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## 12. Understanding the impacts of ecotourism on biodiversity: a multi-scale, cumulative issue influenced by perceptions and politics

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### 12.1 INTRODUCTION AND CONTEXT

In this chapter, we explore the complex character of ecotourism as a phenomenon and how this relates to understanding the potential impacts on biodiversity. We consider the importance of biodiversity in identifying natural places as ecotourism attractions and the role ecotourism plays in the conservation of biodiversity. Ecotourism, however, is not without risks in regard to disturbing wildlife and damaging the environment. Positive and negative impacts are therefore identified but the nature of these impacts varies according to the type of ecotourism activities and how the tourism operators meet the tourists' expectations. We will take the view that ecotourism is a specific type of tourism and that, perhaps unlike many other forms of tourism, has an overall positive impact on biodiversity. This is despite that fact that there may be real and recognizable deleterious impacts occurring as a result of tourism development and activities. We are, however, of the view that in comparison to many of the existing threats to biodiversity, ecotourism has the potential for positive outcomes.

The type and severity of environmental impacts are also influenced by political and socio-economic factors that apply in the areas in which the biodiversity occurs. Protected areas, such as national parks, play a vital role in conserving biodiversity and tourism is considered an encouragement for public engagement with conservation that is regarded as central to the role of parks themselves. Protected area managers have an active role to play in understanding what ecotourism is and in promoting sustainable tourism. This is achieved according to the application of different management strategies such as the provision and maintenance of visitor facilities, controlling where tourists go and what they do and in the provision of educational programmes. The potential negative impacts of tourism on biodiversity often interact with wider landscape-level impacts. Such impacting factors that are derived from the landscape matrix include the presence of pest animals, weeds and human-related activities that compromise

biodiversity conservation. Acknowledging that impact assessment can include wider environmental and social issues this chapter focuses on the biodiversity aspects of impact assessment. Accordingly, we conclude this chapter with an exploration of the implications for impact assessment in regard to the complex characteristics of ecotourism and their interaction with biodiversity. This will be achieved by examining the case of the ecotourism–conservation nexus associated with iconic species such as gorillas in Africa. Overall we consider the need to understand the positive and negative impacts of ecotourism on biodiversity at various scales and levels of socio-political complexity. In doing so we unravel the role of people’s and institutional perceptions of what is regarded as an impact and the cumulative effects of a number of land uses and human activities, of which tourism is only one, on biodiversity.

## 12.2 WHAT IS ECOTOURISM?

The complexity of what ecotourism comprises is reflected in the number of definitions that have been developed over the years. Indeed, generating definitions for ecotourism has been something of an academic ‘cottage industry’, with more than 80 definitions published in recent decades (e.g., Hughes, 2013). The multitude of definitions, and associated understandings, can lead to some confusion as to what actually constitutes an ecotourism product (e.g., Newsome et al., 2005; Newsome and Rodger, 2013; Newsome, 2013). Despite the plethora of definitions, most authors have identified a set of common principles across variants of ecotourism. These principles include that ecotourism:

- is a nature-based activity;
- includes environmental education as a core component of the experience;
- adheres to sustainability principles;
- benefits the region or area in which it takes place.

Further to this, ecotourism is considered to occupy a spectrum of products and experiences based on the types of nature-based locations visited, how the experience is managed and where the emphasis lies in relation to the core principles listed above. Ecotourism is thus complex as it encompasses a range of activities from niche market to mass forms of tourism in a variety of geographic locations and scales of focus (Fennell, 2001; Fennell and Weaver, 2005; Weaver, 2005; Beaumont, 2011; Buckley, 2013; Newsome, 2013). This can lead to a range of terminology that spans a spectrum from mass to niche

ecotourism (Newsome et al., 2013), soft to hard ecotourism (Orams, 2001) or 'light' to stringent ecotourism (Buckley, 2013).

Various authors have discussed the core features of ecotourism listed above (e.g., Fennell, 2001; Weaver, 2008; Krider et al., 2010; Buckley, 2013; Hughes, 2013; Newsome et al., 2013). Buckley (2013) noted that while these principles may be common across various manifestations of ecotourism, there is inconsistency in how they are understood and implemented. For example, while most definitions include references to sustainability, few clearly define what this means in practice. Thus the application of sustainability will depend on where one may be in the world and on the tourism agency and tour operator understanding of what ecotourism is. The nature-based setting as a fundamental aspect of ecotourism can also include a range of understandings depending on how nature is defined (ibid.). Thus while there is a broad consensus on the general attributes of ecotourism, the devil is in the detail of the priority of each criterion and how each is applied (Buckley, 2013). Variations in the implementation of ecotourism principles leads to categorizations of ecotourism practice that can include products that are 'lax' or 'greenwashed' through to more stringent forms (ibid., p. 13). How ecotourism is interpreted and hence put into practice has implications for the potential impacts on biodiversity.

Respective conceptualisations of the ecotourism spectrum differ slightly in emphasis suggesting that the spectrum is actually multidimensional (Buckley, 2013). For example, Weaver's (2005) mass to niche ecotourism is based on the numbers of tourists involved, the extent and character of facilities provided and the degree to which the experience is tailored to specific demands of the individual tourist. Mass ecotourism provides a generic product and experience based on facilities designed to cater for large numbers of tourists simultaneously while niche ecotourism affords a tailored experience for small numbers of tourists. In comparison, Orams's (2001) soft to hard ecotourism focuses on the type of natural area accessed in terms of remoteness and ecological integrity. Soft ecotourism occurs in easily accessible locations that are generally ecologically compromised, have visitor amenities and facilities affording modern comforts and a highly structured educational component, while hard ecotourism includes locations that are remote, ecologically pristine, and difficult to access with no or few visitor facilities. From yet another perspective, Buckley's (2013) lax to stringent ecotourism seems mainly based on the extent to which sustainable practices are effectively implemented. Lax ecotourism is essentially greenwash. That is, it purports to be an ecotourism product (perhaps for marketing purposes) but fails to effectively implement any of the core principles associated with sustainable practice. In contrast, stringent ecotourism adheres strictly to the complete set of ecotourism principles. Wherever it falls along the

various spectra, ecotourism is generally focused on sites that are nature based, scenic, contain charismatic or iconic wildlife, exceptional biodiversity or unique natural phenomena. Owing to their uniqueness or diversity and endemism, ecotourism sites are also often biodiversity 'hotspots' identified in part by being rich in species, habitats or ecosystems that may also be threatened with degradation, loss and even extinction (e.g., Myer et al., 2000).

### 12.3 BIODIVERSITY AND ECOTOURISM

As with ecotourism, biodiversity is a concept with a range of definitions and applications. In its literal sense, biodiversity refers to the variety of life but what this means both as a concept and in practice is harder to define consistently (Maier, 2012). Biodiversity is generally conceived as variety of the biotic elements of an environment at a range of scales. Biodiversity may be considered at a local, regional or global scale and involves a variety of discrete measures that can include abundance, richness and evenness (Myers et al., 2000). For example, biodiversity can refer to species quantity and diversity (including genetic diversity) within a habitat, habitat quantity and diversity within an ecosystem and so forth (Magurran and McGill, 2010). Depending on how it is defined will determine how impact is measured and hence, assessment of the influence of activities such as ecotourism on biodiversity. Measuring and assessing biodiversity is problematic due to the difficulty of precise definition, its fluctuating nature, difficulties in comprehensively measuring all biotic components at a given scale and specificity to geographical, biological and temporal context. As such, there are no benchmarks for what is 'good biodiversity' that can be generally applied (Maier, 2012, p. 501). This means that in many cases ecotourism impacts on biodiversity can be challenging to assess.

Aside from scientific measures of biodiversity, tourist perceptions play an important role (such as ascribing a subjective value) in determining the usefulness and quality of an environment as suggested by notions such as the 'tourist gaze' (Urry, 1992). Tourism, including ecotourism, at a destination is an experiential product co-constructed by the tourist as a consumer of the experience together with the operator or tourism manager as the supplier of the experience. The various classifications of ecotourism reflect this dynamic where mass ecotourism at a highly managed location may be construed as a real or valuable nature experience by some individuals while others may only consider a niche-market, remote-area experience as true ecotourism (Rolston, 1998; Waitt et al., 2001; Hughes, 2013). Along a similar vein, a non-expert individual may view a highly degraded natural area as pristine nature despite its poor measures of biodiversity, and obtain just as satisfactory an experience and associated benefit as would an

expert in a remote relatively pristine natural area with ‘good biodiversity’ (Hughes, 2013, 2014). That is, most tourists understand nature based on the experiential appreciation of biota that represent the broader concept of nature. For example, a tree or a wild animal is a symbolic representation of the broader idea of nature (metonymic cues). Therefore, for some people a satisfactory and valued nature experience can be achieved merely by viewing individual biota. In contrast, biodiversity is a scientific concept that in itself cannot be experienced in the same way, but is measured according to a range of rational assumptions (Maier, 2012; Hughes, 2013). This highlights a difference between conceptions of nature and how it relates to biodiversity, which are important when considering the range of ecotourism and the potential impacts it can have.

Despite the complexities, there are reported measureable relationships between ecotourism and biodiversity. For example, Siikamäki et al. (2015) found that the annual number of visits to specific national parks in Finland was positively correlated with biodiversity measures. Biodiversity was quantified according to the number of Natura 2000 habitat types and occurrence of species on the IUCN Red List within respective Finnish national parks. Further, recreation within the national parks tended to focus on what could be termed ‘hot spots’ with high biodiversity values. Similar to the biodiversity measure described by Siikamäki et al. (2015), Dawson et al. (2015, p. 133) established a link between biodiversity and ‘last-chance tourism’ based on a positive correlation between tourism demand and the threatened status of a range of natural phenomena at varying scales. They identify this phenomenon as tourism demand based on the perceived last chance to see threatened species or habitats before they disappear, or unique ecosystems and landscapes undergoing irreversible changes. This may include mass ecotourism-type experiences such as polar bear viewing in Manitoba, Canada. It may also include niche ecotourism experiences such as the ‘Climate Change Challenge, Mt Kilimanjaro Mission’ (p. 140).

The Tree Top Walk in the Southwest of Western Australia is a specific example of mass ecotourism discussed by Hughes (2013). This ecotourism experience is located in a recognized global biodiversity hotspot within a remnant area of degraded forest consisting of the endemic giant red tingle tree (*Eucalyptus jacksonii*). An extensive agricultural area surrounds the remnant forest. The site is accessible and has purpose-built facilities and amenities that cater for up to 200 000 visitors per year. The site is designed with a strong emphasis on environmental education and sustainable practice intended to minimize visitor impact on the forest environment. Local environmental benefits include a significant reduction in littering, trampling, soil compaction and tree damage compared to the original site configuration as well as some socio-economic benefits through employment of local residents for

operations and maintenance of the site. These attributes arguably place the Tree Top Walk as an ecotourism experience that occurs on a mass tourist scale but that is managed based on the core principles of ecotourism to minimize negative impacts and promote positive impacts on the site and region.

## 12.4 UNDERSTANDING THE IMPACTS OF ECOTOURISM ON BIODIVERSITY

Ecotourism, as with any form of tourism, will inevitably have impacts on the locations where it occurs and these may be both negative and positive. The extent and direction of impacts are likely to vary in direct relation to where on the various spectra an ecotourism activity falls. That is, impacts can occur at different temporal and geographic scales depending on the type of ecotourism and when and where it takes place. In other words, the impacts of ecotourism are complex to measure because they are context specific (Hughes and Carlsen, 2008). For example, the case of viewing gorillas in Uganda, described in this chapter, is focused on a specific species that resides in a small geographic location while each encounter is tightly controlled in terms of duration and proximity between tourists and gorillas. Most biodiversity-related impacts in this case would be confined according to the restricted area and time spent with the gorillas. In contrast, wildflower viewing in Western Australia is focused on a wide range of species, occurs across a large geographical area with the season lasting several months. In this case impacts of tourism activity dispersed across such a wide range of parameters are likely to be more widespread geographically and temporally (Mason et al., 2015).

While specific to context, there is a range of potential negative impacts that can include disturbance to various wildlife behaviours such as foraging, nesting or resting, habituation of wildlife to humans through provisioning, desensitization of wildlife to humans and other potential threats (Hughes and Carlsen, 2008). For example, Lewis and Newsome (2003) noted that poorly regulated ecotourism activity centred on stingrays was associated with a risk of injury to the stingrays – an interesting example of trampling animals rather than vegetation! Muellner et al. (2004) and Biggs (2013) noted that an activity as apparently benign as bird watching can result in disturbance to nesting and other behaviours if occurring during sensitive breeding times or if playback calls are used to attract birds. Poorly managed ecotourism focused on turtles can lead to nest damage (Tisdell and Wilson, 2002). Adverse impacts may also occur to habitats and broader ecosystems through littering, removal or trampling of flora, soil compaction and erosion, and spreading or introduction of pathogens (such as the soil-borne water mould *phytophthora*), unless there is proper management (see, e.g., Ballantyne and Pickering, 2012; Ramchurjee, 2013; Newsome et al., 2013; Fennell, 2015; Mason et al., 2015).

Positive impacts cited in the literature include increased public environmental awareness through education, economic contributions to local areas through visitor expenditure and ecotourism enterprise and motivation for conservation of natural phenomena based on value as an ecotourism focal point. Along these lines, authors such as Siikamäki et al. (2015) and Dawson et al. (2015) argue that the positive correlations they identify between ecotourism and biodiversity measures highlight the role ecotourism can play in promoting biodiversity conservation. For example, while Dawson et al. (2015) point out the potential negative impacts of last-chance tourism in ecologically sensitive locations, they also highlight the opportunity to harness ecotourism demand to provide an incentive to support the endangered system. They note that such ecotourism affords an opportunity to raise public awareness through education, generate local economic benefits through visitor expenditure and related business and hence promote conservation of threatened species and systems. In Torres del Paine Biosphere reserve in Chile, ecotourism has been considered to potentially promote conservation of a rare orchid species (Vidal et al., 2012). Other authors also identify specific examples where development of ecotourism could serve to encourage conservation of unique biodiversity and natural phenomena (see, e.g., Munn, 1992 on macaws; Schwitzer et al., 2006 on lemurs; O'Connor et al., 2009 on whales; Anderson et al., 2011 on manta rays; Cisneros-Montemayor et al., 2013 on sharks; Newsome and Hassell, 2014 on biodiversity). The ecotourism demand for rare and threatened examples of biodiversity fits closely with the notion of biodiversity 'hotspots' as defined by Myers et al. (2000) and could thus assist with conservation of endangered species in such areas. Although ecotourism impacts can include various negative aspects, the primary difference between ecotourism (which adheres to specific core principles) and other forms of tourism and recreation lies in ecotourism's emphasis on managing impacts for the benefit of the nature-based setting in which it occurs. This chapter further details a specific case in Africa where ecotourism can function to promote biodiversity conservation as part of a broader regional management context.

## 12.5 AN EXAMPLE OF THE SOCIO-POLITICAL AND ECONOMIC CONTEXT OF ECOTOURISM AND ITS RELATIONSHIP WITH BIODIVERSITY

### 12.5.1 Psycho-social Touristic Context

A driving force in regard to the relationship, and therefore importance, of ecotourism to biodiversity is the focus that is often placed on rare, iconic, beautiful and interesting species. This is exemplified by the words of Nigel Collar (Birdlife International) who wrote: 'The immeasurable diversity of wildlife is one



of the richest sources of curiosity, stimulus and emotional satisfaction we possess: we cannot value its wealth in dollars, and we cannot calculate its power in terms of utility' (Collar, 1986, p. 18).

To a certain extent, a dollar value can be assigned to the wildlife viewing experience and compared with other land uses that may not be as sustainable (e.g., logging) or remunerative (e.g., agriculture on nutrient poor soils). Collar (2003) went on to write that according to the 'present' trend, and into the future, the continued attitudes and activities of humans will result in large areas of the Earth being devoid of wild areas and that the quality of all human life will be compromised as a result of this degradation. Many concerned scientists and specialists have argued that Collar's reflections on the value of biodiversity as an expression of humans experiencing a 'freedom of the mind' can be realized through tourism. People have a deep interest in wildlife and wild places (e.g., Newsome et al., 2005, 2013) that is often expressed through a strong interest in conservation (e.g., Buckley, 2009). Such ecotourism development (as described by many, e.g., Page and Dowling, 2002; Buckley, 2009) is also important in engaging local communities, such as those that live in the vicinity of biodiversity, in conserving rather than overly exploiting their natural resources (e.g., see Newsome and Hassell, 2014).

Perhaps no greater example of the sentiment highlighted by Collar (1986) is that expressed by tourists who undertake ecotours to Africa to experience great apes (bonobos, chimpanzees and gorillas) in the wild. An indication of the emotional interest and impact of many ecotourism ventures that focus on spectacular and interesting wildlife is exemplified by tourist statements on TripAdvisor (Box 12.1).

<Insert Box 12.1 around here>

### **12.5.2 The East African Afromontane Biodiversity Hotspot and Tourism**

The East African Afromontane Biodiversity Hotspot comprises an arc of mountains and rift valley that extends from Saudi Arabia to Mozambique. According to Birdlife International (2012) the area contains 2350 endemic plants and 1300 bird species, 110 of which are endemic to the region. There are also 100 endemic mammals out of a total of around 500 species. Iconic species include the great apes such as the eastern chimpanzee and Grauer's gorilla. Moreover, Birdlife International (2012) also note that only about 10 per cent of original vegetation remains intact and only 15 per cent of that total land area is officially protected. Important conservation efforts include the development of policies focusing on the co-benefits of biodiversity conservation, improving the protection and management of key areas and the sustainable financing of conservation corridors and key conservation areas.

The Albertine Rift is part of the western Rift Valley of Africa but also comprises the Rwenzori Massif and Virunga volcanoes and, because of significant endemic and endangered species, is recognized as one of the most important conservation sites in Africa (Plumptre et al., 2007). Important protected areas include the Virunga and Kahuzi Biega National Parks in the Democratic Republic of Congo and the Bwindi Impenetrable and Kibale National Parks in Uganda.

In East Africa, Uganda for example, a range of natural features and biodiversity are advertised and marketed in the tourism promotion literature and related websites for trips to protected areas. Some key Ugandan ecotourism products include open plains safaris, large herds of African wildlife, tree-climbing lions, butterflies, tropical forests, iconic mountain scenery, bird watching (especially for iconic birds such as the shoebill and Albertine endemics) and treks to see gorillas and chimpanzees in the wild (e.g., see Naturetrek, 2013; Natural World Safaris, 2016). Two key protected areas namely Bwindi and Kibale National Parks, both of which contain significant plant and animal biodiversity, (Figures 12.1 and 12.2) are highly significant ecotourism destinations in Uganda.

<Insert Figure 12.1 around here>

*Figure 12.1 Pyramid of ecotourism interest in Bwindi National Park, a protected area occurring in the East African Afromontane Biodiversity Hotspot. Tourism facilities form the base of the pyramid to illustrate the point that tourism can support the biodiversity on which it depends*

<Insert Figure 12.2 around here>

*Figure 12.2 Pyramid of ecotourism interest in Kibale National Park, a protected area occurring in the East African Afromontane Biodiversity Hotspot. Tourism facilities form the base of the pyramid to illustrate the point that tourism can support the biodiversity on which it depends*

Bwindi National Park is where tourists go to experience mountain forest and especially the gorilla groups that occur there (Figure 12.1). Kibale National Park is a middle altitude forest site with the main focus being on chimpanzees and birds (Figure 12.2). The conceptual diagrams, represented as a pyramid of tourism interests, serve to illustrate that tourist interest in a specific iconic species can have wider conservation implications as protection of habitat is vital to conservation of species of major tourist

interest. Moreover, by conserving the habitat of the aforementioned iconic species other ecotourism values can be realized by virtue of tourism-related (e.g., bird watching) biodiversity conservation outcomes. Gorillas and chimpanzees as represented at the top of the pyramid thus comprise highly valued ecosystem components of the total biodiversity of these aspects of the East African Afromontane Biodiversity Hotspot.

In Uganda there are 11 habituated gorilla groups that can be seen by tourists. There are four habituated groups located at four different locations in Bwindi National Park. Park management (Figure 12.1) issues 32 permits daily for small-group (six to eight people) excursions to view the different groups of wild mountain gorillas. To ensure minimal impact on the gorillas, and as progress towards sustainable tourism, only a limited number of permits are issued each day. There are very strict rules of conduct in order to ensure safe viewing and minimal disturbance to the gorillas (e.g., see Bwindi National Park, n.d.). The rules focus on aspects such as one visit to a particular group a day, stays are limited to 1 hour and there is guide-controlled maintenance of safe observation distances.

The habituation programme and rules for tourist interaction are designed to minimize the negative impacts of tourism on target species. However, various workers have reported problems associated with gorilla tourism and close contact between humans with gorillas such as the risk of human-carried disease especially affecting gorilla groups (e.g., Bermejo et al., 2006; Rwego et al., 2008; Mittermeier et al., 2013). Such problems have also been reported in regard to ecotourism that is centred on chimpanzees (e.g., Johns, 1996; Goldberg et al., 2007; Humle, 2011).

Despite such potential problems there is a strong opinion that ecotourism primarily benefits great apes in Africa. For example, Lepp (2007) found that at Bigodi (a bird watching and primate site for international tourists) in Uganda, local people benefited from ecotourism in terms of income and community development (positive environmental impact). At Bwindi National Park there are lodges directly associated with the gorilla trekking activities and additional accommodation and services available for ecotourists beyond the borders of the park. Many of the 'high end' accommodation providers in Uganda pride themselves on their sustainable approaches to tourism development. Claims of sustainability relate to the design of ecotourism accommodation facilities as well as use of local produce and materials.

Tourist spend in Uganda confers, and has the capacity to increase, significant positive economic impacts (Moyini, 2012). Having recognized the positive economic impacts of wildlife-based ecotourism in Uganda in particular, some authors have reported the economic situation to be complex and value

driven. Adams and Infield (2003) reported on the complex relationships between multiple stakeholders surrounding the economic benefits of gorilla tourism. Of particular interest is the work of Laudati (2010) where the role of ecotourism as a positive socio-economic benefit is explored in the context of poverty alleviation. Laudati (2010) asserts that the expectation of foreigners (ecotourists) to experience 'untouched and pristine wilderness' may impact on some local communities., for example by excluding them from natural areas, because they were traditionally (or are) dependent on natural forest products for their livelihoods. This last point provides a useful segue into the final part of this chapter where the complex interaction between ecotourism and biodiversity and the context of Environmental Impact Assessment can be considered in regard to a complex mix of socio-economic and environmental factors.

## 12.6 WHAT CAN BE LEARNT IN REGARD TO THE IMPACT ASSESSMENT OF ECOTOURISM ON BIODIVERSITY?

In understanding the environmental impacts of ecotourism on biodiversity it is important to consider the broader socio-political context in which this issue sits. The Eastern Afrotropical Biodiversity Hotspot population of eastern gorillas has been and still is insecure due to intense pressure from armed rebels. Benz and Benz-Schwarzburg (2010) note that all countries where great apes live have had some kind of war since 1946 and that resources are damaged and lost during war due to the absence of effective controls and poor law enforcement. A significant issue has been the proliferation of firearms together with a breakdown of law and order and increase in illegal poaching and logging (Mittermeier et al., 2013).

Another important problem relating to the conservation of great apes in Africa is deforestation (e.g., Walsh et al., 2003). Mittermeier et al. (2013) recognize the rapid removal of forest outside protected areas as a significant threat. In West Africa 80 per cent of original forest cover is gone and one national park in the Ivory Coast lost more than 90 per cent of its forest cover in less than ten years. There is significant loss of forest where the great apes occur, much of it associated with human population growth (ibid.). This problem is slower in the Congo Basin than in other areas but is likely to increase with future expansion of industrial agriculture (ibid.). While forest clearing at mine sites completely destroys natural habitat this is usually quite localized and it is the associated infrastructure such as service roads that facilitate penetration into remote areas that exacerbate other detrimental factors (e.g., Figure 12.3). Poaching is a major problem in Africa and logging plus mining roads allow rapid access to areas that would otherwise require foot journeys that could take weeks. Hence, the penetration of roads for logging

and mining tends to speed up the poaching problem while newly created roads also attract settlers who clear forest for subsistence farming.

<Insert Figure 12.3 around here>

Source: Photograph by Sue Littleton.

*Figure 12.3 Logging access road traversing lowland tropical rainforest Cameroon, West Africa*

There is a long history of the hunting of great apes in Africa especially if it is/has been part of cultural behaviour of particular cultural groups (ibid.). In this regard Leverington et al. (2010) reported that hunting, killing and collecting animals, logging and wood harvesting were the most significant threats to the conservation of species and protected area management effectiveness at the global scale. According to Mittermeier et al. (2013) the western lowland gorilla population in Gabon has declined by 50 per cent from 1980 to 2000 due to a combination of poaching and deaths due to gorillas contracting the Ebola virus. The virus is a major threat to both the western lowland gorilla and human populations in Central Africa (Rizkalla et al., 2007) and while there are health programmes aimed at helping the human populations there are no such programmes for the apes. As stated previously, international tourists, as well as locals, are potential carriers of disease such as measles and influenza to gorilla populations. However, Humle and Kormos (2011) reported that the main cause of death in eastern and western populations of chimpanzees was Ebola associated with ape–human contact, probably via contact with animals killed for the bush meat trade, and because the great apes are highly tactile, the ready spread of the virus from contact with dead/diseased animals (e.g., see Rouquet et al., 2005). Fragmentation of landscapes has also been implicated in the spread of the ebola virus in Africa (Laporta, 2014).

It is thus evident that the conservation of great apes in Africa serves as an example of how ecotourism can function by adding economic and employment values to local communities. Mittermeier et al. (2013) note that the mountain gorilla population in Uganda is increasing and this is likely to be strongly connected with the ecotourism value of these animals and their habitat. However, problems, even with the supposed benign character of ecotourism, such as the risk of human-carried disease transmission to target species, are apparent. Despite this, and compared to other pressures, effectively managed ecotourism can be a positive activity in regard to the conservation of biodiversity. Most of the great apes

in Africa reside in protected areas but even in these places there can be problems of hunting and poaching for food and traditional medicines. These latter issues are regarded as significant problems where there is inadequate protection and park management. This has been identified as a problem by Leverington et al. (2010), who have reported on poor management effectiveness in many of the world's protected areas. These problems occur at various scales such as landscape-level impacts such as pollution, agricultural encroachment, invasion of pest species, illegal logging and inadequate resources to manage a particular park or other type of protected area.

At the same time the future of great ape conservation beyond existing protected area networks (which are potential ecotourism resources) due to deforestation is especially problematic where there is a combination of existing agriculture, rapid human population growth, a lack of enforcement controls on illegal logging (either due to corruption or inadequate park management effectiveness) and planned industrial agricultural projects. Newsome et al. (2013, pp. 195–9) discuss the problem of potential loss of important ecotourism resources and wildlife connectivity. There is a major problem when there are dominant government policies that emphasize agriculture, mining (e.g., Figure 12.4) and timber rather than wildlife-based ecotourism!

If there are no specific reasons for tourists to visit areas that have high biodiversity, governments will not easily be convinced to protect them especially in the absence of financial incentives. In this regard, Environmental and Social Impact Assessment especially needs to be considered in the context of places that are high in biodiversity that have no ecotourism. For example, almost a decade ago, Plumtre et al. (2007) made an important point in regard to the biodiversity of the Albertine Rift. They noted that those areas that remained unrecognized and not properly protected or designated as protected areas are lost opportunities for positive impact ecotourism development. However, this additional ecotourism potential is also dependent on constructive political views and social stability.

<Insert Figure 12.4 around here>

*Note:* Madagascar is one of the world's most significant biodiversity hotspots. Many plants and animals are at low population levels and existing protected areas are at risk from poor management

*Source:* Photograph by David Newsome.

*Figure 12.4 Photograph of currency in Madagascar reflecting dominant government policy in regard to environmental assets*

## 12.7 AN ENVIRONMENTAL IMPACT ASSESSMENT FRAMEWORK IN REGARD TO THE ECOTOURISM–BIODIVERSITY NEXUS

Environmental Impact Assessment (EIA) has been conceptualized as a process that directs decision-making toward sustainability (Hughes and Morrison-Saunders, 2015). In this sense it shares common ground with ecotourism in having sustainable practice as a core ideal. Despite its sustainability claims, EIA is traditionally focused at the specific project level and generally emphasizes minimization of negative impacts (Gibson, 2013). Ecotourism's core principles include contributions of site and regional benefit in addition to minimizing negative impacts. Furthermore, the impact of ecotourism on biodiversity can be understood at a range of geographical and temporal scales. While these are ideals, in practice ecotourism can vary widely in application as indicated by the multidimensional spectra discussed earlier in this chapter. In line with this, Hughes and Morrison-Saunders (2015) note a trend in EIA towards consideration of impacts in the context of broader scales and provision of benefits rather than simply mitigating costs, referred to as sustainability assessment. This trend in EIA recognizes that individual activities and impacts at a specific time and place have implications at the wider scale, resulting in incremental cumulative effects (Gibson, 2013). It also recognizes that the impacts of a specific activity, such as ecotourism, is one impact among many, for example poaching, logging and mining. The recognition of system-wide regional contexts in EIA complements a need to move toward consideration of the broader context in regard to ecotourism impacts within the wider socio-political and geographical context as exemplified by great apes as an ecotourism attraction in Uganda.

The complex, nuanced character of ecotourism and biodiversity and how they relate to each other presents challenges in terms of applying EIA methods. Effective application of EIA requires a clear set of criteria and specific objectives (indicators) in order to determine the type and extent of impact of a specific activity at a given location and to identify actions to minimize any negative impacts (Dahlitz and Morrison-Saunders, 2015). EIA indicators are usually context specific, determined by the type of project being assessed, its site location and time frame. The UNWTO (2004) developed some very general concepts that tourism impact indicators should address that basically reflect the core principles of ecotourism. These include:

- reduction of negative environmental impacts;
- generation of positive impacts;
- information and environmental interpretation;
- contributions toward nature conservation.

Spencely and Bien (2013, p. 409) take these into consideration, along with other international ecotourism-related criteria when outlining a set of ecotourism standards that are also quite general, perhaps due to the complex character of ecotourism and its impacts on biodiversity. These include the presence in an operation of:

- a focus on personal experiences of nature;
- interpretation and education that raises awareness of nature;
- an active contribution to biodiversity conservation;
- positive economic and social contributions to local communities;
- local community involvement;
- locally appropriate scale for tours, accommodation and attractions.

It is evident from past research cited in this chapter that the impacts of individual ecotourism operations and developments are case specific and rely on a series of conditions associated with the type of activity and when and where it takes place. With this in mind, and in consideration of the ecotourism multidimensional aspects, EIA in relation to ecotourism might consider indicators based on generally applicable criteria at the wider scale. Drawing on the evidence presented in this chapter, and the trend in EIA toward consideration of the broader scale, Table 12.1 outlines a set of 'big picture' principles that apply to ecotourism and the broader context in which it occurs. What is important here is that the extent to which ecotourism principles can be effectively implemented in a given location is reliant on the broader context in which it occurs. As a consequence this influences the character and scale of impacts that may result from ecotourism developments and activities.

*Table 12.1 Big picture principles for ecotourism EIA at a given location*



<Insert Table 12.1 around here>

As suggested by the case of ecotourism focused on great apes in Uganda, another possible approach could be consideration of impacts that may occur in the absence of ecotourism. The case studies highlight the circumstance whereby the presence of ecotourism has provided the rationale for biodiversity conservation. Conserving the great apes requires conservation of the broader ecosystem in which they reside and depend on for survival. While ecotourism may pose some threat as noted in the literature, these threats should be considered relative to the potential impacts that may occur in the absence of ecotourism in this region. It is strongly evident that if there were no demand by tourists to see great apes in Uganda, the area in which they reside would be exposed to other land use pressures that are currently held in check by the higher priority given to ecotourism. Governments and land managers will prioritize land uses according to the perceived relative benefit respective land uses afford (Hughes et al., 2013). Land uses that are considered of greater importance or benefit will displace those of lesser status. If great ape-based ecotourism did not exist or did not afford significant benefits, other land uses would encroach on the area, precipitating a potentially greater threat to the apes, their habitat and the associated biodiversity. Therefore, if EIA was to be conducted on an ecotourism operation, consideration of the broader political, social and geographical context is vital to establish the relative impacts of ecotourism in terms of the alternative land uses that could occur in its absence.

## 12.8 CONCLUSION

Ecotourism spans a multidimensional spectrum based on attributes such as organism identity, location and accessibility, scale as well as implementation (Fennell, 2001; Weaver, 2005; Fennell and Weaver, 2005; Beaumont, 2011, Buckley, 2013; Newsome, 2013). The negative and positive impacts of ecotourism can vary depending on where on these various spectra a particular development or activity resides. While negative impacts of ecotourism have been widely reported, particularly in relation to sensitive natural areas, there are also positive impacts primarily focused on facilitating conservation of biodiversity (e.g., Schwitzer et al., 2006; Anderson et al., 2011; Cisneros-Montemayor et al., 2013; Hughes, 2013; Dawson et al., 2015; Siikamäki et al., 2015). This is based on the effective application of fundamental ecotourism principles such as minimizing negative impacts, providing local benefits, promoting biodiversity conservation and adhering to sustainability principles more generally.

Given that ecotourism is generally focused on biodiversity hotspots, and reliant on the establishment of protected areas, it may be construed that the absence of ecotourism could result in biodiversity being lost. Ecotourism thus values biodiversity in situ, whereas other pressures and land uses may generally involve extractive or destructive practices that result in fragmentation and loss of biodiversity. Accordingly, ecotourism promotes ecosystem integrity that is essential for the conservation of biodiversity. Moreover, EIA in theory should determine the most appropriate land use for a given area or location according to the environmental values that have been identified as important. Such values, however, depend on various political, regional and management contexts. As evidenced by the Ugandan great ape cases, the absence of ecotourism could translate into an absence of the local and regional benefits (economic and social) afforded to the community. Ecotourism benefits result in a high value being placed on the region's biodiversity and hence its conservation. It is strongly evident that the great ape-based ecotourism operations in Uganda have displaced (or held at bay) other pressures such as mining, logging, agriculture and hunting. It is highly probable that the absence of ecotourism in this context may facilitate the expansion of other land uses that pose a significantly greater threat to biodiversity values.

## NOTE

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