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Preliminary Title

Revisiting Duffus and Dearden's Wildlife Tourism Framework

Introduction

Thus, it should almost go without saying empirical research is enhanced by being based on explicit theory as a framework for asking questions, while the results are interpreted—and perhaps later reinterpreted—within the context of that theory and new and evolving theories. Conversely, theory does not exist in a vacuum, but needs to be tested, supported, or modified in the empirical realm.(Jackson 2005 pp10-11)

Cohen (1995) observed that, while there is an abundance of theoretical perspectives in tourism, most have escaped vigorous empirical testing. Compounding this, there had been an explosion of field studies which were not clearly connected to a theoretical base (Cohen 1995). A decade and a half has passed since Cohen made this observation, and, although tourism as an area of research has progressed considerably, there is still scope in many areas for greater integration of theory and empirical research. Wildlife tourism presents itself as one such area demanding greater attention. Despite wildlife tourism's relatively recent emergence as a discrete academic field, sufficient time has lapsed and sufficient literature has been accumulated for greater insights into its underpinnings to evolve. Consequently, the purpose of this paper is to review the developments in wildlife tourism research focusing on Duffus and Dearden's (1990) wildlife tourism framework.

Wildlife tourism can be broadly viewed as any tourist activity that has wildlife as its focus of attraction. This can either be in the form of consumptive (i.e. hunting and fishing) or non-consumptive (i.e. wildlife watching) activities and can be based on either captive or free ranging wildlife (Higginbottom 2004). Duffus and Dearden coined the term non-consumptive wildlife-oriented recreation (NCWOR). They focused their attention on the non-consumptive free ranging form: "a human recreational engagement with wildlife wherein the focal organism is not purposefully removed or permanently affected by the engagement" (Duffus and Dearden 1990 p215). For the purpose of this paper 'wildlife tourism' which focuses on non-consumptive uses of wildlife will be used in place of NCWOR since this is the more frequently employed term in the wider literature. Duffus and Dearden (1990) essentially hoped to demonstrate through their conceptual framework, that a multi-disciplinary approach is required by both managers and researchers in order to enhance wildlife conservation and the visitor experience appropriately. Until recently their theory has remained highly

respected, but gone largely untested. Given a number of recent developments in the literature of wildlife tourism and in tourism more generally it is pertinent to discuss Duffus and Dearden's (1990) wildlife tourism framework in light of these recent studies.

Duffus and Dearden Wildlife Tourism Theory

Duffus and Dearden (1990) were the first to propose a conceptual framework for understanding the complexities of non-consumptive wildlife tourism (Figure 1). They brought together research from a range of different disciplines, including biology, recreation, tourism, animal behaviour, and wildlife management to create their model. Their work was conceived at a time when there was a transition in wildlife tourism management, from perspectives that focused on bag limits, to a multi-disciplinary approach attempting to understand and manage the complexities of wildlife tourism. Their framework identifies three major dimensions of wildlife tourism interaction, namely, the wildlife tourist; the focal species and its habitat; and the historical relationships between them. From this platform they then discuss the relationships between these components of wildlife tourism.

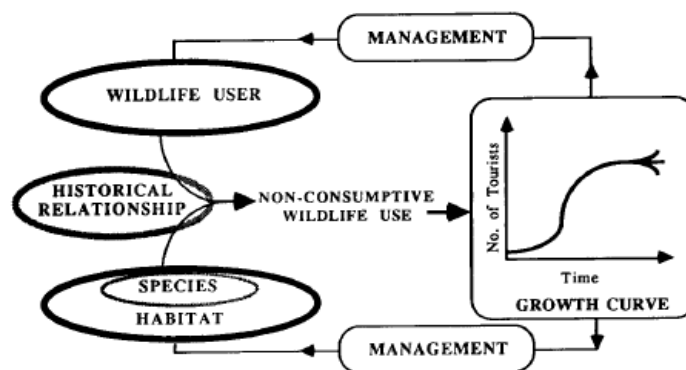


Figure 1: Duffus and Dearden's wildlife tourism framework

Source: (Duffus and Dearden 1990)

Duffus and Dearden (1990) state that the popularity of a species for a tourism focus is largely dictated by the historical relationship between humans and that particular species. They contend that this demand for the physical or experiential consumption of a particular species is a direct result of prior human impact on the species and its environment. That is, tourists are drawn to species that are rare or uncommon, which is often a result of increased past or present negative anthropogenic pressures. On the other hand, the opposite is true for animals

that are regularly or readily seen, such as domestic pets and agricultural species. In addition to the availability of a species, tourists' cultural perceptions also govern the degree to which animals they hold different species in high regard, with animals that are perceived as dangerous to humans likely to be more popular than innocuous species. The second component of the framework concerns the wildlife itself. Duffus and Dearden (1990) contend that wildlife tourism typically relies on the regular occurrence of the target species over a relatively small area. Furthermore, they argue that it is integral, albeit difficult, if the tourism interaction is to be sustainable that behavioural and reproduction indicators be identified since this will enable monitoring to determine potential negative impacts from the human-wildlife interaction. Ultimately in their framework, Duffus and Dearden consider the wildlife tourist. This element is constituted by people seeking non-consumptive encounters with wildlife for the purpose of recreation. They argue that a combination of personality variables, including motivation, and socio-economic status both enable and drive a person to seek a wildlife encounter.

Duffus and Dearden's (1990) next step, after defining the major components of wildlife tourism, involves the development of the interaction between these three dimensions of wildlife tourism. They state that, regardless of the type of interaction, whether it involves a large commercial operation or is centred on an individual's initiative, wildlife tourism industries are dynamic and involve change, both at a user and at a site level. Specifically, as the site changes, the type of user it attracts will change, and *vice versa*. Moreover, they argue that, initially, a wildlife tourism activity will attract explorative users who, in the context of wildlife tourism, are predominantly wildlife specialists. That is, they are people who are knowledgeable and skilled, and require minimal infrastructure and interpretative materials in order to achieve their wildlife interaction experiences. Due to their increased awareness of the environment and their smaller numbers, there is normally only minimal impact on the environment and the focal species. As the popularity of a site increases, they argue, there is an increase in the proportion of generalist wildlife tourists. Generalists, who occupy the opposite end of the spectrum from specialists, require greater facility development and more mediation between themselves and the focal species. Furthermore, without adequate management interventions, generalists place greater pressure on both social and natural environments. Thus, as a wildlife tourism activity evolves to meet the demands of generalists, specialists are marginalised and are likely to seek other out other areas. To explain these dynamics, Duffus and Dearden (1990) integrated three tourism/recreation models—Butler's

tourism life-cycle, Bryan’s leisure specialisation continuum, and, lastly, the Limits of Acceptable Change concept to produce the model seen in Figure 2.2. It is this integral platform that will receive the greatest focus of this paper.

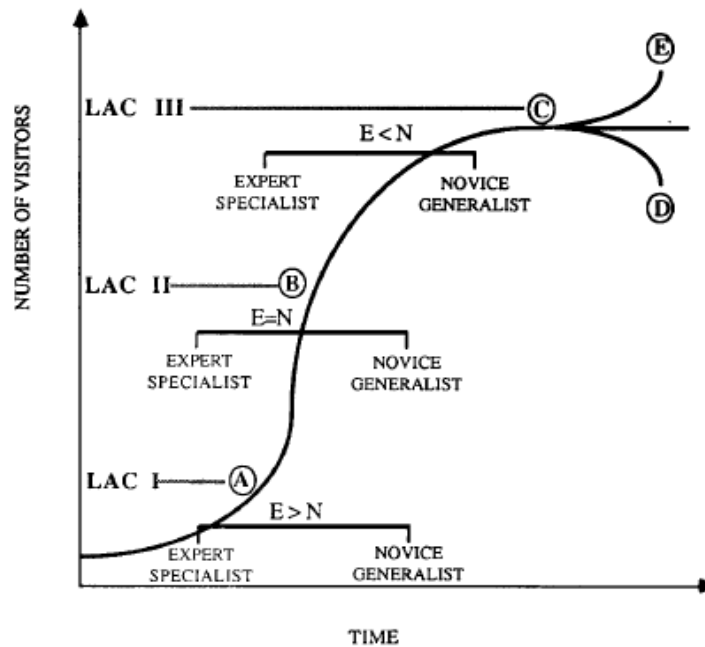


Figure 2: Duffus and Dearden’s wildlife tourism framework, relationship between user and site evolution

Source: (Duffus and Dearden 1990)

Other Wildlife and Nature-based Tourism Concepts

Duffus and Dearden (1990) were not the only theorists to conceptualise wildlife tourism. A few years later Orams (1996) published his model of wildlife tourism interaction. However unlike Duffus and Dearden, Orams (1996) focused solely on classifying the different management alternatives—physical, regulatory, economic, and educational. In particular, he advocated the potential of interpretation (educational management strategies) to enrich and control human wildlife interactions. Several years later Reynolds and Braithwaite (2001) published their conceptual framework for wildlife tourism, taking a somewhat similar perspective to that offered by Duffus and Dearden. Using a systems framework, Reynolds and Braithwaite (2001) categorised the major components of wildlife tourism—the product; favorable conditions; motivations of participants; quality factors of the experience; and

impacts on the wildlife. They consolidated their discussion to create a matrix of wildlife tourism encounters with four degrees of encounters, ranging from high effect/enthrallment experiences that need to be carefully managed to low impact quasi-wildlife experiences such as wildlife text books. Reynolds and Braithwaite (2001) adopted a different emphasis to that of Duffus and Dearden (1990), giving greater attention to dissecting and categorising wildlife tourism rather than providing a focus on change management. However, while their model is highly descriptive and provides intricate detail on various aspects of wildlife tourism, it does little to provide a predictive model that can forecast development, change, and sustainability in a wildlife tourism situation. As stated by Butler and Waldbrook (1991 p3) “It is clear that tourism is extremely dynamic and that destination areas are constantly changing to meet new market tastes.”. In Butler and Waldbrook’s (1991) accompanying paper they adapted the Recreation Operation Spectrum visitor planning framework to a tourism context in order to conceptualise a Tourism Opportunity Spectrum. Like Duffus and Dearden (1990) they positioned tourists on a spectrum of specialisation and also used Butler’s (1980) Tourism Area Life Cycle as their backdrop in order to explain the shift from a specialist to a generalist pool of visitors as a site becomes more popular. While Butler and Waldbrook’s model was initially more general and has a wider spatial focus, their use of a similar body of theory to that of the Duffus and Dearden (1990) to explain and manage tourism demonstrates the value of looking at a tourism situation from both a temporal and a user context.

Tourism Area Life Cycle

Given the centrality of Bulter’s (1980) Tourism Area Life Cycle (TALC) to Duffus and Dearden’s framework it is worthwhile examining it in greater detail. Butler introduced his seminal notion of TALC almost thirty years ago, and it has since become the most written about and cited tourism concept (Boyd 2006; Hall 2006). He proposed that tourist areas (in his case resort destinations) undergo a predictable cycle of change over time. Butler’s model centred on the ‘S’ curve that is fundamental to both the product lifecycle and to biological population dynamics. Although consisting of seven different stages, simply, his model suggests that there is an initial stage of discovery followed by a period of exponential growth in tourist numbers. This rapid growth rate then declines leading to a period of consolidation. Thereafter, tourist areas, depending on a range of internal or external factors, can develop in

any one of a number of ways, including declining, stagnating, or growing. During these different phases, changes occur in both the number and types of visitors and in the scale and nature of the pressures on the socio-cultural, economic, and natural environments. It is the durability and robustness of this model that has facilitated its application in various contexts (see Lagiewski 2006).

Although it could be argued that wildlife tourism activities do not fit into the destination concept as originally hypothesised by Butler, various applications of the model indicate that the notion of destination is somewhat malleable. Due to the original scope of the Duffus and Dearden (1990) article they did not afford much detail to this contention. Most studies refer to resorts as the default scale; however, Beiger (2000) argues, rather than destinations being viewed as being of a set geographical size, they are better viewed from the perspective of the user (cited in Weizenegger 2006). For example Boyd (2006) states, that it is surprising that national parks have been largely overlooked in applications of Butler's concept, since they are becoming increasingly popular tourist destinations and, rather than just being one attraction amongst many, national parks are more and more likely to be the sole focus of a tourism experience. In addition, they are progressively becoming self supporting commercial entities, relying on tourist revenue to validate their existence (Boyd 2006). The same assertion could also be made about specific wildlife tourism activities, particularly those that are iconic tourism attractions, such as gorillas, whale sharks, or tigers. This does not imply that wildlife tourism attractions will necessarily fit suitably into the same frames of analysis as will a resort destination or even that all wildlife tourism attractions can be studied in the same way, but it does not exempt them from use of TALC. As Johnston (2001) notes, while the destination concept is based on a destination with particular attributes, modified versions of the destination concept may require concomitant changes to Butler's concept:

In terms of the existing theory, tourism develops when tourists arrive at a particular destination site, to experience some feature of it, and when business people respond to their presence by developing a tourist industry. Together, the attraction and the commercial area constitute a locale. Thus the spatial scale for which the model is most appropriate, in its present form, would seem be a resort town that has an environmental or cultural resource as its basis of attraction, plus a recreational business district (or the potential for one to be built). Studies of destinations at scales

much larger or smaller than this may require modification to the model because the institutional nature of development would probably be different. (Johnston 2001 p10)

Supporting Johnston's argument, Duffus and Dearden (1990) contend that the shape of TALC is likely to vary according to the context of the wildlife tourism site in which it is tested. Furthermore, Duffus and Dearden (1990) assert that data from a diversity of sites (including national parks and World Heritage Areas) are required in order to understand the trajectory of TALC according to the different types of protection, management regimes, and commercial uses exhibited at various sites. As Weizenegger (2006) states in her discussion of TALC and national parks it is the unit entity (traditionally visitor numbers) that dictates how all the other variables will be perceived, and therefore that it is this variable that requires greatest consideration.

This contention has not been overly explored in a natural or wildlife tourism setting since Duffus and Dearden outlined their model. There is, however, value in looking at the more conventional use of Butler's (1980) framework. A relevant discussion includes the use of alternate variables to the visitor numbers (or unity entity) on the vertical axis. Gale and Botterill (2005) contend that substitute indicators of tourist demand, such as tourist expenditure, may give a better representation of value as well as volume. Strapp (1988), for instance, uses the average length of a visitor's stay as the predicting variable. He argues that this creates a more accurate representation of the decline stage of Butler's model since second home owners may take over as conventional tourist numbers decrease. In another example, Johnston (2001) argues for the use of accommodation provision as the unit entity since this is a key indicator of change and is less likely to fluctuate.

Similarly some wildlife tourism situations may be suited to a modified application of Butler's TALC which may thereby enhance its applicability. As stated by Johnston (2001 p9) "In an inductive approach to theory generation, each of these types of destination might require its own sub-theory, with a corresponding model, because the resource base providing the foundation for institutional behaviour is different". For example, Sorice, Shafer, Ditton (2006) found growth of manatee tourism was best represented by the size and number of tour vessels as opposed to visitor numbers. In another wildlife tourism study, Dearden, Topelko, and Ziegler (2008) plot the growth of whale shark tourism at several different locations around the world. In their analysis they predominantly used visitor numbers as the unity

entity, but for Phuket, Thailand, they substituted participant visitation with the number of dive vessels. Given the opportunistic nature of the wildlife encounters, specialised whale shark tours are not available in Phuket. This fact made estimates of the number of whale shark participants difficult. And, since their numbers are not restricted, the number of tour vessels was an adequate substitute measure for plotting the local growth of the whale shark tourism industry. Using this measure and drawing from other knowledge sources Dearden et al. (2008) conclude that Phuket's whale shark watching industry has peaked and is now in a stage of decline. Conversely, as is more likely in national parks, it is not uncommon for the number of boats, buses, or tour groups to be limited through restrictive licensing systems for viewing wildlife. As a consequence, the viewing platform often forms the rate limiting factor. In this situation, it is important to consider the impact that such restrictions have on the growth of Butler's curve and, if relevant, to incorporate other indicators of growth in modifications of the model. One such indicator integrated by Duffus and Dearden (1990) as being important in measuring the maturation of an industry is user specialisation.

Specialisation

Just as important in the wildlife tourism context is determining the characteristics of the user who participates in this activity. Butler (1980) noted in TALC that as a destination progresses through the life cycle stages it will attract different types of tourists from one stage to the next. Duffus and Dearden (1990) refined this concept to apply it more specifically to wildlife tourism by incorporating the specialisation continuum developed by Bryan (1977), for a range of outdoor leisure pursuits including bird watching. Bryan (1977) argued that recreationalists occupy points along a continuum of specialisation, with novices at one end and experts at the other. Furthermore, he argued that the type of experiences sought by these recreationalists is governed by where they sit on this continuum. Bryan (1979) hoped that his specialisation concept would contribute to the direction and consolidation of recreation research and assist natural resource managers in meeting their environmental and social goals.

Bryan's research stemmed from the realisation that outdoor recreationists, even amongst those participating in the same activity, are a diverse group. Lemelin, Fennell, and Smale (2008) contend that recreation specialisation theory has somewhat blurred the divide between

wildlife tourist profiles and environmental context by combing a diversity of measures. As Bryan (1979 p2) states “Development of a conceptual framework and typology of recreationists relevant to resources management decisions and strategies is different from a simple *ad hoc* classificatory system where more or less arbitrary classes are constructed to summarize data and form descriptive taxonomies.” .

As noted, Bryan’s work was intended to be more inclusive and encompassing than simply identifying one or two characteristics of the outdoor recreationists. Consequently, he used a multi-dimensional assessment to fit recreationists into his specialisation spectrum. The variables he used for this purpose included commitment; preferences for activity settings; skills; and equipment ownership. However, from a wildlife tourism perspective, Duffus and Dearden (1990) noted that some of the variables, such as equipment, may not vary noticeably amongst the different specialisation levels and consequently they may not be as relevant. Furthermore, they added that knowledge of the target species and its environment, and involvement in conservation initiatives could also be important indicators of expertise in the wildlife tourism context. As Lemelin et al. (2008) state, consensus on the variables defining specialisation amongst researchers has not been reached, which may be a consequence of the largely open way in which this paradigm was originally postulated by Bryan, allowing for a number of varied interpretations. Moreover, Lemelin et al. (2008), who studied polar bear wildlife tourists, argue that many specialisation studies have overlooked certain characteristics of specialisation by being over simplistic in their assessments. Consequently, they employed a number of sub-criteria under the categories of: centrality; general experience; equipment ownership; and environmental group membership (Figure 3).

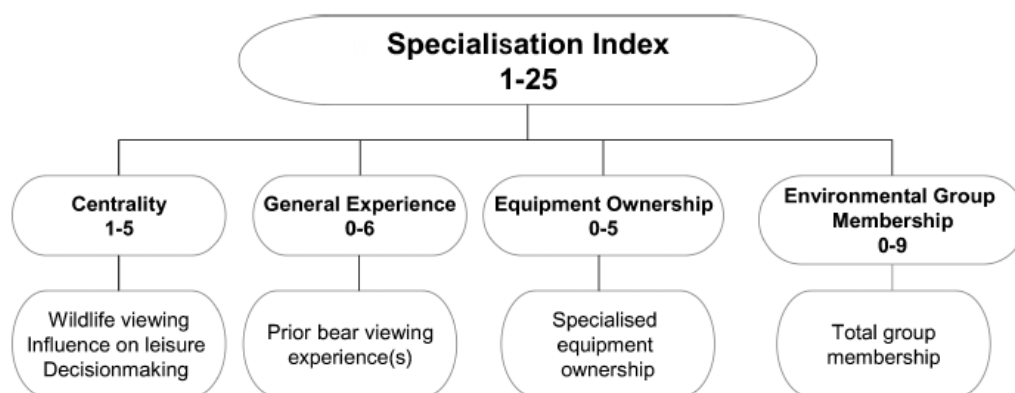


Figure 3: Specialisation construct developed for polar bear viewing tourists

Source: (Lemelin, Fennell, and Smale 2008 p50)

In addition to Lemelin et al.'s (2008) study, Bryan's framework laid the foundation for a number of studies to gain greater insights into wildlife tourist specialisation (Cole and Scott 1999; Malcolm and Duffus 2008; Manfredo and Larson 1993; Martin 1997; McFarlane 1994; Scott and Thigpen 2003). These studies used a diverse range of criteria to assess specialisation in a wildlife tourism context. Nonetheless, a number of recurrent themes emerged from these studies, which were largely consistent with the notions originally offered by Duffus and Dearden (1990). Specifically, novices have a greater interest in the non-wildlife aspects of their tourism experiences than do specialist participants. In addition, they also place more emphasis on the wider range of services and amenities provided. Specialist users, on the other hand, are more concentrated on the focal species, require detailed interpretation and are more likely to be conservation minded. Two such case studies that applied specialisation to wildlife tourism situations with consideration to Duffus and Dearden's (1990) theory are discussed.

Malcolm and Duffus (2008) found a predominance of less specialised wildlife tourists amongst participants on commercial whale watching vessels at three different locations in British Columbia, Canada. Using a refined specialisation index they found that, overall, the market was dominated by novices and intermediate users. In addition, they determined that the level of specialisation varied from one destination to the next. One locale—which involved greater travel times to reach, had less infrastructure, and contained fewer tourism activities—attracted a greater volume of highly specialised whale watchers. These findings are consistent with the explanation by Duffus and Dearden (1990) regarding the use of more remote areas and the lower infrastructure demands of specialised users. Furthermore, Malcolm and Duffus (2008) determined that increased specialisation was related to increased environmental awareness and to more realistic expectations of the likelihood of not encountering whales. From their findings, they extrapolated that, if increased conservation values were to be imparted to the participants, management objectives should be primarily focused towards novice users and to the destinations that they are much more likely to favour.

In another, two-part, study Catlin and Jones (2010) and Catlin, Jones, Norman, and Wood (2010) discovered that whale shark tourism at Ningaloo Marine Park, Western Australia, had

developed according to the trajectory proposed by the Duffus and Dearden (1990) model. By comparing results collected from survey participants in 2005 and 2006 to work published a decade earlier, it was determined that participant numbers had consolidated subsequent to a period of strong growth. More convincing was that the type of tourists now participating were sourced largely from the general tourist population in the region and had higher levels of tolerance to crowding; less of a focus on the target species; lower levels of Scuba qualifications; and were more attentive to the non-wildlife components of the tours such as service quality (Catlin and Jones 2010).

In addition, it was discovered that this shift in tourist specialisation had been accompanied by a significant drop in *per capita* expenditure, signifying that the increased tourist numbers were not increasing total expenditure in the region (Catlin, et al. 2010). This was a particularly useful observation of the connection between wildlife tourist specialisation and expenditure in the context of Duffus and Dearden (1990) theory. As noted earlier by Gale and Botterill (2005) that increases in tourist expenditure may be a better indication of growth than total visitor numbers. This is particularly pertinent if wildlife tourism activities and surrounding locations may in fact not see any significant change in tourist yield despite greater numbers of people visiting and potentially placing greater pressures on the natural and social environments. Moreover, economic values of wildlife are commonly cited in debates advocating conservation, and providing accurate data is paramount.

Duffus and Dearden (1990) contend that, as a site becomes popular, the more specialised market is overwhelmed by less specialised users. The study of whale shark tourists through the comparison of earlier research confirmed this contention. This may also be assumed to be the situation for other wildlife viewing activities that exhibit high proportions of novices. It could be that all wildlife tourism situations have been through an exploratory stage of the TALC and are now more mature. However, it is worthy of consideration that it is widely assumed that wildlife tourism is a growing subsector of tourism. In addition, opportunities to be involved in apparently specialised activities that were previously a preserve of more dedicated tourists are now plentiful (Dearden, Bennett, and Rollins 2006; Higham, Lusseau, and Hendry 2008). Thus, this increased popularity and availability of wildlife tourism opportunities not only increases the likelihood of novices being involved in any given

wildlife tourism activity but also adds an extra consideration to the framing of the specialisation concept.

As Lemelin et al. (2008) suggest, this may be explained by the reasoning proposed by Kuentzel (2001). He contends that, “For some, the proliferation of consumer opportunities in leisure markets may encourage leisure variety and discourage a more focused leisure style...leisure participants may instead be sampling from a growing variety of opportunities. Some participants may favor a diversity of experiences across different activities, rather than a qualitatively better experience with each repeated engagement in a single activity.” (Kuentzel 2001 p353). Honey (2008) also found from a review of several ecotourism destinations that service providers were consistently reporting a shift to ‘ecotourism lite’. That is tourists are less interested in the interpretative and environmental aspects and more focus on comfort and ease of access. Therefore, it may be that wildlife tourism sites, especially those more recently established, go through the stages of Butler’s life cycle at a greater pace, or even omit the earlier stages of development—at least from the perspective of increased specialisation.

This observation is also discussed by Butler (2007) in the broader context of tourism destinations. Bulter (2007) suggests that destinations are now progressing faster than ever through TALC. While he states that it is important to identify the agents of change, the exact reasons for this acceleration are uncertain, though he hypothesises that it could be due to—*inter alia*—greater access, cheaper transportation, and improved communications and awareness. This phenomenon has the potential to change the nature of impacts at wildlife tourism sites if growth and change in tourist numbers and profiles are expedited. This is of particular concern if environmental change is occurring at rates that exceed the ability for mitigating measures. Thus, there is inherent value in the development and clarification of the criteria used to assess specialisation. In choosing and defining these criteria it is important to recognise that specialisation as a construct should not become increasingly narrow in a fluid leisure market.

Limits of Acceptable Change

Duffus and Dearden (1990) argue that, in the absence of the proper management interventions, the impacts on a wildlife attraction will become overwhelmingly negative throughout its touristic evolution. For the purpose of monitoring and managing the change they integrated the Limits of Acceptable Change (LAC) concept into their model. The LAC theory provides a planning framework for generating acceptable forms of use of social and natural resources (Stankey, McCool, and Stokes 1984). LAC's viewpoint is contrary to that of the traditional goal of setting a fixed carrying capacity for an area based on a maximum tolerable level of impacts. It adopts the perspective that change is inevitable in the human use of natural areas and that the purpose of management and planning is to determine those levels of change that are acceptable.

Duffus and Dearden (1990) focus on the use of indicators of both environmental and social change by setting three LAC milestones in their framework. LAC I consists of the initial threshold that allows for a maximum number of visitors without noticeable facility development and environmental impact. LAC II occurs when there is increased human facilitation of wildlife viewing, and a decreased number of wildlife due to increased human impact. LAC III represents the point at which the maximum number of tourists can participate in an activity which can still be sustained. Beyond this point the activity is unlikely to survive, due to the overwhelming impact on the wildlife and the resultant decreased participant satisfaction.

Determining these milestones is the responsibility of managers and researchers. Measures of social indicators for LAC are reasonably achievable, especially in comparison to the biological impacts, through data collection methods such as interviews and questionnaires. However, Malcolm and Duffus (2008) question the relevance of much of the social data that has been collected to date. Although their work focuses specifically on whale watching, it is no less relevant to wildlife tourism more generally. They argue that, while social data has been collected on topics such as motivations, demographics, and education, there has been a lesser focus on the collection of data that is appropriate for management. Thus, the challenge for scientists working in the area of wildlife tourism is to produce results that are not only academic but also pragmatic, and this is where the models such as the Duffus and Dearden's wildlife tourism framework are particularly pertinent, since it allows findings to be contextualised.

For example a useful application Duffus and Dearden (1990) theory was conducted by Dearden, et al. (2006) through an examination of user specialisation amongst Scuba divers in Phuket, Thailand. They found that user specialisation was decreasing and that the novice participants brought with them different preferences and motivations to those of the more specialised divers. In particular, to conserve the natural environment, they argue for regulatory policies to restrict not only the overall numbers, but also to deter less experienced divers, who are not as discerning and are more likely to cause damage, from using areas of high environmental value. Furthermore, Dearden et al. (2006) argued that, for a site to extract the greatest benefit from the industry, it needs to cater for an increase in mainstream tourists but also to have services which are directed at maintaining the specialist segments, which they suggest are high yielding and create more positive marketing exposure.

In another study—investigating manatees as a tourist attraction in Florida, USA—Sorice, Shafer, and Ditton (2006) found that the management practices put in place were failing to protect both the visitor experience and the wildlife species. Growth in the industry had not been accompanied by greater and more effective management strategies. Collection of social data showed that crowding as well as the perceived potential for disturbance of the manatees had both arisen as major concerns, potentially leading to the site being passed over for other manatee viewing areas. Moreover, the government body responsible for the management of the manatee interaction is limited by the fact that their control diminishes greatly when the interaction occurs outside the sanctuary zone, which is a common occurrence. Drawing from Duffus and Dearden's (1990) theory, particularly the importance of management intervention as a site becomes more popular, Sorice et al. (2006) contended, given the current limitations placed on managers, the situation can go to either extreme. That is either a greater reliance on tour operators to self-regulate, or alternatively for greater legal intervention to apply current management strategies to all those areas frequented by manatees and people. Sorice et al. (2006) argue, considering that some operators do not have conservation as their core objective, and that over intrusion by management bodies may irritate tour operators, a balance needs to be struck between operator and governmental management practices.

One of the main dynamic elements of the model is time. However, longitudinal data is rarely available. In a time sensitive research approach, Higham (1998) discovered that Duffus and Dearden's wildlife tourism model predicted the site evolution for tourist viewing of an albatross colony in New Zealand. He found that looking at a range of biological and social

data sets, some up to two decades long, allowed for an accurate picture of the underlying processes to be identified. Higham (1998) discovered that, with an absence of adequate visitor management coupled to an increase in total numbers and a shift to less environmentally aware generalist tourists, there were detrimental impacts on both the focal species and the tourist experience. However, determining these impacts was only possible if they were viewed over a significant time span, and ignoring this context is likely to elicit unreliable results.

Although not drawing directly on Duffus and Dearden (1990), a study of the biological impacts that illustrates the importance of observing impacts from the appropriate temporal perspective is discussed regarding dolphin viewing in Monkey Mia, Western Australia. Higham and Bjeder (2008) comment on the implications of a recent investigation of the negative impacts on the target species from dolphin viewing boats in at this location. They highlighted the value of viewing impacts on the appropriate time scale. A comparison of data on dolphin density collected over a 15 year time frame showed that, since the introduction of a second wildlife tour operator, there had been a statistically significant decrease in dolphin density in the tourism interaction zone while the adjacent control site had experienced an increase. It was determined that, at the current frequency of interaction, more than one tour operator was not sustainable. As a consequence the number of operators was reduced to half by the Western Australian Government. Higham and Bejder (2008) contend that this was a milestone event in the management of wildlife tourism since it was a move from simple acceptance of the Precautionary Principle towards objective science. It also provides an excellent example of the progression towards LAC III in the Duffus Dearden model and the kinds of management interventions required at this point.

It is obvious that wildlife tourism sites evolve through time and considering impacts through this perspective is critical. As a wildlife tourism activity progress through the trajectory proposed by Duffus and Dearden increased management intervention is usually seen as a result of the greater environmental and social pressures. Once impacts are identified gauging the outcome of under-regulation is generally obvious. As exemplified by the lack of restrictions on the number of dive vessels operating out of Phuket, Thailand Dearden et al. (2006) describe, as the activity has grown, more and more financially driven tour operators enter the market. This has led to competition centred on price reductions resulting in cost cutting in areas of safety and educational services. Under these circumstances government

regulation plays a main role in maintaining standards that are likely to result in a more sustainable industry.

However, the interpretation of impacts or the resulting management intervention is not always straight forward. For example, a linear progression of increased impacts without management involvement is not always correct. Social benchmarks, in particular, can sometimes remain undisturbed or even become positive despite a lack of management. Catlin and Jones (2010) discovered that along with greater participant numbers, tolerance to crowding had increased as a result of a shift to more generalist participants in whale shark tourists, an unintended but serendipitous effect of changes in the constitution of participants.

On the other hand, the less conspicuous outcome of overregulation can also result from management intervention. Longitudinal analysis of the licence conditions for whale shark tours at Ningaloo Marine Park, Western Australia showed that there has been incremental but significant growth in the number and severity of licence conditions (Catlin, Jones, and Jones In Press). However, this did not appear to have been a response to deteriorating environmental or social conditions. It could be attributed to the increased popularity and thereby increased focus on the industry. Alternatively it may be a reaction to the overall broadening of environmental regulation over this period. Nonetheless it is an important consideration in the framing of Duffus and Dearden's (1990) model, as it may be seen as paradoxical that environmental regulations will be increased without clear limits of acceptable change being breached. This is not necessarily an unconstructive response since pre-empting possible negative impacts is important. However, greater regulation can both directly and indirectly place extra financial and bureaucratic burdens on commercial operations. This, in turn, has the potential to undermine the progress of greater environmental protection as the operators may become less able to comply with all the environmental safeguards. As noted by McKercher and Robbins (1998) the ability of any nature based tourism operation to meet environmental and social objectives is underpinned by their own economic success.

From Here...

As there has been an accumulation of research into various aspects of wildlife tourism for nearly two decades, there is now a sufficient database from which to contextualise wildlife tourism situations through the application of theory such as that offered by Duffus and Dearden (1990). Butler (2007) reflected that TALC in its original form does not identify adequately the causative agents driving the changes that shape the trajectory of the lifecycle, particularly in the decline stage of the model. He argues that, despite the widespread acknowledgement of the applicability of TALC, there has been relatively little intervention to manage tourist destination change in a way that would lead to more desirable outcomes. The Duffus and Dearden (1990) framework seeks specifically to achieve this ideal within a wildlife tourism setting and several examples have been cited in the foregoing about how this can be achieved.

For managers seeking to derive the benefits that wildlife tourism can bring in the form of support for conservation and realisation of economic benefits, the model provides a dynamic framework that should help the design of optimal management interventions. A key question is to assess the current status of the industry i.e. where on the curve does it sit (Figure.2)? As discussed in this paper there are several ways of doing this and the way selected and units used will vary according to the industry and data available. Industry-specific and place-specific indicators may be useful. For example Dearden et al (2006) suggest that the model may be assessed in a cost-effective way for SCUBA by assessment of the relative proportion of various degrees of specialisation at the site. High proportions of specialists would suggest an early stage of the model.

Having assessed where the industry is at, the second main question is to assess the goals and objectives for the industry, that is where does it want to be. A basic underpinning of the model is that in the absence of management interventions there will be a progression through the stages leading to increasing environmental impacts on the resource, reduced variability and usually yield per visitor with these factors combining to push the industry through point LAC III and leading to collapse. A key need therefore is to establish common goals for industry development. Is the goal to maximise visitor numbers, or yield per visitor for example? How much impact on the resource can be tolerated before unacceptable changes are encountered? This latter question leads to the development and assessment of the LACS, monitoring, and the subsequent management interventions to ensure that LACs are respected.

Roman et al (2007) have provided one such example of LAC-setting and there are many other examples in the literature relating both to social and environmental impacts.

Duffus and Dearden have provided a sound theoretical base from which to examine wildlife tourism, and this is continuing to gain both verification and momentum. However, there is a lot of potential for further development of the model and a need for more case studies that illustrate specific aspects. Understanding wildlife tourism, for instance, from a broader temporal perspective will offer greater insight than that which is available in the form of single, one off case studies. Issues such as optimal unit and scale of measurement, defining specialisation and its implications within different contexts, establishment of LACs and designing optimal management interventions are all subjects of wildlife tourism that would benefit from greater investigation. Dearden and Manowapitr (in press) have recently suggested how the model might be used to investigate the impacts of climate change on wildlife viewing sites, and this topic will obviously become more urgent as time progresses.

The latter paper points also to the need to not only understand the inner workings of the model but also the wider context within which it operates. As Gale and Botterill (2005 p159) argue with regard to TALC that it: "...does not take into account the tourism system in its entirety, with the result that it overlooks exogenous forces such as variations in the economic cycle of source regions and countries.". The same criticism can inevitably be levelled at the wildlife tourism framework. Greater issues such as the health of the national tourism industry and conservation of wildlife (locally or internationally), are just some of the wider issues that might have overwhelming impacts on tourist flows and wildlife viewing opportunities, and consequently on the development of wildlife tourism industries (eg see Higham and Lusseau, 2008, for an example relating to whale watching). Moreover the potential for impact should not be seen as being limited to the more macro issues since it is possible some seemingly isolated event could send ripples through the industry. As Russell (2006) argues, using Chaos Theory, seemingly small unpredictable events can greatly shape the development of a tourist destination purely because they involve the complexity of human nature. Take for instance the possibility of shark attack on a participant in marine wildlife tourism activity. While shark attacks anywhere are very rare, the media attention locally and overseas paid to a single attack is characteristically out of proportion to the actual threat. Consequently, the potential for bad publicity to be generated from a serious attack on a wildlife tour is enormous. History

has proven that shark attacks have the capacity to cause whole city populations to cease using the ocean, even in areas far from the actual incident.

Whether it is a shark attack, terrorist strike, or disease outbreak there is no doubt that these are important considerations which should be included in tourism planning processes, however, it is essentially the purpose of any practical tourism framework, model, or theory to concentrate on those factors that are directly applicable and tangible to the management of the industry. As Weaver and Oppermann (2000) argue, the more external and unintentional the action, the less control that the tourism industry and its managers can exert over it. Moreover, leaving the fate of a wildlife tourism industry's development to external forces is not ideal and it is the more likely and direct scenarios which are most malleable. Furthermore, it is not the argument of this paper that Duffus and Dearden's theory is infallible but that it is an applicable method to view, document and understand the changes that occur in a wildlife tourism system. No framework can predict the future with complete certainty, but appreciating and acknowledging the mechanisms that drive change in the system and using this foresight and knowledge to assist in directing the development of a wildlife tourism site in the desired direction by tour operators, environmental manager, and research scientists is a valuable contribution. The various case studies examined within demonstrate that Duffus and Dearden (1990) were correct in their conceptualisation of wildlife tourism via a user, temporal and impact framework, the challenge now is to continue with their lead. Paradoxically, a large part of this forward thinking process will involve reflection and evaluation of the research already conducted.

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