

CAPTIVE WILDLIFE TOURISM IN AUSTRALIA



By Andrew Tribe

WILDLIFE TOURISM RESEARCH REPORT SERIES: NO. 14
Status Assessment of Wildlife Tourism in Australia Series

RESEARCH REPORT SERIES

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This series presents research findings from projects within the Wildlife Tourism Subprogram of the CRC. The Subprogram aims to provide strategic knowledge to facilitate the sustainable development of wildlife tourism in Australia.

Status Assessment of Australian Wildlife Tourism, Editorial Team: Dr Karen Higginbottom, Ms Kelley Rann, A/Prof Derrin Davis

This report is one in a series comprising a status assessment of wildlife tourism in Australia. It comprises the initial stages of research undertaken by the Wildlife Tourism Subprogram of the CRC. Reports in this series cover various disciplinary perspectives (visitors, economics, hosts, wildlife management) as well as various subsectors (such as zoos, bird watching and hunting). Together, the reports identify the current status and key issues facing Australian wildlife tourism, and make recommendations to enhance its sustainability.

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EXECUTIVE SUMMARY

Despite their popularity, their traditions, and their place in our recreational history, in recent years zoos have undergone considerable change in both their structure and function. They have seen their survival as being dependent upon their changing direction and becoming a relevant part of today's society, and as such have developed three important justifications for keeping wild animals in captivity: conservation, education and research. This report assesses the captive wildlife tourism industry today, evaluates its contribution to Australian society, and identifies its main obstacles and opportunities for the future.

The Australian Zoo Industry

There are more than 200 captive wildlife facilities in Australia. These include:

- Large, publicly owned or statutory zoos that exhibit both native and exotic animals.
- Wildlife exhibits that are part of large theme parks.
- Smaller, privately owned zoos or fauna parks that are non-subsidised, are economically self-sustaining and which mainly exhibit Australian native animals.
- Small exhibits of native wildlife, which are part of other tourist attractions, often based around other themes.
- Individual wildlife exhibitors who maintain a small, captive collection of animals for public display.

The Zoo Visitors

More than eight million people visit captive wildlife facilities across Australia each year; approximately five million (62.5%) are Australian visitors with the remainder being from overseas.

Variation in attendances at individual zoos is influenced by a variety of factors including economic conditions (particularly the international tourism market), weather (especially during holiday periods), increased competition from other tourist attractions and the development of new exhibits.

Most visitors consider zoos to be about entertainment, although the majority also believe that they play an important role in conservation education.

The Wildlife

The primary attraction of zoos is the animals themselves. Yet while they are still places of recreation and enjoyment, changes in public expectations and scientific views have added education, conservation and research to their roles. Consequently, to remain relevant and popular in Australian society, zoos manage their animals in a way that will facilitate these roles. This involves consideration of two important factors; the genetic management of the species in their collections, and the animal welfare concerns of the visitors.

The Contribution of Australian Zoos

Zoos are an important part of the national economy. Through their business activities, zoos create employment, purchase goods, materials and services, earn foreign exchange through their visitation by overseas tourists, and generate operating surpluses which are usually reinvested in zoo development projects. They are also a vital part of local economies both directly and indirectly through attracting visitors to the area.

Australian zoos contribute to conservation in three main ways:

1. Education programs aimed at increasing public awareness of wildlife and the environment and, in particular, of the processes by which wildlife species have become endangered.
2. Captive management programs with the aim of breeding captive animals to serve as reservoir populations for immediate or potential long-term release into the wild.

3. Research projects with objectives and outcomes forming part of an overall conservation effort.

Despite their stated objectives and the expenditure of substantial proportions of their revenue on them, there has never been a comprehensive assessment of the contribution of zoos to the conservation of wildlife.

Zoos also play an important role in community life. Beyond their economic and conservation contributions, zoos can also reflect and participate in the culture of a society.

Obstacles to Development and Sustainability

Two major and related challenges have confronted zoos during recent years, and will inevitably continue to be problems in the future: commercial viability and ethical credibility.

Commercial viability

Zoos must make money to survive but this is an increasingly difficult task. Admission prices have to be kept low enough to encourage repeat visits by a wide spectrum of society; and yet zoos must pay their way. Zoos would be better off, at least financially, if they dedicated themselves wholeheartedly to entertaining the public but this is not possible. Such a policy would compromise their conservation objectives, and leave them open to charges of unprofessionalism, irrelevance, and of 'exploiting wildlife'. This then is a major quandary for today's zoos – how to attract crowds without compromising the basic reasons for the zoo's existence – education, conservation and research.

Ethical credibility

Despite the attempts of zoos to change, they remain open to philosophical accusations that they are irrelevant and wrong, and some in the community even advocate their abolition. For instance the Australian and New Zealand Federation of Animal Societies is opposed to keeping wild animals in captivity, believing that zoos in

their present form provide stressful living conditions and are unnecessary.

Opportunities

There is no doubt that wildlife is a popular and important part of Australian tourism. Zoos continue to capitalise on this popularity through the upgrade of existing facilities and the development of new displays and exhibits. However, rather than merely improving what they already have and do, it is likely that the future development of zoos will require a radical shift in the way zoo managers, staff and visitors see these institutions.

Future zoos will not be bound by existing physical boundaries and activities but will seek to entertain, involve and educate their visitors through a combination of:

- interactive and interpretive displays and presentations;
- themed displays, promoting particular aspects of wildlife and conservation;
- integration and development of other zoo facilities, such as the restaurant and souvenir shop;
- encouragement of community groups and activities and ecotourism, to further bridge the gap between captive and free-range wildlife; and
- greater interaction with *ex situ* conservation activities and ecotourism, to further bridge the gap between captive and free-range wildlife.

Recommendations

A number of recommendations have arisen from the information gathered in this paper. These include the need for:

1. An accurate and complete assessment of the contribution of Australian zoos to conservation, particularly in the areas of

education and captive breeding. This should include research which will evaluate the effectiveness of -

- the various interpretive media (both personal and non-personal) employed by zoos in achieving their wildlife conservation aims; and
- the role of zoos in the captive management, breeding and reintroduction of wildlife, particularly endangered species.

2. A more complete evaluation of the economic impacts of zoos.
3. An identification of those factors which most affect visitor satisfaction and enjoyment.

Such information will benefit not only the zoos themselves but also government and private conservation agencies across Australia. In particular it will:

- indicate how and where zoos most efficiently and effectively contribute;
- guide zoo policy and management towards these areas;
- influence government policies, perceptions and interactions with zoos;
- promote the development of zoos as conservation centres and hence contribute to their sustainability into the future; and
- improve the public perception of zoos and community understanding of the value of their work in wildlife conservation.

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ABSTRACT

Despite their popularity, their traditions, and their place in our recreational history, in recent years zoos have undergone considerable change in both their structure and function. They have seen their survival as being dependent upon their changing direction and becoming a relevant part of today's society, and as such have developed three important justifications for keeping wild animals in captivity: conservation, education and research. This report aims to assess the captive wildlife tourism industry today, evaluate its contribution to Australian society, and to identify its main obstacles and opportunities for the future.

There are more than 100 zoos in Australia, with a total annual visitation greater than 8 million people. More than one third of these are visitors from overseas, which means that zoos make a substantial economic contribution both through the foreign exchange earned and the employment opportunities created.

Their contribution to conservation comes through their educational programs and services and the captive breeding, management and display of the wildlife. However, there has been little assessment of the real value and effectiveness of these activities; this is a major research priority.

A major obstacle for zoos has always been striking an appropriate balance between commercial success and the development of professional conservation credibility; often these objectives have been viewed as being almost mutually exclusive. However, the opportunity for zoos lie in them transforming themselves from traditional, static, animal displays to interactive, entertaining conservation centres.

1. INTRODUCTION

Captive wildlife tourism is big business, with more than one thousand zoos worldwide, attracting some six hundred million visits annually (IUDZG/CBSG (IUCN/SSC) 1993). This represents approximately ten percent of the world's population.

Yet despite their popularity, their traditions, and their place in our recreational history, in recent years zoos have undergone considerable change in both their structure and function. Undoubtedly one of the fundamental purposes served by early zoos was simply the presentation of unfamiliar animals as objects of curiosity (de Courcy 1995, 1999; Mullan and Marvin 1999). Such animal displays were presented in a contextual vacuum: the creature itself was the object of interest, and no attempt was made to present it in an environmental or ecological framework. As Martin (1986) explains, large size, bizarre appearance or assumed ferocity were sufficient reasons in themselves for displaying the animal, rather in the mode of a stamp stuck on an otherwise blank page in an album.

By the late 1960s, zoos were in a parlous state: old fashioned, badly run, badly designed and increasingly out of touch. Their future survival depended upon them changing direction and becoming seen as an integral and relevant part of today's society. Consequently they have embraced three important justifications and objectives for keeping wild animals in captivity (Serrell 1981, Cherfas 1988, Broad and Weiler 1998): conservation, education and research. These are now reflected in the mission statements of zoos, all of which are broadly the same. The World Zoo Conservation Strategy (IUDZG/CBSG (IUCN/SSC) 1993) explains that they contain the concept of conserving the world's fast-disappearing wildlife and biodiversity, in that they aim to:

- provide positive attitudes to wildlife;
- assist in the conservation of the world's living resources;
- highlight the importance of maintaining biodiversity;

- contribute to biological knowledge relevant to husbandry, display and veterinary care of animals; and
- foster the concept of ecologically sustainable development.

The umbrella organisation for the world zoo community is the World Zoo Organisation (formerly known as the International Union of Directors of Zoological Gardens). Its membership includes 132 leading zoological institutions and 14 regional/national zoo associations, whose combined reach includes most of the publicly owned as well as some private, zoological institutions (zoos and aquaria) of the world. Its objectives include:

- promoting cooperation amongst zoological gardens with regard to the conservation, management and breeding of animals in captivity;
- promoting cooperation among regional zoo associations and their constituent members;
- representing zoological gardens in other international organisations and forums; and
- promoting environmental education, wildlife conservation and environmental research.

However, as Mitchell (1991) points out, in addition to conservation, education and research, zoos have to have a fourth justification, and one that often takes precedence over the other three: recreation. They provide a pleasant setting for visitors and family outings, and can be an integral part of the social and cultural life of the community. Cherfas (1984) goes further, and asserts that this recreational role is actually critical to zoos. His view is that if people do not pass through the metaphorical turnstile, the zoo is not a zoo: it may be a school, a breeding station, an experimental laboratory, but it is not a zoo, and without people it will not survive.

This then, is the major quandary for today's zoos – how to attract and entertain their visitors, without comprising the basic reasons for the zoo's existence – education, conservation and research.

This report aims to provide information and insights into captive wildlife tourism in Australia today that are of relevance to the industry itself. In so doing it will assess the current status of the industry, identify obstacles to its development and discuss opportunities for its sustainable growth into the future.

2. METHODS

Captive wildlife tourism is a large and diverse segment of the wildlife tourism industry. As such, this report should not be regarded as a definitive and exhaustive survey but rather as a broad assessment of Australian captive wildlife tourism today.

The information used in this report was gathered in two ways:

1. A review of the relevant literature, both published, and where possible, unpublished.
2. Face-to-face telephone and email interviews with staff from a range of zoos in all states and territories of Australia, and with representatives of the three main zoo organisations:
 - Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA)
 - Queensland Wildlife Parks Association (QWPA)
 - New South Wales Fauna and Marine Parks Association.

Interviewees were asked for information about captive wildlife tourism in Australia from the following perspectives:

- characteristics of the industry;
- zoo visitors and visitation;
- the wildlife in captivity;
- the role and contribution of zoos; and
- opportunities and challenges for the industry.

This information was then collated into the appropriate sections for inclusion into this overview of Australian captive wildlife tourism today.

3. THE AUSTRALIAN ZOO INDUSTRY

Australia has a large variety of zoos and wildlife parks. In fact, because of the enormous variation amongst the institutions that are known as 'zoos', it is difficult to find a precise definition that covers them all. However, as the World Zoo Conservation Strategy (IUDZG/CBSG (IUCN/SSC) 1993) explains, there are in fact two characteristics that all such institutions have in common:

1. Zoos possess and manage collections that primarily consist of wild (non-domesticated) animals, of one or more species, that are housed so that they are easier to see and to study than in nature.
2. Zoos display at least a portion of this collection to the public for at least a significant part of the year, if not throughout the year.

Consequently, regardless of the composition of their collections, and their official name (zoo, aquarium, sanctuary, fauna park etc.), all these zoological institutions will be known by the general term 'zoo' within the framework of this paper.

There are essentially five types of zoo in Australia. These are:

1. Large, publicly owned or statutory zoos that exhibit both native and exotic animals. Such zoos exist in Melbourne, Sydney (Taronga), Adelaide and Perth, together with their open-range facilities (Victoria's Open Range Zoo, Western Plains Zoo and Monarto).
2. Wildlife exhibits that are part of large theme parks. These may display both native and exotic species, and are found typically in tourist areas such as along Queensland's Gold Coast. Examples include Seaworld and Dreamworld.
3. Smaller, privately owned zoos or fauna parks that are non-subsidised, are economically self-sustaining and which mainly exhibit Australian native animals. These zoos can be found in each state of Australia, typically in or near a large city or tourist area,

such as Lone Pine Sanctuary and Alma Park Zoo in Queensland, and Featherdale Park in New South Wales.

4. Small exhibits of native wildlife, which is part of other tourist attractions, often based around other themes. Examples include The Australian Woolshed in Brisbane and Paradise Country on the Gold Coast.
5. Individual wildlife exhibitors who maintain a small, captive collection of animals. These people typically exhibit at shopping centres, schools and shows.

With this diversity of facilities, it is very difficult to calculate the exact numbers of zoos in Australia. However, there are estimated to be 209 captive wildlife facilities (K. Higginbottom, pers. comm.) with three main zoo organisations:

1. Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA). This is the peak industry association covering Australia and New Zealand, and includes all the major zoos in the region. ARAZPA has 40 institutional members of which 31 are in Australia. This number does not include many of the small, private fauna parks that are to be found particularly along the east coast (ARAZPA 1999).
2. Queensland Wildlife Parks Association (QWPA). This association covers most of the zoos in Queensland including both the large corporations and the smaller, private facilities. The QWPA currently has 40 members (T. Long, pers. comm.), nine of which are also members of ARAZPA.
3. New South Wales Fauna and Marine Parks Association. Formed in 1982, this is the oldest of the three zoo associations. It represents zoos in New South Wales that are either council or privately owned, and currently has 34 institutional members. Five of these are also members of ARAZPA.

ARAZPA is currently compiling a complete list of Australian zoos that they expect to have published next year (C. Hopkins, pers. comm.).

4. THE ZOO VISITORS

More than eight million people visit captive wildlife facilities across Australia each year (ABS 1998). Of these, approximately five million (62.5%) were Australian visitors with the remainder being from overseas (ABS 1999). In fact, a recent survey by the Australian Bureau of Statistics found that visiting an animal or marine park was the fourth most popular 'cultural' activity for Australians, behind attending a cinema, library or botanic gardens. The visitor numbers for a selection of Australian zoos are shown in Table 1.

Table 1: Visitor numbers for a selection of Australian zoos

ZOO	YEAR				
	1998/99	1997/98	1996/97	1995/96	1994/95
Melbourne Zoo	908,000	896,000	968,000	943,000	951,000
Healesville Sanctuary	347,000	325,000	332,000	321,000	301,000
VORZ Werribee	203,000	206,000	160,000	122,000	103,000
Adelaide Zoo	315,000	338,000	359,000	365,000	314,000
Monarto Zoo	59,000	51,000	30,000	29,000	31,000
Perth Zoo	636,000	563,000	633,000	549,000	545,000
Currumbin Sanctuary	426,000	453,000	499,000	539,000	546,000
Underwater World	334,142	310,129	294,312	314,000	NA
Taronga Zoo	1,397,582	1,460,566	1,635,553	1,540,961	148,106

These figures indicate that over the past five years, visitation to some zoos has declined (e.g. Melbourne, Adelaide, Currumbin and Taronga), while for others it has increased substantially (Healesville, VORZ Werribee, Monarto and Underwater World). There are a number of reasons that are put forward for such variations, including economic factors (particularly the international tourism market), weather conditions (especially during school holidays), and increased competition from other tourist attractions. One factor that seems to have been significant in the large increase in attendances at both VORZ Werribee and Monarto is the continued development of these two zoos. Both have recently opened major new facilities and animal enclosures. Similarly, Taronga Zoo has attributed its record attendance

in 1995/96 to the arrival of western lowland gorillas (Giles, pers. comm.)

Conversely, Perth Zoo explained their drop in visitor numbers from 1996/97 to 1997/98 as being in part due to a decision against building a new exhibit to be opened in the Christmas holiday period (Williams 1999).

The proportion of international to domestic tourists varies greatly from zoo to zoo. This appears to be largely due to two main factors – the marketing strategy of the zoo, and its proximity to other major tourist attractions (G. Pawson, pers. comm.). Thus Currumbin Sanctuary on the Gold Coast has 65 per cent overseas visitation, while Underwater World on the Sunshine Coast has only 18%. Similarly, 30 per cent of Taronga Zoo's visitors are from overseas, while only 3 per cent of the visitors to Western Plains Zoo at Dubbo are international.

People visit zoos for a number of reasons, but paramount amongst them seems to be recreation (Woods 1998). For instance, in a survey of visitors at Woodland Park Zoo Seattle, Fiedler and Wheeler (1985) found that nearly three quarters considered the zoo to be about entertainment, with 92 per cent visiting as a family or social group. Similarly, Shackley (1996) claimed that 88% of their respondents went to the zoo for a day out or to entertain the children.

In spite of this, many visitors apparently also believe that zoos have a key role to play in conservation education. Of those questioned at Woodland Park Zoo Seattle, 68 per cent claimed that they considered the purpose of the zoo to be primarily educational (Fiedler and Wheeler 1985). This is supported by the studies of Australian zoos by Mazur (1995) and Ford (1995) who also found that the great majority of visitors expected to learn about environmental issues at the zoo.

5. THE WILDLIFE

The primary attraction of zoos is the animals themselves (Woods 1996). Yet while they are still places of recreation and enjoyment, changes in public expectations and scientific views have added education, conservation and research to their roles (Dengate 1993).

Consequently, if they are to remain relevant and popular in Australian society, zoos must manage their animals in a way that will facilitate these roles. This will involve consideration of two important factors:

1. The genetic management of the species in their collections.
2. The animal welfare concerns of the visitors.

5.1 Species Management

A broad range of wildlife species both native and exotic are held in captivity in Australia across the various types of captive wildlife exhibits. For any one zoo, the choice of what species to hold may depend upon many factors including:

- **wildlife laws** both state and federal which may restrict what a zoo may hold, both for exotic and native species;
- **the cost** of maintaining a particular species;
- **conservation status** of a species and the zoo's desire to contribute to a particular captive breeding program;
- **marketability** of the species in terms of its ability to attract visitors;
- the zoo's own **stocking policy** or master plan for future development and availability of suitable enclosure space and facilities; and

- **the availability** of a species from another captive facility in Australia or overseas, which may preclude a zoo from obtaining the species they really want (Larcombe, pers. comm.).

Comprehensive data on Australian captive wildlife is maintained by both ARAZPA and QWPA for their respective member institutions. They each produce an annual document, entitled the Australasian Species Management Program (ASMP) Regional Census and Plan, and Queensland Species Management Plan (QSMP) Regional Census and Plan. These are intended to facilitate cooperative management of zoological collections in the Australasian region, and represent both the agreed position of the ARAZPA and QWPA member institutions, and an annual summary of species management and collection planning recommendations. However, the efficient allocation of the zoos limited resources requires that species are prioritised according to their relative need for regional management. The objective is to preserve as much genetic (i.e. allelic) diversity in the captive population for as long as possible without resorting to supplementation from the wild.

By judicious selection of breeders, fertility control in prolific breeding pairs and family groups, maintenance of accurate computerised studbooks, clear identification of individuals, and inter-zoo movement of individuals (or genetic material) via exchanges, breeding loans and transfers, zoos try to ensure appropriate contributions to the next generation from the bulk of unrelated individuals in captivity (aiming, of course, for equal contributions from all 'founders'), and thereby guard against inbreeding depression.

Co-ordination of genetic management through the ASMP and the QSMP is effected principally by:

- an elected Species Management Co-ordinating Council that appoints a regional co-ordinator;
- species co-ordinators, and
- Taxon Advisory Groups (TAGS).

Depending on the size of their collections, individual zoos will ideally have a dedicated Records Officer and a Species Management Officer.

The management categories employed by both the ASMP and QSMP encompass two forms (Wilcken *et al.* 2000). The first indicates ASMP status – whether or not there is any ASMP – level management for the species, and some indication of why regional resources are, or are not being directed towards it. The second term indicates the level of intensity of population management assigned.

The ASMP species management categories are shown in Table 2.

Table 2: ASMP species management categories used by both the ASMP and QSMP

1. ASMP STATUS	2. LEVEL OF POPULATION MANAGEMENT			
ASMP-level management:				
ASMP Conservation Program	1a	1b	2	3
ASMP Population Management Program	1a	1b	2	3
ASMP Husbandry Research	-	-	-	3
Phase Out	1a	1b	2	3
No ASMP-level management:				
Not evaluated	-	-	-	3
No regional implications	-	-	-	3
Not recommended	-	-	-	3

Notes: Dashes (-) indicate that the management level is not relevant to that particular ASMP Status category. (Source: Wilcken *et al.* 1999)

These ASMP categories are defined as follows:

1. ASMP Status

Conservation Program

Programs in this category include specific conservation objectives that would initiate or assist efforts to support *in situ* populations of the target species.

Population Management Program

The regional aspects of these programs do not include specific conservation objectives but are aimed primarily at satisfying the region's display needs.

Husbandry Research

There remain many taxa in zoos for which husbandry is insufficiently known for a managed program to be possible. Where the TAG feels that a taxon of this type is worthy of the investment of regional resources (usually those species held, or planned to be held, in more than one institution, in numbers >20), this category is applied. The goal of the program is to establish and document husbandry techniques and information for the target taxon.

Phase Out

This category is applied to taxa considered by the TAG to be occupying spaces that could be more usefully assigned to others of higher regional priority.

Not evaluated

Where this category is assigned it indicates that the TAG has not yet evaluated the regional implications or needs of the taxon.

No regional implications

This category indicates that the TAG has evaluated this taxon and sees no need for regional management or resourcing.

Not recommended

This category is only for taxa not currently held in the region but flagged to be imported or collected from the wild.

2. Level of Population Management

Level 1 – Specimen-level management

This is applied to taxa for which specimen-level records are routinely kept, and for which specimen-level manipulation of breeding pairs is possible and practical. Level 1 is further split into high and low intensity management:

1a High intensity genetic and demographic management aimed at maximising gene diversity, minimising inbreeding and controlling reproductive rate. Programs are overseen by a species coordinator who prepares a strategic plan for the population and annual breeding recommendations, which institutions make a formal commitment to follow.

1b Low intensity genetic and demographic management aimed at minimising inbreeding and managing population size. Programs are overseen by studbook keepers, who provide guidance on appropriate reproductive rates, and who regularly publish a list of suitable pairings. Curators use this information to guide animal transfer arrangements and the formation of new pairs.

Level 2 – Group-level management

This level denotes group-level, lower-intensity genetic and demographic management. It is applied to taxa for which group-level animal records are routinely kept, or for which, because of social structure, pedigree data is generally incomplete, or for which specimen-level manipulation of breeding pairs is impossible or impractical. Different schemes are available to meet different aims, though all available techniques are still in the experimental stage. Programs are overseen by a coordinator who would select and implement an appropriate scheme.

Level 3 – Censused only

These taxa are censused annually. The census of current and planned holdings for the region is published in the body of the annual Regional Census and Plan document.

Eventually, it is intended that these regional species management programs will embrace all statutory zoos, private collections, and animals in research institutions. They will have strong links with international programs, will contribute information regularly to international databases, and will be integrated with species recovery and conservation efforts co-ordinated by State and Federal Governments (Hopkins *et al.* 1999).

5.2 Animal Welfare

Although zoos are popular places to visit, the relationship between the zoo and its public can still present problems. Not only do some people believe that zoos are basically cruel and evil places (Weir 1989), but visitors often express a negative attitude towards the animals, their housing or the way in which they are perceived to be treated (Nimon 1990).

Furthermore, Wolf and Tymitz (1981) found that the primary concerns of most visitors were that captivity is comfortable, and the animals appear healthy and happy.

In July 1994, the World Society for the Protection of Animals (WSPA) and the Born Free Foundation (BFF) issued The Zoo Inquiry (WSPA 1994). Whilst anti-zoo movements have been alive and well in many parts of the world and particularly North America, because WSPA and BFF are UK-based, the major concentration of argument centred on UK and Irish zoos.

The recommendations of The Zoo Inquiry were in three parts – welfare, conservation and education.

The **welfare** recommendations focused on a legislative program for zoo reform:

- Enforceable minimum animal welfare standards.
- Mandatory licensing systems to operate zoos, to breed animals and to accredit staff.
- A passport system for wild animals in zoos to control the transfer, sale, exchange or disposal.
- A zoo bond in the form of a guaranteed closure fund to which all zoos must pay.
- A national consultative panel to draw up ethical guidelines and control for codes of practice.

The **conservation** recommendations focused on increased *in situ* conservation programs, habitat-based conservation and *in situ* captive breeding.

The **education** recommendations focused on strategies that emphasise:

- Protection of eco-systems rather than confinement of wild animals.
- Outreach programs that emphasise conservation and environment protection in the field.
- Strategies that encourage problem solving rather than price watching.

Australian zoos have, for the most part, been spared the attentions of animal welfare and animal rights organisations. However, Larcombe (1995a) believes that they must expect increased scrutiny in the future. He points out that, for instance, in 1993 the International Humane Society opened an office in Sydney, and in October 1994, the RSPCA included the Zoo Inquiry brochure in their monthly mail-out.

In addition, the Australian and New Zealand Federation of Animal Societies are overtly opposed to the keeping of animals in zoos. They believe that 'zoos in their present form provide stressful living conditions' and consequently call for their phase-out (ANZFAS, 1996).

To combat the claims of the anti-zoo movement, Larcombe (1995a) believes that zoos in this region must firstly accept the fact that they have a problem of perception, and secondly adopt a proactive stance to argue and promote their cause through the two justifications for keeping wildlife in captivity; captive breeding and education.

Zoos, he says, need to regularly and rigorously test what they do against these justifications.

6. THE CONTRIBUTION OF AUSTRALIAN ZOOS

Zoos can be regarded as contributing to society in three main ways: through their economic performance, their role in wildlife conservation, and their cultural status.

6.1 Contribution to the Economy

Through their business activities, zoos create employment, purchase goods, materials and services, earn foreign exchange through their visitation by overseas tourists, and generate operating surpluses which are usually reinvested in zoo development projects.

The best indication of the size of these business activities comes from the Australian Bureau of Statistics (ABS) census of organisations engaged in the operation of zoological gardens and aquaria (ABS 1998). They collected information from both private zoos and statutory authorities whose main activity was the operation of a zoo. Thus while they excluded many small, private facilities, particularly whose captive wildlife was essentially only a sideline to their main [CORE?] business, the survey nevertheless gives an accurate measure of the scale and scope of the Australian zoo industry. The results are summarised in Table 3.

Table 3: The Australian zoo industry in the year 1996-97

CRITERIA	RESULTS	
Size of Industry	53 zoos and 12 aquaria	
No. Paid Admissions	8 million	
Average Admission Price	\$8.70	
Sources of Income	Admissions	\$ 69 m
	Sale of goods	\$ 29
	Govt. funding	\$ 26
	Donations	\$ 6
	Bequests	\$ 3
	Sponsorships	\$ 3
	Education	\$ 1
	Other	\$ 6
	Total	\$ 143 million
Expenses	Labour	\$ 58 m
	Goods/Materials	\$ 20
	Depreciation	\$ 10
	Promotion	\$ 6
	Maintenance	\$ 5
	Operation Expenses	\$ 16
	Other	\$ 12
	Total	\$127 million
Operating Surplus	Statutory zoos	\$ 15m
	Private zoos	\$ 1
	Total	\$ 16 million
Employment	Full-time	1,268
	Part-time	678
	Total	1,946
	Volunteers	1,591

Source: ABS (1998)

The ABS survey shows that the Australian zoo industry has an annual turnover of some \$143 million, and employs almost 2,000 people. However, it does not provide information about two important aspects of the economic contribution of zoos: firstly, the foreign

exchange earned through the proportion of their income that came from overseas visitors, and secondly the employment generated outside the zoos as a result of their business activities.

6.2 Contribution to Conservation

Conservation is now regarded as being a primary role of zoos, and it is certainly true that the past 20 years have seen a dramatic change in the attitudes and actions of zoos in this regard.

This change is perhaps most clearly seen in regard to the management of their animals. As Mitchell (1991) explains, a new philosophy permeates the zoo – that of ‘the single collection’. Rather than individual zoos going their own way, perhaps to some temporary commercial advantage, animals in Australian zoos are now being managed according to both regional and international co-operative species management programs. As a component of wildlife preservation, and an insurance against total extinction, a healthy zoo population of genetically-managed individuals involving an adequate effective population size of founders and in which the geographic origin of these founders is known precisely, is a very different conservation resource than a comparable number of individuals of unknown provenance and limited genetic diversity (Mitchell 1991). As Bartos and Kelly (1998) explain, the focus is now not only on how well the zoos utilise their own animal collections, but also on how well the collections are utilised for the benefit of the region and the species. How this is achieved will then determine the zoos’ contribution to wildlife conservation and this can essentially be broken down into the three main areas that comprise their objectives for keeping wild animals in captivity:

1. **Education programs** aimed at increasing public awareness of wildlife and the environment, and in particular of the processes by which wildlife species have become endangered.
2. **Captive management** programs with the aim of breeding endangered species to serve as reservoir populations for immediate or potential long-term release into the wild.

3. **Research projects** with objectives and outcomes forming part of an overall conservation effort.

6.2.1 Education programs

The World Zoo Conservation Strategy (IUDZG/CBSG (IUCN/SSC)1993) emphasised the great potential for public education. With 600 million visitors annually, zoos are unequalled by any other group of public, conservation-oriented institutions. They are, as Kellert (1987) described them, 'the sleeping giant of the wildlife education and conservation field'.

In Australia, education is a prominent feature of many zoos, with structured programs for schools, increasing involvement in tertiary education, and a keen awareness of the need to inform and educate the zoo visitor. Nowadays, most zoos at least attempt to communicate a conservation message through the informal education of their visitors. De Koff (1998), for instance, found that conservation issues were communicated to the public for an average of 65 percent of the endangered species in the collection through signage, keeper talks or other forms of communication.

Some zoos, particularly the larger ones, have a significant commitment to education. The Melbourne Zoo Education Service, for instance, has established itself over the 20 years of its existence as a world leader. In excess of 120,000 children utilise this service per year at Melbourne Zoo, Healesville Sanctuary and Victoria's Open Range Zoo at Werribee (Melbourne Zoo 1999). Perth, Adelaide and Taronga Zoos have similar education services.

In addition, Melbourne Zoo has invested \$0.5 million in a public education strategy for each of the past four years. As Larcombe (1995b) explains, they allocate resources to:

- exhibits that display the interaction between animal and habitat;
- enclosures that illustrate bioclimatic zones and themes;
- signage programs giving information at different levels;

- keeper and gardener talks, tours by trained guides, outreach volunteer programs;
- programs for school children;
- facilities for special interest groups;
- a range of publications and public relations activities;
- bookshops and retail materials; and
- internal conservation policies – e.g. water conservation and rubbish recycling.

However, assessing the extent and effectiveness of education activities across the Australian zoo industry is very difficult, and critics of captive animal displays suggest that there has been little research undertaken to ascertain the effectiveness of education and interpretation with captive animal environments (Jamieson 1985,1995; Ollason 1993) of most zoos has not been collected and analysed. In their paper examining best practice in the zoo industry, Bartos and Kelly (1998, p. 150), while identifying education as a key operational area for Taronga Zoo, claimed that 'considerable difficulty was experienced in developing a qualitative and quantitative performance index to measure the effectiveness of delivery, output and the long-term benefit and impact of education programs'. In particular, the content of zoo education messages has been questioned (DeLapa 1994), with some zoo professionals themselves acknowledging the need for a change in focus regarding zoo education (Hancocks 1995).

Overseas, a number of studies have attempted to evaluate this educational role of zoos (Broad 1996, Kellert and Dunlap 1989, Kreger and Mench 1995, Ogden *et al.* 1993, Orams 1996, Tarrant *et al.* 1997). In general, they found that exposure to wildlife in combination with some form of interpretation was associated with increased support for conservation of both the target species and wildlife in general (Moscardo *et al.* 2001).

In Australia, Broad and Weiler (1997, 1998) have used more complex methods to measure the impacts of Tiger Island at Dreamworld and

the tiger exhibit at Western Plains Zoo. They concluded that while both displays were associated with a variety of types of learning, the majority of visitors indicated that what they had learned has come from keeper talks rather than the static displays. This finding is consistent with other studies that also claim keeper talks to be an effective educational technique (Anderson 1992, Simpkin 1994, Moscardo 1996).

However, Mazur (1995) has questioned the effectiveness of zoo education programs in Australia by concluding that while visitors that she surveyed exhibited a significant level of awareness about endangered species and habitat destruction, it was still not clear that they had gained their awareness of conservation from their zoo experience. Similarly, Ford (1995) found that many zoo visitors appeared unable to perceive a natural situation or animal behaviour simply from watching the exhibit. Thus sleeping animals were described as being 'lazy' or 'bored', while solitary ones were assumed to be 'lonely'.

As Broad and Weiler (1997, 1998) found, there is a relationship between the interpretive techniques used, the visit experience and the extent of learning achieved. Their results support other research claims in the literature (Nimon 1990, Anderson 1992, Simpkin 1994, Moscardo 1996) that interpretation programs which offer variety and interaction are more enjoyable, lead to increased visitor attention and learning, and are more effective. However, both Broad and Weiler (1997, 1998) and Woods (1998) also conclude that there is still a need for continuing research to guide the development and management of zoos for the achievement of educational and conservation goals.

Central to this is an understanding of 'interpretation' itself. Clearly it is about communicating and educating, but as Moscardo (1998) explains, interpretation should also include visitor enjoyment, exciting curiosity and on contributing to conservation. As such, interpretation is fundamental to the design and delivery of zoos educational strategies, both the non-personal (static displays, signage etc.) and the personal (keeper talks, guides etc). According to Broad and Weiler (1998) captive wildlife attractions need to embrace interpretation as their key weapon and strategy for achieving both education and conservation.

6.2.2 Captive management programs

Australian zoos have been involved in captive breeding and reintroduction programs for several threatened species. Some of these include the brush-tailed bettong (SA), chuditch or western quoll (WA), eastern-barred bandicoot (VIC), greater bilby (QLD and NT), helmeted honey eater (VIC), Leadbeater's possum (VIC), mallee fowl (NSW), orange-bellied parrot (TAS) and western swamp tortoise (WA) (ASMP 1998). In fact, according to de Koff (1998) Australasian zoos are involved in 35 such recovery programs, 34 of which focus directly on one species. These include 16 mammals, 10 birds, 6 reptiles and 2 amphibians. As de Koff (1998) points out, there is an absence of fish and invertebrates amongst these conservation programs, a fact he attributes to the preference and expertise of the zoo staff and volunteers. The majority of these programs (82%) involve species native to Australia, New Zealand and Papua New Guinea.

Craig *et al.* (1999) have discussed the involvement of Australian zoos in the species recovery process in more detail. They maintain that over the past ten years zoos have been establishing and refining the processes through which they manage captive populations, and have sought to articulate with, and support Australian Federal and State Governments to implement the process of recovering threatened species. As a result, they claim that Australian zoos now have a well-defined role to play in recovery efforts in this country, and conclude that collectively and individually, Australian zoos are committed to pursuing this conservation partnership with their wildlife agencies, in order to realise their potential as effective conservation tools in Australian species recovery.

The difficulty for zoos is in finding the resources to become involved in these endangered species recovery programs. As Larcombe (1995b) explains, zoos must strike balances between the allocation of scarce exhibit display and husbandry resources to the competing demands of captive breeding of endangered species and flagship species that serve as ambassadors for their wild counterparts. He maintains that with greater involvement in *ex situ* and *in situ* conservation efforts, the costs of Melbourne Zoo's collection management plans doubled during the period from 1992 to 1995.

Bartos and Kelly (1998) argue that the percentage of threatened species maintained in the collection, which are in active captive conservation programs, is actually a key performance indicator for zoos. They maintain that such an indicator can then be used to develop industry benchmarks for the effort directed to the conservation of ASMP/Species Survival Commission species. In 1995/96 the average for the Zoological Parks Board of New South Wales was 27 percent. Bartos and Kelly (1998) suggest as a benchmark that 25 percent of an animal collection should be involved in active *ex situ* captive breeding programs. As Mitchell (1994) points out, this is where the 'single collection approach' has become an indispensable prerequisite for Australian zoos achieving their newer and more worthy objective of being net producers rather than consumers of wildlife.

6.2.3 Research

The World Zoo Conservation Strategy emphasises the potential of the research role of zoos, and the requirements for them to implement major and effective programs of research and education (IUDZG/CBSG (IUCN/SSC), 1993; Kelly, 1996) and today many Australian zoos do actively co-operate with research organisations. Zoo based collaborative research is concerned with nutrition, growth and development, infectious disease, environmental toxins, reproduction and reproductive endocrinology, reintroduction biology, stress and behaviour (Mitchell, 1991). All are relevant to the objectives of improved animal husbandry and species management. Much of the research centres around the zoos' veterinary departments and all four of Australia's schools of veterinary science have formal links with their local zoos for both research and tertiary training. In addition, Australia's largest statutory zoos (Adelaide, Melbourne, Taronga and Perth) have all appointed research coordinators as part of their senior management teams.

However, as Bartos and Kelly (1998) point out, there is a paucity of quality evaluation information relating to performance measures for demonstrating the effectiveness of research projects. They explain that since 1988/1989 the Zoological Parks Board of New South Wales has increased its commitment to measurable and effective research programs by nearly 35 percent. Consequently, they argue that serious

consideration should be given to the level of commitment, in financial and other resource terms, that World Zoo Organisation institutions should aspire to as a benchmark in the twenty-first century. Kelly (1996) has suggested that zoological institutions should, as an absolute minimum, commit ten percent of present operating income (rising to twenty percent over ten years) to research and conservation activities if they are to make a real contribution to biodiversity preservation.

Without such a commitment, the risk for zoos is that their conservation credibility will suffer and that this in turn will leave them open to renewed accusations of wildlife exploitation and irrelevance with consequent unpopularity.

6.3 Contribution to Cultural Status

Zoos play an important role in community life. Beyond their economic and conservation contributions, zoos can also reflect and participate in the culture of a society. Mullan and Marvin (1999) have discussed this aspect of zoos in some detail in the book 'Zoo Culture'. They maintain that zoos have many of the same elements as art galleries and museums, particularly through their history and their place in our cultural traditions. However, they argue that in one important aspect zoos are different: whereas art galleries and museums entered the realm of high culture, zoos have become essentially popular. This has led not just to a higher visitation rate, but also to a perception of zoos as being more 'entertaining', friendlier, and more likely to attract both public scrutiny and support.

Australia has had a long zoo tradition. The oldest, Melbourne Zoo, was founded in 1862. The National Trust classifies several of its exhibits, including the main drive and associated garden beds. This confers on the Zoo not only historical status but also some limitations when they attempt to develop and upgrade their oldest exhibits.

The significance and appeal of Australian zoos in society is perhaps best illustrated by the support they receive for their volunteer programs. Many zoos, both public and private, have been able to foster close links with their local communities, and now rely on substantial numbers of volunteers to assist with fund raising, guided

tours, promotional activities, education and research. The large statutory zoos have all developed 'Friends of the Zoo' support groups, with Melbourne and Taronga Zoo boasting about 30,000 members each (J. Henke, pers. comm.). In fact Melbourne Zoo does not advertise for new members because they are concerned that they may not be able to cope with anymore. These people, as Kellert (1996) has shown, are likely to have complex and varied attitudes to animal welfare, conservation and the ways that humans use or interact with nature, but are linked by a common interest in wildlife and in the future of zoos.

7. OBSTACLES TO DEVELOPMENT AND SUSTAINABILITY

Zoos can contribute to Australian society in a number of ways. They are a popular and traditional part of Australian culture, and have adapted and developed to maintain their relevance and support into the twenty-first century. Yet their future is by no means assured. For instance, the past ten years has seen the demise of Broome Wildlife Park, two marine parks in Perth and South Australia, and Gondwana Wildlife Sanctuary in Brisbane. Mitchell (1994) believes that two key ingredients will determine the status and well-being of zoos of the future:

1. the commercial viability of the organisation; and
2. the professional credibility of the industry.

This view is supported by Adams (1995) who claims that poor zoos are poor because of either incompetent or indifferent management, lack of funds, or both.

7.1 Commercial Viability

Zoos must make money to survive, but this is an increasingly difficult task. Admission prices have to be kept low enough to encourage repeat visits by a wide spectrum of society (Mitchell 1994), and yet zoos must pay their way. The decision to close London's Regent's Park Zoo in 1991 because it was too much of a drain on public funds, highlighted both the need and the difficulty for zoos to achieve commercial viability (Lyons 1991, Tisdale 1993). It has been argued that zoos would be better off, at least financially, if they dedicated themselves wholeheartedly to entertaining the public but this is not possible (Cherfas 1984). Such a policy would compromise their conservation objectives, and leave them open to charges of unprofessionalism, irrelevance, and of 'exploiting wildlife'.

7.2 Ethical Credibility

Despite the attempts of zoos to change, they remain open to philosophical accusations that they are irrelevant and wrong, and

some in the community even advocate their abolition. For instance the Australian and New Zealand Federation of Animal Societies is opposed to keeping wild animals in captivity, believing that zoos in their present form provide stressful living conditions and are unnecessary (ANZFAS 1996). As Luomo (1987) explains, zoos must confront the suspicion that all the talk of conservation is no more than window dressing to subdue such criticism: that Barnum is far more important to zoos than biology.

Zoos must constantly be alert to the need to confront such attitudes, both through the maintenance of high standards of animal husbandry and welfare, and through the promotion of their contributions to wildlife conservation. Their problem is how to achieve this, while still providing an entertaining and stimulating experience that can compete effectively with all the other leisure activities available to the Australian public.

8. OPPORTUNITIES

There is no doubt that wildlife is an enormously popular, and important part of Australian tourism. Zoos can continue to capitalise on this popularity through the upgrade of existing captive wildlife facilities and the development of new displays and exhibits. However, rather than merely improving what they already have and do it is likely that the future development of zoos will require a more radical shift in the way zoo managers, staff, and visitors, see these institutions.

As Mazur and Clark (1996) conclude: 'While the zoo community should be congratulated for their efforts at modernising their institutions, continued and increasing environmental degradation will ensure continued societal demands for more fundamental changes in zoos than what have transpired so far'.

Zoos until now have essentially been collections of wild animals on display for the public. They have developed from private collections and menageries to more naturalistic exhibits where the viewer can gain an appreciation of the animal in its own habitat, but for the most part they have still been static and permanent displays. The opportunity and challenge for zoos today is to transform themselves into becoming true conservation centres – where their message is delivered more effectively through a combination of both entertainment and education. This role was outlined by Conway (1999, p.4) in his keynote address to the Annual Conference of the World Zoo Organisation:

'Thus the 21st Century zoo must be redesigned as a hedge against biotic impoverishment; a time machine buying continuance for faltering wildlife populations; a corridor of care between parks and reserves; and, more than ever, humanity's primary introduction to wildlife, promoter of environmental literacy and recruiting centre for conservationists'.

Such a zoo will not be bound by its existing physical boundaries and activities, but will seek to entertain, involve and educate their visitors through a combination of:

1. *Interactive and interpretive displays and presentations, including activities such as:*

- staff-visitor interactions (e.g. an extension of the current 'keeper' talks);
- allowing visitors to view previously 'off-limits' facilities etc.;
- wildlife-visitor interactions (e.g. walking wildlife through the zoo, touch tanks of appropriate species);
- wildlife behaviour displays (e.g. through wildlife 'shows');
- after-hours visitations (e.g. nocturnal or dawn tours);
- school environmental education programs; and
- outreach programs with zoo staff going out to schools and community groups.

Many zoos are starting to do some of these things already; for instance Australia's newest zoo, Melbourne Aquarium, has incorporated several into its design and management.

2. *Themed displays*, promoting a particular aspect of wildlife and conservation. Possibly these will be linked to other events occurring outside the zoo, either natural or human-made. These displays will be constantly changing, creating an incentive for revisits to the zoo.

3. *Integration and development of other zoo facilities*, such as the restaurant and souvenir shop. Traditionally, these have been seen as an adjunct to the zoo, secondary to the animal displays. However, they can be upgraded to become destinations in their own right, and hence another reason for revisiting the zoo. Again, Melbourne Aquarium has deliberately attempted to do this in their new facility.

4. *Encouragement of community groups and activities to use the zoo and its facilities* and so encourage the view of the zoo as an important resource for the whole community.

5. *Greater interaction with ex situ conservation activities and ecotourism*, to further bridge the gap between captive and free-range wildlife.

Such transition from traditional zoo to community conservation centre will also require two important shifts in the way zoos are managed. Firstly, as Mazur and Clark (1996) point out, this will involve developing and implementing appropriate policies, economic and organisational procedures, and nurturing and encouraging zoo personnel in the achievement of change.

Secondly, it will require the zoo to develop more collaborative links and strategic alliances with other components of both business and government. In this way, zoos are more likely to develop new marketing opportunities, raise funding for their capital works projects, and contribute to and promote their contribution to wildlife conservation.

As Conway (1999, p.7) concludes

'Today's exhibit techniques allow us to present wildlife situations as never before, visualise places our visitors could never go, bring nature into our zoos in real time, interpret the beauty and ecology of the creatures we see at any magnification, and offer animal population simulations under any scenario... If we can sustain the animals. Otherwise all this becomes paleontological.'

9. RECOMMENDATIONS FOR ACTION AND RESEARCH

Even amongst their own supporters, there is a realisation that zoos need to be more proactive, and effective in both what they do, and how they promote it. Larcombe (1995a) outlines four areas where he believed that Australian zoos should, both individually and collectively, become more vocal:

1. Take over the higher moral ground.
2. Become their own best critics.
3. Ensure that their conservation programs are more readily published and understood by a wider audience.
4. Substantiate and argue strongly the educational role of zoos.

What is needed initially to achieve these goals is an accurate and complete assessment of the contribution of Australian zoos to conservation, particularly in the areas of education and captive breeding. This should include research that will evaluate the effectiveness of:

- the various interpretive media (both personal and non-personal) employed by zoos in achieving their wildlife conservation aims; and
- the role of zoos in the captive management, breeding and reintroduction of wildlife, particularly endangered species.

In addition, there is also a need to evaluate more completely the economic impacts of zoos, and to identify those factors that most affect visitor satisfaction and enjoyment.

Such information will benefit not only the zoos themselves but also government and private conservation agencies across Australia. In particular, it will:

- indicate how and where zoos most efficiently and effectively contribute;
- guide zoo policy and management towards these areas;
- influence government policies, perceptions and interactions with zoos;
- promote the development of zoos as conservation centres and hence contribute to their sustainability into the future; and
- improve the public perception of zoos and community understanding of the value of their work in wildlife conservation.

As Bartos and Kelly (1998) conclude:

'A summary of measurable contributions by zoos in the areas of education, conservation, research and tourism is of critical importance in demonstrating the contribution of these institutions to the whole community.'

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