one ring and the leash through the other. The rotation should prevent the leash and jesses becoming twisted and tangled.

weather, to: to tether a bird in the open air. A psychological as well as physical conditioning to surroundings.

weathering ground: the area where birds are kept tethered to their perches, in the open air.

weathering, a: a roofed structure, usually open fronted, in which a bird is tethered.

◆ **Definitions Relating to Types of Raptors used in Falconry**

shortwings/accipiters (shortwing hawks): birds belong to genus *Accipiter*, most commonly the Goshawk *A. gentilis* and Sparrowhawk *A. nisus*.

broadwings (broadwing hawks): birds belonging to the genera *Buteo* and *Parabuteo*, i.e. the buzzards and Harris Hawks *Parabuteo unicinctus*; or the eagles most commonly belonging to the genus *Aquila*.

longwings (longwing hawks): birds belonging to the genus *Falco*, i.e. the falcons.

◆ **Abbreviations used commonly throughout the report**

BFSS: British Field Sports Society

BOBARS: British Owl Breeding and Release Scheme

BTO: British Trust for Ornithology

CITES: Convention on International Trade in Endangered Species of Fauna and Flora

DoE: Department of the Environment

EC: European Commission

LRK: licensed rehabilitation keeper

RBA: Raptor Breeders Association

RSPB: Royal Society for the Protection of Birds

RSPCA: Royal Society for the Prevention of Cruelty to Animals

TAG: Taxon Advisory Group

WCA: Wildlife and Countryside Act (1981)

◆ **Summary of the Organisations involved in Aspects of Raptor Keeping**

◆ **British Field Sports Society (BFSS)**

The organisation defending all field sports to individuals, the media and at parliamentary level. It orchestrates a parliamentary committee made up of selected members of the field sports community and pro-field sports MPs. It provides support, advice and information to those involved in any field sports. The BFSS publishes a booklet entitled 'Code of Welfare and Husbandry of Birds of Prey and Owls' compiled by a subcommittee of the BFSS Falconry Committee and the Hawk Board (Appendix 1.1). In addition, it produces a set of guidelines relating to bird of prey flying displays for show organisers and display teams (Appendix 1.2). It gives its official approval to a number of display teams (Chapter 4, section 4.7).

◆ **The Hawk Board**

The Hawk Board's earliest form came into being with the proposed introduction of The Wildlife and Countryside Act (1981)(WCA). It was formed from falconers and others who were concerned about possible restrictive legislation. Now, like the BFSS, the Hawk Board exists to act as advisor to individuals or organisation in the raptor keeping community. Moreover, its role is to advise government (usually the Department of the Environment (DoE) and Joint Nature Conservation Committee) on matters regarding captive raptors. It is made up of elected members of specialists from the commercial and non-commercial raptor keeping world plus representatives from some of the larger falconry clubs. A working party of the Hawk Board produced the 'Code of Welfare and Husbandry of Birds of Prey and Owls' published by the BFSS. Following changes to the wildlife sales controls of the WCA the role of the Hawk Board has changed. These recent legislative changes are outlined in Chapter 2, section 2.10.2, and the new role of the Hawk Board is discussed in Chapter 8, section 8.7.

◆ **British Falconers' Club**

The oldest and largest (in terms of members) falconry club in Britain. It has regional groups covering all areas of the country. Its large membership of approximately 1000 means that it is represented on The Hawk Board. It runs captive breeding schemes to supply birds for falconry. It produces an annual journal entitled 'The Falconer'. It has recently set up its own apprenticeship scheme for new and would be falconers (Appendix 1.3). It has its own code of conduct (Appendix 1.4) and guidance notes for would-be falconers (Appendix 1.5).

◆ **Welsh Hawking Club**

Like the British Falconers' Club, this falconry club has relatively large membership and was founded over thirty years ago in South Wales. It also has a breeding programme which supplies birds to club members. Its large membership (approximately 400) has meant that two separate monthly club meetings are held, one in north Wales and the other in the south. The Welsh Hawking Club is represented on The Hawk Board. It produces an annual journal entitled 'The Austringer' and has its own code of conduct.

◆ **Raptor Breeders Association (RBA)**

An organisation primarily dedicated to the breeding of both diurnal and nocturnal raptors and disseminating information regarding the subject to others. It is represented on The Hawk Board as it has a membership of approximately 150. It produces an annual journal of articles from members and the raptor keeping press. It has its own code of conduct (Appendix 1.6).

◆ **Department of the Environment (DoE)**

The Government department dealing with the registration and licensing relating to captive raptors and falconry. The Department administers licences regulating movements of birds, import, export, sales, quarry, quarantine and so on. The Department also acts as UK secretariat for the Convention on International Trade in Endangered Species of Fauna and Flora (CITES) and controls licensing under this convention.

◆ **Raptor Rescue**

A registered charity involved with rehabilitation of wild injured raptors. It is dedicated to caring for all wild injured and sick raptors, releasing them back to the wild where possible. The organisation is made up of a network of Licensed Rehabilitation Keepers (LRKs) around the UK (the status of LRK is being revoked imminently, see Chapter 2, section 2.10.2d). It produces its own codes of conduct relating to euthanasia and permanent retention of physically disabled or socially disordered wild raptors (Appendix 1.7) and using live birds for fund raising (Appendix 1.8).

◆ **The Federation of Zoological Gardens of Great Britain and Ireland (National Federation of Zoos)**

An organisation attempting to maintain standards of welfare, conservation, education and scientific studies within British and Irish zoological collections. Member zoos must meet required standards and in 1994 there were 54 member zoos. The organisation is often called on to advise government on legislation relating to zoos, conservation and welfare of their animals. Their captive breeding is coordinated through the Joint Management of Species Committee. It represents a professional body of zoos in UK and internationally.

◆ **Royal Society for the Protection of Birds (RSPB)**

A non-government conservation organisation with membership of almost 900,000. They are internationally renowned for direct conservation activities, management of reserves, research, education and campaigning abilities. Although this registered charity's first objective is the conservation of avian species, they successfully campaign for habitat preservation and restoration. The RSPB forms part of the global partnership of Birdlife International.

◆ **The Hawk and Owl Trust**

A non-government conservation charity dedicated specifically to raptors. The organisation carries out direct conservation activities, research and campaigns on issues relating to raptors. Some of the members are raptor keepers and a set of guidelines have been drawn up to advise those taking their live birds to shows, or other such public events, where the organisation may have an advertising stand (Appendix 1.9).

◆ **The Royal Society for the Prevention of Cruelty to Animals (RSPCA)**

A nationally and internationally influential non-governmental animal welfare charity with some 85,000 members and 370,000 supporters. With respect to captive raptors, their team of inspectors make up one of the largest non-governmental law enforcement agencies in the UK, preventing cruelty and bringing prosecutions where necessary. Injured wild raptors may be treated by the RSPCA, or an RSPCA inspector may pass on injured birds to an appropriate LRK.

1

CHAPTER 1: INTRODUCTION**Raptors and Humans**

Raptors have a significant prominence in cultures throughout the world. Historically, they have been both revered and reviled, appearing in myriad myths and legends. Artwork from the ancient civilisations depict raptors in association with great and powerful people. On the whole the relationship between humans and raptors has been one of respect, with the beauty, strength, enviable powers of flight and agility of raptors capturing the imaginations of humans throughout history to modern day. It is interesting to appreciate how these relationships have evolved independently in so many cultures and religions worldwide.

Captive Raptors and Humans

It is difficult to give an exact date at which humans began to take raptors into captivity. It has been suggested that raptors were captured and put to human use as early as 2000 years BC. Whether this is true or not, there have been more substantiated records of raptors trained for falconry from the 7th and 8th Century onwards. This falconry originated in the East, and for those civilisations living in harsh and adverse environments it provided an access to a scarce and desired resource i.e. meat for food.

This unusual relationship between humans and trained wild animals was practised throughout many parts of the Old World reaching its heyday in Britain in Medieval times. By this time, although falconry was still used for a practical purpose, it had become a popular pastime and sport.

During this 15th Century period falconry and falconry terms were commonplace in language and literature, such as that of Shakespeare. Many words and phrases in common usage today are derived from falconry terms e.g. 'fed up', 'larking about', 'mews' and 'towering above' to name a few.

Falconry fell from favour with the advent of more efficient hunting methods i.e. the gun, coupled with the change from subsistence feudal systems to more intensive agricultural practices. With the new management of land for game, raptors became direct competitors for resources and the relationship between humans and raptors changed dramatically. Raptors were perceived as vermin and were persecuted accordingly.

Modern Day Falconry and Raptor Keeping

Since Medieval Times falconry has been practised by a small but enthusiastic few in this country and across Europe relying mainly on taking raptors from the wild as young (eyasses) or adults (usually passage birds). With the advent of the Wildlife and Countryside Act (1981)(WCA)(see Chapter 2, section 2.10) came

more restrictive licensing arrangements for taking raptors from the wild. Those already owning raptors set about captive breeding their birds. The results were, for most species, very good, producing enough birds of a number of popular species to satisfy demand. The expertise at breeding that built up provided a product for the old market but in addition created a new market for many more would-be falconers. Moreover, many took up raptor keeping without becoming involved in the sport of falconry.

Today, the attractiveness of raptors is accessible to many, to know a falconer or keeper, to have viewed a flying display or seen a bird of prey tethered to a perch, is commonplace. The captive bird of prey on the fist today perhaps satisfies some human desire for: a symbol of some ancient and historical relationship between man and beast; the embodiment of our dependence on the countryside for fresh meat from the field; the reflected power and dignity from the raptor to the keeper; or perhaps the ultimate in fashion accessory (Plate 1.2).

In September 1995 a photograph of a Peregrine Falcon took the lead space on the front page of *The Times* (Plate 1.3). The story related to theft of birds from the wild. Why should this bird command front page coverage? Wilson (1992) writes "*No one looks twice at a sparrow or squirrel, or even once at a dandelion, but a peregrine falcon or a mountain lion is a lifetime experience. And not just because of their size (think of a cow) or ferocity (think of a house cat), but because they are rare*". Certainly humans have a particular fascination with those species rare due to their position at pinnacles of biomass pyramids, be they whales, tigers or giant pandas. However, one wonders if the story had related to an equally rare stolen Cetti's Warbler (*Cettia cetti*) would its picture have made lead photograph? Our fascination with birds of prey transcends the rarity argument. Parry-Jones (1993) suggests we relate to them and respect them as hunters due to our ancestral hunter-gathering existence. It is certainly true that a powerful hunter commands respect (although it is unfortunate for the vulture that the scavenger is viewed frequently with disdain).

It is this background of an increasing and widespread interest in raptor keeping that prompted the RSPCA to commission research into the welfare implications of this increasingly popular pastime. The involvement of The Durrell Institute of Conservation and Ecology (DICE) added another aspect to the research, the aim being to establish the relevance of raptor keeping in Britain to conservation.

Raptor keeping in Britain today falls into a number of categories, and it is worth considering the welfare and conservation implications of all:

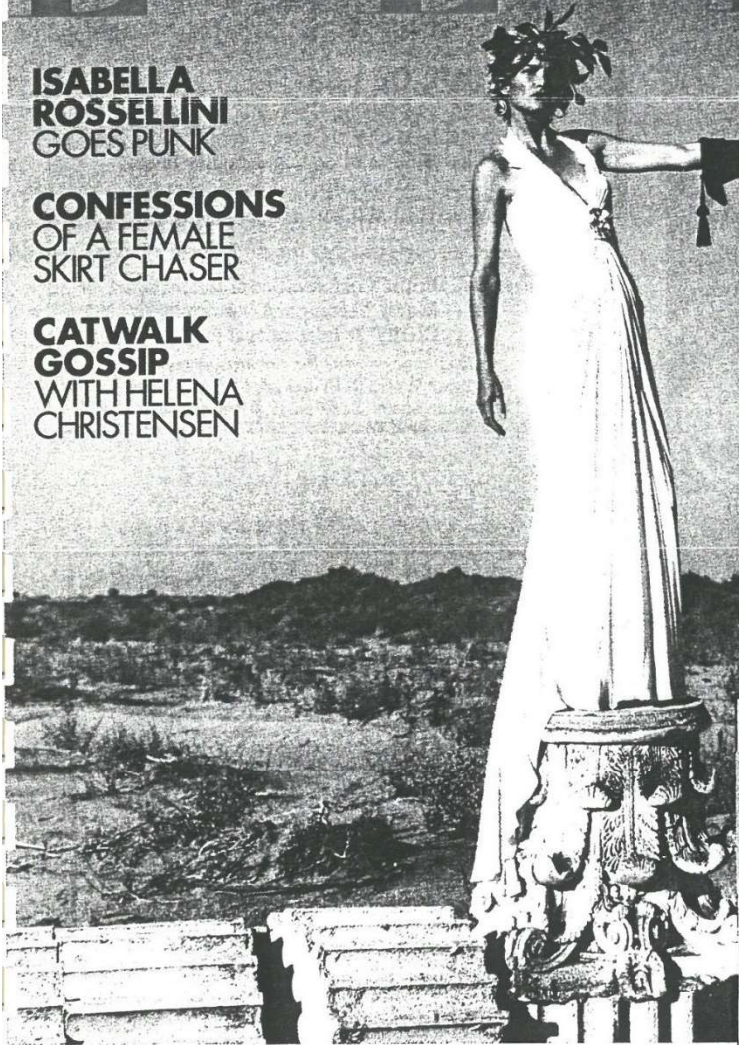
ELLE

ON SALE
FEBRUARY 10

**ISABELLA
ROSSELLINI
GOES PUNK**

**CONFESSIONS
OF A FEMALE
SKIRT CHASER**

**CATWALK
GOSSIP
WITH HELENA
CHRISTENSEN**



FREE
HUNDRED
OF DESIGNE
GIVEAWAY
FROM GAULTIER, RIE
OZBEK, PATRICK CO
GIVENCHY, CLARIS



Plate 1.2: Captive raptors: the ultimate fashion accessory?

THE TIMES



No. 65,386

SATURDAY SEPTEMBER 30 1995

Break-up beyond my control, says Julia Carling



Julia Carling: father read the statement

By DAPHNE KENNEDY
JULIA CARLING admitted yesterday that the breakdown of her 15-month marriage to Will Carling, the England rugby captain, had been beyond her control.

A personal statement issued by her father yesterday morning followed one apparently issued on behalf of the couple the evening before which said "not only she is involved and nothing more could be said."

Yesterday Mrs Carling said: "I confirm that my husband and I have separated. It saddens me deeply that this has happened but the recent

pressures and tensions have produced this situation.

I had always valued my marriage as the most important and sacred part of my life and it hurts me very much to face losing my husband in a manner which has become outside my control.

I have received support from Will and this has unfortunately proved to be no avail.

Mrs Carling's statement was read by her father Brian Smulk, a chartered accountant, outside his home in the Northamptonshire village of Mouldes. Mrs Carling, 30, had dashed past photographers into her parents' home after discussing in a

metallic blue BMW. She carried no luggage.

At a lunch for the Princess of Wales, when Carling has been faced again on her return to the Central Harbour Club.

Carling had one of the Princess's private medical and nursing staff at the Princess's residence in London. He introduced her to ear

with the Princess. Reports that he had a secret affair with the Princess at their first meeting were denied. Mr Watson insisted: "He didn't speak to her, didn't see her, didn't know she was in the clinic."

Carling had one of the Princess's private medical and nursing staff at the Princess's residence in London. He introduced her to ear

to pick up some training shoes. "He has been in my room, but not in my room."

The physiotherapist for Mrs Ma Carling on London, when the rugby player reportedly met the Princess. No one was in the room at about the Princess. "He came in for treatment at a quarter to nine. One. He came straight in - and to see me. He didn't know she was in the clinic. She had the two minutes earlier."

Lonely princess, page 3
Carling to play? page 12

IRA rules out early deal on weapons

By NICHOLAS WATKINS, IRELAND CORRESPONDENT

THE IRA yesterday unequivocally ruled out handing over any arms before a political settlement and warned the Government to drop its "delicious demand for disarmament missions in weapons."

Last night John Major dismissed the call and insisted that the IRA must begin to participate in talks before all-party talks can begin.

As 1989 Sinn Féin activists met and rejected the Northern Ireland peace process at a conference in Dublin today, the current leadership accused Britain of using the arms issue as a "deliberate distraction."

The statement came after Gerry Adams, the Sinn Féin

who wanted to see a "radical settlement". But he declared: "The strategy as pursued by John Major and Sir Patrick Mayhew is one of brinkmanship. It is one of bringing things to the edge. There is always the danger when you bring things to the edge that they will topple over."

Mr Adams responded last night that his speech to the British-Irish Inter-Parliamentary Body could not be interpreted as a desire for a return to violence.

The IRA statement called the decommissioning issue a "deliberate distraction and stalling tactic by a British Government acting in bad faith." It went on: "John



PC Paul Deacock with a falcon at the centre of a court case which saw a breeder jailed for four months. Page 11

Russia threatens new arms bloc

From Barbara Barlow in Moscow

RUSSIAN military chiefs reacted angrily yesterday to Nato's expansion plans and threatened to create a new military bloc and to face conventional and nuclear forces in the Baltic.

Contingency plans for counter-attack Nato's intentions in their membership to former members of the Warsaw Pact were revealed yesterday in the newspaper *Kommunisticheskaya Pravda*.

The Cold War language of the document apparently drawn up by the Russian General Staff, was criticised by press commentators made by Mr Yevgeny Nisov on the radio today.

However, President Yeltsin who is an ally of Moscow has not yet said the report in Nato's conference on disarmament published on Thursday. In the past he has made clear his opposition to Nato expansion, although he agreed to Russia joining the alliance's Partnership for Peace programme.

Nuclear answer, page 15

Plate 1.3: Why is this Peregrine *Falco peregrinus* worthy of front page coverage? The human fascination for raptors.

- ◆ Raptors kept in aviaries in public collections
- ◆ Raptors kept in aviaries in private collections
- ◆ Raptors trained to fly free for flying displays
- ◆ Raptors trained to fly free and hunt i.e. falconry
- ◆ Raptors used as beginners birds or in falconry schools
- ◆ Raptors trained to fly free and for commercial bird clearance
- ◆ Raptors used for educational programmes in school visiting schemes
- ◆ Raptors which have been wild injured and are rehabilitated or retained in captivity if unsuitable for release.

AIM OF THE RESEARCH

The aim of the research is to assess the welfare and conservation aspects of keeping raptors in captivity in the UK.

OBJECTIVES

1. Assess the scale of raptor keeping activities in the UK today including statistics concerning numbers and species of birds of prey (including owls) kept.
2. Appraise husbandry and management techniques used by keepers, falconers, those giving flying displays and rehabilitators.
3. Assess the welfare implications of training birds to fly free and for falconry.
4. Assess the welfare and conservation implications of falconry the field sport and make some assessment of the welfare of prey including an estimation of the numbers and species caught.
5. Assess the conservation value of bird of prey keeping and ascertain the extent to which birds are involved in appropriate and managed captive-breeding, educational or research programmes. Additionally, assess the impact of raptor keeping on wild populations.
6. Assess the current legislation and guidelines concerning bird of prey keeping to ascertain whether or not the regulations are adhered to and whether these protect both welfare of individuals and conservation of species.

The aim and objectives are achieved by the analyses and accounts in the following chapters. Some of the objectives are addressed across the chapters as they are general issues relating to several aspects of raptor keeping.

- ◆ Chapter 2 reviews the current (and past) legislation controlling raptor keeping in Britain today.
- ◆ Chapter 3 reviews the welfare issues of managing raptors in captivity. From reviews and first hand experience a checklist of raptor welfare issues is drawn up.
- ◆ Chapter 4 analyses the welfare and conservation aspects of keeping raptors in public collections and exhibiting raptors to the public at various other public events.
- ◆ Chapter 5 investigates the welfare of raptors and prey involved in the field sport of falconry. The conservation value of falconry is reviewed.
- ◆ Chapter 6 attempts to assess the welfare and conservation aspects of raptors kept by private keepers i.e. mainly for pleasure and non-commercial use. A number of issues general to raptor keeping are reviewed in this chapter together with some other specific activities such as rehabilitation.
- ◆ Chapter 7 summarises the scale of the different raptor keeping activities in the UK today. Extrapolations are made to estimate the extent of some activities.
- ◆ Chapter 8 discusses the findings and reviews adherence to legislation and self regulatory mechanisms. Recommendations are put forward.

Terms of Reference

The baseline for the research accepts that raptor keeping in the UK is a legal activity and the report does not question the ethics of domestic or wild animal keeping.

For an accurate and factual investigation it was considered that the research should be carried out as objectively as possible. To facilitate this, there was extensive collaboration and discussion with those involved in the raptor keeping world. It was considered that those responsible individuals aware of welfare and conservation concerns, would wish for a constructive outcome from this report which would benefit all captive raptors. The report, whilst making some appropriate recommendations, provides an overview and snapshot of the current and perceived future welfare and conservation issues surrounding raptor keeping.

CHAPTER 2

LEGISLATION RELATING TO

RAPTOR KEEPING

ELIZABETH II



Wildlife and Countryside Act 1981

1981 CHAPTER 69

repealed and re-enacted with amendments
by the Wildlife and Countryside Act 1981 (c. 69) and the Wildlife and Countryside Act 1985 (c. 67)

ANIMALS ACT 1971
(1971 c. 22)

ARRANGEMENT OF SECTIONS
Strict liability for damage done by dangerous animals

ANIMALS
ANIMAL HEALTH

The Welfare of Animals during Transport Order 1992

29th December 1992
1st January 1993

Made
Coming into force

Her Majesty the Queen, by the Secretary of State for Scotland and the Secretary of State for Wales, in exercise of the powers conferred on them by section 5(2)(a) of the Animal Health Act 1981 (c. 67), hereby make the following Order:

Enacted in the presence of the Lord Chancellor
The Secretary of State for Scotland
The Secretary of State for Wales
The Secretary of State for Northern Ireland
The Secretary of State for the Home Department
The Secretary of State for the Environment
The Secretary of State for Transport

2 CHAPTER 2: LEGISLATION RELATING TO RAPTOR KEEPING

There are a number of pieces of legislation which relate to various aspects of raptor keeping both in terms of welfare and conservation. For a comprehensive explanation of the legislation, the reader is guided to the Acts themselves (in Halsbury's Statutes e.g. 1987, 1992), Cooper (1987) or Lyster (1985); Ford (1992); Parry-Jones (1993); Durman-Walters (1994a) (it should be noted that the latter five texts do not contain the important changes to the WCA which took place in 1994: these changes are outlined subsequently in this chapter (section 2.10.2). A synopsis of those pieces of legislations most relevant to the subject is given here.

2.1 ♦ Protection of Animals Act (1911), Protection of Animals (Amendment) Act (1954 & 1988)

This act prohibits cruelty to captive animals which includes any actions which cause unnecessary suffering by failing to take due care and attention i.e. preventative action. The word "captive" does not refer to an animal which has "a mere temporary inability to get away". Under the Act a convicted person may be disqualified from owning an animal. Subsequent amendments (1954, 1988) give courts greater penalty powers, which may allow disqualification from ownership of a specific kind of animal for a minimum of one year, a fine and/or up to three month's custodial sentence.

With respect to raptor keeping, this Act relates to the protection of the welfare of captive raptors. The welfare of prey of a falconry bird is not be covered by the Act due to the definition of "captive".

2.2 ♦ Abandonment of Animals Act (1960)

The Abandonment of Animals Act (1960) is one of a group of Acts comprising the Protection of Animals Act. It prohibits any act of abandonment which causes an animal unnecessary suffering. An action of cruelty is an offence under the principle Act i.e. the Protection of Animals Act (1911).

The responsibility for an animal's welfare is placed on the individual having charge or control of that animal. If that individual abandons an animal permanently or otherwise in a situation likely to cause unnecessary suffering, the person is guilty of an offence under the principle Act. An offence is committed if the owner merely permits its abandonment. Ignorance of the consequences or a mistaken view of the effect are not taken as reasonable excuses.

With respect to raptor keeping it is possible that this Act could apply to e.g. release of wild injured rehabilitated, or captive bred, birds which have been caused unnecessary suffering by being unfit for the wild and subsequently starving. No such cases are known.

2.3 ♦ Performing Animals (Regulation) Act (1925) and Performing Animal Rules (1968)

This is another Act which can be cited under the collective title of the Protection of Animals Act. The Act seeks to regulate the training and exhibition of performing animals.

This legislation requires anyone training and exhibiting an animal for public entertainment to be registered with the local authority. The Rules of 1968 raised the fee for registration of exhibitors and trainers.

The expression "exhibit" means exhibit at any entertainment to which the public are admitted, whether on payment of money or otherwise. "Train" means train for the purpose of any such exhibition.

2.4 ♦ The Zoo Licensing Act (1981)

According to the Act a zoo is legally obliged to obtain a licence from its local authority. A "zoo" is defined as "an establishment where wild animals are kept for exhibition to the public otherwise than for purposes of a circus and otherwise than a pet shop". Additionally the Act applies to any zoo to which the public have access, with or without charge for admission, on more than seven days in any 12 month period. A zoo must have a licence which is only granted once the institution has met standards set out by the Department of the Environment (DoE). The zoo must be inspected every three years by a DoE-listed inspector and a local authority inspector. Special or informal inspections may be carried out periodically on a more regular basis.

2.5 ♦ The Veterinary Surgeons Act (1966)

This Act prohibits veterinary treatment of an animal by anyone not registered with the Royal College of Veterinary Surgeons (with a small number of exceptions). There are certain exemptions whereby the lay person is permitted to treat a bird or other animal:

- ♦ any treatment may be given by the owner of the animal, or a member of his/her household or employee

- ◆ first aid may be given by anyone in an emergency in order to alleviate pain or suffering or to save life.

2.6 ◆ The Protection of Animals (Anaesthetics) Act (1954 & 1964)

This Act prohibits the performance of a surgical operation involving soft tissue or bone without the use of an anaesthetic. However, the Act applies only to mammals.

2.7 ◆ The Welfare of Animals during Transport Order (1992)

This Order revokes some sections of the **Transit of Animals (General) Order (1973)** and **Transit of Animals (Amendment) Order (1988)**. This Order states that it is an offence to transport animals without proper attention to their welfare. The Order includes all animals but is not applicable to pets unless in the course of trade or business.

The Order stipulates that appropriate containers should have adequate food, water, ventilation and be maintained at an appropriate temperature.

For animals other than domestic, the following must be adhered to: birds must be kept in semi-darkness, animals of different species must not be travelled in the same container (unless known to be compatible), if a wild, timid or dangerous animal is to be transported the container must bare a notice to that effect.

For air transport or international travel the person responsible for an animal must be in full compliance with **International Air Transport Association** standards and **CITES** guidelines.

2.8 ◆ Animals Act (1971)

The Act makes provision for civil liability following damage done by an animal. The Act places liability on the owner of the animal if that animal causes damage to another person or his/her property in certain circumstances. Most commonly the Act would be used in cases of trespass of livestock, or to protect livestock from dogs.

With respect to raptors, which are predatory and potentially dangerous animals, the owner could be liable if, for example, the bird injures a person or damages their property.

2.9 **◆ Dangerous Wild Animals Act (1976); Dangerous Wild Animals Act (1976) (Modification) Order (1984)**

The Act regulates the keeping of certain kinds of dangerous wild animals, requiring the keeper to have a specific licence. Raptors are not listed on the schedule of this Act and as such keepers do not need to be appropriately licensed. The Act is reviewed further by Cooper (1978).

2.10 **◆ The Wildlife and Countryside Act (1981), the Wildlife and Countryside (Amendment) Act (1985 & 1991)**

Prior to 1981, legal protection for nature conservation was afforded via the Protection of Birds Acts 1954 and 1967 and the Conservation of Wild Creatures and Wild Plants Act 1975. Following the EEC Directive on the Conservation of Wild Birds and the Council of Europe Convention on the Conservation of European Wildlife and Natural Habitats, The Wildlife and Countryside Act (WCA) was drawn up in 1981, becoming fully effective in 1982. The WCA is the most comprehensive piece of legislation to address nature conservation in the UK. Prior to this, protection of habitat was considered only in legislation relating to nature reserves and national parks.

The legislation covers four main areas which are relevant to raptors:

- ◆ conservation: the WCA provides protection for wild birds and other species by restricting various forms of injuring, killing, taking, possessing and trading.
- ◆ close season protection: of some species used in field sports, protection is enforced during their breeding season (restrictions on methods of killing them are also stipulated elsewhere in the Act).
- ◆ control of pest species: certain species considered as pest species are listed in the Act and as such receive no protection under the Act (hence may be taken by falconry birds). Other species usually protected in the above two categories may, under certain circumstances, be controlled if they cause, or threaten to cause, damage to property or crops.
- ◆ trade control: regulations and restrictions are stipulated regarding trade in the species covered in first category (some of the previous controls were covered prior to 1981 by the Endangered Species (Import and Export) Act 1976).

2.10.1 *WCA: Further Detail of Sections Relevant to Captive and Wild Raptors*

Part I deals with the protection of birds.

The WCA provides protection to all wild British (i.e. resident, migrant or vagrant) raptors in this country. Beyond this, it protects British raptors which are held in captivity and those bred in captivity (for a bird to be captive bred its parents must have been legally kept in captivity when the egg was laid). *It is important to realise that it is up to the keeper to prove that a bird is legally held.*

Sections 1-8 of the Act deal with protection of birds. Section 1 makes it an offence to kill, injure or take any wild bird, or to take, damage or destroy the nest (if it is being built or in use) of any wild bird, or take or destroy the egg of any wild bird. It stipulates, also, that it is an offence to disturb nesting birds.

Section 6 deals with the trade aspects of birds and makes it an offence to have in one's possession or control any live, dead or part (including derivative) of a wild bird; or any egg, or part of, an egg of a wild bird.

The species which are exceptions to these Sections are those listed in Schedule 2 of the Act (Appendix 2.1) which include pest and game species (the latter may be taken outside the close season).

There are also other exceptions relating to injured birds which can be cared for if the injury has not been unlawful, or a bird may be killed if it is too seriously injured as to affect its chances of survival, and so on.

Section 8 of the Act stipulates that the keeper of a bird is committing an offence if a bird is kept in a cage or receptacle which is not sufficient in height, length or breadth to permit the bird to stretch its wings freely. The exceptions being: if the bird is being conveyed, undergoing veterinary treatment or on public display or competition.

2.10.1a ♦ *Quarry Species*

With respect to falconry, it is worth listing those species excluded from the above protection as these are the species which may be taken as quarry. These species are listed in Schedule 2 (Appendix 2.1).

Schedule 2 Part 1 stipulates the species which may be taken outside the close season. Part 2 stipulates the species which may be taken at all times by an authorised person. For taking game species a game licence is required which can be obtained from a Post Office.

However, other species which are protected under Sections 1-8 and not listed on Schedule 2, may be taken as quarry for falconry if a licence is obtained from the DoE. These quarry licences are issued under Section 16 and allow the killing of species such as Skylarks *Alauda arvensis*, Meadow Pipits *Anthus pratensis*, Blackbirds *Turdus merula* and Song Thrushes *T.philomelos*. To obtain a quarry licence, an application must be made to the DoE stipulating the ring number of the raptor involved and an estimation of the number of wild birds to be taken. Thus, the licence stipulates when and how many quarry may be taken including the ring number of the raptor. The lark-hawking season begins on 1st September and typically lasts one month.

2.10.1b ♦ Schedule 1 listed Raptors

Raptors which are fully protected and have a special penalty of £1000 are listed in Schedule 1 of the Act and are as follows:

Golden Eagle*	<i>Aquila chrysaetos</i>
White-tailed Sea Eagle	<i>Haliaeetus albicilla</i>
Honey Buzzard	<i>Pernis apivorus</i>
Red Kite	<i>Milvus milvus</i>
All species of Harrier	<i>Circus spp.</i>
Goshawk*	<i>Accipiter gentilis</i>
Hobby	<i>Falco subbuteo</i>
Merlin*	<i>Falco columbarius</i>
Gyr Falcon*	<i>Falco rusticolus</i>
Peregrine*	<i>Falco peregrinus</i>
Osprey	<i>Pandion haliaetus</i>
Barn Owl	<i>Tyto alba</i>
Snowy Owl	<i>Nyctea scandiaca</i>

* those marked thus, together with hybrids thereof, are known to the DoE as the "monitored species". These birds are desirable falconry birds and could potentially be taken illegally from the wild. The system of monitoring these species more closely was introduced as a deterrent for such activities.

The Barbary Falcon* *Falco pelegrinoides* is recognised as a monitored species - taxonomic confusion has led to this possible race or subspecies of the Peregrine Falcon not being listed as a separate species on Schedule 1.

2.10.1c ♦ Re-Scheduling of the Barn Owl *Tyto alba*

Prior to 1992, the Barn Owl *Tyto alba* was listed under Schedule 3, Part I, and as such could be sold alive at all times if ringed and bred in captivity. The excessive number of non-coordinated breed and release schemes for this nationally

threatened species prompted a change in its Scheduling in the Act (see Chapter 6, section 6.8, for a more detailed account).

At the end of 1992 the Barn Owl was moved from Schedule 3 of the WCA and was instead, listed on Schedule 9. In essence, a licence was then required to release birds. This licensing scheme came into effect from the beginning of 1993.

The breed and release schemes as both a welfare and conservation problem are documented in Chapter 6, sections 6.8.1c and 6.8.1d respectively.

2.10.1d ♦ *Birds Listed on Schedule 4 prior to changes made in 1994 (subsequently detailed later in section 2.10.2)*

Prior to 1994 all British or foreign wild or captive bred diurnal birds of prey except vultures, (i.e. all birds of the taxa Falconidae and Accipitridae excluding the genera *Gypaetus*, *Gypohierax*, *Gyps*, *Neophron*, *Sarcogyps* and *Trigonoceps*) together with a small number of rare British non-raptors were listed on Schedule 4 of the Act (Appendix 2.2). Under Section 7 of the Act, all those listed on Schedule 4, when kept in captivity had to be registered with the DoE and ringed with a DoE ring under the Wildlife and Countryside (Ringed of Certain Birds) Regulations 1982. General or individual exemption licences could be sought for specific reasons.

In essence, this meant that all diurnal raptors in captivity, other than vultures, had to be ringed shortly after hatching with a uniquely numbered DoE-issued closed ring. A closed ring is, as the name suggests, a closed band of metal. When the chicks were approximately 7-14 days of age a DoE inspector would place the appropriate (in terms of species and sex) size of ring over the chick's foot and onto the leg (actually the metatarsus). This closed ring system meant that the rings could not be removed once the birds were older without it being sawn off or the foot amputated. If, for some reason, the bird had to be ringed at an older age, e.g. the bird had to have its ring cut off for veterinary purposes or the bird was wild injured, the bird would be given a numbered cable tie.

Under this system the DoE would be notified when a registered bird was moved to a new address, sold, exported, escaped, died, or released back to the wild if it was a wild injured bird. Re-registration was necessary if the bird was transferred to a new owner, or if the ring had to be removed or became illegible.

For each registration and transfer of a bird a fee was paid. Each registration was renewed triennially. The fee structure (Appendix 2.3) depended on the status of both the keeper and the bird. The status of the former was designated by membership, or not, of a DoE-recognised club. Members of The British Falconers' Club, North of England Falconry Club, Welsh Hawking Club, Raptor Breeders' Association (RBA), raptor owning members of The Hawk and Owl

Trust and more recently The South East Falconry Group paid reduced fees. Discounts were given also for membership of the Zoo Federation. The fee for administration of monitored species was greater than that for the non-monitored species (Appendix 2.3).

Please note that there was no ringing or registration system for owls i.e. nocturnal raptors.

2.10.1e ◆ *Licence Rehabilitation Keeper (LRK) Status*

Under the registration system Licence Rehabilitation Keepers (LRKs) are licensed to keep Schedule 4 birds unlicensed for up to six weeks under an open general licence agreement. This latter agreement also permits veterinary surgeons to keep injured wild birds unlicensed whilst undergoing treatment for the same length of time. The six week limit was put in place as this is the time in which most injured birds would have been treated and released or died. Beyond this period of time, it is necessary to have an injured bird registered and ringed. In these situations the registration fee is reduced. (*See section 2.10.2d for imminent changes to LRK status*).

2.10.1f ◆ *Release or Escape of Non-indigenous Species* (still relevant post 1994)

Under Section 14 of the Act it is an offence to release a species not ordinarily resident, nor regular visitor, in Britain. In addition, it is an offence to release or allow escape of any animal listed on Part I of Schedule 9 (the case of the Barn Owl has been mentioned previously and the whole issue is detailed further in Chapter 8, section 8.2). However, if it can be shown that all due care was taken to prevent an escape or release then no offence has been committed.

2.10.1g ◆ *Enforcement* (still relevant post 1994)

The Wildlife Inspectorate of the DoE are responsible for enforcement of the Act. As such DoE inspectors or others authorised by the DoE (e.g. a DoE recognised club member) may periodically inspect premises where Schedule 4 birds are kept. These inspections involve verifying that those birds present at a premises are those registered with the DoE.

Beyond the DoE inspection scheme, a magistrates' court can authorise a police constable to enter and search premises for evidence of offenses under the Act.

The breeding activities of the monitored species are observed and documented by the DoE (e.g. a DoE inspector witnesses ringing of all monitored species).

2.10.1h ◆ *Trade Control of Indigenous and Non-Indigenous Raptors* (still relevant post 1994)

◆ *at a national level*

As stated previously, Section 6 of the Act governs sales of wild birds. Also stated previously Barn Owls (which were, prior to new regulations detailed in Chapter 6, section 6.8, listed on Part I of Schedule 3) could be sold without a licence provided they had been captive bred and were ringed in accordance with the regulations. However, an open general licence permits the sale of various live raptors, again, providing they have been captive bred and are ringed in accordance with the regulations.

◆ *at an international level*

All those species listed on Schedule 1 of the WCA are prohibited from trade internationally unless authorised by a DoE licence.

The UK is one of the signatories to the Convention on International Trade in Endangered Species of Fauna and Flora (CITES). The European Commission (EC) implements the convention through the **EC Regulation 3626/82**.

CITES licensing is administered in the UK by the DoE. The licenses required and extent of permitted trading are determined by the species' CITES Appendix listing:

- ◆ CITES Appendix I: Endangered species regulated by EC Regulation Annex C, Part I. Essentially no trading is allowed, however, there are exceptions for e.g. captive bred birds. Scientific input is required for all reviewed applications.
- ◆ CITES Appendix II: Threatened species regulated by EC Regulation Annex C, Part II. Trading is allowed as long as it is sustainable.
- ◆ CITES Appendix III: Vulnerable species regulated by EC Regulation Annex C, Part III. Trading is permitted more freely, again on the premise that the trade is sustainable.

CITES Appendix listings of both diurnal and nocturnal raptors are given in Appendix 2.4. In essence, 16 diurnal raptors and five nocturnal raptors are Appendix I listed with all other Falconiformes and Strigiformes listed on Appendix II. However, the Cathartidae (New World vultures) are not included as the taxonomy adopted by CITES places them outside the Falconiformes. This said, both the California Condor *Gymnogyps californianus* and the Andean Condor *Vultur gryphus* are Appendix I listed in their own right and the King Vulture *Sarcorampus papa* is Appendix III listed, similarly. Hence, appropriate CITES licences are required for all exports and/or imports of birds of prey.

2.10.2 Review of UK Wildlife Sales Controls: Important Changes to the EC and UK Legislation affecting Raptor Keeping

At the end of 1992 a DoE announcement was made that a review of the UK wildlife sales controls would be carried out during 1993.

2.10.2a ♦ Reasoning Behind the Review

As well as administration of the WCA, the DoE is responsible for controlling CITES regulations in the UK and the Endangered Species (Import and Export) Act 1976. Proposed new EC regulations on the wildlife trade sought to replace the previous EC CITES Regulation 3626/82 which regulated sales controls. As the WCA had been in place for over a decade it was considered necessary to review the sales controls of the Act to determine to what extent it overlapped with these other pieces of legislation. It was pointed out that any regulations must be workable within the available resources. With respect to the bird registration scheme, it was calculated that there was a net cost to the DoE of £13 per bird to register compared with a registration fee of between £7 and £20 (depending on bird and category of keeper, see Appendix 2.3) payable by the keeper. In addition, it was considered that new regulations must not over burden those affected by the legislation.

2.10.2b ♦ A Summary of the Review in Relation to Raptors

♦ The Original Bird Registration Scheme

The scheme was intended as a conservation measure reducing the taking of birds from the wild whilst allowing establishment of sufficient captive stock to satisfy demand.

At the time of the review, of all registerable birds the following eight species made up 81% of the total:

Species	Number of Registered Birds (1993 Figures)
European Kestrel	3,855
Common Buzzard	2,472
Harris Hawk	1,815
Peregrine	1,418
Eurasian Sparrowhawk	1,157
Red-tailed Buzzard	1,062
Goshawk	880
Merlin	361

The government considered whether keeping registration of the common raptors i.e. Kestrel, Common Buzzard and Sparrowhawk, and non-indigenous species of raptor, was:

- ◆ achieving the objectives of the Act
- ◆ a sensible use of resources.

On 30th April 1993 the DoE circulated the appended details (Appendix 2.5) to interested parties and their comments regarding the review were sought.

2.10.2c ◆ *Responses from those Organisations Concerned with Raptors*

◆ *The Authors' Response*

The authors responded (Appendix 2.6) pointing out that the timing was unfortunate as the results from this research were yet to be elucidated. Whilst the authors were aware that the legislation was primarily directed at conservation of wild birds, they felt that it would be a potential retrograde step with respect to animal welfare.

◆ *The Hawk Board's Response*

The Hawk Board responded (Appendix 2.7) in essence agreeing with the deregistration of the proposed species. The response pointed out that:

- ◆ raptors have been subject to over-regulation by comparison to other taxa in UK
- ◆ as part of the EC, there should be parity between regulations affecting UK raptor keepers and other EC country regulations
- ◆ DNA technologies can be used as a control measure to prove conclusively parentage (or non-parentage) of captive raptors. Passive injectable transponders (identichips) can be used for permanently identifying individual birds (discussed further in Chapter 6, section 6.4.6)
- ◆ rings on individual birds have been the cause of death and injury to individual raptors and in itself, ringing cannot be seen as a positive welfare measure
- ◆ a number of rare European species continue to be monitored at present levels.

2.10.2d ♦ *The New Regulations Regarding the Registration System*

As of 24th May 1994, the following changes to the registration scheme came into effect:

Thirty eight species of diurnal raptor are still listed on Schedule 4 (Appendix 2.8) and there is no change to their registration and ringing requirements. This applies also to hybrids thereof i.e. a bird whose parent or ancestor is one of those species listed. The fee structure remains unchanged for these birds (Appendix 2.3) and closed rings for these birds will continue to be supplied automatically by the DoE.

All other raptors are no longer listed on Schedule 4 i.e. they no longer require registration or ringing.

However, it is still necessary for a non-registerable bird to be closed ringed if it is to be sold (even if merely exchanged or bartered) or displayed. For sales of either registrable or non-registrable birds, the bird must have been captive bred and documentary evidence of captive breeding must accompany the sale. If a bird is to be sold or displayed a licence is required.

The DoE has been keen to point out that it is still the responsibility of the keeper to be able to show that the bird in their possession is legally held. The DoE recommends keepers to maintain detailed written records and to continue to fit closed rings to their birds even if these will no longer be supplied automatically by the DoE. Other forms of identification of individuals are encouraged e.g. the use of passive injectable transponders placed just beneath the skin (these are discussed further in Chapter 6, section 6.4.6).

Imported registrable species still require registration.

♦ *Quarry Licences*: the procedure and requirement for issuing quarry licences remain unchanged.

♦ *Inspections*: periodic inspections by DoE inspectors will no longer be carried out for the non-registrable species. Whereas in the past ringing of monitored species was always witnessed by the DoE, this will be done only randomly for any of the 38 registrable species.

♦ *DNA testing for Enforcement*: a programme of inspections has been introduced whereby blood samples are taken from a selected sample of monitored species and their alleged corresponding offspring. Analyses of the samples confirm or disprove allegations regarding familial relationships.

Whilst it is no longer necessary to register many of the species of raptor commonly kept in captivity it is still an offence to take such birds from the wild.

Since this deregistration of the majority of captive held raptors, a number of voluntary registration schemes have sprung up. Presently there are two major operations (Peter Mulholand Bird Registration and Independent Bird Register) still operating although between them they undoubtedly do not register the majority of captive raptors.

◆ *LRK status*

Following the review, the status of LRK will be discontinued from 1st November 1995. A person will not be guilty of an offence of keeping a bird undergoing rehabilitation (as long as the injury was not imposed by that person) and releasing once recovered. However, the DoE have pointed out that it is still the responsibility of the keeper of that rehabilitating or permanently disabled bird, to ensure that they can prove its legal origins. Keepers are advised to maintain documentary evidence to this effect.

However, an injured bird of a registrable species will have to be registered.

For further clarification the following documents from the DoE are appended:

Information relevant prior to the review:

Appendix 2.9:

*1993 Breeding season for registerable birds
Ringing and registering chicks
Registration procedures reminder (sent to all keepers)*

Appendix 2.10:

1993 Close ringing of captive bred Schedule 4 birds: a guide for keepers

Appendix 2.11:

1993 DoE Information Sheets:

- 1. Possession, competitive showing and display*
- 2. Registration of birds*
- 3. Birds which must be registered if kept in captivity*
- 4. Owls*
- 5. Sick or injured wild registerable birds*
- 6. Falconry*
- 7. Sale of live birds*
- 8. Schedule of fees*

The review and subsequent relevant information**Appendix 2.12:**

*1994 Review of Sales and Related Wildlife Controls WCA 1981
Proposed amendments to Schedule 4: Bird registration and ringing*

Appendix 2.13:

1994 Changes to the registration system (information for keepers)

Appendix 2.14:

1995 Close ringing of captive bred Schedule 4 birds: a guide for keepers (update of Appendix 2.10)

Appendix 2.15

1995 DNA testing of blood samples from Schedule 4 birds

Appendix 2.16:

1995 Ringing and registration of 1995-bred birds

2.11**◆ CODES OF CONDUCT AND VOLUNTARY GUIDELINES**

In addition to legislation, the raptor keeping community is regulated by a number of organisations which produce guidelines and codes of conduct.

BFSS Code of Welfare and Husbandry of Birds of Prey and Owls

In 1993 a subcommittee of the BFSS Falconry Committee and the Hawk Board produced the general voluntary "Code of Welfare and Husbandry of Birds of Prey and Owls" (Appendix 1.1). The code was designed for: those thinking of taking up raptor keeping; as a reminder for those already involved in the practice; to any interested parties; and lastly to "show to those who may not approve or understand the reasons for keeping birds of prey or owls, that we always have the birds' best welfare and husbandry in mind". The timing for the production of the 13 page booklet was appropriate as there was increasing awareness in the raptor keeping world that welfare problems were arising. In addition, raptor keeping was coming to the attention of organisations which may not approve of such activities. It is the authors' belief that the timing of the code's production and the commencement of this RSPCA-funded research are not coincidental.

The code itself is an excellent and commendable outline of the standards which should be maintained. It acknowledges that it provides only a broad outline of practices to minimise welfare problems. It suggests that further information should be gathered from other sources.

It constitutes the most important and all encompassing voluntary regulation in use in raptor keeping. Adherence to this guide is discussed in Chapter 8, section 8.4.

Other guidelines

An assessment of adherence to the other voluntary codes of conduct is made in Chapter 8, section 8.4. These guidelines relate to various aspects of raptor keeping including falconry, public raptor flying displays, rehabilitation and displaying birds for fund raising for rehabilitation.

CHAPTER 3

CAPTIVE RAPTOR WELFARE

ISSUES

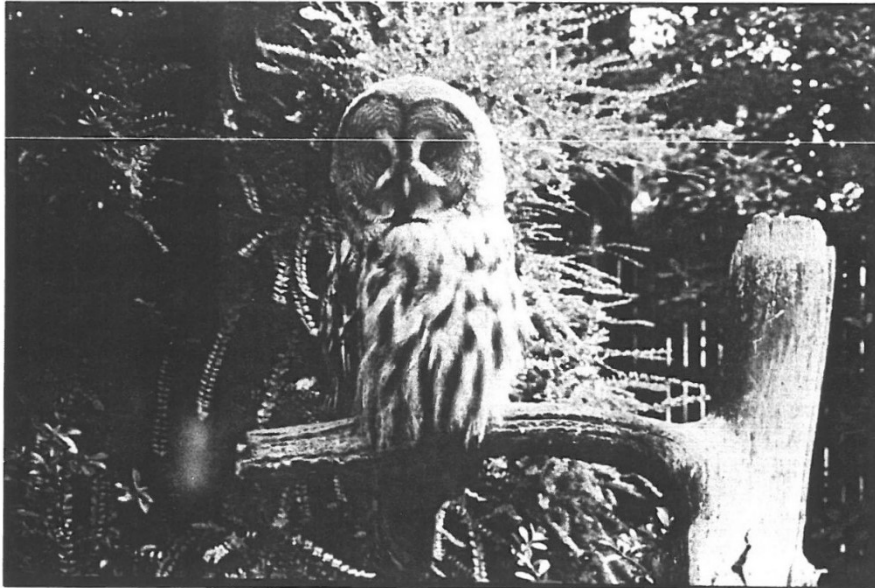


Plate 3.1: The product of high welfare standards: a physiologically and psychologically healthy animal (Great Grey Owl *Strix nebulosa*).

CHAPTER 3: CAPTIVE RAPTOR WELFARE ISSUES

This chapter provides a background to the concept of animal welfare. It discusses why humans care about welfare of captive raptors; aspects of well being and suffering; and how to measure welfare status for the purposes of this research. The welfare aspects relevant to captive raptor management are discussed and a checklist of welfare criteria is drawn up.

Animal Welfare

Broom (1986) defines welfare of an individual as its state as regards its attempts to cope with its environment. There are two aspects in this definition, both how much has to be exerted in order to cope and secondly, to what extent the coping attempts succeed. It can be seen that animal welfare in itself is a neutral term unless it is coupled with a positive or negative expression. Where an individual's welfare is poor, that animal is failing to cope effectively (Broom and Johnson, 1993).

Although a potentially nebulous concept, **stress** has been defined as a biological consequence of exposure to adverse environments (Selye, 1973). These adverse conditions, such as excess cold or pain etc., are referred to as 'stressors' and the processes of responding to the stressors as 'stress responses'. These stress responses are clearly intrinsically linked to the concept of coping as part of an animal's welfare.

3.1 Why Care about Welfare of Captive Animals?

Before examining further aspects of animal welfare perhaps it is worth considering *why* it is important to be concerned about welfare of captive animals, and in this case, raptors. Whilst it is desirable to assume that reason (i) outlined below is the principle reason, the other reasons may well play a part in the justification or motivation of the keeper:

(i) for the sake of the bird

As responsible custodians of captive raptors, keepers have a moral obligation to ensure that they are cared for to prevent the individual bird from suffering unnecessarily (defined subsequently, section 3.2.1). This obligation may be an acceptance of the intrinsic rights of the animal.

(ii) for the sake of the species

If a bird is kept in captivity for conservation reasons, as part of a captive breeding programme, it is important to optimise production. Birds

managed for optimal mental and physical health are more likely to propagate than those where welfare is compromised.

(iii) for the sake of the law

There are legal obligations to ensure that good welfare standards are maintained as outlined in Chapter 2.

(iv) for the sake of finance

The purchasing and management of most raptors represent a substantial financial outlay. It would seem prudent, therefore, to reduce welfare problems as a means of preventing morbidity or mortality. The former would lead to expensive veterinary bills and the latter to outlay for a new bird.

Using the same argument as outlined in (ii), if commercial breeders are to be successful in business i.e. production of good quality birds, high welfare standards must be maintained.

If the birds are displayed to the public, the discerning or concerned public may expect high standards. If these standards are poor the displayer may be prosecuted or campaigned against, leading to his or her business being disrupted or closed down.

(v) for the sake of a pastime

If a keeper flies a bird it is in his or her best interest to maintain the bird in good physical condition so as to gain the satisfaction of seeing it fly or hunt well. If one's pastime of raptor keeping does not address welfare issues, again a prosecution can deny the keeper his or her hobby, or the concerned and campaigning public will ensure that it is denied eventually, for all.

3.2 Improving Animal Welfare

Improving animal welfare has two major objectives:

◆ *to promote well-being*

'Well-being' can be defined as a condition within an animal; a state of harmony between the animal and its environment. It is a positive concept with components of psychological and physiological health.

◆ *to prevent or reduce suffering*

3.2.1 Suffering

For the purposes of this research, suffering has been given the broad working definition of a wide range of unpleasant emotional and physical states, that is a slight expansion of that given by Dawkins (1980). These states include, amongst others:

- ◆ *fear*
- ◆ *frustration*
- ◆ *pain*

◆ Fear

This is part of an emotional reaction to an adverse stimulus which will lead to the animal's attempting to stop, escape from or avoid the stimulus (Duncan and Mench, 1993). Classic behaviours of fight, flight or freezing may be exhibited. Clearly, these are important adaptive mechanisms for dealing with perceived danger and there is a spectrum of responses to a stimulus (from slight alerting and avoiding to outright panic and hysteria, which could be defined as inappropriate and excessive fight-flight responses). It is important, yet difficult, to determine at what level fear can be considered detrimental to animal welfare. It should be pointed out, however, that for birds destined for release to the wild, either following rehabilitation or as part of captive breeding and release schemes, it is essential that they retain appropriate fear responses.

For this report an animal will be considered to be suffering if it is considered to be experiencing unnecessary:

- ◆ *acute intense fear* (high level fear for under one hour)
- ◆ *chronic intense fear* (protracted high level fear i.e. over one hour)
- ◆ *chronic lower grade fear* (protracted low level of fear i.e. over one hour)

Apart from its intrinsic effect of reducing welfare status, fear has also secondary effects e.g. injury following a flight response within the confines of an aviary; chronic situations may lead to sub-optimal functioning of the immune system leading to disease (Broom and Johnson, 1993; Cromie *et al*, 1991; Gross *et al*, 1989).

◆ Frustration

Frustration has been defined as the state of an animal placed in an objectively defined frustrating situation i.e. one in which it is prevented from obtaining a physical goal by the performance of responses which previously led to the

attainment of that goal (Duncan and Mench, 1993). However, this implies it must have done something before to miss it now, as described previously in domestic fowls (Koene, 1993). It is possible that some activities may be intrinsic or inherent i.e. an animal may be genetically programmed to carry out an activity and to prevent it from doing so may lead to suffering. For example, a raptor having never been offered a bath may still feel frustrated and 'long' to bathe, both for the physical benefit to plumage but also for the mental benefit of performing the potentially 'pleasurable'¹ action. In some circumstances in the wild, frustration may be a perfectly natural part of life history e.g. sexual deprivation via separation may enhance breeding success in some species, a scenario exploited in some captive breeding programmes.

If frustration is mild or of short duration displacement activities may ensue e.g. preening. Alternatively, if the frustration is chronic then it may lead to other behavioural changes such as increased aggression (e.g. birds attacking owners); or stereotypic behaviour as has been described in poultry (Duncan and Wood-Gush, 1971; 1972). As before, the spectrum of the responses means that an attempt must be made to judge at what level of frustration an animal is suffering.

For this report an animal will be considered to be suffering if it is assessed to be experiencing:

- ◆ *acute intense frustration* (high level frustration for under one hour)
- ◆ *chronic intense frustration* (protracted high level frustration i.e. over one hour)
- ◆ *chronic lower grade frustration* (protracted low level of frustration i.e. over one hour)

◆ Pain

Pain may be defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Duncan and Mench, 1993). As humans, we would consider this is probably the most obvious and direct cause of suffering. It is considered that the ability of birds to experience pain, is similar to that of mammals, with which we are all familiar (Bateson, 1992), although there may be differences in terms of threshold and types of painful stimuli. Pain is often the result of injury (which may result from fear or frustration). However, it may be caused as a secondary effect of a management situation which has resulted in painful disease. As an example of this, poor perch design may ultimately lead to bumblefoot which, as classic inflammation, is considered to be painful (Cooper, pers. comm.).

Whilst realising the important evolutionary benefits of the noxious experience of

¹ *Pleasure: a sensation of contentment or enjoyment caused by an emotional or physical experience*

pain (Broom and Johnson, 1993), it would be considered generally that a management system resulting in pain is unacceptable.

For this report an animal will be considered to be suffering if it is assessed to be experiencing:

- ◆ *acute intense pain* (high level pain for under one hour)
- ◆ *chronic intense pain* (protracted high level pain i.e. over one hour)
- ◆ *chronic lower grade pain* (protracted low level of pain i.e. over one hour)

◆ Other States

It is difficult to determine which other states raptors may experience. The extent to which they suffer from *boredom* i.e. adverse effects from too few stimuli, is unknown but it is speculated by Forbes (1994) that this is the reason for Harris Hawks *Parabuteo unicinctus* plucking out their own feathers. The state of boredom is well documented in higher vertebrates in domestic, laboratory and zoo situations (e.g. Bostock, 1993; Broom and Johnson, 1993). Advances are being made in all of these situations and environmental enrichment has attempted to stimulate a range of different activities and behaviours in captive animals.

Perhaps raptors suffer from *loneliness* (particularly the gregarious species), or more likely the opposite of loneliness; *grief* (perhaps following the loss of a mate); or *other emotions* not experienced by humans.

3.3 Understanding an Animal and its Needs

It is contentious to assume that an animal in the wild is in its optimal state of welfare e.g. a prey species may spend an inordinate amount of time in fear for its life. However, that the animal has successfully reached this stage in its evolution by eating what it eats, living where it lives, behaving as it behaves, can be considered to be a relatively successful strategy for the species and probably the individual.

If we are to keep an animal in captivity then we are obliged (for any of the reasons mentioned previously) to understand its needs and to fulfil these if the animal is not to suffer. Therefore, before any animal is taken, or bred into, captivity it is essential to understand its ecology in the wild i.e. the niche it has evolved to fill, its habitat, its diet, its social group, its behaviour etc. In this way we can begin to understand an animal's needs.

Perhaps the greatest failing in domestic, laboratory and zoo animal management

has been the assumption that once physiological needs have been attended to then welfare has been addressed. It is recognized increasingly that management systems should encourage a natural repertoire of behavioural patterns. In poultry these sorts of behavioural patterns have been referred to as "luxury" behaviour patterns (e.g. play i.e. sparring and frolicking; and exploratory behaviour). Research has shown that these patterns are only displayed when animals are not suffering and their physiological needs are met. The authors would suggest that, for example, the response of flying for a raptor evolved to fly when confronted with an aversive stimulus, is probably not so much a luxury as a basic need.

Creating a captive environment where a full repertoire of behaviours is to be encouraged need not necessarily involve, for example, reconstructing an Amazonian rainforest for a Harpy Eagle *Harpia harpya*. Instead, the captive environment can functionally replace aspects of the native environment and conditions in which the species has evolved, to encourage eliciting of some basic or complex behaviours.

◆ Social behaviour

If a wild animal is solitary by nature it is an evolutionary strategy and behaviourally the animal will endeavour to remain solitary usually by avoidance rather than outright aggression. To put a naturally solitary wild animal into a captive unnatural social group may be inherently stressful i.e. a combination of fear, frustration and the opposite of loneliness. Likewise, for those animals which have evolved a social life history, i.e. have relied on being hidden in a group or where many pairs of eyes are at any one time looking out for danger or some resource, living singly may be inherently stressful e.g. a combination of fear, frustration and loneliness.

In most wild situations raptors live singly or in pairs whilst their prey species may find safety in numbers. One notable exception, commonly kept in captivity, is the Harris Hawk which not only lives in family groups but birds depend on each other to cooperate in hunting. Perhaps in captivity these birds should be kept in their family groups or at least in visual contact with others of the same species. However, their skill as falconry birds means that they are kept to a great extent in captivity where falconers and their dogs may functionally take on the same role as members of their genetic family.

Differences between Species

This research deals with a number of diverse species. It is important to realise the different characteristics of different species and ensure appropriate management for each species.

Differences between Individuals

Beyond differences between species, all animals have individual characteristics and demeanours (which may be a product of both nature and nurture) and a management system should be devised to suit this individualism. A good keeper will develop a knowledge and understanding of a bird. However, this system relies on the keeper making subjective assessments of an individual's welfare and it should not be used as an excuse to maintain animals in inappropriate conditions.

Individuals respond differently to different situations and vary in their susceptibility to disease and their response to stressors.

3.4 The Quandary of which Welfare Category should take Precedence

It is almost impossible to address all of the aforementioned welfare categories to their greatest degree. To remove all fear, pain and frustration does not recreate what the animal would experience in the wild. Moreover, fear, pain and frustration are all important parts of life and serve to cushion an individual from permanent damage. There are those who would point out that to avoid them one should not be born at all (Fox, 1995a; Appendix 5.3). Nature is brutal with most species being inherently programmed to produce more than available resources will sustain; therefore, it can be seen that suffering is a natural process (Howard, 1989).

There are inevitable compromises to be made, for example, managing for low risk of a painful infectious disease by creating a scrupulous and near sterile environment may lead to frustration or boredom in a bird. How do we make decisions about the weighting of these factors when making compromises? In the absence of the animals telling us which they would prefer, it is up to the keeper to make the decisions or to provide choices. For this research the authors will attempt to make reasoned balances.

3.5 How do we Measure and assess Suffering or Welfare?

It is imperative to understand an animal's needs and then to determine whether these are being attended to. Beyond this, other biological parameters can be used to measure welfare status.

◆ **Physiological measurements**

Physiological needs can be assessed by understanding something about an animal's biology and the physical health of the individual may be an indicator of physiological welfare. Physical health can be measured by various clinical procedures to determine parameters such as body condition index e.g.

weight/wing length (Owen and Cook, 1977), disease status, organ or system (e.g. immune) function tests etc. such as the thorough health screening protocol of Cooper (1989). Physiological measurements such as assessment of respiratory or heart rate (Patton *et al*, 1985), or endocrinal parameters (Broom and Johnson, 1993; Freeman and Flack, 1980) provide an indication of stress levels.

Psychological health is not assessed by these methods although this aspect probably impinges on physiological health.

◆ **Reproduction**

Although reproduction *may* be a general guide to physical health it is an inadequate measure of psychological, and therefore overall, welfare. Indeed, lending weight to the Selfish Gene Hypothesis (Dawkins, 1976) animals with low body condition can still reproduce following a reassignment of body resources to reproductive effort at the expense of the mother's body maintenance.

◆ **Behaviour**

If animal welfare is intimately connected with how animals feel then it seems likely that an animals' behaviour will be the best 'window' on its feelings. Such observations and conclusions are consolidated if they are backed up with psychological tests i.e. ideally asking the individual how it feels about certain environments (an unsuccessful strategy with raptors). In the absence of consolidatory evidence, behaviour can provide only general conclusions about welfare status (Patton *et al*, 1985).

This said, it may be possible to assess the level of stress in birds living together in captivity by measuring behavioural synchrony (feeding, preening together etc.), allopreening, inter-bird distances or the frequency and intensity of aggressive behaviours.

Aggressive interactions between birds in captivity is exemplified in poultry which indulge in feather pecking and cannibalism, two activities which are directly related to housing conditions and stocking densities (e.g. Duncan and Mench, 1993). As raptors are well equipped with talons and beak, the consequences of living together in captivity can be very serious.

For birds living singly, flight or attempted flight e.g. bating, away from an aversive stimulus may be used as a crude measure of the welfare of the bird.

A research project investigating non-invasive techniques for measuring indicators of pain in wild injured raptors has just begun at Colorado State University, USA (Morris Animal Foundation, 1995). Results are awaited.

Broom and Johnson (1993) summarise measures of welfare as follows:

3.5.1 Measures of Poor Welfare

- ◆ reduced life expectancy
- ◆ reduced ability to grow or breed
- ◆ body damage
- ◆ disease
- ◆ immunosuppression
- ◆ physiological attempts to cope
- ◆ behavioural attempts to cope
- ◆ behavioural pathology
- ◆ self narcotization
- ◆ extent of behavioural aversion shown
- ◆ extent of suppression of normal behaviour
- ◆ extent to which normal physiological processes and anatomical development are prevented

3.5.2 Measures of Good Welfare

- ◆ variety of normal behaviours shown
- ◆ extent to which strongly preferred behaviours can be shown
- ◆ physiological indicators of pleasure
- ◆ behavioural indicators of pleasure

Ideally for this research, all of these measures would have been used. However, current understanding of raptor behavioural indicators of welfare are rudimentary and it is impossible, and unethical for the sake of this research, to carry out some of the physiological measurements. Moreover, many of the data for this report have been collected unobtrusively, or when observing a bird for a relatively short period of time, therefore excluding the possibility of assessing some of these indicators. For these reasons assessments have been made by assessing to what extent the keeper has catered to our present understanding of what constitutes a raptor's needs, both in terms of physiology and psychology. Where possible, behavioural indicators have been used, as have measures of life expectancy, disease or disease risk.

A checklist of welfare parameters is given below following a discussion of aspects of captive raptor management.

3.6 **A GENERAL ACCOUNT OF CAPTIVE RAPTOR MANAGEMENT**

This account provides an outline of those husbandry and management techniques specific to captive raptors. In essence raptors are kept either:

- ◆ loose in an aviary
- ◆ trained to fly free, a practice which requires a bird to be put through a training process, throughout and following which it may be tethered to a perch.

The categories are not discrete and individual birds may be managed by either method or a combination of the two throughout its life. This account gives a brief overview of the two forms of management. It should be noted that some of the issues discussed may be specific to the birds kept by either falconers or keepers who fly their birds for recreational or commercial purposes.

This account has been written following a review of the available literature (e.g. Parry-Jones, 1993; 1994; Ford, 1992; Durman-Walters, 1994a), a review of the BFSS "Code of Welfare and Husbandry of Birds of Prey and Owls", 28 years' worth of falconry experience of the second author, visiting a number of local public collections of raptors, interviews with key individuals and spending time at The National Birds of Prey Centre, Newent, Gloucestershire. Whilst at the latter establishment, the first author was able to discover by first hand practical experience and by numerous extensive discussions with avicultural staff, general welfare issues relating to management of raptors in captivity. Welfare criteria have been identified and a checklist has been drawn up. The surveys subsequently carried out for this research are based on these aspects of management itemised in the checklist.

3.7 **1. Aviary Design**

There are numerous variations on a theme as to how to construct an aviary (e.g. Hurrell, 1968; Parry-Jones, 1993; Ford, 1992), however, the most vital features include the following which make up a checklist.

3.7.1 **A Checklist of Welfare Criteria for Birds Maintained in Aviaries**

Shelter - Perhaps the most fundamental design feature should be the provision of shelter from the elements i.e. wind, rain and sun. Exposure to wind and rain may produce direct health effects in the form of chilling or they may have indirect effects by increasing susceptibility to disease. Shelter from sunlight is required to prevent heat stress. Such shelter is most commonly provided by the use of three (or four) solid walls with a half covered roof. The front of the aviary is commonly constructed of mesh which extends over half of the roof.

Access to sunlight - The exact role of ultraviolet radiation in avian physiology is unknown and its role in vitamin D metabolism is undetermined (Cooper, 1991). However, Houston (1980) suggests a role in feather shape maintenance. As ultraviolet radiation has bactericidal actions it may play a role in maintenance of plumage condition. Observations by one of the researchers during this research recorded a number of birds basking by outstretching the wings, seen most commonly in eagles and vultures, or owls turning their facial disc to the sun. Other than physical benefits it may be psychologically beneficial and even pleasurable.

As the benefits of access to the sun are arguable, there are those who feel that the welfare benefits of a solid roof covering the whole of the top of the aviary outweigh the resultant reduction in available sunlight (Parry-Jones, pers. comm.). The benefits being identified as total protection from the elements and a reduction in the risk of wild birds passing on infections via their droppings through the roof of a mesh-topped aviary. Advocators of a solid roof on an aviary point out that a bird can sit at the front of the aviary when the sun is shining in that direction if it so wants. However, in a public collection of raptors the front of an aviary is also closer to the public and may be less appealing to a bird. Skylights in solid roofs of the aviaries may act as a compromise, although penetration of ultra violet radiation may be reduced.

Wherever the sunlight in the aviary, the appropriate positioning of perches within this lit area is crucial.

Direct sunlight within an aviary may have additional benefits via the bactericidal properties of UV radiation reducing bacterial viability and hence disease risk (Cromie *et al*, 1991).

Size - Aviaries must be of sufficient size to allow a bird room for flight or other exercise. It has been argued that an aviary should not be so big as to allow a bird to build up sufficient speed as to injure itself should it fly into the aviary wall or mesh front. The temperament of the individual bird must be borne in mind when constructing an aviary.

Condition - Aviaries should be constructed so that they are free of potential dangers e.g. sharp wires, holes in the walls of the aviary allowing draughts or possible escape etc.

Hygiene - As with keeping any animal in a confined area it is essential to ensure high standards of hygiene to reduce risk of infection. Additionally, rotting food left in an aviary may attract rats or other predators.

Security from ground predators - An aviary should be constructed so as to be secure from ground predators such as rats, cats and foxes.

Perches - Captive raptors are susceptible to foot problems such as bumblefoot (Cooper, 1991). Such conditions are usually the result of some form of trauma to the planar aspect of the foot which may be followed by entry of pathogenic organisms which establish chronic and sometime systemic infections. The original trauma may be caused by what is essentially a pressure sore on the foot of the bird as a result of poor perch design. Prevention is better than cure as such conditions are notoriously difficult to treat due to the chronic granuloma which may develop being effectively isolated from host immune responses (Remple, 1993). A variety of perches of an appropriate size and of good hygiene, reduce the risk of such conditions. A special covering on the perches to diffuse pressure over the foot may be beneficial.

Bath - Raptors should have access to water for drinking if so desired (although they drink rarely) or for bathing. Bathing may provide both physiological benefits to plumage condition and temperature regulation, and psychological benefits. The bath should be clean enough to be appealing to the bird and be of value in maintaining plumage condition. In addition, if the bird should drink from it, it should be free from risk of infectious agents. The bath should be positioned where faecal contamination is unlikely. Baths should be designed so as not to cause or exacerbate foot problems. Additionally, a bath should be designed so that the bird can climb in and out readily.

Aspergillosis risk - Captive raptors are susceptible to the fungal infection aspergillosis caused by *Aspergillus fumigatus*. The fungus grows readily on damp and rotting vegetation and its spores can result in infections which are frequently fatal in captive birds. Stressed birds are particularly susceptible to infection, the disease often manifesting itself following a stressful episode in the bird's life. For this reason it is imperative to reduce the environmental risk of infection by preventing build up of damp or rotting organic matter both within and proximal to the aviary.

Refuge - Any captive animal must be given an area in its enclosure where it feels secure and out of human view if it so wishes. Such refuge may take various forms such as a nest box, vegetation to hide in, height or depth in the aviary, and so on.

Environmental enrichment - There would appear to be little in the literature regarding environmental enrichment for raptors *per se*. However, it is felt by the authors that aviaries could be furnished with play items such as foliage or even toys such as tennis balls, to prevent boredom (Forbes, 1994). Traditionally, some falconers used to feed 'tirings' i.e. a piece of bony or feathery meat containing little food e.g. a pigeon's wing or a chicken's neck. Such food requires time to find and eat and occupies a bird until 'tired'. This tradition has probably died out to some degree due

to the use of day old cockerels as a whole food source.

Perhaps the greatest source of external stimuli for a bird is to provide an "interesting" view i.e. one with changing visual stimuli.

3.8 2. Training a Bird to Fly Free

Birds may be trained to fly free by falconers for the sport of falconry, or by keepers for recreational or commercial purposes. The process of training a bird is dependent upon the species and individualism of the animal. The intricacies are great but the general principles are the same for all.

3.8.1 ◆ Body Mass of Raptors

Before considering how a raptor is trained to fly free and return to the falconer or keeper, it is necessary to understand *why* it is motivated to fly and return. It is the body condition (a ratio of body fat: muscle) of a raptor which determines its willingness and ability to fly for food, or hunt in the case of a falconry bird (Fox, 1980). This is the same for many vertebrate predators, when the animal's weight is high (due to gut contents and/or body fat) and the animal does not feel hungry, there is little incentive to expend energy moving about unless to avoid danger, find a mate, challenge an intruder or so on. Wild raptors, having recently fed (and hence increased their weight) will sit with the food in their gut and digest their meal. They will not hunt again until their weight of gut contents and body fat has dropped, and they experience a physiological sensation of hunger.

In practical terms, body mass (weight) is a measure of body condition. Falconers, describe their birds as having three levels of weight. The first is a high weight which may describe a bird recently fed up, or one with fat reserves left from lack of exercise (as may happen when a bird is moulting and not being flown). At this weight a bird will not be interested in flying or hunting for food. When the weight drops the bird may reach an opportunist weight, where if an easy opportunity for food presents itself, a bird may fly for it. The bird will probably not work very hard to obtain food as it has no physiological need to. Once weight drops below this opportunist weight, the bird is said to be at its flying or hunting weight i.e. the bird is keen to fly or hunt and as such is said to be "keen". A fit bird is one with a high proportion of muscle, and a fit and keen bird is a bird with a high proportion of muscle and low proportion of body fat (Fox, 1980). Birds flown for flying displays for the public may be flown at either their opportunist or flying weight.

It is the knowledgeable manipulation of the *quantity* and *quality* of a bird's food intake by the falconer or keeper that results in raptors actually hunting or flying for their human associates. This understanding of what happens in wild raptors

has allowed falconers to capitalise on the hunting abilities of raptors. However, weight manipulation, which practically involves cutting down, increasing or altering the quality of the food given to the bird daily as appropriate, is a skilled activity. It involves detailed understanding of the individual bird, its rate of metabolism, daily weight measurements and an understanding of dietary requirements. There is a balance between cutting the weight down low so that the bird will fly or hunt and cutting it so low that it is unable to fly due to lack of energy (during which time it will be metabolising muscle for energy). The balance is particularly hard to determine or maintain in smaller birds or birds with high basal metabolic rates, e.g. the accipiters (Ford, 1992; Fox, 1980). In this situation a bird may be essentially yet inadvertently starved to death. It is tempting to think that a bird of prey not being flown should be fed *ad libitum* and cause its body weight to rise to a maximum. However, it seems that foot problems (Forbes, 1992; Harcourt-Brown, 1995) and other conditions such as fatty liver syndrome are related to high body weight and food intake. As Fox (1980) points out, the complexities are great and he feels that many who fly birds may have only a vague understanding of the true intricacies.

3.8.2

◆ Manning

Manning is the process of making a 'new' and untrained bird become accustomed to human company and associated paraphernalia. The process is gradual and requires skill and patience on the part of the falconer. It begins with the anklets and jesses being fitted to the bird's legs. The bird is then trained primarily to sit on the fist and subsequently feed on the fist.

The initial training sessions, traditionally take place in subdued light in an attempt to avoid an incessant state of bating when on the fist (Ford, 1992). Once the bird has accepted the fist and will stand for some minutes without bating it can be offered food. If the bird refuses food it is not provided with food at other times until it feeds on the fist. It is an indisputably stressful time for a raptor (BFSS, 1993)(Appendix 1.1). The bird is subjected to bouts of acute fear. Such stress can predispose the bird to stress related diseases such as aspergillosis (Forbes, 1992). From an animal welfare perspective this manning process may sound wholly unacceptable i.e. tying up a bird, forcing it to sit on a fist and refusing it any food other than that offered on the fist which it may be too terrified to eat. However, if a bird is to be allowed to fly free then this process is essential and on balance a bird having gone through this acute phase of fear and become properly manned will have a less frightening life than one that is not properly manned. The latter will suffer more subsequent bouts of fear and possibly pain caused by excessive bating later in life. Even birds to be maintained in aviaries may benefit from this manning period, as an example Goshawks settle more quickly in aviaries if manned first (Kimpson, pers. comm.). The skills of a 'good' falconer can be used to get through this critical time whilst subjecting the bird to minimal stress.

3.8.3 ◆ Tethering

The furniture employed to tether a bird of prey by its legs is described extensively in the literature (eg. Michell 1900, Woodford 1960, Glasier 1978, Kimsey & Hodge 1992). In brief, a pair of leather straps - jesses - are attached one to each of the legs (tarsometatarsi) of the bird. The free ends of the jesses are joined first to a metal swivel and then to a nylon, terylene or, traditionally, leather leash. The leash is either gathered in the gloved hand on which the bird is being carried or tied to a rigid perch on which the bird sits. The purposes of tethering are twofold. Firstly, and most clearly, it is a method of restraint: a bird of prey so tethered cannot escape. The second reason is control. Just as it would be difficult for a rider to control a horse without bit and rein, it would not be possible for a falconer or keeper to control a bird unless it was in some way restrained. Thus, an untrained bird would merely fly away unless tethered. A trained bird may take flight at an inopportune moment eg. to attack an unsuitable prey species, to fly at quarry being pursued by another bird, to attack another bird etc. Given then that there is reason for tethering a bird, other than on its legs there are few other suitable pieces of anatomy to attach tethers: it cannot be bitted and bridled or wear a halter like a horse, nor a collar like a dog or a ring through its nose like a bull.

3.8.3a ◆ Theory and Practice of Tethering

Weathering: Once birds are trained it is traditional practice to put them each day out into the open air and tied to a low perch in order to "weather". Thus, a falcon is tied to a wooden block which is meant to emulate a rock on which a wild falcon would by preference take perch. On the other hand, the short and broadwings are tethered to a bow perch or ring perch which approximates to a tree branch. For preference the perch is moved to a fresh spot on the weathering ground (a well mown lawn) each day so that the bird is not surrounded by its own mutes (faeces).

Modern houses tend on average not to have unlimited lawns and modern falconers or keepers tend to be away from home during the daytime. Therefore, it may be impractical to supervise weathering birds and to protect them from extremes of weather or marauding cats by moving them to a sheltered or safer spot. Modern keepers, therefore, tend to place their bird on its perch in an enclosed and part roofed weathering area, called a "weathering" (see Glasier, 1978; Parry-Jones, 1993; Kimsey and Hodge, 1992 for designs).

Night time: Again by tradition (Michell 1900, Woodford 1960) birds weathered during the day were placed indoors on a high "screen perch" i.e. a horizontal pole from which hangs a screen of heavy material such as hessian. The bird would be tethered so that it can only move the length of its jesses (not the length of its leash as on an outdoor perch) on either side of the swivel. The screen prevents it from

flying around the pole and tangling itself up and the fabric helps it to scramble back up to its perch if it bates off.

Glasier (1978) disapproves of the use of screen perches partly on the grounds that wing and tail feathers are easily broken when a bird tries to escape from its tether by bating along the length of the pole. More seriously however, this author points out that a sick bird is unlikely to regain its perch after a bate and it is likely to die if it ends up hanging upside down from the perch. Instead, he suggests that a bird is placed loose in a night quarters - a box of about a metre cubed with solid sides and a barred door - instead of the traditional screen perch.

Today's practice: In the UK, falconers and keepers seem to have taken to heart Glasier's (1978) advice concerning the unsuitability of screen-perches. No modern books recommend them and their common use seems to have died out. What *seems* to have replaced them is the use of the weathering as the bird's accommodation both during the day and night. When not being hunted or loose in breeding aviaries, birds are tethered in a weathering. Here, they are protected by some kind of fence from potential predators and have shelter from the elements. Also, if the weathering area is enclosed with some sort of mesh, then should the bird's tether fail, it cannot escape.

Advantages of tethering: Trained and well manned birds can adapt well to being tethered. When put out to weather they are in the fresh air and may have the advantage of a changing view to alleviate boredom. With *well designed* perches the bird cannot break feathers or in other ways damage itself. A bird in training is presumably supervised by its falconer or keeper, fed daily on the fist and generally tended. Its feeding and health may be easily monitored. The bond between bird and its trainer is thus reinforced and the result is a 'tame' bird attuned to the regime of falconry or other form of flying.

Therefore, the whole concept of weathering is in contrast to keeping the bird untethered in some sort of pen or aviary. If the aviary is a secluded structure then the advantages of tameness and the bird being subjected to a changing view are not met. More seriously, if the bird becomes unwell in an aviary it is not as visible as a tethered bird. If the structure is open and clad with wire mesh then the bird, if not particularly tame, could fly against or hang onto the mesh and damage itself. Indeed, cere and flight feather damage are particularly common in birds ill at ease in aviaries.

Disadvantages of tethering: These can be divided in to:

- ◆ *direct physical damage* caused by restraint
- ◆ *indirect damage* caused by the tether tangling with the bird and/or the perch
- ◆ *indirect health problems* caused by prolonged tethering in one location.
- ◆ *direct physical damage*

Harcourt-Brown (1995) notes more damage to tibio-tarsal areas in hunting birds wearing jesses and other furniture (including the DoE leg ring) than those kept in aviaries. Damage to tendons and scales can occur and tendon damage can be caused particularly by abrasion by the brass eyelet of Aylmeri type jesses. Falconers and keepers appreciate that such damage can be caused and special precautions, especially in including the eyelet of the Aylmeri jess, can be made (Kimsey and Hodge 1992).

Bating against the tether (i.e attempting to fly away but being stopped dead by the tether) aggravates these problems and in rare circumstances causes fractures. Harcourt-Brown (1995) notes that the commonest fracture in birds being flown (rather than being kept in an aviary) is to the tibio-tarsus and occurs mostly in those birds newly jessed and tied to a perch.

However, it is true to say that the majority of tethered birds do not suffer fractures or otherwise damage pelvic limbs.

Unpublished work carried out at Canterbury Christ Church College by Julia Kennett suggests that a force equivalent to approximately 5-6 x the bird's body mass comes into play when a small raptor (including owls) bates against a fixed perch. Some falconry texts (e.g. McElroy, 1977; Kimsey & Hodge, 1992) suggest the use of elasticated "bumpers" attached to leashes or making the leash from elastic material. These refinements are meant to help counteract this abrupt force.

◆ *indirect damage caused by tangling*

If a bird becomes tangled with its tether and remains undiscovered for some time it may become injured by abrasion or restricted circulation. Tangles can occur within the jess/swivel/leash arrangement. Most commonly this is caused by the button on the end of the leash jamming the swivel (Fox 1982) and subsequently causing the jesses to twist together, hobbling the bird. Merely changing the attachment of the leash to the swivel (e.g Fox, 1982; Beebe & Webster, 1985; Kimsey & Hodge, 1992) can eradicate this problem.

Falcons tethered by long jesses on a block of small cross-sectional diameter can "straddle" their perch. The bird struggling to free itself can become tangled and cause traumatic injuries. A short or broadwing can sometimes cause its leash to tangle around its bow or ring perch. Kimsey and Hodge (1992) review extensively the mechanical causes of tangles between bird, leash and perch. They suggest many simple designs and refinements to traditional perches which seem to alleviate these.

◆ *other direct problems*

Harcourt-Brown (1995) considers that a falcon restricted from flying, fed so that it is heavy relative to flying weight and kept perched on a hard wood or concrete surface invariably results in bumblefoot. This series of circumstances describes closely a bird kept tethered to a perch, fed *ad libitum* and so above its flying weight cannot be flown loose. The second author demonstrates that taking the bird up for flying, reducing its weight and changing the perch surface (to a soft irregular surface such as "Astroturf"), returns a foot with this condition to normal. However, if untreated, bumblefoot often becomes infected (e.g. with *Staphylococcus aureus*) and becomes a complicated chronic condition. Harcourt-Brown (1995) further observes "committed falconers seldom have birds with bumblefoot, perhaps due to the increased exercise of their birds when compared with the flying that some falconers think is adequate. It is also significant that many birds that have perfect feet through the hunting season are at greater risk of developing bumblefoot when moulting in an aviary".

As well as causing foot problems particularly in falcons, prolonged tethering to a perch in an enclosed weathering area, without being flown daily or 2-3 times per week must surely lead to boredom if not to other health disorders. Moreover, if birds are kept tethered to a perch in a weathering which is a permanent structure then cleanliness and hygiene must be scrupulously attended to. Block perches in particular can become soiled with faeces as does the area immediately below the perch.

3.8.3b

◆ *Alternatives to tethering*

◆ *Alternatives for restraint*

There are essentially two sorts of alternatives to restraint. One of these is to tether but to a mobile restraint which gives the bird at least some freedom. The other technique is to "free-loft" birds within a building, aviary or other enclosure.

◆ *Mobile tethering*

Apparently originating in Germany as a method of tethering Goshawks, the hawk may be tied by its leash to a ring which runs along a taught wire. This wire is parallel to and, say 0.25 or 0.5 m above the ground, and stretches between two perches fixed several metres apart. One or both of the perches may be within some sort of shelter. The advantages of the system are that the bird has the choice of one or other perch, and can get at least some exercise by flying between the two. This could be particularly desirable for active species such as accipiters and the method has been adapted for other species including eagles. Disadvantages

include the possibility of the bird becoming tangled or hooked up over one of the perches and again accipiters are particularly adept at this!

◆ *Free Lofting*

Rather than tethering when the bird is at home it is tempting to think that they can be kept loose in an aviary or some other enclosure so alleviating the problems associated with tethering. McElroy (1977) gives a design for a "mew" in which to keep a Cooper's Hawk *Accipiter cooperi* or Goshawk. This is a timber structure some 6ft. x 6ft. x 7ft. long and of solid sides back and roof with vertical timber bars to the front. Glasier (1978) suggests a similar design but with a barred window in an otherwise solid wall for light and ventilation. Kimsey & Hodge (1992) have reviewed the various designs of indoor mew and suggest variants for different species. Of particular interest is the "window porch" which is essentially a barred bow window through which a bird can gain a wider view and extra ventilation.

These designs appear to be popular in North America and do not seem to have gained favour here in the UK.

◆ *Alternatives for control*

It is difficult to see how a trained bird of prey can be controlled other than by some kind of mechanical restraint. Perhaps imprinted or perfectly trained birds may be so in tune with the wishes of their falconer or keeper that they do not need mechanical restraint. The literature contains odd anecdotal accounts of very tame birds which were not jessed (e.g. Meinertzhagen, in Mavrogordato 1960), but the practice does not currently seem practical or widespread in the UK, today.

◆ *Flying without jesses*

In North America one species, namely the Harris Hawk, seems to have been flown without jesses by at least some falconers. Thus, it seems that this species can be flown by transporting it to the flying ground unrestrained within a vehicle, allowed to fly directly from the vehicle, controlled in the field by conditioned commands and trained to home to the vehicle when hunting is finished (McElroy 1977). Other North American falconers who live within their hunting precincts also report that they may release a Harris Hawk directly from its enclosure whereupon it immediately takes to the hunting field. It must be emphasised that Harris Hawks are *no ordinary bird* and their peculiar (for a raptor) social and gregarious behaviour makes them adapt to falconry in ways which other species cannot.

◆ *Flying from transport boxes*

Imprinted and, by virtue of their subsequent aggressive behaviour, unhoodable

Cooper's Hawks and also Harris Hawks have been flown in North America directly from the transport boxes used to carry them by vehicle into the field. McElroy (1977) appreciates the analogy between hooding and thus calming a bird by placing a leather hood on its head, and placing the whole bird inside a transport box, thus rendering it in darkness. He refers to transport boxes used in this context as "modified hoods" and it is possible to transport birds in them without jesses attached to a restraint.

3.8.3c ◆ Summary of points regarding tethering

As in all branches of animal husbandry practice may not always equate to theory. Whilst a working sheepdog may be tethered to its kennel at night whilst it sleeps and for part of the day, this may be only acceptable in the knowledge that for some of the day at least it will be loose at work or as a companion for a human. What would be totally unacceptable would be a dog tied up for months on end, receiving little interaction with humans or other dogs, and perhaps laying in its own faeces. Even if such an unfortunate animal was well fed then its situation would be still regarded as cruel.

So, if a raptor is kept tethered permanently, fed by throwing its food on the ground by its perch, and hardly ever picked up by its falconer or keeper, then this too must surely be regarded as cruel. A very fortunate bird may be the sole charge of a full time falconer or keeper who has time every day to move it from its night quarters to weather for a few hours tied to its perch before being taken to fly or hunt for several hours before being returned to its perch "fed up" and content and finally put away for the night.

3.8.4 ◆ Hooding

Hooding is used to keep a bird in the dark and hence calm as once hooded the bird is effectively shielded from visual stimuli. It is traditionally used for longwings and once used to hooding a bird seems to accept it readily, often closing the nictitating membrane over the eyeball in anticipation of being hooded. However, Patton *et al* (1985) found the effect of a hood to be minimal on the level of stress suffered from an admittedly small sample size of birds. Although there are likely to be long term advantages in reducing stress in hooded birds, the process of training a bird to use one probably incurs intermediate (or high?) grade fear in the bird.

There are disadvantages and these include the possibility of choking if the bird attempts to cast a pellet whilst hooded. Although some designs of hood e.g. Anglo Indian hoods, allow casting, other e.g. Dutch pattern, do not. Falconers should be aware of whether the bird has cast or not before using a hood.

There is a serious problem if a bird flies off whilst hooded, but this is a problem of carelessness on the part of the keeper or falconer rather than a fundamental

problem of hooding *per se*. As mentioned previously, transporting birds in boxes acts as a 'modified hood'.

3.8.5 ♦ Preventing Loss of a Bird Flying Loose

There are a number of reasons why it is important not to lose a bird that is being flown free:

Welfare of the bird: a bird trained for falconry may be able to survive if a falconer loses it as it may be able to hunt and catch food. Indeed, it is more likely to survive than a bird merely trained for flying without hunting e.g. in displays. However, it is unlikely that a falconry bird is as fit as a wild bird, and without the assistance of humans and dogs or ferrets to increase its chances of hunting effectively, it may starve to death.

Conservation aspects: a lost bird constitutes a package of pathogens and genes which may or may not be indigenous to an area. As an example, avian herpes is endemic in captive and wild North American falcons yet causes losses in British captive raptors which are naive to this foreign pathogen. Its impact on wild raptors is unknown but could be serious.

Should a lost bird pair and breed with a wild counterpart, integration of these genes into the wild population is not a problem if the genes are indigenous. However, the introduction of non-native genes will cause genetic pollution to the wild population.

A lost bird may not breed, a situation likely with non-indigenous species or an imprinted bird, but may still compete with wild birds for limited resources.

To the falconer or keeper, a lost bird may mean the loss of a loved bird, or an animal in which they have invested much time and money.

Therefore, it can be seen that it is essential to take precautions to prevent a bird becoming lost when flying free. There are two main methods for increasing the chances of a falconer finding his or her bird should it disappear from sight. Out of sight may not mean out of aural range. Traditionally, small dual pitched bells were attached to the leg of the bird. This system is still practised extensively today with leg or tail mounted resonant bells being used. The bells can be heard over some distance whenever the bird moves so leading the falconer or keeper to the bird.

Radiotelemetry i.e. radio tracking equipment, has improved the chances of a bird being found. Tail, leg, neck or back mounted transmitters may be attached to the bird (although neck mounted telemetry has been the cause of garotting, Durman-Walters, 1994a). The range of the transmitter is dependent on the surrounding

terrain and obstructions but can be several kilometres. The use of telemetry has been criticised by those who suggest that it lulls the falconer into a false sense of security in their technology. In these situations birds not ready to be flown free may be risked or birds may be flown at what would otherwise be considered inappropriate times. In addition, the equipment may fail due to failure of a component or operator error. On the other hand, birds can be flown in much higher body condition than previously as loss of a bird is less likely. This has led to a reduction in the incidence of hypoglycaemic 'low sugar fits' which result from a bird (usually of the smaller species) being flown in low condition using up available energy when, for example, flown in cold weather.

3.8.6 A Checklist of Welfare Criteria for Tethered Birds or those Flown Free

From the above discussion the following specific aspects have been compiled into a checklist by which to measure welfare of birds tethered or flown free, whether for private or commercial purposes. The list is by no means definitive but provides some means to quantify welfare standards.

3.8.6a ♦ Tethered birds on weathering grounds

For each bird tethered the following criteria were assessed:

Species and its behaviour - (e.g. bating) to assess its suitability to tethering

Frequency of being flown - a tethered bird should be flown daily

Condition of bird - plumage, legs, feet, beak as an indication of physiological and psychological health

Hygiene of perch or block - good hygiene is essential to reduce the risk of foot problems such as bumblefoot

Perch or block covering - i.e. whether or not the perch has an appropriate artificial covering on it to reduce the risk of foot problems

Distance between birds - birds should not be tethered within reach of one another, whether sharing a weathering or tethered in the open, as they may attack

Shelter - from sun, wind and rain to prevent chilling or heat stress

Protection from predators - e.g. other raptors flying free, mobbing birds, cats, foxes, humans etc.

Amount of furniture on legs - excessive amounts may cause abrasions etc. on metatarsus and feet.

Design and condition of furniture - poorly designed furniture may cause leg problems and poor quality or worn out furniture may break leading to the bird escaping

Positioning of furniture - bells, rings etc. should be positioned *above* the anklets to ensure that they are not capable of cutting into the foot

Feeding one bird in view of other birds - this is considered to be stressful for viewing birds particularly if they are physiologically hungry (Patton *et al*, 1985).

3.8.6b ♦ Flying Free

Species of bird - suitability of bird to flying for falconry/displays etc.

Wearing of field or flying jesses - (without slits in the leather) rather than mews jesses to reduce the risk of the bird becoming tangled in e.g. vegetation. A bird tangled up and hanging upside down, out of reach of the handler, may die relatively quickly

Wearing of bells and/or telemetry - to increase the chances of a bird being found should it escape or become lost. A bird trained to fly to a lure or the fist for feeding may not be able to hunt if it escapes and may starve

Area for flying - e.g. flying arena size, ensuring the birds have sufficient space to fly in, falconry birds should not be flown proximal to roads etc.

Potential hazards to flying birds - e.g. wire fences, overhead wires, distractions etc. Birds flying at speed may collide with such obstacles particularly if they are visually focusing on the keeper/lure or prey at the time. Additionally, even if an obstacle is seen by the bird, the bird may not be experienced, fit or adept enough to avoid it

Two individuals of incompatible species loose simultaneously - i.e. in a situation where birds may attack one another.

3.9 **OTHER GENERAL ISSUES RELEVANT TO BOTH AVIARY MAINTAINED BIRDS AND THOSE FLOWN FREE**

3.9.1 **1. Transporting Raptors**

It is almost certain that a raptor will be transported by vehicle at some point in its life.

Few falconers live within walking distance of their hunting ground. It is more likely that they must transport themselves and their bird in a vehicle. Even those close to their usual hunting ground will probably transport their birds at some time or other. Journey times may be considerable e.g. travelling from the south of England to enjoy grouse hawking in Scotland. Birds forming part of a display team for public events may spend the summer travelling extensively from display to display.

Different falconers and keepers have different views on ideal ways to transport birds, however, most would agree on the following:

- ◆ *Longwings*: it would seem behaviourally that falcons travelled hooded, tethered on a box cage (solid walled cage against which birds can brace their tails) fixed in a car are not distressed.
- ◆ *Short and Broadwings*: it is now possible to buy bow perches designed to fix to a car seat. However, it would seem that a suitable box with a perch or flooring such as carpet is preferable as the bird is kept in the dark and not in a position to be afraid of the speed of passing objects. Ventilation holes should be positioned along the bottom of the box as birds may bate upward if they are above the bird. See previous Flying from transport boxes section 3.8.3b, also.

For all birds being transported the provision of shelter from extremes of temperature, freedom from exhaust fumes and access to good ventilation are essential.

3.9.2 **2. Diet**

A thorough understanding of dietary requirements of a captive animal is surely one of the most fundamental aspect of animal husbandry. Raptors are carnivorous and in the wild would achieve dietary balance from catching or scavenging different food sources and/or eating whole prey i.e. meat, bones and fur or feathers. Some species have evolved specialist invertebrate diets. As Cooper (1991) points out, there has been relatively little research carried out on captive raptor dietary requirements. However, dietary deficiencies and imbalances have been more widely documented (e.g. Cooper, 1991; Forbes, 1992). Feeding wild caught prey would seem the ideal way to mimic a natural diet. However, the incidence of infectious organisms in wild populations means that a keeper must

be cautious or understand ways in which to reduce the viability of such organisms e.g. protracted freezing of wild caught pigeons incapacitates *Trichomonas spp.* responsible for trichomoniasis or 'frounce' (Cooper, 1991).

To promote health and prevent health problems in captivity, birds must be fed an appropriate quantity of food which comprises an appropriate balance of nutrients. There is no single food source commonly used which constitutes a complete diet. A balanced diet may include day old cockerels, quail, beef and rats together with vitamin and mineral supplements where appropriate. Bird and Ho (1976) found whole day old cockerels to be deficient in manganese and hence the use of these as a sole food source is contraindicated. This mineral deficiency has been found to be responsible for perosis in young female Peregrines *Falco peregrinus* (Sykes, 1982). Deficiencies of calcium and/or vitamin D3 can cause osteodystrophy and/or the laying of thin shelled or shell-less eggs (Bird and Brown, 1991). Vitamin and mineral supplements are commercially available.

As part of the diet birds require roughage in the form of fur or feathers which permit the formation of pellets or castings. These contain the indigestible parts of a meal and are regurgitated several hours after feeding.

Dietary composition is particularly important during development of young birds when they are susceptible to bone deformations during this rapid growth phase. An inappropriate balance of calcium to phosphorous is a common cause of osteodystrophy.

3.10

CONCLUSION

Raptors are managed in captivity both within aviaries and beyond the aviary. The techniques are varied and complex. The welfare criteria checklists for both aviary, tethered and flying birds are used throughout the research, with appropriate adaptations depending on the context of the captive bird. A checklist of conservation criteria is given in Chapter 4, section 4.2.2.

CHAPTER 4

**THE WELFARE AND CONSERVATION
ASPECTS OF EXHIBITING RAPTORS TO
THE PUBLIC: IN ZOOLOGICAL
COLLECTIONS AND TRAVELLING
FLYING DISPLAYS**



Plate 4.1: Flying demonstrations can bring something of the true nature of birds of prey to the public. Raptors, like this Bengal Eagle Owl *Bubo bubo bengalensis*, can be displayed beyond the aviary.

4

CHAPTER 4: THE WELFARE AND CONSERVATION ASPECTS OF EXHIBITING RAPTORS TO THE PUBLIC: IN ZOOLOGICAL COLLECTIONS AND TRAVELLING FLYING DISPLAYS

Raptors are used in exhibitions to the public for commercial purposes in two discrete situations i.e.

- ◆ *Zoological collections* where a member of the public pays specifically to see raptors and/or other animals in a captive situation.
- ◆ *Country shows, game fairs, public events, etc.* where a travelling bird of prey display team exhibits birds in a static and flying display to the public. Such events may be peripheral to the rest of the event and thus may form incidental entertainment for the public.

This chapter deals with these situations separately although many of the issues are relevant to both. The latter section is reviewed secondly (section 4.7).

4.1

1. ZOOLOGICAL COLLECTIONS

INTRODUCTION

Definition Zoo (zoological garden): "a public garden or park with a collection of animals for exhibition and study" (Concise Oxford Dictionary)

Other than the United States, Britain has more public zoos than any other country in the world. Some 17 million visitors visit Britain's zoos annually (Bristow, 1994). Of the traditional zoos with their exhibitions of myriad species, many have small numbers of raptors as part of larger bird collections. However, there are now also a large number of centres specialising in this particular taxon: the so called "falconry centres".

Animal Welfare in Zoos

Animal welfare in zoos has been the subject of much debate and concern (e.g. Bostock, 1993; Jamieson, 1985; Kiley-Worthington, 1990; McKenna, 1987; UFAW, 1988). With the realisation of the importance of psychological, as well as physiological health, the science of environmental enrichment has evolved. Most of this research has concentrated mainly on those species which behaviourally display any mental disturbance most readily e.g. felids, primates, elephants and bears (e.g. Ames, 1993).

As previously discussed in Chapter 3, section 3.1, humans may care about the

welfare of their zoo animals for a number of reasons. With so much vocal and organised criticism of zoos e.g. "The Zoo Inquiry" (1994) produced by the World Society for the Protection of Animals (WSPA) and The Born Free Foundation (BFF) one would assume, *if* their facts are correct (Ames, 1995), that there is a bleak future for those zoos not attending to the welfare concerns of their charges. Indeed, market research carried out at some of Britain's major zoos (summarized by Ament, 1994) has shown that the main concern of the visiting public at zoos is the issue of captivity and how this affects the welfare of the animals. This was reiterated by The Zoo Inquiry which indicated that 80% of those questioned about zoos were concerned about the welfare of the animals. As visitor numbers are the crucial economic factor for most zoos, the message is clear.

Conservation in Zoos

The role of captivity in the conservation of species has been accepted widely as being important for three reasons i.e. captive breeding, research and education.

The theory of captive breeding is essentially to "keep as many species as possible alive as long as is necessary (which could well mean several centuries) in a state in which they are capable of returning to the wild" (Tudge, 1992) i.e. zoos act as an ark. The problems are obvious: the logistics of housing, maintaining and breeding the multitudinous species held on the planet, genetic management, retention of appropriate behavioural characteristics, and so on.

Beyond captive breeding and research, captive animals can provide a resource with a great potential for effective conservation. That potential is through education, raising awareness of the issues and offering alternatives values or resources. Conservation education should make provision for enabling the impotent public to help.

The three main threats and causes of raptor population declines are habitat loss, the effects of toxic chemicals and persecution: all human mediated (Newton, 1990). Perhaps if humans are the cause of these problems, the solution would be to encourage reviewal and amendment of lifestyles, and empower people to help alleviate and reverse the situation.

The majority of the general public are not active conservationists. It is this majority i.e. the "casual visitors" who make up the majority of the 17 million people visiting British zoos annually. How are *they* to be interested and affected? Whilst many of us may see and appreciate wild animals, the majority of contacts between non-domesticated animals and people is in the captive situation at a zoo. If a zoo purports to be actively involved in conservation then the educational opportunity of this captive situation *should* be exploited.

One of the short-comings of exhibiting any captive wild animals in a zoo is that

it is difficult to exhibit the animals in a way that conveys their natural behaviour. However, in the case of raptors, birds can be displayed beyond the aviary. They can be trained to fly to the fist or lure and in doing so, provide an opportunity for the public to experience *something* of the true nature of raptors. Firstly, as raptors are highly enigmatic creatures, such a display potentially could be wholly captivating, and secondly, a formal display "captures" the usually roving zoo audience into a structured situation where conservation education messages can be passed on readily via a commentary.

This section of the chapter relating to zoological collections assesses the extent to which public collections address the welfare concerns of their captive raptors and to what extent they are involved in conservation.

4.2

METHODS

Zoological Collections

Zoological collections of raptors open to the public were identified from the bird keeping press, The Good Zoo Guide (Ironmonger, 1992)(which is in effect merely a catalogue of the larger zoos), the Zoo Federation Membership list, information from regional Tourist Boards and word of mouth from informed individuals. In this way, a database was built up of the majority of centres where raptors are kept and shown to the general public. This database is listed in Appendix 4.1. The list is not definitive, and undoubtedly misses more of the smaller or newer collections than older more established collections.

For the purposes of this study the centres open to the public were divided and classified into *specific categories*:

- ◆ **Raptor centre:** centre exhibiting diurnal and usually nocturnal raptors in aviaries and/or on weathering grounds. Flying displays are usually given.
- ◆ **Owl centre:** as above, but specialising in nocturnal raptors only.
- ◆ **Falconry school:** centre primarily for training would-be falconers, but open to the public and birds on the weathering grounds on static display. The public can view the birds in training.
- ◆ **Rehabilitation centre:** centre primarily for rehabilitation but open to the public with non-rehabilitating birds exhibited in aviaries and/or on the weathering grounds (the majority of rehabilitation centres are not open to the public).
- ◆ **Animal garden:** small menagerie of various species including raptors.
- ◆ **Bird park:** collection of birds including raptors.
- ◆ **Country park:** usually a stately home with extensive grounds in which raptors are displayed.
- ◆ **Theme park:** centre primarily for entertainment from rides or amusements with raptors exhibited in aviaries and/or in flying displays.

- ◆ **Zoo:** traditional larger collection of various species.

To generalise, the centres were grouped into three *general categories*:

- ◆ **Specialist raptor centre** i.e. typical raptor centres, owl centres, falconry schools and raptor rehabilitation centres open to the public.
- ◆ **"Zoo" with raptor flying display** and usually raptors exhibited in aviaries i.e. some traditional zoos, some animal gardens, country parks, some theme parks.
- ◆ **"Zoo" without raptor flying display** and just raptors exhibited in aviaries i.e. some traditional zoos, bird parks, some animal gardens, some theme parks.

A number of centres were visited as an aid to developing the methodology. Following this, 38 (out of 95: see Results section, section 4.3) randomly selected centres from these groups were visited and qualitative and quantitative data were collected. Table 4.1 shows the numbers of centres assessed, broken down by general and specific category, and Zoo Federation membership. The visit of the researcher carrying out the survey of public collections was as though a fee paying member of the public and therefore, unannounced. Data were collected discretely using a dictaphone, the researcher seeing what a discerning member of the public would see. A number of other centres were visited but equipment failure prevented thorough data being gathered. From these centres a number of incidents were recorded but exact quantitative data are missing. All centres were visited in the same season i.e. summer 1994, to avoid seasonal bias in the results.

On a number of occasions the researcher gathered the data from the centre and then spoke to the manager or staff of the centre about specific points or the research in general. In this way other not apparent information was collected or constructive ideas were discussed. Frequently other centres and concerns were identified from these discussions.

4.2.1 *I. ASSESSING WELFARE CRITERIA*

4.2.1a **A Checklist of Welfare Criteria: "Aviary Birds" and "Display Birds"**

As the animal welfare implications of birds maintained in aviaries are, to some extent, different from those which are tethered and flown free, the two groups were assessed independently and have been classified as "aviary birds" and "flying birds" respectively in the following sections.

Table 4.1: Centres assessed qualitatively and quantitatively

General Category	No. of centres assessed	Percent
specialist raptor centre	20	52.6
zoo with display	9	23.7
zoo without display	9	23.7
Total	38	100.0
Specific Category	No. of centres assessed	Percent
animal garden	3	7.9
country park	2	5.3
falconry school	1	2.6
owl centre	2	5.3
rehabilitation centre	1	2.6
raptor centre	16	42.1
theme park	2	5.3
zoo	11	28.9
Total	38	100.0
Zoo Federation	No. of centres assessed	Percent
Non-member	24	63.2
Member	14	36.8
Total	38	100.0

The welfare criteria from the checklist drawn up in the previous chapter were assessed:

Criteria were scored 0-6 where appropriate, where

0 = atrocious (*introduced as a result of occasional data ranking below the original definition of "very poor" which was scored as 1*)
6 = excellent

Rather than detailing the exact scoring for each welfare criterion, the extremes and mid-points of two are given here as an example:

Shelter from wind in an aviary

0 = no shelter whatsoever, not even from the presence of a few bushes in an aviary
3 = e.g. an area within an aviary which would keep out the usual prevailing wind direction yet would be exposed if the wind were from another direction
6 = an area within the aviary which is out of the wind without obvious cracks in an aviary wall through which drafts could penetrate

Hygiene of perch (whether bird is tethered or in an aviary)

0 = 100% of the perch is covered with a thick layer of faeces
3 = a small amount of accumulation of faeces or food e.g. perhaps one or two days' worth
6 = perch appears clean with no significant amount of faeces (other than that day's) or old food

1. Aviary Birds

At each aviary the following data were gathered:

(a) For each bird within an aviary the following were scored:

- ◆ *condition of the bird* (mere visual assessment)
- ◆ *behaviour* - behaviour such as persistent attempted escape, or stereotypic behaviour were noted.

(b) For each aviary the following were scored:

- ◆ *size*
- ◆ *condition*
- ◆ *hygiene*
- ◆ *security from ground or ariel predators*

- ◆ *shelter from wind and rain*
- ◆ *shelter from sun*
- ◆ *access to sun*
- ◆ *number of perches*
- ◆ *perch design*
- ◆ *perch covering*
- ◆ *perch hygiene*
- ◆ *presence of bath*
- ◆ *hygiene of bath*
- ◆ *design of bath*
- ◆ *aspergillosis risk*
- ◆ *environmental enrichment*
- ◆ *view from the aviary*

2. Display Birds

Welfare criteria for display birds were established in two situations:

- A. tethered on their weathering grounds
- B. flying loose.

A. Tethered Birds on Weathering Grounds

For each bird tethered the following criteria were assessed:

- ◆ *species - suitability to tethering in public*
- ◆ *behaviour e.g. bating*
- ◆ *whether the bird was actually flown or not*
- ◆ *condition of bird*
- ◆ *perch or block design*
- ◆ *hygiene of perch or block*
- ◆ *perch or block covering*
- ◆ *distance between birds*
- ◆ *shelter*
- ◆ *protection from aerial attack - by those birds flying free*
- ◆ *distance from the public*
- ◆ *protection from the public*
- ◆ *feeding in view of other birds*
- ◆ *amount of furniture on legs*
- ◆ *design and condition of furniture*
- ◆ *positioning of furniture on the leg*

Quantification of the last three criteria was found to be practically difficult so was abandoned subsequently.

B. Birds Flying in Displays

For each bird flown the following data were gathered:

- ◆ *species or individuality of bird* - suitability of flying in displays i.e. appropriate temperament
- ◆ *wearing of field or flying jesses*
- ◆ *wearing of bells and/or telemetry*
- ◆ *flying arena size*
- ◆ *potential hazards*
- ◆ *birds loose in view of one another*

The accompanying commentary was scrutinised to assess the inclusion of matters such as:

- ◆ *stressing birds of prey are not pets* - if they are seen as pets the implication is that they are domestic animals which can be cared for easily. This may cause an indirect welfare problem if it encourages a viewer/listener to acquire a raptor
- ◆ *stressing the difficulty in the training and management* - if the implication of the commentary is such that it is easy to train and manage a bird, again a viewer/listener may be encouraged to acquire a bird
- ◆ *contact with the public* - touching and stroking of birds may cause fear or annoyance to a bird and effect the condition of the plumage. Additionally, contact with the public by e.g. a member of the public allowing the bird to land on their fist, may encourage the idea that it is an easy and appealing pastime, without being aware of the intensive management and commitment required. There is also the possibility that a member of the public may harm the bird, or as is more likely, the bird may intentionally or unintentionally harm the person. In this situation it is unlikely that a positive attitude towards raptors would be developed.

Other points were noted on a case by case basis whenever necessary.

4.2.2

II. ASSESSING CONSERVATION CRITERIA

When visiting public collections of raptors as a casual viewer it was difficult to assess the extent of conservation captive breeding or research.

Conservation research was assessed superficially by a search for published papers or articles which had used captive raptors from public collections in UK. In addition a review was made of 157 available undergraduate and postgraduate student theses produced as a result of work carried out on captive collections of

animals belonging to Zoo Federation members.

However, it was possible to make some assessment of the educational value of the raptors at the centres.

4.2.2a A Checklist of Conservation Education Criteria

To assess the educational value of the birds or centre, data were collected regarding the following:

1. Aviary Birds

At each centre individual aviaries were assessed for:

- ◆ *educational design of the exhibit* e.g. providing the viewer with some idea of the birds' biology or ecology
- ◆ *presence of a label* - to provide the most basic of information i.e. to identify the species contained within
- ◆ *educational interpretation* - the information other than the species' name, the method for providing messages or information
- ◆ *anthropomorphism of the interpretation* - to evaluate the extent to which the visitor may leave with a false anthropomorphic experience of the animal.

2. Display Birds

The accompanying commentary for flying displays was scrutinised to assess the:

- ◆ *educational content* - providing the listener with some idea of the birds' biology or ecology
- ◆ *information regarding conservation* of specific species of raptors or raptors in general, and how the public can aid the conservation of these birds
- ◆ *anthropomorphism or attitude toward the bird* to evaluate the extent to which the visitor may leave with a false experience of the animal.

As for the welfare criteria for display birds, the extent to which the animals are seen as: pets; easy to train and manage; and the extent of contact with the public, is relevant to conservation as the perception of the public may be affected adversely. *In extremis* it may lead to birds being taken from the wild.

The data collection sheets are appended in Appendix 4.2.

4.2.3 Classification of Birds into Species Groups

For ease the birds have been classified as follows:

- ◆ **Buzzards** (genera *Buteo* and *Parabuteo*)
- ◆ **Eagles** (genera *Haliaeetus*, *Terathopius*, *Aquila*, *Hieraaetus*)
- ◆ **Accipiters** (genus *Accipiter*)
- ◆ **Kites** (genera *Milvus* and *Haliastur*)
- ◆ **Falcons** (genus *Falco*)
- ◆ **Caracaras** (genera *Polyborus* and *Phalcoboenus*)
- ◆ **Owls** (Families *Strigidae* and *Tytonidae*)
- ◆ **Vultures** (both Old and New World: (genera *Aegypius*, *Gyps* and *Neophron* and Family *Cathartidae*)
- ◆ **Secretary Birds** (species *Sagittarius serpentarius*)

Whilst this may be a crude classification, it reflects the basic physiological and psychological needs and similarities within and between groups.

These groups are referred to hereafter within the report as 'species groups'.

4.3 RESULTS AND DISCUSSION

4.3.1 The Scale of Public Collections of Raptors

Some 95 centres were identified as holding collections of raptors in specialist raptor centres, traditional zoos and various other institutions e.g. bird parks, theme parks etc. (Appendix 4.1).

A breakdown of these data into categories is shown in Table 4.2.

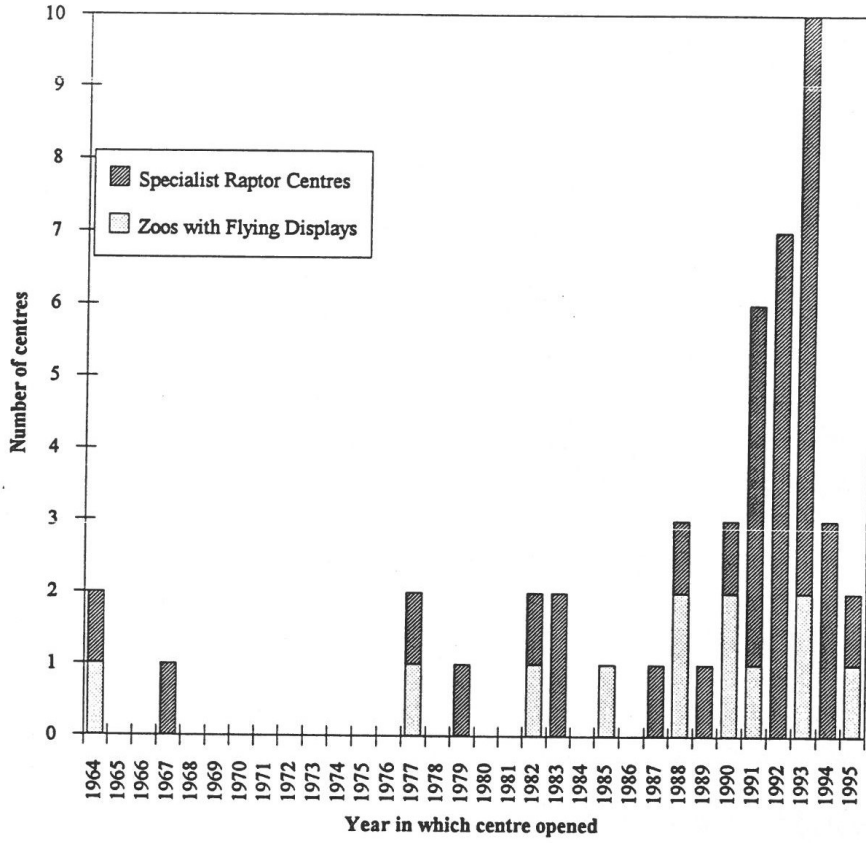
4.3.2 The Increase in Specialist Raptor Centres

There has been a dramatic rise in the number of specialist raptor centres as well as a rise in the number of other tourist attractions (traditional zoos, animal gardens, theme parks, and country parks) offering bird of prey flying displays. This is illustrated in Figure 4.1. Oddly enough, of the 36 specialist raptor centres identified (Appendix 4.1), nine (25%) were situated at garden centres. The connection between raptors and horticulture is not obvious. It is assumed that raptor centres affiliate with garden centres as the latter provide car parking and other facilities.

Table 4.2: Categories of centres identified with captive collections of raptors

<u>General Category of centre</u>	<u>Specific Category of Centre</u>	<u>Number of Centres</u>
Specialist Raptor Centre	diurnal and nocturnal bird of prey centres	30
	owl centres	3
	falconry schools open to the public	2
	rehabilitation centre (open to the public with other non-rehabilitating birds on display)	1
Total		36
Zoos with Flying Displays	traditional zoos	13
	animal gardens	2
	theme parks	1
	country parks	2
Total		18
Zoos without Flying Displays	traditional zoos	18
	animal gardens and bird parks	20
	theme parks	3
Total		41
Overall Total		95

Figure 4.1: Growth in the Number of Centres offering Bird of Prey Flying Displays (as of mid-1995)



4.3.3 Courses in Raptor Management, Handling and Falconry

Of 35 specialist raptor centres, from which it was possible to ascertain the availability of courses on various aspects of raptor management and falconry, 34 (97.1%) offered falconry or raptor management courses. These courses ranged from half a day's private tuition with a raptor handler, up to two week courses on falconry. One of the researchers was assured by one centre that she could learn "all you need to know in a four day course" with the proviso that she possessed "a couple of brain cells". Reassuring for her, if not her potential first bird.

Of the other zoos and tourist attractions which offer bird of prey displays, 3/14 (21.4%) offered courses (data were unobtainable from four centres).

◆ Quality of Teaching for the Courses

At present there is no system of quality control for courses provided. An assessment of the quality of the courses provided was not made directly by the researchers, however, there is much voiced concern within the raptor keeping community (e.g. Anon, 1992; Ayers, 1993; Fox, 1993; Heming, 1994; Norman, 1994) that some courses may not be of an appropriate standard. Indeed, this research found one case where courses were being given by an individual who had been given instruction regarding some aspects of raptor keeping only a few months earlier.

(The ratings of the quality of courses taken by falconers and members of the Raptor Breeders Association are provided in Chapter 5 and 6 respectively where courses are discussed more thoroughly, sections 5.3.2d and 6.3.1e. Conclusions about courses in general are made in Chapter 8, section 8.6.3).

4.4 **RESULTS AND DISCUSSION FROM THE 38 CENTRES ASSESSED PART I:**

4.4.1 **I. WELFARE ASPECTS (Conservation aspects follow in section 4.5.1)**

Practical difficulties with translation of dictaphone taped results account for occasional missing data.

4.4.2 **1. RESULTS AND DISCUSSION FOR AVIARY BIRDS**

The results of the information about welfare of birds contained in aviaries are summarised in Tables 4.5 to 4.23. In total 340 aviaries at 36 centres were evaluated (two centres maintained all birds tethered, hence had no aviaries). Table 4.3 shows the numbers of aviaries assessed, broken down by general category, specific category and Zoo Federation membership. It is not surprising that the specialist raptor centres have proportionately higher numbers of aviaries

Table 4.3: Table to show number of aviaries according to category of centre

<u>General Category</u>	<u>No. aviaries</u>	<u>Percent</u>
specialist raptor centre	232	68
zoo with display	59	17.3
zoo without display	49	14.4
Total	340	100
<u>Specific Category</u>	<u>No. aviaries</u>	<u>Percent</u>
raptor centre	170	49.9
zoo	78	22.9
owl centre	48	14.1
animal garden	15	4.4
rehabilitation centre	13	3.8
country park	12	3.5
theme park	4	1.2
Total	340	100
<u>Zoo Federation</u>	<u>No. aviaries</u>	<u>Percent</u>
Non-member	227	66.8
Member	113	33.2
Total	340	100

Figure 4.2: Number of Aviaries in Categories of Centre

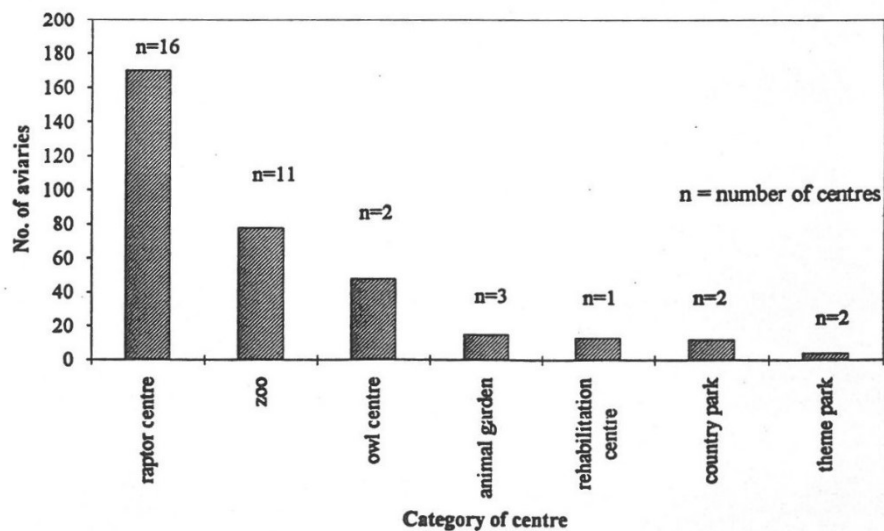


Table 4.4: Number of Aviaries per Centre

<u>Coded Centres</u>	<u>No. aviaries</u>	<u>Percent</u>
18	29	8.5
1	26	7.6
2	22	6.5
11	21	6.2
7	19	5.6
17	19	5.6
10	13	3.8
20	13	3.8
5	12	3.5
30	12	3.5
13	11	3.2
12	10	2.9
28	10	2.9
29	10	2.9
22	9	2.6
32	9	2.6
34	9	2.6
9	8	2.3
37	8	2.3
3	7	2.1
4	7	2.1
26	7	2.1
27	7	2.1
33	6	1.8
21	5	1.5
8	4	1.2
14	4	1.2
15	4	1.2
35	4	1.2
23	3	0.9
25	3	0.9
38	3	0.9
16	2	0.6
36	2	0.6
24	1	0.3
31	1	0.3
Total	340	100

containing raptors than the non-specialist raptor collections. Table 4.4 shows the number of aviaries per centre. Figure 4.2 illustrates the total number of aviaries assessed per category of centre.

Table 4.5 summarises the means and modes for those welfare criteria which were scored between 0 and 6.

4.4.2a

◆ Numbers of Birds and Different Species per Aviary

The majority of birds were kept as pairs (185 pairs, 54.3% of total aviaries assessed), with 34.6% (118) of birds kept singly (Table 4.6; Figure 4.3). Many of the remaining 36 aviaries containing more than two birds were family groups of parents and recent offspring. A breakdown of the data shows that most of the aviaries with more than a pair of bird were aviaries containing owls (Table 4.7). In total, there were seven aviaries of mixed species (of which four were aviaries of mixed species of owls). The aviary containing two species of vulture, contained species which are naturally sympatric over much of their natural range and are often found together naturally. The only unusual combination of species was an aviary containing an Old and New World vulture, a Common Buzzard *Buteo buteo* and Crested Caracara *Polyborus plancus*. There appeared, however, to be no behavioural signs of stress.

4.4.2b

◆ Number of Aviaries per Species Group

Table 4.8 classifies the findings according to number of aviaries, number of species and number of individual birds per species group. Figure 4.4 illustrates the number of aviaries per species group.

Although only two specialist owl centres were visited, in total there were more than twice as many aviaries of owls (230/340, 67.4%) as diurnal raptor aviaries. Breaking this down further as detailed in Table 4.9, it can be seen that of the ten most common species in aviaries, eight were species of owl (Figure 4.5). There are a number of possible reasons for this, including availability and price. As an example, the most commonly exhibited raptor (in terms of numbers of aviaries), the Barn Owl, is readily available in captivity due to its ease at captive breeding and associated low cost (discussed more fully in Chapter 6, section 6.8). In addition, within the last century the British public have developed a particular fondness for this now nationally threatened species which for so long was immersed in folk-lore and seen as a harbinger of doom and messenger of death (Bunn *et al*, 1982). In terms of actual numbers of birds exhibited, there were marginally more Snowy Owls *Nyctea scandiaca* exhibited, although this is a product of a clearly successful breeding season with many family groups on display. It is interesting that these two widely exhibited species are predominantly white. There seems to be a cultural affection for white creatures whether they be white doves, white swans, white horses and so on (Philippa Scott, pers. comm.). Incidental observations by the researcher found the public often spending greater

Table 4.5: Summary of means and modes for those aviary welfare criteria scored 0-6 except * (scored 1-4)

Welfare Criteria	mean	st. dev.	n	mode
Condition of first bird	5.54	1.01	195	6
Condition of second bird	5.59	1.01	135	6
Aviary size	3.40	1.29	340	3
Aviary condition	3.54	1.14	340	3
Aviary hygiene	3.42	1.18	337	3
Aviary predator proofness	3.56	1.16	282	3
Shelter from wind	4.83	1.17	340	6
Shelter from rain	4.87	1.36	340	6
Shelter from sun	4.96	1.28	340	6
Access to sun	4.09	1.86	340	6
Perch hygiene	3.54	1.31	319	4
Bath hygiene	3.10	1.77	190	4
Bath design	3.19	1.32	190	3
Aspergillosis risk (6=high risk)	1.47	1.50	333	1
View from aviary	3.67	1.48	334	4
*Environmental enrichment (1-4)	2.02	0.95	290	1

Table 4.6: Number of birds per aviary

<u>No. birds</u>	<u>No. aviaries</u>	<u>Percent</u>
1 bird	118	34.6
2 birds	185	54.3
3 birds	15	4.4
4 birds	10	2.9
5 birds	8	2.3
> 5 birds	3	0.9
Total	340	100
Mode	2	

Figure 4.3: Number of Birds per Aviary

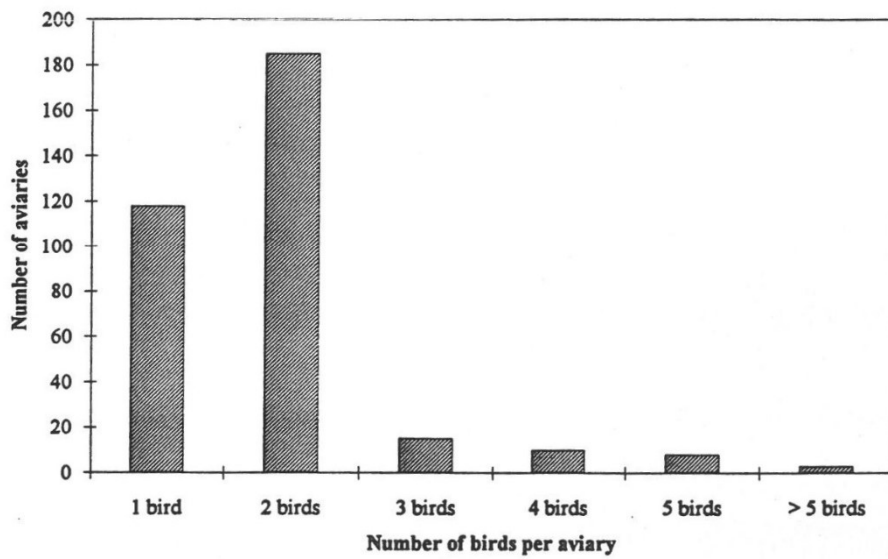


Table 4.7: Numbers of birds per aviary for the most commonly exhibited species

Species	Birds per aviary	No. of aviaries	% of aviaries	No. of birds	Species	Birds per aviary	No. of aviaries	% of aviaries	No. of birds
barn owl	1	16	50	16	Bengal eagle owl	1	7	58	7
	2	13	41	26		2	5	42	10
	3	0	0	0		3	0	0	0
	4	2	6	8		4	0	0	0
	5	1	3	5		5	0	0	0
	>5	0	0	0		>5	0	0	0
Total		32	100	55	Total	12	100	17	
tawny owl	1	11	41	11	great horned owl	1	1	13	1
	2	12	44	24		2	6	75	12
	3	0	0	0		3	1	13	3
	4	1	4	4		4	0	0	0
	5	2	7	10		5	0	0	0
	>5	1	4	6		>5	0	0	0
Total		27	100	55	Total	8	100	15	
European eagle owl	1	9	33	9	ferruginous buzzard	1	2	29	2
	2	15	56	30		2	5	71	10
	3	1	4	3		3	0	0	0
	4	1	4	4		4	0	0	0
	5	1	4	5		5	0	0	0
	>5	0	0	0		>5	0	0	0
Total		27	100	51	Total	7	100	12	
snowy owl	1	4	17	4	Harris hawk	1	4	57	4
	2	13	54	26		2	3	43	6
	3	3	13	9		3	0	0	0
	4	2	8	8		4	0	0	0
	5	2	8	10		5	0	0	0
	>5	0	0	0		>5	0	0	0
Total		24	100	57	Total	7	100	10	
little owl	1	9	56	9	Magellan eagle owl	1	2	33	2
	2	6	38	12		2	3	50	6
	3	1	6	3		3	0	0	0
	4	0	0	0		4	0	0	0
	5	0	0	0		5	1	17	5
	>5	0	0	0		>5	0	0	0
Total		16	100	24	Total	6	100	13	
common buzzard	1	5	33	5	boobook owl	1	0	0	0
	2	7	47	14		2	3	60	6
	3	1	7	3		3	2	40	6
	4	2	13	8		4	0	0	0
	5	0	0	0		5	0	0	0
	>5	0	0	0		>5	0	0	0
Total		15	100	30	Total	5	100	12	
Eurasian kestrel	1	6	43	6	Macdonald's eagle owl	1	0	0	0
	2	7	50	14		2	4	80	8
	3	0	0	0		3	1	20	3
	4	0	0	0		4	0	0	0
	5	0	0	0		5	0	0	0
	>5	1	7	6		>5	0	0	0
Total		14	100	26	Total	5	100	11	
African spotted owl	1	7	50	7	mixed owls	1	0	0	0
	2	6	43	12		2	2	50	4
	3	1	7	3		3	0	0	0
	4	0	0	0		4	1	25	4
	5	0	0	0		5	0	0	0
	>5	0	0	0		>5	1	25	12
Total		14	100	22	Total	4	100	20	

Table 4.8: Number of aviaries, individual birds and species per species group

Species Group	No. aviaries	Percent	No. birds	Percent	No. species	Percent
owl	230	67.4	444	69.1	33	50
buzzard	35	10.3	64	10	5	7.5
falcon	29	8.5	53	8.2	10	15.2
vulture	15	4.4	29	4.5	6	9.1
eagle	14	4.1	26	4	7	10.6
caracara	9	2.6	15	2.3	2	3
kite	4	1.2	8	1.2	1	1.5
accipiter	2	0.6	2	0.03	1	1.5
secretary bird	1	0.3	2	0.03	1	1.5
mixed groups	1	0.3				
Total	340	100	643	100	66	100
<i>Mode</i>	<i>owl</i>		<i>owl</i>		<i>owl</i>	

Figure 4.4: Percentage of Aviaries containing each Species Group

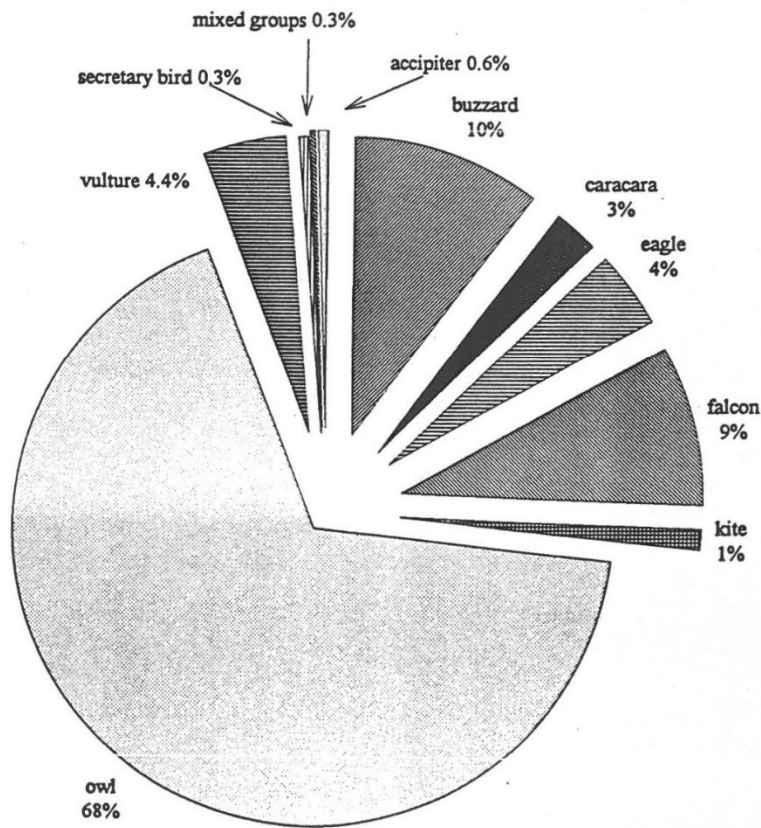
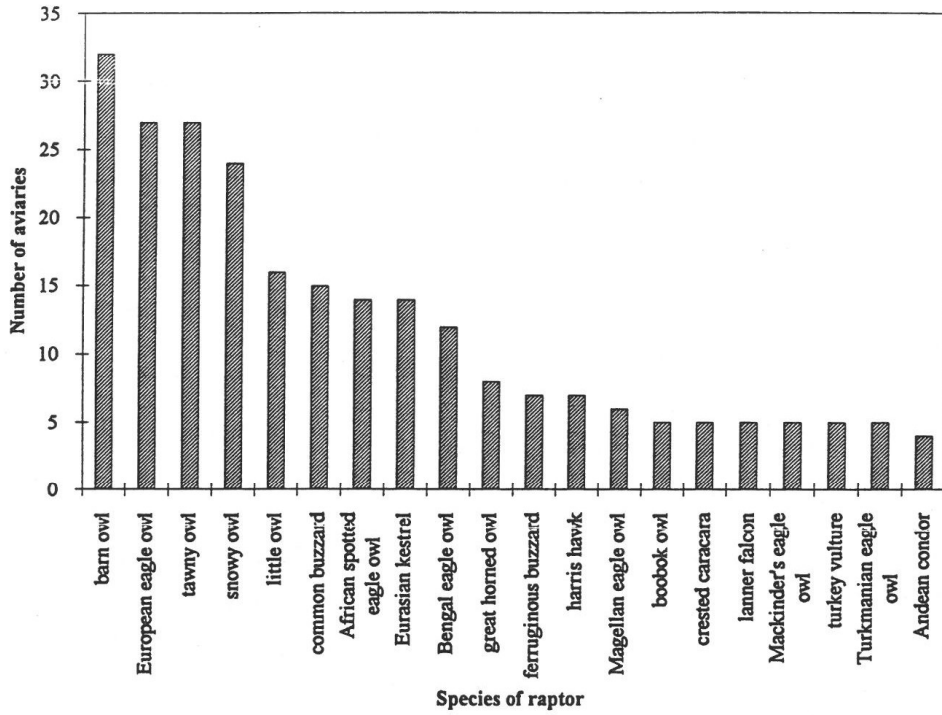


Table 4.9: Number of aviaries containing each species

Species	No. aviaries	Percent	Species	No. aviaries	Percent
barn owl	32	9.4	bateleur	2	0.6
European eagle owl	27	7.9	brown fishing owl	2	0.6
tawny owl	27	7.9	collared scops owl	2	0.6
snowy owl	24	7.1	dark breasted barn owl	2	0.6
little owl	16	4.7	lappet-faced vulture	2	0.6
common buzzard	15	4.4	lugger falcon	2	0.6
African spotted eagle o	14	4.1	sparrowhawk	2	0.6
Eurasian kestrel	14	4.1	striped owl	2	0.6
Bengal eagle owl	12	3.5	white-faced scops owl	2	0.6
great horned owl	8	2.4	American kestrel	1	0.3
ferruginous buzzard	7	2.1	black vulture	1	0.3
Harris hawk	7	2.1	European black vulture	1	0.3
Magellan eagle owl	6	1.8	ferruginous pygmy owl	1	0.3
boobok owl	5	1.5	griffon vulture	1	0.3
crested caracara	5	1.5	hawk owl	1	0.3
lanner falcon	5	1.5	hobby	1	0.3
Mackinder's eagle owl	5	1.5	merlin	1	0.3
turkey vulture	5	1.5	mixed	1	0.3
Turkmanian eagle owl	5	1.5	mixed buzzards	1	0.3
Andean condor	4	1.2	mixed vultures	1	0.3
black kite	4	1.2	New Zealand falcon	1	0.3
great grey owl	4	1.2	peregrine	1	0.3
Iranian eagle owl	4	1.2	pygmy owl spp.	1	0.3
milky eagle owl	4	1.2	Sauvigny's eagle owl	1	0.3
mixed owls	4	1.2	scops owl spp.	1	0.3
red-tailed buzzard	4	1.2	secretary bird	1	0.3
striated caracara	4	1.2	spotted owlet	1	0.3
burrowing owl	3	0.9	steppe eagle	1	0.3
golden eagle	3	0.9	Swainson's buzzard	1	0.3
long eared owl	3	0.9	Syrian little owl	1	0.3
Mauritius kestrel	3	0.9	Tengmalm's owl	1	0.3
spectacled owl	3	0.9	Verreaux's eagle	1	0.3
tawny eagle	3	0.9	wedge-tailed eagle	1	0.3
ural owl	3	0.9	white-bellied sea eagle	1	0.3
Abyssinian eagle owl	2	0.6	Woodford's owl	1	0.3
bald eagle	2	0.6			
			Total	340	100

Figure 4.5: Twenty most Commonly Exhibited Raptors according to Number of Aviaries



amounts of time viewing these birds and remarking on their appeal. Indeed, owls in general tend to be popular for a number of reasons including their round-faced doe-eyed neotenous attractiveness to humans and their perceived intelligence. From a more practical stance, in comparison to diurnal birds of prey, owls are perhaps seen as *relatively* easy to keep.

Of the diurnal birds of prey Common Buzzards and Eurasian Kestrels *Falco tinnunculus* were most represented both in terms of numbers of aviaries (15 and 14 respectively)(Table 4.9; and Figure 4.5) and individual birds (30 and 26 respectively)(Table 4.7). Once more this is probably related to availability and cost of birds, and possibly the wish to exhibit native species.

By comparison to the widely displayed species groups, there were only two aviaries of accipiters, namely Eurasian Sparrowhawks *Accipiter nisus* (Table 4.8). Accipiters are well known to be of flighty temperament (Ford, 1992) and as such are generally not suitable for exhibition to the general public.

Of the other species groups, the species exhibited appear to be a representative cross-section of wild species of raptor.

4.4.2c

◆ Condition of Birds

On the whole birds appeared in good or excellent condition with a mean score of 5.56 (on the 0-6 point scale)(n=330, mode 6) (Tables 4.5 and 4.10). However, from a distance it was very difficult to make a reliable assessment of physical condition particularly where birds were sitting at the back of dark aviaries. Indeed, making visual assessments of physical condition can only hope to give a superficial evaluation of physical or mental health.

In cases where the condition of the bird seemed below optimal, this was frequently due to damage to the bird's cere. At one of the centres where equipment failure prevented qualitative and quantitative data being collected, a great number of birds had severe cere damage which was undoubtedly caused by flying into the chicken wire from which the aviaries were constructed. This particular centre contained a rehabilitation hospital, and the majority of occupants were apparently rehabilitating birds. It is uncertain as to their condition prior to entering the centre but those with such severe cere damage could not be released in that condition. The traumatic injuries were so bad due to a combination of poor aviary design and wild birds being publicly exhibited which resulted in birds displaying fear responses i.e. crashing about in the aviary in an attempt to escape.

4.4.2d

◆ Behaviour of Birds

Of all birds assessed only three (0.9%) showed obvious behavioural signs of stress. In one of the two extreme cases a Striated Caracara *Phalacrocorax australis* exhibited stereotypic behaviour characterised by running in a repetitive figure of

Table 4.10: Condition of bird(s)

<u>Score</u>	<u>Condition of first bird</u>	<u>No. birds</u>	<u>Percent</u>
1	very poor	2	0.6
2	poor	4	1.2
3	marginal	6	1.8
4	satisfactory	13	3.8
5	good	19	5.6
6	very good	151	44.3
	impossible to ascertain	145	42.5
Total		340	100

<u>Score</u>	<u>Condition of second bird</u>	<u>No. birds</u>	<u>Percent</u>
		1	0.4
1	very poor	1	0.4
2	poor	2	0.9
3	marginal	2	0.9
4	satisfactory	9	4
5	good	13	5.8
6	very good	107	48.2
	impossible to ascertain	87	39.2
Total		222	100

eight at the front of its cage for prolonged periods of time. The caracaras, like the vultures, are scavengers and intelligent birds, which naturally pick up and carry various items. The bird in question was housed in a small barren aviary (with the exception of a few dog toys) with a limited view, indeed no view from the floor of the aviary which is where caracaras spend most of their time in captivity. It is speculated that the lack of environmental enrichment was the primary cause of this bird's apparent abnormal behaviour.

In the other extreme case the bird in question was a Burrowing Owl *Speotyto cunicularia* housed in a walk-through aviary. The bird's mate (which, incidentally, was a Little Owl *Athene noctua*) was brooding in an underground tunnel in the aviary and the Burrowing Owl was standing at the entrance to defend it. As the public were in such close proximity (within inches) the bird was in a near constant state of threat displays. Unfortunately, as is the nature of humans, a small bird behaving in an unusual way attracts much attention and hence the situation was exacerbated by near continual presence of the public and responding threat display. It was considered, therefore, that this small bird was in a near perpetual state of fear and/or frustration during the day when the public were in the aviary. An inordinate amount of time displaying also reduces the amount of time for normal daily activities or the activities required for parenting newly hatched offspring.

With respect to the rehabilitation centre mentioned in the previous section (section 4.4.2c) where quantified data were not collected, many of the wild injured birds showed behavioural signs of fear by crashing about in their aviaries and giving alarm calls.

The vast majority of birds (99.1%) showed no behavioural signs of stress, indeed most of the nocturnal or crepuscular species i.e. the owls, were asleep or drowsing. However, as pointed out by Patton *et al* (1985), lack of behavioural change may not mean lack of physiological change in response to stressors.

Aviary Design:

Table 4.11 details the results for the following four welfare criteria.

4.4.2e

◆ Aviary Size

The assessment of aviary size was made by an observation of the dimensions of the aviary, and the size and number of birds contained within.

The results of aviary size show a normal distribution with the majority of aviaries falling in the marginal or satisfactory range (Figure 4.6). Aviaries of these sizes were sufficiently big to allow a bird one or two flaps to get from one end to another but insufficient to facilitate any great amount of aerobic exercise. The positioning of perches is also crucial to the amount of room a bird has to fly in,

Table 4.11: Specific Aviary Criteria: size, condition, hygiene, predator proofness

Aviary Size			Aviary condition		
Score	No. of aviaries	Percent	No. of aviaries	Percent	
1 very poor	19	5.6	10	2.9	
2 poor	61	17.9	34	10	
3 marginal	111	32.6	156	45.7	
4 satisfactory	92	27	66	19.4	
5 good	35	10.3	52	15.2	
6 very good	20	5.9	22	6.5	
Total	340	100	Total	340	100
Aviary hygiene			Aviary predator proofness		
Score	No. of aviaries	Percent	No. of aviaries	Percent	
0 atrocious	2	0.6	8	2.3	
1 very poor	20	5.9	7	2.1	
2 poor	41	12	10	2.9	
3 marginal	117	34.3	107	31.4	
4 satisfactory	96	28.2	101	29.6	
5 good	52	15.2	37	10.9	
6 very good	9	2.6	11	3.2	
unknown	3	0.9	58	17.3	
Total	340	100	Total	340	100

Figure 4.6: Aviary Size

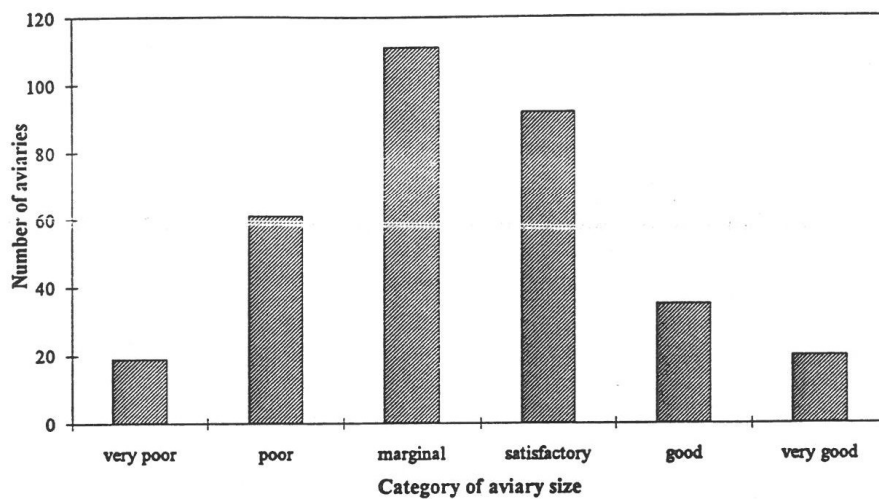
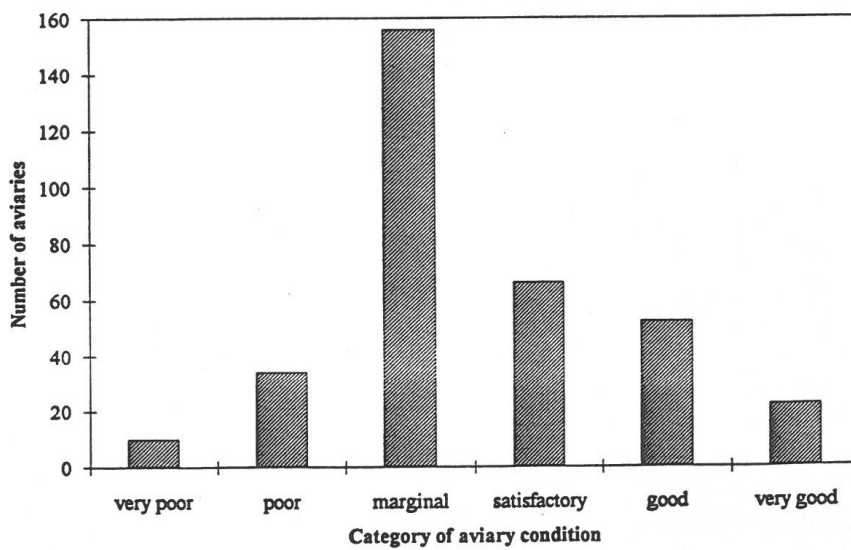


Figure 4.7: Aviary Condition



or the encouragement of flight from one end of the aviary to the other. Although not quantified, a number of the larger aviaries were high and encouraged upward flight. This demands a significant expenditure of energy and is good, therefore, at promoting physical fitness. There are the additional benefits of a sense of extra security for birds in high aviaries, where they can look down on the public rather than be towered over. The aviaries included in the good and very good categories had this feature. As a cautionary note some species e.g. Gyr Falcons *Falco rusticolus* are not suited to high aviaries as they can land with too great a force which may lead to foot problems such as bumblefoot (Forbes, pers. comm.).

It is debateable whether providing extra space encourages extra exercise or reduces boredom, but it gives the bird the opportunity to exercise should it feel like flying, hopping between perches or walking about. The argument against providing too much space is that birds can build up too great a speed and subsequently injure themselves should they fly into the aviary walls. In addition they may land on a perch with more force increasing their risk of foot problems.

4.4.2f

◆ Aviary Condition

The condition of the aviary impinges to some extent on some of the other welfare criteria, such as shelter and protection from predators. However, as a discrete category the majority of aviaries were in the range of marginal or satisfactory (Figure 4.7). In the category of very poor, these aviaries were poorly constructed and the 'sheltered' areas gave access to draughts or possible predators via cracks or holes in the aviary walls. In addition, in some, the deterioration of the aviary had led to potential dangers e.g. pieces of wire and other sharp objects projecting into the aviary. In some of the smaller newer raptor centres the aviaries were still in satisfactory condition but the construction suggested that their condition may deteriorate relatively quickly.

4.4.2g

◆ Aviary Hygiene

As with aviary condition and size, the hygiene of aviaries followed a normal distribution, again peaking in the range of marginal or satisfactory (Figure 4.8). Sixty three aviaries (18.5%) ranked as poor or worse, indicating that those birds contained within were at greater than usual risk of infectious disease. Of these 63, two were assessed as atrocious. Perhaps as a defence, it could be argued that as the assessments were carried out in the summer the hygiene may have deteriorated as the breeding season progressed. Whilst accepting that the breeding sites for most wild raptors are filthy i.e. contaminated with faeces and waste food, it is worth pointing out that wild raptors escape from this filth periodically and are under different stresses.

4.4.2h

◆ Aviary Security from Predators

This category was difficult to assess as it was not easy to inspect all aspects of

Figure 4.8: Aviary Hygiene

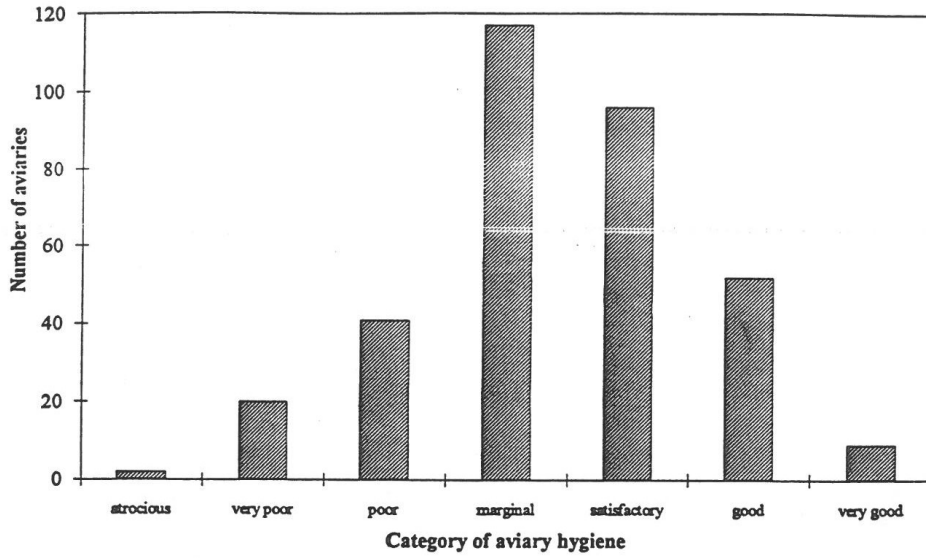
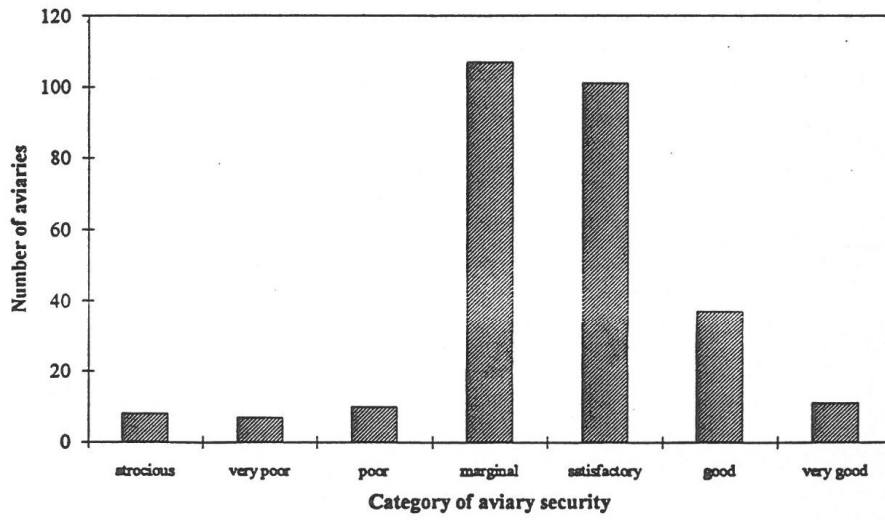


Figure 4.9: Aviary Security Against Predators



aviaries for predator proofness. As stated previously, this category is related to the condition of the aviary in many respects. The majority of aviaries had satisfactory or marginal security from predators (Figure 4.9).

An unusual case of the potential danger from predators is worth documenting. An aviary adjoining one containing two Barn Owls was used to house ferrets. These ferrets had obviously dug their way through to the owls previously as a section of wire had been placed over their tunnel in an attempt to block their access. However, the ferrets had begun digging elsewhere. Ferrets are voracious and dangerous creatures which would attack a small owl such as a Barn Owl given the chance. Even if the Barn Owl fought back it would probably sustain injuries.

4.4.2i

◆ Shelter from Sun, Wind and Rain

The results of shelter from sun, wind and rain, are skewed with the majority of aviaries having wholly adequate shelter from the elements (Table 4.12)(Figures 4.10-4.12). The three sets of results are clearly correlated and are a product of managing for one aspect which functionally manages for the other aspects. The most common design of aviary incorporates at least one part of the aviary having solid walls on three sides (the fourth being mesh) and a roof. In this situation, as long as there is an appropriate perch within this area the birds are provisioned with shelter.

The encouraging results for these three criteria would imply that shelter from the elements is perceived by raptor keepers as one of the most fundamental welfare criteria.

4.4.2j

◆ Access to the Sun

The distribution of results for access to the sun show a similar skewed distribution to that of shelter from the sun, wind and rain, with the majority of aviaries allowing access to the sun should the bird wish to exploit this opportunity (Table 4.12; Figure 4.13). This said, there were still some 91 aviaries (26.8%) which had poor or worse solar access. This was usually caused by solid roofed and sided aviaries, with a northerly aspect, or entirely enclosed barn type constructions (often used to house Barn Owls).

4.4.2k

◆ Perches

The results for the welfare criteria relating to perches are summarised in Table 4.13.

As foot problems, including bumblefoot, are such a common complaint of captive raptors, it is important to provide a variety of clean perches of different textures and surface. Although the majority of aviaries offered a few perches, there were still some 59 (18%) aviaries which offered only one or two perches (Figure 4.14).

Table 4.12: Specific Aviary Criteria: shelter from sun, wind and rain; and access to sun

Shelter from the wind			Shelter from the sun		
Score	No. of aviaries	Percent	No. of aviaries	Percent	
0 atrocious	2	0.6	2	0.6	
1 very poor	0	0	0	0	
2 poor	6	1.8	18	5.3	
3 marginal	44	12.9	32	9.4	
4 satisfactory	70	20.5	51	15	
5 good	91	26.7	70	20.5	
6 very good	127	37.2	167	49	
Total	340	100	Total	340	100
Shelter from the rain			Access to sun		
Score	No. of aviaries	Percent	No. of aviaries	Percent	
0 atrocious	2	0.6	6	1.8	
1 very poor	4	1.2	31	9.1	
2 poor	17	5	54	15.8	
3 marginal	38	11.1	41	12	
4 satisfactory	54	15.8	35	10.3	
5 good	63	18.5	50	14.7	
6 very good	162	47.5	123	36.1	
Total	340	100	Total	340	100

Figure 4.10: Shelter from the Rain in Aviaries

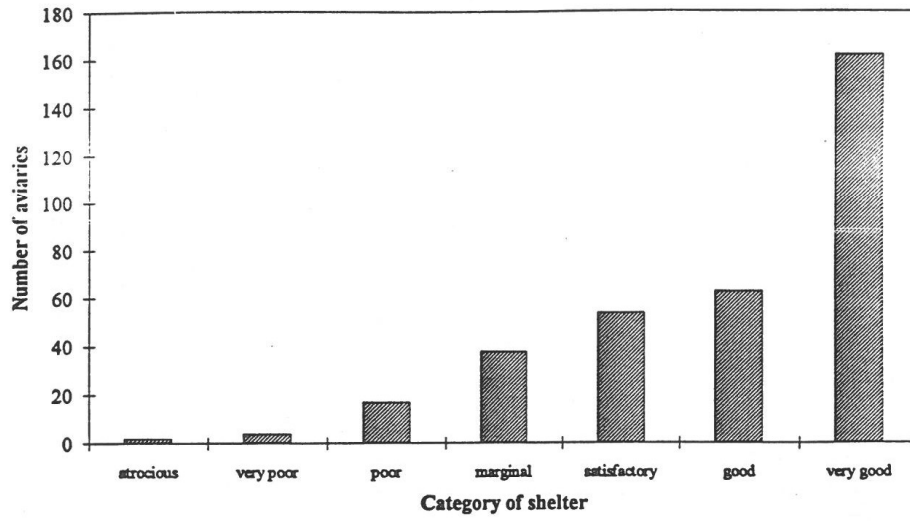


Figure 4.11: Shelter from the Wind in Aviaries

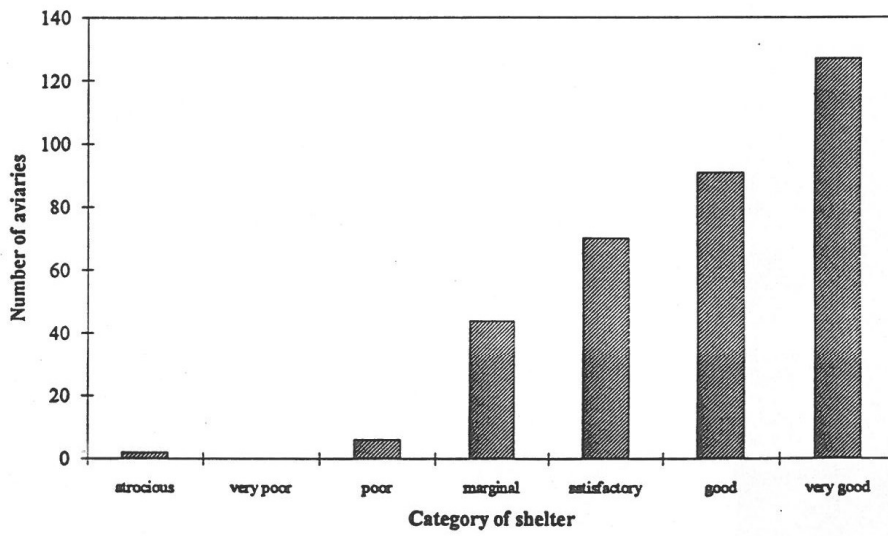


Figure 4.12: Shelter from the Sun in Aviaries

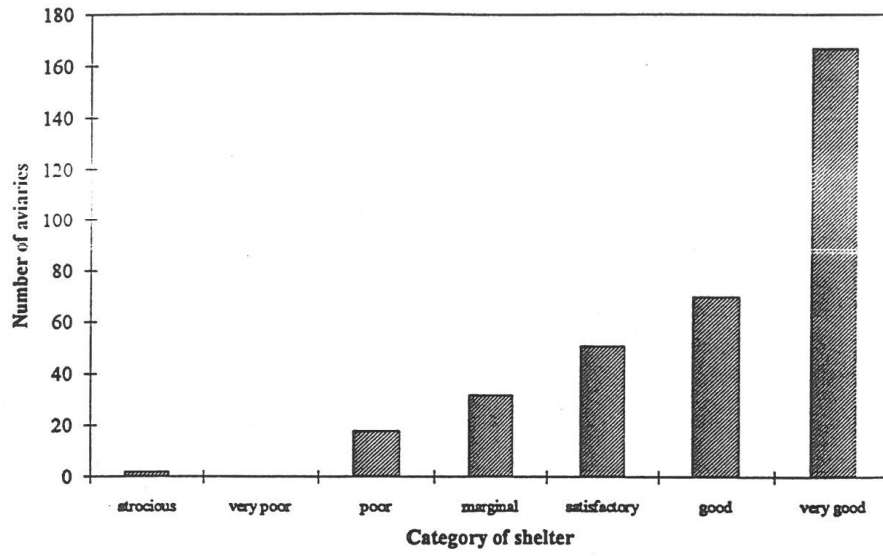


Figure 4.13: Access to the Sun in Aviaries

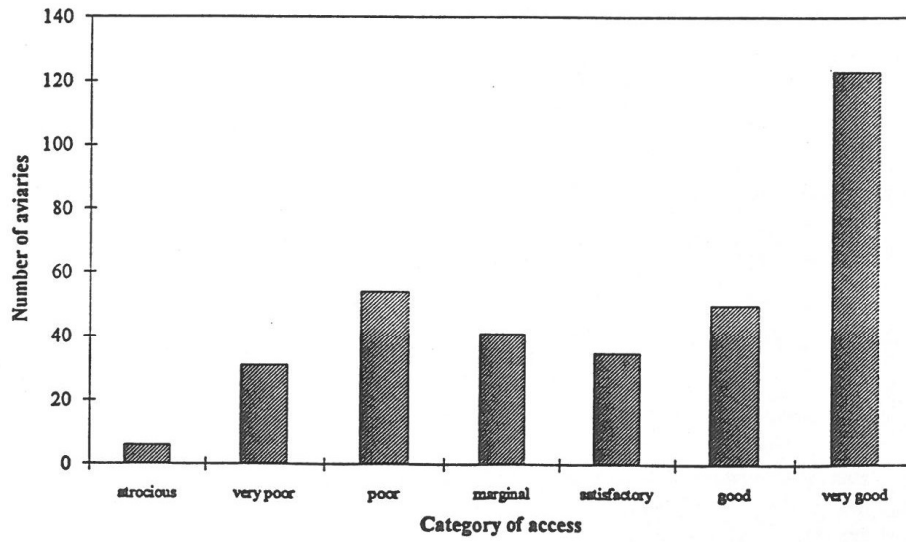


Table 4.13: Specific Aviary Criteria: Perches-number, type, hygiene and cover

Number of perches			Perch type		
	No. of aviaries	Percent		No. of aviaries	Percent
only 1 perch	17	5	branches	249	73
only 2 perches	42	12.3	square timbers	39	11.4
a few perches	164	48.1	trunk/stump	18	5.3
many perches	105	31.1	swinging perch	8	2.3
missing data	12	3.5	appropriate	6	1.8
			missing data	20	5.9
Total	340	100	Total	340	100

Perch hygiene			Perch cover		
	No. of aviaries	Percent		No. of aviaries	Percent
atrocious	11	3.2	none	297	87.1
very poor	13	3.8	astroturf	9	2.6
poor	29	8.5	faeces	2	0.6
marginal	93	27.3	missing data	33	9.7
satisfactory	99	29			
good	62	18.2			
very good	12	3.5			
missing data	21	6.2			
Total	340	100	Total	340	100

Figure 4.14: Number of Perches in Aviaries

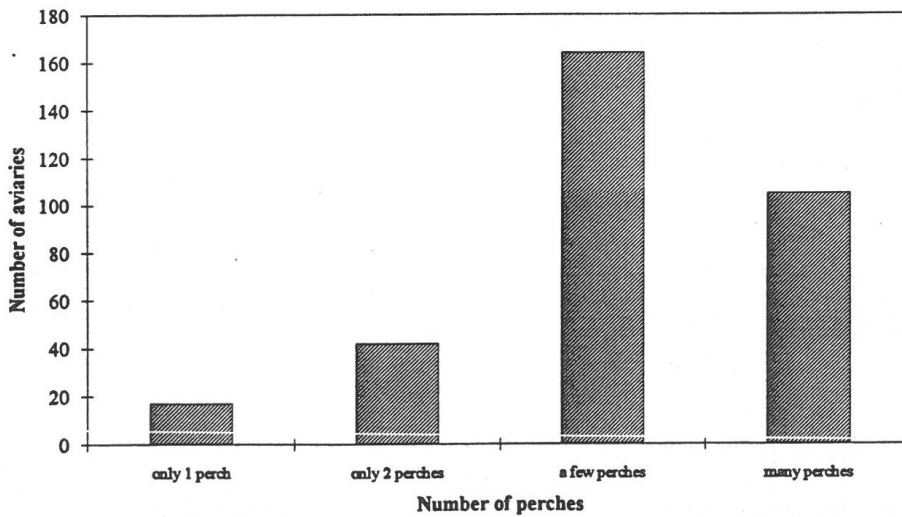


Figure 4.15: Types of Perches in Aviaries

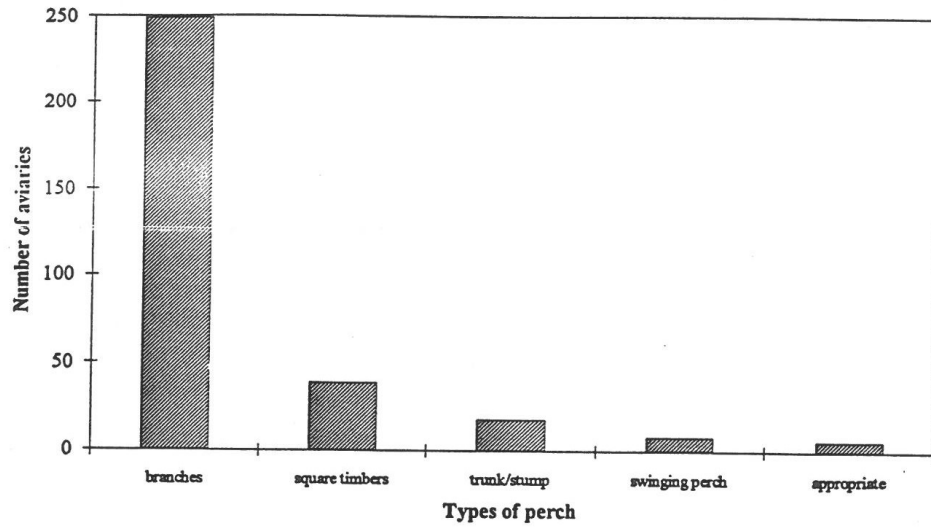
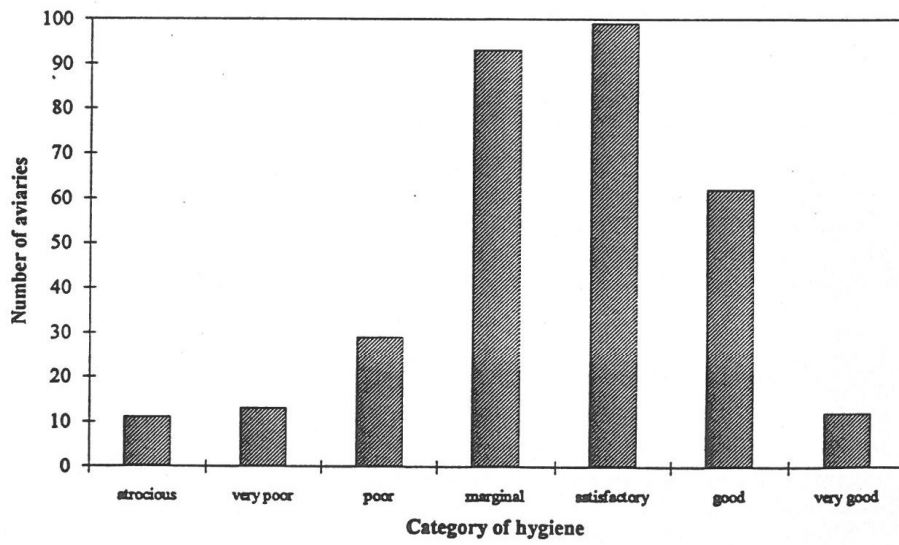


Figure 4.16: Perch Hygiene in Aviaries



The vast majority of perches were branches (Figure 4.15) which provide a natural surface, although raptors are wont to select a favourite perch which they use habitually. This area may become seasoned and very hard.

Swinging perches i.e. ones suspended by ropes, were used in a small number of aviaries (8/320, 2.5%). These have two benefits, namely they "give" when the bird lands, reducing impact on the feet. Moreover, they may swing whilst the bird is in position and so may build up muscle tone.

The category of "appropriate" perches was introduced for species such as Snowy Owls which in the wild usually sit on the ground or low rocks, and species such as Secretary Birds *Sagittarius serpentarius* which are more terrestrial than aerial and arboreal.

Regardless of the number or types of perch, if the hygiene is poor the birds are at risk of infections leading to conditions such as bumblefoot. In 53/319 (16.6%) aviaries the perch hygiene was poor or worse and regarded as putting birds at risk (Figure 4.16). In two cases the perch cover was assessed to be faeces only. With respect to perch coverings in aviaries, the vast majority had no covering, a situation which would be found in the wild. Astro turf was found to be used extensively for tethered birds (see subsequent section 4.4.3b) but was used to cover perches in only nine (3%) aviaries.

At one centre where quantitative data were not gathered, perches of aviaries containing birds had been freshly treated with a chemical wood preserver similar to creosote. Topical contact would almost certainly cause irritation or worse to skin on the feet, and may be ingested when a bird 'fakes' i.e. wipes its beak on its perch.

4.4.21

◆ Baths

Of the 272 aviaries from which it was possible to ascertain the presence or absence of a bath, 191 (70%) contained baths (Table 4.14; Figure 4.17). However, birds in the remaining 81 aviaries (30%) had no access to water. In a number of aviaries there were baths which contained no water, and appeared to have not been filled for a long period of time. In these situations aviaries were classed as no bath being present.

A number of raptor keepers feel that it is unwise to keep a bath in an aviary with breeding birds as a freshly bathed bird looks small and bedraggled and may be mistaken for prey and hence attacked. In addition, the disturbance caused by cleaning out or filling up a bath may be detrimental to breeding success. However, it should be easy to fill a bath using a hose through the mesh on the aviary, and a bath should be positioned such that this is practical. To restrict birds from bathing in the hot weather of summer may be frustrating for the birds and lead to poor plumage condition. Additionally, birds should have access to water

Table 4.14: Specific Aviary Criteria: Bath- presence, hygiene and design

Presence of bath					
	No. of aviaries	Percent			
Yes	191	56			
No	81	23.8			
unknown	68	19.9			
<hr/>					
Total	340	100			
Bath hygiene			Bath design		
Score	No. of aviaries	Percent	No. of aviaries	Percent	
0 atrocious	24	7	1	0.3	
1 very poor	13	3.8	6	1.8	
2 poor	26	7.6	30	8.8	
3 marginal	41	12	62	18.2	
4 satisfactory	50	14.7	60	17.6	
5 good	12	3.5	15	4.4	
6 very good	23	6.7	7	2.1	
unknown	151	44.3	159	46.6	
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Total	340	100	To	340	100

Figure 4.17: Presence of Bath in Aviary

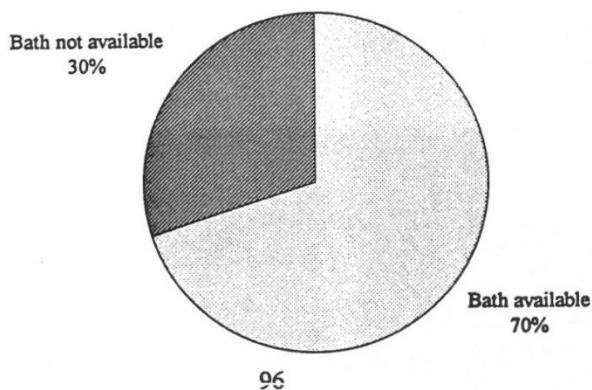


Figure 4.18: Bath hygiene

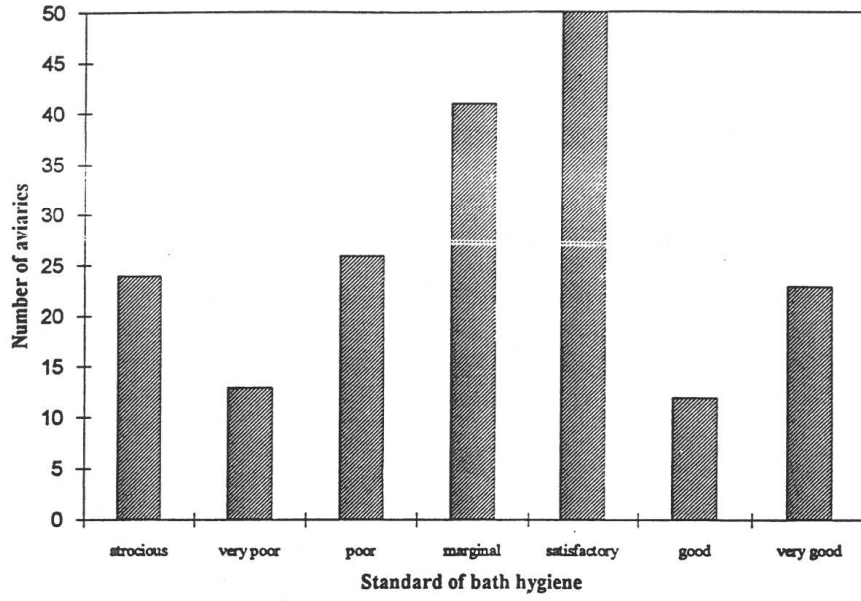
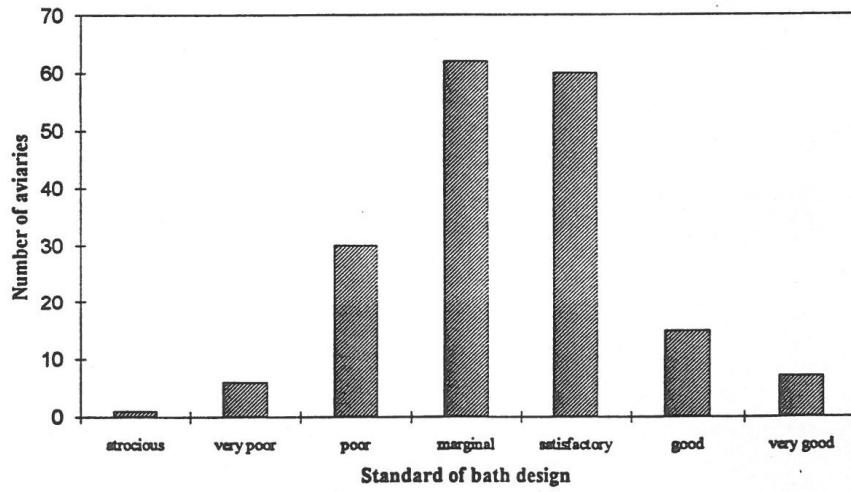


Figure 4.19: Bath Design



should they want to drink, although many tend not to.

The hygiene of baths varied greatly with a high number of baths (63/189, 33%) scored as poor or worse (Table 4.14)(Figure 4.18). Of these, the hygiene of 24 (12.7%) were scored as atrocious. In these situations there was essentially no bath available to the bird. This may be particularly frustrating to those birds evolved to live in close association with water. As a comparison, a pair of Brown Fish Owls *Ketupa zeylonensis* (evolved for riparian habitats) kept at one centre were provided with lush green vegetation and a running stream through their aviary (a combination of welfare and educational criteria being catered for), whereas at another centre these rare birds were kept with a hollow in the ground filled with mud, sticks and no water.

Bath design showed a normal distribution (Figure 4.19), with a large number of poorly designed baths being used, these usually constituted inappropriately small sized plastic trays with only a little water.

The positioning of baths was occasionally seen to be inappropriate with the bath placed within muting distance of the birds, hence the water was fouled quickly.

4.4.2m

◆ Aspergillosis Risk

The risk of a bird developing aspergillosis is dependent on both the environmental risk of contact with *Aspergillus fumigatus* spores and susceptibility of the bird itself. In situations where the bird is mentally and physically fit contact with spores *may* cause no problems. For these reasons it is difficult to evaluate the risk of succumbing to infection, the assessment has been made, therefore, to assess the environmental risk primarily, with a secondary assessment of susceptibility.

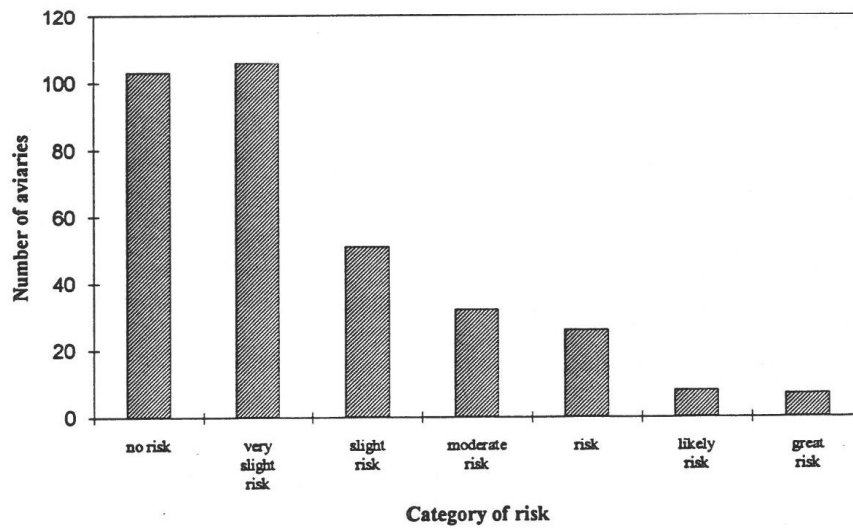
The few aviaries where there was a risk of aspergillosis, summarised in Table 4.15 (Figure 4.20), were those aviaries which appeared damp and had quantities of potentially decomposing organic matter. An evaluation in wetter winter months may provide slightly different results.

Bark chippings are now used quite widely in zoos as a flooring for numerous species. Discussions with zoo keepers in general revealed its usefulness as a substrate as droppings are absorbed in a discrete area rather than spreading out across a smoother surface. Discrete areas can then be cleaned up. Whether this actually occurs in raptor aviaries is not known. It is possible that damp bark chippings could provide a source of *Aspergillus spp.* spores although this is controversial, some suggesting that it should never be used. Discussion with the owner of one centre felt that they provided an ideal substrate as long as they were managed properly.

Table 4.15: Specific Aviary Criteria: aspergillosis risk

Score	No. of aviaries	Percent
no risk	103	30.2
very slight risk	106	31.1
slight risk	51	15
moderate risk	32	9.4
risk	26	7.6
likely risk	8	2.3
great risk	7	2.1
missing data	7	2.1
Total	340	100

Figure 4.20: Aspergillosis Risk in Aviaries



4.4.2n

◆ Environmental Enrichment

Most aviaries provided some sort of view, although it was noted that at some of the smaller centres the views tended to be of short distances to the aviaries opposite (Figure 4.21). Some 69 (20.7%) aviaries had poor or worse views (Table 4.16). It is difficult to calculate the effect of no visual stimulation (of which some may be frightening) but it is assumed that an aviary with no view is probably equivalent to a prison cell.

The results of an assessment of play items (including natural items such as vegetation where appropriate) gave most cause for concern (Table 4.16; Figure 4.22). The results show how the greatest proportion of aviaries were devoid of such items and appeared bleak and sterile. It could be argued that items such as vegetation merely obstruct a bird's flight within an aviary. However, it is easy to balance these two aspects, a balance not carried out in the majority of cases. It has been argued that creating what appears, to the human eye, to be an interesting aviary may not be so for raptors. The researchers feel that captive birds must be given the option of different places to sit, a view to see, items to investigate and so on, in an attempt to reduce frustration and boredom. This is particularly important for the intelligent species such as vultures and caracaras or social species such as Harris Hawks.

The presence of vegetation, large size, height or relief in aviaries can provide essential refuge for a bird also.

Plate 4.2 illustrates a good aviary for a Striated Caracara which illustrates good size and hygiene; there is good shelter from the elements (out of shot) which provides refuge also; access to the sun; a variety of perches; a good view; plenty of room on the aviary floor for exploration (caracaras spend much time on the ground); vegetation and stones etc. for interest for the birds; plastic coated mesh (to help prevent injury should the bird fly into it); and low apparent risk of *Aspergillus spp.* spores.

Table 4.16: Specific Aviary Criteria: Environmental enrichment-view, play items/vegetation

View from Aviary			Play items/vegetation		
Score	No. of aviaries	Percent	Score	No. of aviaries	Percent
atrocious	8	2.3	very poor	113	33.1
very poor	25	7.3	marginal	75	22
poor	36	10.6	satisfactory	86	25.2
marginal	59	17.3	good	16	4.7
satisfactory	105	30.8	missing data	50	14.7
good	69	20.2			
very good	31	9.1			
missing data	7	2.1			
Total	340	100	Total	340	100

Figure 4.21: Aviary Environmental Enrichment- view from the aviary

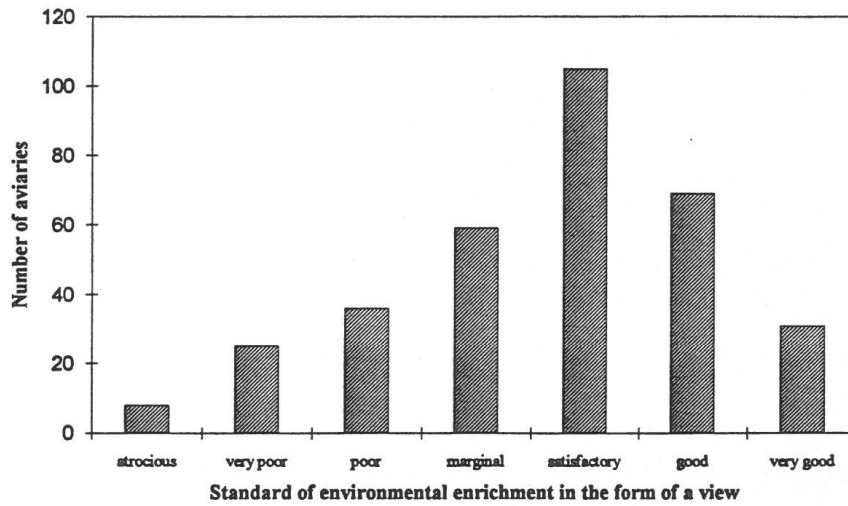
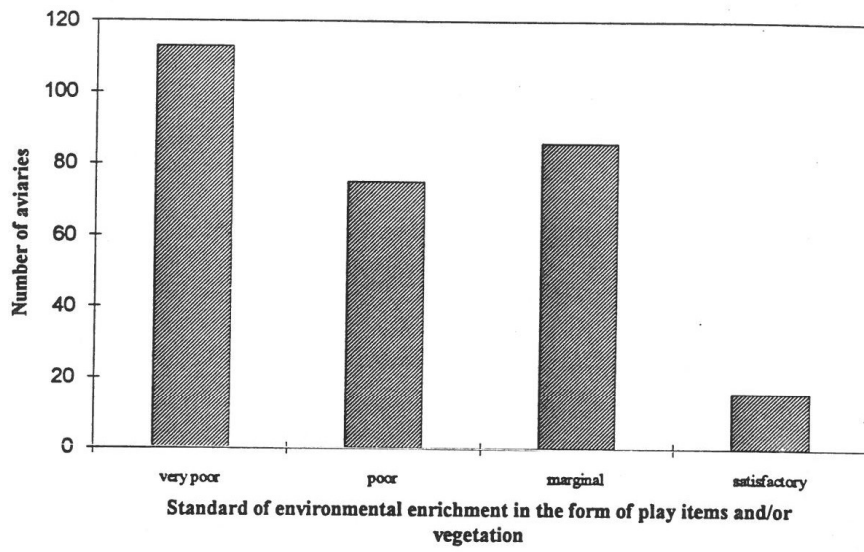


Figure 4.22: Aviary Environmental Enrichment- play items and/or vegetation



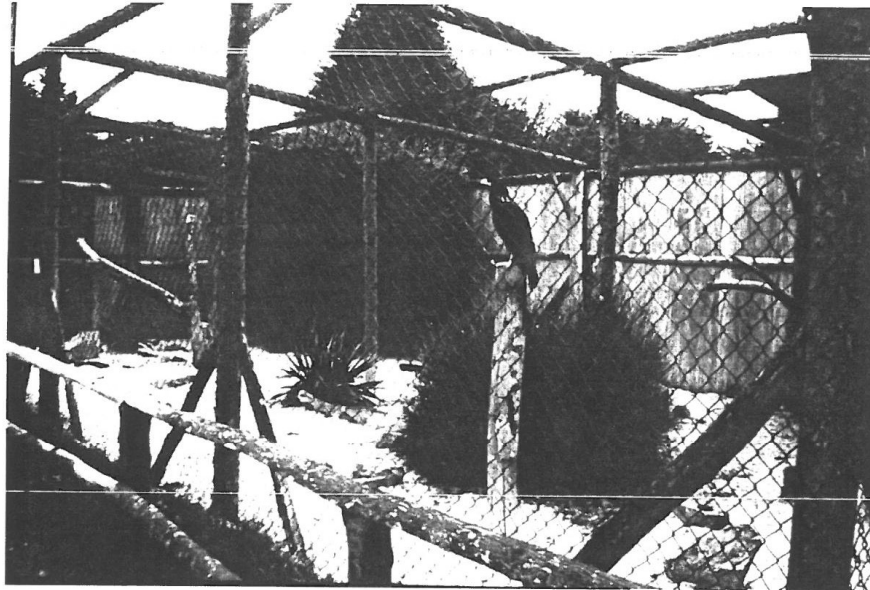


Plate 4.2: An example of a good and appropriate aviary for a Striated Caracara *Phalacrocorax australis*:

- ◆ good size
- ◆ high standards of hygiene
- ◆ good shelter from the elements (out of shot)
- ◆ refuge (also out of shot)
- ◆ access to the sun
- ◆ bath (out of shot)
- ◆ a variety of perches which are clean
- ◆ a good view
- ◆ plenty of room on the aviary floor for exploration (caracaras spend much time on the ground)
- ◆ vegetation and stones etc. for interest for these intelligent birds
- ◆ plastic coated mesh
- ◆ low apparent risk of *Aspergillus spp.* spores.

(Balance of welfare criteria: open roofed aviary allows access of pathogens from wild birds' droppings and is more exposed to the elements).

Table 4.20: Comparison using Kruskal Wallis 1-way ANOVA of aviary welfare criteria for Category of Centre

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
109.4662	6	0.000
Type of centre	Mean Rank	No. aviaries
Owl centre	249.1	48
Zoo	220.5	78
Theme park	218.6	4
Country park	205.1	12
Raptor centre	141.4	170
Rehabilitation centre	59.8	13
Animal garden	44.1	15
Total	340	

Table 4.21: Multiple Range Test Comparisons between Category of Centres for aviary welfare criteria

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq 4.9636 * RANGE * \sqrt{1/N(I) + 1/N(J)}$
 with the following value(s) for RANGE: 2.78

(*) Indicates significant differences which are shown in the lower triangle

Mean	Centre Category	ag	rh	rc	cp	tp	z	oc
36.35	ag							
38.75	rh							
44.42	rc	*	*					
48.96	cp	*	*	*				
50.75	tp	*	*	*	*			
51.73	z	*	*	*	*	*		
54.70	oc	*	*	*	*	*	*	*

ag = Animal garden
 rh = Rehabilitation centre
 rc = Raptor centre
 cp = Country park
 tp = Theme park
 z = Zoo
 oc = Owl centre

Table 4.22: Comparison using Kruskal Wallis 1-way ANOVA of aviary welfare criteria for Individual Centres

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
275.9121	35	0.000
Centre (coded)	Mean Rank	No. aviaries
30	317.83	12
18	300.55	29
35	299.38	4
25	289	3
34	286.22	9
26	284.07	7
33	276.08	6
15	275.25	4
38	263.17	3
31	260	1
3	248.71	7
10	237.27	13
23	222.83	3
2	217.64	22
22	199.17	9
27	198.36	7
32	194.11	9
17	170.58	19
14	150.25	4
29	139.65	10
13	135.95	11
11	134	21
7	130.95	19
12	128.05	10
1	107.29	26
16	103.25	2
24	85	1
8	82.38	4
5	79.29	12
37	60.44	8
20	59.77	13
36	45.5	2
9	41.69	8
28	30.4	10
21	17.3	5
4	5.71	7
Total		340

Table 4.23: Multiple Range Test Comparisons between Individual Centres

Multiple Range Tests: LSD test with significance level .05 The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq 2.7366 * RANGE * \sqrt{1/N(I) + 1/N(J)}$ with the following value(s) for RANGE: 2.78

Mean	CENTRE (coded)	4	21	28	9	37	36	20	8	5	24	1	16	7	12	11	13	29	14	17	32	27	22	2	23	10	3	31	38	15	25	34	26	33	35	18	30		
30.96																																							
33.41	21																																						
35.72	28	*																																					
37.38	9	*	*																																				
37.78	37	*	*	*																																			
38.01	36	*	*	*	*																																		
38.75	20	*	*	*	*	*																																	
40.76	8	*	*	*	*	*	*																																
40.83	5	*	*	*	*	*	*	*																															
41.01	24	*	*	*	*	*	*	*	*																														
41.78	1	*	*	*	*	*	*	*	*	*																													
42.30	16	*	*	*	*	*	*	*	*	*	*																												
43.38	7	*	*	*	*	*	*	*	*	*	*	*																											
43.97	12	*	*	*	*	*	*	*	*	*	*	*	*																										
44.08	11	*	*	*	*	*	*	*	*	*	*	*	*	*																									
44.33	13	*	*	*	*	*	*	*	*	*	*	*	*	*	*																								
44.75	29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																							
45.00	14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																						
46.75	17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																					
48.11	32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																				
48.37	27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																			
48.62	22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																		
49.99	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																	
50.00	23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																
51.32	10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*															
52.14	3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
53.01	31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*													
54.00	38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*												
54.30	15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*											
56.00	25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
56.50	34	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*									
56.77	26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*								
57.36	33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*								
59.75	35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*							
59.91	18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
62.08	30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

(*) Indicates significant differences which are shown in the lower triangle

The categories of centre were found to be statistically different from one another ($p < 0.000$) with a ranking as shown below in Table 4.20. Table 4.21 shows how categories differed significantly from each other.

The results show owl centres and zoos to have the lowest number of welfare problems with animal gardens and the one rehabilitation centre faring worst. However, the small sample sizes for actual numbers of centres within each category, with the exception of zoos and raptor centres, should be noted (animal garden 2; country park 2; rehabilitation centre 1; owl centre 2; theme park 2).

Comparison 4: Differences between Individual Centres

From the previous comparison, it is not surprising that there are differences between individual centres ($p < 0.000$). The ranking of centres is shown in Table 4.22. The high ranking of one of the two owl centres reveals why the owl centre category fared so well previously when compared by category of centre. The range of means shows the diversity in standards at centres. Table 4.23 shows statistical differences between individual centres using multiple range tests.

To test the hypothesis that welfare standards were related to how long a centre had been operating i.e. open to the public, regression analyses were carried out. However, no relationship was found between welfare standards and the date in which individual centres opened.

4.4.3

2. RESULTS AND DISCUSSION FOR DISPLAY BIRDS

Of the 38 centres assessed, 29 had birds tethered and offered flying displays. Total values within the results tables may not equal 29 due to a small number of centres having off view mews or weathering grounds or a flying display not taking place due to factors such as adverse weather conditions.

The results are divided into tethered birds on their weathering grounds and birds flying in displays.

A. Tethered Birds on Weathering Grounds or in Weatherings

Tables 4.24-4.34 shows the results of welfare issues relating to birds tethered in weatherings. Comparisons were made between the data from the specialist raptor centres and zoos with flying displays. No statistical differences were found between these two groups for any of the welfare criteria using Mann-Whitney U tests.

4.4.3a

◆ Numbers and Species of Birds

Table 4.24 shows the number of birds tethered divided by general category, specific category and Zoo Federation membership. Table 4.25 and Figure 4.23

Table 4.24: Numbers of birds tethered at different categories of centre

<u>General Category of Centre</u>	<u>No. of centres</u>	<u>No. of birds</u>	<u>Percent</u>
specialist raptor centre	20	276	83.6
zoo with flying display	9	54	16.4
Total	29	330	100.0
<u>Category of Centre</u>	<u>No. of centres</u>	<u>No. of birds</u>	<u>Percent</u>
raptor centre	17	272	82.4
zoo	5	29	8.8
country park	2	17	5.2
animal garden	1	8	2.4
rehabilitation centre	1	4	1.2
owl centre*	2		
theme park*	1		
Total	29	330	100.0
<i>* no tethered birds on display</i>			
<u>Zoo Federation Membership</u>	<u>No. of centres</u>	<u>No. of birds</u>	<u>Percent</u>
Non-Member	22	279	84.5
Member	7	51	15.5
Total	29	330	100.0

Table 4.26: Number of tethered birds according to species group

<u>Species group</u>	<u>No. of birds</u>	<u>Percent</u>
falcon	132	40.0
owl	85	25.8
buzzard	66	20.0
eagle	29	8.8
accipiter	7	2.1
kite	5	1.5
caracara	3	0.9
vulture	3	0.9
Total	330	100.0

Figure 4.24: Percentage of Birds Tethered According to Species Group

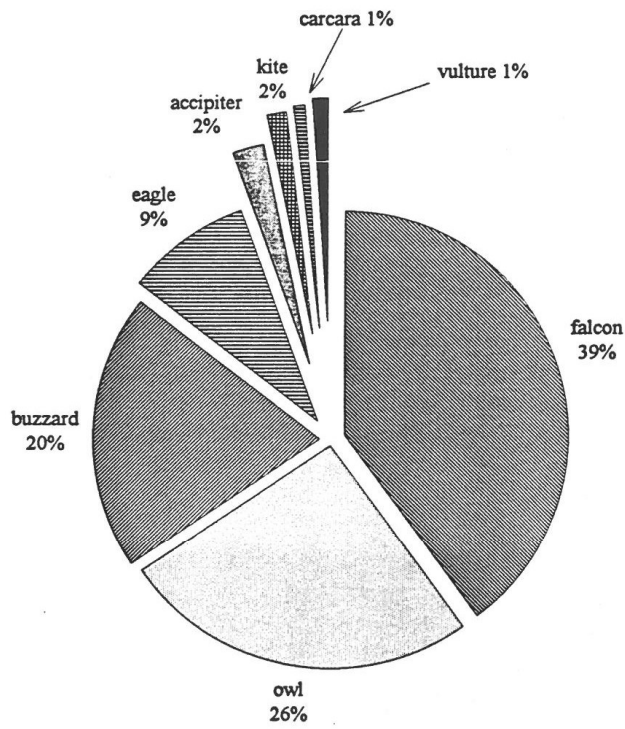


Table 4.27: Number of tethered birds according to species

<u>Species</u>	<u>No. of birds</u>	<u>Percent</u>
lanner falcon	44	13.3
common buzzard	29	8.8
Eurasian kestrel	25	7.6
European eagle owl	24	7.3
Harris hawk	23	7.0
Bengal eagle owl	20	6.1
peregrine	18	5.5
barn owl	18	5.5
saker falcon	18	5.5
tawny eagle	14	4.2
hybrid falcon	12	3.6
ferruginous buzzard	9	2.7
tawny owl	9	2.7
bald eagle	6	1.8
lugger falcon	6	1.8
snowy owl	6	1.8
red-tailed buzzard	5	1.5
merlin	5	1.5
sparrowhawk	5	1.5
golden eagle	3	0.9
brahminy kite	3	0.9
crested caracara	2	0.6
bateleur	2	0.6
hobby	2	0.6
African spotted eagle owl	2	0.6
Iranian eagle owl	2	0.6
turkey vulture	2	0.6
goshawk	2	0.6
striated caracara	1	0.3
Verreaux's eagle	1	0.3
steppe eagle	1	0.3
New Zealand falcon	1	0.3
black kite	1	0.3
scops owl	1	0.3
Turkmenian eagle owl	1	0.3
African fish eagle	1	0.3
Siberian eagle owl	1	0.3
king vulture	1	0.3
red kite	1	0.3
prairie falcon	1	0.3
white-tailed sea eagle	1	0.3
Total	330	100.0

Figure 4.25: Twenty Most Commonly Exhibited Tethered Species

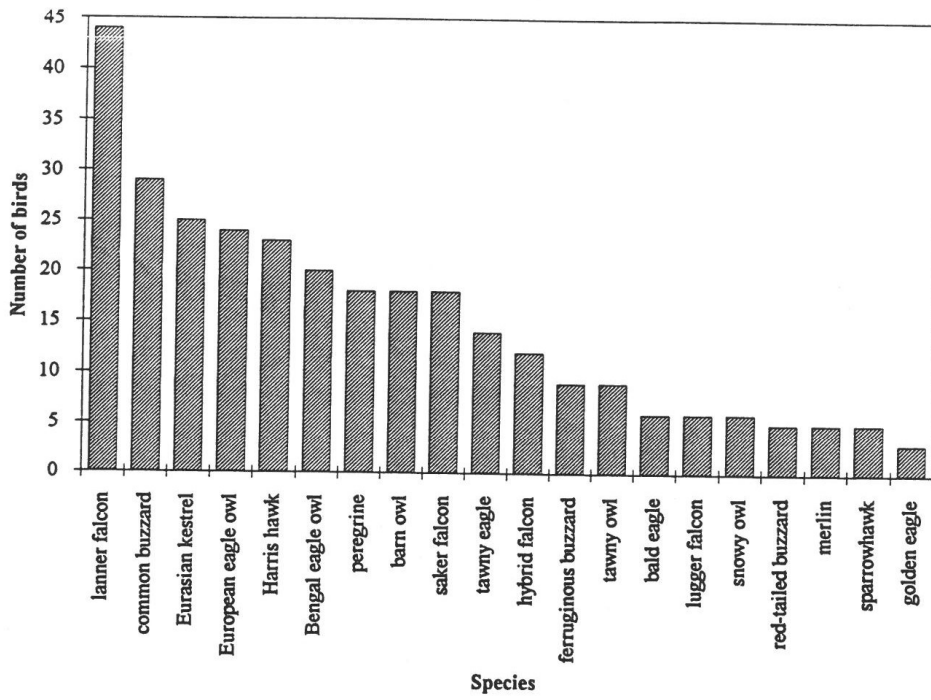


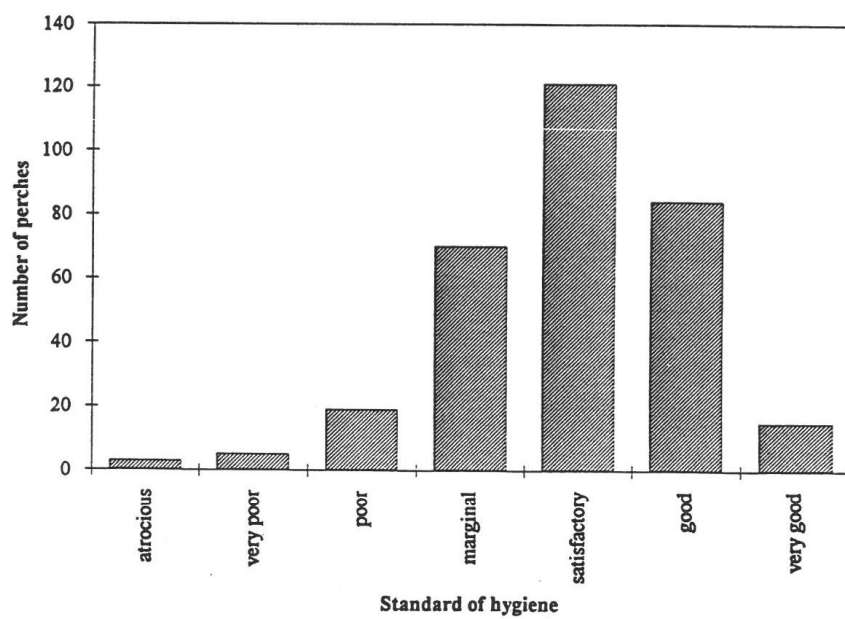
Table 4.29: Coverings for type of perch

Perch Coverings					
Block	No. of perches		Percent	Bow perch	
	No. of perches	Percent		No. of perches	Percent
astroturf	84	52.2		19	18.3
cork	44	27.3		9	8.7
rope	0	0.0		20	19.2
plastic	0	0.0		5	4.8
nothing	9	5.6		5	4.8
leather	3	1.9		35	33.7
other	21	13.0		11	10.6
Total	161	100.0		104	100.0
Stump	No. of perches		Percent	Ring perch	
	No. of perches	Percent		No. of perches	Percent
		0.0			0.0
astroturf	12	29.3		0	0.0
cork	0	0.0		0	0.0
rope	0	0.0		0	0.0
plastic	0	0.0		3	75.0
nothing	29	70.7		0	0.0
leather	0	0.0		1	25.0
other	0	0.0		0	0.0
Total	41	100.0		4	100.0
Concrete stump/rock	No. of perches		Percent	Other	
	No. of perches	Percent		No. of perches	Percent
astroturf	0	0.0		4	66.7
cork	0	0.0		0	0.0
rope	0	0.0		0	0.0
plastic	0	0.0		0	0.0
nothing	5	100.0		2	33.3
leather	0	0.0		0	0.0
other	0	0.0		0	0.0
Total	5	100.0		6	100.0

Table 4.30: Hygiene of perches for tethered birds

<u>Standard of hygiene</u>	<u>No. of perches</u>	<u>Percent</u>
atrocious	3	1
very poor	5	2
poor	19	6
marginal	70	21
satisfactory	121	37
good	84	26
very good	15	5
<i>missing data</i>	12	4
Total	330	100

Figure 4.26: Hygiene of Perches for Tethered Birds



tangled each time it bated over the object and was left dangling upside down as illustrated from afar in Plate 4.4 (the Plate also illustrates the odd nature of some public collections with flying displays!). Fortunately, the handler rescued the bird within minutes but in the absence of this assistance the bird would be left suspended by its legs.

At one centre a Crested Caracara was tethered to a block by the till in the entrance foyer (Plate 4.5). This bird was tethered by passing the leash directly through the eyelet of *one anklet* rather than being attached via a swivel to both jesses. Had the bird bated all of the stress, and probable twisting, would have been concentrated on the one leg probably resulting in injury. Such an act is quite thoughtless in any situation but placing it in such an accessible and public place puts the bird at greater risk of frightening stimuli and hence increases the potential for bating.

4.4.3c

◆ Perch Hygiene

Whereas in an aviary a bird may be able to select a number of different perches, a tethered bird is restricted to one perch only. For this reason good hygiene is of paramount importance. Table 4.30 and Figure 4.26 show the results of perch hygiene. It can be seen that results follow a normal distribution with 8.2% (27/330) scored as poor or worse. Poor hygiene was of particular concern where there was no cover on the perch i.e. the bird was sitting in an infectious environment on a hard even surface.

4.4.3d

◆ Weathering Design

On the whole the design of mews was found to be good, with adequate shelter (24/27, 89%) and size (26/27, 96%) (Table 4.31). It should be noted, however, that for those birds tethered out with no shelter (3/27, 11%), weather conditions were extremely hot and birds at two of the three centres showed signs of heat stress by panting or attempting to shelter in the shade of their block or perch.

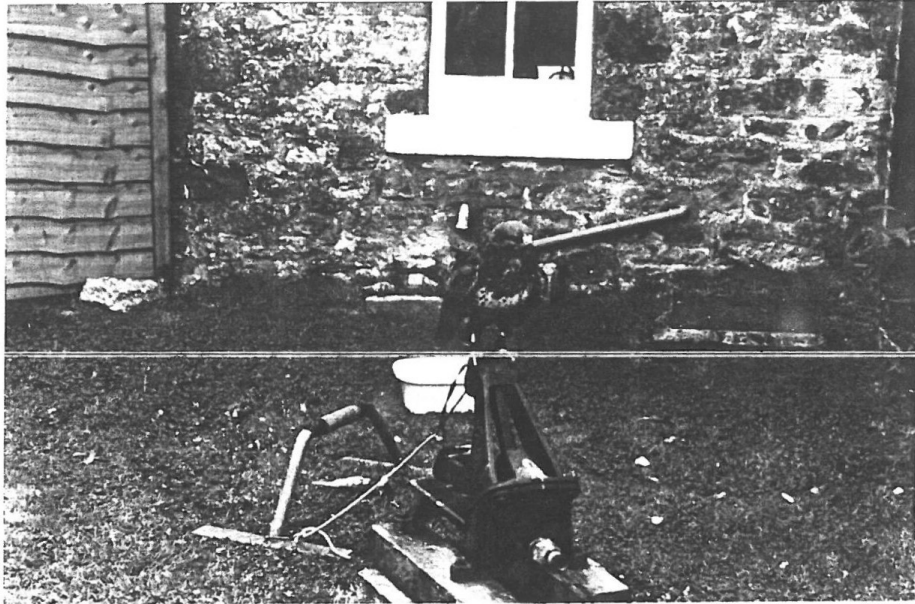


Plate 4.3: Tethered birds should be surrounded by nothing on which they can become tangled: Common Buzzard *Buteo buteo* selecting the highest point to sit i.e. the proximal object.



Plate 4.4: Tethered bird, not surprisingly, tangled up: the same Common Buzzard having bated over the obstacle and dangling upside down (Plate illustrates the odd nature of some public collections).

4.4.3e

◆ Tethering in View of Each Other

Two thirds of centres (18/27) tethered their birds in view of each other. Aversive behavioural responses to this were displayed infrequently indicating that, as far as was possible to ascertain, this practice may not compromise welfare (Table 4.31). However, at one centre pride was taken by the keeper in tethering a male Eurasian Kestrel next to a particularly large female Bald Eagle *Haliaeetus leucocephalus*. The apparent joke value of the size disparity was probably lost on the kestrel which was possibly suffering chronic low(?) grade fear.

Of those birds tethered in view of each other, 4/18 (22%) centres tethered some birds so close that they could probably reach one another, had they wanted to attack one another (Table 4.31). This may, or may not, be a problem depending on the unascertainable relationship between the two birds. Regardless of this relationship, birds of prey are known to be temperamental for a number of intrinsic and extrinsic reasons and it is considered by the researchers that it is an unwise practice with associated potential dangers.

4.4.3f

◆ Protecting the Birds from the Public and vice versa

As the birds are tethered they are unable to escape should a member of the public attempt to touch or harm them. Almost a fifth (5/27) of centres allowed the public close proximity to the birds with 26% (7/27) of centres providing no, or a wholly inadequate, barrier between birds and the public (Table 4.32). This said, no incidences of humans attempting to cause harm were recorded. However, in one situation a young boy became very upset after being bitten by the tethered kestrel he was allowed to stroke. Regardless of signs or keepers to warn the public of the dangers to both parties, adequate barriers and sufficient distance are required. Plates 4.6-4.8 illustrate the danger to the public and the cavalier attitude of the bird handler. Fortunately, the boy was not injured.

However, over half the centres maintained an adequate distance between the public and the birds (52%) and an adequate barrier (59%)(Table 4.32).

Plate 4.9 illustrates an Iranian Eagle Owl *Bubo bubo nikolskii* tethered sensibly in the shade of a tree on a clean bow perch with suitable covering; a bath of good design and hygiene is available to the bird-to one side to avoid the bird fouling the water with faeces; a fence is present to keep the public at a safe distance.

Table 4.31: Tethered bird welfare criteria: shelter; size of mews; birds in view of one another and/or within reach of one another

Welfare criteria	No. of centres	Percent
Tethered birds provided with shelter		
yes	24	88.9
no	3	11.1
Total	27	100.0
Adequate size of mews		
yes	26	96.3
no	1	3.7
Total	27	100.0
Tethered birds in view of one another		
yes	18	66.7
no	9	33.3
Total	27	100.0
Adequate distance between tethered birds		
yes	14	77.8
no	4	22.2
Total	18	100.0

Table 4.32: Tethered bird welfare criteria: protection from the public

Welfare Criteria	No. of centres	Percent
Distance from the public		
close proximity	5	18.5
short distance	6	22.0
adequately separated	16	59.3
Total	27	100.0
Adequacy of barrier between birds and public		
poor	7	25.9
adequate	6	22.2
good	14	51.9
Total	27	100.0



Plates 4.6-4.8: White-bellied Sea Eagle *Haliaeetus leucogaster* (with a bill in great need of coping) biting a member of the public, whilst in the care of a responsible handler(?)

4.4.3g

◆ **Incompatible Birds Flying Loose or in View of Tethered Birds**

A high number of centres allowed birds to fly free in view of tethered birds or allowed (accidentally or purposefully) incompatible birds to fly loose together (10/24, 41.6%)(Table 4.33). This is a very serious welfare concern although the researchers did not witness any birds attacking others. As an example of the potential danger Plate 4.10 shows a Common Buzzard in an easy position to attack the hooded, and hence unaware of the danger, falcons below. At some of the centres poor practice on behalf of the handler was responsible for the danger. At other centres, in particular the smaller centres, the flying arena was positioned proximal to the weathering. The extent of this problem is difficult to ascertain due to the snapshot of time the researcher was present at each centre i.e. witnessing a maximum of three different displays on only one day.

Incidences have occurred at centres in the past e.g. an incident involving an Eurasian Kestrel being attacked by a Harris Hawk (as described by various letters to the editors of *The Falconers and Raptor Conservation Magazine*, Autumn 1994; Appendix 4.3). This particular incident illustrates how the primary interest was to provide an entertaining spectacle for the public with welfare concerns a secondary interest.

4.4.3h

◆ **Feeding Birds in View of One Another**

This practice would probably not be a welfare problem if the observing birds were replete. However, at three of the 28 centres (11%) where feeding birds took place directly in view of tethered birds, the latter bated toward the food and were undoubtedly frustrated and risked leg damage due to excessive bating (Table 4.33). As mentioned previously, flying birds were often loose in view of tethered birds, and at a number of these centres tethered birds could observe the flying birds feeding on the fist or flying to the lure.

4.4.3i

◆ **Tethering Indefinitely**

At 11/28 (39%) centres, one or more birds were knowingly tethered indefinitely/or certainly not flown daily as was claimed (Table 4.34; Figure 4.27). In a number of cases this was due to the bird(s) being old or suffering from a respiratory disorder which rendered them unsuitable to flying distances. In both these cases, there is no excuse for not retiring birds to aviaries. At other centres birds were tethered whilst the building of aviaries was anticipated i.e. birds were bought, accepted or bred before acquiring suitable accommodation. This attitude is most perturbing, as tethering is seen, therefore, as a space saving device. The maximum length of time spent tethered is uncertain but at one centre this was undoubtedly months.

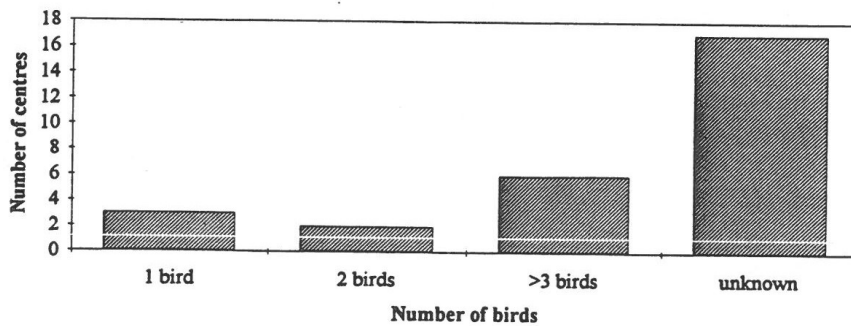
Table 4.33: Tethered bird welfare criteria: birds flying loose together/ in view of tethered birds; birds fed in front of one another

Welfare Criteria	No. of centres	Percent
Incompatible flying birds loose together or in view of tethered birds		
yes	10	41.6
no	14	58.3
Total	24	100.0
Birds fed in front of other birds		
observed	3	10.7
unknown	25	89.3
Total	28	100.0

Table 4.34: Tethered bird welfare criteria: tethered without being flown daily

Welfare Criteria	No. of centres	Percent
Birds known to be tethered without being flown		
1 bird	3	10.7
2 birds	2	7.1
>3 birds	6	21.4
unknown	17	60.7
Total	28	100.0

Figure 4.27: Number of Birds Tethered Without being Flown Daily per Centre



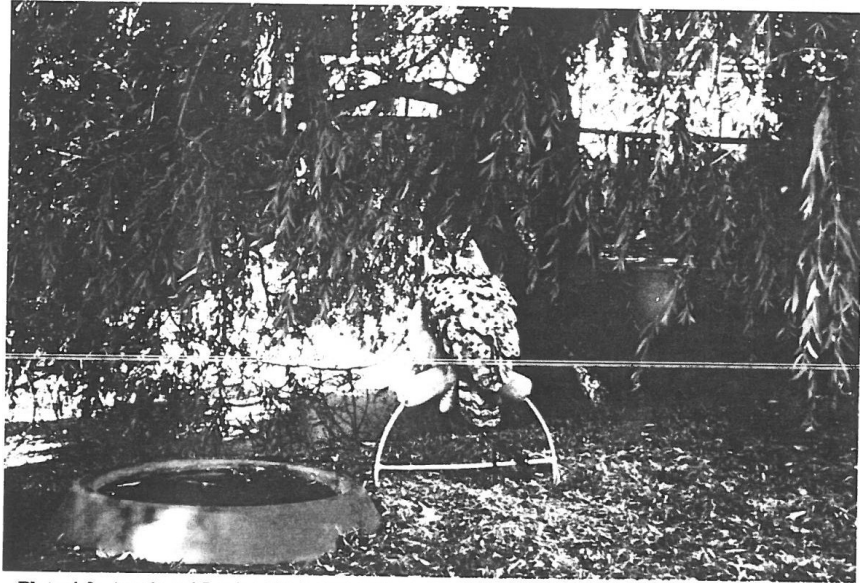


Plate 4.9: A tethered Iranian Eagle Owl *Bubo bubo nikolskii* with welfare *a priori*. Some would suggest not tethering *any* owls, however, if a bird is to be tethered it should be furnished with a suitable clean perch, in the shade, with access to a well designed bath of good hygiene. Additionally, it should be safe from predation (it is behind a fence to deter humans and below a tree to deter aerial attack although mobbing non-raptors are a potential problem).



Plate 4.10: Common Buzzard *Buteo buteo* loose in view of two unsuspecting hooded falcons below: an easy meal? (Handler appeared unaware of the buzzard's presence).

Most centres are keen to claim that *all* tethered birds are flown daily, as they should be, and this was always the response when staff were asked by the researcher. However, when asked about specific birds which looked incapable of flight, staff would admit to its sedentary existence. A particularly sad case involved a Verreaux's Eagle *Aquila verreauxii*. This bird was obtained as wild disabled from South Africa. It was imported into this country with appropriate CITES licences to become part of a proposed captive breeding programme. This programme never transpired and the bird was passed from owner to owner. Eventually it ended up at a raptor centre where it is tethered permanently on display with its damaged wing obviously preventing it from flying (Plate 4.11).

Table 4.25 and Figure 4.23 showed the numbers of birds tethered per centre which equates to a mean of 13.8 (330/24) tethered birds per centre. It would seem that most centres fly no more than ten birds to the public in one day, with some perhaps flying as many as 15. Other centres fly fewer than this and at two centres birds were flown only when a sufficient number of members of the public came in. Are the other birds flown in the evening or before the public arrive? As a rough calculation, a single bird takes at least 15 minutes to exercise, this includes the preparation of food, weighing the bird, flying the bird for five minutes and putting it away. If the public arrive at 10am and leave at 6pm this leaves perhaps four hours (two hours before 10am and two hours after 6pm) in which to fly the other birds, i.e. time for an additional maximum of 16 birds to be flown individually. Centres such as the one with 35 tethered birds seem practically to be unable to live up to the claim that all birds are flown daily i.e. this would take one handler 35 x 15 minutes, 8.75 hours per day doing nothing else but exercising birds.

The researcher was left with the impression that some centres feel it is important to offer the public something to see even if this compromises the welfare of the bird.

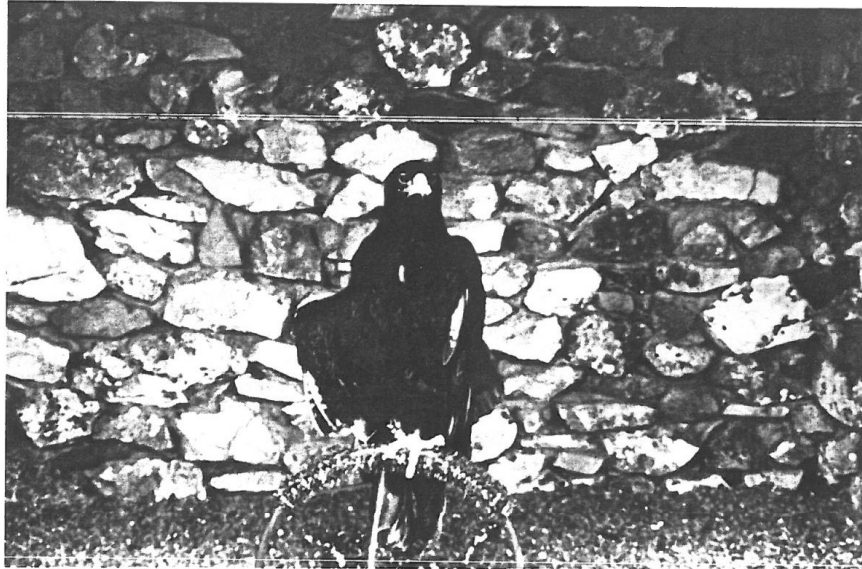


Plate 4.11: Tethered birds should be flown daily: tethered wild disabled Verreaux's Eagle *Aquila verreauxii*, clearly incapable of flight. Imported (under pretences of a captive breeding programme) from its native South Africa to end up tethered indefinitely at a British raptor centre.

B. Birds Flying in Displays

The results of welfare criteria for birds flown free during flying displays are summarised in Tables 4.35-4.42.

4.4.3j

◆ The Flying Arena

The size of arenas was relatively evenly distributed between small, medium and large (30%, 37% and 33% respectively)(Table 4.35). Of centres with small arenas (8/27), six were at small centres where space was restricted for both aviary birds and flying birds. Falcons were witnessed being flown at three of these centres, the arenas being wholly unsuitable for such birds.

4.4.3k

◆ Dangers to Flying Birds

Over a third of centres had their arenas positioned where there were no apparent dangers to flying birds (Table 4.35). However, at 10/27 (37%) centres there were potential dangers to flying birds and serious dangers were found at a further 7/27 (26%) centres. One of the two most common forms of danger was proximity of roads (six centres). It is known that at two of these centres, birds have been hit by cars whilst flying in displays. Of these six centres sited by main roads, five were associated with garden centres, which are generally positioned on main roads in order to attract the public.

The other equally common danger was the presence of wires (including barbed wire) positioned above or around the flying arenas. Whilst these wires *may* be an unlikely cause of morbidity or mortality to birds such as the owls, the falcons are at particular risk due to their speed of flight. Other dangers included tall trees and buildings surrounding the arenas, large bodies of water directly next to the arena and even proximity of large carnivore enclosures at one zoo. At one centre with a lake adjacent to the arena, the handler joked how he was always having to retrieve birds from it.

4.4.3l

◆ Loss of Birds

Of 20 centres where it was possible to ascertain whether birds had flown off and become lost during flying displays, 18 (90%) admitted to having lost birds (Table 4.35). However, most centres from which it was possible to obtain information (12/14) stated that the birds had been recovered days or weeks later. Of the other two centres, one had lost a bird permanently and the other centre stated that some of its lost birds had been recovered over time whilst other birds had not (Table 4.35). At one centre where quantified data were not gathered, the researcher witnessed a falcon flying off which, by three days later, had not returned.

The loss of birds from centres can provide good publicity. One centre reported high visitor numbers after a Bald Eagle was lost and local media covered the story

Table 4.35: Flying bird welfare criteria: arena size; dangers to birds; lost birds

Welfare Criteria	No. of Centres	Percentage
Size of flying arena		
small	8	29.6
medium	10	37.0
large	9	33.3
Total	27	100.0
Dangers to flying birds		
none	10	37.0
potential danger	10	37.0
serious danger	7	26.0
Total	27	100.0
Admitting to losing birds		
yes	18	90.0
no	2	10.0
Total	20	100.0
Return of lost birds		
yes	12	85.7
no	1	7.1
some	1	7.1
Total	14	100.0

extensively. Once the bird was returned, having been found being mobbed by several hundred seagulls, the public were keen to visit the centre to see the bird.

4.4.3m

◆ The use of Radio Tracking on Flying Birds

From the total values in Table 4.36 it can be seen that the great majority of birds (85%) wore no telemetric (radio tracking) devices when flying free. The greatest proportion of birds wearing telemetry were the falcons (31%)(Figure 4.28). The falcons are the group which travel fastest and usually furthest from the handler and probably have the greatest chance of flying away. It could be argued that birds such as the owls, caracaras, kites and vultures rarely fly great distances in displays and are, therefore, less likely to fly away hence their need for telemetry may not be as great as that of the falcons. Both the buzzards and eagles are capable of travelling relatively great distances from the display giver, however, only 20% of the former and 27% of the latter wore telemetry.

Telemetry technology is expensive and this may account for the low numbers of birds being fitted, the radio tracking devices potentially costing more than a single bird. However, at centres where numerous birds are flown the cost, if divided per bird flown, is greatly reduced. Beyond welfare, many of the birds were very valuable in financial terms and it is surprising that centre staff may dispense with the available safeguards against losing a bird.

4.4.3n

◆ The use of Bells on Flying Birds

Bell wearing was found to be a far more common practice. This may be because bells are more traditional and unlike telemetry, bells are relatively inexpensive (although in certain species, such as Barn Owls, they *may* cost more than the bird). In addition, the range of the sound of the bells may be considered adequate by the handler for the average range of the bird during displays. Not surprisingly, the highest rate of bell wearing was found in the buzzards and falcons (80% and 75% respectively). However, only half of the eagles were fitted with bells.

4.4.3o

◆ The use of neither Radio Tracking nor Bells on Flying Birds

Table 4.36 and Figure 4.29 show the numbers of birds in each species group wearing neither telemetry nor bells. In this situation the handler is relying on his or her own eyesight to keep in contact with the bird. The efficacy of this may be better where the flying arena is large and open but many arenas were surrounded by buildings or trees (see section 4.4.3k). Should the bird decide to fly away or become lost there is no way of tracking it.

Excluding the kites, vultures and caracaras because of their small sample size, it can be seen that the greatest proportion of birds wearing neither telemetry nor bells were the owls. This group of birds tends not to fly far during displays and owls are often used to demonstrate silent flight hence may not be fitted with bells

Table 4.36: Flying Bird Welfare Criteria: telemetry, bells and types of jess

Species Group	Telemetry	%	No telemetry	%	Bells	%	No bells	%	Flying jesses	%	Mews jesses	%	Other jesses	%	Neither bells nor telemetry	%
buzzards	6	20	24	80	24	80	6	20	0	0	30	100	0	100	5	16.7
eagles	3	27.3	8	72.7	5	50	5	50	0	0	12	100	0	0	5	50
falcons	11	30.6	25	69.4	27	75	9	25	0	0	37	100	0	0	9	25
caracaras	0	0	2	100	0	0	2	100	0	0	2	100	0	0	2	100
kites	0	0	3	100	0	0	3	100	0	0	0	0	3	100	3	100
vultures	0	0	4	100	1	25	3	75	0	0	2	50	2	50	3	75
owls	0	0	46	100	7	15.9	37	84.1	0	0	41	89.1	5	10.9	37	86
Total	20	15.2	112	84.8	64	49.6	65	50.3	0	0	124	92.5	10	7.5	64	50

Totals may not tally due to occasional incomplete data

Figure 4.28: Welfare Criteria for Falcons being Flown Loose: telemetry, bells and types of jess

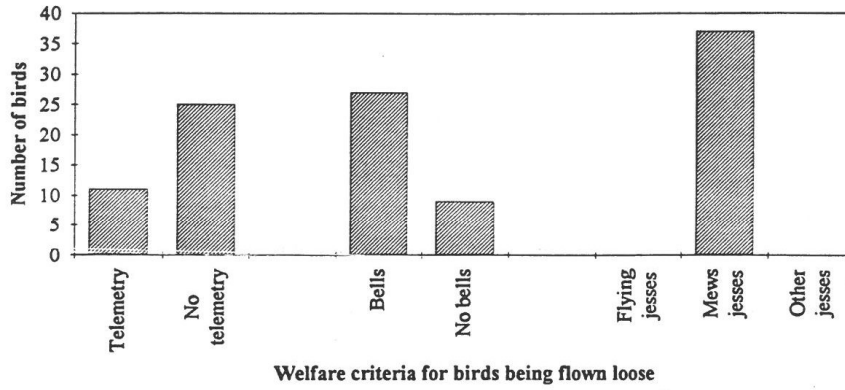


Figure 4.29: Percentage of Birds Flown wearing neither Telemetry nor Bells per Species Group

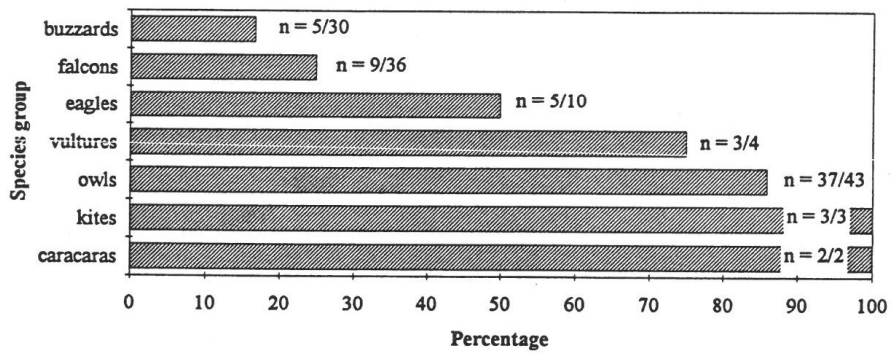


Table 4.37: Other welfare problems of flying and tethered birds

Other welfare problems	No. of Centres	Percentage
no other major concerns	16	57.1
other problems	5	17.9
other serious problems	1	3.6
other very serious problems	6	21.4
Total	28	100.0

for educational purposes. It is surprising, however, to see the relatively high proportions of buzzards, eagles and falcons being flown with no safeguards against their becoming lost. As mentioned previously, falcons usually fly great distances from the handler. One in four of these birds is flying at great risk of becoming lost. This apparent recklessness on behalf of the handler is particularly odd considering the abilities of some of the individual birds. Six of the birds were Lanner or Saker Falcons *Falco cherrug* which appeared to be very fit and flew out great distances at great speed. At one centre the arena and surrounding countryside was very open and the wind was very strong, yet two of the Saker Falcons were flown without telemetry or bells. It is not surprising that birds had been lost previously from this centre.

Of the 18 centres admitting to having lost birds, 14 (78%) were observed flying birds without bells or telemetry. However, the two centres that claimed they had never lost a bird also flew their birds without bells or telemetry. Sample sizes within species group were too small for any statistical evaluation of the use of tracking devices and bird return rates.

Should a bird become lost, the chances of a display bird surviving by comparison to a falconry bird, are slim. The welfare and conservation problems of lost birds have been discussed in Chapter 3, section 3.8.5.

4.4.3p

◆ The use of Flying or Field Jesses on Flying Birds

The results (Table 4.36) show clearly that although birds are flying free, none were fitted with flying jesses although eight of the ten from the "other" category were birds flown with no jesses. The huge majority of birds (124/134, 93%) were flown with mews jesses and as such are at risk of becoming tangled up. Plate 4.12 shows a publicity photograph of a Bengal Eagle Owl *Bubo bubo begalensis* used to advertise a raptor centre. The bird is flying whilst wearing mews jesses. Many birds, most commonly the buzzards, were seen to fly and hop about in trees around the arena, usually well out of reach of the handler should entanglement occur. Without bells, should a bird become entangled out of sight of the handler it is unlikely that it would be found and reached in time to save it.

In addition, a number of falcons were flown where there was barbed wire topping the edge of the arena or in the vicinity of the arena as discussed in section 4.4.3k. Many falcons were witnessed flying over the wire at great speeds. Should the jesses have caught on the wire there would have been considerable traumatic injury (fractures and/or dislocations).

One of the "other" cases involved a European Eagle Owl *Bubo bubo* being flown free with its jesses, swivel and leash still attached (Plate 4.13). Admittedly, it flew only a short distance, but had it flown off the likelihood of it becoming entangled in a short space of time is very high. This centre offers courses in raptor management.

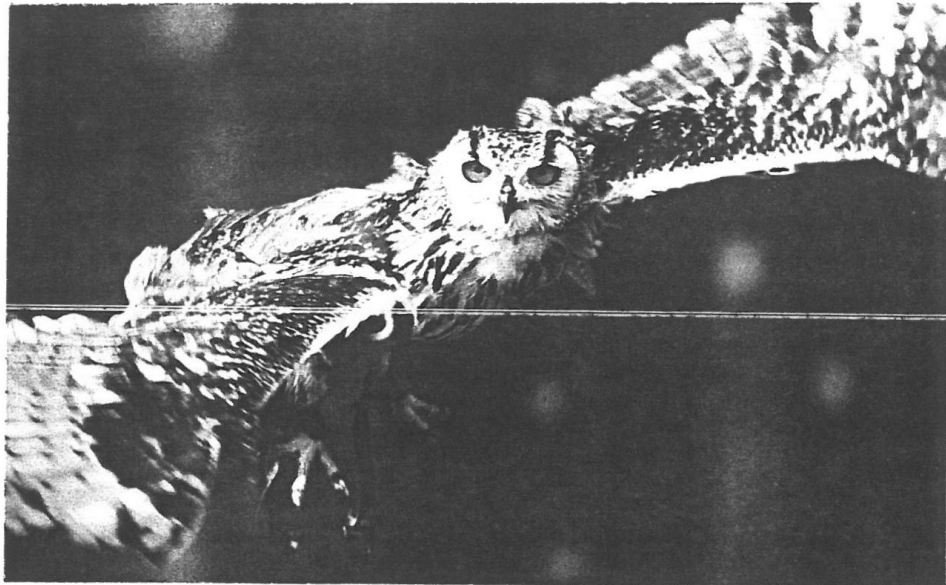


Plate 4.12: Advertising poor practice: publicity photograph of a Bengal Eagle Owl *Bubo bubo bengalensis* used to advertise a raptor centre, flying whilst wearing mews jesses.



Plate 4.13: Extreme example of the potential dangers to birds flying loose: European Eagle Owl *Bubo bubo* loose whilst wearing jesses, swivel and leash (additionally, the educational value of teasing it with earthworms is dubious).



Plate 4.14: Poor practice leading to behavioural problems: a (not surprisingly) angry Tawny Eagle attacking a handler after food was "stolen" from it.

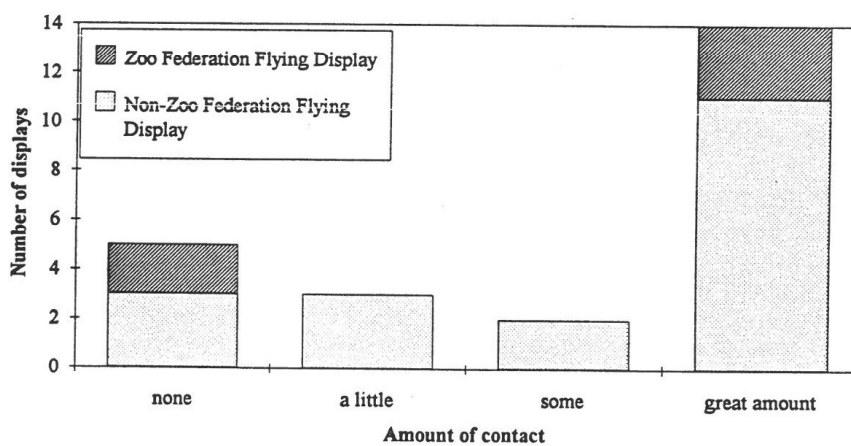


Plate 4.15: Potential danger to the public: White-tailed Sea Eagle *Haliaeetus albicilla* flown to a member of the public (if a problem occurs the handler in the background cannot help as he has given his glove to the member of the public).

Table 4.38: Direct contact with the public during flying displays

Score	Non-Zoo Federation	Zoo Federation	Total
none	3	2	5
a little	3	0	3
some	2	0	2
great amount	11	3	14
Total	19	5	24

Figure 4.30: Amount of Direct Contact between the Birds and the Public



The welfare of the public must be considered also. When the bird in Plate 1.1 bated, it inadvertently hit a young boy who was subsequently distressed although not injured. Plate 4.15 illustrates a White-tailed Sea Eagle *Haliaeetus albicilla* about to land on the hand of a member of the public. This is clearly a huge bird which could easily intimidate a member of the public. Should the "perch" i.e. hand, be retracted in fear, the bird could well attempt to land on another part of the member of the public causing accidental yet potentially serious injuries. Another observation shows the man responsible for the bird in the background. He is without his glove as he has given this to the member of the public. Should an unfortunate incident occur he is in a poor position to help as he is without defence. Those caring for their birds know of their charges' temperament and may feel that a bird can be trusted. However, no captive raptor is beyond being aggressive should environmental or internal factors solicit such a response.

4.4.3s

◆ **Emphasis of Difficulty or Non-Pet Status in the Commentary of Displays**

It is difficult to assess whether members of the public are influenced to take up raptor keeping and to what extent this may affect welfare of birds in the future. However, an assessment was made of the emphasis of this aspect in the commentary, as flying displays often appear exciting and birds easy to train. Of the 24 displays witnessed, only two (8.3%) mentioned that it was difficult or time-consuming. The same centres also emphasised that the birds were not pets. The other centres i.e. the great majority of centres (91.7%) made no reference to this aspect.

4.4.3t

Differences between Centres

The same statistical analyses used to assess the aviary data were carried out to analyze the data regarding display birds at the centres i.e. both data from the tethered birds and the flying displays. Centres were allocated a single score based on the sum of the scores for individual welfare criteria. Different weightings were given to some of the criteria to reflect their importance. Although 28 centres with displays were assessed, four centres had to be omitted from the results: at one centre the mews were not displayed to the public and at three of the centres the researcher did not witness a display either due to poor weather conditions or, as in one case, birds being flown only when sufficient number of visitors came in. These centres (a zoo, theme park and two raptor centres) have had to be omitted from the analyses as it was not possible to give a score for the actual flying display or the weathering facilities.

Comparison 1: Differences between Zoo Federation Members and non-Members

No significant difference was found between Zoo Federation and non-Federation centres, although the sample size is smaller than for the comparison of aviaries (Table 4.39).

Comparison 2: Differences between General Category of Centre i.e.:

specialist raptor centre
zoo with flying display

As for comparison 1 there was no statistical difference between the two general categories. The small sample size (18 specialist raptor centres and six zoos with flying displays) may be responsible for this lack of statistically significant difference (Table 4.40).

Comparison 3: Differences between Category of Centre i.e.:

animal garden
country park
owl centre
rehabilitation centre
raptor centre
theme park
zoo

A comparison between category of centre found no statistical differences, again perhaps due to the small sample size. The means ranks do however illustrate a trend (Table 4.41).

However, a multiple range test does show owl centres, country parks, raptor centres and zoos to be significantly better than the single rehabilitation centre, with significant differences between the country park and the lower ranking raptor centres and animal garden ($p < 0.05$)(Table 4.42).

Comparison 4: Differences between Individual Centres

As a single score was given per centre no analysis could be carried out between individual centres.

Again, testing the hypothesis that welfare standards were related to how long a centre had been operating i.e. open to the public, found no relationship using regression analyses.

Table 4.39: Comparison using Kruskal Wallis 1-way ANOVA of both tethered and flying birds for Zoo Federation Members and Non-members

Kruskal-Wallis 1-way ANOVA		
<u>Chi-Square</u>	<u>D.F.</u>	<u>Significance</u>
0.8539	1	0.3555
<u>Zoo Federation membership</u>	<u>Mean Rank</u>	<u>No. of Centres</u>
Non-member	11.82	19
Member	15.1	5
Total		24

Table 4.40: Comparison using Kruskal Wallis 1-way ANOVA of both tethered and aviary birds for General Category of Centre

Kruskal-Wallis 1-way ANOVA		
<u>Chi-Square</u>	<u>D.F.</u>	<u>Significance</u>
2.56	1	0.1096
<u>General Category</u>	<u>Mean Rank</u>	<u>No. of Centres</u>
Specialist raptor centre	11.17	18
Zoo with flying display	16.5	6
Total		24

4.5 **RESULTS AND DISCUSSION: PART II.**

4.5.1 **II. CONSERVATION ASPECTS**

4.5.2 **1. Conservation Captive Breeding**

Captive breeding for conservation may be carried out with birds belonging to individuals but it is only through *coordination* with other breeders and experts that any conservation benefits can occur. The IUCN/Species Survival Commission/Conservation Breeding Specialist Group initiatives are implemented at a national level through the Zoo Federation by Taxon Advisory Groups (TAGs). Each TAG is made up of individuals and institutions with expertise in the conservation of a particular taxon. It is the responsibility of the chair of each TAG to coordinate these activities. The Bird of Prey TAG is divided into:

- ◆ The Diurnal Bird of Prey TAG
- ◆ The Owl TAG

Both are chaired by directors of specialist raptor centres, Jemima Parry-Jones, Director of The National Birds of Prey Centre, chairs the former, and Tony Warburton, Director of the World Owl Trust, chairs the latter. Participants in TAGs include both Zoo Federation members and non-members as well as owners of private collections of raptors.

From this it can be seen that certain individuals, specialist raptor centres and some zoos are vital to conservation captive breeding within the UK. Certainly The National Birds of Prey Centre has gained an international reputation due to its prestigious breeding record, having bred more raptor species (including IUCN red listed species) than any other single establishment.

4.5.3 **2. Conservation Research Projects**

Reviewing literature for published articles about research projects involving captive birds of prey in the UK revealed a number of papers relating to the veterinary science or clinical aspects of captive raptors as well as accounts relating to captive breeding. However, there appeared to be no reports of research regarding other aspects of raptor biology, ecology or behaviour using captive animals from public collections.

Of 157 Zoo Federation research projects reviewed, only seven (4%) were projects involving avian species and none of these involved raptors.

4.5.4 **3. Conservation Education**

Conservation education was assessed alongside welfare at both aviaries and flying displays.

Table 4.41: Comparison using Kruskal Wallis 1-way ANOVA of both tethered and aviary birds for Category of Centre

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
11.3362	5	0.0451
Category of centre	Mean Rank	No. of Centres
country park	22.75	2
owl centre	19	2
zoo	16.17	3
raptor centre	10.8	15
animal garden	5	1
rehabilitation centre	1	1
Total		24

Table 4.42: Multiple Range Test Comparisons between Categories of Centre for both tethered and flying bird welfare criteria

MULTIPLE RANGE TESTS: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq 6.0300 * RANGE * \sqrt{(1/N(I) + 1/N(J))}$
 with the following value(s) for RANGE: 2.97

(*) Indicates significant differences which are shown in the lower triangle

Mean	Category	rh	ag	rc	z	oc	cp
28.02	rh						
45.01	ag						
54.3413	rc	*					
61.34	z	*	*				
65	oc	*	*	*			
70	cp	*	*	*	*		

rh = Rehabilitation centre
 ag = Animal garden
 rc = Raptor centre
 z = Zoo
 oc = Owl centre
 cp = Country park

(i) Aviaries

The results of educational value of aviaries are shown in Tables 4.43-4.44 and are divided into data from Zoo Federation members and non-members due to the former's objective of education.

4.5.4a

◆ Interpretation

The majority of interpretation at aviaries was found to be inadequate with 31/340 (9.1%) aviaries lacking *any* form of information i.e. not even displaying a label to identify the contained species (Table 4.43; Figure 4.31). The greatest proportion of aviaries (114/340; 33.5%) merely displayed a label to identify the species. Those data recorded as "unsatisfactory" in the main indicate a label with species name and a token distribution map or few words to describe distribution.

There were no aviaries which used imaginative or interactive interpretation to provide an accessible message for the public. Some interpretation was rather misleading....(Plate 4.16).

4.5.4b

◆ Design

The design of aviaries from an educational perspective was found to be quite awful. Almost half the aviaries (158/340, 46.4%) were categorised as "very poor" (Table 4.44; Figure 4.32). This usually entailed a shed-like aviary containing a bird. The results of environmental enrichment reflect how barren many of the aviaries were, and this sterility provides no information for the public.

At the other extreme, a few centres had obviously made an effort to recreate the habitats from which some of the species came in an attempt to get over the diversity of ecosystems in which raptors play a role. As an example the aviary of the Great Grey Owl *Strix nebulosa* illustrated in Plates 4.17 and 4.18 show a wood owl living in an approximation of a forest (although not coniferous as is their natural habitat). However, it is likely that the public rarely see the owl(s)! Exciting interpretation *could* encourage the public to spend more time looking into the aviary whilst learning something of its role in northern circumpolar coniferous forests.

Table 4.43: Interpretation at aviaries

Score	Non-Zoo Federation	Zoo Federation	Total
very poor	19	12	31
poor	96	18	114
unsatisfactory	56	34	90
satisfactory	50	34	84
moderately good	3	4	7
good	2	11	2
excellent	0	1	1
Total	226	114	329

Figure 4.31: Interpretation at Aviaries

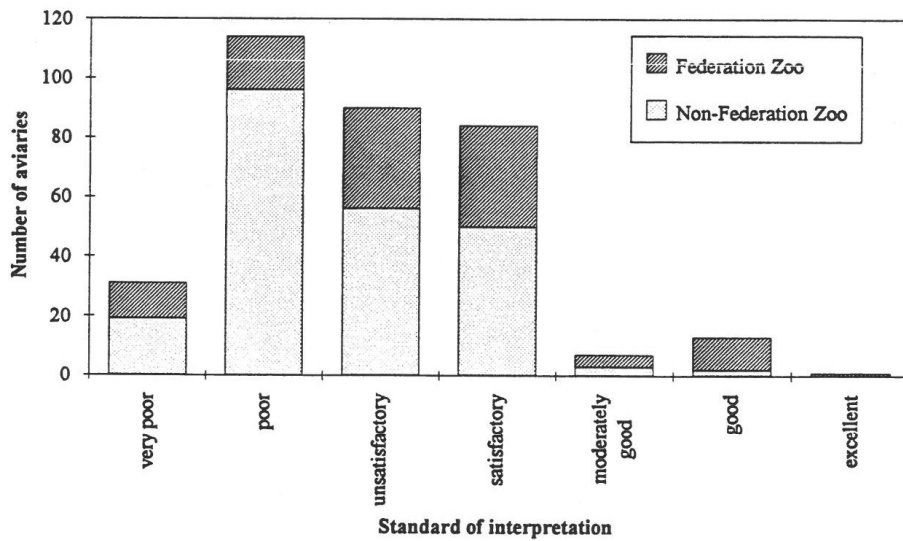
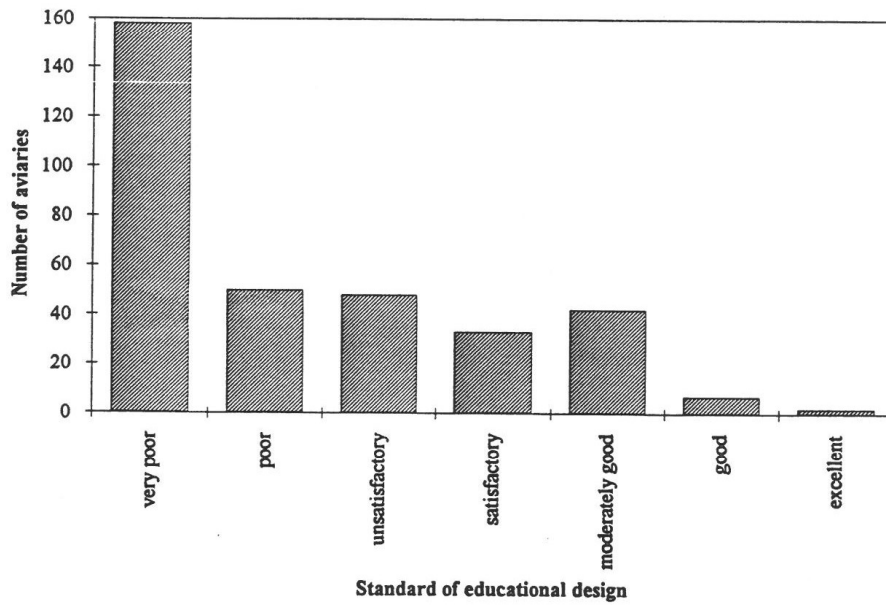


Table 4.44: Educational design of aviaries

Score	Non-Zoo Federation	Zoo Federation	Total
very poor	126	32	158
poor	38	12	50
unsatisfactory	25	23	48
satisfactory	18	15	33
moderately good	17	25	42
good	2	5	7
excellent	0	2	2
Total	226	114	340

Figure 4.32: Educational Design of Aviaries



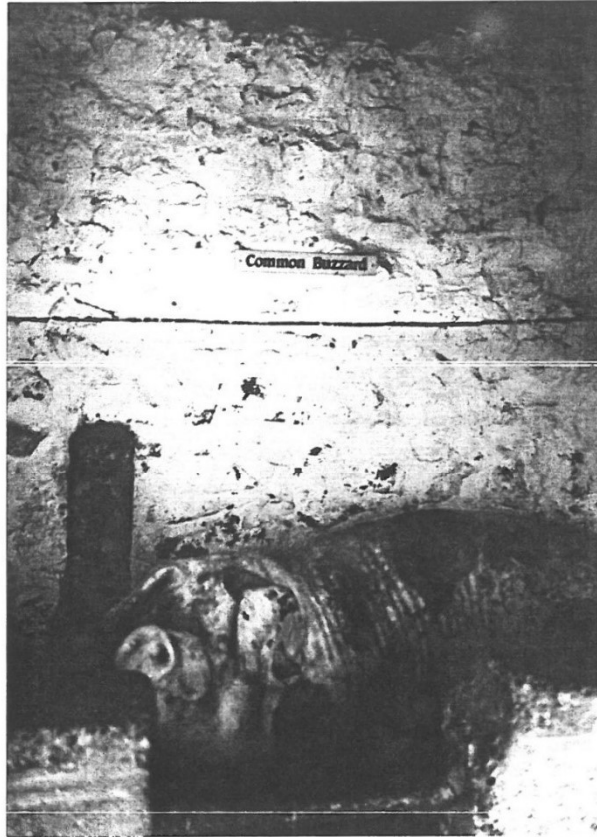


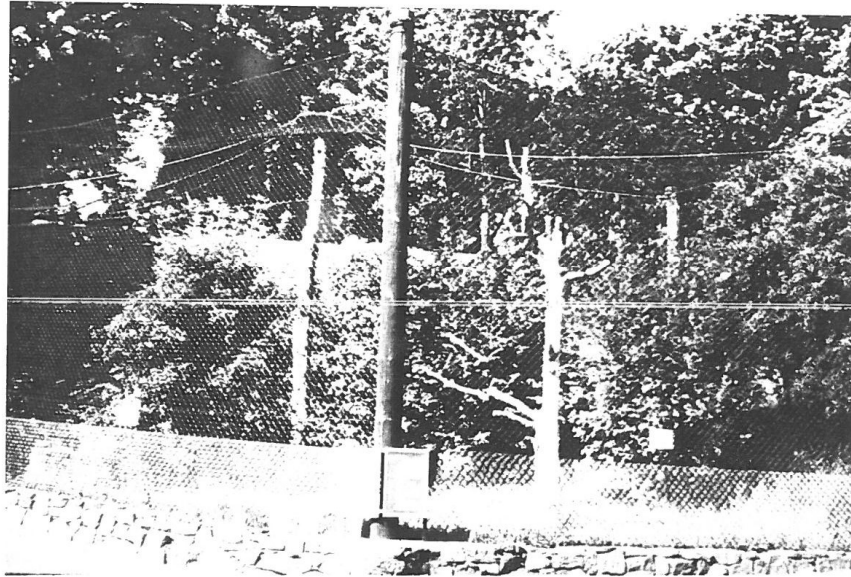
Plate: 4.16: Educational Interpretation?

Benefits to animal welfare can be gained also from such undertakings. As an example, at an owl centre aviaries housing desert-living species of owl were redesigned to approximate a desert environment with sand and appropriate xerophytic plants. From an educational perspective it suddenly becomes obvious why these birds have evolved sandy coloration and that deserts, typically perceived as barren ecosystems, are perhaps less species poor than realised. From a welfare perspective the birds are surrounded by an evolutionary familiar environment and in the case of the desert living owls, as soon as the birds were reintroduced to their renovated aviaries they proceeded to sand-bathe. It is difficult to determine how frustrating the prevention of sand-bathing may be to a species evolved to carry out this behaviour, but it illustrates how environmental enrichment can improve the welfare of the animal and the educational potential. However, in the case of some Barn Owls aviaries, birds were put at risk of developing aspergillosis by the recreation of barn environments complete with many bales of straw: an ideal source for *Aspergillus spp.* spores. Similarly, health problems of the Great Grey Owl shown in Plates 4.17-4.18 may not be noticed by a keeper. Balances must be calculated.

4.5.4c

◆ Anthropomorphism

The information at a small percentage of aviaries (5.6%, 19/340) was found to be anthropomorphic (e.g. "Harry the Harris Hawk enjoys watching television.....") with an additional four (1.1%) being slightly anthropomorphic. Such information is of dubious educational value and is more often misleading.



Plates: 4.17-4.18: An example of recreation of natural habitat for education with associated welfare benefits for a Great Grey Owl *Strix nebulosa*.

4.5.4d

Differences between Centres

The same statistical analyses used to assess the aviary welfare data were carried out to analyze the data regarding the educational aspects of the aviaries. Each aviary was given a single score based on scores given for design, presence of label, interpretation and anthropomorphism. Different weightings were given to the criteria to reflect their importance. Where data were missing a mean score for that criterion for that centre was assigned.

Comparison 1: Differences between Zoo Federation Members and non Members

A significant difference was found between the results of Zoo Federation and non-Zoo Federation members, with the former performing better than the latter ($p < 0.000$)(Table 4.45). Whilst this affirms their commitment to conservation education, it should still be noted that a small number of aviaries in Zoo Federation institutes were of poor educational value.

Comparison 2: Differences between General Category of Centre i.e.:

specialist raptor centre
zoo with flying display
zoo without flying display

A statistically significant difference was found between the general categories with the zoo without flying displays ranking highest ($p < 0.000$)(Table 4.46).

Further multiple range tests show that this group differed significantly from the other two groups ($p < 0.05$), no difference being found between these latter two groups. Of the zoos without flying displays 7/9 were Zoo Federation members i.e. the results of this and the former comparison are correlated (Table 4.47).

Comparison 3: Differences between Category of Centre i.e.:

animal garden
country park
owl centre
rehabilitation centre
raptor centre
theme park
zoo

A comparison between category of centre found statistical differences, with zoos ranking highest ($p < 0.000$)(Table 4.48). The multiple range tests finds zoos, owl centres and animal gardens being significantly better than raptor centres and the rehabilitation centre (Table 4.49). Interestingly, the rehabilitation centre in

Table 4.45: Comparison using Kruskal Wallis 1-way ANOVA of aviary educational criteria for Zoo Federation Members and Non-members

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
45.5136	1	0.000
Zoo Federation	Mean Rank	No. Aviaries
Non-member	144.96	226
Member	221.14	114
Total		340

Table 4.46: Comparison using Kruskal Wallis 1-way ANOVA of aviary educational criteria for General Category of Centre

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
50.2612	2	0.0000
General Category	Mean Rank	No. Aviaries
Specialist Raptor Centre	153.16	231
Zoo with Display	158.03	55
Zoo without Display	257.38	54
Total		340

Table 4.47: Multiple Range Test Comparisons between General Category of Centre for aviary welfare criteria

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq 1.7989 * RANGE * \sqrt{1/N(I) + 1/N(J)}$
 with the following value(s) for RANGE: 2.78

(*) Indicates significant differences which are shown in the lower triangle

Mean	Gen. Category	zd	sr	z	
9.06	zd				
9.34	sr		*		
12.50	z	*	*		

zd = Zoo with flying display
 sr = Specialist Raptor Centre
 z = Zoo without display

Table 4.48: Comparison using Kruskal Wallis 1-way ANOVA of aviary educational criteria for Category of Centre

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
46.6377	6	0.000
Category of Centre	Mean Rank	No. Aviaries
zoo	216.29	78
owl centre	201.26	48
country park	197.33	12
animal garden	189.27	15
raptor centre	145.39	170
theme park	128	4
rehabilitation centre	77.15	13
Total		340

Table 4.49: Multiple Range Test Comparisons between Category of Centre for educational criteria for aviaries

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J)-MEAN(I) \geq 1.8753 * RANGE * \sqrt{1/N(I) + 1/N(J)}$
 with the following Categories for RANGE: 2.78

(*) Indicates significant differences which are shown in the lower triangle

Mean Rank	Category	rh	tp	rc	cp	ag	oc	z
7.93	rh							
9.01	tp							
9.05	rc							
10.17	cp	*						
10.47	ag	*		*				
10.77	oc	*		*	*			
11.01	z	*		*	*	*		

rh = Rehabilitation centre
 tp = Theme park
 rc = Raptor centre
 cp = Country park
 ag = Animal garden
 oc = Owl centre
 z = Zoo

Table 4.50: Comparisons using Kruskal Wallis 1-way ANOVA of aviary educational criteria for Individual Centres

Kruskal-Wallis 1-way ANOVA		
Chi-Square	D.F.	Significance
236.9192	35	0.0000
Centre (coded)	Mean Rank	No. Aviaries
30	326.46	12
26	294.07	7
33	288.83	6
34	280.22	9
18	263.88	29
25	262.33	3
35	255.38	4
37	241.25	8
1	239.65	26
10	238.92	13
31	236	1
22	230.06	9
32	216.22	9
4	204	7
3	194.93	7
29	182	10
16	175.5	2
13	151.41	11
21	149.6	5
38	143.83	3
2	137.8	22
7	117.74	19
17	105.68	19
5	103.33	12
27	99.93	7
23	99.17	3
11	97.6	21
9	80.5	8
12	80.5	10
24	80.5	1
36	80.5	2
20	77.15	13
15	63.63	4
14	46.75	4
8	30.5	4
28	13	10
Total		340

Table 4.51: Multiple Range Test Comparisons between Individual Centres for aviary educational criteria

Multiple Range Tests: LSD test with significance level .05 The difference between two means is significant if $MEAN(J)-MEAN(I) \geq 1.1502 * RANGE * \sqrt{1/N(I) + 1/N(J)}$ with the following value(s) for RANGE: 2.78
 (*) Indicates significant differences which are shown in the lower triangle

Mean	Centre	28	8	14	15	23	11	20	9	24	36	12	27	7	5	17	13	2	38	21	29	16	4	3	32	31	10	22	1	25	35	37	18	34	26	33	30		
4.03	28	*																																					
6.01	8		*																																				
6.02	14			*																																			
7.015	15				*																																		
7.35	23					*																																	
7.3962	11						*																																
7.9338	20							*																															
8.01	9								*																														
8.01	24									*																													
8.01	36										*																												
8.01	12											*																											
8.1486	27												*																										
8.1705	7													*																									
8.3433	5														*																								
8.6326	17															*																							
9.1	13																*																						
9.1859	2																	*																					
9.3367	38																		*																				
9.4	21																			*																			
9.61	29																				*																		
10	16																					*																	
10.01	4																						*																
10.2886	3																							*															
10.78	32																								*														
11	31																										*												
11.0785	10																												*										
11.1111	22																													*									
11.5038	1																														*								
11.67	25																															*							
11.75	35																															*							
11.7512	37																																*						
12.1728	18																																*						
12.5567	34																																*						
13.2837	26																																*						
14	33																																*						
15.4167	30																																	*					

question markets itself as an educational institution.

Comparison 4: Differences between Individual Centres

Significant differences were found between individual centres ($p < 0.000$) and their ranking is shown in Table 4.50. Table 4.51 shows the results of multiple range test comparisons. The spectrum of results reflects how diverse the attitudes towards education were at the individual centres.

(ii) Flying Displays

4.5.4e

◆ Educational Content of Commentary

The results of educational content of the commentary during flying displays are summarised in Table 4.52 and displayed in Figure 4.33. The results are divided into results from Zoo Federation members and non-members as the Zoo Federation aims to promote education through its zoos. Whilst one of its members gave an excellent educational commentary whilst flying its birds, another was of very poor quality which, overall, scored the lowest.

With the exception of the "very poor" category, the results follow a normal distribution with most ranking as satisfactory or moderately good. The most usual educational topics were related to how the birds hunt, or how fast they can fly, how well they can hear, and so on.

The subject of falconry was discussed at a number of centres, sometimes accompanied with verbal advertisements for the courses run by the centre.

In the "very poor" section, the commentary was either non-existent or wholly misleading.

4.5.4f

◆ Conservation Education Content of Commentary

Surprisingly the majority of displays witnessed included no mention of conservation of birds of prey (Table 4.53 and Figure 4.34). This should be addressed as raptors in this country, and across much of their range, have suffered and continue to suffer due to human action in the form of habitat destruction, the effects of toxic chemicals and direct persecution.

As the words "conservation" and "education" slip into the *raison d'être* for many of these centres it would be expected that conservation education would be forthcoming. Whilst this is the case at a small number of centres, generally it is a disregarded topic.

A Mann-Whitney U test found a positive relationship between the educational and conservation content of the commentary ($Z=0.74$, $p < 0.05$) i.e. centres

Table 4.52: Educational content of commentary of flying display

Score	Non-Zoo Federation	Zoo Federation	Total
very poor	4	1	5
poor	1	0	1
unsatisfactory	2	0	2
satisfactory	4	3	7
moderately good	7	0	7
good	1	0	1
excellent	0	1	1
Total	19	5	24

Figure 4.33: Educational Content of Commentary of Flying Display

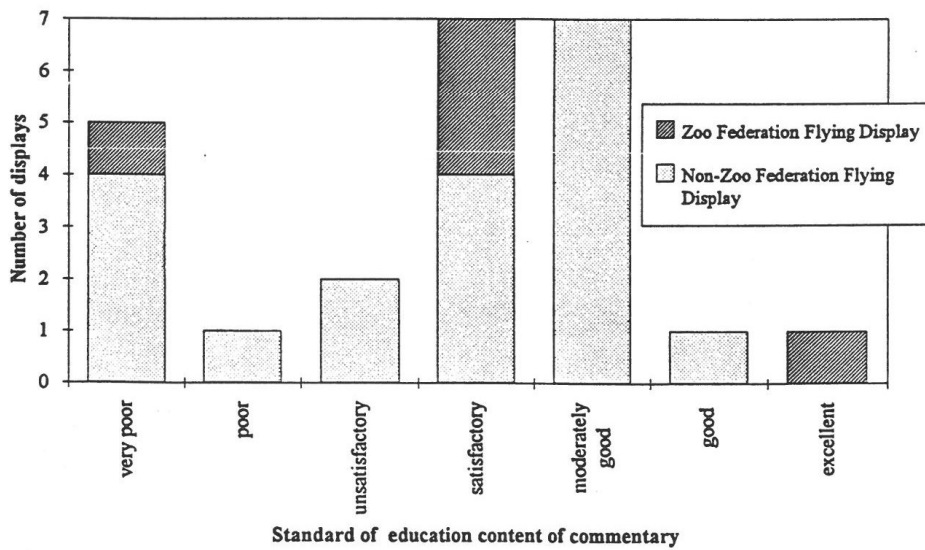
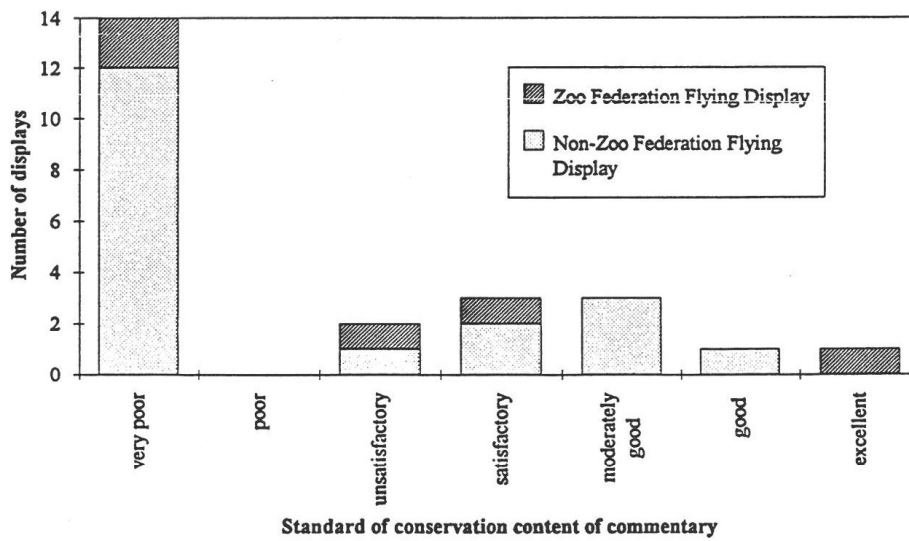


Table 4.53: Conservation content of commentary

Score	Non-Zoo Federation	Zoo Federation	Total
very poor	12	2	14
poor	0	0	0
unsatisfactory	1	1	2
satisfactory	2	1	3
moderately good	3	0	3
good	1	0	1
excellent	0	1	1
Total	19	5	24

Figure 4.34: Conservation Content of Commentary of Flying Display



providing a poor educational commentary were similarly lacking in conservation education content.

4.5.4g **◆ Emphasis of Difficulty or Non-Pet Status in Commentary of Displays**

This category was discussed in the previous welfare section (section 4.4.3s), yet may be important in influencing the perceptions of the public. If the public perceive raptors as pets, their attitude towards them and their conservation may be affected. From a conservation and education perspective this is a double edged sword as humans are wont to love their pets or animals which are pet-like (e.g. habituated Mallard *Anas platyrhynchos* or domestic ducks on a village pond) even if this brings associated unintentional welfare problems. However, their understanding of their biological and conservation needs may be distorted by the idea that domesticity is in the animals' best interests.

In addition, a potential conservation problem arises if a person is influenced to take a raptor from the wild.

4.5.4h **◆ Attitude to the Birds**

Whilst 18/24 (75%) of display givers had a satisfactory or positive attitude to their birds during displays, the attitude of the other handlers towards their birds was poor. In the latter situations the bird was used as an object of fun, with many jokes at its expense. The use of humour in entertainment may be prerequisite whereas the use of humour in education has to be appropriate. Learning in the informal and casual environment of a zoo is traditionally difficult and humour may make educational messages more accessible. However, if the only messages are how stupid the animal looks or how exceptionally unintelligent it is, any educational message is negated and the listener hears only a distorted perspective.

Beyond jokes at the animal's expense, the birds were sometimes used to display how brave the handler was, by playing up the aggressive nature of the beast and the associated courageousness of the display giver.

4.6 **GENERAL DISCUSSION AND SUMMARY**

It was 1954 when the first public display of raptors flying to a lure was given at the first Country Landowner's Association Game Fair (Durman-Walters, 1994a) and such displays continued to be unusual until more recently. Today, public displays of trained raptors have become commonplace with most people having witnessed a flying display or become aware of the use of raptors for such activities. Many centres specialising in raptors and using such displays now exist.

4.6.1 ◆ Spectrum of standards and experience

The results for both the aviary and display bird welfare, together with the conservation aspects, show the wide spectrum of attitudes and actions in such centres. Whilst there was a spectrum within individual centres the main differences were between centres. The centres without displays i.e. those merely exhibiting birds in aviaries ranked significantly higher than the other two groups with display birds. The two forms of management are very different and perhaps the energies expended in managing display birds detract from that required for managing birds in aviaries.

It is interesting to note that the obvious welfare criteria such as shelter from the elements were on the whole catered for. It would seem that it was those criteria which need a greater understanding of the birds' needs and the criteria which require foresight which were not catered for. Such lack of foresight is not malicious but may come from lack of experience i.e. the owner has yet to go through the learning curve which takes place when a practice goes wrong. If these individuals are providing courses to the public (and one centre advertised birds for sale with a price list) the future raptor keepers will be inadequately prepared for keeping an exotic animal which will ultimately lead to many moribund and dead birds.

4.6.2 ◆ Size of centre

Size of centre seems to be related to welfare status, although this was not quantified and analyzed statistically. The smaller raptor centres and the rehabilitation centre tended to have lowest ranking welfare standards whereas the larger zoos and the country parks which had more room for aviaries and flying birds often (with exceptions) ranked higher.

4.6.3 ◆ Indefinite tethering

One of the most disturbing aspects of tethering is the endorsement of indefinite tethering as acceptable practice at a number of centres. Although there has been no quantified calculation of maximum length of time for tethering, to restrict an animal's movement completely for a protracted period cannot be justified. It could be argued that as predatory carnivorous animals most raptors would fly or run to catch food but would then sit and digest a meal for many hours until physiologically hungry enough to hunt again. In other words, if not hungry most raptors sit still (see section 3.8.1). Removing a bird's need to hunt could, therefore, remove its need to move about. Using this argument it could be considered that it is more cruel to restrict the movements of e.g. a chicken (whose wild ancestors habitually scratch to forage) in a battery than to tether a raptor indefinitely. This said, many keepers or falconers having managed raptors which fly free for either displays or falconry would still find the practice of indefinite tethering as unacceptable.

In the same vein, using tethering as a space saving device to provide the public with some spectacle reflects the same attitude as that where a display must continue even if the welfare of the birds is compromised e.g. flying a second bird after the first has refused to return i.e. allowing two birds loose together. This is the problem of providing a service to a paying, and therefore expectant, public. It is a patronising attitude if the figures regarding public concern for animal welfare cited in the introduction are correct. If the public are concerned and made aware of the problems they would not demand more animals to see. If the public could use their discretion and visit only those centres approved by some welfare quality control, then those with inadequate standards would not be able to compete in the market. However, it is the suspicion of the researchers that although a positive decision may be made on the part of a potential centre visitor to visit the larger centres, visits to those centres attached to, e.g. garden centres, is opportunist.

4.6.4 ♦ Extent of welfare problems

The scale of welfare problems within public collections was illustrated by every discussion with centre managers or staff during the data collection. All personnel interviewed in this situation could tell tales of welfare concerns. Indeed, one centre manager felt so strongly about the problems of raptor keeping in general that he almost closed his centre in protest. Some of the issues raised throughout these discussions may have been sniping professional rivalry, but it seems to underline the fact that problems are apparent. As a balance, it is worth saying that almost all keepers of animals of whatever species know of someone or something which has compromised animal welfare at one time.

4.6.5 ♦ Rehabilitation centres

Although quantitative data were collected from only one rehabilitation centre, welfare standards were equally poor at the other where equipment failure prevented data collection. Concern was raised also by staff at other establishments about rehabilitation centres. There was an allegation of one centre accepting young raptors for rehabilitation yet allowing them to become "accidentally imprinted", so preventing their release back to the wild hence building up the centre's collection. Rehabilitating animals should not be displayed to the public, such acts can only hinder an animal's recuperation. Understandably, rehabilitators require funds to continue their work but charging the public to see sick animals is not only illegal, if a licence or exemption have not been granted (see Chapter 2, section 2.10.2d), but ethically cannot be justified. Rehabilitation is discussed further in Chapter 6, section 6.7.

4.6.6 ♦ Zoo licensing inspections

The Zoo Licensing scheme inspections are reportedly very stringent. It is uncertain whether all centres visited legally held licences. Assuming they did,

inspections can only assess apparent standards on the day of the inspection. It is likely that these inspections do not assess the potential for welfare concerns in flying displays particularly as many of these concerns appear to be accidental.

In the meantime the EC still deliberates over proposed intentions to produce Europe-wide legislation, or recommendations, controlling the activities and standards in zoos. The proposed undertaking to bring all zoos up to a certain minimum standard would be a massive yet important process (RSPCA, 1994a).

4.6.7 ♦ Zoo Federation

Whilst Zoo Federation institutes were, on the whole more educational and had fewer welfare concerns, there were notable centres which did not live up to the Federation's stipulated objectives regarding both welfare and conservation. Following discussions with the Zoo Federation it is apparent that these concerns are known about and the Federation is endeavouring to attend to the matter. Part of the TAG's remit is to produce Guidelines for Husbandry and Management of the various taxa. The Federation is in the process of producing the birds of prey guidelines and it is envisaged that the results from this report, together with the authors, will assist in their compilation.

4.6.8 ♦ Conservation

It has been seen that the expertise of some individuals and presence of some centres with their associated species are vital to the captive aspects of conservation of raptors in UK. Captive breeding and release has formed a vital part in the conservation of a number of species e.g. the Mauritius Kestrel *Falco punctatus* (Jones *et al.*, 1995). The Mauritius Kestrel is one of the few species of animal which can be said to have been saved from extinction by the efforts of captive breeding and release. Through the coordination of IUCN/The World Conservation Union specialist groups e.g. the Conservation Breeding Specialist Group, and TAGs a great deal of expertise in this field has now been built up within some public collections of raptors.

The role of those outside this coordinated approach to conservation is less obvious (the issue of captive breeding by private raptor keepers is discussed in Chapter 6).

Captive breeding successes have reduced the "need" for wild caught animals, however, trade from the wild to zoological collections still occurs. There has been recent criticism (Goldsmith, 1995), and counter criticism (Tingay, 1995), following the import to a centre of a pair of wild caught Steller's Sea Eagles *Haliaeetus pelagicus*, a CITES Appendix II listed bird. Indeed, the whole issue of such trade and the role of captive breeding is a thorny and highly controversial issue (Tudge, 1992).

With respect to conservation education, whilst some collections and displays were found to be excellent and educational, unfortunately many were disappointing and reveal the overall lack of imagination used when attempting to educate the public. Most centres claim to be actively involved in conservation. A frustrated zoo education officer commented that often it is not so much "conservation in action" as claimed by many institutes but instead "conservation inaction" (Woollard, pers. comm.). Education seems to be seen as a subject anyone can do. Perhaps professionals should be employed to take on this important task. However, it is unlikely that all centres could afford such posts.

The results show how opportunities are being missed for, not only informing people about the birds and their role as part of complex ecosystems, but also the way in which the public *themselves* can help raptor conservation beyond making financial donations e.g. joining raptor conservation organisations, erecting nest boxes in sites depleted of natural nest sites, and so on. Perhaps a springtime campaign urging members of the public to leave "abandoned" baby owls where they are found would help to avoid the unnecessary suffering brought to many "orphans".

As a new mentality of justifying the existence of every animal in captivity in terms of conservation and education as part of a formal devised strategy, invades the better zoos, there appears to remain a naive "stamp collecting" attitude within some centres i.e. it is merely important to have many different species. Perhaps as these centres mature their attitudes will develop accordingly.

Flying displays are potentially an ideal forum for educational talks and raising conservation awareness relating to birds of prey (Plate 4.19). Raptors are animals which are wholly engaging, which can be seen truly in action and the public can experience their fascinating characteristics at first hand. Unfortunately, the quality of the commentaries provided during such displays was not always found to be adequate. Moreover, not only are valuable opportunities being missed but occasionally the educational interpretation was found to be inappropriate i.e. sensational or anthropomorphic. In these situations one is reminded of parrot shows and the image of a macaw on rollerskates has done little for psittacine conservation.

4.6.9

◆ The "hidden agenda" of displaying live animals

It is appreciated widely that if welfare of the animals exhibited is compromised, any positive benefits of education are negated and the hidden message distorts the viewer's perception (Bostock, 1993; RSPCA, 1988). Additionally, it is unknown to what extent flying displays have encouraged raptor keeping. If there were no welfare or conservation concerns this would be of no consequence. However, this is undoubtedly not the utopian case. Human beings can be easily influenced, and The Hawk and Owl Trust in the past have advised the television companies not to televise the film "Kes" in the spring as previously showings of this film at that

time of year have resulted in young Kestrels being taken from the wild.

Moreover, where the interpretation is incorrect more harm can be done than good. As an example, in the situation mentioned previously where a Little Owl had been allowed to hybridise with a Burrowing Owl, the owner of the centre gave a relatively formal talk to his seated audience. He told of how he had created "a new species" and apparently Tony Soper, Gerald Durrell (prior to his death) and David Attenborough were meeting to discuss what to call this new species. This sort of misinformation can only mislead or confuse the public.

Those exhibiting raptors to the public should commit themselves to conservation education and become centres where *affective* education is provided, empowering the general public to appreciate and actively help to conserve. If captive animals can act as educational tools, then like much of the earth's wealth this unique resource is being wasted.

4.6.10

LIMITATIONS

The data analyzed in this chapter were all collected in the summer months to avoid seasonal bias between the centres. It should be realised that the same survey carried out in the winter months may have given different results as welfare criteria such as shelter from the elements could have been assessed more precisely. In addition, as the researcher was present at any one centre for only a matter of hours, a snapshot of welfare concerns has been taken. There are probably many more unidentified positive and negative welfare concerns not apparent to the researcher.

The welfare criteria checklist was as thorough as was practically possible but there are other aspects which perhaps could or should have been assessed. However, raptor keeping is not a defined science where exact best practice has been quantified. There is much debate and disagreement between the "experts" regarding many aspects. In these situations it is difficult to judge, for example, which is the best design of perch, or which is the best perch covering and so on i.e. there may be rights and wrongs but there is also a large grey area about many aspects. It would have been useful to have carried out some quantified tests regarding these aspects but ethically this would have been unjustifiable. A long term analysis of veterinary records could produce some amount of quantification. This would involve a coordinator to ensure standardisation of responses and perhaps visits to view the management situation where e.g. a foot problem has occurred. In this way compounding factors could be eliminated to some extent.

Moreover, it can be seen that a balancing of welfare criteria is required (as described in Chapter 3, section 3.4) e.g. size of aviary: spatial freedom vs. dangers of colliding with the walls at speed. It is up to humans to make decisions on behalf of the birds and it can only be hoped that these decisions are appropriate.

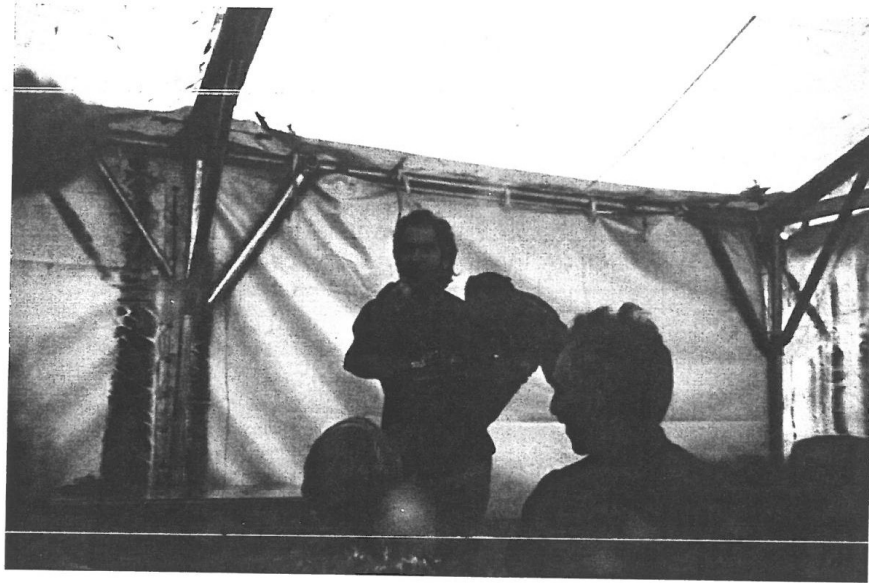


Plate 4.19: European Eagle Owl *Bubo bubo* used in a display/talk. With the right personnel and structured situation, a display can be an educational experience.

4.7 2. TRAVELLING BIRD OF PREY FLYING DISPLAYS AT FAIRS AND COUNTRY SHOWS

INTRODUCTION

Raptor flying displays have become a special feature of many public events such as country shows, game fairs, historic pageants and so on. Personnel involved in these displays constitute either a "specialist" roving display team or a team from a public collection using birds from their centre.

The numbers of people in the audience for such events can be great e.g. audiences at the annual British Falconry and Raptor Fair or the annual Country Landowners Association Game Fair have been witnessed to comprise of many hundreds of people. The impact of the message, whether good or bad, may be greater than that at a public collection with lower visitor numbers.

The BFSS produce a set of guidelines in an attempt to ensure welfare standards at flying displays. These guidelines entitled "Demonstrations by Birds of Prey: Guidance to Show Organisers and Display Teams" are appended (Appendix 1.2). In addition, the BFSS give their approval to a number of display teams (Table 4.54).

The welfare concerns of training, tethering and flying birds are considered to be the same as those discussed previously for birds at public collections.

4.8 METHODS

A number of public events where raptor flying displays took place were visited initially as an aid to drawing up a checklist of welfare criteria and developing the methodology of collecting data from both public collections and country shows etc. In addition to these events, a further six were visited where qualitative and quantitative data were collected. The random one-off nature of these events made attendance difficult to plan. In addition, it was considered unnecessary to visit events where the same display team were in operation.

4.9 RESULTS AND DISCUSSION

Some eight specialist display teams were identified. In addition, personnel from nine centres were found to be involved in travelling display teams (Table 4.54). The numbers involved are thought to be a minima and it is probable that others have not been identified.

Due to the small sample size of events assessed quantitatively it is considered unnecessary to present all of the data. Instead, general comments are made.

Table 4.54: Organisations or Centres known to give Flying Displays at Public Events**Display Team:**

Bryan Patterson, Kidderminster, Worcester*
Terry Large, Chester*
D & R Falconry
Grampian Hawks and Falcons, Forres, Moray*
Shire Falconry Displays, Northampton
South East Falconry Group, Tilbury, Essex*
Ye Olde Red Tail Falconry Display Team, Wisbech, Cambridgeshire
Landrover Display Team

Centres or Personnel from Centres:

Cotswold Falconry Centre, Moreton-in-Marsh, Gloucestershire
Lakeland Bird of Prey Centre, Lowther, Cumbria
National Birds of Prey Centre, Newent, Gloucestershire*
Northumbria Bird of Prey Centre, Gosforth, Newcastle*
Sussex Falconry Centre, Chichester, West Sussex
The Hawk Conservancy, Weyhill, Hampshire*
The Falconry Centre, Hagley, West Midlands
The Scottish Deer Centre, Cupar, Fife*
Yorkshire Dales Falconry and Conservation Centre, Settle, North Yorkshire*

* *BFSS Approved, February 1992*

Although the welfare concerns were generally those of tethered and flown birds at public collections, there were five areas where welfare aspects differ or were found to be of particular concern. These concerns were:

- and
- ◆ insufficient safety barrier between the tethered birds and the public and their animals
 - ◆ inadequate facilities for shelter for tethered birds
 - ◆ hazards to flying birds
 - ◆ tethered birds in view of flying birds
 - ◆ transport of the birds

4.9.1a

◆ Insufficient Safety Barrier between the Tethered Birds and the Public and their Animals

Of the six events assessed, three were found to provide inadequate protection for the tethered birds in the form of a safety barrier.

Country shows and game fairs differ from public collections due to the presence of dogs, both domestic pets and the working dogs often displayed. Uncontrolled dogs pose a threat to tethered birds.

At one event the tethered birds were separated from the public by a low rope. This was insufficient to keep out a determined member of the public and, more importantly, the preponderance of dogs at the show. At one point a pack of hunting beagles ran amongst the numerous tethered birds. Fortunately, although some of the birds bated none were attacked by the dogs.

At one country show a static display was given by a nearby raptor centre as an advertisement, although no birds were flown. The birds were separated from the public by a piece of rope which was approximately 12" from the birds. The proximity of so many people seemed to be particularly stressful for a small male Merlin *Falco columbarius* which bated frequently or tried to hide behind its block. A transporter containing baby owls was also brought along to attract the public: a practice considered unnecessarily stressful for the birds by the researchers.

At another event no barrier was provided at all, and the public wandered freely amongst the tethered birds.

Whilst poor practice was observed at three events, the other three provided well constructed fences to prevent access to humans and dogs alike.

Within a centre it is possible to build both shelter and adequate safety barriers with relative ease. At an ephemeral site where birds will be held for possibly only a few hours, it would seem that some display givers feel it is unnecessary to make the usual provision.

4.9.1b

◆ Inadequate Facilities for Shelter

All but one of the weathering areas at the events assessed had sufficient shelter from the elements. Perhaps display givers consider this a more basic requirement for bird welfare. Most commonly this took the form of an awning, although substantial weathering were constructed from wooden panels at two of the events.

4.9.1c

◆ Hazards to the Flying Birds

The selection of a site for a flying arena within a public collection can be made so as to minimise risks to flying birds. However, the arena at e.g. a country show is determined by the show organisers and may not be selected with raptor welfare in mind. In general, arenas are in large open spaces. However, the presence of wires such as those around raised PA systems may be hazardous to flying birds. In addition, there may be bizarre hazards such as microlight planes (Parry-Jones, 1993). Of the events assessed the following hazards were noted: two had helicopters landing and taking off proximal to the arena and at another there was a nearby rifle range.

As the arena is an unfamiliar venue for the bird, there is an increased risk of it becoming lost.

4.9.1d

◆ Tethered Birds in View of Flying Birds

As with the design of the arena the area allocated by the show organisers for the static display may be inappropriate with tethered birds in view of the flying birds in the arena. This was found to be the case at two of the displays assessed. At one show a Harris Hawk flew out into the arena whilst a Barn Owl was still loose. The handler managed to call the owl back and shield it from attack.

4.9.1e

◆ Transport of Birds

Transport of raptors was discussed in Chapter 3, section 3.9.1, as most captive raptors are transported via vehicles at some time in their lives. However, birds used as part of roving display teams clearly spend a greater proportion of their time travelling. It is vital that display teams use specially equipped vehicles with appropriate provisions. Birds must be carried in appropriate containers to minimise mental stress and physical damage. It was practically difficult to assess travelling conditions for the display birds, hence it is uncertain to what extent welfare may be compromised.

An analysis of adherence to BFSS guidelines on "Demonstrations by Birds of Prey: Guidance to Show Organisers and Display Teams" is made in Chapter 8, section 8.4.

4.9.2 Static Displays

Other than birds flown in demonstrations some birds are taken to shows merely to form static displays i.e. they are merely tethered at the show ground and not flown. Such birds may be part of the display team, tethered all day whilst their counterparts are flown. Such was the case with at least three of the display teams assessed. The publicity material for one of the display teams advertised thus: "out of approximately fifteen birds, eight are flown".

One of the display teams not assessed provides various services including the provision at shows of a static display (with no birds flown). Whilst the service includes the keeper in attendance to answer questions, the implication to the public may be that it is acceptable practice to transport birds about and tie them up all day. The public are not to know that they may be flown when they are returned home.

Organisations such as Raptor Rescue, or other raptor centres use static displays for fund raising or advertising respectively. The use of live birds to raise money for rehabilitation is discussed further in Chapter 6, section 6.7.2e.

An analysis of adherence to BFSS guidelines is made in Chapter 8, section 8.4.

In conclusion, problems may be caused by a lack of understanding by show organisers of the needs of the display team and their birds, coupled with provision of inadequate or inappropriate facilities. Ultimately, it is down to the discretion of the display team whether or not to put birds at risk. However, in a situation where a service has been paid for it may be difficult to retract from a contractual obligation.