Review of Zoos’ Conservation and Education Contribution

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Project Team

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The team was supported by the following specialist advisers:

- BIAZA (British and Irish Association of Zoos and Aquariums); and
- England Marketing - provision of telephone fieldwork services

I declare that this report represents a true and accurate record of the results obtained/work carried out.

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Executive Summary

Objectives
The aims of this project were to collect and assess information about the amount and type of conservation and education work undertaken by zoos in England. On the basis of that assessment, and in the light of the Secretary of State’s Standards of Modern Zoo Practice (SSSMZP) and the Zoos Forum Handbook (2008 - including the Annexes to Chapter 2), the project will make recommendations for:

- minimum standards for conservation and education in a variety of sizes of zoo; and
- methods for zoo inspectors to enable them to assess zoo conservation and educational activities.

The specific objectives for this project were to assess the current level of conservation and education work for a range of zoos in order to:-

a) provide an analysis of how zoos are meeting their legal obligations;

b) recommend minimum standards for zoos with regard to their education and conservation work; and

c) identify a proportionate means for zoo inspectors to assess compliance with the legislation.

Methods
The study was conducted by ADAS working in close collaboration with the British and Irish Association of Zoos and Aquariums (BIAZA).

A Project Steering Group oversaw delivery of the project and additional specialist advice was provided to the Project Team by a Consultation Group made up of veterinary and non-veterinary inspectors, local authority licensing officers and zoo operators.

The project followed an iterative approach that began with a review of available literature. This informed the development of a telephone survey of a representative sample of the population of licensed zoos in England that generated 31 responses from zoos with no dispensation and 69 responses from zoos with some dispensation. Six case studies provided an opportunity for a more detailed review of conservation and education activities among a selected sub-sample. The findings of each stage were analysed to provide the basis for the development of evidence-based conclusions and recommendations.

Findings
The review of available literature reported considerable evidence of the wide range of conservation and education projects conducted by zoos. Concerns remain, however, with regard to the lack of available evidence about the effectiveness of these projects. These concerns are not restricted to zoos, for example museums and field conservation projects face similar challenges. An improved ability to demonstrate the effectiveness of their conservation and education activities may be expected to be of increasing value to zoos not only in meeting their legal obligations but also in communicating and promoting their role in the face of negative campaigning from groups opposed to zoos.

On the evidence of this project, zoos in England are meeting their conservation and education requirements through a diverse and expanding range of activities. Furthermore, a
comparison of the findings of this project with the suggested guidelines for conservation and education contribution set out in the Zoos Forum Handbook (2008), confirms that the measures are both broadly achievable and being achieved. In reviewing the results, it is important to remember the proportionality ethos of the legislation. Zoos with dispensations are not expected to carry out the same degree of conservation and education work as zoos with no dispensations.

Conservation contribution

The Zoo Licensing Act 1981 (as amended) suggests a range of different conservation activities. Zoos must participate in at least one of these and will typically be involved in a range of different options that together make up their overall conservation contribution.

The survey found that 91% of respondents reported activity in at least one of the key conservation activities of research, training, exchange of information, breeding programmes and re-population / re-introduction. Indeed, 33% reported activity across all of these areas. Of some concern however, as this is a requirement of licensing, was the finding that 9% of respondents did not report participation in any of these activities. Zoos with no dispensation were more likely to report conservation activities than zoos with dispensations:

- 94% of respondents from zoos with no dispensation and 61% of respondents from zoos with some dispensation reported participation in research projects from which conservation benefits have or will be derived;
- 100% of respondents from zoos with no dispensation and 66% of respondents from zoos with some dispensation reported involvement in field conservation projects, either in the United Kingdom or overseas. In the majority of cases, 77%, these projects included a training component;
- 94% of respondents from zoos with no dispensation and 71% of respondents from zoos with some dispensation reported participation in the exchange of information relating to the conservation of species of wild animals;
- 94% of respondents from zoos with no dispensation and 64% of respondents from zoos with some dispensation reported involvement in managed breeding of species in captivity; and
- among respondents involved in field conservation projects, 77% of respondents from zoos with no dispensation and 56% of respondents from zoos with some dispensation indicated that their projects included re-introduction or re-population activities.

Education contribution

The foundations of zoos’ education activities as defined in the SSSMZP may be defined as the written education policy, the availability of suitable facilities (commensurate with the size of the zoo) and the provision of accurate information about the species that make up the collection.

There was considerable evidence of the positive influence of zoos’ written education policy on their activities with mean scores of four and above on a five-point scale (1 of no impact and 5 of great impact) when respondents were asked to evaluate the impact of their policy.

Not surprisingly, larger zoos (as defined by visitor numbers) and zoos with no dispensation tended to have access to a wider range of facilities for education. All zoos with no dispensation and 83% of zoos with some dispensation confirmed that classes were provided for visiting school or adult groups. The majority of respondents also provided outreach visits.
The important role played by signage in communicating with visitors was emphasised by the literature review. The SSSMZP states that, as a minimum, signage should include common name, scientific name, natural habitat, some biological characteristics and details of conservation status. Although widely mentioned, these cornerstones were not universally recalled when respondents were asked to describe the categories of information included as standard on their enclosures. Feedback from the Consultation Group, however, suggested that these requirements were firmly embedded in zoos. The majority of respondents reported that animal shows or presentations for visitors were provided at animal enclosures.

Potential self assessment
The concept of a self-assessment tool, especially in an on-line format, designed to assist zoos to comply with their conservation and education requirements was well received by respondents to the survey.

Recommendations
• the current categorisation of zoos appears to work, especially as the study shows a strong correlation between visitor numbers and dispensation status, and should be maintained;
• recommended standards of conservation and education are achievable, care needs to be taken by inspectors to identify those zoos that are not achieving all that they should be;
• as there were some zoos in the survey that did not appear to be complying with the conservation recommendations, inspectors should be reminded that all zoos must comply with at least one of the conservation measures and ensure that this is the case;
• the ‘suggested benchmarks for education and conservation’ guidance for inspectors of zoos should be reviewed in light of the findings of this report;
• the addition to the SSSMZP, and to the suggested guidelines set out in the Zoos Forum Handbook, of a requirement for the evaluation of education activities should be considered;
• there was little evidence of activity in conservation among farm parks with small collections of animals. This may reflect the available resources of small farm parks and should be reviewed;
• the Zoos Forum Handbook does not otherwise need to be adjusted;
• the concept of a self assessment tool designed to assist zoos to comply with their conservation and education requirements, especially if made available on-line, was well received by respondents to the survey. The development of this tool, as part of the pre-inspection process, should be progressed. This should make the job of the inspector easier and allow for better consistency between inspectors;
• the lack of available evidence with respect to the effectiveness of conservation and education activities together with the call from zoos for practical examples to assist them with the development of their own programmes, highlights the need to collect and disseminate examples of best practice. Developing these tools could be the topic of a future Defra research project; and
• in acknowledgment of the challenges faced by smaller zoos, the potential for a mentoring system should be investigated. This would allow smaller zoos to benefit from the resources and experiences of their larger peers while the role of the latter could be taken into account when assessing their contribution.
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1. Background

1.1 Requirement for participation in conservation and education

Zoos in England have a legal requirement to participate in conservation and education measures under the provisions of the Zoo Licensing Act 1981 (as amended)¹. Each zoo’s contribution to conservation and education is expected to be proportionate to its size and type. The Secretary of State's Standards of Modern Zoo Practice (SSSMZP)² sets out minimum standards by which zoos are expected to comply (Appendix 1), according to the following measures:

- participating in research from which conservation benefits accrue to the species, and/or training in relevant conservation skills, and/or the exchange of information relating to species conservation and/or, where appropriate, captive breeding, re-population or re-introduction of species into the wild; and

- promoting public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats.

Where necessary, the SSSMZP advises zoos to seek assistance in planning and implementing their conservation and education strategies. The Zoos Forum Handbook³ supplements the SSSMZP guidance for zoos and outlines options and examples for the types of conservation activities in which zoos may choose to participate. These examples take the form of benchmarks for minimum standards and describe the level of activity commensurate with a range of zoos of different size.

The SSSMZP states that zoos should demonstrate measurable performance in conservation, education and research. This should include: overall conservation and education policy, and how this relates to the World Zoo and Aquarium Conservation Strategy (WZACS⁴); and type and level of input into international conservation programmes. The World Association of Zoos and Aquariums (WAZA) published its original conservation strategy in 1993. For the first time, this document sought to define “the responsibilities and opportunities that the international zoo and aquarium community needed, in order to be fully involved in nature conservation”. The WZACS, launched in 2005, builds on the themes of the earlier strategy to provide a “common philosophy for zoos and aquariums across the globe and defines the standards and policies that are necessary to achieve their goals in conservation.”

1.2 Licensing of zoos

Licensing of zoos in England is the responsibility of local authorities. The Secretary of State’s appointed Zoo Inspectors carry out inspections of zoos and animal collections and in addition to safety of the visiting public and animal welfare they also assess the zoo’s contribution to conservation and education.

The suggested guidelines presented in the Zoos Forum Handbook (2008) assist in this process by outlining some minimum contributions to conservation and education that may be expected. The guidelines in the Handbook are, however, only that and a

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¹ http://www.defra.gov.uk/wildlife-pets/zoos/licensing-act.htm
degree of judgement is left to inspectors, especially when they are assessing an activity or contribution that is not necessarily articulated within the guidelines. The wide range of animal collections in England represents an additional challenge when it comes to assessing the adequacy of each zoo’s level of contribution to conservation and education.

There is a risk of inconsistency of application where different inspectors assess different zoos. Furthermore, given the relatively small number of licensed zoos within each local authority area, some local authority’s officers may have infrequent and intermittent liaison with zoos in their area. In response to these risks, inspectors are rotated between areas and regular training for local authority licensing officers is provided in order to assist them in keeping up to date with the legislation and processes associated with licensing zoos.

Animal Health\(^5\) (formerly the State Veterinary Service or SVS) is the government’s Executive Agency responsible for managing and maintaining the list of Secretary of State Zoo Inspectors that are qualified to inspect zoos in England. The Zoo Inspector list is made up of two parts:

- the first part contains details of veterinarians with experience of zoo animals and competent of advising on appropriate conservation measures in accordance with the requirements of the Zoo Licensing Act 1981 (as amended); and
- the second part contains details of persons competent to inspect animals in zoos and to advise on their welfare and husbandry as well as the implementation of conservation measures and the management of zoos more generally.

Animal Health’s Zoo Inspectorate nominates suitable inspectors on behalf of local authorities to conduct the inspections required by the Zoo Licensing Act 1981 (as amended).

1.3 Rationale for this project

This study was commissioned, in England only, by the Department for Environment, Food and Rural Affairs (Defra) to assist with the assessment of zoos’ evolving role in a wide-range of conservation and education activities. This has been achieved by reviewing how zoos are currently meeting their obligations in this area, by recommending minimum standards with regard to conservation and education work and by identifying proportionate means to assist in assessing compliance. The outcomes of this project are expected to be of benefit in highlighting examples of best practice and encouraging a consistent approach for zoos and inspectors.

2. **Introduction**

2.1 **Definitions**

2.1.1 **Zoos**

For the purposes of this project, the term "zoos" is used as a generic term that includes the wide variety of licensed collections including farm parks, aquariums, bird gardens and safari parks as well as traditional zoos.

According to the Zoo Licensing Act 1981 (as amended), zoos are defined as an establishment where wild animals are kept for exhibition to the public otherwise than for purposes of a circus and otherwise than in a pet shop. The term “wild animals” means animals not normally domesticated in Great Britain. The Act applies to any zoo to which members of the public have access, with or without charge for admission, on seven days or more in any period of twelve consecutive months.

2.1.2 **Dispensation status**

Section 14 of the Zoo Licensing Act 1981 (as amended) provides the Secretary of State with powers to relax the requirements of the Act for a small zoo or for a small zoo exhibiting only a small number of different kinds of animals. Zoos considered by the Secretary of State as suitable for an exemption under section 14(1)(a) generally are small collections of non-hazardous and non-conservation sensitive wild species not exceeding 120 specimens (although each case is treated on its individual merits). Zoos with such an exemption are exempt from the requirements of the Act, including the conservation and education requirements. Exemptions are issued by the Secretary of State and are not given where, in the Secretary of State’s opinion; it is prejudicial to the protection of wild animals and the conservation of biodiversity.

Zoos with dispensations under either sections 14(1)(b) or 14(2) are required to comply with the Zoo Licensing Act 1981 (as amended) including the conservation and education requirements, but the inspection requirements afforded the Act are relaxed. The conservation and education requirements for zoos are required to be commensurate to the size and nature of the zoo and are not necessarily linked to the type of dispensation that the zoo might have.

2.1.3 **Number of zoos by dispensation status**

As at March 2009, Animal Health reported that there were 262 zoos in England (Appendix 2). General mixed collections accounted for 32% of all collections; bird collections, 27%; farm parks, 16%; aquariums, 11%; invertebrates, 6%; reptiles and amphibians, 2%; and others for almost 7%. By dispensation status, there were:

- 161 (61%) zoos with 14(2) dispensation status;
- 55 (21%) zoos with 14(1)(a) dispensation status;
- 1 (<1%) zoo with 14(1)(b) dispensation status; and
- 45 (17%) zoos with no dispensation.

For the purposes of this report, ‘some dispensation’ refers to zoos with Dispensation14(1)(b) or 14(2); and ‘no dispensation’ describes zoos with none.
2.2 Conservation

2.2.1 Working definition

Among the many definitions of conservation, The World Association of Zoos and Aquariums (WAZA) defines conservation as the ‘…securing of long-term populations of species in natural ecosystems and habitats wherever possible’ (2005). Conservation may take the form of in situ and ex situ activities. The Convention on Biodiversity (CBD) that underpins the requirement for zoos to participate in conservation activities defines in situ conservation as:

- the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of some domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

and ex situ conservation as:

- the conservation of components of biological diversity outside their natural habitat.

2.2.2 Conservation in practice

The amount and type of conservation work carried out by zoos tends to reflect their type, size and dispensation status. Activities can be undertaken in the zoo or abroad, and can involve indigenous or exotic species. Conservation activities include research, training in relevant conservation skills, exchange of information, captive breeding, re-population and re-introduction of species. Zoos tend to make their major contribution to conservation through Species Management Programmes. These usually involve captive breeding with the possible intention of future re-introduction.

WAZA (Building a Future for Wildlife, 2005), calls on zoos to adhere to integrated conservation to ‘achieve the greatest sustainable conservation benefit for threatened species, their habitats and their human neighbours’. Integrated conservation emphasises collaboration, co-ordination and communication, for example by supporting species in the field that relate to species in zoos’ own collections.

2.2.3 Evaluating conservation

Conservation activities may be measured in terms of inputs and/or outputs. Inputs can be measured relatively easily by the amount of resources e.g. finance, equipment, staff time and training; by their very nature, outputs tend to be more difficult to assess.

The Zoos Forum Handbook (2008) emphasises the importance of effective project management to “oversee, co-ordinate and monitor the implementation of all project activities". Within these project management activities, the need to define indicators that can be measured and monitored against the project’s objectives is highlighted. Furthermore, the Handbook advises that a project’s achieved outputs should be compared with the project’s proposed outputs. Performance indicators are suggested as a means of measuring progress against defined targets in both securing inputs and delivering outputs. The importance of a project report is emphasised as a basis to allow the exchange of information.

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6 http://www.waza.org/conservation/wzacs.php
2.3 **Education**

2.3.1 **Working definition**

Zoos provide education in many different ways. For example, students may be educated through formally taught classes delivered by trained staff. These classes are often linked to key-stage educational programmes and may take place either in the zoo or as outreach programmes for non-visitors. More informal education involves the interpretation within the zoological park e.g. through signage on the enclosures, talks to visiting members of the public as well as talks delivered through outreach programmes. There is also non formal education, e.g. the messages communicated when buying and eating food, is it sustainable etc, and throughout the zoo site.

2.3.2 **Education in practice**

Education is one of the core objectives of zoological collections. The Zoos Forum Handbook (2008) states that the education strategy should facilitate the translation of educational aims and objectives into policy and practice and suggests aims that may be featured in the strategy:

- to excite, enthuse and interest people in the natural world;
- to encourage public understanding of conservation issues;
- to develop public support and action to address conservation concerns; and
- to provide experiences for visitors to enable them to make choices about their impact upon the environment.

2.3.3 **Evaluating education**

Evaluation to measure the success of education activities often takes the form of teacher feedback sheets, surveys and behavioural studies such as the time visitors spend at various enclosures/events. For local authority sponsored projects, the preparation of OFSTED-type reports may be a requirement.

Although not restricted to the larger zoos with dedicated education facilities, it is acknowledged that best practice is often observed where staff and resources are available to implement ideas. Evaluation, however, has tended to be subjective and it is recognised that more empirical evidence is needed to better demonstrate the educational value of a zoo’s work. The consistency and content of outgoing communications delivered by zoo staff and volunteers also require monitoring.

The Zoos Forum Handbook (2008) emphasised that visitors to zoos have an existing knowledge and understanding of the natural world, as well as emotional responses to certain issues. These are characteristics that are likely to have been developed since early childhood through interaction with family, friends and the media as well as via the formal and non-formal educational activities of zoos and other information providers. Collections are advised to have some awareness and to take into account, the level and emphasis of public knowledge and understanding in all age groups and categories of visitor in order that the educational strategy can be most effectively targeted. In this way, the education strategy will help visitors to become better informed and to achieve a greater understanding about a range of issues facing the natural environment such as conservation biology, adaptation, predator-prey interactions and habitat requirements. In this context, the importance of research into conservation education is highlighted.
3. **Aims and objectives**

3.1 **Project aims**

The aims of this project were to collect and assess information about the amount and type of conservation and education work undertaken by zoos in England. On the basis of that assessment, and in the light of the SSSMZP and the Zoos Forum Handbook (2008 - including the Annexes to Chapter 2), the project will make recommendations for:

- minimum standards for conservation and education in a variety of sizes of zoo; and
- methods for zoo inspectors to enable them to assess zoo conservation and educational activities.

3.2 **Project objectives**

The specific objectives for this project were to assess the current level of conservation and education work for a range of zoos in order to:-

A. provide an analysis of how zoos are meeting their legal obligations;

B. recommend minimum standards for zoos with regard to their education and conservation work; and

C. identify a proportionate means for zoo inspectors to assess compliance with the legislation.
4. Methodology

4.1 Methodological discussion

4.1.1 Overview

A review of available literature informed the development of a survey of a representative sample of the population of licensed collections in England. Six case studies provided an opportunity for a more detailed review of conservation and education activities among a selected sub-sample. These had the objectives of demonstrating best practice in selected conservation and education activities and of providing practical examples that would inspire other zoos. Each stage of the process was supported by reference to the Project Consultation Group.

The survey of a representative sample of the population of licensed collections in England was conducted to gather information about their education and conservation activities. The findings were expected to be of particular value in providing an analysis of how zoos were meeting their legal obligations (Objective A). In addition, results would be of assistance in both the development of recommendations for minimum standards for zoos with regard to their education and conservation work (Objective B); and in identifying a proportionate means for zoo inspectors to assess compliance with the legislation (Objective C).

4.1.2 Key issues

In the light of previous attempts that have been made to identify a proportionate means for zoo inspectors to assess compliance with the legislation, it was recognised from the outset that Objectives B and C would not be easily addressed. The difficulties centre on an ability to “score” and assess the various conservation and education activities undertaken within the wide range of licensed zoos. There is a large degree of subjectivity and consensus may be difficult.

Any recommended assessment methods would need to be pragmatic and to take into account the practical situation in which the inspections occur. Furthermore, pre-inspection audits may have an increasingly important role to play in helping zoos to evaluate their own contributions in terms of their licence compliance. This may include, for example, using on-line self-assessment tools.

There are various movements towards numerically evaluating conservation activity success throughout the conservation field. The Cambridge Conservation Forum’s (CCF), Harmonizing Measures of Conservation Success Group has presented its methodology widely. Some of the problems with this development have included defining what conservation actually encompasses and how to measure whether the contribution input is sufficient and adequate based upon size, or indeed capability, of the zoo. The British and Irish Association of Zoos and Aquariums (BIAZA) has attempted to address some of these issues with its membership, and discussions with key stakeholders continue.

Within assessment of education contributions, previous attempts have included surveying visitors to zoos before and after their visit to gauge if their knowledge had increased as a result of their visit (Balmford et al 2007). This methodology has given cause for concern among some stakeholders in terms of its reliability and validity. Other studies have used a similar methodology to produce significant differences in visitor knowledge before and after a particular exhibit. These and other results suggest that it is not possible to state categorically that zoos’ both engage and fail to engage in successful forms of science and environmental education.
4.2 Methodology in detail

4.2.1 Project team
The project was co-ordinated by ADAS UK Ltd (http://www.adas.co.uk/). Working in collaboration with ADAS, the British and Irish Association of Zoos and Aquariums (BIAZA, http://www.biaza.org.uk) provided specialist advice and support. BIAZA is the professional body that represents leading zoos in Britain and Ireland where the emphasis is on animal welfare, education and conservation work.

4.2.2 Project steering group
A Project Steering Group oversaw completion of the work. Meetings between the Steering Group and the Project Team were held at key stages of the study and regular e-mail and telephone contact was maintained throughout. In addition to Jane Withey and Margaret Finn from Defra’s Biodiversity Programme, Helen Pontier (Defra) acted as Scientific Adviser and Stephen Woollard represented the Zoos Forum7.

4.2.3 Summary statement
The project was aimed at all licensed zoos in England, not just members of BIAZA. A transparent approach was maintained at all stages and a summary (Appendix 3) was published for information at the outset via the Defra, BIAZA and ADAS websites.

4.2.4 Project consultation group
A Consultation Group was created, with representation of local authorities, inspectors and zoos, to inform key stages of the project (Appendix 4). In making the choices of participants, some specific considerations were taken into account: to have representation from a wide geographical area and across a range of organisations of different size; the experience and previous engagement of nominated participants in zoo licensing issues and meetings; and likely availability and willingness to participate in the process. Between them, the nine members of the Consultation Group, as shown in Table 1, brought a wealth of experience and knowledge to the project.

Table 1: Project consultation group profile

<table>
<thead>
<tr>
<th>Member</th>
<th>Position</th>
</tr>
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<tbody>
<tr>
<td>Carroll, Bryan</td>
<td>Non-veterinary inspector – Bristol Zoo</td>
</tr>
<tr>
<td>Jackson, Nick</td>
<td>Non-veterinary inspector – Welsh Mountain Zoo</td>
</tr>
<tr>
<td>Thornton, Sue</td>
<td>Veterinary inspector – International Zoo Veterinary Group (IZVG)</td>
</tr>
<tr>
<td>Bradfield, Deborah</td>
<td>Local authority licensing officer – City of London</td>
</tr>
<tr>
<td>Wastnedge, Roger</td>
<td>Local authority licensing officer – Chester (retired)</td>
</tr>
<tr>
<td>Wearden, Peter</td>
<td>Local authority licensing officer – South Hams</td>
</tr>
<tr>
<td>Batters, Gary</td>
<td>Banham Zoo</td>
</tr>
<tr>
<td>D’arronville, Zahra</td>
<td>Blue Reef Aquarium</td>
</tr>
<tr>
<td>Ross, David</td>
<td>Knowsley Safari Park</td>
</tr>
</tbody>
</table>

4.2.5 Literature review

A review of available literature was conducted. The search focused on previous studies into education and conservation within licensed zoos and included current licence requirements and consideration of areas where Council Directive 1999/22/EC\(^8\) is implemented. The outputs of this review informed development of survey materials.

4.2.6 Survey of zoos

A telephone survey of senior management among a representative sample of 100 licensed zoos in England was conducted.

Sample design

Of the 262 zoos in England, at the time of the survey there were 55 with a 14(1)(a) dispensation. As these collections were exempt from the Zoo Licensing Act 1981 (as amended) this gave a target population of 207 licensed zoos. Various approaches were investigated with a view to achieving a representative sample from the 100 planned interviews. Table 2, below, summarises the working sample design. The definitions reflect those that are used by Animal Health in classifying its database.

<table>
<thead>
<tr>
<th>Collection type</th>
<th>Total</th>
<th>Dispensation status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>14(1)(b)/14(2)</td>
</tr>
<tr>
<td>General mixed</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Birds of Prey</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Invertebrate</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Aquarium</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Other bird collection</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Farm Park</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Reptile/amphibian</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>55</td>
</tr>
</tbody>
</table>

Animal Health provided contact details for the sample. All records for zoos with no dispensation were required, records for zoos with Dispensation 14(1)(b) or 14(2) were selected at random according to the stratification shown in Table 2, above. In the event that zoos with no dispensation did not wish, or were not able, to take part, additional contacts were sourced for zoos with Dispensation 14(1)(b) or 14(2).

The Steering Group was mindful that there might be criticism that the project focus was biased towards larger zoos (those with no dispensation). As these were more likely to report innovative strategies for education/conservation activities and were subject to the full provisions of the Act, this approach was felt to be fully justified. Needs specific to those premises operating under Dispensation 14(1)(b)/14(2) were acknowledged through their inclusion in the sample design.

Fieldwork
Survey materials were designed by the Project Team - in consultation with the Project Steering Group and subject to comment from the Consultation Group – and pre-tested prior to submission to Defra for final approval and the start of main-stage fieldwork.

A pre-survey letter (Appendix 5) was sent to all 207 zoos eligible to take part in the survey. Each letter was accompanied by a copy of the questionnaire (Appendix 6). A telephone helpline was provided as a point of contact in the event of any queries.

Telephone interviews were conducted on behalf of ADAS by England Marketing, a specialist provider of telephone research services. The research took place between June and October 2009. Some participants returned completed questionnaires and these were processed for analyses along with responses from the telephone survey. Results are reported in aggregate and individual zoos have not been identified. Where quoted, statistical probabilities are based on the chi-squared test.

The target of 100 interviews was achieved. The level of support shown by all of the zoos that were approached as part of this survey reflected the sector’s positive approach to conservation and education and is gratefully acknowledged. The sample achieved is compared with the original sample design in Table 3, below. Chi-squared tests confirmed that significantly more interviews were completed with respondents with dispensation than originally targeted and hence fewer without dispensation; and that the number of ‘others’ was significantly higher than targeted, although the numbers are small. The number of ‘general mixed’ was under quota.

<table>
<thead>
<tr>
<th>Collection type</th>
<th>Total Achieved</th>
<th>Target</th>
<th>Some Dispensation Achieved</th>
<th>Target</th>
<th>No Dispensation Achieved</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>General mixed</td>
<td>43</td>
<td>50</td>
<td>21</td>
<td>15</td>
<td>22</td>
<td>35</td>
</tr>
<tr>
<td>Birds of Prey</td>
<td>10</td>
<td>13</td>
<td>10</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Invertebrate</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Aquarium</td>
<td>14</td>
<td>11</td>
<td>13</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Other bird collection</td>
<td>9</td>
<td>11</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Farm Park</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reptile/amphibian</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>69</strong></td>
<td><strong>55</strong></td>
<td><strong>31</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

4.2.7 Case studies
All respondents to the survey were invited to take part in further research associated with this project, the majority replied to the positive. An anonymous shortlist was drafted to provide: various types of ownership (private, charity and local authority), a range of visitor numbers, a good geographic spread and a cross-section of type of collection. A total of six zoos were identified as the first choice with eight zoos in reserve. In the event, the reserve list was not needed. Appointments were made with representatives of the target zoos for members of the Project Team to visit in order to collect information about their conservation and education activities. These visits focused in detail on selected activities to form the basis of the case studies.
5. **Literature review**

Zoos' education and conservation activities often complement one another. This is not always the case as Davey (2005) highlighted that the efforts to meet the welfare needs of animals often compromise visitors' needs due to decreased animal visibility. However, animal welfare initiatives such as naturalistic features need not necessarily conflict with visitor interest and non-visible animals can even stimulate visitor interest.

There is considerable evidence of the wide range of conservation and educational projects undertaken by zoos but concerns remain with regard to a lack of available evidence on the effectiveness of these projects. These concerns are not unique to zoos but extend to a range of visitor attractions including, for example, museums.

A summary of the key findings to emerge from the review of available literature is presented below; the full report is included for reference at Appendix 7.

5.1 **Conservation**

5.1.1 **Species management programmes**

Zoos' major contribution to conservation tends to be made through species management programmes. These programmes typically involve captive breeding with the possible intention of future re-introduction of a self-sustained population – this is known as *ex situ* conservation. Zoos may also carry out conservation in the field (*in situ*). Maintaining, restoring and providing habitat are key components of these projects that often involve changing local attitudes regarding policies affecting habitats. Smith & Hutchins (2000) quoted that zoos can contribute to wildlife and habitat conservation in a number of ways, including public education, scientific research, development of relevant technologies, professional training and technology transfer, ecotourism, political action and involvement in field conservation. As shown in Building a Future for Wildlife (WAZA 2005), many zoos now follow an integrated approach, linking their living collections with on-going conservation in the field.

5.1.2 **Funding constraints**

Conservation work is often constrained by funding. While entrance fees and other expenditure by visitors remain the main sources of income, zoos may use a number of other methods to generate additional funds. For example, sponsorship from local and national organisations, membership schemes and animal adoption programmes. Smaller zoos may find these activities more difficult and Smith *et al* (2007) emphasised the importance of partnerships between zoos, government agencies, and non-governmental organisations for successful conservation.

5.1.3 **Extent of evaluation**

There is much evidence of the wide range of conservation projects undertaken by zoos. There is less evidence with regard to the effectiveness of these projects.

With respect to conservation in general, not just that supported by zoos, Fazey *et al* (2005) quoted that only 13% of studies actively went out to test or review conservation actions. Similarly, Pullin *et al* (2004) reported that on being asked whether they had been able to evaluate the effectiveness of actions in their management plans, 16% said all had been evaluated, 36% said most had been evaluated, 37% said some had been evaluated and 6% reported that none had been evaluated.

With respect specifically to projects supported by zoos, Walter (2005) found that many appeared to lack an established practice to collect appropriate data, or to define
appropriate indices, for measuring effect. This makes it problematic to determine conservation outcomes, and represents a flaw that the conservation movement needs to address more widely (Pullin & Knight 2001, Sutherland et al, 2004).

5.1.4 Evaluation process
A number of systems have been devised to help examine the effectiveness of conservation projects. Some involve a series of questions, but are often specific to the planning process or are measures of in-house processes rather than assessments of the consequence of conservation spend for wild species and habitats. One of the latest systems to be developed is the Mace et al (2007) system. This system incorporates guidelines to score the importance, volume and effect of five different components (Education, Habitat, Research, Training and Species) of conservation projects. An overall impact score is then calculated according to three scores (importance, volume and effect). An issue with many of the evaluation systems, including Mace et al, is the lack of agreement between the scores of the independent scorer (who had some knowledge of the scoring system) and the project leader or someone who had significant knowledge of the scoring system.

Stem et al (2005) suggested that an approach that provides specific steps and guidance was needed to effectively evaluate conservation measures. This approach may include tools such as a scorecard, but it is the approach, not the tool, that explicitly specifies the steps to carry out the evaluation. The need for practitioner training in the use of conceptual frameworks, the development of conceptual models, and the application of quantitative and qualitative research methods was highlighted.

5.1.5 Information sources
There is a concern that scientific evidence is not being sufficiently used in conservation practice. Pullin and Knight (2001) quoted that for the majority of conservation projects, justification for proposed actions is experience-based rather than evidence-based, action is often taken without monitoring or evaluation of effectiveness, and results are rarely widely disseminated.

Pullin et al (2004) asked compilers about the sources of information used to support their decision-making. The most frequently used sources were existing management plans (60%), expert opinion from outside the compilation group (49%), published reviews, books or handbooks (47%), and documentation or personal accounts of traditional management practices (46%). Least frequently used sources of information were electronic / web-based materials (4%), published popular articles (13%) and published scientific papers (23%). Pullin et al (2004) found that primary scientific literature was infrequently accessed. When they asked a subgroup during follow-up interviews why they did not access primary literature to help them in their decision-making, the most frequent responses were that it was too time consuming to locate (65%) and too time consuming to read (60%).

Scientific evidence
Pullin et al (2004) undertook a formal assessment of the extent to which scientific evidence was being used in conservation practice by conducting a survey of management plans and their compilers from major conservation organisations within the United Kingdom. They found that only 23% of practitioners always or usually used scientific publications when compiling management plans.
5.2 Education

5.2.1 Range of activities
Zoo education has a wide remit; it may take the form of formal presentations or a more informal approach such as the interpretation within the park. Many zoos have invested in education through purpose built classrooms, educational officers and interactive touch tables etc. for their visitors, as well as press releases and outreach programmes for those who do not visit the zoo.

5.2.2 Visitors' characteristics
Visitors to the zoo who are there primarily for recreational purposes often do not wish to be educated. Several studies have indicated that the average time visitors spend looking at exhibits is short e.g. from ten seconds to three minutes. Visitors may lose interest in response to the scientific and biological details of animal physiology and breeding techniques that accompanies the zoo's conservation message and they may not wish to hear harsh truths.

5.2.3 Educational signs
Some studies have indicated that visitors to zoos pay only cursory attention to educational signs. A study in New Zealand found that only 29% of visitors were observed to read signs at all (Tofield et al, 2003). Work by Brennan (1977) found that less than half of the groups in the study read the signs and also highlighted the importance of the location of the sign. For example, visitors typically tend to gather in front of wherever the animals may be found and if that spot does not correspond with where the sign is placed then sign reading is unlikely to occur. The study suggested ways of increasing sign reading through change of design, sign format, colours used, informational content, lead phrases, and placement in the exhibit.

5.2.4 Novel approaches
Visitors often remember more from animal training and presentations than visual signs. Technological approaches may also increase the information absorbed. Lindemann-Matthies & Kamer (2006) found that visitors using the touch table (an area containing animal artefacts with people explaining to visitors what they are) knew more about the biology, ecology and conservation of bearded vultures, both immediately after their visit to the zoo and two months later. A BIAZA report showed that 58% of BIAZA members had touch tables for visitors. Keepers' talks, guided tours and activity trails have also been found to stimulate interest among visitors.

5.2.5 Evaluation process
Given the complexities associated with understanding attitudes and behaviours with respect to major conservation issues, The Zoos Forum Handbook (2008) notes that it is inherently difficult to effectively evaluate the impact of zoo education in this area. Zoos can, however, take steps to measure intent and, with repeat visitors, attempt to evaluate changes in attitude, knowledge and behaviour over time.

Evaluation often takes the form of feedback sheets, surveys and behavioural studies, such as the time visitors spend at various enclosures, to assist zoos' achieve a better appreciation of how successfully educational messages are being communicated to the target audience. Despite this, few studies have examined the overall experience/education at the zoo and tend to focus more on exhibits or visitors’ general natural history knowledge. Outgoing communications may be monitored through a formal process of staff appraisal where actions are observed, recorded and assessed, or more informally by way of conversations, meetings or training events/talks.
6. Results

Results are reported in aggregate and individual zoos have not been identified. Where statistical probabilities have been quoted, the data concerned have been subjected to analysis by the chi-square test.

6.1 Sample description

65% of respondents represented private zoos; 25% of respondents were from charity zoos and 7% were from local authority zoos. At 58%, the majority of respondents stated that their zoo promoted a particular theme, story or design, including a focus on species, a geographical location or historical theme that characterised the collection. For 71% of respondents, their zoo was described as a stand-alone attraction. The other 29% of respondents stated that the zoo formed part of a larger overall attraction.

Respondents from zoos with no dispensation reported significantly higher visitor numbers, as shown in Table 4, than did zoos with some dispensation (P< 0.001).

Table 4: Number of visitors by dispensation status

Q4: approximately how many visitors came to your zoo in 2008?

<table>
<thead>
<tr>
<th>Visitor numbers (2008)</th>
<th>Some Dispensation</th>
<th>No Dispensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>69</td>
<td>31</td>
</tr>
<tr>
<td>30k or less</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>26%</td>
<td>-</td>
</tr>
<tr>
<td>&gt;30k but &lt;80k</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>3%</td>
</tr>
<tr>
<td>&gt;80k but &lt;200k</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>28%</td>
<td>29%</td>
</tr>
<tr>
<td>&gt;200k but &lt;350K</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>12%</td>
<td>26%</td>
</tr>
<tr>
<td>&gt;350k</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>4%</td>
<td>42%</td>
</tr>
</tbody>
</table>

There was a wide range in the number of full time equivalent (FTE) staff employed: 38% of respondents reported 1-10; 39% reported 11-50; and 22% reported 51 or more. As visitor numbers increased, there was a significant increase in the number of FTE staff employed (P<0.001). The important role played by volunteer workers was reflected by the finding that 80% of respondents received support from this source.

All respondents reported some FTE staff involved in education activities. 44% of respondents said that the number of education staff had increased compared with three years ago; 50% said that the number was the same and 4% reported a decline. At 81%, most respondents confirmed that some members of their zoo’s education staff were qualified in a biological and/or teaching discipline.

Respondents from zoos with no dispensation reported a significantly higher number of staff involved in education activities than respondents from zoos with some dispensation (P=0.032). Similarly, respondents from zoos with no dispensation reported a significantly higher number of staff involved in conservation activities than respondents from zoos with some dispensation (P=0.004).
6.2 Comparison of survey responses with minimum standards

Under the terms of the Zoo Licensing Act 1981 (as amended), zoos are required to participate in conservation and education measures. Each zoo’s contribution is expected to be proportionate to its size and type; the legislation does not distinguish between zoos funded by different means (charity, private, local authority etc.). The Zoos Forum Handbook (2008) suggests minimum standards that might reasonably be expected although it is emphasised that, wherever possible, zoos should aim to exceed these standards to make the maximum possible contribution. The guidance provided by the Handbook serves to assist not only zoo operators by outlining the minimum contribution expected of them, but also local authority officers and zoo inspectors responsible for administering the zoo licensing regime.

By way of an introduction to the results, responses to the survey are compared, below, with the minimum standards described in the Zoos Forum Handbook (2008). Additional detail with respect to respondents’ contribution to conservation and education is then provided in the sections that follow.

6.2.1 Conservation measures

The legislation requires zoos to participate in conservation but it is left to the zoos themselves to decide how best to meet this requirement. The Zoo Licensing Act 1981 (as amended) describes a range of different options for conservation. Zoos must participate in at least one of these options but will typically be involved in a range of different options that all contribute to their overall commitment to conservation.

Table 5 shows the level of participation among respondents to the survey in each of the conservation measures suggested by the Act. Presenting the findings by annual visitor numbers highlights the range of activity across zoos of all sizes (as determined by visitor numbers).

Table 5: Conservation measures, by visitor numbers

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>30k or less</th>
<th>&gt;30k but &lt;80k</th>
<th>&gt;80k but &lt;200k</th>
<th>&gt;200k but &lt;350k</th>
<th>&gt;350k</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Research from which conservation benefits accrue to the species</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>11</td>
<td>21</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>61%</td>
<td>50%</td>
<td>75%</td>
<td>88%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>ii) Training in relevant conservation skills</td>
<td>8</td>
<td>9</td>
<td>16</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>44%</td>
<td>41%</td>
<td>57%</td>
<td>81%</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>iii) The exchange of information relating to species conservation</td>
<td>12</td>
<td>15</td>
<td>23</td>
<td>15</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>67%</td>
<td>68%</td>
<td>82%</td>
<td>94%</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>iv) (where appropriate) Breeding of wild animals in captivity</td>
<td>10</td>
<td>12</td>
<td>21</td>
<td>14</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>56%</td>
<td>55%</td>
<td>75%</td>
<td>88%</td>
<td>94%</td>
<td></td>
</tr>
<tr>
<td>v) (where appropriate) The repopulation or reintroduction of species into the wild</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>44%</td>
<td>36%</td>
<td>43%</td>
<td>56%</td>
<td>75%</td>
<td></td>
</tr>
</tbody>
</table>
There were 33 respondents that reported participation in all five areas of conservation activity, 19 operated with no dispensation and 14 had some dispensations. Table 6 shows conservation measures according to respondents’ dispensation status.

Table 6: Conservation measures, by dispensation status

<table>
<thead>
<tr>
<th>Dispensation status</th>
<th>Some</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base</strong></td>
<td>69</td>
<td>31</td>
</tr>
<tr>
<td>i) Research from which conservation benefits accrue to the species</td>
<td>42</td>
<td>29</td>
</tr>
<tr>
<td>ii) Training in relevant conservation skills</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>iii) The exchange of information relating to species conservation</td>
<td>49</td>
<td>29</td>
</tr>
<tr>
<td>iv) (where appropriate) Breeding of wild animals in captivity</td>
<td>43</td>
<td>29</td>
</tr>
<tr>
<td>v) (where appropriate) The repopulation or reintroduction of species into the wild</td>
<td>25</td>
<td>24</td>
</tr>
</tbody>
</table>

There were nine zoos that did not report participation in any of the five suggested conservation activities. These were all private collections with some dispensation and their focus tended to be on the provision of education activities.

6.2.2 Education provision

The EC Zoos Directive requires zoos, no matter what their size, to promote public education and awareness in relation to the conservation of biodiversity. Zoos are encouraged to provide information about the species exhibited and their natural habitats. Basic minimum standards are defined by the SSSMZP, as follows:

- a zoo must have a written education strategy and an active education programme;
- suitable facilities, commensurate to the size of the zoo, should be available for education purposes; and
- accurate information about the species exhibited must be available
  - as a minimum, this should include the species name (scientific and common), its natural habitat, some of its biological characteristics and details of its conservation status.

The Zoos Forum Handbook (2008) confirms that the focus of inspectors and licensing authorities is on a zoo’s education activities as a whole rather than an assessment of individual elements.

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Table 7 provides an overview of respondents’ education activities against an approximation of the minimum standards as defined in the SSSMZP. The influence of the zoo’s written education policy was evidenced by mean score values of 4 or above (on a 5-point scale) among all respondents. In line with expectations, larger zoos (as defined by visitor numbers) tended to be better resourced in terms of access to a range of educational facilities. On being asked to recall the information displayed as standard on enclosures, scientific and common name were not universally mentioned.

### Table 7: Education measures, by visitor numbers

<table>
<thead>
<tr>
<th>Annual Visitor Numbers</th>
<th>30k or less</th>
<th>&gt;30k but &lt;80k</th>
<th>&gt;80k but &lt;200k</th>
<th>&gt;200k but &lt;350k</th>
<th>&gt;350k</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>18</td>
<td>22</td>
<td>28</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>i) Extent to which written education policy influences education work (1, not at all; 5, a great extent): mean score</td>
<td>4.00</td>
<td>4.12</td>
<td>4.04</td>
<td>4.46</td>
<td>4.75</td>
</tr>
<tr>
<td>ii) Suitable facilities:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...none of classroom, library or lecture theatre</td>
<td>3 (17%)</td>
<td>3 (14%)</td>
<td>4 (14%)</td>
<td>2 (13%)</td>
<td>1 (6%)</td>
</tr>
<tr>
<td>...any one of classroom, library or lecture theatre</td>
<td>9 (50%)</td>
<td>9 (41%)</td>
<td>13 (46%)</td>
<td>6 (38%)</td>
<td>4 (25%)</td>
</tr>
<tr>
<td>...any two of classroom, library or lecture theatre</td>
<td>3 (17%)</td>
<td>8 (36%)</td>
<td>7 (25%)</td>
<td>3 (19%)</td>
<td>5 (31%)</td>
</tr>
<tr>
<td>...any three of classroom, library or lecture theatre</td>
<td>1 (6%)</td>
<td>1 (5%)</td>
<td>3 (11%)</td>
<td>4 (25%)</td>
<td>6 (38%)</td>
</tr>
<tr>
<td>iii) Information: scientific name + common name*</td>
<td>12 (67%)</td>
<td>15 (68%)</td>
<td>25 (89%)</td>
<td>11 (69%)</td>
<td>12 (75%)</td>
</tr>
</tbody>
</table>

* spontaneously recalled by respondents

Active education was reflected, in part, by the number of pupils booked onto formal education sessions and respondents from zoos with no dispensation tended to report higher numbers of pupils booked onto formal education classes in the year 2008, than were reported by respondents from zoos with some dispensation.

### 6.2.3 Suggested guidelines

The Zoos Forum Handbook (2008) provides guidance - in the form of six hypothetical examples - that has been designed to assist local authority officers, zoo inspectors and zoo operators with the interpretation of the requirements of the legislation. These examples are framed to reflect the different types and sizes of zoos. It is intended that the examples provide an indication only of the broad level of contribution to conservation and education that the Zoos Forum considers to be the minimum. A comparison of responses to the survey with these guidelines (Appendix 8) provides a measure of the level of reported activity versus expected minimum levels of activity.

This comparison confirms that the suggested guidelines are broadly achievable. There was, however, little available evidence of conservation activities among farm parks with very small collections of wild animals suggesting that this requirement should be reviewed. Similarly, there was little evidence of publication of papers and notes on the results of research projects among zoos with high visitor numbers.
6.3 Conservation measures
For the purposes of this project, the questionnaire explored research, breeding and field conservation projects. Key findings are discussed in the section below.

For guidance, respondents were asked to include conservation activities involving both native and non-native species that had been undertaken in accordance with the provisions of the Zoo Licensing Act 1981 (as amended), since the year 2006.

6.3.1 Research projects
As shown in Table 8, below, the proportion of respondents that reported involvement in research projects from which conservation benefits have, or will be derived, was significantly higher (P=0.001) among zoos with no dispensation (94%) than zoos with some dispensation (61%).

Table 8: Research projects by dispensation status
Q12: including any partnership work, has your zoo/aquarium/animal park undertaken (in the last 3 years) or are you currently undertaking any research projects from which conservation benefits, including ex-situ behavioural studies, have or will be derived?

<table>
<thead>
<tr>
<th>Dispensation status</th>
<th>Base</th>
<th>Some</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>69</td>
<td>42</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>61%</td>
<td>94%</td>
</tr>
<tr>
<td>No</td>
<td>31</td>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38%</td>
<td>6%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1%</td>
<td>-</td>
</tr>
</tbody>
</table>

47% of respondents from zoos with some dispensation reported that all or some of the results from research projects had been published, Table 9. This was significantly lower (P=0.042) than the 76% of respondents from zoos with no dispensation that reported publication of all or some of the results of their research projects.

Table 9: Publication of research projects by dispensation status
Q15: Have the results of these projects been published and put in the public domain?

<table>
<thead>
<tr>
<th>Dispensation status</th>
<th>Base</th>
<th>Some</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, all</td>
<td>42</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Yes, some</td>
<td></td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40%</td>
<td>69%</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Not yet</td>
<td></td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29%</td>
<td>7%</td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12%</td>
<td>7%</td>
</tr>
</tbody>
</table>
6.3.2  Training in conservation skills
The majority of respondents, 77%, that were involved in field conservation projects reported that their projects included a training component, Table 10. Where field conservation projects included a re-introduction or re-population component; the proportion of projects that had a training component increased to 86%.

Table 10: Relationship between re-introduction/re-population activities and training
Q27: Did any of these field conservation projects have a re-introduction or re-population component? And Q29: Did any of these field conservation projects have a training component?

<table>
<thead>
<tr>
<th>Did project(s) have a re-introduction or re-population component?</th>
<th>Base</th>
<th>Did project(s) have a training component?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did project(s) have a re-introduction or re-population component?</th>
<th>Base</th>
<th>Did project(s) have a training component?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

6.3.3  Exchange of information
At 94%, a significantly higher proportion (P=0.012) of zoos with no dispensation participated in the exchange of information relating to the conservation of species of wild animal compared with zoos with some dispensation (71%).

Information was exchanged in a wide variety of ways and often disseminated in more than one way. The main channels of communication were:

- via media, magazines, newsletters, websites, papers (25 respondents);
- conferences, meetings and talks (24 respondents);
- communications/visits to other zoos (17 respondents);
- sharing research data, responding to surveys (16 respondents); and
- discussion with industry/professional bodies (12 respondents).

As shown in Table 11, below, respondents from zoos with 200-350k visitors per year were the most likely, at 94%, to report participation in the exchange of information. Among slightly smaller zoos (as defined by visitor numbers) with 80-200k visitors and slightly larger zoos with 350k or more visitors, around 80% of respondents reported involvement in the exchange of information. Among the smallest zoos (less than 80k visitors), 66% participated in the exchange of information.
Table 11: Exchange of information, by number of visitors
Q32: Has your zoo/aquarium/animal park participated in any exchange of information relating to the conservation of species of wild animals during the last 3 years? And Q4: approximately how many visitors came to your zoo in 2008?

<table>
<thead>
<tr>
<th>Number of Visitors</th>
<th>Base</th>
<th>Participated in exchange of information?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>30k or less</td>
<td>18</td>
<td></td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>66%</td>
<td>33%</td>
</tr>
<tr>
<td>&gt;30k but &lt;80k</td>
<td>22</td>
<td></td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>&gt;80k but &lt;200k</td>
<td>28</td>
<td></td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>82%</td>
<td>18%</td>
</tr>
<tr>
<td>&gt;200k but &lt;350k</td>
<td>16</td>
<td></td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>94%</td>
<td>6%</td>
</tr>
<tr>
<td>&gt;350k</td>
<td>16</td>
<td></td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
<td>78</td>
<td>22</td>
</tr>
</tbody>
</table>

6.3.4 Managed breeding
Zoos in the 200-350k and over 350k visitor categories were significantly more likely to be involved in managed breeding programmes than those in the under 30k and 30-80k categories (P=0.015), as shown in Figure 1, below.

Figure 1: Involvement in managed breeding programmes, by visitor numbers

Q16: Has your zoo been involved in any managed breeding programmes of species in captivity?

Base: 98 respondents answering Q16
At 94%, significantly more (P=0.002) respondents from zoos with no dispensation reported that their zoo had been involved in managed breeding of species in captivity compared with 64% of respondents from zoos with some dispensation.

59% of respondents from zoos with no dispensation that were involved in managed breeding programmes also had responsibility for co-ordination of the studbook. This compared to 28% among respondents from zoos with some dispensation, Table 12. Zoos with no dispensation were significantly more likely (P=0.009) to report responsibility for studbook co-ordination, and the commitment that this represents.

Table 12: Responsibility for co-ordination of studbook by dispensation status
Q19: Do you co-ordinate or keep the studbook for any of these programmes?

<table>
<thead>
<tr>
<th>Dispensation status</th>
<th>Involved in managed breeding</th>
<th>Co-ordinate Studbook</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Some</td>
<td>43</td>
<td>12</td>
</tr>
<tr>
<td>None</td>
<td>29</td>
<td>17</td>
</tr>
</tbody>
</table>

6.3.5 Conservation in the field
At 100%, respondents from zoos with no dispensation were significantly more likely (P=0.0002) to report involvement in field conservation projects compared with respondents from zoos with some dispensation, 66%. Involvement in field conservation projects was reported across zoos of all sizes, as shown in Figure 2.

Figure 2: Involvement in field conservation projects, by visitor numbers

Q20: Has your zoo been involved in projects connected with conservation in the field?

Base: 99 respondents to the survey
For 31% of respondents, their field conservation projects took place in the UK; 40% stated that projects were conducted exclusively outside the UK; and 29%, reported activities both inside and outside the UK.

As summarised in Figure 3, below, there was a wide spread in the approximate annual cost of field conservation projects. Responses ranged from less than £500 to more than £3 million. While the majority of the larger, >£100k, projects were associated with the larger zoos (as defined by visitor numbers), there were also some smaller zoos that reported this level of expenditure.

**Figure 3: Approximate total annual cost of field conservation projects**

Q25: What is the approximate total annual cost for field conservation project(s)?

![Bar chart showing the approximate total annual cost for field conservation projects](chart.png)

*Base: 58 respondents recalling annual cost of field conservation projects*

The basis on which respondents’ calculated annual cost of field conservation projects showed wide variation. While most included funds from zoo budgets, funds raised from the public and staff time/resources in their definition; other combinations were also reported to suggest that like for like comparisons may be problematic.

**Re-introduction or re-population activities**

Zoos with no dispensation that were involved in field conservation were significantly more likely (p=0.05) to have some projects that included a re-introduction or re-population component.

Among the 31 respondents from zoos with no dispensation that were involved in field conservation projects, 24 (77%) reported that some of their projects included a re-introduction or re-population component. Among the 45 respondents from zoos with some dispensation that were involved in field conservation, 25 (56%) reported that some of their projects included a re-introduction or re-population component.
6.3.6 Evaluation of conservation activities

Evaluation of field conservation projects

Up to this point in the survey, various inputs into conservation had been investigated but it is also important to measure and evaluate outputs i.e. did the project achieve its goals. As described in Section 4.1.2, this is a difficult and time consuming activity.

Figure 4 shows that evaluation was not embedded in all field conservation projects with nine respondents that reported no evaluation. Whereas just over half (52%) of respondents among zoos with no dispensation that were involved in field conservation projects reported that more than three-quarters of their projects were evaluated, this was true for just under half (49%) of respondents from zoos with some dispensation.

Figure 4: Evaluation of field conservation projects, by dispensation status

Q31: what proportion of your field conservation projects are evaluated to see if the results (outcomes) fulfil the aims of the project?

<table>
<thead>
<tr>
<th>Evaluation Level</th>
<th>Some dispensation (45)</th>
<th>No dispensation (31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No projects evaluated</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>&lt;50% evaluated</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>51-75% evaluated</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>&gt;76% evaluated</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>Don't Know</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Base: 76 respondents involved in field conservation projects

Perceived compliance with conservation requirements

Using a five-point scale, where one was not very well and five was very well, respondents were asked to indicate how well they felt that they were meeting their obligations to comply with their conservation requirements.

Although there was a tendency for a higher proportion of respondents from larger zoos (size as defined by visitor numbers), and zoos with no dispensation, as shown in Figure 5, to report a higher score, these differences were not found to be significant.
Figure 5: Perceived compliance with conservation requirements, by size

Q57: How well do you feel you are meeting your obligations to comply with your conservation requirements?

As shown in Figure 6, below, whereas, 52% of respondents from zoos with no dispensation perceived that they were fully meeting their conservation requirements, this compared with 31% of respondents from zoos with some dispensation.

Figure 6: Perceived compliance with conservation requirements, by dispensation status

Q57: How well do you feel you are meeting your obligations to comply with your conservation requirements?
Measures of contribution to conservation
Respondents were asked how, if at all, their zoo’s contribution to conservation was measured, 74% reported that some measures were in place, 26% reported that no measures were in place. Replies are shown in Table 13, below, according to respondents’ perceptions of how well they saw themselves complying with their conservation requirements.

Table 13: Conservation measures by perceived compliance with conservation obligations
Q55: How, if at all, do you measure your zoo/aquarium/animal park’s contribution to conservation? And Q57: How well do you feel you are meeting your obligations to comply with your conservation requirements? (1 = not very well and 5 = very well)

<table>
<thead>
<tr>
<th>How contribution to conservation is measured</th>
<th>Total</th>
<th>Not Well* (1 or 2)</th>
<th>OK (3)</th>
<th>Well (4 or 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>99</td>
<td>11</td>
<td>21</td>
<td>67</td>
</tr>
<tr>
<td>Hours of time from staff</td>
<td>36</td>
<td>0</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Involvement in fundraising</td>
<td>33</td>
<td>1</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>Involvement in awareness raising campaigns</td>
<td>40</td>
<td>1</td>
<td>7</td>
<td>32</td>
</tr>
<tr>
<td>Money spent</td>
<td>34</td>
<td>1</td>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>Press reports</td>
<td>21</td>
<td>-</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Visitor feedback</td>
<td>31</td>
<td>2</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Don’t measure</td>
<td>26</td>
<td>7</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>16</td>
<td>-</td>
<td>3</td>
<td>13</td>
</tr>
</tbody>
</table>

* low base

Among 11 respondents that perceived their zoo as not complying very well with its conservation obligations, seven respondents reported that contribution to conservation was not measured. 21% of respondents that perceived their zoo to be complying well, stated that their zoo’s contribution to conservation was not measured.

Where ‘other’ measures were mentioned (16%), these were made up of a range of quantitative and qualitative approaches, including: four mentions of field data; three mentions of a review against project aims; and single mentions of project assessment visits, general correspondence and ethical review.

6.3.7 Additional remarks with respect to conservation
Respondents were invited to ‘add anything else with regard to the conservation activities of their zoo’ and a total of 58 replies were received. Three key themes emerged among responses: conservation covers such a diverse range of activities that it makes consistent evaluation problematic; although not readily quantified, the contribution made by zoos to conservation in the form of staff time should not be underestimated; and the specific challenges faced by small zoos were highlighted with calls for additional support in the form of external help and advice.
6.3.8 Key conservation projects for the future

Respondents were asked whether or not their zoo had any key conservation projects planned for the three years after the survey. Two thirds of respondents replied to the positive. The description of projects was wide-ranging, as follows:

Conservation in the field

There were specific mentions of overseas training projects in Nepal, Sudan and Northern Africa.

There were 14 mentions of species-specific projects and these included:

- birds: penguins (two mentions), red billed chaff, blue throated macaw, kingfishers, cranes (two mentions), red breasted goose, Madagascan pochard, parrots, grey partridge;
- primates (two mentions);
- whales and dolphins;
- beavers, otters; and
- cheetahs, leopards, lions.

There were 14 mentions of habitat conservation projects and these included:

- landscape for native species (six mentions);
- marshland (three mentions);
- native woodland (two mentions);
- tropical forest (two mentions); and
- marine conservation.

Research projects

There were ten mentions of research projects and these included a GPS-tracking study of wildlife around water-holes; research into the re-introduction of African Lions in parts of Zimbabwe and Zambia; a baseline study of native wildlife populations; animal health and welfare studies with regard to conservation breeding; population studies of birds in Sumatra; investment in a research centre to study underwater activity; ex-situ conservation project for butterflies – evidence based and ethically reviewed; working with ethnology students to establish baseline behavioural data among long-term captive animals; and an octopus behavioural project.

Managed breeding in captivity

There were seven mentions of forthcoming breeding projects that covered a wide range of species. These included native mammals (harvest mice, water voles and dormice) and birds (native birds, vultures and owls).
6.4 Education activities

The questionnaire included a series of questions about the education and public awareness programmes provided by respondents' zoos.

6.4.1 Education policy

For 51% of respondents, their zoo’s written education policy was prepared by the Education Manager (Officer, Head or Co-ordinator). For 30% of respondents, the policy was prepared by the Managing Director / Owner. Other mentions, included:

- three mentions of Curator;
- two mentions of Development Manager; and
- single mentions of: Head of Discovery and Learning, Display Development Manager, Scientific Officer, Council Curriculum Adviser, Falconer, Supervisor and Consultants.

As shown in Table 14, below, respondents from zoos with no dispensation were significantly more likely (P=0.004) to cite an education officer than respondents from zoos with some dispensation.

Table 14: Preparation of education policy, by dispensation status

<table>
<thead>
<tr>
<th>Q36: The Zoo Licensing Act requires all licensed zoos to have a written education policy, who prepares this at your zoo?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispensation status</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Base</td>
</tr>
<tr>
<td>Education Officer</td>
</tr>
<tr>
<td>39%</td>
</tr>
<tr>
<td>MD/owner</td>
</tr>
<tr>
<td>36%</td>
</tr>
<tr>
<td>Don’t know</td>
</tr>
<tr>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>17%</td>
</tr>
</tbody>
</table>

Respondents were asked to use a five-point scale to describe the extent to which they perceived that their written policy influenced their zoo’s educational work. For the majority of respondents, the policy was said to exert a considerable influence with no significant differences between responses from zoos with no dispensation and zoos with some dispensation. Where an Education Officer had responsibility for the written education policy, respondents appeared more likely to attribute greater influence to the policy although this difference was not found to be significant.

6.4.2 Enclosures, signage and presentations

Figure 7, below, illustrates the range of replies from respondents when asked to describe the information displayed on enclosures. Responses were based on spontaneous recall and, as such, provide a reflection of relative levels of information included on enclosures rather than an absolute measure. For example, whereas most
respondents cited name (common and scientific) and origin, only about half of respondents mentioned aspects of diet, husbandry and habitat.

**Figure 7: Information included on enclosures**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>17%</td>
</tr>
<tr>
<td>Photograph/picture</td>
<td>19%</td>
</tr>
<tr>
<td>Lifecycle/behaviour</td>
<td>38%</td>
</tr>
<tr>
<td>Size/characteristics</td>
<td>38%</td>
</tr>
<tr>
<td>Habitat</td>
<td>59%</td>
</tr>
<tr>
<td>Diet/husbandry</td>
<td>59%</td>
</tr>
<tr>
<td>Conservation status</td>
<td>73%</td>
</tr>
<tr>
<td>Scientific name</td>
<td>82%</td>
</tr>
<tr>
<td>Origin/distribution</td>
<td>87%</td>
</tr>
<tr>
<td>Common name</td>
<td>88%</td>
</tr>
</tbody>
</table>

*Base: 97 respondents responding to Q38*

In addition to the core information, some more anecdotal communications were mentioned, for example “what the keeper says...” as well as explanations of why the animals are being kept in the zoo. There were additional mentions of the medium used to convey information, including videos, touch screens and information boards.

Table 15, below, shows the provision for interaction between zoo staff and visitors. The overwhelming majority of respondents, regardless of dispensation status, reported that animal shows or talks to visitors were provided at animal enclosures.

**Table 15: Provision of animal shows and availability of staff, by dispensation status**

*Q41: Do you hold animal shows or have presenters talking to visitors at animal enclosures?  Q42: Do you have scheduled times when staff are available?*

<table>
<thead>
<tr>
<th></th>
<th>Dispensation status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Some (69)</td>
</tr>
<tr>
<td>Animal shows/presenters talking at enclosures</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>62 90%</td>
</tr>
<tr>
<td>No</td>
<td>7 10%</td>
</tr>
<tr>
<td>Scheduled times for staff to talk generally to visitors</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>50 72%</td>
</tr>
<tr>
<td>No</td>
<td>19 28%</td>
</tr>
</tbody>
</table>
With regard to providing scheduled times for staff to talk generally to visitors, at 94% respondents from zoos with no dispensation were significantly more likely (P=0.017) to do so than were respondents from zoos with some dispensation, 72%.

6.4.3 Educational resources

As shown in Table 16, below, a wide range of educational resources were provided. The proportion of respondents that reported provision of a website, teachers resources and digital touch screens/interactive displays and ‘other’ were all unaffected by dispensation status. Zoos with no dispensation, however, were significantly more likely to provide guidebook/leaflet (P=0.008), activity booklet/workbook/worksheets (P=0.014), audio guide (P=0.0004) and trails (P=0.0142) than zoos with some dispensation. The other resources that were cited by respondents included a mix of talks, workshops, presentations, animal encounters and events.

Table 16: Educational resources provided by dispensation status

Q39: which of these information/educational resources does your zoo provide?

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>Some</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidebook or leaflet</td>
<td>50</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75%</td>
<td>97%</td>
<td></td>
</tr>
<tr>
<td>Website</td>
<td>62</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>93%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Teachers resources</td>
<td>53</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>79%</td>
<td>94%</td>
<td></td>
</tr>
<tr>
<td>Activity booklet, workbook or</td>
<td>48</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>worksheets</td>
<td>72%</td>
<td>94%</td>
<td></td>
</tr>
<tr>
<td>Audio guide</td>
<td>1</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>Trails</td>
<td>40</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60%</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>Digital touch screens,</td>
<td>11</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>interactive displays</td>
<td>16%</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28%</td>
<td>45%</td>
<td></td>
</tr>
</tbody>
</table>

The largest zoos (size as defined by visitor numbers) with over 350k visitors were more likely (P=0.033) to report having access to classrooms than the smaller zoos with 80k visitors or less. Similarly, the largest zoos (>350k visitors) were more likely (P=0.041) to report access to a library than the smallest (<30k) and medium sized (80-200k) zoos. Nevertheless, all respondents reported access to educational facilities of some description with no respondents that reported ‘none’, as illustrated in Table 17.
Table 17: Access to educational facilities, by visitor numbers

Q40: Which of the following educational facilities does your zoo have access to? And Q4: approximately how many visitors came to your zoo in 2008?

<table>
<thead>
<tr>
<th>Available educational facilities</th>
<th>Visitor Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30k or less</td>
</tr>
<tr>
<td>Base</td>
<td>18</td>
</tr>
<tr>
<td>Classrooms</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>50%</td>
</tr>
<tr>
<td>Library</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>17%</td>
</tr>
<tr>
<td>Lecture theatre</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>33%</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>44%</td>
</tr>
</tbody>
</table>

6.4.4 Formal education

All respondents from zoos with no dispensation offered classes for visiting schools/groups and they were significantly more likely (P=0.013) to do so than respondents from zoos with some dispensation, 83%. Activities were not, however, restricted to the larger zoos, as illustrated in Figure 8, below.

Figure 8: Provision of classes for visiting school or adult groups, by number of visitors

Q43: Does your zoo/aquarium/animal park offer classes for visiting school or adult groups?

Base: 98 respondents
Table 18, below, highlights the range and scale of educational provision delivered by zoos in the survey. For example, 56% of respondents reported that 1,000 or more primary school children had booked formal education sessions in the year 2008 and many zoos reported that their formal education sessions included some adult classes.

**Table 18: Number of pupils booked onto formal education sessions (2008)**

Q44: How many of the following were booked onto formal education sessions, 2008?

<table>
<thead>
<tr>
<th>Target group</th>
<th>Base</th>
<th>Number of pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>&lt;50</td>
</tr>
<tr>
<td>Adults (&gt; 16 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some dispensation</td>
<td>53</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15%</td>
</tr>
<tr>
<td>No dispensation</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Secondary school children (11-16 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some dispensation</td>
<td>54</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>No dispensation</td>
<td>31</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Primary school children (5-11 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some dispensation</td>
<td>56</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>No dispensation</td>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Pre-school children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some dispensation</td>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15%</td>
</tr>
<tr>
<td>No dispensation</td>
<td>31</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13%</td>
</tr>
</tbody>
</table>

6.4.5 Outreach projects

As shown in Figure 9, below, 19% of respondents from zoos with no dispensation reported that outreach visits were not made and this compared with 36% among respondents from zoos with some dispensation. These proportions were not significantly different between the two groups. The overall majority of respondents, however, reported that outreach visits were undertaken. Among respondents from zoos with no dispensation, 13% made visits without live animals but 68% reported that live animals were sometimes included. At 19%, a higher proportion of respondents from zoos with some dispensation reported that live animals were not included although 44% stated that live animals were sometimes involved.
Among respondents that visited schools and other venues for teaching purposes:

- 18% said that up to five visits/year were conducted on average;
- 20% reported making 6-10 visits/year;
- 18% reported 11-24 visits/year; and
- 40% of respondents said that in excess of 25 visits/year were made.

6.4.6 Educational support and capacity building

Respondents from zoos with no dispensation were equally divided among those that did and did not provide educational support and capacity building to field projects in the United Kingdom. 34% of respondents from zoos with some dispensation provided educational support and capacity building and 66% replied to the negative.

In addition, respondents were asked whether or not they provided educational support and capacity building to projects outside the United Kingdom. 55% of respondents from zoos with no dispensation replied to the positive compared with 16% of respondents from zoos with some dispensation.

There were eight respondents (26%) from zoos with no dispensation and 42 respondents (61%) from zoos with some dispensation that did not provide educational support and capacity building either in the United Kingdom or overseas. This was significantly more likely (P=0.001) among zoos with some dispensation. A total of 18 respondents provided educational support and capacity building both in the United Kingdom and outside the United Kingdom.
6.4.7 Evaluation of education activities

Using a five-point scale, where one was not very well and five was very well, respondents were asked to indicate how well they felt that they were meeting their obligations to comply with their education requirements. Responses, shown in Figure 10 below, indicated that the majority of respondents felt that they were doing well or very well. Differences between responses from zoos with some dispensation and no dispensation and, although not illustrated, between zoos of different size (as determined by visitor numbers) were not found to be significant.

Figure 10: Perceived compliance with education requirements, by dispensation status

Q58: How well do you feel you are meeting your obligations to comply with your education requirements?

<table>
<thead>
<tr>
<th>Percentage of respondents</th>
<th>Some dispensation (68)</th>
<th>No dispensation (31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (not well)</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>27%</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>35%</td>
<td>45%</td>
</tr>
<tr>
<td>5 (very well)</td>
<td>35%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Base: 99 respondents

Respondents were asked how, if at all, their contribution to education was measured, responses are shown in Table 19, below. At this stage, the questionnaire did not distinguish between formal and informal learning activities.

It was observed that 14 respondents were not measuring the contribution of their zoo – although ten of these respondents nevertheless perceived their zoo to be meeting its education obligations. In the majority of cases, however, measures were in place, most widely in the form of visitor feedback that was mentioned by 59% of respondents. Educational visits/year were used as a gauge by 49%, and hours of staff time by 36% of respondents.

Where other measures were mentioned, these included:

- teacher/staff feedback (four mentions);
- school recommendations (one mention);
- attendance figures (one mention); and
- re-bookings (one mention).
Table 19: How contribution to education is measured by perceived compliance with education obligations

Q56: How, if at all, do you measure your zoo/aquarium/animal park’s contribution to education? And Q58: How well do you feel you are meeting your obligations to comply with your education requirements? (1 = not very well and 5 = very well)

<table>
<thead>
<tr>
<th>How contribution to education is measured</th>
<th>Total</th>
<th>Compliance with education obligations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not Well* (1 or 2)</td>
</tr>
<tr>
<td>Base</td>
<td>99</td>
<td>2</td>
</tr>
</tbody>
</table>

Visitor feedback
58 59%
- 12 57%
- 46 61%
Number of educational visits per year
49 49%
- 8 38%
- 41 54%
Hours of time from staff
35 36%
- 5 24%
- 30 39%
Involvement in awareness raising campaigns
19 19%
- 2 10%
- 17 22%
Money spent
17 17%
- 2 10%
- 15 20%
Don’t measure
14 14%
2 2 10%
10 13%
Press reports
13 13%
- - 13 17%
Involvement in fundraising
12 12%
- - 12 16%
Other
10 10%
- 2 10%
8 11%

* low base

Evaluation of visitor interpretation, talks and formal education classes
Respondents were asked whether or not their zoos had an evaluation process in place with respect to visitor interpretation, talks and formal education classes. Where respondents replied to the positive, supplementary questions were asked to investigate how the evaluation was undertaken; where replies were to the negative, respondents were asked if some form of evaluation was being considered.

As shown in Figure 11, below, zoos with no dispensation tended to be more likely than zoos with some dispensation to report evaluation processes in place for formal education classes (90% vs. 80%) and talks (87% vs. 73%) although differences were not statistically significant. The proportion of zoos that reported evaluation processes in place for visitor interpretation was unaffected by dispensation status at 74% for those with some dispensation and 71% for no dispensation.
Where respondents reported that evaluation processes were in place, they were asked how this evaluation was conducted. Responses are shown in Table 20, below.

Table 20: How evaluation of selected activities was conducted

<table>
<thead>
<tr>
<th></th>
<th>Visitor interpretation</th>
<th>Talks (i.e. presentations and shows)</th>
<th>Formal education classes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base</strong></td>
<td>71</td>
<td>76</td>
<td>78</td>
</tr>
<tr>
<td>Visitor satisfaction feedback form</td>
<td>58 (82%)</td>
<td>52 (68%)</td>
<td></td>
</tr>
<tr>
<td>General visitor surveys</td>
<td>42 (59%)</td>
<td>37 (49%)</td>
<td></td>
</tr>
<tr>
<td>Targeted before and after visitor surveys</td>
<td>17 (24%)</td>
<td>15 (20%)</td>
<td></td>
</tr>
<tr>
<td>Measures on dwell time</td>
<td>17 (24%)</td>
<td>12 (16%)</td>
<td></td>
</tr>
<tr>
<td>Suggestion box</td>
<td>15 (21%)</td>
<td>10 (13%)</td>
<td>6 (8%)</td>
</tr>
<tr>
<td>Teacher feedback form</td>
<td></td>
<td></td>
<td>68 (87%)</td>
</tr>
<tr>
<td>Class feedback forms</td>
<td></td>
<td></td>
<td>18 (23%)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (17%)</td>
<td>15 (20%)</td>
<td>15 (19%)</td>
</tr>
</tbody>
</table>
Visitor interpretation

For 82% of respondents, visitor satisfaction feedback forms were used as a means of evaluating visitor interpretation; 59% reported the use of general visitor surveys; 24% cited the use of before and after visitor surveys; 24% stated that measures on dwell time were used; and suggestion boxes were cited by 21%.

In addition, 17% of respondents reported other mechanisms of evaluating visitor interpretation. These included mentions of face-to-face visitor interviews; on-line visitor feedback; visitors’ comment book; mystery shopping; visitors’ exit poll; participation in the Visitor Attraction Quality Assurance Scheme; and personal communications between staff and visitors (one mention).

Talks

Visitor satisfaction feedback forms, cited by 68% of respondents, were the most widely cited mechanism for the evaluation of talks and 49% mentioned general visitor surveys. Targeted before and after visitor surveys were used by 20% of respondents and 16% included measures on dwell time. Suggestion boxes were cited by 13% of respondents as a means of evaluating talks.

Other methods of evaluation were mentioned by 20% and these included: informal visitor/staff feedback; monitor of visitor numbers; mystery shopping; focus groups; exit poll; dedicated animal training/presenting consultant; forthcoming paper (due for publication in the Visitor Studies Journal, based on a video study of visitor behaviour at talks); structured face-to-face interviews; and question and answer sessions.

Formal classes

At 87%, almost nine out of ten respondents that evaluated formal education classes cited teacher feedback forms and 23% used class feedback forms. Suggestion boxes were cited by 8%. Other mechanisms were described by 19% of respondents and these included a mix of structured as well as some more informal approaches:

- teacher/staff review on completion of the visit (four mentions);
  - structured review/focus group with teachers
  - informal discussions with teachers
  - use of mind-maps
- post-visit review with teachers (three mentions);
  - follow-up e-mail/postal correspondence with teachers
  - web-link to online evaluation sent via e-mail to teachers
  - follow-up discussions with staff/teachers
- feedback from pupils (three mentions);
  - letters and pictures from children
  - verbal feedback from children
  - pupil feedback questionnaire
6.4.8 Additional remarks with respect to education

Respondents were invited to ‘add anything else about the educational activities of their zoo’ and replies were received by a total of 53 respondents. These covered a range of topics and reflected the breadth of education activities among respondents.

One theme to emerge was concerned with aspects of communicating with the target audience. For some, the emphasis was on encouraging dialogue between visitors and zoo staff by ensuring availability of keepers to answer questions as well as through the provision of more formal ‘meet the keeper’ events. For others, the focus was on the relationship between the zoo and local schools and colleges. This was reflected, for example, by a commitment to providing work experience placements for local college students and the provision of free entry to year six primary school pupils. Others described the development of novel means of communication, such as production of a video aimed at school children and internet-based learning resources.

Another theme reflected respondents’ ongoing commitment to education activities. For example, through investment in new resources or the recruitment of staff dedicated to education activities. Two respondents, however, cited concerns with regard to the possible impacts of the economic downturn and in one of these cases the consequences of a fall in visiting school-children numbers on the zoo’s ability to meet its licence obligations.

Other respondents took the opportunity to emphasise their zoo’s current commitment to education that was illustrated by the numbers of pupils that participated in activities.

6.4.9 Key education projects for the future

Respondents were asked whether or not their zoo had any key education projects planned for the next three years. Two thirds of respondents replied to the positive and between them they described a wide ranging programme of continued development and innovation in their education activities. These included:

- investment in infrastructure (18 mentions). Including commissioning of newly built facilities; expansion of existing facilities; new build activity; new interactive displays / upgraded signage; and new enclosures;

- expansion of current activities (18 mentions). Replies included revised teaching sessions to better reflect school requirements; updated school education packs; expanded programme of talks for adult learning; recruiting and training additional volunteer staff to supplement ‘meet the keeper’ talks; increased number of work placements from local colleges; development of expanded range of talks; and developing further links with excluded children and their families;

- seven respondents described activities aimed at consolidating and improving their existing programmes; and

- seven respondents described plans to develop new markets and target new sectors. These included: implementing new learning and engagement strategies; developing a programme of winter visits (when zoo is quieter); launching a new education pack targeting key stages 1, 2 and 3; producing an on-line teachers’ guide; introducing new workshops and visitor talks; developing special needs packs including braille, audio and large-print facilities; and recruitment of specialist education staff.
6.5 Potential self assessment

Reactions were sought to the concept of a self-assessment tool to assist zoos to comply with their conservation and education requirements.

6.5.1 Potential for self-assessment

Respondents were asked to use a five-point scale (where one was not at all in favour and five was very strongly in favour) to indicate the extent to which they would be in favour of some form of self-assessment tool to assist them to comply with their conservation and education requirements. Respondents were subsequently asked, using the same five-point scale, to what extent they would be in favour of a self-assessment tool being made available on-line. Replies are illustrated in Figures 12 and 13, below.

Among respondents from zoos with no dispensation, 45% were very strongly in favour of the concept of a self-assessment tool and 21% were in favour to give a total of 66% of respondents that were in favour, just 3% were not at all in favour. Similarly, among respondents from zoos with some dispensation, 40% were very strongly in favour and 22% were in favour to give 62% in favour overall with 9% that were not at all in favour.

With respect to an on-line self assessment tool, 55% of respondents from zoos with no dispensation and 49% of respondents from zoos with some dispensation stated that they were very strongly in favour of the concept. There were 3% and 9% of respondents from zoos with no dispensation and some dispensation, respectively, that were not at all in favour.

Figure 12: Response to concept of self-assessment tool, by dispensation status

<table>
<thead>
<tr>
<th>Q59: to what extent would you be in favour of some form of self assessment tool designed to assist zoos to comply with their conservation and education requirements?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of respondents</td>
</tr>
<tr>
<td>Some dispensation (68)</td>
</tr>
<tr>
<td>1 (not in favour)</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5 (strongly in favour)</td>
</tr>
</tbody>
</table>

Base: 97 respondents
Figure 13: Response to concept of on-line self-assessment tool, by dispensation status

Q60: to what extent would you be in favour of a self assessment tool being made available on-line?

As shown in Table 21, below, where respondents were in favour of a self-assessment tool, they tended to be in favour of this tool being available on line.

Table 21: Perceptions of a self assessment tool by visitor numbers

Q59: To what extent would you be in favour of some form of self assessment tool designed to assist zoos to comply with their conservation and education requirements? And Q60: to what extent would you be in favour of a self-assessment tool being made available on line?

<table>
<thead>
<tr>
<th>Response to the concept of an on-line self-assessment tool</th>
<th>Base</th>
<th>1 (not at all in favour)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (very strongly in favour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td></td>
<td>7</td>
<td>11</td>
<td>18</td>
<td>21</td>
<td>40</td>
</tr>
<tr>
<td>1 (not at all in favour)</td>
<td>7</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>-</td>
<td>7</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>-</td>
<td>1</td>
<td>9</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>-</td>
<td>1</td>
<td>6</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>5 (very strongly in favour)</td>
<td>50</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>

Among respondents that felt they were not complying as well as possible with their conservation obligations, the majority indicated that they were in favour of an on line self assessment tool. Responses are shown in Table 22, below, together with replies according to respondents’ perceived compliance with their education obligations.
Table 22: Perceptions of an on-line self-assessment tool by perceived compliance with conservation and education obligations

Q60: To what extent would you be in favour of a self-assessment tool being made available on line? And Q57: How well do you feel you are meeting your obligations to comply with your conservation requirements? And Q58: How well do you feel you are meeting your obligations to comply with your education requirements?

<table>
<thead>
<tr>
<th>Perceived compliance with conservation obligations</th>
<th>Perceived compliance with education obligations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Well* (1 or 2) OK (3) Well (4 or 5) Not Well* (1 or 2) OK (3) Well (4 or 5)</td>
<td></td>
</tr>
<tr>
<td>Base</td>
<td>11</td>
</tr>
<tr>
<td>Not stated</td>
<td>2</td>
</tr>
<tr>
<td>1 (not at all in favour)</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5 (very strongly in favour)</td>
<td>6</td>
</tr>
</tbody>
</table>

* low base

6.5.2 Additional remarks with respect to assessment and evaluation

Respondents were invited to add any additional comments with respect to assessment and evaluation. Replies were wide-ranging and included:

- six respondents voiced concern about likely increases in staff workload in response to the introduction of self-assessment systems;
- five respondents referred to work currently underway in their zoos that aimed to address the topic of evaluation of conservation and education activities;
- four respondents felt that evaluation was sufficiently covered under the existing zoo licensing system and were concerned at the risk of duplication;
- four respondents from smaller zoos highlighted the specific challenges that they faced in meeting their conservation and education obligations and argued that any self assessment must be commensurate with each zoo’s resources;
- four respondents identified the importance of examples to assist with benchmarking of businesses and fulfilling assessment criteria;
- three respondents felt that an independent, external assessment represented a more robust approach, to their way of thinking, than self-assessment; and
- two respondents emphasised their concerns at the volume of red-tape.
6.6 **Case studies**

Six case studies were conducted to collect examples of education and conservation activities from a range of zoos of different size, type, funding structure and location. Findings are summarised below, further details are provided in Appendix 9. The support of the zoos that took part in this exercise is gratefully acknowledged.

6.6.1 **Blackpool Zoo: educational development activities**

Blackpool Zoo is a private zoo with 200-350k visitors each year, including school visits from over 35k children from throughout the North West. Outreach visits to schools and groups bring the zoo into contact with an additional 3k pupils each year.

Since the mid-1990’s, the zoo has been working with educational development groups. This has informed a programme of activities designed to meet the needs of a wide range of pupils. On one day of the week, the zoo hosts 7-10 year old children from a Pupil Referral Unit (PRU), slightly older 11-14 year old pupils from two different PRUs attend the zoo on another two days of the week. These are all children that have been excluded from mainstream education. The zoo also receives students with learning difficulties (access level group). Working closely with teaching staff, the zoo organises a range of activities that have been designed with the specific objectives of helping pupils to build their confidence, to deal with their emotional behaviour, to learn about animals and conservation and by so doing to develop their literacy, numeracy and skills for life. Provision of feedback to teachers and an evaluation of pupil’s progress are an important part of the process. Improvements in behaviour and a proportion of children returning to education reflect the success of this project.

6.6.2 **Brighton Aquarium: display enrichment programme**

Brighton is one of over 30 aquariums around the world that make up the Sea Life group. Sea Life has stated its commitment to marine conservation through a mix of conservation, education, awareness and direct action. Brighton has strong links with overseas turtle conservation projects in Brazil, Thailand, the Cayman Islands and Greece. Closer to home, the Aquarium works with the local community on an innovative programme of practical conservation activities, including its annual beach clean event. The aquarium regularly attracts more then 200k visitors per year.

Brighton Aquarium is one of the world’s oldest and largest aquariums. Its listed Victorian architecture provides a special setting but some unique challenges as well. A programme of work is underway to enrich the display environment for all exhibits, including the aquarium’s two giant turtles. This has seen changes to the feeding routines that have helped to encourage more natural browsing behaviour leading to measureable improvements in the turtles’ health. Positive behavioural changes have also been observed resulting from the increased interaction between aquarists and the turtles. The success of the enrichment programme is such that it is set to provide a blueprint for Sea Life attractions worldwide.

6.6.3 **Lotherton Bird Garden: contribution to biodiversity action plans**

The Lotherton Hall estate is managed by Leeds City Council parks and countryside department. The estate provides a range of attractions centred on the mansion house, its gardens and parkland. These include a red deer park, nature trails and the bird garden. The latter alone receives nearly 400k visitors each year. With only ten full-time members of staff and three volunteers, labour is at a premium to care for the 200 or so rare and endangered species that make up the bird garden’s collection.
The conservation work at Lotherton although only recently established now extends widely, as illustrated through its contribution to Leeds City Council’s Biodiversity Action Plans (BAPs). Population surveys of local birds, pond life and bats are regularly carried out by members of zoo staff. Management action plans are agreed to promote conservation across the estate and responsibilities for other Leeds City Council sites have been taken on with the objective of achieving better linking of staff and resources. Participation of the general public is encouraged through a series of workshops that range from pond surveys to making and installing bat boxes.

6.6.4 Marwell Wildlife: re-introduction of scimitar-horned oryx in Tunisia

Marwell Wildlife is a registered charity based in Hampshire. The wildlife park employs over 200 staff, 9 staff are responsible for education and a further 7 staff are responsible for conservation. The zoo receives additional support from over 150 individual volunteers and occasional volunteer groups. The zoo entertains and educates over half a million visitors each year – this includes nearly 38k educational visits. In addition, in the region of 60 outreach visits are made to schools each year.

With the support of partner organisations worldwide, Marwell has over thirty year’s involvement in the re-introduction of scimitar-horned oryx to national parks in Tunisia. Marwell co-ordinates the international studbook for the scimitar-horned oryx and is responsible for the genetic and demographic modelling of the population. The output of this work informs the selection of appropriate groups suitable for re-introduction. A monitoring programme allows key performance indicators to be measured on an ongoing basis. Information about the project is widely disseminated.

6.6.5 Wildwood Trust: re-introduction of native species

Based in Kent, the Wildwood Trust covers some 40 acres of ancient woodland. The Trust is a registered charity dedicated to the conservation of native species. The wildlife park attracts around 80k visitors each year and this includes 13k educational visits. Outside visits to schools bring the zoo into contact with a further 2k pupils.

Much emphasis is placed on the re-introduction of native species and the protection of their natural habitats. This work is demonstrated by an ongoing programme of activities to conserve the water vole in the face of severe pressures on existing populations. The zoo is working closely with a number of research institutions and organisations to re-introduce water voles to areas where they once existed. This work is underpinned by a captive breeding programme. Running alongside these activities is a commitment to education that has seen close links developing with local schools. In recognition of the pressures faced by water vole populations, Wildwood is developing programmes to encourage householders adjacent to re-introduction sites to take more responsibility for managing and maintaining their surrounding area.

6.6.6 Woburn Safari Park: support for EAZA annual conservation campaigns

Woburn Safari Park will be celebrating its 40th anniversary in 2010. Part of historic Woburn Abbey in Bedfordshire, the Safari Park alone attracts more than 350k visitors each year, including 27k school children.

The park dedicates considerable time and resource to a wide range of fundraising activities in support of EAZA’s annual conservation campaigns and frequently ranks among EAZA’s leading fundraisers. This is achieved by involving members of the public in an innovative programme of activities while at the same time communicating information about conservation in general and relating to each year’s theme in particular. Where the programme can be linked to the park’s own collection, has been shown to work to considerable advantage in raising campaign funds.
7. Conclusions, discussion and recommendations

7.1 Conclusions and discussion

The results of this survey demonstrate the extensive contribution to conservation and education made by zoos in England. In considering the results it is important to remember the proportionality ethos of the legislation. Smaller zoos and those with dispensations are not expected to carry out the same degree of conservation and education work as larger zoos with no dispensations.

Overall, comparing the findings of this survey with the suggested guidelines for conservation and education contribution described in the Zoos Forum Handbook (2008), shows that the required measures are broadly achievable and being achieved.

7.1.1 Conservation contribution

The survey found that 91% of respondents reported activity in at least one of the key conservation activities of research, training, exchange of information, breeding programmes and re-population / re-introduction. Indeed, 33% reported activity across all areas. Of concern however, as this is a requirement of licensing, was the finding that 9% of respondents did not report participation in any of these activities.

The research showed significant correlations between size and lack of dispensations with participation in managed breeding programmes and studbook co-ordination. Similarly, larger zoos and those with no dispensation were more likely to report field conservation projects and to carry out training and be part of re-introduction projects.

Research

In line with zoo licensing recommendations, there was evidence that more research was carried out in zoos with no dispensations than in zoos with some dispensations. While research is not compulsory, the finding that two zoos with no dispensations were not involved in research is concerning and the 38% of those with dispensations that reported no research activity may also be a cause for some concern.

- research projects from which conservation benefits have or will be derived were reported by:
  - 94% of respondents from zoos with no dispensation; and
  - 61% of respondents from zoos with some dispensation.

Training

All respondents from zoos with no dispensation confirmed that they were involved in field conservation projects as did 66% of respondents from zoos with dispensations.

- conservation projects in the field, either UK or overseas, were reported by:
  - 100% of respondents from zoos with no dispensation; and
  - 66% of respondents from zoos with some dispensation.

Among respondents participating in field conservation projects, 77% reported that these projects included a training component.
Exchange of information
A significantly higher proportion of respondents from zoos with no dispensation participated in the exchange of information compared with respondents from zoos with some dispensation.

- Participation in the exchange of information relating to the conservation of species of wild animals (in the three years before the survey) was reported by:
  - 94% of respondents from zoos with no dispensation; and
  - 71% of respondents from zoos with some dispensation.

It was reported by the literature review that scientific evidence was not sufficiently used in conservation practice. One study reported that the main reasons for primary literature not being more widely referenced were that it was too time-consuming both to locate and to read. Publication of the findings of research projects was variable – 76% of respondents from zoos with no dispensation and 47% of respondents from zoos with some dispensation reported that all or some of the results of research projects had been published and placed in the public domain. From the comparison of the findings with the guidelines set out in the Zoos Forum Handbook (2008), among the larger zoos (as defined by visitor numbers) with annual visitor numbers of around 400k, the level of publication of research findings fell below expectations.

Managed breeding programmes
A significantly higher proportion of respondents from zoos with no dispensation reported participation in managed breeding programmes of species in captivity compared with respondents from zoos with some dispensations.

- managed breeding programmes of species in captivity were reported by:
  - 94% of respondents from zoos with no dispensation; and
  - 64% of respondents from zoos with some dispensation.

Among respondents involved in managed breeding programmes, zoos with no dispensation were significantly more likely to report responsibility for co-ordination of the studbook compared with respondents from zoos with some dispensations. As described in the case study for Marwell Wildlife (Page 42 and Appendix 9), responsibility for the international studbook may require sophisticated genetic and demographic modeling capabilities to inform re-introduction programmes involving zoos from around the world.

Re-population and re-introduction
Zoos with no dispensation that were involved in field conservation projects were significantly more likely to report that these projects included a re-introduction or re-population component than respondents from zoos with some dispensations.

- re-introduction or re-population activities as part of field conservation programmes were reported by:
  - 77% of respondents from zoos with no dispensation; and
  - 56% of respondents from zoos with some dispensation.
The Wildwood Trust’s water vole re-introduction activities described in the case study (Page 42 and Appendix 9), demonstrate that smaller zoos (as defined by visitor numbers) have the potential to make a considerable conservation contribution.

7.1.2 Evaluation of conservation

Published evidence
The review of available literature highlighted the lack of published evidence on the effectiveness of the wide range of conservation and education projects conducted by zoos. Concerns with regard to a lack of available evidence are not unique to zoos but extend to a range of visitor attractions including, for example, museums as well as being a major problem for many field conservation programmes. As such, evaluation of conservation activities is understood to be the subject of some considerable research activity given the challenges associated with delivering it effectively.

Conservation measures
Most, but not all, respondents tended to perceive that they were meeting their conservation requirements. Asked how their contribution to conservation was measured, 74% of respondents in the survey reported having one or more of a range of measures in place. The wide range of measures cited, highlighted the challenge of achieving a consistent, and comparable, measure between zoos.

Of the 11 respondents that perceived their zoos not to be complying very well with their conservation requirements, seven did not measure their contribution. Among respondents that perceived their zoo to be complying well, 21% did not measure their contribution. This suggests that more effort needs to be put into measurement of both conservation inputs and outputs, and evaluation of these outcomes.

Proportionality
The challenges associated with the evaluation of zoos’ conservation activities are heightened by the wide range in size and type of zoo. The Consultation Group commented that it is more common for smaller zoos (as defined by visitor numbers) to under-sell themselves in terms of conservation and education activity rather than (as might be expected) exaggerate their contribution. This may reflect a lack of understanding among operators about the exact nature of the requirements.

The case study at Lotherton Bird Garden (Page 41 and Appendix 9) described the activity associated with bird feeding stations, the installation of bat boxes and pond surveys. Small zoo operators do not always realise that they can include these activities in support of their conservation contribution.

Diversity of projects
The international scope of many zoos’ work, for example 40% of participants in the survey reported that their field conservation projects were overseas, represents an additional consideration. This diversity extends not just to the zoos themselves but also to the range of conservation projects undertaken by them. If anything, the range of projects is set to increase, as evidenced by the breadth of research projects that respondents reported as having planned for the future.

The case study at Woburn Safari Park (Page 42 and Appendix 9) described the level of activity dedicated to fund-raising support for the annual EAZA campaigns. Although not an issue in this example, it nevertheless raises the potential difficulty for zoos that provide funds for conservation activities without themselves having staff on the ground.
7.1.3 **Education contribution**

There was much evidence of the positive influence of zoo’s written education policy on their activities with mean scores of four and above (on a five-point scale) when respondents were asked to evaluate their impact. Not surprisingly, larger zoos (as defined by visitor numbers) and zoos with no dispensation tended to have access to a wider range of facilities for education. And zoos with no dispensation were significantly more likely to offer classes for visiting schools groups than were zoos with some dispensations. The number of pupils that were enrolled in formal education classes in the year 2008, bears witness to the wide reach of zoos’ education contribution from primary school children through to adult groups.

**Educational facilities**

Most respondents reported access to educational facilities of some description, typically in the form of classrooms, libraries or lecture theatres. Not surprisingly, the larger zoos with no dispensations had a wider variety of facilities and materials available to them. Brighton Aquarium’s beach clean event, as described in the case study (Page 41 and Appendix 9), highlights the scope for novel delivery of events with an educational component that do not depend on access to purpose built resources.

All zoos with no dispensation were providing classes for visiting school or adult groups as were 83% of respondents from zoos with some dispensation. Education is not, however, dependent on visits to the zoo and 81% of respondents from zoos with no dispensation reported making outreach visits as did 64% of respondents from zoos with some dispensation.

Respondents’ commitment to education was further evidenced by the range of education projects planned for the future that typically involved investment in infrastructure and an expansion of their offer to target a broader range of students.

**Information on enclosures**

The literature review highlighted the important role played by signage in disseminating information. The SSSMZP states that as a minimum this should include common name, scientific name, natural habitat, some biological characteristics and details of conservation status. Although widely mentioned, these cornerstones were not universally recalled when respondents were asked to describe the categories of information included as standard on their enclosures. The literature review also emphasised the important role of interaction with visitors in communicating information. The majority of respondents reported that animal shows or presentations for visitors were provided at animal enclosures. Digital touch screens and interactive displays were reported by 22% of respondents and reflected growth in the uptake of these technologies.

7.1.4 **Evaluation of education**

The overwhelming majority of respondents tended to perceive that their zoos were meeting their obligations for education requirements using one or more of a wide range of measures. Visitor satisfaction forms were used by 82% of respondents to evaluate visitor interpretation and by 68% of respondents to assist in the evaluation of talks. A total of 87% of respondents reported the use of teacher feedback forms for the purposes of evaluating formal education classes. Mystery shopping, focus groups and exit polls were among other techniques that were cited for their role in evaluation. As described in the case study for Blackpool Zoo (Page 41 and Appendix 9), ongoing pupil evaluation and close liaison with teachers are central components of the zoo’s successful educational development programme.
7.1.5 Potential for self assessment
The concept of a self-assessment tool to assist zoos to comply with their conservation and education requirements was well received by respondents to the survey. The proportion of respondents in favour of this concept increased when it was described as ‘on-line’. This increase may reflect concerns expressed elsewhere in the interview about the prospect of any increase in administration and a desire to see the administrative burden reduced. The majority of respondents that perceived they were not complying as well as possible with their conservation and education obligations were in favour of an on-line self-assessment tool to assist them to comply with requirements. Were this tool to become part of the pre-inspection process then its implementation could be expected to assist in reminding zoos not only of the full breadth of their requirements but also the range of eligible activities; as well as assisting inspectors in identifying any shortfalls.

7.2 Recommendations
• the current categorisation of zoos appears to work, especially as the study shows a strong correlation between visitor numbers and dispensation status, and should be maintained;

• recommended standards of conservation and education are achievable, care needs to be taken by inspectors to identify those zoos that are not achieving all that they should be;

• as there were some zoos in the survey that did not appear to be complying with the conservation recommendations, inspectors should be reminded that all zoos must comply with at least one of the conservation measures and ensure that this is the case;

• the ‘suggested benchmarks for education and conservation’ guidance for inspectors of zoos should be reviewed in light of the findings of this report;

• the addition to the SSSMZP, and to the suggested guidelines set out in the Zoos Forum Handbook, of a requirement for the evaluation of education activities should be considered;

• there was little evidence of activity in conservation among farm parks with small collections of animals. This may reflect the available resources of small farm parks and should be reviewed;

• the Zoos Forum Handbook does not otherwise need to be adjusted;

• the concept of a self assessment tool designed to assist zoos to comply with their conservation and education requirements, especially if made available on-line, was well received by respondents to the survey. The development of this tool, as part of the pre-inspection process, should be progressed. This should make the job of the inspector easier and allow for better consistency between inspectors;

• the lack of available evidence with respect to the effectiveness of conservation and education activities together with the call from zoos for practical examples to assist them with the development of their own programmes, highlights the need to collect and disseminate examples of best practice. Developing these tools could be the topic of a future Defra research project; and

• in acknowledgment of the challenges faced by smaller zoos, the potential for a mentoring system should be investigated. This would allow smaller zoos to benefit from the resources and experiences of their larger peers while the role of the latter could be taken into account when assessing their contribution.
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7. Conservation and Education Measures

(See also Appendix 1 – The EC Zoos Directive and Appendix 3 – Conservation and Education)

7.1 Long recognised as an important feature of UK zoos, conservation and education became subject to legislative control in the UK when the EC Zoos Directive came into force. The Directive made it a formal statutory requirement for the first time that zoos implement the following measures:

- participating in research from which conservation benefits accrue to the species, and/or training in relevant conservation skills, and/or the exchange of information relating to species conservation and/or, where appropriate, captive breeding, repopulation or reintroduction of species into the wild and;
- promoting public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats.

7.2 These requirements, referred to as conservation and education measures respectively, have been transposed into domestic legislation (the Zoo Licensing Act 1981 as amended) and are further explained below.

7.3 In addition to these statutory requirements, as a general principle zoos should establish ethical review processes and, where appropriate, seek appropriate help in planning and implementing their conservation and education strategies.

(See Appendix 2 – Ethical Review Process)

Conservation Measures Within And Beyond The Zoo

7.4 The Directive requires that zoos undertake conservation measures and gives a number of options for doing so. The options given in the Directive for conservation measures are:

- participating in research from which conservation benefits accrue to the species, and/or;
- training in relevant conservation skills, and/or;
- the exchange of information relating to species conservation and/or;
- where appropriate, captive breeding, repopulation or reintroduction of species into the wild.
Secretary of State’s Standards of Modern Zoo Practice
7. Conservation and Education Measures Last updated: September 2004

7.5 Zoos must therefore undertake, as a minimum, at least one of these options. The measures required should be proportionate to the size and type of the zoo.

7.6 Where the relevant species are held, a zoo must be an active participant in recognised species management programmes.

7.7 Zoos should be able to demonstrate their conservation measures, including research if undertaken. Areas to be examined will include overall conservation policy, and how this relates to the World Zoo and Aquarium Conservation Strategy, and type and level of input into international conservation programmes.

7.8 Zoos should generally be able to demonstrate that they encourage research. Research can be developed through forging links with Higher Education Institutions. Full details of such projects should be available on request.

7.9 In any research carried out, care must be taken to comply with all relevant legislation and be subject to ethical review.

Education Measures

7.10 The Directive requires that zoos must promote public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats. The measures required should be proportionate to the size and type of the zoo.

7.11 A zoo must have a written education strategy and an active education programme.

7.12 Suitable facilities, commensurate to the size of the zoo, should be available for education purposes.

7.13 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.

7.14 Other areas to be examined include:
   • the educational role of the zoo as set out in any mission statement;
   • how the written education plan applies to different sections of the zoo’s visitors.
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Source: Animal Health, March 2009
Appendix 3: Summary statement

Review of Zoos’ Conservation and Education Contribution
Contract No. CR 0407 - Summary Statement

This study has been commissioned by Defra to assist with the assessment of zoos’ evolving role in a wide-range of conservation and education activities. This will be achieved by reviewing how zoos are currently meeting their obligations in this area, by recommending minimum standards with regard to conservation and education work and by identifying proportionate means to assist in assessing compliance. The outcomes of this project will be of particular benefit in highlighting examples of best practice and encouraging a consistent approach for both zoos and inspection agencies.

The term “zoos” is used throughout this statement as a general term that includes the wide variety of licensed collections including farm parks, aquaria, bird gardens and safari parks as well as traditional zoos. According to the Zoo Licensing Act 1981 (as amended) zoos are defined as an establishment where wild animals are kept for exhibition to the public otherwise than for purposes of a circus and otherwise than in a pet shop. The term “wild animals” means animals not normally domesticated in Great Britain. This Act applies to any zoo to which members of the public have access, with or without charge for admission, on seven days or more in any period of twelve consecutive months.

Under the provisions of the above Act and as stated in the Secretary of State's Standards of Modern Zoo Practice (SSSMZP), zoos are required to participate in conservation and education measures. The contribution is expected to be proportionate according to the size and type of zoo. The Zoos Forum Handbook, that is designed to supplement the SSSMZP, sets out guidance for zoos. The Handbook also outlines options for the types of conservation activities that zoos may choose to participate in and outlines suggested benchmarks for minimum standards of conservation, by zoo type, size and dispensation status.

Licensing of zoos in England is the responsibility of Local Authorities. The Secretary of State’s appointed Zoo Inspectors carry out inspections of these zoos and in addition to safety of the visiting public and animal welfare; they assess the zoo’s contribution to education and conservation. While the benchmark guidelines from the Zoos Forum Handbook set out some minimum contributions, there are, nevertheless, some concerns with regard to this approach;

- The guidelines in the Handbook are only that, and leave a degree of judgement to the Inspectors, especially when they are assessing an activity or contribution that is not necessarily articulated on the list in the guidelines. The wide and varied ranges of animal collections that exist in England can make it difficult to assess the adequacy level of contribution. Judgement when considering innovative activities or contributions is, to a large extent, up to the individual inspector. In recognition of this, Animal Health rotates inspectors such that they gain experience of a wider range of collections and types of premises and maintain as objective an approach as possible.

- Due to the relatively small number of licensed zoos within each Local Authority area, some Local Authorities’ officers may have infrequent and intermittent liaison with zoos within their area making it difficult for them to keep abreast of legislative developments and indeed the process in general. Animal Health runs biennial training for local authority licensing officers in order to assist them to keep up to date with the legislation and processes associated with licensing zoos.

This project aims to collect and assess information about the amount and type of conservation and education work that zoos in England are currently undertaking. On the basis of that assessment, and in the light of the SSSMZP and the Zoos Forum Handbook (including the Annexes to Chapter 2), the project will make recommendations for:

- minimum standards for conservation and education in a variety of sizes of zoo; and

- methods for zoo inspectors to enable them to assess zoo conservation and educational activities.
The specific objectives for this project are to assess the current level of conservation and education work for a range of zoos in order to:-

- provide an analysis of how zoos are meeting their legal obligations;
- recommend minimum standards for zoos with regard to their education and conservation work; and
- identify a proportionate means for zoo inspectors to assess compliance with the legislation.

The work will be delivered by ADAS working in close collaboration with BIAZA (British and Irish Association of Zoos and Aquariums). Between them, they have extensive knowledge of zoo licensing requirements, conservation and education measures so far developed and in-house market research and analysis expertise in order to successfully deliver this project.

ADAS is a large, independent provider of environmental consultancy, rural development services and policy advice. ADAS consultants have a well established track-record in the delivery of research and consultancy services to Government. The company has a proven network of links with professional market research providers that complement its in-house capability in undertaking surveys, data analysis and interpretation. http://www.adas.co.uk/

BIAZA is the main professional organisation representing the zoo and aquarium community in Britain and Ireland. Founded in 1966, it is a conservation, education and scientific wildlife charity. BIAZA works closely with Government, the Zoos Forum and Local Authorities, advising on all aspects, promoting the values of good zoos and aquariums to inspire people to help conserve the natural world, to participate in effective co-operative conservation programmes and to deliver the highest quality environmental education, training and research. BIAZA surveys members annually with regards to conservation and education measures enabling advice on improvements and best practices. http://www.biaza.org.uk/

The proposed approach for this project is staged:

- A review of the current measures and studies that have been undertaken in developing minimum standards and a proportionate means for assessment of zoos’ compliance with the license will be conducted to ensure that this project builds upon work already completed and in use within the sector;
- A representative sample, drawn from a list of licensed zoos in England, will be interviewed by telephone to collect details of their current contributions to education and conservation (using the current minimum standards as defined in the Zoos Forum Handbook) and also to capture details of any innovative contributions to education and conservation and any barriers to their participation. Questionnaire design will be informed by the review that forms the first stage of the project;
- A Consultation Group made up of representatives of Local Authorities, Zoo Inspectors and Zoo Operators will be established to advise the project team and to assist with the development of an approach to deliver the objectives of this project; and
- The project will produce a final report for publication on the Defra website. This report will cover the policy, scientific background, methods used, results and conclusions with recommendations. A PowerPoint presentation will also be produced that will illustrate the findings and the recommended approach to take forward.

The market research conducted during the course of this project will be in accordance with the Market Research Society’s Code of Conduct and as such data from individual zoos will be anonymous. During the survey, however, consent for further contact and use of information will be sought from individual respondents. Where consent is given, case studies will be developed using information provided by these zoos. These case studies will be used to illustrate best practice as examples of effective contribution to education conservation.
Summary ‘terms of engagement’ for Consultation Group: Review of zoos’ conservation and education contribution

Background to project
- Defra has commissioned ADAS (http://www.adas.co.uk/), supported by BIAZA (http://www.biaza.org.uk/), to conduct a review of English zoos’ conservation and education contribution
- This will be achieved by reviewing how zoos are currently meeting their obligations in this area, by recommending minimum standards with regard to conservation and education work and by identifying proportionate means to assist in assessing compliance
- The programme of work includes a review of available literature, a survey of a representative sample of zoos and a series of case studies
- The outcomes of this project will be of particular benefit in highlighting examples of best practice and encouraging a consistent approach for both zoos and zoo inspectors

Proposed profile of Consultation Group
- A ‘Consultation Group’ is proposed to support delivery of this project
- The profile of the Group to take into account geographical location, reflective of different size of organisations and a range of experience and previous engagement in zoo licensing activities
- Membership of the Group to be made up of:
  - 3 x Local Authority representatives
  - 3 x Secretary of State Zoo Inspectors
  - 3 x Zoo Operators

Proposed role of Consultation Group
- In overview, to provide informed advice and guidance to the project. More specifically:
  - To comment on the design of proposed survey materials
  - To comment on proposed analyses of survey findings
  - To comment on emerging findings, conclusions and recommendations
  - To advise on selection and preparation of 6 x case studies
  - To comment on draft report

Outline timings
- Comment on draft questionnaire, April 2009
- Comment on analyses plan, June 2009
- Comment on emerging findings, July 2009
- Input into selection and preparation of case studies, September 2009
- Comment on draft report, October 2009

End.
Dear Sir / Madam

Review of zoos’ conservation and education contribution

A review of how English zoos, aquariums and other licensed animal collections are currently meeting their conservation and education obligations [Section 1A, Zoo Licensing Act 1981 (as amended)] has been commissioned by Defra. This work is being conducted by ADAS (www.adas.co.uk). A key output of the project will be to highlight examples of best practice and to identify proportionate means to assist in assessing compliance.

A core component of the study will be a telephone survey among a stratified sample of zoos, selected to be representative of the wide range of licensed zoos, aquariums and animal collections in England. This fieldwork will be conducted in June and early July 2005. During this short telephone interview, participants will be asked to rate some issues with regard to the conservation and education activities of their zoo over the last three years. There will also be an opportunity for respondents to expand on their answers by providing accompanying views and opinions. A copy of the questionnaire to be covered in the interview is enclosed for information. While participation in the survey is voluntary, in the event that your zoo is selected then we would very much appreciate your support with this important project. Our interviewers will be pleased to arrange a mutually convenient time for the call that is expected to last not longer than twenty to thirty minutes - when we call you we will, in the first instance, contact the Zoo Director. If there is someone else you would like us to contact instead, please let us have their contact details. The anonymity of all respondents will be fully respected and findings will be reported in aggregate. If you would prefer not to be contacted as part of this project then please advise ADAS at the above address.

Although it will not be possible to interview all zoos as part of the survey, a summary of key findings will be made available and comments and feedback will be welcomed. In this way, all licensed zoos, aquariums and animal collections will have an opportunity to input into the study.

Further details about the project and links to the Zoos Forum can be found on the zoos pages of Defra’s web-site (http://www.defra.gov.uk/wildlife-countrywide/execution/zoos/index.htm). If you have any queries, require any further details or have any concerns about this work then please do not hesitate to contact the ADAS HelpLine for assistance, on (01354) 692531.

Yours faithfully,

[Signature]

Sami Brecherer
ADAS Project Manager

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Review of zoos, aquariums and animal parks' contribution to conservation and education

GENERAL QUESTIONS

The first section asks some general questions about your zoo/aquarium/animal park

Q1 Which of the following best describes the ownership of your zoo/aquarium/animal park?
   - Local authority
   - Charity
   - Private
   - Other (please specify): ______________________________________________________________________

Q2 Is the zoo/aquarium/animal park part of another attraction i.e. a theme park or museum?
   - Yes
   - No

Q3 And what best describes the types of animals you have?
   - General mixed
   - Aquarium
   - Birds of prey
   - Farm park
   - Other bird collection
   - Reptile/amphibian
   - Invertebrate
   - Other

Q4 And approximately how many visitors came to your zoo/aquarium/animal park in 2008?
   - 30k or less
   - More than 200k but less than 350k
   - More than 30k but less than 80k
   - More than 350k
   - More than 80k but less than 200k
   - Don't know

Q5 Does your zoo/aquarium/animal park have a particular theme, story or design?
   - Yes
   - No
   - Please specify:
     ______________________________________________________________
     ______________________________________________________________
     ______________________________________________________________
     ______________________________________________________________

Q6 When did your current zoo/aquarium/animal park licence start?
   (Month and year)
   ______________________________________________________________

Q7 How many FTE (full time equivalent) staff, including full time and part time are employed by the zoo/aquarium/animal park (excl. volunteers)?
   ______________________________________________________________

Q8 How many volunteers are involved with the zoo/aquarium/animal park?
   ______________________________________________________________

Q9 How many FTE staff are involved in...
   - Education activities
   - Conservation activities
   ______________________________________________________________
   ______________________________________________________________

Q10 What percentage of your education staff are qualified in a biological and/or teaching discipline?
   ______________________________________________________________

Q11 Is your number of education staff more, less or the same as it was 3 years ago?
   - More
   - The same
   - Less
   - Don't know
   ______________________________________________________________
CONSERVATION MEASURES

In this section, we are interested in finding out about the conservation activities, involving both native and non-native species, that you have undertaken in accordance with the provisions of the Zoo Licensing Act during the last 3 years i.e. since ’06. We will be asking separately about research, breeding and field conservation projects.

Firstly, Research projects from which conservation benefits accrue to wild animals

Q12. Including any partnership work, has your zoo/humane/humane/aquarium/aquarium/animal park undertaken in the last 3 years any research projects from which conservation benefits, including ex situ-biological studies, have or will be derived? Yes □ No □

Q13. How many research projects have been completed in the last 3 years?

Q14. How many research projects are currently on-going?

Q15. Have the results of these projects been published and put in the public domain? Yes □ Yes some □ No □ Not yet □ Don't know □

Now looking at Managed breeding of species in captivity

Q16. Has your zoo/humane/humane/aquarium/aquarium/animal park been involved in any managed breeding programmes of species in captivity during the last 3 years?

Q17. How many breeding programmes are you or have you been involved in?

Q18. What species are involved in the programme(s)?

Q19. Do you co-ordinate or keep the studbook for any of these programmes?

Moving onto Conservation in the field

Q20. Has your zoo/humane/humane/aquarium/aquarium/animal park been involved in projects, either by providing funds and/or staff time and resources, connected with conservation in the field, either in the UK or overseas during the last 3 years?

Q21. How many field conservation projects have you been involved in?

Q22. What countries did the projects take place in?

Q23. How many, if any, of these projects have been completed in the last 3 years?

Q24. How many of these projects are currently on-going?

Q25. What is the approximate total annual cost for field conservation project(s)?

Q26. Does this figure include funds for the project from zoo budgets, funds raised from the public and/or staff time and resources? Funds from zoo □ Funds raised from □ Staff time & resources □ None of these □
Appendix 6: questionnaire

Q27 Did any of these field conservation projects have a re-introduction or re-population component?
Yes......................  □  Go to Question 25
No......................  □  Go to Question 29

Q28 How many?

Q29 Did any of these field conservation projects have a training component?
Yes......................  □  Go to Question 30
No......................  □  Go to Question 31

Q30 Was the training carried out by your own staff or in partnership with other organisations?
Own staff......................  □  In partnership:......................  □

Q31 What proportion of your field conservation projects are evaluated to see if the results (outcomes) fulfil the aims of the project?
None:...........................................  □  51% - 75%:...........................................  □
1% - 25%:...........................................  □  76% - 100%:...........................................  □
26% - 50%:...........................................  □

Information exchange

Q32 Has your zoo/aquarium/animal park participated in any exchange of information relating to the conservation of species of wild animals during the last 3 years?
Yes......................  □  Go to Question 33
No......................  □  Go to Question 34

Q33 What are the main ways in which this has been carried out?

General

Q34 Does your zoo/aquarium/animal park have...
A stated environmental policy
Hold a sustainability kite mark
E.g. ISO 14001
Assess its own environmental impact

Q35 Is there anything else you would like to add with regard to the conservation activities of your zoo/aquarium/animal park? (Please confirm if conservation projects are co-ordinated on-site or centrally)

EDUCATION AND PUBLIC AWARENESS

Q36 The Zoo Licensing Act requires all licensed zoos to have a written education policy, who prepares this at your zoo/aquarium (Job title?)

Q37 To what extent does your policy influence your educational work?
Please answer on a scale of 1 to 5, where 1 is not at all and 5 is to a great extent
1......................  □  2......................  □  3......................  □  4......................  □  5......................  □

Q38 What categories of information do you include as standard on each enclosure?
Q39 Which of these information/educational resources does your zoo/aquarium/animal park provide?
- Guidebook or leaflet
- Trails
- Digital touch-screens / interactive displays
- Website
- Audio guide
- Activity booklet/workbook/worksheets
- Teachers resources
- Other
- (please specify):

Q40 Which of the following educational facilities does your zoo/aquarium/animal park have access to?
- Classrooms
- Lecture theatre
- Library
- Other
- (please specify):

Q41 Do you hold animal shows or have presenters talking to visitors at animal enclosures?
- Yes
- No

Q42 Do you have scheduled times when staff are available to talk generally to visitors?
- Yes
- No

Q43 Does your zoo/aquarium/animal park offer classes for visiting school or adult groups?
- Yes
- No

Q44 How many of the following were booked onto formal education sessions during 2001?

<table>
<thead>
<tr>
<th>Adults (&gt;16)</th>
<th>51 - 100</th>
<th>101 - 500</th>
<th>501 - 1000</th>
<th>1000+</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
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<tr>
<td>Yes</td>
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</tbody>
</table>

Q45 Does your zoo/aquarium/animal park visit schools and other venues for demonstration and teaching purposes?
- Yes
- No

Q46 On average, how many visits do you conduct per year?
- <3
- 4-10
- 11-24
- 25+

Q47 What proportion of these visits involve working with live animals?
- None
- < 25%
- 26-30%
- 31-75%
- 76-100%

Q48 Do you provide educational support and/or capacity building to other projects in the field in the UK?
- Yes
- No

Q49 Do you provide educational support and/or capacity building to other projects in the field in countries outside the UK?
- Yes
- No

Q50 Is there anything you wish to add about the education activities of your zoo/aquarium/animal park?

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
ASSESSMENT / EVALUATION

The last section covers assessment and evaluation.

Q51  A - Do you have an evaluation process in place for...
     IF 'YES' go to Q52, 53 and/or 54
     IF 'NO' - B - Is this something that is being considered?
     Visitor interpretation  A - Yes  A - No  B - Yes  B - No
     Talks i.e. presentations and shows  A - Yes  A - No  B - Yes  B - No
     Formal education classes  A - Yes  A - No  B - Yes  B - No

Q52  How do you evaluate visitor interpretation?
     Visitor satisfaction feedback form  General visitor surveys
     Targeted before and after visitor surveys  Measures on dwell time
     Suggestion box  Other
     Other (please specify):

Q53  How do you evaluate talks?
     Visitor satisfaction feedback form  General visitor surveys
     Targeted before and after visitor surveys  Measures on dwell time
     Suggestion box  Other
     Other (please specify):

Q54  How do you evaluate formal education classes?
     Teacher feedback form  Class feedback forms
     Suggestion box  Other
     Other (please specify):

Q55  How, if at all do you measure your zoo/aquarium/animal park’s contribution to conservation?
     Hours of time from staff  Press reports
     Involvement in fundraising  Visitor feedback
     Involvement in awareness raising campaigns  Don’t measure
     Money spent  Other
     Other (please specify):

Q56  How, if at all do you measure your zoo/aquarium/animal park’s contribution to education?
     Hours of time from staff  Press reports
     Involvement in fundraising  Visitor feedback
     Involvement in awareness raising campaigns  Don’t measure
     Money spent  Other
     Number of educational visits/year  Other
     Other (please specify):

Q57  How well do you feel you are meeting your obligations to comply with your conservation requirements? Please answer on a scale of 1 to 5 where 1 is not very well and 5 is very well.
     1  2  3  4  5

Q58  How well do you feel you are meeting your obligations to comply with your education requirements? Please answer on a scale of 1 to 5 where 1 is not very well and 5 is very well.
     1  2  3  4  5
Q59 To what extent would you be in favour of some form of self assessment tool designed to assist zoos/aquariums/animal parks to comply with their conservation and education requirements? Please answer on a scale of 1 to 5 where 1 is not at all in favour and 5 is very strongly in favour.
1   2   3   4   5

Q60 To what extent would you be in favour of a self assessment tool being made available on-line? Again, please answer on a scale of 1 to 5 where 1 is not at all in favour and 5 is very strongly in favour.
1   2   3   4   5

Q61 Do you have any comments that you would like to add about assessment and evaluation?


Q62 Do you have any key conservation projects planned for the next 3 years?
Yes
No
If so, please give a summary of what they will involve


Q63 Do you have any key education projects planned for the next 3 years?
Yes
No
If so, please give a summary of what they will involve


That's the end of my questions

Q64 Would you be willing for us to contact you in future in connection with this piece of work?
Yes
No

Q65 Name

Q66 Organisation

End.
Literature review of Zoos’ Conservation and Education

Contribution

• Abbreviations
AZA - Associations of Zoos and Aquariums
BIAZA - British and Irish Association of Zoos and Aquariums
EAZA – European Association of Zoos and Aquaria
EEPs - European Endangered Species Programmes
IUCN - International Union for Conservation of Nature
NBPC – National Birds of Prey Centre
SSSMZP - the Secretary of State’s Standards of Modern Zoo Practice
WAZA - World Association of Zoos and Aquariums
WWT – Wildfowl and Wetlands Trust
ZSL – Zoological Society of London

• Working definition of zoos
For the purposes of this review, the term ‘zoos’ is used as a general term that includes the wide variety of licensed collections including farm parks, aquariums, bird gardens and safari parks as well as traditional zoos. According to the Zoo Licensing Act 1981 (as amended) zoos are defined as establishments where wild animals are kept for exhibition to the public otherwise than for purposes of a circus and otherwise than in a pet shop. The term ‘wild animals’ means animals not normally domesticated in Great Britain. The Zoo Licensing Act 1981 (as amended) applies to any zoo to which members of the public have access, with or without charge for admission, on seven days or more in any period of twelve consecutive months.

• Current licence requirements
The Zoo Licensing Act 1981 was amended by the Zoo Licensing 1981 (Amendment) (England and Wales) Regulations 2002 giving force to European Council Directive 1999/22/EC relating to the keeping of animals in zoos. The Zoo Licensing Act 1981 (amended) made it a legal requirement for zoos in England and Wales to participate in conservation and education measures, the contribution of each zoo being proportionate to its size and type.

The Secretary of State’s Standards of Modern Zoo Practice (SSSMZP) sets out minimum standards by which zoos are expected to comply. It is stated that in addition to these requirements, as a principle zoos should establish ethical review processes and seek help, as appropriate, in planning and delivering their conservation and education strategies. The Zoos Forum Handbook supplements the SSSMZP through the provision of: examples of conservation and education activities; suggested benchmarks for minimum standards; and guidance notes for inspectors on the requirements for zoos to participate in conservation and education measures.
Dispensation status (Annex I and II) is determined by the number of animals and the species kept. Collections with dispensations should have rather lower requirements for conservation and education than those without.

The EU Zoos Directive requires that all zoos implement the following conservation measures (regardless of dispensation status):

- participating in research from which conservation benefits accrue to the species, and/or training in relevant conservation skills, and/or the exchange of information relating to species conservation and/or, where appropriate, captive breeding, repopulation or reintroduction of species into the wild; and

- promoting public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats.

Responsibility for the day-to-day operation of the Zoo Licensing system and the administration of the Zoo Licensing Act 1981 (as amended) in England rests with local authorities. The Secretary of State for Environment, Food and Rural Affairs has responsibility for maintaining a list of zoo inspectors and for setting detailed standards for zoo management with which zoos are expected to comply, the Secretary of State’s Standards of Modern Zoo Practices. This states that inspectors, zoos and local authorities should be familiar with the education standards expected in member zoos of the British and Irish Association of Zoos and Aquariums (BIAZA).

The SSSMZP applying to education states that:

- a zoo must have a written education strategy and an active education programme;

- suitable facilities should be available for education purposes; and

- accurate information about the species exhibited must be available. 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.

The SSSMZP states that zoos should be encouraged to evaluate the effectiveness of their research and suggests that research is of very little value if the results are not made available to others. The SSSMZP emphasises that data needs, at the very least, to be readily available on request; preferably it should also be published.

The World Zoo and Aquarium Conservation Strategy is a blueprint (for all members of the world zoo and aquarium community, not just the members of the World Association of Zoos and Aquariums (WAZA)) for their contribution to implementing the International Union for Conservation of Nature (IUCN) Programme and Vision of ‘a just world that values and conserves nature’. The document sets out policies and standards to be reached under headings relating to the key functions and activities of all zoos and aquariums, however diverse, and focuses on the long-term demonstrable achievement of conservation. The document intends to provide a future blueprint for urgent local and collective action by zoos and aquariums worldwide through directed policies and a series of accompanying manuals containing more detailed procedures and examples of good practice.
Appendix 7: Review of available literature

- **Amount and type of conservation and education work currently undertaken**

- **Conservation**

  Definitions of conservation, include: ‘action that directly enhances the chances of habitats and species persisting in the wild’ and ‘conservation is an action that effectively enhances the survival of species and habitats’ (Zoos Forum Handbook, 2008). WAZA (2005) defined conservation as ‘the securing of long-term populations of species in natural ecosystems and habitats wherever possible’.

  The amount and type of conservation work carried out by zoos mostly reflects the zoo type, size and dispensation status. Conservation may be undertaken directly in the wild or indirectly with captive programmes. Conservation tends to be measured in terms of inputs and outputs. Inputs may be measured relatively easily by the amount of resources e.g. finance, equipment, staff time and training. Outputs tend to be more difficult to measure and evaluate, particularly in the wild.

  Zoos make their major contribution to conservation through Species Management Programmes. These usually involve captive breeding with the possible intention of future reintroduction. These programmes are often combined with *in situ* conservation activities, for example local awareness campaigns; ecology and conservation research; and population monitoring surveys.

  Maintaining, restoring and providing habitat are key components of conservation projects that often involve changing attitudes regarding policies affecting habitats. The Zoos Forum Handbook (2008) suggests five categories (Annex III).

  The examples of species-conservation projects undertaken by zoos and shown in Annex IV highlight the importance attached to the exchange of information, from the field to the zoo and vice versa. The Zoos Forum Handbook (2008) describes this as conservation training, and examples are shown in Annex V. Conservation training may extend to the training of local populations to help maintain the species.

  A BIAZA report published in January 2009 reported that its members supported 612 field projects with a contribution of £7.8 million in 2007. This represented an increase in the number of projects (335) and in financial contribution (£5 million) on 2005. BIAZA collections account for around 25% of zoos in England. On a worldwide scale, AZA (Associations of Zoos and Aquariums) institutions supported or conducted nearly 700 field conservation and research projects in 80 countries during 1997 (Smith & Hutchins, 2000). In 2002, facilities accredited by AZA reported 1240 *in situ* research and conservation projects were carried out in 95 different countries (Baker, 2007). This provides an indication of the extent of conservation work that is carried out by zoos throughout the world and how it has increased since the late 1990s.

  Conservation work is often constrained by funding. Entrance fees and other revenues generated by visitors are the main sources of funding. Davey (2007) investigated worldwide zoo attendance during a 40 year period. The data showed that zoo attendance declined during the 1960s and 1970s but had increased since the 1980s. Attendance figures for zoos around the world were compared with several socio-economic variables, and the analysis revealed a positive significant relationship between a country’s population size, country income and zoo attendance figures.

  Many zoos use a combination of methods to generate income, such as sponsorship from local and national organisations, membership schemes and animal adoptions.
Smith & Hutchins (2000) of the American Zoo and Aquarium Association quoted that wildlife conservation was among the highest priorities of professionally managed zoological parks and aquariums. Even if reintroduction is not the goal of a captive breeding programme, zoos and aquariums can contribute to wildlife and habitat conservation in a number of ways, including public education, scientific research, development of relevant technologies, professional training and technology transfer, ecotourism, political action and involvement in field conservation.

Smaller zoos may find these activities more difficult and Smith et al (2007) emphasised the importance of partnerships between zoos and aquariums, federal and state agencies, and non-governmental organisations for successful conservation. Descriptive statistics showed that effective leadership, clear and consistent communication, and trust between partners were the three key characteristics that led to partnership success.

There is considerable evidence in BIAZA’s quarterly LifeLines magazine, the Zoos Forum Handbook (2008) and on individual zoos’ websites that demonstrates the wide range of conservation projects undertaken by zoos. There is less evidence to show the effectiveness of the conservation projects. Fazey et al (2005) quoted that only 13% of studies actively went out to test or review conservation actions. (This is not unique to zoo projects, it covers all conservation projects).

WAZA (2005) quotes five qualitative measures that indicate successful achievement of conservation:
1. Increasingly secure populations of species in the wild.
2. Increasing areas/volumes of secure, sustainable habitat.
3. Greater knowledge and application of species biology, ecology and conservation science.
4. More political awareness of environmental issues with better environmentally-friendly decision making and increasingly higher conservation priorities.
5. Increasing capacity in habitat areas through training, education and public awareness.

Walter (2005) asked ‘Are we making a difference?’ Other questions to have been raised included ‘Are our actions working?’ (Hockings, 2003), ‘Are we conserving what we say we are conserving?’ (Ervin 2003, Parrish et al 2003) and ‘What are the results?’ (Christensen, 2003). Salafsky et al (2002) raised three questions:
1. what should our goals be and how do we measure progress in reaching them?
2. how can we most effectively take action to achieve conservation? and
3. how can we learn to do conservation better?

Miller et al (2004) suggested eight potential questions to evaluate actions towards zoos conservation mission:
1. does conservation thought define policy decisions?
2. is there sufficient organisational funding for conservation activities?
3. is there a functional conservation department?
4. does the institution advocate for conservation?
5. do conservation programmes effectively target children and adults?
6. does the institution contribute directly to habitat protection locally and internationally?
7. do exhibits explain and promote conservation efforts?
8. do internal policies and activities protect the environment?
Mace *et al* (2007) reported a system to assess contributions to conservation. The system incorporated guidelines to score the importance, volume and effect of five different components (Education, Habitat, Research, Training and Species) of conservation projects with an overall impact score then being calculated. The mechanism developed by Mace *et al* comprises a questionnaire:

- Part 1: a series of questions for the zoological collection on their perception of the responsibility of zoological collections to conservation;
- Part 2: factual questions on how much the zoological collection has contributed to field-based conservation in terms of staff time, funds, animals and other support; and
- Part 3: a matrix that enables an evaluation of the conservation impact of the projects chosen for support by each zoological collection.

Analysis of results allowed assessment of whether or not the conservation effort that each zoo made matched their practices and policies, and helped to determine if the zoo was engaging in enough ‘conservation effort’ in relation to its size. More importantly for the British licensing authorities, it would enable zoo inspectors to decide whether this ‘effort’ was enough to warrant the collection being recommended for a licence. Walter (2005). Mace *et al* (2007) concluded that further work would be needed if it were required to compare scores across different project types.

Walter (2005) tested the effectiveness of the Mace *et al* method to evaluate the impact conservation effort had on biodiversity. A key finding was the lack of agreement between the scores of the independent scorer (who had *some* knowledge of the scoring system) and the project leader or someone who had *significant* knowledge of the scoring system. Walter (2005) suggested that all future project assessments that seek to examine conservation outcome using the Mace *et al* system should incorporate a college or panel of independent scorers that understand the system and have experience across the field of conservation biology. Walter (2005) found that the independent scorers that use the Mace *et al* system should be provided with the scoring system, a handbook through which they calibrate their scores, and training on how to use the scoring system and handbook. Another finding was the lack of evidence of effect arising from different project activities/interventions.

Based on the findings of Walter (2005), many projects appear to lack an established practice to collect appropriate data, or even to define appropriate indices, for measuring effect. In turn, this makes it problematic to determine conservation outcomes, and represents a fundamental flaw that the conservation movement needs to address more widely (Pullin & Knight 2001, Sutherland *et al*, 2004).

Walter (2005) highlights the improvement in the Mace *et al* system compared to the scorecard system developed in the mid-1990s by conservation organisations to structure assessments of their site-level activities. Stem *et al* (2005) quoted that scorecards are technically not a monitoring and evaluation approach, rather they are a tool to facilitate monitoring and evaluation. Walter (2005) quoted, unlike the scorecard system that can only assess projects in concurrent analyses (Stem *et al*, 2005), the Mace *et al* system can compare the impact of projects scored at different times. WAZA has carried out an analysis of their branded projects carried out by zoos ([http://www.waza.org/en/site/conservation/waza-projects](http://www.waza.org/en/site/conservation/waza-projects)) that uses a similar methodology to Walter.
Stem et al (2005) suggested that an approach that provides specific steps and guidance is needed to monitor and evaluate; the approach could include tools such as a scorecard, but it is the approach, not the tool that explicitly specifies the steps to carry out the monitoring and evaluation. Practitioner training in the use of conceptual frameworks, the development of conceptual models, and the application of both quantitative and qualitative research methods were recommended.

Sutherland et al (2004) agreed with Pullin & Knight (2001) that support for decision making in conservation could benefit from the production of systematic reviews of evidence on the effectiveness of interventions in achieving stated objectives. Sutherland et al (2004) suggested that the evidence could then be disseminated in a form similar to the web-based database of systematic reviews on effectiveness in medical practice. Such a review would follow strict criteria for assessing the quality of the data in each study – a process called ‘critical appraisal’. The main suggestion of Sutherland et al (2004) is for a central database of the information on conservation practice (Annex VI). Sutherland et al (2004) highlighted that the problem of evaluation of effectiveness is not unique to zoo field projects and there may be scope to learn from others. Pullin et al (2004) strongly advocate that conservation adopt the evidence-based concept developed and used in medicine and public health that aims to promote the use of the best available evidence to inform decision making.

Pullin and Knight (2001) quoted that for the majority of conservation projects, justification for proposed actions is experience-based rather than evidence-based, action is often taken without monitoring or evaluation of effectiveness, and results are rarely widely disseminated. Fazey et al (2005) raised the question ‘What do conservation biologists publish?’ They viewed 547 papers published in 2001 and found that most studies were quantitative (89%) and used inferential statistics (63%). Research was biased towards vertebrates, forests, relatively pristine landscapes, and towards studies of single species and assemblages rather than communities or ecosystems. It was found that 20% of studies had high relevance to policy and 37% of studies had high relevance to management. However Randerson (2004) quoted that conservation managers are not taking scientific evidence into account when drawing up their plans. Pullin et al (2004) found that only 23% of practitioners always or usually used scientific publications when compiling management plans.

Pullin et al (2004) undertook a formal assessment of the extent to which scientific evidence is being used in conservation practice by conducting a survey of management plans and their compilers from major conservation organisations within the UK. Data collected suggested that the majority of conservation actions remain experience-based and rely heavily on traditional land management practices.

Pullin et al (2004) asked compilers about the sources of information used to support their decision-making. The most frequently used sources were existing management plans (60%); expert opinion from outside the compilation group (49%); published reviews, books or handbooks (47%); and documentation or personal accounts of traditional management practices (46%). Least frequently used sources of information were electronic/web-based materials (4%) published popular articles (13%) and published scientific papers (23%). Pullin et al (2004) found that primary scientific literature is infrequently accessed and 12% said that it was never accessed. When they asked a subgroup during follow-up interviews why they did not access primary literature to help them in their decision-making, the most frequent responses were that this literature is ‘too time consuming to locate and access’ (65%) and that this literature is ‘too time consuming to read’ (60%). A significant number (25%) said
'primary literature is too technical and difficult to interpret' in the context of their decision making. Importantly, 25% stated that they relied on in-house advisers or expert groups to interpret information from primary literature on their behalf.

Pullin et al (2004) found that to locate published information, 8% of respondents routinely hand-search library resources and 3% electronically search library databases. 72% had never undertaken an electronic search of a library database in connection with management plan compilation. Less than 1% routinely used a web-search for publications and 76% had never done so. Most respondents rely on literature recommended by a colleague (42%) or use of their own or a colleague’s personal collection (56%) to locate published material and in this way are using literature that is immediately available to them.

Pullin et al (2004) further quoted that half responded that research was ongoing and results were awaited; 22% said some results had been published; whilst 72% responded that results had been written up in a report but either not disseminated or only locally disseminated within the organisation or local area. Some respondents (22%) reported cases of research being undertaken but not written up.

Pullin et al (2004) asked the compilers if the actions proposed in the management plan had been implemented. Only 3% said all had, whilst 73% said most had. Asked if monitoring programs had been put in place to measure the outcome of actions, 22% responded that this was always done, a further 48% said this was usually done and 5% said it was never done. Asked if they had been able to evaluate the effectiveness of actions in their management plans, 16% said all had, 36% said most had been evaluated, 37% said some had and 6% said none had. A subset (20) of those that said they had done some evaluation of the effectiveness of their plans was asked how this was measured. 45% said that evaluation was only qualitative and often experience-based, 35% said they used annual counts of species and species trends and 20% had put in place direct monitoring of progress toward outcomes. Each was subsequently asked what had been done with the information arising from the evaluation and 25% said the information was written up as a report but in no case was this widely disseminated. The remaining 75% said evaluations were not formally written up, but 35% were referred to in the next management plan in some form.

Salafsky & Margoluis (2001) developed an approach called threat reduction assessments (TRA) that measured project outcome. They found that although the TRA approach had theoretical disadvantages of being a proxy measure of bio diversity and was subject to bias, it had the theoretical advantages of being sensitive to changes over short time periods and throughout a project site, and of allowing comparison among projects in different settings. While the authors’ considered that the approach needed further refinement, they believed that it could complement biological approaches to measuring conservation project success.

Christensen (2003) reported that The Nature Conservancy of California has a ‘measures and audit team’ that requires projects to assess if they are achieving their goals. Four other major conservation organisations: Conservation International, the World Wide Fund for Nature/World Wildlife Fund, the Wildlife Conservation Society, and the African Wildlife Foundation have joined the Conservancy to form the Conservation Measures Partnership, co-ordinated by Foundations of Success, a non-profit organisation to help conservation groups measure success. Christensen (2003) concluded that while there may never be an answer to the question, ‘Are we conserving what we say we are?’, measuring and auditing could provide a dynamic method for conservation projects to hone their strategies in a changing world.
Appendix 7: Review of available literature

Education

Zoo education can be described in many different forms. It may be formal taught classes with trained staff that are often linked to key stage educational programmes. These may take place in the zoo or in the form of an outreach programme for non-zoo visitors. The more informal education is the interpretation within the zoological park e.g. from the signs and public talks. There is also the non formal education, e.g. the messages taken when eating food, is it sustainable etc.

Balmford et al (2007) quoted that ‘zoos have enormous potential to educate and inspire the public about conservation’. Very few studies have so far attempted to quantify whether zoo visits change people’s conservation-related knowledge, attitudes, or behaviour, or whether such impacts vary across zoos. Balmford et al (2007) quoted that most assessment of educational impacts to date has instead been non-quantitative. Moreover, rather than examining the effects of a zoo visit on people’s overall conservation knowledge or attitudes, research has usually focused either on general natural history knowledge, or on whether a visit specifically changes people’s attitudes to zoos or knowledge of zoos’ role in conservation. Likewise, more work has looked at the effects of particular (usually new) exhibits rather than at the impact of a zoo visit in its entirety. The Zoo Measures Working Group of BIAZA devised a questionnaire aimed at quantifying the effects of informal education on adult visitors to UK zoos. This focused on measuring various aspects of visitors’ knowledge about conservation, their level of concern about conservation relative to other issues, and their ability to suggest practical ways in which they could make a difference to conservation. They surveyed 1,340 adult visitors at six UK zoos during arrival or departure. The only significant difference to emerge was the respondent’s ability to name practical contributions which they could make, and this was only found at one zoo. Balmford et al (2007) could find no strong and consistent signal, within individual sites, of informal education of adults during a single visit. Balmford et al (2007) concluded that this may be due to under sampling.

• Exhibits

Some studies have indicated that visitors pay cursory attention to educational signs in zoos. For example, in one study in a zoo in New Zealand, only 29% of visitors were observed to read signs at all (Tofield et al, 2003). Interestingly, several studies have indicated that the average time visitors spend looking at animal exhibits is extremely short (e.g. from ten seconds to three minutes) and indicate that a large majority of visitors spend less than two or three minutes at any given exhibit, including those of the most popular or charismatic animals (Tofield et al, 2003).

Brennan (1977) found that 80% of the observed visitors spent less than two minutes in front of exhibits. The composition of the group (number of children etc) had no effect on the time spent in front of the exhibits. Brennan (1977) also found that less than half of the groups read the signs and only a small percentage read the sign out loud to each other. The importance of the location of the sign was highlighted, for example, the crowd gathers in front of wherever the gorillas may be and if that spot doesn’t correspond with where the sign is placed, then sign reading is unlikely to occur. Talking while watching an exhibit and pointing at an exhibit occurred 91% and 67% of the time respectively. Not all groups were uniform in talking while at an exhibit. Groups containing two female adults and 3-4 children were found to be more often involved in conversation irrelevant to the zoo experience than the other groups.
Brennan (1977) suggested ways of increasing sign reading through change of design, sign format, colours used, informational content, lead phrases, and placement in the exhibit. An interesting contrast Brennan (1977) found in his survey that visitors stated that they were in favour of advances towards displaying animals in large outdoor enclosures. On the other hand visitors stated they preferred to view these animals on a close up, intimate scale.

Mayer & Slotta-Bachmayr (2005) evaluated standard signs in Salzburg Zoo. They found that 19% of visitors do not read the signs. Of those that do, 50% read less than 15% of the sign. Only 5% of the visitors read more than half of the information about the different species in the zoo. Mayer & Slotta-Bachmayr (2005) found that the mean reading time was eight seconds.

• **Negative press**
  
  Despite repeated claims of their value in education (e.g. “the culture of UK zoos is ‘shot through’ with the educational ethos” (John Regan Associates Ltd, Manifesto for Zoos)), it remains to be proved that zoos lead to a demonstrable increase in public education and awareness of bio diversity conservation.

  The RSPCA has expressed concern (2006 & 2007) that there may be welfare problems occurring in animals kept by zoos that cannot be justified by claims of conservation or education benefit. In addition, the RSPCA has expressed concerns that current legislation is too weak to ensure that zoos are of real conservation or education benefit and that the available evidence of zoos inspiring people to take action on wildlife conservation is sparse.

  The Born Free Foundation has stated its belief that ‘wildlife belongs in the wild’ and works to phase out zoos. The Foundation’s website quoted that ‘zoos frequently promote themselves to the general public as centres of conservation and education’ but The Born Free foundation believes that the conservation benefits claimed by zoos do not justify the keeping of wild animals in captivity, and questions the effectiveness of captivity-based conservation and education. The Born Free website quoted further that ‘Zoos often promote their role in education, but the effectiveness of captivity-based education has not been well established’

www.bornfree.org.uk/campaigns/zoo-check/zoos/zoos-in-the-uk/

  Indeed, the Zoos Forum Handbook (2008), compiled by the government advisory body on zoo issues, states that: “Measures of success [in conservation education] have largely been subjective and based on ‘hearsay’, such as the comments of teachers and visitors. More empirical evidence is needed to demonstrate the educational value of a zoo’s work.” In 2005, at 53%, just over half of BIAZA (British and Irish Association of Zoos and Aquariums) zoos carried out some sort of evaluation of their formal education programmes (BIAZA Annual Report 2005). The figure for non-BIAZA zoos is likely to be considerably less.


  Mulder et al (2009) supports some of the Born Free suggestions, and quoted that visiting the zoo had little impact on children’s knowledge of wildlife and did not change attitudes to utilization and exploitation. Their findings from a questionnaire given to 366 children in Guyana suggest that zoos could enhance the dissemination of their message through making more frequent and sustained visits, imparting more detailed knowledge, and educating children of the potential dangers, utilisation and exploitation.
• Increasing visitor experience

Weiler & Smith (2009) studied the relationship between the level of exposure to interpretive media and the cognition, affect and behaviour of zoo visitors (what they report knowing, feeling and doing following their interpretive experience at the zoo). The 288 respondents experienced between one and four different interpretive media, and the results on every one of ten indicators revealed that visitors’ reported cognitive, affective and behavioural outcomes were greater, many with statistical significance, as the number of interpretive media increased.

Tofield et al (2003) reported on the use of zoos as a source of informal or free choice learning. Visitor perception and actual use of the zoo in New Zealand were investigated using structured interviews. The visitors spent little time at a given exhibit, and rated the more naturalistic or enriched exhibits more favorably, but older visitors seemed less concerned with naturalness of exhibits. Both general visitors and school groups reported that the prime purpose of their visit was entertainment. Similarly Ryan & Saward (2004) found that visitors were not generally interested in acquiring detailed information about wildlife. More importance was attached to the viewing of animals than to the recognition that animals might require private places.

Anderson et al (2003) investigated the effects of performing animal-training sessions with Asian small-clawed otters while zoo visitors watched. Their findings suggest that public animal training and public animal training with interpretation produce more positive zoo experiences, training perceptions and longer visitor exhibit stay times when compared to passive exhibit viewing and interpretation-only sessions.

• Evidence of educative influence of visit

Smith et al (2008) quoted that zoos suggest that they can play a role in fostering conservation behaviour but there is only limited support for such claims. Smith et al (2008) looked at two behaviours communicated during a talk at an Australian zoo (recycling and removing road kill). Results showed that 81% of respondents recalled hearing the conservation actions during the presentation and 54% intended to increase their commitment or start an action. In 38 follow up interviews six months after their visit, 26 had started or increased their commitment to an action.

Mallapur et al (2008) conducted a survey to assess the educative influence of zoo visits at three Indian zoos. When asked about the goals of a zoo, responses varied from zoo to zoo. A total of 20% and 29% of zoo visitors at two of the zoos stated that the goal of the zoo was to protect endangered species, while 69% of zoo visitors at the third zoo said they did not know. Zoo visitors correctly answered a greater number of questions on the biology, behaviour and habitat of Lion-tailed macaques in comparison with the general public. Mallapur et al (2008) concluded that zoos are an excellent learning environment to convey the conservation and education message but currently they are an underutilised resource.

Lukas & Ross (2005) findings supported Mallapur et al (2008) statement that zoos are an excellent learning environment. Lukas & Ross (2005) evaluated visitors’ knowledge and conservation attitudes towards African apes at Chicago’s Lincoln Park Zoo. They found that on average, visitors correctly answered 60% of knowledge questions, performed better on exit than entrance surveys. Older and more educated respondents performed better on knowledge questions than did younger and less educated respondents. Repeat visitors exhibited more eco-scientific attitudes than did first time visitors.
Spotte & Clark (2004) also found that visitors queried on exit had a significantly greater fraction of correct answers. Spotte & Clark (2004) conducted a knowledge-based survey of adult visitors at Mote Aquarium, Florida, based on questions predicated on information in graphics located near exhibits.

Balmford et al (2007) found little effort appeared to have been made by conservation educators and trainers on how to assess their activities beyond the number of people targeted, possibly due to the complexities involved in measuring such an effect accurately. Walter (2005) found that Education and Training components scored lower in the Mace et al system than Habitat, Research and Species.

- **Evidence of educational effort**

BIAZA quote that over a 1.7m people (mainly children) visit BIAZA collections each year on organised educational visits, with 660 thousand being taught by zoo staff. Some of the larger zoos receive over 30 thousand school children in any one year. Over 24 million people visit BIAZA collections each year, this represents one third of the population. An estimated 600 million visitors visit zoos world-wide.

Many zoos have full time education officers and many larger zoos with large numbers of visiting school parties have invested in purpose built education centres. While the zoo itself is an educational facility and education centres are not essential, 79% of BIAZA collections have access to teaching facilities.. Most zoos now have animal encounters/demonstrations and talks by keepers at feeding times etc.

Provision for the over 16-year olds and university students is often determined by exact syllabus requirements. Leading zoos have improved provision for this sector by offering specific days or events with a range of presentations, case studies, activities and discussions that meet syllabus requirements and advance the issues of conservation, sustainability and animal welfare (Zoos Forum Handbook, 2008).

- **Education outside the zoo**

Zoos also have a responsibility to educate non-visitors. This can be done in a number of ways such as via the media, leaflets and publications and outreach visits. Zoos have successfully used the media to try and educate non-visitors. Animal births and other important occasions are often reported in the news. Other examples include London Zoo's completion of the Blackburn Pavilion and return of the hummingbirds to the Zoo. This was launched to press with national and international audience with coverage in magazine, newspaper, web, radio and television media. National press coverage reached a potential audience of more than 37.3 million.

- **Do the public always want to know the truth?**

Turley (1999) quoted that there is a danger of overemphasising the more serious side of the work of zoos to the potential visiting public whose orientation is fundamentally recreational. There is a fear that the interest of the average UK zoo visitor will not be sustained by the detailed scientific detail of that accompanies the zoo’s conservation message.

The Hard Rain project explores the issues that are defining the 21st century: climate change, poverty, habitat loss, human rights etc and displayed these issues in pictures in the form of an international touring exhibition that seeks to raise public awareness of human impact on the environment. Moss (2008) evaluated the success
of the exhibit at Chester Zoo by collecting dwell time data for the exhibition and developing an engagement ‘scale’ for visitor behaviour. They also asked for visitor feedback. They found that while 95% of groups exhibited engagement, adult responses were mixed and many children left negative responses.

• **Why do the public visit zoos?**

Turley (1997) found that recreation was the main decision to visit followed by education then conservation. Rajack & Warren (1996) found the main reason to visit a zoo was ‘to visit with friends’ followed by ‘for fun’ then ‘entertainment’. Only 4% visited for education reasons and 5% to see rare animals. The English Tourist Board (1983) found that 64% of zoo visits were made to have a day out, with only 7% to learn about animals and birds. Kellert (1979) found the opposite to this in a study in the US where the main reason for visiting was education for children. Other studies into the public perceptions of the roles of zoos found that conservation and education mostly came out as the most important function before recreation and entertainment (Rajack & Waren, 1996. John Arden, 1989).

• **Evaluating education**

The 2007 BIAZA data shows that 70% of BIAZA members evaluated their formal education but only 44% interpretation and public talks. In the BIAZA Annual Awards 2008, Chester Zoo recognised that one of the core ways of presenting educational messages in zoos is through interpretation at exhibits, but the effectiveness of this is under-researched. Testing prior visitor knowledge and prototyping interpretation allowed them to make informed choices over the final design of a new attraction. Post-installation analysis revealed areas that required remedial work to improve visitor usage. The result was significantly increased visitor stopping rates and the length of time spent interacting with interpretation. A scale of visitor engagement was developed to further assess the relationship between visitors and interpretation. From this the tentative conclusion that increased time spent at an interpretive element increased the level of visitor engagement (in a proportional manner) was made.

www.biaza.org.uk/resources/library/images/awards%2008%20abstracts2.pdf

Lindemann-Matthies & Kamer (2006) studied the effect of a touch table on 600 visitors’ learning in a Swiss zoo. For half of each day visitors could choose to gain information from labels and posters next to the enclosures. In addition, for the other half of the day visitors could also choose to make use of a touch table. Lindemann-Matthies & Kamer (2006) concluded that the latter approach was successful. Visitors using the touch table knew more about the biology, ecology and conservation of the exhibit, both immediately after their visit to the zoo and two months later.

Davey (2005) highlighted how the efforts to meet the welfare needs of the animals often compromise visitor’s needs due to decreased animal visibility. Davey (2005) concluded that animal welfare initiatives such as naturalistic features do not necessarily conflict with, or impinge on, visitor interest. Non-visible animals motivate people to look for them and therefore stimulate visitor interest. Immersive exhibits can solve these issues and enhance visitor experiences. Moss et al (2008) investigated an immersive exhibit at Chester Zoo. Multiple, discreet viewing areas are one of the key features of immersive zoo exhibits. They found that visitors were much more likely to stop, and stay for longer, at the largest viewing areas. They found a proportional increase in visitor interest with increasing viewing area size.
Appendix I - Dispensation for particular zoos. (The UK Statue Law Database)

14. - (1) [Subject to subsection (1A),] if the local authority with power to grant a licence for a zoo inform the Secretary of State that in their opinion a direction should be made under this subsection because of the small [number of animals kept in] the zoo or the small number of the kinds of animal kept there, he may, after consulting such persons on the list as he thinks fit, direct—
(a) that this Act shall not apply to that zoo; or
(b) that sections 10 and 11 or either of them shall not apply thereto.

[(1A) The Secretary of State may only make a direction under subsection (1) where he is satisfied that it is not prejudicial to the protection of wild animals and the conservation of biodiversity to do so.]

(2) If the operator of a zoo informs the Secretary of State that in his opinion a direction should be made under this subsection because the number of inspectors provided for by section 10(4)(a) is too large for the zoo (having regard to the small size of the zoo or the small number of the kinds of animal kept there), the Secretary of State may, after consulting the local authority with power to grant a licence for the zoo and such persons on the list as he thinks fit, direct—
(a) that in the application of this Act to the zoo, section 10(4)(a) and (b) shall not apply; and
(b) that, instead, any inspection to be carried out under section 10 shall be conducted by such inspector or inspectors as the Secretary of State appoints.

(3) [Subject to subsection (3A),] any direction made under subsection (1) or (2) may be revoked or varied by a further direction of the Secretary of State made after he has consulted the local authority and such persons on the list as he thinks fit.
[(3A) The Secretary of State may only vary a direction made under subsection (1) where he is satisfied that it is not prejudicial to the protection of wild animals and the conservation of biodiversity to do so.]

(4) While a direction under subsection (1)

has effect, this Act, or sections 10 and 11, or either of them, shall not apply to the zoo (depending on the terms of the direction and any variation made by a further direction under subsection (3)).

(5) While a direction under subsection (2)

has effect, this Act shall apply to the zoo with the modifications specified in the direction (subject to any variation made by a further direction under subsection (3)).

(6) The Secretary of State shall take reasonable steps to secure that the local authority and any person who operates the zoo are notified in writing of any direction made under subsection (1), (2) or (3).
Zoo Licensing Act 1981 (as amended) Dispensations/Exemptions
Although each case is considered on its merits, and other situations may qualify, it may help to know that directions will normally be made when zoos fall into one of the following categories.

Section 14(1)(a) Direction on application from the Local Authority
(i) traditional deer parks
(ii) collections of llamas and alpacas not exceeding 5
(iii) collections, excluding those of wild mammals, of small, non-hazardous and non conservation sensitive wild species not normally exceeding 120 specimens.

Section 14(1)(b) Direction on application from the Local Authority
(i) collections of llamas and alpacas not exceeding 10
(ii) collections of non-hazardous and non-conservation sensitive wild species, excluding wild mammals, not normally exceeding 200 specimens.

Section 14(2) Direction on application from the Zoo Operator
Small collections not included in 14(1)(a) and 14(1)(b) where the hazardous and/or conservation sensitive species component of the collection not normally exceeds 50 specimens

ANY CHANGES TO ANIMAL COLLECTIONS MAY AFFECT THE DISPENSATION STATUS.

Removal of invasive species:
- Eradication of introduced rabbits and goats on Round Island, organised by the Durrell wildlife Conservation Trust and Mauritian Wildlife Foundation.

Protecting reserves:
- Operation Amba, funded by 21st Century Tiger, a partnership between The Zoological Society of London (ZSL) and Global Tiger Patrol, helps to protect reserves by combating poachers.
- Partula snail project in the Society Islands, run by ZSL, among other things, seeks to eliminate introduced predator snails so the Partula spp can re-establish themselves. The project also seeks to find new sites suitable for reintroduction.

Improving habitat:
- A study is underway on Eelmoor Marsh, a Site of Special Scientific Interest within the boundaries of the Defence Evaluation and Research Agency (DERA, now part of Defence Estates), to find an appropriate grazing regime to maintain the habitat.
- Since 1992 over 10 000 field crickets (Gryllus campestris), bred in captivity by ZSL, have been reintroduced to sites selected by English Nature where the species had become extinct. Appropriate grazing patterns are also adopted.
- Many zoos have an opportunity to create natural habitats for wildlife in designated areas within their own grounds, such as the Wildlife Garden at London Zoo.

Monitoring habitat:
- Eelmoor Marsh provides a good example of the annual monitoring of plant and insect life with habitat management planned around the results. The programme is run by Marwell Preservation Trust with funding from DERA and English Nature.
- In collaboration with the Egyptian Environmental Affairs Agency, staff from London Zoo have studied the behaviour and food preferences of the North African Kleinmann’s tortoise (Testudo kleinmanni) to help recovery of the wild populations.

Changing attitudes regarding policies affecting habitats:
- As part of a project to conserve Golden-headed lion tamarin (Leontopithecus chrysomelas), the Federal Environment Agency of Brazil expanded the Una Biological Reserves Bahia (the only protected area for the species) by over 2000 ha and has undertaken a successful Landowners Environmental Education Programme in regions neighbouring the Reserve. This project has been strongly supported by zoos and was the topic for the 2002 EAZA Conservation Campaign.
- Scottish Natural Heritage, in response to concern over the potential impact of a beaver reintroduction in Scotland, undertook a public-consultation exercise. Informative displays about beavers (Castor fiber) in UK zoos have undoubtedly contributed to the awareness and support for the project shown by the public.
- Red kite (Milvus milvus). The NBPC uses captive red kites to highlight problems and increase appreciation of these birds, which, since the 1990s, have had the dwindling wild stocks supplemented by continental specimens.

**Ex situ** conservation and repopulation as part of a managed programme:

- **Scimitar horned oryx** (*Oryx dammah*). This species is managed as a successful EEP, with the co-ordinator based at Marwell Zoo. It is important that the captive population is well managed as the species is probably extinct in the wild and has been the focus of reintroductions to Morocco, Algeria and Tunisia.
- **Water vole** (*Arvicola terrestris*). The water vole population in England has declined and at time of writing a national water vole captive-breeding and reintroduction programme is underway. The captive-breeding programme comes under the auspices of the Zoos Federation Rodent and Lagomorph TAG.

**Technology, information transfer and training:**

- **Spanish imperial eagle** (*Aquila abalberti*). The NBPC has visited the captive-breeding facility in Spain and provided technical advice on breeding techniques. The project has benefited from this and species reintroduction is now more likely as a result.
- A group from the Fish & Aquatic Invertebrate TAG is collaborating with the University of Morelia and the National Autonomous University of Mexico (UNAM) to develop the skills required to establish a well managed captive breeding programme for over 80 species of highly threatened endemic freshwater live bearing Mexican fish.

**Provision of equipment:**

- **21st Century Tiger** (ZSL/Global Tiger Patrol) has provided one truck, one Maruti jeep and 140 sets of uniforms for the guards, which will be used in the effort to help conserve and protect the tigers and other wildlife in the Sariska Tiger Reserve, India. All zoos can contribute to and help support 21st Century Tiger projects.

**Reintroduction, re-enforcement/supplementation/repopulation and translocation:**

- **Reintroduction**: the last wild Californian condors (*Gymnogyps californianus*) were taken into captivity and a successful captive-breeding programme, and releases, involving Los Angeles and San Diego Zoos have taken place.
- **Re-enforcement/Supplementation/Repopulation** is the addition of individuals to an existing population of conspecifics. The sand lizard (*Lacerta agilis*) and natterjack toad (*Bufo calamita*) programmes use captive-bred animals to re-enforce native populations.
- **Translocation**: in 1963 Hirola (Hunter’s hartebeest, *Damaliscus hunteri*) were translocated to Tsavos East National Park, Kenya, and a further translocation took place in 1996. Elephants have been translocated to safer areas or from areas where they are crop raiding in Zimbabwe and Kenya. One-horned rhinoceros (*Rhinoceros unicornis*) are regularly translocated from Royal Chitwan to Royal Bardia National Park in Nepal.

Practical and technical skills:
- In-range training with the scimitar-horned oryx (*Oryx dammah*) reintroduction project, Sidi Toui Park, Tunisia. Training has been provided by Southampton University in GIS mapping techniques and by Sparsholt College in radio-tracking. Keepers from Bratislava and Marwell Zoos accompanied the animals and trained local staff in management techniques before the release.
- Veterinary training in Nepal. Funded by the Department for International Development and managed by ZSL, the Wildlife and Domestic Veterinary Programme involves the setting up of four clinics in the buffer zone of Royal Chitwan National Park. Local technicians are being trained and will continue the work at the end of the project.
- Egyptian tortoise (*Testudo kleimmani*). Led by London Zoo and involving the British and Irish Herp TAG, this project includes the rehabilitation of seized tortoises, habitat recovery, management of tortoises in semi-wild pens, a pilot reintroduction programme and health monitoring. An education and craft programme has also been developed with local Bedouin communities. London and Rome zoos have provided training in captive management and Edinburgh Zoo provided radio-tracking equipment for use in the pilot release programme. Many collections could become involved with this type of project.

Provision of handling equipment to rehabilitation centres:
- The NBPC has trained staff and volunteers at South Carolina Center for Birds of Prey, USA, to work with the permanently disabled wild birds that are used for educational purposes. The NBPC also provided handling equipment (e.g. proper gloves, hoods, travelling boxes) for the birds being released back into the wild. This two-way project has worked well and the RSPCA is now hoping to duplicate the design of the pre-release pens used in the USA.

Community education:
- Bristol Zoo supports a programme at Yaounde Zoo, Cameroon, aimed at reducing the bushmeat trade through community education
Suggested structure for evidence-based websites (Sutherland et al, 2004)

The execution of a shift to collating evidence is probably best achieved by the establishment of a website, or perhaps a series of sites, covering different aspects such as habitat management, control of introduced species, captive breeding and integrated conservation development projects. The site that we envisage for habitat management would comprise a searchable database including the following fields:

- Country
- Site name (leading to a file describing site)
- Name and organization of contributor
- Major habitat category (from menu)
- Habitat detail (e.g. dominant plant species)
- Type of problem (menu)
- Species involved
- Broad conservation action (menu)
- Detailed description of action (including description of any replication and controls)
- Consequences of action, including problems. This could be data and analyses or simply a subjective opinion.

The easiest way to establish this website would be by extracting results from papers and reports using the systematic review process, and then by speaking to practitioners and encouraging them to use the website and contribute.
Appendix 7: Review of available literature

References


LifeLines 103 January 2009


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RSPCA: Horsham, West Sussex


The UK Statue Law Database www.statutelaw.gov.uk Accessed April 2009


Example 1: farm park with a very small collection of wild animals

In this example, the Zoos Forum Handbook (2008) describes a farm park with very small numbers of wild animals that are all non-conservation sensitive. The zoo only just falls within the zoo licensing regime. Around 80k visitors/year are received, reflecting attendance at the wider attraction rather than just the zoo element. Base for comparison: five farm parks with visitor numbers between 30-200k, all with 14(2) dispensation.

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<thead>
<tr>
<th>Measures undertaken in the example</th>
<th>Reported level of activity</th>
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<td>Contributing towards local habitat management and maintenance for the benefit of biodiversity. This can include simple measures such as sensitive farming practices, bat and bird boxes, maintaining a wildlife pond or hedgerows for the benefit of local wildlife. Alternative measures could include: * sensitive habitat management and maintenance under agri-environment schemes such as Defra’s Environmental Stewardship; * participating in rare breeds conservation programmes, if appropriate; * involvement with native species or habitat monitoring schemes; and * financial contributions to conservation activities, alongside other measures</td>
<td>FEW (one) reported involvement in conservation in the field; DATA not available re: alternative measures</td>
</tr>
<tr>
<td>The zoo has a simple written education strategy outlining key target audiences and methods.</td>
<td>ALL confirmed having a written education policy in place</td>
</tr>
<tr>
<td>The wild animal species have basic identification labels – featuring name, scientific name, range/natural habitat</td>
<td>When asked what categories of information included as standard on each enclosure... ALL cited common name; MOST (four) mentioned scientific name; MOST (three) mentioned origin; FEW (two) mentioned habitat.</td>
</tr>
<tr>
<td>Staff are able to answer general questions about the animals and their care, e.g. diet</td>
<td>MOST (four) hold animal shows or have presenters talking to visitors; MOST (three) have scheduled times when staff are available to talk to visitors; n.b. just one site reported no animal shows and no scheduled times for talking to visitors</td>
</tr>
<tr>
<td>Visitors are informed, for example by signs, leaflets, or staff, about environmental issues and actions, such as efforts to manage local habitat for the conservation of biodiversity and efforts to operate sustainably. Visitors are thereby encouraged to find out more about local and global environmental issues and given information to enable them to act more sustainably. (For example, waste management, recycling, energy saving, putting up bird boxes, gardening for wildlife).</td>
<td>ALL provided a website; MOST (four) provided a guidebook; ONE site reported having a stated environmental policy; a sustainability kite mark and assessed its own environmental impact</td>
</tr>
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Example 2: small aquarium with a small collection of species

This example describes a small aquarium with annual visitor numbers of around 30,000 and dispensation status of 14(2). The aquarium holds wild species, although only a relatively small number of conservation-sensitive species. Base for comparison: twelve respondents (eight bird of prey collections and four general mixed collections) that each reported 30k or less visitors per annum and all with dispensation status of 14(2).

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<tbody>
<tr>
<td>This collection is well placed to promote public education and awareness in relation to conservation activities, and therefore focuses largely on educational measures such as making links to local marine and freshwater environments, and the associated conservation issues. The relatively strong input on educational activities can be taken into account in considering requirements on the practical conservation side. The hypothetical establishment undertakes the following activities:</td>
<td>ALL hold animal shows or have presenters talking to visitors at animal enclosures; MOST (seven) have scheduled times when staff are available to talk to visitors; ALL offer classes for visiting schools/groups; ALL visit schools and other venues for demonstration and teaching purposes</td>
</tr>
<tr>
<td>Occasionally contributing staff time or resources to relevant local conservation projects or activities such as beach clean-ups and wildlife pond management.</td>
<td>MOST (seven) reported involvement in field conservation projects</td>
</tr>
<tr>
<td>When conservation-sensitive species are held then the collection participates in appropriate captive-breeding species management programmes and provides data to studbooks.</td>
<td>MOST (eight) reported involvement in managed breeding programmes of species in captivity – three of whom co-ordinated or kept the studbook</td>
</tr>
<tr>
<td>The aquarium has a simple written education strategy outlining key target audiences and methods.</td>
<td>ALL confirmed written education policy</td>
</tr>
<tr>
<td>Each exhibit has basic identification labels – featuring species and range, and habitat type. Conservation sensitive species are specifically highlighted.</td>
<td>When asked what categories of information included as standard on each enclosure… MOST (ten) mentioned common name; MOST (eight) mentioned scientific name; MOST (ten) mentioned origin; MOST (seven) mentioned habitat</td>
</tr>
<tr>
<td>Information is provided (e.g. through signs, leaflets, guidebook) on the marine habitat highlighting threats and conservation. For example, illustration of the interdependence of species and impact of environmental disturbance such as pollution.</td>
<td>MOST (eight) provided a guidebook or leaflet; MOST (eleven) provided a website; MOST (eight) provided teacher resources; MOST (eight) provided an activity book.</td>
</tr>
<tr>
<td>Staff are able to answer general questions about the animals and their care, e.g. diet</td>
<td>ALL hold animal shows or have presenters talking to visitors at animal enclosures; MOST (seven) have scheduled times when staff are available to talk generally to visitors</td>
</tr>
<tr>
<td>When projects such as beach-cleans and wetland habitat management are conducted local groups and/or visitors are involved and/or informed about them</td>
<td>No comparable data available</td>
</tr>
</tbody>
</table>
Example 3: zoo with a small collection
In this example, the zoo is described as having annual visitor numbers of some 80,000 and with Section 14(2) dispensation. The zoo holds primarily wild exotic species, but a relatively small number of conservation-sensitive species and so therefore has a dispensation (e.g. a small general zoo collection, also similar to a specialist collection such as a bird of prey centre). As the collection includes some conservation-sensitive species, the requirements will be increased. Base for comparison: thirteen respondents (seven aquariums and six general mixed collections) - all with dispensation status of 14(2) and each receiving 80-200k visitors.

<table>
<thead>
<tr>
<th>Measures undertaken in the example</th>
<th>Reported level of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The zoo is involved with one conservation project for threatened species/habitats. A member of the zoo staff contributes their expertise and a proportion of their time. The zoo also supports this project and other campaigns through fundraising</td>
<td>MOST (nine) reported involvement in field conservation projects; of which:</td>
</tr>
<tr>
<td></td>
<td>Five included a training component;</td>
</tr>
<tr>
<td></td>
<td>Four reported funds raised from public</td>
</tr>
<tr>
<td>The zoo also participates in several managed breeding programmes, helping ensure that the zoo’s captive-breeding programme contributes effectively</td>
<td>MOST (ten) reported involvement in managed breeding programmes</td>
</tr>
<tr>
<td>The zoo facilitates occasional research opportunities for students from a local college and helps publicise the outcomes</td>
<td>MOST (ten) reported involvement in research projects from which conservation benefits accrue to wild animals; of which</td>
</tr>
<tr>
<td></td>
<td>One stated that all results published and put in the public domain; five stated that some results had been published; three stated that results had not/not yet been published; and one did not answer.</td>
</tr>
<tr>
<td>The zoo also seeks to operate sustainably and has a basic environmental policy.</td>
<td>MOST (seven) reported having a stated environmental policy in place;</td>
</tr>
<tr>
<td></td>
<td>NONE held a sustainability kite mark;</td>
</tr>
<tr>
<td></td>
<td>MOST (seven) said that their zoo assessed its own environmental impact.</td>
</tr>
<tr>
<td>The zoo has a written education strategy outlining key target audiences and methods</td>
<td>ALL confirmed presence of written education policy</td>
</tr>
<tr>
<td>Each exhibit has basic identification labels – featuring species name and range and habitat. Conservation sensitive species are specifically highlighted</td>
<td>When asked what categories of information included as standard on each enclosure…</td>
</tr>
<tr>
<td></td>
<td>MOST (eleven) mentioned common name;</td>
</tr>
<tr>
<td></td>
<td>MOST (twelve) mentioned scientific name;</td>
</tr>
<tr>
<td></td>
<td>MOST (ten) mentioned origin;</td>
</tr>
<tr>
<td></td>
<td>MOST (eight) mentioned habitat</td>
</tr>
<tr>
<td>Information is provided (e.g. through signs, leaflets, guidebook and talks or demonstrations) on species, habitats and related conservation issues</td>
<td>MOST (ten) provide a guidebook or leaflet;</td>
</tr>
<tr>
<td></td>
<td>ALL provide a website</td>
</tr>
<tr>
<td>Staff are able to answer general questions about the animals and their care, e.g. diet, and tailor this information to different audiences (including schools/children)</td>
<td>MOST (twelve) hold animal shows or have presenters talking to visitors at animal enclosures;</td>
</tr>
<tr>
<td></td>
<td>MOST (twelve) have scheduled times when staff are available to talk generally to visitors</td>
</tr>
</tbody>
</table>
Example 4: zoo with low visitor numbers
In this example, the zoo is described as having annual visitor numbers of about 80,000, with no dispensation. The zoo holds primarily wild exotic species, including a number of conservation-sensitive species (e.g. a small general zoo collection or a large specialist collection). Since no dispensation is in place, the conservation requirements will be proportionately greater. Base for comparison: seven respondents (five general mixed and two bird collections) – all receiving 80-200k visitors per year and each with no dispensation.

<table>
<thead>
<tr>
<th>Measures undertaken in the example</th>
<th>Reported level of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The zoo participates in a field conservation project, to which zoo staff contribute their time and expertise. The zoo also supports this project and other campaigns through fundraising</td>
<td>ALL involved in field conservation projects</td>
</tr>
<tr>
<td></td>
<td>MOST (six) included funds raised from the public in estimated total annual cost.</td>
</tr>
<tr>
<td>The zoo also participates in managed breeding programmes and provides data to studbooks (such as International Studbooks, EEP’s and ESB’s). This helps ensure that the zoo’s captive-breedig programme contributes effectively</td>
<td>MOST (six) reported involvement in managed breeding programmes of species in captivity; of which ONE co-ordinated/kept the studbook</td>
</tr>
<tr>
<td>The zoo regularly facilitates research for students and has good links with the local college. It therefore undertakes and facilitates a small number of research projects</td>
<td>MOST (six) reported involvement in research projects.</td>
</tr>
<tr>
<td>The zoo has a written education strategy outlining key target audiences and methods</td>
<td>ALL confirmed presence of written education policy</td>
</tr>
<tr>
<td>Each exhibit has identification labels – featuring species name and range and habitat. Conservation sensitive species are specifically highlighted</td>
<td>When asked what categories of information included as standard on each enclosure…</td>
</tr>
<tr>
<td></td>
<td>ALL mentioned common name;</td>
</tr>
<tr>
<td></td>
<td>ALL mentioned scientific name;</td>
</tr>
<tr>
<td></td>
<td>MOST (six) mentioned origin; and MOST (five) mentioned habitat</td>
</tr>
<tr>
<td>Information is provided (e.g. through signs, leaflets, guidebook and talks or demonstrations) on species, habitats and related conservation issues; and upon the conservation work undertaken by the zoo</td>
<td>MOST (six) provided a guidebook or leaflet</td>
</tr>
<tr>
<td></td>
<td>ALL provided a website</td>
</tr>
<tr>
<td>Staff are able to answer general questions about the animals and their care, e.g. diet, and tailor this information to different audiences (including schools/children)</td>
<td>ALL hold animal shows or have presenters talking to visitors at animal enclosures;</td>
</tr>
<tr>
<td></td>
<td>ALL have scheduled times when staff are available to talk generally to visitors</td>
</tr>
<tr>
<td>A dedicated area or room/building is provided to enable public presentations and/or schools programmes</td>
<td>ALL provide access to educational facilities (one or more of classroom / library / lecture theatre / other)</td>
</tr>
<tr>
<td>There is a trained member of staff for undertaking the education programme*. (*This staff member may have other duties as well. Their training may be through recognised qualification and/or through attendance at appropriate meetings and conferences, shadowing at other zoos etc). If a schools programme is operated the staff involved should be familiar with the curriculum and needs of the target age/ability groups focused upon</td>
<td>ALL said that 51% or more of education staff were qualified in a biological or teaching discipline</td>
</tr>
</tbody>
</table>
**Example 5: zoo with medium visitor numbers**

In this example, the zoo is described as a medium sized collection including some conservation-sensitive species. Annual visitor numbers of some 200k are suggested. Base for comparison: eight respondents (six general mixed and two bird collections) – all with no dispensation and each receiving 200-350k visitors per year.

<table>
<thead>
<tr>
<th>Measures undertaken in the example</th>
<th>Reported level of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The zoo participates in several conservation projects, providing some funding and for which zoo staff contribute their time and expertise (to the value of in the region of several thousand pounds per year). The zoo also supports this project and other campaigns through fundraising. On occasion this involves captive-breeding for release projects.</td>
<td>ALL reported involvement in field conservation projects;</td>
</tr>
<tr>
<td></td>
<td>MOST (six) reported that annual cost for field conservation projects included some funds from zoo budgets</td>
</tr>
<tr>
<td></td>
<td>MOST (seven) reported that staff time and resources included in annual cost for field conservation projects</td>
</tr>
<tr>
<td></td>
<td>MOST (seven) reported that some funds raised from the public</td>
</tr>
<tr>
<td>The zoo also participates in managed breeding programmes and provides data to studbooks (such as International Studbooks, EEP’s and ESB’s), including holding the EEP studbook for a threatened species. This helps ensure that the zoo's captive-breeding programme contributes effectively.</td>
<td>ALL reported involvement in managed breeding programmes of species in captivity; of which</td>
</tr>
<tr>
<td></td>
<td>MOST (six) co-ordinated/kept the studbook for these programmes</td>
</tr>
<tr>
<td>Zoo staff participate in Taxonomic Advisory Group meetings within the UK for several species groups, helping contribute their expertise and also exchanging information to assist in conservation</td>
<td>MOST (seven) reported participating in the exchange of information relating to the conservation of species of wild animals</td>
</tr>
<tr>
<td>The zoo regularly facilitates research students and has good links with the local college. It therefore undertakes and facilitates a number of research projects. Publication of research results in appropriate journals.</td>
<td>ALL reported involvement in research projects; of which</td>
</tr>
<tr>
<td></td>
<td>Four reported some results published;</td>
</tr>
<tr>
<td></td>
<td>Three reported no results published</td>
</tr>
<tr>
<td></td>
<td>One did not know</td>
</tr>
<tr>
<td>The zoo also seeks to operate sustainably and has an environmental policy which regularly assesses its own environmental impact.</td>
<td>MOST (six) reported having a stated environmental policy in place;</td>
</tr>
<tr>
<td></td>
<td>FEW (two) held a sustainability kite mark</td>
</tr>
<tr>
<td></td>
<td>MOST (seven) said that their zoo assessed its own environmental impact</td>
</tr>
<tr>
<td>There is a trained member of staff for undertaking the education programme*. (*This staff member may have other duties as well. Their training may be through recognised qualification and/or through attendance at appropriate meetings and conferences, shadowing at other zoos etc). If a schools programme is operated the staff involved should be familiar with the curriculum and needs of the target age/ability groups focused upon</td>
<td>MOST (seven) reported that some education staff qualified in an education or teaching discipline</td>
</tr>
<tr>
<td>Each exhibit has identification labels – featuring species name and range and habitat. Conservation sensitive species are specifically highlighted. Some have additional interpretation (e.g. graphics and/or audio point, video etc)</td>
<td>When asked what categories of information included as standard on each enclosure…</td>
</tr>
<tr>
<td></td>
<td>MOST (seven) mentioned common name;</td>
</tr>
<tr>
<td></td>
<td>MOST (five) mentioned scientific name;</td>
</tr>
</tbody>
</table>
Appendix 8: Comparison with suggested benchmarks

<table>
<thead>
<tr>
<th>Information is provided (e.g. through signs, leaflets, guidebook and talks or demonstrations) on species, habitats and related conservation issues; and upon the conservation work undertaken by the zoo</th>
<th>MOST (seven) mentioned origin; MOST (six) mentioned habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff are able to answer general questions about the animals and their care, e.g. diet, and tailor this information to different audiences (including schools/children)</td>
<td>ALL held animal shows or have presenters talking to visitors at animal enclosures; ALL have scheduled times when staff are available to talk generally to visitors</td>
</tr>
<tr>
<td>An area or room/building is provided to enable public presentations and/or schools programmes. A programme of talks or lessons is available for different target groups, e.g. nursery, primary, secondary and adult groups</td>
<td>ALL provide access to education facilities ALL cater for different target groups</td>
</tr>
<tr>
<td>There is at least one trained member of staff for undertaking the education programme*. (*This staff member’s primary duty is ‘education’. Their training may be through recognised qualification and/or through attendance at appropriate meetings and conferences, shadowing at other zoos etc). If a schools programme is operated the staff involved should be familiar with the curriculum and needs of the target age/ability groups focused upon</td>
<td>MOST (six) reported some staff qualified in a biological/teaching discipline</td>
</tr>
<tr>
<td>An education section on the zoo’s website</td>
<td>Data not available</td>
</tr>
<tr>
<td>Visitors are encouraged to get involved / to take action that is beneficial to conservation</td>
<td>Data not available</td>
</tr>
</tbody>
</table>

**Example 6: zoo with high visitor numbers**

This example describes a large zoo with annual visitor numbers of around 400,000. There is no dispensation. The collection includes significant numbers of conservation-sensitive species. Base for comparison: eleven general mixed collections with no dispensation and annual visitor numbers in excess of 350k.

<table>
<thead>
<tr>
<th>Measures undertaken in the example</th>
<th>Reported level of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in a range of conservation projects contributing funds, time and expertise of zoo staff (to the value of in the region over £10k per year). Equally, this could consist of participation in a smaller or greater number of projects but at a similar overall level.</td>
<td>ALL reported involvement in projects, either by providing funds and/or staff time and resources, connected with conservation in the field, either in the UK or overseas.</td>
</tr>
<tr>
<td>Participation with local wildlife groups in managing an area of local habitat for biodiversity conservation.</td>
<td>(No comparable data available)</td>
</tr>
<tr>
<td>The zoo also participates in managed breeding programmes and provides data to studbooks (such as International Studbooks, EEP’s and ESB’s), including holding the EEP studbook for several threatened species. This helps ensure that the zoo’s captive-breeding programme contributes effectively.</td>
<td>ALL reported involvement in managed breeding programmes of species in captivity during the last three years. MOST (seven) reported having responsibility for co-ordinating or keeping the studbook for breeding programmes.</td>
</tr>
<tr>
<td>Active involvement in species management programmes for threatened species through</td>
<td>ALL reported a training component in their field conservation projects.</td>
</tr>
<tr>
<td>Activity</td>
<td>Most (ten)</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Taxon advisory groups. This involves staff contributing their expertise and also exchanging information to assist in conservation.</td>
<td>MOST (ten) participated in the exchange of information relating to the conservation of species of wild animals.</td>
</tr>
<tr>
<td>Captive-breeding of a rare native species to assist a reintroduction programme in partnership with English Nature and several non-governmental organisations. Opportunities to participate in this kind of work may be rare but zoos are well placed to play an important role.</td>
<td>MOST (ten) reported participation in field conservation projects with a re-introduction or re-population component.</td>
</tr>
<tr>
<td>Undertaking several research projects. Collaborating with a local university and college on research, facilitating opportunities for research.</td>
<td>ALL reported involvement in research projects from which conservation benefits were expected to be derived.</td>
</tr>
<tr>
<td>Publication of papers and notes each year on the results of research and field conservation work.</td>
<td>FEW (one) reported that the results of research projects had been published and put in the public domain.</td>
</tr>
<tr>
<td>Fundraising for a field conservation project sometimes undertaken by outside organisations and sometimes by the zoo itself.</td>
<td>MOST (ten) reported funds from zoo budgets contributing to their field conservation projects. ALL reported funds raised from the public towards field conservation projects.</td>
</tr>
<tr>
<td>The zoo also seeks to operate sustainably and has an environmental policy which regularly assesses its own environmental impact.</td>
<td>MOST (ten) reported a stated environmental policy. ALL assessed their own environmental impact.</td>
</tr>
<tr>
<td>The zoo has a written education strategy outlining key target audiences and methods. And education is one of the elements considered in other strategies and operations, e.g. enclosure design; species selection etc</td>
<td>ALL reported that written education policy was prepared by an education officer</td>
</tr>
<tr>
<td>Each exhibit has identification labels – featuring species name and range and habitat. Conservation sensitive species are specifically highlighted. Many exhibits have additional interpretation, such as extra graphic panels, audio, interactives, video etc. In large multi-species aquaria (tanks) key species are highlighted with identification information, other species are listed</td>
<td>When asked what categories of information included as standard on each enclosure… MOST (nine) mentioned common name; MOST (nine) mentioned scientific name; MOST (nine) mentioned origin; MOST (eight) mentioned habitat</td>
</tr>
<tr>
<td>Information is provided (e.g. through signs, leaflets, guidebook and talks or demonstrations) on species, habitats and related conservation issues; and upon the conservation work undertaken by the zoo; and encouraging public involvement in conservation</td>
<td>ALL provided a guidebook or leaflet ALL provided a website</td>
</tr>
<tr>
<td>Staff are able to answer general questions about the animals and their care, e.g. diet, and tailor this information to different audiences (including schools/children)</td>
<td>ALL hold animal shows or have presenters talking to visitors at animal enclosures; MOST (six) have scheduled times when staff are available to talk generally to visitors</td>
</tr>
<tr>
<td>An area or room/building is provided to enable public presentations and/or schools programmes. A programme of talks or lessons is available for different target groups, e.g. nursery, primary, secondary and adult groups, tailored to the curriculum</td>
<td>ALL provide access to education facilities ALL cater for different target groups</td>
</tr>
<tr>
<td>There are at least two trained members of staff for undertaking the education programme*. (*&quot;One of these staff member's sole duty is</td>
<td>ALL reported some education staff qualified in an education/teaching discipline</td>
</tr>
</tbody>
</table>
Appendix 8: Comparison with suggested benchmarks

| ‘education’. Their training may be through recognised qualification and/or through attendance at appropriate meetings and conferences, shadowing at other zoos etc). Education staff are supported by other staff having education roles (e.g. keepers, graphics, presenters giving talks). If a schools programme is operated the staff involved should be familiar with the curriculum and needs of the target age/ability groups focused upon |
| Educational resources are available and designed for target groups of visitors, e.g. trails, fact sheets for families, for primary school children etc. |
| Educational elements are incorporated into at least some of the zoo’s conservation in situ projects and might be the main focus of some in situ conservation work |
| An education section on the zoo’s website, with additional information on some species/habitats |
| Visitors are encouraged and given ideas or opportunities to get involved / to take action that is beneficial to conservation |

**ALL** provide trails
**ALL** provide teacher resources
**ALL** reported that some field conservation projects had a training component
**ALL** reported a website
(No comparable data available)

**Additional actions (all zoos) – selected comparisons**

<table>
<thead>
<tr>
<th>Measures undertaken in the example</th>
<th>Reported level of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Base:</strong></td>
<td></td>
</tr>
<tr>
<td>providing talks for local groups &amp; schools…this can be in the zoo</td>
<td>MOST (4)</td>
</tr>
<tr>
<td>or at the group/school’s own facility</td>
<td>FEW (1)</td>
</tr>
<tr>
<td>adult education classes</td>
<td>FEW (1)</td>
</tr>
<tr>
<td>visitor interactives (might include touch screens, computers, audio points etc)</td>
<td>NONE</td>
</tr>
<tr>
<td>audio guide or commentary (for example in drive-through exhibits, but also general use)</td>
<td>NONE</td>
</tr>
</tbody>
</table>
Educational development at Blackpool Zoo

Blackpool Zoo is a private zoo with a mixed collection of animals. The zoo receives 200-350k visitors each year – this includes school visits from over 35k children from throughout the North West of England. Outside visits to schools and groups bring the zoo into contact with a further 3k pupils each year.

Conservation and education activities

Around 10 research projects are completed each year and the zoo is involved in many overseas projects. A good example of these being the Biodiversity Elephant Conservation Trust in Sri Lanka. Blackpool Zoo supplies funds for an education officer to teach children in remote schools about the importance of elephants and the type of crops that attract them. Since this project started, evidence suggests that it has helped to reduce the conflict between local people and elephants.

Considerable emphasis is placed on educational development at Blackpool Zoo. A programme of activities has been designed to meet the needs of a wide range of pupils.

Background to educational development

Blackpool Zoo has been working with educational development groups for over four years. The contact was started when a need was identified to provide practical experience for a group of students with learning difficulties from a local agricultural college. The scheme was then offered to Pupil Referral Units (PRU) that were also looking for an alternative methodology of education provision.

Educational activities in detail

On one day of the week, the zoo hosts 7-10 year old children from a PRU with slightly older 11-14 year old pupils from two different PRUs attending the zoo on another two days of the week. These children are excluded from mainstream education. Once a week, the zoo receives students with learning difficulties (access level group). A typical week at Blackpool might appear as follows:

<table>
<thead>
<tr>
<th>Group size</th>
<th>Tues</th>
<th>Weds</th>
<th>Thurs</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group profile</td>
<td>PRG</td>
<td>PRU</td>
<td>PRU</td>
<td>Access level</td>
</tr>
</tbody>
</table>

| Group size | 5 | 8-10 | 8-10 | 10 |
| Age range (years) | 7-10 | 11-14 | 11-14 | 16-20 |

Working closely with each group’s teaching staff, the zoo organises a range of appropriate activities. The tasks are designed so that all pupils have the opportunity to become actively involved. Weekly group discussions help children to understand how they feel about the animals, themselves and the wider world.

Pupil Referral Units

Each group spends around 4 hours per week in the zoo carrying out a range of tasks under the supervision of zoo education staff and keepers. Pupils are encouraged to name and take responsibility for some small animals, such as the rabbits in the Children’s Zoo. The groups keep a zoo diary, write stories about the animals and have homework to do between sessions.

Access level groups

The animal care study group is made up of 10 pupils that spend three hours per week helping zoo keepers and carrying out academic tasks over a 30 week period. The main aims of these courses are to help pupils to:

- build their confidence to speak to new people and develop their career;
- deal with their emotional behaviour; to develop self esteem, confidence and mental wellbeing;
- learn about the animals and conservation; and
- learn literacy, numeracy and skills for life.

Evaluation

The zoo’s education team completes evaluation sheets as evidence of progress and checks that teachers are satisfied that appropriate work is being carried out. Pupil evaluation is through narratives, pictures and written work. Attendance rates also provide a good measure of how much the pupils enjoy the programme.

Evaluating education programmes from the perspective of students, teachers and education officers ensures consistency and effectiveness. This material is retained as a supplement to the zoo license inspection process.

Dissemination of information

Papers have been included in BIAZA publications and presentations given at national conferences. Reports are produced on a termly basis to be discussed with each of the PRU and access group tutors. Reports and examples of the work produced by the PRUs are also provided for the Blackpool Children Services as evidence indicators of the success of this scheme. The access level group produces a portfolio of evidence that contributes towards an ASDAN qualification.

Future development

Currently, only 18+ year olds are taken for individual work experience placements at Blackpool but the zoo is in the process of developing a project for groups of younger, 15-18 year olds. The zoo hopes to create a 10 week programme aimed at young people that need practical experience as part of their application to work in animal related fields.

Further information

To find out more about the conservation and education activities described in this case study, please contact: Sarah.Thomas@blackpoolzoo.org.uk or www.blackpoolzoo.org.uk
Display enrichment activity at Brighton Aquarium

Brighton Aquarium is one of the world’s oldest and largest aquariums. Its listed Victorian architecture and seafront location provide not only a special setting but some unique challenges as well. The aquarium attracts more than 200k visitors per annum, including many families with young children. Brighton, one of over 30 aquariums around the world that make up the Merlin Entertainment Group’s Sea Life attractions, holds a diverse collection of fish, octopus, sharks and turtles.

Conservation and education activities

Sea Life has stated its commitment to conservation through a mix of conservation, education, awareness and direct action. Brighton itself has well established connections with overseas turtle conservation projects in Brazil, Thailand, the Cayman Islands and Greece.

Closer to home, strong links have been forged with the local community through a programme of activities that encourage involvement in practical conservation as evidenced by the aquarium’s annual beach clean event. This also provides an opportunity to explain to participants about the hazards of waste for marine birds and animals. The aquarium’s commitment to education and conservation is further demonstrated through an affiliation with a local university. This includes the provision of laboratory space within the aquarium and an ongoing programme of research activities for students and the associated publication of papers.

Background to display enrichment

While it has always aimed to re-create their natural habitat as closely as possible, more recently Brighton has been placing an increasing emphasis on environmental enrichment - beginning with the aquarium’s giant sea turtles, Lulu and Jersey.

Imported into the United Kingdom more than fifty years ago, Lulu, a green turtle, has spent her adult life in captivity. Lulu’s well documented history makes her of particular value as a monitor not just for turtles but for a whole range of species in aquariums and zoos. Since Lulu was first imported, considerable advances have been made in understanding green turtles’ diet and health. For example, semi-dry displays have been superseded by wet tanks and diets rich in sea grasses have replaced fish-based diets. While these improvements have benefited Lulu’s health, behavioural changes, however, prompted the team at Brighton to consider how best to enrich her surroundings.

Display enrichment in detail

The introduction of a split feeding system, as opposed to the former central feeding routine, better reflected the natural environment and allowed the faster swimming species in the display a greater share while also encouraging Lulu to browse and compete for her food more actively, enriching the environment for all.

By way of another example, greater emphasis has been placed on devising in-water tactile procedures. Encouraging interaction between aquarists and Lulu, such as during tank-cleaning dives, provides a source of mental stimulation and interest for Lulu. Secondary benefits, in the form of reduced stress during routine handling tasks, have also been realised.

Evaluation

The centre’s veterinary surgeon is closely involved in the display enrichment programme. Lulu’s health is monitored to provide a record over time that will serve as a valuable reference in managing turtles. The most immediate benefits for Lulu have been observed in the form of improved shell structure and reduced body fat.

All visitors are invited to complete a short Visitor Survey form that asks them to rate various aspects of their visit to the aquarium. These forms include specific questions about conservation issues facing marine life, and a rating of any talks/presentations that have been attended. In addition, the aquarium receives numerous thank you letters. All of this feedback, formal and informal, is collated and made available to inspectors as part of the licence inspection process. With regard to school visits, teacher and pupil evaluation forms are completed and reviewed after each visit.

Dissemination of information

An Entertainments Team works closely with the aquarists to provide presentations for visitors. Two talks are provided each day to coincide with feeding at the turtle display. These talks describe the history of turtles at Brighton; the ongoing programme of work to improve their health and enrich their environment; the status of turtles in the wild; the threats that they face; and the conservation activities to support them.

A novel initiative has seen the introduction of dive sessions that combine diving with conservation talks. In this way, members of the public are given the opportunity to dive with a range of species, including the turtles, and aquarists are able to disseminate information about conservation of the various species and their natural habitat.

Future development

The programme of enrichment that has been initiated for the turtles at Brighton is being rolled-out to other Sea Life centres around the world. The planned publication of a scientific paper will ensure that the findings of the aquarium’s work on enrichment processes are made more widely available.

Further information

To find out more about the conservation and education activities described in this case study, please contact:

www.sealiffeurope.com
Biodiversity action plans at Lotherton Bird Garden

The Lotherton Hall estate is managed by Leeds City Council. The estate provides a range of attractions centred on the mansion house, its gardens and parkland. These include a red deer park, nature trails and the bird garden itself. The latter alone receives nearly 250k visitors each year. With only ten full-time members of staff and three volunteers, labour is at a premium to care for the 200 or so rare and endangered species that make up the collection. The bird garden operates without gate money and faces a number of pressures due to its size and limited number of staff.

Conservation and education activities

The bird garden has been involved in many captive breeding programmes and has supplied a range of species to other zoological collections. Although perhaps best known for its collection of rare and endangered birds, Lotherton’s conservation activities extend widely, as illustrated through its contribution to Leeds City Council’s Biodiversity Action Plans (BAPs).

Background to Biodiversity Action Plans

BAPs address threatened species and habitats and are designed to protect and restore biological systems. Lotherton Bird Garden supports the Conservation Officers at Leeds City Council in achieving their BAPs. Lotherton’s involvement is mostly focussed on the species action plans concerning Pipistrelle bats, Great crested newts and native bird species.

Biodiversity Action Plans in detail

Lotherton keepers carry out bird surveys on the estate, to identify species present, and population numbers. A number of feeding stations have been introduced and these are used as observation stations. As staff build up a picture of populations of birds, it is intended to monitor the species to establish whether or not numbers are increasing or in decline, and to establish to what extent estate management operations are having a positive or negative effect on populations. Identified outcomes will be raised at management level and conservation measures will then be implemented.

Staff from the bird garden are responsible for the monitoring of all ponds on the estate to see if the great crested newt is present. Although there is no evidence to suggest that the great crested newt is on the estate, an ancient woodland nearby (¼ mile) has a pond where a great many are found. Lotherton Bird Garden is actively seeking to create a series of ponds, linking this woodland with the estate. This has been discussed with local landowners that are also keen to be involved.

The main objectives of Lotherton’s involvement with the Pipistrelle bat are to maintain and increase the population found to be roosting within the bird garden and on the estate and in particular to maintain the maternity roost. Frequent surveys are carried out, with the support of keepers and staff, on the estate with bat detectors and bat counts made.

Due largely to the promotion of conservation awareness at estate management level, Lotherton estate is increasingly aware of how maintenance of the grounds can be carried out in an environmentally friendly way.

Evaluation

All of the conservation activities carried out by the Bird Garden staff, are recorded in the Bird Garden Diary. A conservation log, accessible to all staff, is also maintained. Whenever a conservation/education event occurs, i.e. a survey, attendance on a workshop, etc. it is logged. The data recorded is then transferred to an evidence sheet that goes into a conservation/education file. This is then submitted, alongside photographs, as part of the pre inspection audit.

Dissemination of information

The general public and students often assist with the surveys carried out by the bird garden staff. Several times a year the general public are invited to bat evenings at the Lotherton estate where a conservation officer from Leeds City Council gives a presentation on bats. Lotherton staff also hold a number of bat box making workshops to demonstrate to visitors how to construct and install boxes, and to encourage public awareness of bat conservation.

The general public are encouraged to attend pond survey sessions and to survey ponds in their own gardens. A pamphlet is produced to explain how to survey and an identification chart is distributed to help with this task. Similar to the bat evenings, pond evenings are held four or five times a year on the estate.

Future development

The manager at Lotherton Bird Garden has taken on the responsibility of other Leeds City Council sites, such as Tropical World and Pudsey Pets with the aim of achieving better linking of staff and resources.

At Lotherton Bird Garden a wildlife garden conservation area is under design to demonstrate activities that the general public could implement in their own gardens to make them ‘wildlife friendly’. A bird feeding station has been built that will give a constant food supply to birds as well as an observation station for the visitors and an identification board will be placed nearby. Also under consideration as a way of encouraging the public to become involved is provision of a board where visitors can record the species that they have seen.

Further information

To find out more about the conservation and education activities described in this case study, please contact: Peter.Quince@leeds.gov.uk
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www.leeds.gov.uk/lothertonHall/Lotherton_Hall/the_bird_garden.aspx
Conservation of scimitar-horned oryx at Marwell

Marwell Wildlife is a registered charity based in Hampshire. The park employs over 200 staff with additional support from over 150 individual volunteers and occasional volunteer groups. The zoo entertains and educates over half a million visitors each year – this includes nearly 36k educational visits. In addition, in the region of 60 outreach visits are made to schools each year. A Mission Driver attends many local events to promote interest in nature and conservation.

Conservation and education activities

Numerous research and conservation projects are undertaken at any one time by Marwell. For example the Eelmoor Marsh is a heathland site in southern England where Marwell staff have been monitoring the vegetation and working to improve the botanical diversity. As a consequence species such as the Dartford warbler and the nightjar have reappeared.

Overseas reintroduction projects reflect Marwell’s philosophy that an effective conservation project is one that has a biological outcome as well as a benefit to local people. Examples include the Grevy’s Zebra in Kenya where the population was under threat. Promoting the Grevy’s Zebra as a flagship species has attracted tourists and helped to improve the local economy with numbers now steadily increasing.

Marwell has been increasingly involved over many years in the re-introduction of scimitar-horned oryx to Tunisia with the support of organisations worldwide.

Scimitar-horned oryx

This project forms part of the wider meta-population action plan for antelope in Tunisia and contributes towards the enhanced botanical diversity in the region. The scimitar-horned oryx once inhabited large areas of the Sahara. It is thought that they reached extinction in the wild in the late 1980s, and as early as 1910 in Tunisia, due to the development of marginal sub-desert lands and competition with domestic livestock, along with unsustainable hunting. The aim is to reintroduce the Oryx across its former habitats, in the periphery of the Sahara. This is ultimately dependant on addressing the underlying reasons for its disappearance and the ongoing decline of other desert wildlife.

Captive breeding

Marwell is responsible for the international stud book for the scimitar-horned oryx that is now in nearly fifty zoos worldwide. Marwell is also responsible for the genetic and demographic modelling of the Oryx population. Before reintroduction, Marwell studies the genetics available and selects the most appropriate diverse group for release. The group may be drawn from as many as twenty different collections. The animals are selected from pedigree analysis of the stud book, with a diverse genetic variation. The main criteria being an appropriate age structure to form a social group and that they must all pass the medical health screening.

Reintroduction

The success of the reintroduction programme is monitored through key milestones:

- to monitor population performance;
- that the number of offspring exceed the number of animals initially released;
- low mortality rate;
- calves born in park (reproduction);
- monitor health; and
- monitor social behaviour interactions;

Of particular note in the last two years has been a mortality rate of zero.

Education

The Tunisian government is currently building an Eco museum as part of the Biodiversity restoration project and as a means of educating the local population. Marwell is helping with the design and promotion of this initiative as well as assisting with the interpretation. Marwell also provides ongoing training in Tunisia on managing and monitoring animals. For park staff, this includes the provision of equipment and training on practical field observations and data handling.

The scimitar-horned oryx project is featured within Marwell’s park in Hampshire and in the zoo’s outreach programme as well as updates in the zoo’s newsletters.

Evaluation

Evaluation is carried out against project objectives, a monitoring program runs alongside the evaluation criteria and positive biological outcomes are seen.

Dissemination of information

The genetics of the scimitar-horned oryx has been published in scientific journals. Information on the conservation work has been disseminated at conferences and technical workshops. Many public talks are given, in particular to local societies.

An annual review of the scimitar-horned oryx project is produced and circulated to the Tunisian authorities.

Future development

Despite working with the scimitar-horned oryx for over thirty years the projects continue to evolve each year. Comparative studies are planned for 2010 comparing the vegetation in the parks with the surrounding area where it is often subjected to over-exploitation.

Further information

To find out more about the conservation and education activities described in this case study, please contact: TimW@marwell.org.uk

www.marwell.org.uk
Conservation of water voles at the Wildwood Trust

Based in the Kent countryside, the Wildwood Trust occupies some 40 acres of ancient woodland. The Trust is a registered charity that is dedicated to the conservation of native species. The wildlife park attracts around 80k visitors each year and this includes 13k educational visits. Outside visits to schools bring the zoo into contact with a further 2k pupils.

Conservation and education

Considerable emphasis is placed on the reintroduction of native species and the protection of their natural habitats at Wildwood. This work is demonstrated by an on-going programme of activities to conserve the water vole in the face of severe pressures on existing populations. The zoo is working closely with a number of research institutions and organisations to reintroduce water voles to areas where they once existed.

Running alongside these activities is a commitment to education that has seen close links developing with local schools. Other education activities include special family days at Wildwood, a number of training sessions dedicated to water vole conservation and in depth training courses covering water vole ecology and conservation.

Water vole conservation activities in detail

Once widespread, the water vole is now recognised as one of Britain’s most endangered mammals. Wildwood has been working to conserve water voles since the late 1990’s with the objectives of these projects being to:

- reintroduce water voles into areas of SE England;
- work with other organisations to achieve this; and
- mitigate the need for reintroduction.

The focus of the reintroduction programmes is in the South East of England where the water voles are locally adapted. Wildwood works with a wide range of organisations, such as the Essex Wildlife Trust, to achieve suitable habitats for the water voles.

Captive breeding

Wildwood currently has over 300 water voles in its captive breeding programme. Animals are brought in from sites where development or other works will have an adverse effect on the local population.

Reintroduction

All water voles are micro-chipped, weighed and health checked before being released. The conservation officers consider success criteria to be:

- Animals release themselves successfully;
- Evidence animals bred in 1st year;
- Animals successfully overwinter;
- Subsequent breeding from wild born animals; and
- Population still there after 5 years.

Evaluation

Reintroduction is carefully monitored through field science, and micro-chipping allows individual animals to be tracked. The programme is modified each year in the light of findings from previous years. Evaluation is carried out through veterinary reports, scientific data, record keeping and how to adapt to improve. The zoo’s conservation and education activities are demonstrated to inspectors via examples of educational resources at all levels, facts and figures, booking information, research projects that have been carried out and evidence of all the topics mentioned under sub-headings in the education strategy.

Dissemination of information

Each project is reviewed by Wildwood’s ethical review committee, and reports are regularly produced for the zoo’s director and trustees. Wildwood has over 43k members that are updated via regular news-sheets. The zoo’s activities have also attracted considerable media attention through local news coverage as well as featuring on nature programmes, such as Countryfile. Many students have published papers, with the help of Wildwood employees, in a range of journals.

Other activities include training sessions dedicated to water vole conservation and more specialised courses for local wildlife groups, students and land-owners on surveying small mammals. Water voles are part of the A-level Endangered Species Conservation session. The zoo hosts many work experience students on conservation or animal care courses and they spend a considerable amount of their time with the water voles.

Future development

Wildwood is planning to become more involved with housing associations to explain to residents located adjacent to water vole reintroduction sites the importance of managing their surrounding area.

Wildwood will continue to work with conservation organisations and landowners to return water voles to more areas of the South East from which they have become extinct. Wildwood will also encourage universities to carry out further research into water vole ecology using their captive water voles to benefit the species in the wild.

Wildwood is currently working on new A-level resources on the practical implications of biological science in field conservation. This will be done so that students can understand how scientific procedures are of practical benefit to endangered species restoration.

Further information

To find out more about the conservation and education activities described in this case study, please contact:

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http://www.wildwoodtrust.org/index.htm
Woburn Safari Park supporting EAZA campaigns

Woburn Safari Park will be celebrating its 40th anniversary in 2010. Part of historic Woburn Abbey in Bedfordshire, the Safari Park alone attracts more than 350k visitors each year and this includes 27k school children. In addition around 15 outside visits are made to schools in the area as well as occasional outreach visits to local interest groups.

Conservation and education activities

Woburn’s involvement in conservation activities pre-dates the opening of the Safari Park although the approach has evolved considerably over this time. These days, the Safari Park is involved in a wide range of conservation projects around the world and supports the European Endangered Species Programme (EEP) and the European Studbook (ESB). The park itself manages the ESB for the Mountain Bongo and in this role is responsible for recommending the movement of stock in light of detailed genetic analyses to optimise their captive breeding potential.

Woburn Safari Park hosts an annual non-residential ‘week on the wild side’ for children aged 8-12 years old and day work-shops for children aged 5-7, 8-12 and 12 years and over. These events give children the opportunity to engage with animals, increase their knowledge of animals and conservation, develop a greater understanding of animals kept in captivity and the chance to take part in hands on activities.

The Safari Park frequently ranks among the European Association of Zoos and Aquaria’s (EAZA’s) leading fundraisers. This is achieved by involving members of the public in an innovative programme of activities while at the same time communicating information about conservation in general and relating to each year’s theme in particular. A key ingredient to the success of these campaigns lies in linking with the species on site.

Background to EAZA campaigns

EAZA has over 300 members in 35 different countries that share a common goal to encourage education, research and conservation. Each year, EAZA features a themed campaign to promote its activities.

Woburn Safari Park has consistently been one of the top fundraisers for the EAZA campaigns. The Park’s 2007 ‘Madagascar Campaign’ raised almost £30k and was awarded the Community Impact and Campaign Fundraising award at that year’s EAZA conference. Woburn’s 2008 ‘Year of the Frog’ amphibian campaign raised more than £10k. The fact that this was less than the previous year was believed to reflect not having the species on site. The theme for 2009 was “Living Together”. This had the joint aims of supporting the conservation of carnivores in Europe while at the same time recognising that education was required where these species may come into conflict with local communities. The Park’s 2009 fundraising campaign raised a total of £15k.

Fundraising campaign in detail

September sees the launch of EAZA’s annual campaign and Woburn then briefs its zoo staff at a team meeting in the following November. A detailed plan is developed by the campaign team over the winter and presented to all members of the zoo’s staff in March. This gives staff the information needed to disseminate through their talks and presentations during the summer. Considerable emphasis is placed on communicating to all staff and gaining their commitment from the outset. An events committee is formed at an early stage to oversee delivery and execution of the campaign. An evening event has become a particular feature of the zoo’s annual fundraising activities.

The zoo believes that the success of their campaigns is due to giving an individual overall responsibility for its organisation and making sure that they can dedicate the time that it needs. Enthusiastic staff are a vital ingredient to the success of the campaigns.

Education

Staff are provided with information regarding the campaign to include in their talks and demonstrations. The focus is on defining the species in the campaign, why they are important and why they need protecting.

Local schools are encouraged to become involved and are provided with a factsheet about each animal in the campaign as a learning resource. The campaign is featured in the zoo’s wider programme of school talks.

Evaluation

The funds raised throughout the year are monitored and updates circulated to staff every couple of weeks. The park regularly receives letters from the general public thanking them for events. All zoo staff are encouraged to seek feedback from visitors during the campaign.

Dissemination of information

Activities are featured in EAZA’s magazine and in other trade press. It is estimated that some 150k members of the general public have been exposed to the aims of the campaign via associated radio publicity, and a further 1.5 million ‘surfers’ on the website as well as 350K visitors to the park itself.

Future development

Woburn plans to set aside a dedicated budget each year to support the EAZA campaign, for promotional materials and to co-ordinate the fundraising evening.

Further information

To find out more about the conservation and education activities described in this case study, please contact:

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