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The economic and social contribution of the zoological industry in Australia

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This paper is based on a report that Aegis Consulting Australia and Applied Economics prepared for the Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) in March 2009. We discuss the zoological industry's contribution to the Australian economy and society in terms of the following items.

- Economic value, that is Gross Domestic Product, employment and tourism.
- Value for consumers, based on visitor survey results, financial support for zoos and consumer surplus.
- Conservation value, including the type and results of *in situ* and *ex situ* programmes and research.
- Education value, including success in raising conservation awareness and motivating behaviour change.
- Value of contribution to bio-security.

Our research is based on surveys and interviews with a range of stakeholders, including zoos, governments, consumers, industry representatives and conservation organizations. In the report, comparisons are drawn between government and private-sector contributions to the financial upkeep of zoos and the contribution of zoos to the governments' conservation obligations and priorities, and the resultant savings to the public sector. In conclusion, the report finds that there is a strong case for governments to increase their contributions to zoos to assist in ongoing education, conservation and bio-security services to the Australian and international community.

Key-words: biodiversity; conservation; consumer value; economic value; education; environmental contribution; social value; zoo contribution

FOREWORD

A key role of a regional zoo and/or aquarium association is to advocate on behalf of its membership, particularly to governments where it aims to exert influence to shape legislation and policy. However, this is often in the context of strong lobbying from groups with markedly opposing positions to that of the zoo and aquarium community. To be effective, an association needs to define its approach by 'what is in it for the government' rather than purely the environmental value of *ex situ* conservation and its supporting activities. Moreover, any approach to government has to be robust to withstand external public scrutiny. In 2008, Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) set a strategy to 'establish and maintain a Government and stakeholder campaign' so that it could influence governments, build partnerships and notably mitigate the influence of industry opponents. In order to build a campaign, ARAZPA needed to have credible facts and consequently commissioned a socio-economic study into the value of the zoo and aquarium community in Australia. This paper provides an overview of the study with some remarkable and interesting findings. *Martin Phillips, Executive Director, ARAZPA*.

INTRODUCTION

In October 2008, ARAZPA commissioned Aegis Consulting Australia to prepare a report to help to determine the economic and social value that wildlife parks, zoos and aquariums contribute to Australia. The report is being used by ARAZPA as a key platform to promote the profile and community contribution of zoos in Australia, demonstrate the value of sponsoring zoo activities and affirm the benefit of government funding and regulatory support for the role of zoos.

Aegis Consulting Australia assessed five ways by which zoological organizations (zoos) contribute their value to Australia.

- Economic value, measured in terms of contributions to gross domestic product, employment and tourism (production value).
- Value for consumers, measured via visitor survey results, the revenue and financial support provided to zoos, and consumer surplus (recreational value).
- Value of the contribution to conservation, measured by the nature and results of *in situ* and *ex situ* programmes and research.
- Value of the contribution to education, measured by the nature and results of school, tertiary and visitor education programmes and their links to raising conservation awareness and motivating behaviour change.
- Value of the contribution to bio-security, measured by the role zoos play in protecting Australia's biodiversity and environment, and primary production industries.

The consultant's assessment of these values was based on the following factors.

- A formal survey of all 107 zoos in Australia, to which 20 organizations (representing 24 zoos) responded. The respondents represent the major government-owned and private zoos in Australia. The other zoos, which did not respond, are mainly small privately owned, family-run businesses.
- Visits to 18 zoos (of which 12 responded to the formal survey and six did not respond to the formal survey).
- Advice and opinion from over 30 conservation and education experts from government, academia and non-government organizations (NGOs).
- Literature and data reviews, including information from the Australian Bureau of Statistics.

The zoos responding to the survey and visited by the consultants reflected a wide cross section of large, medium, small, government, private, not-for-profit, urban and regional zoos in each State and Territory of Australia. Overall, for preparing this report, data and information were gathered directly from 30 zoos (28% of all 107 zoos) of which 22 were ARAZPA members (56% of the 39 total institutional members) and eight were non-members.

THE SURVEY AND FINDINGS

The zoo survey questionnaire was divided into five sections.

- Finance and production: financial details for the years 2006–2007 and 2007–2008; business activity; staffing.
- Consumer values: visitor numbers; consumer reactions and activities; sponsorship.
- Conservation activities and achievements: *in situ* and *ex situ* conservation activities; sponsorship of animal rescue or preservation organizations.
- Education services: school, vocational and tertiary programmes; informal education.
- Bio-security services: disease and pest identification and control.

The findings presented here are based on the data provided by the participating zoos and extrapolations drawn from these data about the economic and social contributions of the total zoo sector. Even though the participating zoos represent 28% of all Australian zoos, they constitute almost all the major government-owned and private zoos. The activities of these major zoos make up the bulk of the total zoo sector contributions in the five areas examined. Zoos that did not participate in the formal survey are chiefly privately owned zoos that are small-scale organizations, which make a minimal contribution to the total conservation, education and other economic and social output of the total zoo sector.

Economic value of zoos

The estimated total production by zoos in Australia is *c.* AU$424 million per annum. This consists of an annual operating expenditure of about AU$358 million and a capital expenditure of about AU$66 million.

(Australian Bureau of Statistics, 1998, 2006, 2008a; Aegis Consulting Australia, 2009.)

Zoos employ about 5300 people, including 3700 full-time employees and 1600 part-time employees.

International visitors to zoos may create an estimated net benefit to the Australian economy of about AU$58 million per annum in addition to their payments for admissions to zoos. Allowing for a multiplier of up to 2·0 (i.e. the multiplier that is acceptable to the Australian Treasury for use in economic assessments), this could convert to a total value of about AU$116 million per annum (Australian Bureau of Statistics, 2008b).

Value for consumers

There are an estimated 15·4 million visits to zoos per annum, which include about 3·3 million visits by international tourists and 12·1 million visits by Australian residents (Australian Bureau of Statistics, 2008a; Aegis Consulting Australia, 2009).

In 2005–2006, nearly 36% of the population over 15 years of age visited a zoo at least once. More Australians visit zoos each year than any other form of cultural entertainment, apart from going to the cinema (65%). Zoos have maintained this rate of visitation for over 10 years (Australian Bureau of Statistics, 2008a; Aegis Consulting Australia, 2009).

It is significant that zoos maintain the second highest level of annual visitation compared with other cultural activities, such as libraries, museums and art galleries, even though zoo visits come at a cost and general admission to libraries, museums and art galleries is widely free. This is a strong indicator of the value that consumers attribute to zoos.

Overall, the private sector including visitors, contributes three-quarters of the revenue of zoos. This is an indication of the minimum level of benefits to the consumers. The price of admission is one source of this private revenue. The median price of admission to ARAZPA member zoos is about AU$24 per adult and AU$12 per child. The median price and the other price data are based on the admission prices of the 39 institutional members of ARAZPA and respondents to the formal survey carried out by Aegis Consulting Australia.

Consumer surveys indicate that the value that consumers place on zoos and the benefits they provide (like education and conservation) are typically greater than what consumers pay for admissions. As a result, consumer surpluses (where benefits to consumers exceed the prices they pay) occur, although the consultants do not have data on the possible magnitudes for such surpluses. In response to the formal survey, six organizations provided results of their own consumer surveys, providing information for two large public organizations representing three zoos, two large private zoos, one public small/medium enterprise (SME) zoo and one private SME zoo.

State governments contribute about a quarter of the revenue of zoos. On a per capita basis, their contribution is only AU$2·92 across Australia or AU$4 per visitor (Australian Bureau of Statistics, 2008c). Between 2006 and 2008 the Commonwealth government allocated only AU$1·1 million to three zoos (two of which are State government owned zoos) (Aegis Consulting Australia, 2009). These contributions are very low compared with government subsidies provided to other cultural activities, such as libraries, museums and art galleries.

An analysis of general surveys conducted by zoos show a particularly high level of consumer satisfaction with zoo education. These consumer surveys (from six organizations) suggest that learning about the animals themselves has overtaken the pure novelty or entertainment value of zoos as one of the principal reasons why people visit. Recent independent studies confirm this and demonstrate that 76% of the international tourists are interested or very interested in experiencing (mainly iconic) native wildlife and of these more than half preferred to visit either a zoo or wildlife park, rather than take a tour in the wild (Prideaux & Coghlan, 2006).

The value that consumers place on zoos is also represented by the following parameters (Aegis Consulting Australia, 2009):

- Number of people who belong to Zoo Friends Associations (>167 000) and the

median price they are willing to pay for Zoo Friends membership (about AU$80 per person for ARAZPA member zoos).
- Number of people who volunteer at zoos (2300).
- Number of corporate sponsorships of zoos (198).
- Amount of non-corporate donations to zoos (about AU$10 million in 2007–2008).

Value of conservation activities

There are many perspectives on what conservation means but, in reality, zoos play a role in delivering *ex situ* and *in situ* conservation for both biological diversity and conserving wild populations of animals in their natural habitats (CBD, 1992; WAZA, 2005, p. 9; Dickie *et al*., 2007). The significant value that the international community places on conservation is reflected by the commitment of the vast majority of nations in the world to key international treaties regulating the conservation of biological diversity (CBD, 1992) and the import and export of endangered species (CITES, 1975), as well as the widespread membership of the International Union for Conservation of Nature (IUCN). The Convention on Biological Diversity (CBD) is an international treaty and the paramount legal instrument governing the conservation of biodiversity. Every nation in the world, with the exception of the United States, has ratified the CBD (see http://www.cbd.int/countries/). The IUCN has over 1000 government and NGO members, as well as >11 000 volunteer scientists from about 160 countries, including Australia.

The significant value that the Australian community places on conservation is reflected by the Australian Government's ratification of these international treaties and the range of Commonwealth and State regulation concerning threatened species and habitat protection (Australian and New Zealand Environment and Conservation Council, 1996).

There are a myriad of views about how to measure the contribution zoos make to conservation. Nevertheless, the vast majority of parties consulted during the preparation of this report (including most NGOs) consider that zoos make valuable and unique contributions to both *ex situ* and *in situ* conservation. For example, NGOs and State government agencies that manage *in situ* conservation programmes [e.g. Flora and Fauna International (Tiger Conservation Sumatra), Cheetah Outreach Program (Zambia), Free the Bears Foundation (Vietnam) and the Department of Environment and Conservation, Government of Western Australia] advised the consultants of the following factors.

- While in an ideal world captive breeding would not be necessary, in dealing with the reality of the degradation of natural ecosystems, it is an essential component to support species recovery and reintroduction programmes.
- Only zoos have the animal husbandry and veterinary expertise to undertake necessary captive breeding.
- Only zoos can care for animals that cannot be settled in free-range enclosures.
- Zoos are well placed to educate and focus the public on conservation and raise funds for *in situ* activities.
- The remote and on-the-ground access to veterinary advice that zoos provide is invaluable to *in situ* work.
- The nature of zoos and their resident expertise enable them to provide focused and practical assistance to *in situ* programmes, that promotes ecosystem conservation.
- The *in situ* programmes zoos are involved with would not be as successful without the support that zoos provide through captive breeding, financial contributions, research and veterinary advice. (See, for example, Coonan *et al*., 2010.)

The views of these NGOs and government agencies are consistent with the notion that zoos play three main roles in relation to conservation.

- Captive or conservation breeding of threatened species.
- Scientific investigation of species biology, natural history and other areas to support field work.

- Development, articulation and marketing of the conservation agenda to increase support from the public and community, and government leaders (Tribe, 2001; Conway, 2003).

The general value to Australian society of zoos *in situ* and *ex situ* native species conservation is particularly significant because according to the Australian Government, 93% of frogs, 89% of reptiles, 85% of flowering plants, 82% of mammals and 45% of land birds that occur in Australia are unique in the world (Australian and New Zealand Environment and Conservation Council, 1996). Thus, arguably, any effort to conserve native species is valuable, regardless of the number species or animals within a species that are saved.

One of the clearest methods developed to assess the contribution of zoos to conservation suggests that conservation projects undertaken by zoos should be measured according to the (1) importance of the project to conserving wild species or their habitats, (2) the scale of the project and (3) the impact of the project (Mace *et al*., 2007). The difficulty with this is the long time frame projects need to make a discernable difference (see also Gusset & Dick, 2010).

This approach is also project based and not suitable for the kind of national assessment undertaken in this report. Accordingly, the contributions of zoos were assessed against the specific criteria relating to *ex situ* and *in situ* conservation that the CBD (1992) requires ratifying parties to undertake. Australia is a party to the CBD.

Judged against these criteria and based on the survey data, the following findings were confirmed (Aegis Consulting Australia, 2009).

- Zoos deliver four of the five CBD criteria for *ex situ* conservation. These are (1) conserve the components of biological diversity, (2) provide facilities for conservation research, (3) recover and rehabilitate threatened species and reintroduce them into the wild, and (4) provide financial and other support to conserve biological diversity in developing countries.
- Zoos deliver four of the 13 CBD criteria for *in situ* conservation. These are (1) promote the protection of ecosystems and the maintenance of viable populations of species in natural surroundings, (2) rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies, (3) prevent the introduction of, control or eradicate those alien species that threaten ecosystems, habitats or species, and (4) provide financial and other support for *in situ* conservation outlined in Article 8, particularly in developing countries.
- Twenty-four zoos hold about 3900 species of native and exotic vertebrates and invertebrates. Of these, 173 are Australian native species and 197 are exotic species included on the *IUCN Red List of Threatened Species* (IUCN, 2008). These are not net figures as many of these zoos hold the same species under joint breeding programmes.
- Some larger highly resourced zoos undertake their own conservation and scientific research, but many SMEs and large zoos fund external research. Between 2006 and 2008, ten SMEs and large organizations provided over AU$2 million in research funding to universities and other research institutions.
- Sixteen zoos participate in specific *in situ* conservation programmes. Spending on *in situ* programmes occurs through general capital expenditure (such as animal facilities to support breeding programmes for reintroduction), distribution of public donations collected at animal displays in support of campaigns about threatened species and donations from Zoo Friends Associations.
- In 2007–2008, these 16 zoos implemented 75 *in situ* programmes to conserve 48 native threatened species. Eighty-one per cent of these programmes are recovery and re-introduction programmes, and 19% are habitat and species-management programmes.
- In 2007–2008, 12 zoos contributed to 37 *in situ* programmes for the conservation of 20 exotic species. Of these, 35 programmes

are habitat and species-management programmes, and two are recovery and reintroduction programmes. These 12 zoos also contributed to five international programmes for the creation of sanctuaries in the wild. Almost all of these programmes are undertaken in conjunction with an NGO.
- The international programmes to which these 12 zoos contributed occurred in 15 countries, 14 of which are developing.
- Fifteen zoos provide wildlife rehabilitation programmes for native species and treat over 14 000 animals each year. The cost of these programmes is absorbed in the general operating expenditure of zoos. Nevertheless, given the volume of animals treated, government agencies and/or NGOs would require significant expert personnel and financial resources to substitute this function.
- The majority of large zoos provide a wildlife hospital service. One zoo estimated the additional cost of this service was at least AU$2 · 3 million in 2007–2008 but, given veterinary, nursing and hospital costs as well as medicine and consumables, it would be reasonable to assume that the total value across all zoos would be tens of millions of dollars. Some zoos maintain their own fleets of vehicles, aircraft and ships to be able to undertake specialist land or marine species rescue work.

In making these assessments, the consultants did not attempt to rank species that are subject to conservation programmes according to their worth to ecosystems, as this is beyond the scope of the report. However, it is generally acknowledged that some species (such as 'umbrella species': i.e. species selected for making conservation-related decisions, typically because protecting these species indirectly protects many other species that make up the ecological community of its habitat) are more important to ecosystems than others.

Value of education activities

Zoos provide a range of conservation education programmes for school and tertiary students, visitors and the general public. Seventeen of the 18 zoos visited by the consultants during the preparation of this report demonstrate a very strong commitment to student and visitor education through all facets of zoo operations, ranging from signage to mobile zoos and community-based programmes (Aegis Consulting Australia, 2009).

The zoos meet all the standards of conservation education programmes set by the European Association of Zoos and Aquaria (WAZA, 2005, p. 36). In 2007–2008, 19 zoos provided formal education to about 613 000 students nationally. In many states zoo education programmes are either integrated with or reflect the state education curriculum (Aegis Consulting Australia, 2009).

Education experts consider that zoos are a unique place for education activities (Dr Jennifer Pearson, Murdoch University, pers. comm.; Dr Rob Morrison, Flinders University, pers. comm.; Dr Susan Groundwater, Sydney University, pers. comm.).

- Children learn about environmental issues because they can see and feel animals, and this sensory experience is essential to the way children learn.
- Field and zoo biologists study. Biologists are essential for animal husbandry, animal welfare and connecting environment sustainability with issues of development and economic growth.
- Veterinary science students learn about animal care and wildlife medicine.

Only four zoos seek to evaluate their education programmes as a part of their visitor surveys or in other ways in relation to school education. The survey conducted by one of these zoos indicates that 83% of visitors discovered new things that they did not know about before visiting the zoo.

Overall, education programme evaluation is not highly developed among zoos globally. However, Australian zoos are investing in new research to understand how education programmes can and should change visitor behaviour to support conservation over the long term.

Nevertheless, during their visits to zoos, the consultants observed that zoos make strong attempts, through animal exhibits and signage and other material about threatened species and habitats, to stimulate emotional responses in visitors and suitable reactions in support of conservation. The report has identified some case studies that seem to illustrate that zoo education can stimulate longer lasting behaviour change for conservation (responses to the formal survey from Zoos Victoria and Perth Zoo).

Value of bio-security activities

Zoos play an important role in bio-security because most diseases over the last 30 years are zoonotic or occur first in wildlife (Australian Government Wildlife Information Network, pers. comm.). Bio-security management tends to be undertaken by large zoos, universities, NGOs and government agencies working in collaboration, because smaller zoos do not have the resources to fund such work (Aegis Consulting Australia, 2009). Wildlife disease surveillance is coordinated nationally through the Australian Wildlife Health Network (AWHN), in which many zoos participate.

A review of Australia's bio-security regime in October 2008 found that the AWHN performs an invaluable role in monitoring disease in feral and native wildlife but requires more personnel and resources to work at an optimal level (Beale *et al*., 2008).

Zoos collaborate with other organizations to maintain the Australian Registry of Wildlife Health (http://www.arwh.org/ARWH/home.aspx), which undertakes diagnostic work, disease investigation, disease surveillance, research and education.

CONCLUSION

Zoos make a significant contribution to Australia's economy and society; however, the contributions that governments make to the zoo sector are very low, compared with the way in which society values zoos and the contributions that zoos make to conservation, education and bio-security.

The private sector, including visitors, contributes 75% of the overall revenue of zoos, with State governments contributing only 25%. The average contribution of State governments to the zoos sector is equivalent to about AU$2 · 92 per capita or AU$4 per zoo visitor. In terms of direct grants to zoos the Commonwealth government provided a total of only AU$1 · 1 million among three zoos between 2006 and 2008.

In addition to supporting overall economic activity and international tourism, zoos provide essential services to government and the community that governments and NGOs would not be able to substitute without the allocation of considerable expert human and financial resources; for example, wildlife rescue and rehabilitation, and wildlife disease monitoring and responses to bio-security issues. The saving to government while not quantified is estimated as tens of millions of dollars.

The value that consumers attribute to zoos is reflected in the fact that zoos attracted about 12 million visits from Australian residents in 2007–2008. Around 36% of the population visits zoos every year, more than any other cultural activity except going to the cinema. This has been the case for the last 10 years.

Consumers also demonstrate the value they attach to zoos by joining Zoo Friends Associations, volunteering or donating. In 2007–2008, about 2300 people volunteered their time to work at zoos (worth about AU$7 · 8 million), non-corporate donations to zoos totalled about AU$10 million and zoos attracted about 198 corporate sponsors.

Conservation remains one of the primary goals of zoos and when judged against the internationally agreed criteria in the CBD (1992), zoos make significant contributions to *ex situ* and *in situ* conservation.

Government agencies suggest that the success of their species reintroduction programmes would not have occurred without the animal husbandry and veterinary expertise from zoos, and the professionalism they provide that is necessary for successful captive-breeding programmes.

Similarly, field NGOs consulted during the preparation of this report suggest that their programme success relies on the human resource contribution that zoos make, such as access to 24 hour veterinary advice, and the capacity of zoos to raise funding through animal displays that promote the need for public and corporate support for threatened species conservation.

While zoos are not unique places of conservation and scientific research, larger zoos undertake research that supports broader scientific endeavour and large, medium and small zoos contribute funding to support research. In 2007–2008, zoos contributed over AU$2 million to fund university-based research for conservation outcomes.

Conservation education is another primary goal of zoos and they demonstrate a strong commitment to make visitors aware of conservation issues through signage, keeper talks and community-based activities. In 2007–2008, zoos provided education classes to about 613 000 students.

Education programme evaluation is not highly developed among zoos globally. However, Australian zoos are investing in new research to understand how education programmes can and should change visitor behaviour to support conservation over the long term.

The Australian Government's capacity to deliver the objectives of its National Strategy for the Conservation of Australia's Biological Diversity (Australian and New Zealand Environment and Conservation Council, 1996) is reliant in part on the ability of zoos to pursue *ex situ* conservation, particularly in relation to threatened native species.

To ensure that zoos can consistently contribute to these strategies, regardless of wider economic conditions affecting their revenue base, it is sensible for the Australian and State Governments to consider providing subsidies to all zoos participating in agreed conservation programmes, regardless of their ownership structure.

There is capacity for this, given the very low contribution governments currently make to zoos relative to the benefits they represent. The full report and tables can be viewed at http://www.aegisconsulting.com.au

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