

THE EU ZOO INQUIRY 2011

An evaluation of the implementation and enforcement of the EC Directive 1999/22, relating to the keeping of wild animals in zoos.

REPUBLIC OF IRELAND



Written for the European coalition ENDCAP by the Born Free Foundation



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Country Report **REPUBLIC OF IRELAND**



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ABBREVIATIONS USED

APOS	Animal Protection Ordinance of Switzerland, Tierschutzverordnung 2008
BIAZA	British and Irish Association of Zoos and Aquariums
DEFRA	UK Department for Environment, Food and Rural Affairs
EAZA	European Association of Zoos and Aquaria
EEP	European Endangered Species Breeding Programme
ESB	European Studbook
EU	European Union
IAS	Invasive Alien Species
IUCN	International Union for Conservation of Nature
NGO	Non-Governmental Organisation
NPWS	National Parks and Wildlife Service
OIE	World Organisation for Animal Health
R440/2003	European Communities (Licensing and Inspection of Zoos) Regulations 2003
SMZP	Standards of Modern Zoo Practice, DEFRA, 2004
WAZA	World Association of Zoos and Aquariums

TERMS USED

Animal: A multicellular organism of the Kingdom Animalia including all mammals, birds, reptiles, amphibians, fish, and invertebrates.

Animal Sanctuary: A facility that rescues and provides shelter and care for animals that have been abused, injured, abandoned or are otherwise in need, where the welfare of each individual animal is the primary consideration in all sanctuary actions. In addition the facility should enforce a non-breeding policy and should replace animals only by way of rescue.

Circus: An establishment, whether permanent, seasonal or temporary, where animals are kept or presented that are, or will be, used for the purposes of performing tricks or manoeuvres. Dolphinarium, zoos and aquaria are excluded.

Domesticated Animal: An animal of a species or breed that has been kept and selectively modified over a significant number of generations in captivity to enhance or eliminate genetic, morphological, physiological or behavioural characteristics, to the extent that such species or breed has become adapted to a life intimately associated with humans.

Environmental Quality: A measure of the condition of an enclosure environment relative to the requirements of the species being exhibited.

Free-roaming Animals: Animals that have been deliberately introduced to the zoo grounds and that are free to move throughout the zoo.

Not Listed: Species of animal that are not listed on the IUCN Red List of Threatened Species™, including species that have yet to be evaluated by the IUCN and domesticated animals.

Pest: An animal which has characteristics that are considered by humans as injurious or unwanted.

Species Holding: The presence of a species in a single enclosure. For example, two separate enclosures both exhibiting tigers would be classed as two *species holdings*; while a single enclosure exhibiting five species of birds would be classed as five *species holdings*.

Threatened Species: A species that is categorised by the IUCN Red List of Threatened Species™ as *Vulnerable*, *Endangered* or *Critically Endangered* (IUCN Red List website).

Wild Animal: An animal that is not normally or historically domesticated in Ireland.

Zoonoses: Those diseases and infections which are naturally transmitted between vertebrate animals and man.

Zoo: All permanent establishments where animals of wild species are kept for exhibition to the public for seven or more days in a year, with the exception of circuses, pet shops and establishments which Member States exempt from the requirements of the Directive on the grounds that they do not exhibit a significant number of animals or species. (Directive 1999/22/EC)

SUMMARY

Of the 27 identified zoological collections in the Republic of Ireland, eight zoos were assessed as part of a pan-European project to evaluate the effectiveness and degree of implementation and enforcement of European Council Directive 1999/22/EC (relating to the keeping of wild animals in zoos) in European Union (EU) Member States. A total of 468 species (including subspecies, where appropriate) were observed in a total of 302 enclosures. Information was collected concerning a number of key aspects of each zoo's operation including: participation in conservation activities; public education; enclosure quality; public safety; and the welfare of the animals. These criteria were evaluated against the legal requirements of Directive 1999/22/EC and the Irish European Communities (Licensing and Inspection of Zoos) Regulations 2003, S.I. no.440/2003. Key findings were:

- **Irish zoos appear to demonstrate a limited commitment to the conservation of biodiversity and, in particular, Threatened species.** Only 14% (n = 67) of the total number of species (n= 468) in the selected zoos are categorised as Threatened (*Vulnerable* (7%), *Endangered* (5%) and *Critically Endangered* (2%)). The highest proportion of Threatened vertebrate species belongs to the taxa of amphibian. Only one of the 1,898 Threatened species of amphibia were kept by the zoos.
- **Only 10% of species observed were participants in European co-ordinated species management programmes (EEPs or ESBs).**
- **Whilst some zoos were better than others, as a whole the selected zoos did not fully meet all the 'required conservation measures' (Articles 4 & 6, R440/2003).**
- **Three of the eight zoos did not appear to be participating in conservation activities such as scientific research or species reintroduction.**
- **Signage for species in the zoos was often incomplete, inaccurate or absent.** A quarter of *species holdings* lacked information signage and, on average, 84% of species signage did not contain all the required criteria (SMZP).
- **Nine out of ten enclosures did not provide the animals they contained with any behavioural or occupational enrichment items, specifically toys or feeding devices.**
- **Two thirds of enclosures did not provide appropriate environmental complexity.**
- **Poor enclosure design and a lack of stand-off barriers in some zoos may be putting the public at risk of injury.**
- **Whilst the requirements of the EC Directive 1999/22 has been accurately transposed into R440/2003, there are inconsistencies in its application.**
- **Further to the 10 Government-recognised zoos, another 17 zoological collections were identified that may need a zoo licence. The failure to effectively identify a 'zoo', or the possible misinterpretation of terminology, could mean that many 'zoos' are unlicensed, but operational. This would undermine the objective of the Directive.**

RECOMMENDATIONS

The Department of Environment, Heritage and Local Government should take the necessary measures to:

- 1) Establish a licensing procedure that ensures all permanent establishments open for seven days or more in a year and that display any number of wild animal species to the public are licensed, receive regular inspections and meet the specified requirements of Regulation 440/2003.
- 2) Ensure the terms used such as 'zoo', 'animal of wild species' and 'conservation sensitive' are appropriately defined in Part 1 of the Regulation 440/2003 and to consider the issuing of further guidance similar to that of Government Circular 2/2003, DEFRA, as a matter of urgency.
- 3) Ensure, through effective enforcement, that all zoos (*as defined by the Directive*) abide by the requirements of national zoo law and that existing, available penalties (Articles 19 & 20, R440/2003) are applied to zoos that fail to meet the 'conservation measures' stipulated in Articles 4 & 6.
- 4) Raise the welfare standards for wild animals in zoos through the development of species-specific guidance, which includes environmental enrichment.
- 5) Ensure that all enforcement personnel and state veterinarians involved in the inspection and regulation of zoos are equipped with the relevant training and skills pertaining to the care and welfare of wild animals in captivity.
- 6) Establish criteria to evaluate and improve educational and 'required conservation measures' in zoos.
- 7) Establish a mandatory requirement for all zoos to implement an environmental enrichment programme.
- 8) Ensure zoos keep and conserve predominantly indigenous and European Threatened species rather than non-European species.
- 9) Publish guidance to assist zoos, enforcement personnel, veterinarians and NGOs to effectively interpret the requirements of Regulation 440/2003 and, specifically, participate in the application of meaningful, peer-reviewed conservation and education programmes.
- 10) Encourage EAZA and BIAZA to assist all zoos in the Republic of Ireland to meet their legal obligations and the required criteria to become an accredited member of these national and international zoo associations.
- 11) Ensure regular training of the Ministerially-appointed zoo inspectors and an annual audit of the quality of the review process to help ensure greater consistency in application and compliance with R440/2003.
- 12) Ensure that direct contact with animals, particularly those listed in Category 1 'Hazardous Animals' (SMZP) and those known to carry zoonoses, is prohibited.

THE EU ZOO INQUIRY 2011

Introduction and methodology



INTRODUCTION

Council Directive 1999/22/EC ('the Directive'), relating to the keeping of wild animals in zoos, was adopted in 1999. The Directive came into force in April 2002, when the EU comprised 15 EU Member States. Since then, all countries that are Members of the EU have been obliged to transpose the requirements of the Directive into national legislation and, from April 2005 (2007 in the case of Bulgaria and Romania), fully implement and enforce its requirements. The European Commission has the responsibility to oversee and ensure the effective implementation of the Directive by Member States and to take legal action in the event of non-compliance.

The Directive provided a framework for Member State legislation, through the licensing and inspection of zoos, to strengthen the role of zoos in the conservation of biodiversity and the exchange of information to promote the protection and conservation of wild animal species. This is in accordance with the Community's obligation to adopt measures for *ex situ* conservation under Article 9 of the Convention on Biological Diversity (1992). Member States are also required to adopt further measures that include: the provision of adequate accommodation for animals in zoos that aims to satisfy their biological needs; species-specific enrichment of enclosures; a high standard of animal husbandry; a programme of preventative and curative veterinary care and nutrition; and to prevent the escape of animals and the intrusion of outside pests and vermin.

Although the Directive has been transposed in all Member States, national laws often lack detailed provisions relating to educational and scientific activities, guidance on adequate animal care, licensing and inspection procedures, as well as clear strategies for dealing with animals in the event of zoo closure. The Directive's requirements themselves are relatively ambiguous and allow for inconsistencies in interpretation. Competent Authorities in Member States have not been provided with comprehensive guidance or training to facilitate the adoption of the provisions of the Directive and, as a consequence, many are failing to ensure these provisions are fully applied by zoos (Eurogroup for Animals, 2008; ENDCAP, 2009).

Estimates place the total number of licensed zoos in the EU to be at least 3,500. However, there are thought to be hundreds of unlicensed and unregulated zoological collections that have yet to be identified and licensed by the Competent Authorities. No more than 8% of the total number of zoos in Europe are members of the European Association of Zoos and Aquaria (EAZA) which therefore should not be regarded as a representative of zoos in the European Community.

Preliminary investigations revealed that many zoos in the EU are substandard and are failing to comply with the Directive. Furthermore, EU Member States are inconsistent in their application of the Directive, but little effort has been made to identify and address the reasons behind this. The project aims to assess the current situation in the majority of Member States, identify any issues requiring attention and provide recommendations with regards how application can be improved.

METHODOLOGY

Between March and December 2009, an assessment of 200 zoological collections in 20 EU Member States was made as part of an evaluation of the level of implementation and enforcement of the European Council Directive 1999/22/EC. The project included an evaluation of national laws pertaining to zoos in each EU Member State compared to the requirements of the Directive, an analysis of the implementation and enforcement of those laws and an assessment of the status and performance of selected zoos in each Member State.

A Zoo Assessment Protocol was developed and tested to ensure consistency in data collection. For certain Member States (England, France, Germany, Ireland, Italy, Malta and Portugal) individual, locally fluent investigators were contracted to undertake the work. In other Member States (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia) a single investigator from the UK, collected and analysed the data.

Implementation and enforcement of Member State legislation

Data were collected and evaluated through:

- Completion of a questionnaire by the Competent Authorities in each Member State (Standard Member State Questionnaire)
- Informal interviews with the Competent Authority (or Permanent Representative to the EU)
- Reviewing national zoo legislation

Status and performance of zoos

Using the definition of a zoo in the Directive¹, a variety of zoological collections was assessed including: traditional zoos, safari parks, aquaria, dolphinariums, aviaries and terraria. In some cases, national legislation does not use this definition, which can lead to inconsistencies in application. Where this is the case, any variance was noted but zoos, as defined by the Directive, were nevertheless included in the project to maintain consistency.

Zoos were selected for evaluation using two methods: A. For those Member States with large numbers of zoos, 25 zoos were randomly selected (France, Germany, Italy and England). B. For those Member States (n = 16) with a small number of zoos, between three and ten collections were selected, dependant upon the total number of zoos in the country and their accessibility. Zoos were identified by referring to Government records (if these exist), using online resources, published media and information from local NGOs.

Data were collected using a video camera which recorded a complete overview of the structure and content of each zoo, including: all enclosures; all visible animals; signage; public education facilities; any talks, shows or interactive animal handling sessions; public/animal contact and security issues. Additional information was collected from the zoo website and literature that was, occasionally, provided by the zoos themselves. Data collection was undertaken without the prior knowledge of the zoo management and therefore only areas accessible to the general public were recorded. Thus, for example, off-show areas, food preparation and storage rooms, quarantine and veterinary facilities were not included.

Data were analysed using a Zoo Assessment Protocol that had been developed and refined during an assessment of zoos in Spain (InfoZoos 2006 - 2008) and took into consideration the requirements of the Directive, national zoo law and the EAZA *Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria* (available on the EAZA website and referred to in the preamble of the Directive). Information and guidance was also drawn from the DEFRA Standards of Modern Zoo Practice 2004 (SMZP) and Zoos Forum Handbook. The Zoo Assessment Protocol was adapted for each Member State dependent upon the specific requirements of national law.

¹“ all permanent establishments where animals of wild species are kept for exhibition to the public for seven or more days a year...” (Article 2, European Council Directive 1999/22/EC)

The analysis was separated into the following sections:

- A. General Zoo Information;
- B. Conservation Commitment;
- C. Public Education;
- D. Evaluation of Animal Enclosures;
- E. Animal Welfare Assessment.

Further details of the assessment method are available at www.euzooinquiry.eu

All zoos included in the evaluation were asked to complete a Standard Zoo Questionnaire that asked for details of their participation in: European coordinated captive breeding programmes; *in situ* conservation projects; public education; and current research activities.

The Questionnaire also sought information relating to levels of staff training; veterinary care; and programmes to provide environmental enrichment and appropriate nutrition.

Resources dictated that the EU Zoo Inquiry 2011 included an assessment of the following EU Member States: **Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovenia and United Kingdom (England only).**

The remaining seven Member States were not included in the zoo assessment (March – December 2009). However a further report focussing on zoo regulation in **Spain** will be published in 2011.

REPUBLIC OF IRELAND

Country Report



INTRODUCTION

The Republic of Ireland joined the European Union in 1973. By April 2002, Ireland, along with 14 other EU Member States, was required to transpose the requirements of the Directive into its national law. This was not fully achieved until 2003, following intervention by the European Commission. European Communities (Licensing and Inspection of Zoos) Regulations 2003, S.I. no.440/2003 (R440/2003) was adopted in September 2003, through Section 3 of the European Communities Act 27/1972. All EU Member States (25) were required to fully implement and enforce the requirements of the Directive by April 2005.

The Government department responsible for the implementation and enforcement of the law is the National Parks & Wildlife Service (NPWS), within the Department of Environment, Heritage and Local Government (the 'Competent Authority'). As part of this investigation, the Competent Authority was asked to complete a Standard Member State Questionnaire. The response received, including details on procedures for licensing and inspecting zoos in the Republic of Ireland, have been included throughout this report.

According to the central zoo database held by the Department of Environment, Heritage and Local Government there are 10 licensed zoos in Ireland. These are inspected annually by a team of Ministerially-appointed inspectors to ensure that they meet the requirements of R440/2003. Zoo Licences in Ireland should not exceed a five-year term. However, they are usually granted for a three year period (Article 5(1) (c), R440/2003) (Standard Member State Questionnaire).

During the Ireland zoo investigation a total of 27 zoological collections were identified where there was reasonable suspicion to assume (from their websites and leaflets) that wild animals were exhibited to the public and therefore could be considered to be 'zoos'. These consisted of the 10 collections that have been granted a zoo licence by the Competent Authority and a further 17 establishments which may require licensing. The majority of the unlicensed establishments have been identified as 'open farms', and whilst it is not known if '*animals of wild species*' (Article 2 of the Directive) are kept by the majority, two 'open farms' were visited as part of this investigation and were identified as requiring a Zoo Licence (due to the presence of '*animals of wild species*'). Eight 'zoos' were assessed as part of this investigation: six licensed zoos and the two unlicensed 'open farm' zoos.

Zoo Licensing Requirements

According to the Standard Member State Questionnaire, zoos are defined as in the Directive: '*all permanent establishments where wild animals of wild species are kept for exhibition to the public for seven days or more of the year except circuses and pet shops and other establishments that do not exhibit to the public a significant number of animals or species*' (Article 2 of the Directive). The definition of a 'zoo', however, is not included in the Regulation 440/2003.

Furthermore, as specified by the Directive, the Member State Government can exempt zoological collections from the R440/2003, on the grounds that the collection '*does not or will not exhibit a significant number of animals or species to the public*' and that '*the exemption will not jeopardize the protection of wild fauna or the conservation of biodiversity*' (Article 2 of the Directive). The same option is included under Article 11 of R440/2003. No further guidance or explanation is provided by the Competent Authority to clarify the criteria for Exemption. However, in consultation with the Competent Authority (Standard Member State Questionnaire), it has been further specified that '*any collection that houses hazardous or conservation sensitive wild species for public view are subject to zoo licensing*'. Therefore, in Ireland, it is not only the numbers of species or individual animals that are taken in account when considering the licensing of an establishment, but it also depends on the presence of '*hazardous or conservation sensitive*' species. However, no further guidance was provided by the Competent Authority.

According to the Standard Member State Questionnaire, R440/2003 regulates a variety of 'types' of zoological collection, including specialist collections such as aquaria and captive dolphin facilities (dolphinarium).

All licensed zoos in Ireland have to meet a series of requirements in order to obtain a Zoo Operating Licence. These include:

Conservation

- '1) The Minister may grant a licence to operate a zoo, if satisfied that the required conservation measures will be implemented in a satisfactory manner at the zoo.
 - 2) ..required conservation measures:
 - a) Participating in at least one of the following activities:
 - i. Research from which conservation benefits accrue to the species
 - ii. Training in relevant conservation skills
 - iii. The exchange of information relating to species conservation
 - iv. Where appropriate, captive breeding, repopulation or reintroduction of species into the wild'
- (Article 4(2)(a), R440/2003)

The Directive's requirement for zoos to conserve biodiversity has been effectively transposed into the 'requirements applicable to zoos' in Ireland (through Article 4 of R440/2003) and the above 'required conservation measures' are stipulated throughout R440/2003. At all stages of the licence application process (Article 4(3)(f)), licence renewal (Article 8(4)) and licence transfer (Article 9(2)), the Ministerially-appointed inspectors are required to ensure that the zoo 'is being operated in compliance with the required conservation measures.'

In addition to the requirements in Article 4 of R440/2003, the Competent Authority refers to the UK's 'Standards of Modern Zoo Practice' (SMZP) (DEFRA, 2004) (Standard Member State Questionnaire), which is adopted under Article 6 of R440/2003 (NPWS, pers. comm., 11th November 2010).

Education

Article 4 of R440/2003 also stipulates the following:

'Promoting public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats.' (Article 4(2) (b), R440/2003)

On application for a licence (Article 4(3)), the zoo must satisfy the Ministerially-appointed inspectors that their education activities are in accordance with their 'required conservation measures'. Further mandatory guidance is provided to the zoo operator through SMZP, Section 7, Nos. 7.10-7.14.

Animal welfare provisions

Article 4 of R440/2003 continues by stipulating that zoos must:

Accommodate 'the animals under conditions that aim to satisfy the biological and conservation requirements of the individual species, including, among other things, by providing species specific enrichment of the enclosures;'
 (Article 4(2) (c), R440/2003)

Maintain 'a high standard of animal husbandry in the zoo, including a developed programme of preventative and curative veterinary care and nutrition;'
 (Article 4(2) (d), R440/2003)

On application for a licence, the zoo must satisfy the Ministerially-appointed inspectors that the animals are appropriately kept, in accordance to their 'required conservation measures'.

Standards of Modern Zoo Practice (SMZP)

The SMZP were established in the United Kingdom under of the Zoo Licensing Act of 1981 (Article 9). These same Standards are used in the Republic of Ireland, which the Minister specifies are to be met by licensees *'in implementing the required conservation measures'* (Article 6, R440/2003) (NPWS, pers. comm., 11th November 2010). The SMZP are based on the 'Five Freedoms' (OIE Terrestrial Animal Health Code, 2010), providing guidance for appropriate animal care and management, and details of suitable conservation, education and public safety measures.

The Zoo Investigation

From the 27 identified zoological collections in the Republic of Ireland, a total of eight zoos were selected.

Data were collected at the following zoos in October 2009 (Fig. 1):

- Eagles Flying – Irish Raptor Research Centre
- Lahinch Seaworld
- Dingle Oceanworld Aquarium
- Fota Wildlife Park
- Blackwater Open Farm
- Reptile Village Zoo
- Glenroe Open Farm
- Dublin Zoo



Figure 1 Geographical locations of the eight zoos visited in Ireland.

RESULTS AND INTERPRETATION

GENERAL ZOO INFORMATION

Overview

The investigation evaluated a total of eight 'zoos' in the Republic of Ireland: six of the ten Government-recognised and licensed zoos; and two unlicensed zoos.

Dublin Zoo, Dingle Oceanworld Aquarium and Fota Wildlife Park, are members of the *British and Irish Association of Zoos and Aquariums* (BIAZA), Dublin Zoo and Fota Wildlife Park are also members of the *European Association of Zoo and Aquaria* (EAZA) and Dublin Zoo are also a member of the *World Association of Zoos and Aquariums* (WAZA). Members of BIAZA and EAZA, in particular, are required to meet higher standards than those often required by national law. BIAZA has a membership of 97 zoos in Great Britain and Ireland, and EAZA has 282 Members throughout Europe and the Mediterranean (BIAZA and EAZA websites).

According to the Competent Authority, 10 zoos are currently licensed and are regularly inspected to ensure the stipulated '*required conservation measures*' have been met (Article 4, R440/2003) (Standard Zoo Questionnaire).

While housing conditions for the animals in zoos largely accommodated their basic needs, there were individual enclosures in each of the zoos assessed that failed to provide for the animals' species-specific requirements. The majority of enclosures lacked sufficient environmental complexity. Furthermore, some enclosures were observed in a poor state of repair and overly restrictive.

A total of 468 species (including subspecies where appropriate) were identified in 302 enclosures in the eight zoos. A total of 27 *species holdings* could not be identified (see online Methodology).

Only three of the eight zoos completed and returned the Standard Zoo Questionnaire. These were the Reptile Village Zoo, Eagles Flying – Irish Raptor Research Centre and Dingle Oceanworld Aquarium. One zoo chose not to complete the Questionnaire and no response was received from the remaining four selected zoos.

Prevention of animal escapes

Article 4 of R440/2003 stipulates that zoos must:

Prevent 'the escape of animals from the zoo in order to avoid possible ecological threats to indigenous species;'
(Article 4(2)(e), R440/2003)

Prevent 'the intrusion of outside pests and vermin into the zoo;' (Article 4(2)(f), R440/2003)

Three zoos had free-roaming animals, which included Patagonian mara, Indian peafowl and a variety of waterfowl species.

The majority of zoos appeared to have an adequate perimeter fence to prevent escaped animals in zoos from leaving the zoo.

Most observed enclosures were sufficiently secure to retain the animals enclosed. However, two enclosures at Eagles Flying – Irish Raptor Research Centre, which both exhibited domestic guinea pigs, had numerous holes in the fencing and in the floor of the enclosure. This could indicate that the animals were able to escape from their enclosure. Domestic guinea pigs are a DAISIE-listed invasive alien species (IAS) (DAISIE website).

SMZP provides further guidance on the management of 'Free-Ranging Species' (Nos. 8.26 to 8.28) and prevention of animal 'Escapes' (Section 8.29 to 8.40).

Public placed at risk of injury and disease transmission

The public could easily come into direct contact with animals in 77 out of the 228 randomly-selected enclosures (Section D and E). This included a number of potentially dangerous wild animals, some of which are listed as Category 1 'Greater Risk' Hazardous Animals by the SMZP including: Sika deer, black vultures, Himalayan vultures and Californian sea lions. The public could have unsupervised and unlimited contact with certain fish species - thornback skate and undulate ray - at two of the zoos (Lahinch Seaworld and Dingle Oceanworld Aquarium). Despite being classified as Category 2 'Less Risk' by the SMZP 2004 Hazardous Animals (requiring caution), both species were kept in unsupervised, open 'touch-pools'.

In one zoo, members of the public were encouraged to handle and touch bird of prey species. While hand-washing facilities were available and signage did encourage the public to wash their hands after contact with animals, at no time did the investigator observe zoo staff actively encouraging people to wash their hands either before or after animal contact.

Figure 2

Eagles Flying – Irish Raptor Research Centre.

Inadequate fencing fails to prevent members of the public approaching potentially dangerous wild animals.



Figure 3

Dublin Zoo.

This enclosure fencing may allow members of the public to have direct contact with California sea lions, a Category 1 'Greater Risk' Hazardous Animal (SMZP). The addition of a stand-off barrier would prevent contact.



CONSERVATION

The conservation of biodiversity is the main objective of the Directive. This also takes prominence in R440/2003, which requires a series of ‘*conservation measures*’:

Conserving biodiversity

The proportion of Threatened species to Not Threatened species (IUCN Red List of Threatened Species™) kept by a zoo might indicate the degree of commitment given to conserving biodiversity, particularly where Threatened species are nearing extinction. Results indicate that the majority of species exhibited in the selected Irish zoos are Not Threatened, and are either of the category *Least Concern* (species of low conservation priority) or *Not Listed* by the IUCN Red List of Threatened Species™.

Percentage of Threatened Species

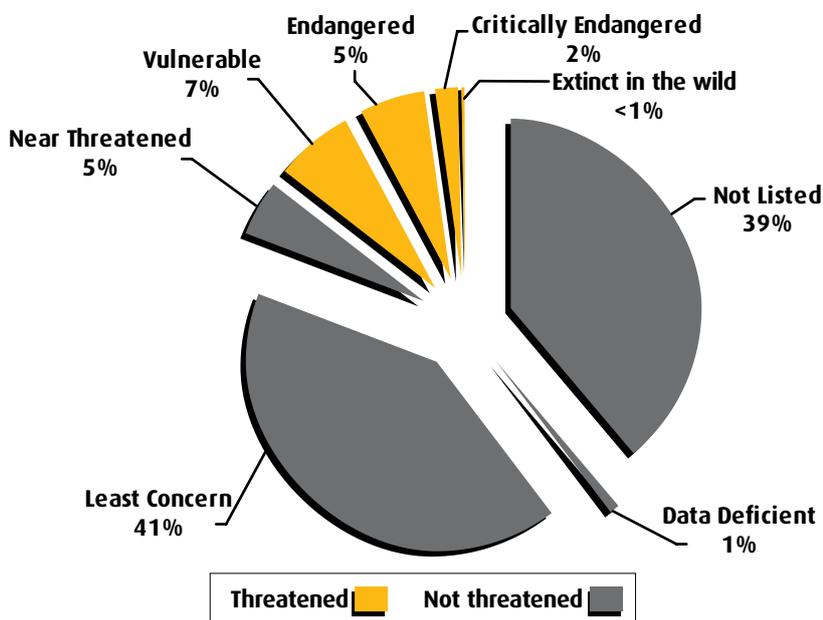


Figure 4 Proportion of the 468 species identified (including subspecies where appropriate) in the eight Irish zoos that are categorised by the IUCN Red List of Threatened Species™ as Threatened and Not Threatened.

Percentage of Threatened Species and Taxa

IUCN Red List of Threatened Species™ Categorisation	Taxonomic Group						Total No. Species	Proportion of total no. Species (%)
	Mammals	Birds	Reptiles	Fish	Amphibians	Invertebrates		
Not Listed	9	7	40	108	0	18	140	39%
Not Evaluated	0	0	0	0	0	0	0	0%
Data Deficient	0	0	0	4	0	0	4	1%
Least Concern	20	144	9	17	2	0	192	41%
Near Threatened	4	11	0	6	1	0	22	5%
Vulnerable	9	15	5	3	0	0	32	7%
Endangered	14	10	1	0	0	0	25	5%
Critically Endangered	7	2	0	0	1	0	10	2%
Extinct in Wild	1	0	0	0	0	0	1	<1%
Total No. Species	64	189	55	138	4	18	468	100%
Proportion of total no. Species (%)	14%	41%	12%	29%	1%	4%	100%	

Table 1 Proportion of the 468 species (including subspecies where appropriate) identified in eight Irish zoos, categorised as Threatened and Not Threatened by the IUCN Red List of Threatened Species™ by taxa.

The results indicate that 14% (n = 67) of the total number of species from the selected zoos (n= 468) are categorised as Threatened (*Vulnerable* (7%), *Endangered* (5%) and *Critically Endangered* (2%)) (Table 1). Of the 67 Threatened species: 45% were mammals, 40% birds, 9% reptiles, 4% fish and the remaining 1% were amphibians. The remaining 86% of the species were Not Threatened. These were either classified as *Least Concern* (41%) or *Near Threatened* (5%) by the IUCN Red List of Threatened Species™ categorisation, or Not Listed (39%) (Fig. 4). Dublin Zoo and Fota Wildlife Park both kept scimitar-horned oryx (*Oryx dammah*) in their collections: species categorised as *Extinct in the Wild*.

Participation in European coordinated captive breeding programmes

A further indicator of a zoo's commitment to the conservation of biodiversity is its participation in *ex situ* species management programmes - European Endangered Species Breeding Programmes (EEPs) or European Stud Books (ESBs). Both the Directive and R440/2003 promote the need for zoo involvement in captive breeding.

Percentage of species in Irish Zoos involved in coordinated captive breeding programmes (EEPs or ESBs)

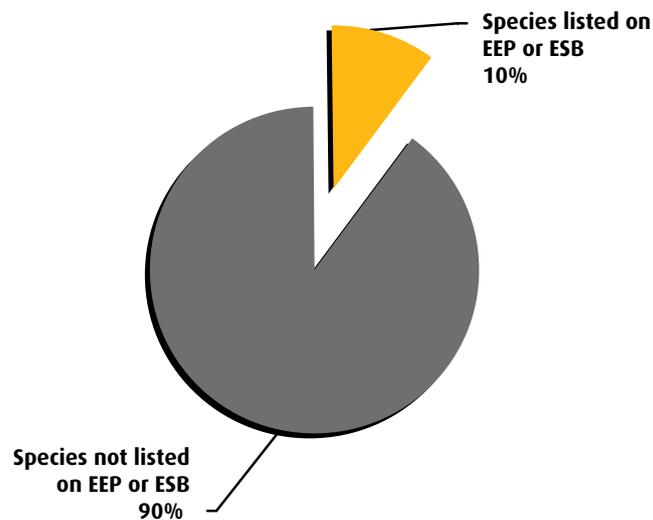


Figure 5 The percentage of the 468 species (including subspecies where appropriate) identified in the eight Irish zoos that have an ESB or EEP.

Only 10% (n = 49) of the 468 species in the zoos are listed on the register of European Endangered Species Breeding Programmes (EEPs) or European Stud Books (ESBs). Dublin Zoo and Fota Wildlife Park were the only zoos to have species registered, and both zoos appeared to participate in species management programmes. According to the zoo websites, information provided in guidebooks and on the species information signage, all 49 species were actively participating in EEPs or ESBs (Fig. 5). This included the Amur tiger and the Bornean orangutan in Dublin Zoo and cheetah and giraffe in Fota Wildlife Park.

According to the Standard Zoo Questionnaire, Dingle Oceanworld Aquarium keeps and breeds '*Malawi cichlid species, Banggai cardinals, Atlantic dogfish and rays, Atlantic lobster and freshwater fish species*'. However, none of these 'species' are listed on the register of EEPs or ESBs. No further details were provided to indicate the objectives of these species management programmes.

The results indicate that those selected zoos affiliated with BIAZA or EAZA demonstrated a more significant contribution to the conservation of biodiversity.

Participation in research that benefits conservation

Three of the eight zoos (50% of the selected, licensed zoos) participate in research activities. Dublin Zoo and Dingle Oceanworld Aquarium, for example, are apparently collaborating with Higher Education Institutes (Standard Zoo Questionnaire and zoo websites).

In the remaining three selected licensed zoos, no evidence could be found (from the zoo visit, the website or literature available at the zoo) that any in-house research is undertaken. Interestingly, Eagles Flying, which is also referred to as the 'Irish Raptor Research Centre' on their website, did not undertake any research or conservation activities (Standard Zoo Questionnaire). Neither of the unlicensed zoos selected in this investigation appeared to undertake any form of research that would benefit or influence the conservation of biodiversity.

Support and funding of *in situ* conservation

In situ conservation includes the funding of local conservation projects within species' range States and the involvement in local breeding and release programmes.

According to their website, guidebook and signage within the zoo, Dublin Zoo actively provides funds to a number of organisations and conservation programmes. This includes: the Snow Leopard Trust, Painted Dog Conservation, Elephant Family and the Lowveld Rhino Trust. In addition, and as a Member of EAZA, Dublin Zoo has reportedly raised €130,000 over the last nine years for EAZA-coordinated Campaigns.

Dingle Oceanworld Aquarium, a BIAZA member, has '*a funding programme to invest money into conservation programmes*', which appears to be through a collaboration with local businesses and the Udaras na Gaeltachta (the regional authority responsible for the economic, social and cultural development of the Gaeltacht (Irish speaking region)), which provides grants for projects. According to information received from this zoo, '*In 2006 a total of €4,000 was raised for conservation projects*' (Standard Zoo Questionnaire). It is not known if the zoo also contributes to this '*funding programme*', as no further information was provided.

Reptile Village Zoo has provided unknown grants to anaconda DNA research in Venezuela (2007), the Agumbe Rainforest Station in India (2008) and Gharial Conservation Alliance in India (2009) (Standard Zoo Questionnaire).

Fota Wildlife Park reportedly supports cheetah conservation in Namibia, scarlet macaw conservation in Belize, the *Fynbos* Flower Valley Project in South Africa as well as local conservation projects within Cork Harbour.

Lahinch Seaworld apparently breeds common lobsters for a local breeding programme for release into local waters.

No evidence could be found at the three remaining selected zoos, Eagles Flying, Backwater Open Farm and Glenroe Open Farm, to indicate that they were actively participating in, or contributing to (financially or otherwise) any *in situ* conservation activities.

EDUCATION

The Directive states that zoos should '*promote public education and seek to raise awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats*' (Article 3). Article 4 of R440/2003 includes the same text, however, in addition, and according to Article 6, the Standards of Modern Zoo Practice (SMZP), zoos:

'must have a written education strategy and an active education programme.' (No. 7.11, SMZP, DEFRA 2004)

According to the returned Standard Zoo Questionnaires, three of the eight zoos confirmed that they had a written education strategy. However, due to observed activities, five of the eight zoos appeared to have established an education programme that included more than just the minimal provision of species-specific signage. This included: classroom facilities for pre-organised school groups (four of the eight zoos); the possibility for the public to purchase or obtain educational literature at the zoo's entrance (four of the eight zoos); animal interaction sessions (two of the eight

zoos); species-specific talks or shows for the visiting public (three of the eight zoos); and educational programmes for schools (four of the eight zoos). Information provided to the public during the visits to the zoos was largely accurate and usually included information about species conservation.

According to the Standard Zoo Questionnaire, completed by three of the eight selected zoos, all participated in educational activities, which include information about the species, their biological characteristics and their natural habitats.

Two of the eight zoos selected in this investigation did not appear to undertake specific activities to educate the general public about species and their conservation.

Three of the eight zoos encouraged the public to have direct contact with the animals. Furthermore, at the time of investigation, Eagles Flying – Irish Raptor Research Centre, hosted a ‘Bird Show’. This lasted approximately 70 minutes and consisted of a series of different bird species flying around a seated area. While the show included information about the species involved, the investigator expressed concern about the Centre’s encouragement of the public to have direct contact with these wild bird species.

Minimal species information

A basic requirement of a zoo is to inform their visitors about the species they exhibit. This includes information about their biology, natural habitat and conservation status. Article 6, SMZP, states:

‘Accurate information about the species exhibited must be available. Generally, this should include, as a minimum, the species name (both scientific and common), its natural habitat, some of its biological characteristics and details of its conservation status.’

(No. 7.13, SMZP, DEFRA 2004)

Proportion of Species Information Signage Present

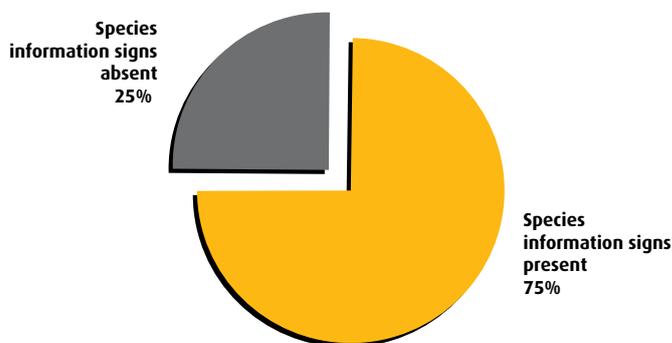


Figure 6

The average percentage of species information signage present or absent (for all 699 *species holdings*) from eight Irish zoos.

Overall, on average, 25% of *species holdings* information signage was absent (Fig. 6).



Figure 7

Lahinch Seaworld.
25% of *species holdings* at this aquarium did not have species information signage.

Quality of Species Information Signs

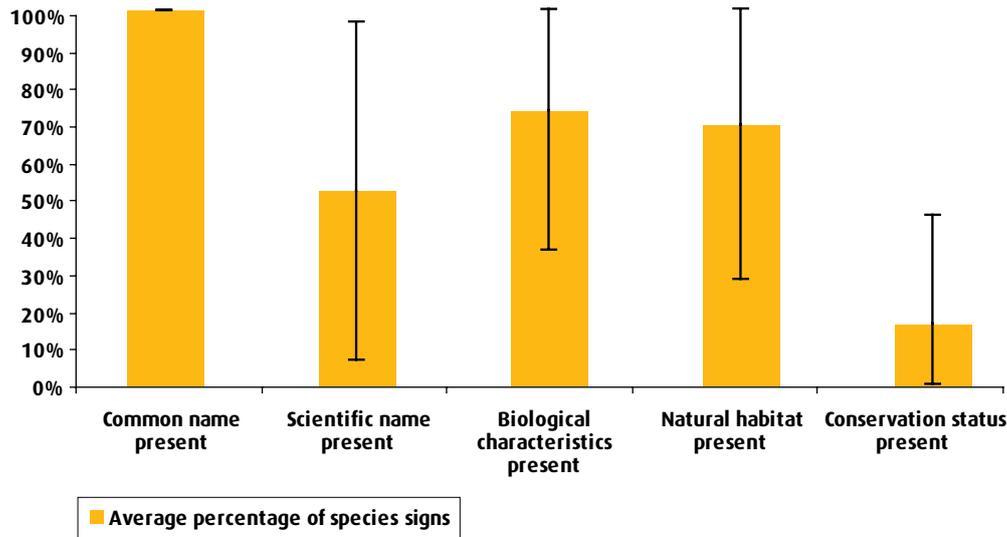


Figure 8 Content of species information signage within the eight Irish zoos. Each column represents specific information, as indicated by required criteria (SMZP). Each value (e.g. Conservation status present, 16%) represents the average of the 385 species information signs observed in 30 randomly selected enclosures. Error bars are a visual representation of the standard deviation from the mean value, demonstrating the variability in performance amongst selected zoos (e.g. the presence of information related to the natural habitat of the species varied considerably between zoos in comparison to the presence of species common name).

The results (Fig. 8) demonstrate that few of the species information signs observed on the randomly selected enclosures contained all the required criteria (SMZP): common name; scientific name; biological details; natural habitat; and conservation status. The majority of the signage observed included the species' common name. However, on average, 48% did not include the scientific name, 27% did not include any biological characteristics and 31% did not include information about their natural habitat. Furthermore, 84% of the signage did not include information on the species' conservation status, a specific requirement of R440/2003. Of the 55 signs that did display the species conservation status, 16% did not refer to the internationally recognised IUCN Red List of Threatened Species™ categorisation.

Signage for 14 *species holdings* was incorrect (inaccurate species' scientific names or incorrect conservation status), whilst other *species holdings* signage provided less than the required minimum information (No. 7.13, SMZP).

EVALUATION OF ANIMAL ENCLOSURES

To evaluate the suitability and quality of each of the 228 selected enclosures, data on 12 criteria that are regarded as vital to the health and welfare of the species (and the individual animals) were analysed using the evaluation method as described in Sections D and E of the Methodology. The 'Five Freedoms' (OIE Terrestrial Animal Health Code, 2010) were referenced as the criteria on which to base minimum standards for the keeping of animals, but species-specific needs were also taken into account, particularly in relation to the suitability of the captive environment.

In reference to the 'Five Freedoms', the 12 criteria and guidance provided by EAZA, which were all used to assess enclosure quality, the following observations were made:

Freedom from Hunger and Thirst: Provision of Food and Water

'Food and drink provided for animals to be of the nutritive value and quantity required for the particular species...'

(Article 20, EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria, 2006)

Some animals did not have access to clean drinking water.

Freedom from Discomfort: Provision of a Suitable Environment

'Animal enclosures to be furnished, in accordance with the needs of the species in question, with such items as bedding material, perching, vegetation, burrows, nesting boxes and pools'

(Article 11, EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria, 2006)

Many enclosures were predominantly sterile environments, some lacked appropriate bedding and protection from extreme temperatures. Where an indoor enclosure was present, access was usually available, but other furnishings providing shelter or refuge within the outdoor enclosure were frequently absent, especially for tethered birds of prey and domesticated ungulates.

Freedom from Pain, Injury and Distress: By Preventative Health Measures as well as Provision of Suitable Health Care

'Proper standards of hygiene . . . be maintained'

Art. 25, EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria, 2006

Some of the animals did not have access to fresh drinking water, for example, in some cases the water appeared to be stagnant. There were also a number of animals that were housed in unhygienic conditions mostly due to the build-up of faeces (especially within aviaries), urine and stagnant water.

Freedom to Express Normal Behaviour: Provision of Suitable Space and Proper Facilities

'Animals to be provided with an environment, space and furniture sufficient to allow such exercise as is needed for the welfare of the particular species.'

(Article 3, EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria, 2006)

The majority of birds at Eagles Flying – Irish Raptor Research Centre were tethered. This greatly restricts their ability to fly, exercise and express normal behaviours. Apparatus and furnishings that would provide environmental enrichment were lacking in many enclosures. There were some enclosures in all the selected zoos that did not provide suitable features to allow the animals to express natural behaviours. For example, concrete flooring prevented rabbits from being able to dig and small ponds prevented all individual waterfowl from occupying the pool at any one time.

Freedom from Fear or Distress: Ensuring conditions that avoid mental suffering

'Any direct physical contact between animals and the visiting public only to be under the control of zoo staff and for periods of time and under conditions consistent with the animals welfare and not leading to their discomfort'

(Article 19, EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria, 2006)

In some cases, social species were not housed in natural social groups.

At Eagles Flying – Irish Raptor Research Centre, birds of prey were tethered by means of leather anklets ('aylmeri') and a length of cord ('jesses'), by one leg to a fixed 'block' or 'bow'. This prevented flight and restricted movement. The birds were restrained in close proximity to one another, potentially causing some distress. The majority had no refuge from potential predators or privacy from the viewing public (Appendix 8.7, SMZP). This may subject the animals to high levels of unnecessary stress and discomfort.

Environmental Quality of Enclosures

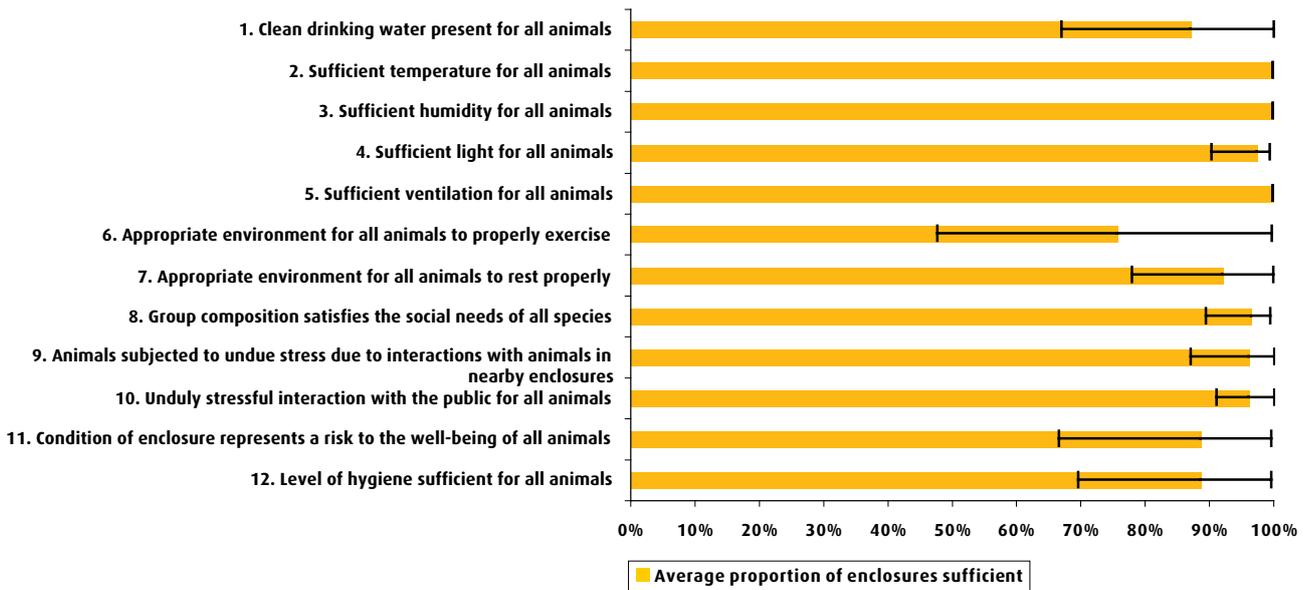


Figure 9 Environmental quality of the 228 randomly selected enclosures from eight Irish zoos. Each column represents a criterion used to assess the suitability of the enclosures to meet the needs of the animals contained. Error bars are a visual representation of the standard deviation from the mean value, demonstrating the variation in performance amongst selected zoos (e.g. the level of hygiene of the enclosures varied considerably between zoos in comparison to the temperature). Where the presence of a condition or factor could not be determined, data were not included.

The results (Fig. 9) demonstrate that some enclosures failed to meet all the requirements. While most enclosures appeared to provide the animals with sufficient light, temperature, humidity and ventilation at the time of assessment, other requirements were not consistently observed in the randomly selected enclosures. These included, on average; 13% of enclosures did not provide clean drinking water, 11% had a poor level of hygiene; and 11% posed a possible risk to the health of the animals, such as potentially hazardous defects in the enclosure barriers (No. 2.3, SMZP) and a build-up of excrement (No. 3.4, SMZP).



Figure 10

Eagles Flying – Irish Raptor Research Centre.

A number of birds of prey were observed tethered to posts without access to drinking water, privacy or shelter from the elements. Close proximity to other birds could cause them distress.



Figure 11

Blackwater Open Farm. Construction material left unattended in this enclosure could cause the animals injury.

The results also indicated that on average, 24% of the randomly selected enclosures did not allow the animals to properly exercise and display natural locomotive behaviour, for example the tethered birds of prey. Other enclosures failed to allow all the individual animals in the enclosure to seek refuge and privacy from public view (No. 2.2, SMZP), including the American alligator and spectacled caimans observed at Reptile Village Zoo.



Figure 12

Reptile Village Zoo. This enclosure (approximately 6m²), which housed both a spectacled caiman and two American alligators, failed to provide all the animals with sufficient space. Furthermore, there was no refuge from public view or opportunities for escape from potential aggression between enclosure companions.

EVALUATION OF ANIMAL WELFARE

A restrictive, predictable and barren captive environment is known to compromise the welfare of animals (Mallapur *et al.*, 2002; Lewis *et al.*, 2006) and may result in the development of abnormal behaviour which can become increasingly more difficult to reverse, even with the application of environmental enrichment techniques (Swaigood & Sheperdson, 2006). The following represents the results of an assessment as to the suitability of those enclosures assessed to permit the expression of most natural behaviours. The results have been ranked, with the most severe issues indicated in the graph opposite.

Issues requiring immediate attention (where the percentages of enclosures complying score below 50%)

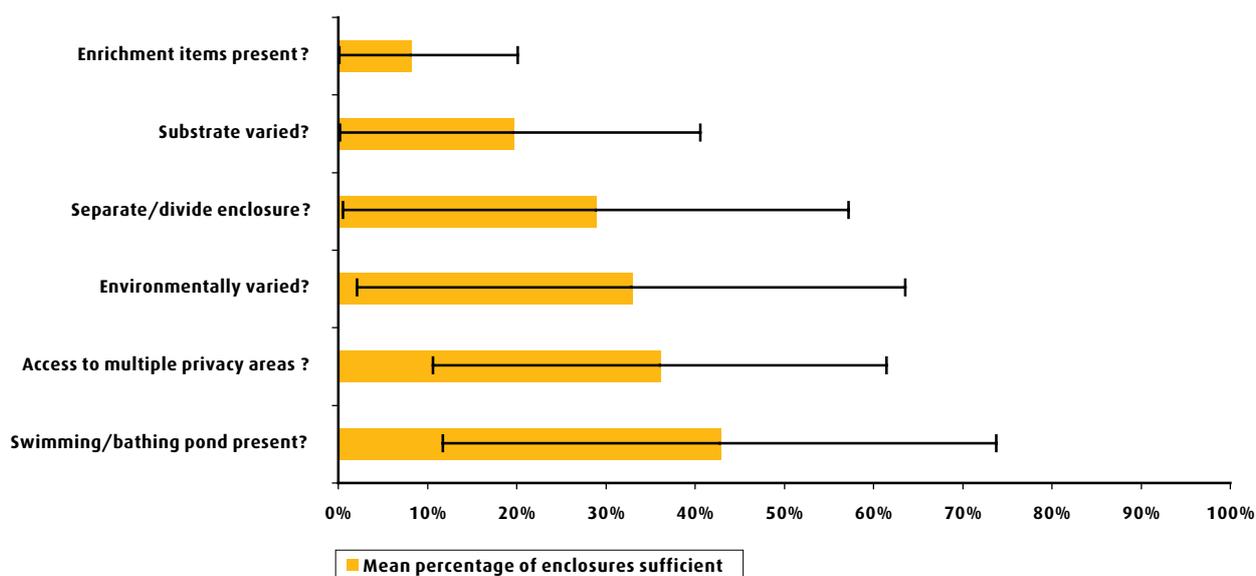


Figure 13 Issues requiring immediate attention as identified from the assessment of 228 randomly selected enclosures from the eight Irish zoos. Error bars are a visual representation of the standard deviation from the mean value, demonstrating the variability in performance amongst selected zoos (e.g. the access to multiple privacy areas varied considerably between zoos). Where the presence of a condition or factor could not be determined, data were not included.

The level of animal welfare was assessed in 228 randomly selected enclosures in the eight zoos (Fig. 13). Issues requiring immediate attention include: the lack of any behavioural or occupational enrichment items or techniques such as toys or feeding devices in, on average, 90% of the enclosures; the lack of environmental variation in 67% of enclosures and the inability for animals to access multiple privacy areas in 62% of enclosures. Such measures would encourage animals to express natural behaviours, as required by Article 3 of the Directive, Article 4(2)(c) of R440/2003 and Nos. 4.3 & 4.4 SMZP.

Widely Represented Issues of Concern (where the percentages of enclosures complying score between 51% and 70%)

- On average, 44% of enclosures did not appear to meet the requirements of APOS.
- On average, 32% of enclosures did not contain a variety of usable, species-appropriate permanent features and furnishings. .

Less Widely Represented Issues of Concern (where the percentages of enclosures score above 71%)

- On average, 31% of enclosures were not large enough to allow the animals to sufficiently distance themselves from cage companions in the event of them becoming aggressive.
- On average, 29% of enclosures were not large enough to allow the animals to sufficiently distance themselves from the viewing public.
- On average, 20% of enclosures were not large enough to permit the animals to express their full repertoire of normal locomotive movements.
- On average, 5% of enclosures did not appear to mitigate climatic extremes properly.

The Animal Protection Ordinance of Switzerland, Tierschutzverordnung 2008 (APOS) was used in the investigation to ascertain whether the enclosures were suitable for the species contained. This was chosen as an independent set of standards from a non-EU Member State. All selected enclosures (from Sections D and E analysis) were assessed against the standards. The results determined that, on average, 44% of enclosures that exhibited species listed on APOS did not meet these minimum requirements.

CONCLUSION



This investigation covered nearly one third of the identified zoological collections in the Republic of Ireland; and six of the 10 currently licensed zoos. The investigation included two zoological collections: Blackwater Open Farm and Glenroe Open Farm, which were unlicensed, but were identified as 'zoos' by the investigator due to the display of animals not normally or historically domesticated in Ireland ('wild animals').

Overall, the investigation of zoos in the Republic of Ireland has revealed that although the EC Directive 1999/22 has been accurately transposed into Regulation 440/2003, there are inconsistencies in application. Furthermore, those selected zoos affiliated with BIAZA and EAZA appear to participate in more conservation measures, as compared to non-affiliated zoos.

These Conclusions are divided into seven sections for ease of reading:

1. Implementation of the Directive

The Directive has been accurately transposed into the European Communities (Licensing and Inspection of Zoos) Regulations 2003, S.I. no.440/2003. The Directive came into force in the Republic of Ireland in April 2005. Since then all 'zoos' (as defined) should be licensed and inspected, and meet the specified requirements of R440/2003. In most cases, the requirements of the Directive have been incorporated into the Regulations (Articles) of R440/2003 word for word. Additional guidance is provided through Article 6 of R440/2003, which currently refers to the UK's Standards of Modern Zoo Practice (SMZP). All licensees are required to implement the Standards and the '*required conservation measures*'.

Although the implementation of the Directive by Member States is an issue for subsidiarity, it is important to note that the interpretation of the Directive by Member States lacks uniformity, which has led to inconsistencies in its application. This includes varying interpretations of important definitions, in particular the definition of a 'zoo'. This has resulted in large numbers of zoological collections currently being exempt from the Directive and, therefore licensing and compliance with standards, which appears to compromise the objective of the Directive. In Ireland, 17 additional, currently unlicensed establishments have been identified and should, in the opinion of the authors, be regulated by the Directive and R440/2003 if it is confirmed that they '*display animals of wild species*' to the public 'for seven or more days a year' (Article 2 of the Directive). It is for this reason the 'open farms', Blackwater Open Farm and Glenroe Open Farm have been included in this evaluation.

Despite the fact that neither the definition of a 'zoo', nor '*animal of wild species*' has been included in Part 1(2) (Interpretation) of the Regulation 440/2003, the Irish national zoo law has adopted all the '*Requirements applicable to [licensed] zoos*' as stipulated in Article 3 of the Directive. However, there are concerns over the interpretation of terms. This specifically relates to the exemption of zoological collections, through Article 11 of R440/2003, where decisions by the Competent Authority are dependent upon '*a significant number of animals or species*' and further whether the species are recognised as '*hazardous or conservation sensitive*' (Standard Member State Questionnaire). It is assumed by the authors that 'hazardous' refers to the 'Hazardous Animal Categorisation' in SMZP, however there is no reference to the criteria used to identify 'conservation sensitive species'. Failure to define these terms could result in inconsistent application of the law, which may undermine the objective of the Directive.

Interestingly, the UK Government, which established the SMZP, recognised the need to further facilitate the interpretation of terms used and the Exemption criteria through issuing the Government Circular 2/2003 (DEFRA). This not only classified the term '*significant number of animals or species*' but further identified which species would be considered '*animals of wild species*' (included in Annex E, Government Circular 2/2003). At the time, this clarification led to the identification of 109 unlicensed zoological collections in England, Wales and Scotland that required a Zoo Licence (Born Free Foundation, 2004).

However, it is reasonable to expect that an establishment that keeps animals, and an authority that is required to uphold standards in animal care, have shared responsibility towards the animals kept, regardless of the numbers of species and individuals.

The main focus of the Directive is the conservation of biodiversity (Article 9, CBD) and to ensure all zoos adopt the specified role to actively participate in conservation measures. Therefore the failure of Competent Authorities to identify 'zoos' is relevant and may well undermine this objective of the Directive. Ireland is no exception. Despite the specific requirement for zoos to implement the '*required conservation measures*', **this evaluation has revealed that all selected zoos are failing to meet all the requirements (Articles 4 & 6, R440/2003).**

2. Inconsistent enforcement

At the time of the investigation (October 2009), the Department of Environment, Heritage and Local Government had licensed 10 zoological collections. All other zoological collections identified by the authors, remain unlicensed, but operational. As indicated above **this could be as a result of a failure by the Competent Authority to correctly identify establishments as 'zoos'**, or, as a result of the mis-interpretation of terminology. According to Article 3 of R440/2003, a person shall not operate a zoo unless that person has been granted a licence.

By April 2005, all zoos in the Republic of Ireland were required to be licensed and meet the specifications of Regulation 440/2003. Results demonstrate, however, that at the time of the zoo investigation, none of the zoos appeared to fully comply with either the Directive or R440/2003. Identified problems include failure to: demonstrate a commitment to conserve biodiversity; provide detailed information about the exhibited species and; keep animals in an appropriate manner. Taking all requirements of R440/2003 into account, **conditions in some of the selected Irish zoos remain substandard.**

The results highlight an inconsistency in application of the requirements of R440/2003, particularly concerning the inspection of zoos. According to Article 12, the Minister may appoint a series of '*suitable persons*', who are responsible for the inspection of licensed zoos ('*at least once every 12 months*') and those applying for a new licence, to ensure compliance with the requirements of Article 4 of R440/2003 ('*required conservation measures*'). Whereas some of the zoos (Dublin Zoo, Fota Wildlife Park and Dingle Oceanworld Aquarium) do appear to be complying with the majority of the requirements, this is not the case for the remaining selected licensed zoos (and the two selected unlicensed). Deficiencies include; the presence of incomplete/inaccurate signage; minimal conservation measures; and low standards of animal welfare. Despite an indication that zoo inspectors attend seminars organised by DEFRA (Standard Member State Questionnaire), **regular training of the Ministerially-appointed zoo inspectors and an annual audit of the quality of the review process could help to ensure a greater consistency in the application and improve compliance with R440/2003.**

3. Ability to prevent animal escapes

The R440/2003 states that zoos should prevent '*the escape of animals from the zoo in order to avoid possible ecological threats to indigenous species*' (Article 4(2)(e), R440/2003). This has particular relevance to animals of wild, non-indigenous species that, should they escape from a zoo into the natural environment, could pose a risk to that environment and/or native wildlife. This is particularly significant if the species is a known IAS and listed by DAISIE.

Despite the fact that the majority of zoos selected in this investigation had a perimeter fence that could realistically be expected to contain escaped animals, certain practices at a number of zoos were identified as representing a significant risk in relation to the potential introduction of IAS. This included the prevalence of free-roaming animals in three of the eight zoos and the bird of prey show at Eagles Flying. For example, Fota Wildlife Park kept 124 species of free-roaming waterfowl, which were not contained to the lake only. The same zoo also hosted free-roaming mammal species, including the DAISIE-listed red-necked wallaby (DAISIE website). Bird of prey free-flight shows also run the risk of non-indigenous bird species not returning to their handler. Many cases exist of birds of prey escaping from falconry centres into the natural environment (Born Free Foundation Escapes Database).

In 2001 the European Commission recognised the need to address IAS as an integral part of halting biodiversity decline and initiated the development of an EU strategy to substantially reduce their likelihood and impact (Shine *et al.*, 2009).

It has long been recognised that zoos pose a significant risk of presenting pathways for the introduction of alien species, from the invasion of the ruddy duck (*Oxyura jamaicensis*) into Europe, which now threatens the indigenous white-headed duck (DAISIE website) to, more recently, an investigation of 63 zoos in Spain (2010), which found that 75% had enclosures that were 'non-secure', allowing inward and outward migration. In the Spanish investigation, 80% of these enclosures housed non-indigenous species, including 21 species listed by the European Inventory of Invasive Species (Fàbregas *et al.*, 2010).

4. Public placed at risk of injury

R440/2003 requires a zoo to:

Protect the 'safety of both wildlife and the public'. (Article 7(f), R440/2003)

The EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria specifies:

'Any direct physical contact between animals and the visiting public only to be under the control of zoo staff and for periods of time and under conditions consistent with the animals' welfare and not leading to their discomfort'

(Article 19, EAZA Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria, 2006)

Poor design of enclosures, inadequate fencing, the lack of stand-off barriers and the shortage of available zoo staff, allowed direct and unsupervised or planned contact to take place and, in some cases, placed the public at significant risk.

At the licensed Eagles Flying centre, birds of prey including eagle owl species, black vultures and Himalayan vultures were tethered to a fixed point and were only separated from the public by a knee-height cord that offered minimal public protection from these potentially dangerous, Category 1 ('Greater Risk') and Category 2 ('Less Risk') SMZP-listed Hazardous Animals. The SMZP not only states that owls and vultures should not be tethered (Appendix 8.7, SMZP), but it also advises that Category 1-listed species should '*be separated from the public by a barrier of suitable design to prevent physical contact between animals and members of the public*' (Appendix 12, SMZP). In addition, during the free-flight bird of prey show at the same establishment, the public was encouraged to have direct contact with potentially hazardous Category 2 species (e.g. white tailed sea eagle, European eagle owl and Harris hawk). At no time during the assessment did the investigator observe the zoo staff encourage the public to wash their hands either before or after contact with the birds (Appendix 6, SMZP). Birds can harbour *salmonella* (Centers for Disease Control and Prevention website) and the avian H5N1 virus (World Health Organisation website), which are both diseases transmissible and harmful to humans.

At the licensed Lahinch Seaworld and Dingle Oceanworld Aquarium, the public could have unlimited and unsupervised access to SMZP-listed Hazardous Animals (Category 2). Both species, thornback skate and undulate ray, were exhibited in unsupervised, open 'touch-pools' that permitted and encouraged direct contact. The SMZP states that touch pools that permit direct access should be continually supervised (Appendix 6.18(a), SMZP) and further that the animals used in the touch-pools should be rotated throughout the day to allow animals a quiet period to minimise stress (Appendix 6.18(c), SMZP). At no time was this observed during the assessment in either of the licensed aquaria.

The need for additional preventative measures, such as the positioning of warning signs, deployment of effective stand-off barriers and the employment of trained zoo staff, is acute and urgent.

Many animals are carriers of zoonotic diseases that are transmissible and may be harmful to humans. Animals, particularly wild animals, are thought to be the source of >70% of all emerging infections (Kuiken *et al.*, 2005). Direct contact between the public and numerous reptile and amphibian species was observed at the licensed Reptile Village Zoo. Although these were supervised encounters, animals were frequently picked up and held. These activities are not

only inappropriate and may be detrimental to the animals' welfare, but also potentially places the participating public at risk from injury and disease transmission. Around 200 *zoonoses* have been described and over 40 of these are associated with reptiles and amphibians (Warwick *et al.*, 2009). Contact with reptiles is responsible for an estimated 74,000 cases of human salmonellosis in the United States annually (Mermin *et al.*, 2004). During the assessment, members of the public, who were actively encouraged to hold the animals, were not informed of the potential risks or required to wash their hands both before and after contact - a practical preventative measure to limit disease transmission (Appendix 6, SMZP).

Equally, according to the SMZP, there are human health and safety considerations in the keeping of waterfowl. Ponds are a source of infectious organisms. The SMZP states that electric fences must be positioned such that the public cannot come into contact with the birds and pond edges must be fenced where necessary (Appendix 8.6, SMZP). At the Fota Wildlife Park, the waterfowl were kept in a large lake in the centre of the zoo, but there was no barrier preventing public contact with the birds or access to the deep water.

Zoos should take a far greater responsibility for the health and welfare of their animals, and the safety of the visiting public. To safeguard the wellbeing of the public, direct contact with animals, particularly those listed in Category 1 'Hazardous Animals' (SMZP) and those known to carry zoonoses, should be prohibited.

5. Poor conservation record

The involvement of zoos in the conservation of biodiversity, and specifically *ex situ* conservation, became a legal obligation in the EU with the introduction of the Directive. Zoos have often assumed the role of animal 'arks' and promoted the conservation of biodiversity.

The Directive requires all zoos in the European Community to undertake *conservation measures* that contribute to the conservation of biodiversity in accordance with the Community's obligation to adopt measures for *ex situ* conservation under Article 9 of the *Convention of Biological Diversity* (1992). Zoos are given the opportunity to choose from various options:

- *'research from which conservation benefits accrue to the species;*
- *training in relevant conservation skills;*
- *the exchange of information relating to species conservation;*
- *captive breeding, repopulation or reintroduction of species into the wild'*

(Article 3, Directive 1999/22/EC & Article 4, R440/2003)

Zoos must undertake, as a minimum, at least one of these ambiguous options. Further guidance on the '*required conservation measures*' by licensed zoos is specified under Article 6 of R440/2003, which is also referred to as the Standards of Modern Zoo Practice, SMZP 2004. Section 7 and Appendix 3 (SMZP) refer to '*Conservation and Education Measures*', and provide further, but minimal guidance on what type of activities are relevant to the requirements above.

Recognising that zoos in Ireland only have to partake in one of the options listed in Article 4, R440/2003, this investigation has analysed the participation of the selected zoos in all the '*required conservation measures*' including the requirement to promote public education and awareness in relation to the conservation of biodiversity (Article 4(2)(b), R440/2003):

Participation in scientific research

According to No. 7.7 of SMZP, zoos should be able '*to demonstrate that they encourage research*' and Appendix 3 of SMZP advises, '*zoos should be encouraged to evaluate the effectiveness of their research*'.

Results indicate that three of the zoos (50% of the licensed zoos) participate in research activities and two of these zoos, Dublin Zoo and Dingle Oceanworld Aquarium, involve a Higher Education Institute (Standard Zoo Questionnaire and zoo websites). For the remaining three licensed zoos and two unlicensed zoos, no evidence could be found from the zoo visit, their website or literature available at the zoo, that any in-house research to benefit or influence the conservation of biodiversity is undertaken. Other than the described activities undertaken at Dingle Oceanworld Aquarium and Reptile Village Zoo (Standard Zoo Questionnaire), it is not known if the research in other zoos is such that “*conservation benefits accrue to the species*”, as required by R440/2003.

According to Rees (2005) most current zoo research is concerned with [captive animal] behaviour, environmental enrichment, nutrition and reproduction, and is therefore largely irrelevant to conservation. Field based studies are likely to be more relevant to conservation than zoo studies. A good deal of zoo research is unsuitable for publication in academic journals. By its very nature, such research is conducted in unnatural conditions and often with small samples of animals (Rees, 2005). These deliberations question the significance of zoo research.

Protecting threatened species

Zoos commonly claim an essential role in the conservation of biodiversity and often promote their commitment to ‘saving’ Threatened species from extinction through *ex situ* species management programmes. In this investigation, the proportion of the different categories of IUCN Red List species in the selected zoos was evaluated. The IUCN Red List catalogues and highlights those taxa facing a higher risk of global extinction. It could therefore reasonably be expected that the majority of species kept by zoos are Threatened.

The contrary proved to be the case. In the Republic of Ireland, the majority of species (80%) kept by the zoos assessed were either species of low conservation importance, or *Not Listed* species, which are largely domesticated animals. Threatened species were a small minority. **This does not demonstrate a significant commitment by Irish zoos to conserve biodiversity and, in particular Threatened species.**

Bird, fish and mammal taxa predominated the overall species kept by the selected zoos, whilst Threatened amphibian species were massively under-represented in the zoos (1% of all Threatened species). In terms of utilising space and financial resources to achieve the highest species conservation benefit, maintaining populations of amphibians could be more effective (but possibly less publicly appealing) than focusing on larger bodied taxa. Overall, of the 6,714 vertebrate species categorised as Threatened by the ICUN Red List (ICUN Red List website), only 67 (1%) were kept in the selected Irish zoos. **Decisions taken concerning the proportion of the different Threatened taxa to be kept by the zoos do not appear to be influenced by their risk of global extinction.**

Neither of the unlicensed zoos selected in this investigation exhibited any Threatened species.

Promoting information relating to species conservation

All the licensed zoos operated educational activities for the public and the majority included reference to species conservation. However, a talk observed at Dublin Zoo (10th October 2009) about the Humboldt penguin, however, gave no mention of the species’ conservation status.

Evaluation of the selected signage indicated that **84% of signage failed to provide any information about the species’ conservation status** (a specific requirement of R440/2003) and of the 56 signs that did contain the conservation status of the species, 16% did not refer to the internationally recognised IUCN Red List of Threatened Species™ categorisation.

Participating in species management programmes

Coordinated captive-breeding programmes, according to zoos, were established to maintain genetic diversity over multiple captive generations and maximise the species' viability, should reintroduction into the wild become an option (BIAZA website; Jiang *et al.*, 2005; Smithsonian National Zoological Park website). It could therefore be reasonably expected that all Threatened species kept by zoos would be managed under such programmes.

This investigation has already shown that the zoos hold less Threatened species than might be expected, but the analysis also revealed additional areas where Irish zoos appear to be under-performing:

Only 10% (n = 49) of the 468 species in the zoos are listed on the register of European Endangered Species Breeding Programmes (EEPs) or European Stud Books (ESBs). Only two of the eight zoos kept species listed on the register of EEPs or ESBs. SMZP states that *'where relevant species are held, a zoo must be an active participant in recognised species management programmes'* (No. 7.6, SMZP). Indications are that all 39 (of the total 83) species kept at Dublin Zoo, and 18 (of the total 153) species at Fota Wildlife Park are participating in EEP and ESB Programmes. However, recognising that EU zoos should make a conscious effort to prioritise the conservation of European Threatened species, none of the selected zoos appeared to significantly contribute to regional conservation efforts through captive breeding programmes. Only Fota Wildlife Park participated in two Programmes dedicated in European Threatened species.

Support and funding of *in situ* conservation

Feedback from the Standard Zoo Questionnaire and analysis of zoo literature indicated that four of the eight zoos (two thirds of the licensed zoos) actively provide funds to numerous conservation programmes. However, little information was found as to the amounts donated and the frequency of these donations. This requires further investigation. Those zoos affiliated with national and international zoo associations, such as BIAZA and EAZA made greater contributions to the conservation of biodiversity.

Overall, the selected zoos largely failed to live up to their obligations to the conservation of biodiversity.

To date, no independent quality assurance assessment has been undertaken to identify whether the European zoo community as a whole either is or has the capability of effectively and significantly contribute to the conservation of biodiversity and thereby justify their existence under the terms of the Directive.

6. Education measures

In addition to a commitment to actively conserve biodiversity, zoos in the EU must also promote and inform the public about the animal species kept at the zoo, provide information about their biology and natural habitats and seek ways to raise public awareness about the importance of species conservation (Appendix 3.13, SMZP). These requirements have been transposed effectively into the Irish zoo law, R440/2003, which has also incorporated the requirement through No. 7.11 of SMZP that states zoos:

'... must have a written education strategy and an active education programme.' (No. 7.11, SMZP, DEFRA 2004)

'... must have a written education policy...' (Article 2, EAZA Education Standards)

From the returned Standard Zoo Questionnaire, **half of the selected licensed zoos in the Republic of Ireland have a written education strategy.** Despite four of the selected, licensed zoos having a classroom facility for school groups, at the time of the assessment, only three zoos had scheduled talks for the general public where species conservation education was promoted.

Clearly some licensed zoos are participating in more educational activities than others, but the unlicensed zoos, (two 'open farms' with animals of wild species) appeared not to provide any educational materials or activities for the visiting public.

The quality of species information signage also varied between each assessed zoo. Overall, the results demonstrate that basic information about the species (species information signage on the enclosures) was often incomplete (SMZP), inaccurate, incorrect or absent. Accurate and complete species signage should be regarded as an absolute minimum requirement within a zoo's educational strategy and **the results of this investigation indicate that species information signage rarely included all the required information (No. 7.13, SMZP).**

Despite some zoos being affiliated with national and international zoo associations, such as BIAZA and EAZA, which encourage additional educational requirements and encourage more diverse techniques to communicate their educational message, overall Irish zoos are not adequately educating the public about all the species in their care.

To date, no independent quality assurance assessment has been undertaken to identify whether the European zoo community as a whole either is or has the capability of effectively and significantly contributing to the education of the public and thereby justify their existence under the terms of the Directive.

7. Animal husbandry and care

The assessment of zoo enclosures in Ireland identified an apparent lack of consideration for the species-specific needs of wild animals and their care in captivity.

For example:

- some species were kept in small enclosures that did not attempt to meet their spatial needs;
- some animals were not provided with the necessary apparatus and materials to allow the species to exercise and express normal behaviour;
- in some instances social species were housed alone;
- the majority of species were not provided with behavioural or occupational enrichment opportunities by way of items, specifically toys or feeding devices.

It is widely recognised that the keeping of animals for prolonged periods in 'impoverished', cramped, captive conditions can compromise both their physical and mental health and their general welfare. Conditions that fail to provide the animal with its species-specific needs can give rise to abnormal behaviour, disease and early mortality. Zoos must therefore seek to provide all their animals with more suitable environments that encourage exercise and natural behaviour.

Irish zoo law (440/2003) has recognised these basic needs and has incorporated the requirements of the Directive that all zoos should '*aim to satisfy the biological and conservation requirements of individual species*' into Article 4, R440/2003. This requires zoos to incorporate measures to deliver species-specific environmental enrichment and good animal husbandry, to ensure the appropriate keeping of wild animals in captivity. However, unlike other EU Member States, there are no additional species-specific minimum standards of animal keeping, other than the guidance in SMZP.

In this EU-wide project, consideration has been given to APOS, which provided an independent assessment of 'appropriate' animal keeping. Results indicate that, on average, 44% of enclosures in Irish zoos that exhibited species listed on APOS did not meet these minimum requirements. Furthermore, on average, 24% of the randomly selected enclosures did not allow the animals to properly exercise and display natural locomotive behaviour. This was most notable at Eagles Flying. Although it is common practice to tether birds of prey, it is highly restrictive, and subjecting other animal species to such practice would be unacceptable. According to UK VET (Rees Davies, 2005) whilst keeping

birds in aviaries are preferred, the tethering does not usually compromise the welfare of some species, providing the bird is well trained, the animals are kept in a good condition and the birds are given regular free flying. Behavioural problems do however result from a lack of stimulation, namely repetitive bathing (jumping from the perch, which can result in the fracture of both legs), feather plucking and screaming, which can be addressed through environment enrichment (Rees Davies, 2005).

The evaluation revealed a generally proficient level of basic animal care and husbandry in the Irish zoos. However, results indicated that **little consideration appears to have been given to species-specific requirements, particularly the provision of environmental enrichment**. Specific problems include:

- On average, nine out of ten of enclosures lacked any form of behavioural or occupational enrichment;
- On average, nearly one third of enclosures were not large enough to allow the animals to sufficiently distance themselves from the viewing public;
- Most enclosures lacked any environmental complexity.

It is widely recognised that the inclusion of varied environmental enrichment is integral to reducing the negative impacts of confinement on animals in captivity (maintaining healthy animals in a captive environment) (Pruetz & Bloomsmith, 1992; Crockett *et al.*, 1989; Jordan, 2005) and without it animals are likely to develop abnormal repetitive behaviours, recognised as indicators of poor animal welfare (Mason and Rushen, 2006). Equally, a cramped and 'predictable' captive environment can lead to obesity and muscular atrophy, which may in turn lead to welfare impacts with secondary health consequences (Fowler & Mikota, 2006; Harris *et al.*, 2008).

Abnormal and stereotypic behaviour was observed in four of the eight zoos, which included grey wolf at Dublin Zoo, giraffe at Fota Wildlife Park and rabbit at Glenroe Open Farm.

The SMZP provides additional guidance on appropriate animal husbandry and care (No.2, No.4 & Appendix 8) but no species-specific guidance or detailed environmental enrichment protocols are provided. BIAZA does provide its membership with husbandry guidance for a limited number of species, but these are not commonly promoted to other, non-BIAZA zoos. **The Competent Authority should consider requiring zoos, through Article 6 of R440/2003, to implement an environmental enrichment programme that aims to provide the animals with behavioural and occupational enrichment items, toys and feeding devices to encourage most natural behaviours.**

In summary

Irish zoos are:

- **failing to participate in or make a significant contribution to the conservation of biodiversity.**
- **failing to make a significant contribution to *ex situ* conservation.**
- **failing to provide significant information about the species exhibited to the general public.**
- **failing to recognise and address species-specific requirements.**
- **on the whole, failing to meet the minimum requirements of the Directive and R440/2003.**

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Born Free Foundation

Born Free Foundation is an international wildlife charity, founded by Virginia McKenna and Bill Travers following their starring roles in the classic film Born Free. Today, led by their son Will Travers, Born Free is working worldwide for wild animal welfare and compassionate conservation.

Born Free supports and manages a diverse range of projects and campaigns. We embrace both compassion and science in setting an agenda that seeks to influence, inspire and encourage a change in public opinion away from keeping wild animals in captivity while, in the short term, working with governments, the travel industry and like minded organisations to seek compliance with existing legislation and improve the welfare conditions for wild animals currently held in zoos. Via our Compassionate Conservation agenda (www.compassionateconservation.org), we provide protection for threatened species and their habitats across the globe. Working with local communities, Born Free develops humane solutions to ensure that people and wildlife can live together without conflict. www.bornfree.org.uk

ENDCAP

ENDCAP is a European coalition of 27 NGOs and wildlife professionals from 20 European countries that specialise in the welfare and protection of wild animals in captivity. Working with the European Institutions, national governments and experts, ENDCAP aims to improve knowledge and understanding of the needs of wild animals in captivity, uphold current legislation and seek higher standards, whilst challenging the concept of keeping wild animals in captivity. www.endcap.eu

EU Zoo Inquiry 2011

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Report Methodology: For full details of methodology and to view the other Reports published as part of this project www.euzooinquiry.eu

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