

## Contributions of Non-consumptive Wildlife Tourism to Conservation

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### Abstract

Wildlife tourism has the potential to contribute to conservation through a variety of mechanisms. This chapter presents a preliminary assessment of the extent to which this potential is currently being realised, comparing tourism based on viewing of animals in captive settings (with a focus on federated zoos) with that in free-ranging situations (wildlife watching). The key mechanisms involved are: direct wildlife management and research; use of income derived from wildlife tourism to fund conservation; education of visitors to behave in a more conservation-friendly manner; political lobbying in support of conservation; and provision of a socio-economic incentive for conservation. All of these occur in at least some zoos and wildlife-watching situations, and collectively the contribution of non-consumptive wildlife tourism to conservation is significant, though impossible to quantify. The key strengths of the zoo sector in this regard are its inputs into captive breeding and its potential to educate large numbers of people. In contrast, wildlife watching provides significant socio-economic incentives for conservation of natural habitats. There seem to be significant opportunities for expanding the role of non-consumptive wildlife tourism in conservation.

### Introduction

Tourism can have positive, neutral or negative effects on the natural environment (Budowski, 1976). In wildlife tourism, encounters with wild (non-domesticated) animals are a focus of the visitor experience. It is thus crucial, not only to the conservation of the animals but to the sustainability of the tourism businesses concerned, that the net effects of tourism on wildlife are neutral or preferably positive. Moreover, there is increasing consensus that

nature-based or wildlife tourism should create a mutualistic relationship between tourism and nature conservation (e.g. WZO, 1993; Commonwealth Department of Tourism, 1994; Young *et al.*, 1996; van Oosterzee, 2000; Ecotourism Association of Australia, 2001).

The net effects of wildlife tourism on wildlife are a result of the balance between any negative impacts of the tourism-related activities on the animals and any – generally indirect – positive contributions to their con-

ervation. While the potential negative effects have been reviewed in detail elsewhere (e.g. Liddle, 1997; Green and Higginbottom, 2001), there has been little attempt to systematically review the positive effects. Given a lack of adequate quantitative data, objective quantification of contributions of wildlife tourism to conservation is not yet possible, but this review represents a first step in this direction and provides a framework for future research. It is important to bear in mind, however, that a balanced assessment requires simultaneous consideration of both negative and positive effects.

This review focuses on so-called 'non-consumptive' wildlife tourism (i.e. excluding hunting and fishing). While many of the issues covered in this chapter are also applicable to consumptive wildlife tourism, the latter raises some additional issues that are beyond the scope of the present review. This chapter provides a new perspective by comparing the contributions of two sectors of non-consumptive wildlife tourism: captive wildlife tourism (carried out by institutions that are henceforth described as 'zoos') and non-consumptive wildlife tourism based on free-ranging animals (referred to henceforth as 'wildlife watching'). Nowadays there is a continuum ranging from situations where the animals are confined in small cages through to those where they are able to range freely without any barriers to movement. However, in practice, the distinction remains useful, as the types of organizations, the associated literature and the philosophies that have arisen around the two sectors remain largely distinct.

Ultimately, conservation of wildlife involves what people do (or do not do) to wild animals or their habitats that directly increases the chances of long-term persistence of wild populations. For convenience we refer to deliberate manipulations of wild animals or their habitats to achieve conservation goals as 'direct wildlife management'. Such management in turn nearly always requires funding and political support. The behaviour of the public sometimes directly influences animal populations and can be modified by education. However, the main way in which education is likely to lead to enhanced wildlife management is through increasing public con-

cern for conservation issues, which in turn translates into enhanced funding and political support, particularly through political pressure. Education can also lead to enhanced funding through facilitation of voluntary donations. Some tourism operators may be motivated to contribute to conservation because of their personal ethics and/or because tourism is linked to activities that were set up with conservation objectives in mind. Even where this is not the case, engaging in wildlife tourism can provide a political or economic incentive for engaging in conservation-enhancing behaviour.

Thus we can classify the ways in which wildlife tourism is potentially associated with conservation benefits into the following categories:

1. Direct wildlife management and supporting research.
2. Providing funding for conservation.
3. Providing education about conservation.
4. Political lobbying in support of conservation.
5. Providing socio-economic incentives for conservation.

In this chapter we review what is known of the nature, magnitude and effectiveness of each of these contributions for each sector, pointing out gaps in existing knowledge. We then use this information to draw general conclusions about the scope and magnitude of contributions to conservation by non-consumptive wildlife tourism; compare the situation for captive and non-captive sectors; and propose key steps that should be taken to enhance contributions to conservation. To provide the necessary context, we begin by introducing the zoo and wildlife-watching sectors, providing a brief overview of each sector and its approach to conservation.

Given a lack of systematic research aimed at quantifying such contributions, our review is necessarily mainly qualitative. While our scope is international, the review is applicable especially to more developed countries than to less developed countries, especially in the case of zoos. Where available, we use Australian examples to illustrate our points and, whenever not stated otherwise, the wildlife-tourism sites or activities we refer to

are in Australia. The present chapter draws heavily on a report by Higginbottom *et al.* (2001a), which provides further details on some of the issues covered in this chapter.

### Zoos and their role in conservation

Zoos can be defined as institutions that confine, manage and exhibit collections of living wild animals. The World Zoo Conservation Strategy (WZO, 1993) estimates that there may be well over 10,000 zoos worldwide, of which approximately 1000 participate in national or international zoo federations. This report focuses on these federated zoos, because membership requires a commitment to work together towards joint conservation goals.

Zoos today see themselves as important conservators of nature. Despite their claims, they are still seen by some as being superficial, expensive and ineffective (ANZFAS, 1996; Hewitt, 2001). Consequently, as Larcombe (1995a) explains, zoos must not only contribute to conservation but must also be seen to be doing so. As Bartos and Kelly (1998) argue, 'a summary of measurable contributions by zoos in the areas of education, conservation, research and tourism is of critical importance in demonstrating their contribution to the whole community'.

### Wildlife watching and its role in conservation

Wildlife watching is a subset of nature-based tourism and comprises a diversity of forms, based on tours, attractions or accommodation. Although called 'watching' here for convenience, this form of tourism can also involve listening, photography, feeding, live-trapping or any other form of interaction that does not kill the animal. Further information on the scope of activities involved is given by Higginbottom *et al.* (2001b).

There have been a number of claims that wildlife watching, like nature-based tourism in general, can be good for conservation (e.g. Roe *et al.*, 1997; National Watchable Wildlife Program, 2001; International Association of Fish and Wildlife Agencies, 2002), especially

because of associated economic incentives and education. Further, in policy statements and in popular terminology, wildlife watching is often seen as a form of ecotourism. According to some definitions of the latter term, this necessarily means that the tourism is associated with conservation-related education and other localized conservation benefits (Weaver, 2001). Promotion of this concept of ecotourism by governments and industry associations in more developed countries, such as Australia and the USA, has helped to provide an impetus to attempts to maximize the conservation benefits of wildlife watching.

### Methods

Information for this review was obtained from the following main sources:

- A review of the relevant literature, both published and unpublished.
- Semi-structured telephone interviews with key staff of Australian conservation agencies.
- Informal conversations with selected wildlife-watching tour operators.
- A review of the conservation objectives and achievements of zoos, through face-to-face interviews with key individuals and stakeholders at a selection of zoos and through their relevant professional associations. These concentrated on the UK and Australia, which were chosen as being representative of federated zoos throughout the world.

### Direct Wildlife Management and Supporting Research

#### Zoos

The involvement of zoos in conservation is chiefly *ex situ* (outside the natural habitat), but recently some zoos have also become involved with *in situ* (inside the natural habitat) conservation initiatives.

The desire of zoos to contribute to wildlife conservation is demonstrated in the way they manage their collections. Nowadays, this is

via cooperative species-management programmes, in which the genetic diversity, population size and origin of the founders are all accounted for. This greatly enhances the reintroduction potential of captive-bred populations (Mitchell, 1991). Such genetic management is facilitated regionally through the zoo federations and globally through the International Species Inventory System (ISIS), with the aim of having self-sustaining captive collections as insurance for wild populations. ISIS data indicate that 92% of zoo mammals and 71% of birds are now captive-bred.

Zoos are also involved in captive breeding for reintroduction. For instance, Australian zoos participate in at least 35 such programmes (de Koff, 1998) and, over the past 10 years, have refined their captive management to cooperate with government authorities in the process of recovering threatened species. Consequently, Craig *et al.* (1999) claim that Australian zoos now have a well-defined role in the conservation of endangered wildlife.

Nevertheless, captive breeding of endangered species is limited for two main reasons: the lack of captive space available (Seal, 1991; Bartos and Kelly, 1998; Conway, 1999a) and the high cost of producing animals. For instance, in Australia each native animal produced for reintroduction costs on average Aus\$6546 (Perth Zoo, 2000). Similarly, Alibhai and Jewell (1994) estimate that it is 16 times more expensive to maintain a black rhinoceros in captivity than to protect enough wild habitat to support it. Thus Dixon and Travers (1994) and Hewitt (2001) argue that zoos are not the best targets for limited conservation funds.

Many zoos actively cooperate with research organizations. Zoo-based collaborative research is usually concerned *ex situ* with improving captive management through studies of nutrition, growth, infectious disease, environmental toxins, reproduction, reintroduction biology, stress and behaviour (Mitchell, 1991).

However, zoo research can also have an important role in linking *in situ* and *ex situ* conservation activities. There is a flow of information from zoo researchers to field scientists that can assist in species reintroduction and management, while, reciprocally, data

collected in the field can enhance captive breeding. Ryder and Feistner (1995) have reviewed new research initiatives being undertaken by zoos and found that reproductive and genetic technologies have particular significance for conservation of threatened species. They conclude that this role needs to be expanded and developed as wildlife populations and biological diversity continue to decline.

An increasing number of zoos now recognize the importance of promoting the interface between captive breeding and in-country conservation efforts (Durrell and Mallinson, 1998; Mallinson, 1998). For instance, in 1992 fewer than 325 *in situ* conservation projects were being supported by American Zoological Association zoos, while by 1999 the number had increased to over 650 (Conway, 1999a). Similarly, federated zoos in the UK supported 177 *in situ* projects in 2000, an increase of 61% since 1995 (Federation of Zoological Gardens of Great Britain and Ireland, 2001). If this trend continues, Conway (1999a) believes that zoos could become the primary non-government field-conservation organizations.

In Australia, zoos have traditionally been more involved with captive breeding programmes for native species, but recently some have established partnerships to support *in situ* projects. Examples of such work are Adelaide Zoo's participation in the rescue and health screening of the endangered Seychelles magpie robin (Adelaide Zoo, 2000), Melbourne Zoo's contribution to the restoration of the Calperum Biosphere Reserve (Melbourne Zoo, 2000) and the establishment of a 150 ha predator-free sanctuary by Western Plains Zoo (David Blyde, Manager, Life Sciences, Western Plains Zoo, Dubbo, New South Wales, 6 February 2002, personal communication).

### Wildlife watching

In contrast to zoos, direct wildlife management associated with wildlife watching is nearly always *in situ*, and covers a wider range of activities, such as reintroduction, control of exotic predators, patrolling for poachers, tree planting and weed control. There has been

very little research to indicate the effectiveness of any of these initiatives in contributing to conservation. Whether a wildlife-watching operation is involved in conservation appears to be very much dependent on the philosophy and objectives of the individual operator, in contrast to the more institutionalized approach of the larger zoos. One exception – at least in principle – is operators who have obtained certification from a marketing programme that recognizes contributions to conservation, with Australia's Nature and Ecotourism Accreditation Program (NEAP II) as a leading example (NEAPWG, 2000).

Wildlife-watching operators who participate in conservation-related wildlife management include government organizations (e.g. Landscape Expeditions, Western Australia), non-profit organizations set up mainly for conservation reasons (e.g. Australian Koala Foundation) and commercial tourism operators. Even the latter make significant contributions to conservation in some cases. Operators of private game reserves in South Africa have reintroduced a range of animal species that had become locally extirpated, including some that are endangered (James and Goodman, 2000). Earth Sanctuaries Ltd is a publicly listed Australian company established with a conservation mission, but with the explicit intention of using tourism to help achieve this mission (Earth Sanctuaries, 2002). The company undertakes its own captive breeding, combined with acquisition of animals from elsewhere, and carries out reintroductions into a network of private reserves.

In addition to deliberately undertaking activities that assist conservation, wildlife tour operators in some cases contribute indirectly by acting as deterrents to the disturbance or killing of wildlife by people. The Zaire Gorilla Conservation Project provided surveillance for a large area of a park inhabited by endangered mountain gorillas, with four of the largest families being monitored daily. This has been demonstrated to have helped reduce poaching of gorillas (Aveling and Aveling, 1989; McNeilage, 1996).

Some larger wildlife-watching attractions make a significant contribution to wildlife research. Tourism income derived from Phillip

Island Penguin Reserve (Australia) has funded research and monitoring that has greatly increased knowledge of the biology of the little penguin, other fauna of the region, and related conservation management issues (Rowley, 1992; Phillip Island Nature Park Board of Management, 1998; Ray Leivers, General Manager, Phillip Island Nature Park, Cowes, Phillip Island, Victoria, 25 September 2001, personal communication). A number of smaller Australian operators, listed by Higginbottom *et al.* (2001a), combine commercial objectives with participation in conservation research.

In the wildlife-watching sector, in contrast to zoos, tourists as well as operators are sometimes involved in direct wildlife management or research. There are small but growing numbers of organizations internationally that specialize in activities where tourists assist in conservation-related field research, monitoring or conservation work (IRG, 1992; Preece and van Oosterzee, 1997). Major examples of such organizations operating in Australia are Landscape Expeditions, Earthwatch, Conservation Volunteers Australia and Operation Raleigh (see Higginbottom *et al.*, 2001a, for further details).

## Providing Funding for Conservation

### Zoos

Zoos invest considerable amounts of money in pursuit of their conservation objectives. For instance, in 1995 UK federated zoos contributed approximately Aus\$4.5 million to *in situ* conservation and more than Aus\$15 million in 2000. In addition, specific campaigns since 1996 have raised a further Aus\$1 million (Federation of Zoological Gardens of Great Britain and Ireland, 2001).

Unfortunately, in most cases it is not possible to calculate the amount spent specifically on conservation, because the costs involved are bound up with the running expenses of the zoo. This is particularly true for *ex situ* projects, where staff time, equipment and facilities come out of routine operational budgets. Thus, in Australia, while the total income derived from the zoo industry was Aus\$142 million in

1996/97 (ABS, 1998), it is not known how much was used to fund conservation. As an indication, Perth Zoo, in their 1998/99 annual report, calculated the total cost of producing seven threatened species for reintroduction as Aus\$1,066,951, representing 18% of its gross income (Perth Zoo, 1999).

Most zoos have difficulty finding enough resources to become involved in conservation (Mitchell, 1994). As Larcombe (1995b) explains, they must strike balances between the allocation of scarce resources for exhibits and the demands of conservation. He maintains that the costs of maintaining Melbourne Zoo's collection doubled during the period from 1992 to 1995 due to their greater involvement in conservation.

### Wildlife watching

There is a range of government charges on commercial nature-based tourism operators and tourists that are intended to contribute to the costs of management associated with tourism activities. Most of these fees relate to the use of protected areas (where most wildlife watching probably occurs). Less common is the practice of requiring permits (with associated fees) for tourism operators who offer close encounters with particular species of wildlife that are of conservation concern, even if outside protected areas. For instance, in Western Australia (WA), operators who provide encounters with whale sharks must pay for a special interaction licence (Doug Coughran, Supervising Wildlife Officer, Department of Conservation and Land Management, WA, 25 September 2001, personal communication).

Although revenues from parks around the world are generally not sufficient to fully offset their operating costs (Goodwin *et al.*, 1998), let alone to provide net funding for conservation, there are some exceptions. User fees at some parks or in some regions provide revenues that not only support their own operations but provide funding for conservation measures (Lindberg *et al.*, 1996; FPTF, 2000; IUCN, 2000; GBRMPA, 2001). Most of the cases reported in the literature where government charges relating to wildlife tourism have raised funding for conservation involve

big-game hunting. One of the few published cases involving wildlife watching is tourism based on mountain gorillas in East Africa. Income from tourism has been used to pay for habitat conservation and anti-poaching measures, which have apparently been crucial to conservation of this endangered species (McNeilage, 1996; Butynski and Kalina, 1998). Although application of the 'user-pays' principle is becoming increasingly widespread (Goodwin *et al.*, 1998; IUCN, 2000), there are various philosophical, political and practical constraints on the use of this mechanism to fund conservation (e.g. Butynski and Kalina, 1998; Buckley, 2000a; IUCN, 2000; Lindberg, 2001).

Some developed attractions based on wildlife watching provide significant revenue for conservation. Net income to the Phillip Island Penguin Reserve in Victoria in 1992/93 was estimated to be Aus\$690,000 (Meek *et al.*, 1994). Revenue generated from turtle-viewing tourism at Mon Repos Conservation Park in Queensland, Australia, is invested in sea-turtle research, patrolling nesting beaches and predator-control measures (Tisdell and Wilson, 2000). Many authors suggest that the revenue-generating potential of some nature-based tourism products (both private and public) is not being realized, particularly where the funds are seen to contribute to conservation (Lindberg, 1991; Pearce, 1995; Laarman and Gregersen, 1996). A recent study at Mon Repos Conservation Park (Australia) indicated that tourists would be willing to pay more than double the existing fee (Tisdell and Wilson, 2000). Recent in-house research at Phillip Island Penguin Reserve similarly established that entrance prices could be raised well above their levels at the time (Ray Leivers, General Manager, Phillip Island Nature Park, Cowes, Phillip Island, 25 September 2001, personal communication). It is important to caution, however, that such indications of willingness do not necessarily translate into action.

Like zoos, some wildlife-watching enterprises donate at least some of their profits to conservation initiatives or provide opportunities for their guests to make financial contributions to conservation through donations or sponsorships (see examples in

Lindberg, 1991; IRG, 1992; Higginbottom *et al.*, 2001a). Earth Sanctuaries Ltd explicitly uses tourism as a source of revenue for its conservation and education programmes. There seems to be scope for expanded use of donations by visitors (Lindberg, 1991; IUCN, 2000; Higginbottom *et al.*, 2001a).

## Providing Education about Conservation

### Overview

It is often stated that visitors, as part of their wildlife- or nature-based tourism experience, can be educated to increase their conservation awareness and to behave in ways that have positive consequences for wildlife and/or their habitats (e.g. Duff, 1993; NBTAC, 1994; Parks and Wildlife Commission Northern Territory, n.d.). Education of wildlife tourists can occur through changes in attitudes and/or increased knowledge, which in turn may promote:

- more responsible behaviour towards wildlife and the natural environment, both in terms of minimizing negative effects in the area where tourism occurs and more broadly;
- subsequent involvement in wildlife conservation or research;
- increased donations of money towards conservation;
- increased political pressure on governments to achieve conservation objectives;
- more satisfied customers and therefore more successful businesses.

### Zoos

The development of zoos as educational establishments has mirrored their change from menageries to conservation parks. Contemporary zoos strive to display their animals as part of the overall environment and to utilize them in a variety of both formal and informal educational roles (Woollard, 1998).

Formal education involves structured programmes for schools and an increasing involvement in tertiary education. For

instance, in a review of zoo education in the UK and Ireland, Woollard (1999) found that 71% of zoos had an education department and 73% taught visiting school pupils, with more than 750,000 pupils visiting these zoos. In Australia, many zoos also have a significant commitment to formal education. The Melbourne Zoo Education Service, for instance, has 12 full-time teachers, with more than 120,000 children utilizing the service each year (Melbourne Zoo, 1999).

Most zoos also attempt to communicate a conservation message through the informal education of their visitors. However, assessing these activities is difficult (Bartos and Kelly, 1998), and critics suggest that their effectiveness is unclear (Ollason, 1993; Jamieson, 1995; Scott, 2001). On the one hand, several studies have found that exposure to captive wildlife in combination with some form of interpretation was associated with increased support for conservation (Broad, 1996; Tarrant *et al.*, 1997; Moscardo *et al.*, 2001). On the other hand, Mazur (1995) has questioned this effectiveness by concluding that, while visitors exhibit an awareness of endangered species and habitat destruction, it is not clear that they have gained this from their zoo experience. She maintains that for zoos to fulfil their education potential, they should critically evaluate their current activities and provide more tangible information about conservation threats and measures used to combat them.

### Wildlife watching

Many wildlife- and nature-based tourism operators, whether from the private or the public sector, incorporate environmental interpretation and education components. For many non-profit organizations involved in wildlife tourism, raising public awareness of environmental issues is the primary purpose (IRG, 1992; see Australian examples in Higginbottom *et al.*, 2001a). Government conservation agencies around the world also make varying levels of commitment to providing environmental interpretation, mainly in protected areas. For most commercial operators, commitment to education is a personal or business decision of the individual operator.

However, operators accredited under Australia's NEAP II (NEAPWG, 2000) are required to ensure that customers have access to well-planned interpretation, accurate information and trained staff that have an understanding of nature and conservation issues. The recent development of a related accreditation system for nature guides (Crabtree and Black, 2000), initiated by the Ecotourism Association of Australia, is a further step to facilitate improvement of the standard of interpretation in nature-based tourism products in Australia.

There is little published research on the effectiveness of wildlife interpretation in free-ranging settings, in contrast to the situation in zoos. Two Australian studies of visitors' responses in relation to sea-turtle viewing at Mon Repos Conservation Park showed that exposure to interpretation resulted in attitudes indicating increased support for conservation of these turtles (Howard, 1999; Tisdell and Wilson, 2000). Other positive effects on conservation-related attitudes have been noted for the dolphin interpretation programme at Tangalooma, Australia (Orams, 1995). A number of key informants interviewed by Moscardo *et al.* (2001) and Higginbottom *et al.* (2001a) felt that the quality of wildlife interpretation available in Australia needs to be improved in order to realize much of its educational potential, and this situation is probably common worldwide.

### **Political Lobbying in Support of Conservation**

#### **Zoos**

Apart from their role in conservation education, zoos are rarely involved in lobbying for conservation and, where this has occurred, it has usually been through their federations. For instance, the European Association of Zoos and Aquaria has recently launched a substantial public campaign against the bushmeat trade in Africa (EAZA, 2000). This lack of involvement apparently stems from both a belief that this is not a core role of zoos and a reluctance to be seen as being political (Ed MacAllister, Director, Adelaide Zoo, South

Australia, and President, Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA), 12 October 2001, personal communication).

### **Wildlife watching**

There are a number of situations in which wildlife-watching operators have lobbied for conservation of the natural resources on which they depend financially. In Tasmania, many wildlife-tourism operators lobbied the government in opposition to both the proposed damming of the Franklin River and the process of clearfell logging in areas where wildlife operations occur (Nick Mooney, Wildlife Management Officer, Tasmanian Department of Environment and Land Management, Tasmania, 31 March 2000, personal communication). Purportedly as a result of lobbying from Great Barrier Reef tourism operators, the Australian government recently allocated additional funds into research on the crown-of-thorns starfish, which is detrimentally affecting the Reef. However, a number of authors (e.g. Buckley, 2000a; van Oosterzee, 2000) have noted that, unlike other commercial interest groups that depend on natural resources, the tourism industry generally seems to lack awareness of its dependence on natural resources and could be doing much more to lobby for conservation.

### **Providing Socio-economic Incentives for Conservation**

#### **Zoos**

Contemporary zoos not only have a self-imposed commitment to conservation, but they are subject to a sociopolitical imperative to contribute to conservation, enforced by the relevant zoo legislation. For instance, the Secretary of State's revised Standards of Modern Zoo Practice in the UK and the European Union's Zoos Directive both state that in future zoos will have to satisfy conservation requirements to be relicensed (Department of Environment, Transport and the Regions, 2000). Similar legislative require-



ments have been introduced in Australia (Department of Natural Resources and Environment, Victoria, 1998). These requirements reflect a view of society that keeping animals in captivity must be justified on conservation grounds (Conway, 1999b; Tribe, 2000).

In general, however, zoos do not appear to view the need to attract customers as an economic incentive for conservation. Indeed, there is little information about the expectation or satisfaction of visitors with the role of zoos in conservation (Ed MacAllister, Director, Adelaide Zoo, South Australia, and President, ARAZPA, 12 October 2001, personal communication). In the absence of evidence, some zoos seem reluctant to fully embrace their conservation potential, apparently believing that money spent on conservation will not be compensated for by increased visitor revenue (Ed MacAllister, Director, Adelaide Zoo, South Australia, and President, ARAZPA, 12 October 2001, personal communication, cf. Cherfas, 1984). In so doing, such zoos may in fact be missing out on important marketing and fundraising opportunities. Gipps (1993) suggests that the problem with zoo management is its lack of awareness that 'conservation can sell tickets', and, if zoos are to attract visitors and financial support, then they will have to work harder at promoting their conservation activities. For an industry committed to supporting wildlife conservation, it is clear that more information is needed about the role that conservation can play in supporting the industry.

### Wildlife watching

Since wildlife watching, unlike zoos, is dependent directly on the existence of natural populations of wildlife, the existence of this form of tourism can provide operators and/or host communities who benefit from this tourism with a vital incentive for conservation (cf. Buckley 2000b; van Oosterzee, 2000).

In many countries, expected revenue from nature-based tourism has been reported to have provided an economic and political incentive for the creation of government-owned protected areas (Young *et al.*, 1996; Preece and van Oosterzee, 1997; Goodwin *et*

*al.*, 1998). In many cases, the principal attraction involved is wildlife (see EWG, 1995; Isaacs, 2000; Higginbottom *et al.*, 2001a). In the USA, a major increase in participation in non-consumptive wildlife recreation is reported to have helped motivate interest in the protection of natural areas for the benefit of tourism (Vickerman, 1988).

There are also several published examples of wildlife tourism creating an economic incentive for conservation of private lands (see also Higginbottom *et al.*, 2001a). In a survey of 27 private game-reserve managers in South Africa, 48% said that if [wildlife] tourism had not been a commercial option, they would have continued to farm cattle (which is generally considered to be a less sustainable land use in such areas) (James and Goodman, 2000). Across South Africa more generally, successful reintroduction programmes on hundreds of private game reserves and small state reserves are reported to have been motivated largely by the economic incentive provided by wildlife tourism, especially wildlife watching (Stuart Pimm, Professor, University of Tennessee, Knoxville, USA, 10 July 2001, personal communication).

The introduction of wildlife tourism may also provide an economic incentive leading to conservation-orientated changes in wildlife-management practices. This is likely to be of most conservation significance in cases where the wildlife are hunted or taken for live trade for subsistence or commercial purposes. The mountain gorilla is a classic case of a highly endangered species, threatened by poaching, for which it is widely thought that the introduction of tourism has allowed continued survival, largely because of a socio-economic incentive (McNeilage, 1996; Vieta, 1999). A similar argument may apply in more developed countries, where it is most likely to apply to species normally considered to be pests, particularly to agriculture (e.g. Brooke, 1996).

Several international examples (mostly from less developed countries) illustrate links between the implementation of wildlife tourism and increased support for wildlife conservation from local communities, who benefit through income and/or employment. These include political support for a ban on hunting (Parsler, 1997) and apparent increased support

for the protection of wildlife (Groom *et al.*, 1991; Shackley, 1995; Gillingham and Lee, 1999; Higginbottom *et al.*, 2001a). Despite numerous anecdotes, evidence for changes in local attitudes as a result of nature-based

tourism is mostly of poor quality (see Higginbottom *et al.*, 2001a, for more details).

As for zoos, a final socio-economic incentive for wildlife-tourism operators to contribute to conservation is that this may assist them in

**Table 17.1.** Summary of contributions of non-consumptive wildlife tourism to conservation.

Type of contribution	Wildlife watching (free-ranging wildlife)	Zoos (captive wildlife in federated zoos)
Direct wildlife management and research:		
<i>in situ</i>	<ul style="list-style-type: none"> <li>• Significant numbers of mostly small-scale contributions, though minority of operators</li> </ul>	<ul style="list-style-type: none"> <li>• Minority of operators with mostly small-scale contributions, but growing</li> </ul>
<i>ex situ</i>	<ul style="list-style-type: none"> <li>• Very rare; a few cases involving captive breeding and reintroduction</li> </ul>	<ul style="list-style-type: none"> <li>• A major formal objective and the primary way in which zoos contribute to conservation; occurs in all cases</li> </ul>
Providing funding for conservation	<ul style="list-style-type: none"> <li>• Government charges provide contributions in a minority of cases</li> <li>• Significant numbers, though a minority, of operators provide contributions</li> <li>• Donations provided by tourists in a minority of cases; probable unmet potential</li> <li>• Contributions are generally to <i>in situ</i> conservation, often by other organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Government charges do not provide contributions</li> <li>• All operators provide contributions</li> <li>• Donations provided by tourists in all cases</li> <li>• Contributions are generally to <i>ex situ</i> conservation, within the zoo</li> </ul>
Providing education about conservation	<ul style="list-style-type: none"> <li>• Highly variable in quantity and quality between operators</li> <li>• Potential to reach large numbers of people, limited mainly to interpretative displays and signs in protected areas</li> </ul>	<ul style="list-style-type: none"> <li>• A major formal objective; significant efforts in all cases</li> <li>• Potential to reach very large numbers of people; far from fully realized</li> </ul>
Political lobbying in support of conservation	<ul style="list-style-type: none"> <li>• Small minority of cases</li> </ul>	<ul style="list-style-type: none"> <li>• Small minority of cases</li> </ul>
Providing socio-economic incentives for conservation	<ul style="list-style-type: none"> <li>• Major contribution in terms of protected-area creation, especially in less developed countries</li> <li>• Significant contribution in terms of private land conservation, though opportunities for increase in some regions</li> <li>• Minor but growing incentive associated with marketing</li> <li>• No strong sociopolitical imperative for conservation</li> </ul>	<ul style="list-style-type: none"> <li>• Possible incentive associated with marketing, but little recognized</li> <li>• Strong sociopolitical incentive for conservation in some countries</li> </ul>

attracting tourists. Some commercial nature-based tourism operators who make contributions to conservation are at least partially motivated to do so by their perception that this will help them to attract environmentally aware clients, and they incorporate this into their advertising (EWG, 1995; Higginbottom *et al.*, 2001a). Accreditation schemes like Australia's NEAP II (NEAPWG, 2000) are based on the premise that operators will be able to use accreditation (which, at the advanced level, signifies that the operator makes contributions to conservation) to help market themselves. However, there has been no convincing research confirming the validity of this assumption.

### Conclusions

There is clearly a wide range of mechanisms through which non-consumptive wildlife tourism currently contributes to conservation, as summarized in Table 17.1. It is not possible to quantify these contributions, although an indication of their probable scale is given. Further quantitative research is recommended in order to refine the conclusions and recommendations given here. It is, however, clear that, within each sector and collectively, the contributions of non-consumptive wildlife tourism to conservation are significant and probably growing. There also seems to be considerable unrealized potential.

The key strength in relation to conservation potential that is particular to wildlife watching is the economic incentive that this can create for the conservation of natural environments. Such links could be strengthened by wider quantification and publicizing of the financial benefits derived from protected areas and from an increase in government support to private landowners considering implementation of nature-based tourism. The key strengths of zoos lie in their contributions to *ex situ* wildlife management and to intensive education of large numbers of people. However, the extent to which these mechanisms are effective is yet to be established, and it has been argued that the former is an inefficient use of conservation funding. The coordinated approach to conservation efforts

that applies to federated zoos should also help facilitate more efficient channelling of conservation efforts than generally occurs in the free-ranging sector. Efforts by governments and industry associations (such as Australia's NEAP) to achieve greater coordination with and between nature-based tourism operators should be encouraged, although this is difficult since operators are diverse, numerous and typically small. There is considerable common ground between the two sectors in feasible mechanisms for contributing to conservation, suggesting that there may be benefits in zoos collaborating with wildlife-watching operators to learn from each others' experience and achieve greater efficiencies in achieving joint conservation objectives.

While there may be potential for increasing the contributions of non-consumptive wildlife tourism to conservation, there are a number of serious constraints on this potential. The most obvious is the limited capacity of tourists and operators to divert finances and time into conservation. Significant increases in contributions thus depend to a large extent on increasing the tourism income obtained by wildlife-tourism operators and using the existing potential more effectively. However, this will still be constrained by the primarily commercial orientation of some wildlife-watching operators. Another major constraint is the lack of research in this area, particularly in terms of assessing effectiveness of existing mechanisms (especially education) in making a real difference to conservation and in determining the relationship between participation of operators in conservation and their ability to attract customers. Specific actions that can be taken to enhance the contributions of wildlife tourism to conservation are given by Tribe (2000) and Higginbottom *et al.* (2001a). These should occur in the context of a strategic and coordinated approach, involving cooperation between different types of wildlife-tourism operators and other conservation stakeholders. Such an approach should allow wildlife tourism to more fully realize its apparently substantial potential to contribute to conservation.

### Acknowledgements

This research was financially supported by the Cooperative Research Centre for Sustainable Tourism and Hermon Slade Fund. We are grateful to Chelsea Northrope for assisting with the preparation of the manuscript.

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