

ISSUES IN APPLYING CARRYING CAPACITY CONCEPTS: EXAMPLES FROM THE UNITED KINGDOM

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Introduction

Over the past four decades ever increasing numbers of visitors to recreation and tourist areas have created concerns among many planner, managers, owners and users of destinations about resulting problems of overuse and unwanted impacts. Such feelings are still not universal, there are many involved in the promotion and development aspects of recreation and tourism facilities who are keen to continue to attract even more visitors, but even bodies such as the World Tourism Organization (WTO) have begun to recognise that the sheer volume of tourism has negative as well as positive impacts on destination environments and populations (WTO 1999). With the exception of 1991 (Gulf War) and 2001 (September 11 World Trade Center attack) international tourist numbers have increased every year since statistics have been collected (WTO 2001). There is little to indicate that this trend will end unless global catastrophe occurs, although of course individual areas and destinations are likely to increase and decrease in popularity depending on their attractions, management, and local conditions. The problems which increasing numbers bring to recreation and tourist areas has been recognised for many years (see for example, Darling and Eichorn 1967; and Young 1973).

Figures for domestic tourism are much more unreliable, as no borders are crossed and thus most figures are based on sample surveys and it is clear that levels of accuracy are not always high. However, there is little doubt that numbers of domestic tourists are increasing also, perhaps even at a faster rate than are international tourist numbers, as people are more likely to take their first holidays within their home country rather than abroad. As countries with large populations such as China and India reach an economic level that allows increasing numbers of their citizens to take vacations for the first time, potentially vast numbers of people are becoming tourists. It is reasonable to assume, therefore, that overall tourist numbers will continue to increase globally and that pressure on resources, populations, environments and destinations generally will continue to increase with every greater severity.

Trends in leisure, recreation and tourism have been such that the boundaries between these phenomena, if they every really existed, have become less and less perceptible (Jackson and Burton, 1999). It is more realistic to think of visitors to destinations rather than attempting to categorise people into leisure visitors, recreationists or tourists, and for much of the discussion which follows, the term visitor will be used. It is recognised that there may be differences in behaviour, and particularly in time spent at destinations depending whether a visitor is there for a short visit (leisure

visitor), a day trip (recreationist), or a holiday (tourist), but it is their cumulative impacts on the destination which are the primary cause for concern rather than inter-category differences.

The Case for the Concept of Carrying Capacity

The primary focus of this paper is a short review of the application of actions to limit overuse and negative impacts on protected areas in the United Kingdom, but before this it seems appropriate to briefly make the case for continuing to utilise the concept of carrying capacity. It has become common in recent decades to downplay the validity of the carrying capacity concept in the management of recreation and tourist areas, most recently by McCool and Lime (2001). This paper, like many written by present and former members of the US Forest Service bears excellent witness to the splendid research undertaken in wildland management by that organisation. To this author, it is disappointing, although all too frequent, to see the scholars who, along with their colleagues, have been instrumental in undertaking so much valid and important work on carrying capacity, now being prepared to abandon the concept as “Tempting Fantasy” rather than “Useful Reality” (McCool and Lime 2001). The study of carrying capacity research in a recreation (and tourism context) has been discussed by a good many authors (Getz 1982, 1983; Manning, Lime and Hof 1996; Johnson and Thomas 1994; O’Reilly 1986; Shelby and Heberlein 1986; and Williams and Gill 1999a, b) and there is little point in attempting to repeat such reviews.

Suffice it to say that the concept had its origin in rangeland ecology and since the seminal works of Lucas (1964) and Wagar (1964) has been a central if controversial feature of recreation resource research, and a more limited area of research in tourism. Over the decades since the early efforts in the 1960s, attention has shifted more heavily to the social side of carrying capacity and the application of norms in attempts to determine maximum acceptable levels of use (see for example, Brouwer et al 2001; Bultena et al 1981; Ditton et al 1983; Hall and Shelby 1996; Hammitt and Rutlin 1995; and Shelby et al 1988). With the focus increasingly on social aspects of overuse and crowding, and management implications, attention and support began to focus on management approaches such as the Limits of Acceptable Change (Stankey and Cole 1985) and the Recreation Opportunity Spectrum (Clark and Stankey 1979). The acceptance of these concepts and their application meant a shift in emphasis from determining maximum acceptable levels of use and visitor numbers to determining acceptable and desired quality of environment and experience, matching appropriate activities with environmental and social constraints. Appropriate though these techniques may be in many outdoor and wilderness settings, this author has already argued (Butler 1996) that they are not acceptable substitutes for determining carrying capacity of all areas.

The seminal work of Hardin (1969) on common resources, and the application of some of his ideas in a tourism context (Healey 1994) note the importance of limits on use if environments are to be preserved. While change in many areas may be acceptable, there are areas in which permanent change caused by intrusive activities (such as recreation and tourist use) is not acceptable, and in such situations, there is no acceptable change. In order to maintain an environment or perhaps, more appropriately allow an environment to maintain itself, there are situations in which

limits on the amount of use must be imposed, and such limits almost inevitably have to involve limits on the numbers of visitors. In recent years there has been much less attention paid to the ecological element of carrying capacity (Brown and Turner 1997; Buckley 1999) but this aspect of the problem is the most important one in the context of protected areas which are normally protected on environmental grounds.

It is widely accepted that a single magic number can rarely be found as the answer to the question of what is the carrying capacity of an area, unless it has a homogenous environment and a single set of homogenous users. Even in densely used recreation areas such as beaches however, which may have an extremely high resistance to impact, there is a maximum number of people who can be accommodated, although some users may not be able to tolerate such high levels of density (Brougham 1982; McConnell 1977). It is also clear that there is more than one type of capacity of an area, relating at the very least to ecological, social, perceptual, safety and spatial limitations. To identify all of such limits for all potential uses at all times by all sorts of users would be impossible and pointless. What is possible and needed, it is argued, is to identify the lowest limit in terms of levels of use and utilise that limit as the effective management carrying capacity for that area. As an area is developed, some aspects of that capacity may change (Butler 1980; Martin and Usyal 1990) and a different element emerge as the critical and defining one. Thus development may change the market and hence the social carrying capacity, or expand the spatial limits, and the new defining limit may become the ecological component of an area. When this occurs, if the area is a protected area, being maintained because of specific ecological values, it is surely vital that the critical level of use be determined and used as a limit.

It is accepted that this is not easy, and it is accepted that there will often be arguments that what this generation regards as important is not necessarily appropriate for all time, as values change. Mountains were once not regarded as worth preserving but were viewed as barriers to be scaled and cut through, and species were made extinct because they were not valued at the time. These mistakes and changes in tastes should convince us that we should err on the side of protection and maintenance of some areas, and that this will inevitably require limits on numbers. We need to find those numbers sooner rather than later. If we accept that ultimately there will be too many users, however we manage them and whatever uses they engage in, then we have to accept the concept of carrying capacity. It need not be a fixed number and it may change, there can be more bird watchers than bird hunters permissible in a set area, and if the mix of uses change, then numbers can change also. We accept hunting and fishing limits because we can see and measure what is taken and we can calculate (not always very well) what is a sustainable yield. We simply have not learned or been willing to learn what is an acceptable if less tangible take relating to other uses of natural areas. There is rarely a simple direct correlation between numbers and impacts (and change) but there is a relationship and at some point, numbers count, and therefore, there is a carrying capacity.

In-the-field managers of a wide variety of recreation and tourist destinations face the problem of excessive numbers and overuse on a regular basis. They find ways to deal with this problem, most often in ad hoc and pragmatic ways, very often limiting use in some form in order to limit impacts. They are applying carrying capacity principles

because they have to and applying them in the way they do because there is little information available on how to calculate or establish what appropriate limits might be. The problem which managers of protected areas face is both simpler and more serious than that faced by managers of other visitor destinations. They have a charge to protect all or some elements of the ecosystem under their control, and overuse threatens this. They, above all, if we are serious about sustainability, need assistance, advice, and management tools to deal with issues of capacity.

The United Kingdom Context

Many of the above points are particularly true in the case of the United Kingdom, where the patterns of leisure excursionists, day recreationists and holiday-making tourists are closely intertwined and often almost indistinguishable. The countryside of the United Kingdom is a primary attraction, as are many of the cities, particularly London, for all who wish to spend leisure time away from home. Britain, like many European countries, has a large population, a small land area, (and thus a high population density), a dense pattern of communications, high car ownership, and a long history of settlement and established patterns of behaviour. It is also characterised by an absence of true “wilderness”, and although there are significant areas of unsettled or very thinly populated areas, particularly in Scotland, Wales and some of the other upland areas, no area is more than 20 miles from some permanent population and thus all parts of the country are potentially exposed to pressure from visitation.

Visitation to the coast, to urban centres, to upland areas, and to specific sites such as heritage properties and designated natural areas is extremely high, with estimates of 100 million visits a year to the countryside alone probably being conservative (Countryside Commission 1996). The problems that result from such heavy and continuous use have been apparent for many years (Tivy 1973) and management agencies have tried a number of approaches to both reduce pressure and to reduce impacts, generally with relatively little success in absolute terms, although considerable success in relative terms. By this it is meant that the absolute increases in pressure and impact have been considerable, because increases in visitor numbers have tended to overwhelm efforts to reduce impact through management, but relative impacts and pressure, e.g. if measured per capita, have almost certainly been reduced. The only real solution to the problems of overuse and negative impacts lie in reducing both national and international visitor pressure, and individual destinations, or even individual agencies can do little or nothing in this regard. They can only attempt to alleviate some of the problems in respect to their own operations, and this is what this paper focuses on.

Examples from the United Kingdom experience

Introduction

A major caveat has to be given at the beginning of this discussion. What follows is not meant to be a comprehensive survey or review of everything which has been

undertaken in the United Kingdom. The author has not had time or opportunity to undertake such a study since accepting the invitation to participate in this meeting. A brief survey was undertaken of some specific destinations to explore what has been the management response, and a larger, more comprehensive survey is in the planning stage. A review was made of published material which involved studies of carrying capacity (few though they are) and findings synthesised from these. The discussion which follows is, therefore, an overview and interpretation rather than a definitive statement. It endeavours to summarise approaches and their effectiveness but should not be viewed as complete or all-inclusive.

National or system wide initiatives

The issue of carrying capacity in recreation and tourist areas in the United Kingdom was not seen as one of national importance during the 1950s and 1960s. There is very little reference to the topic in any plans or management documents during those decades. The only well publicised example of carrying capacity guidelines is one produced in the Republic of Ireland (and thus not in the United Kingdom, although within the British Isles) which was published under United Nations auspices in 1966 (An Foras Forbatha 1966). Although innovative at the time in approach, the delimitations of capacity and suggested levels were arbitrary and not based on specific empirical work, and as far as is known, were not applied elsewhere. The first significant study on carrying capacity was done by Tivy (1973) for the Countryside Commission for Scotland (CCS), and was essentially a review of mostly North American work (such as that by Lucas, 1964 and Wagar, 1964), and some suggestions relating to the allocation of priorities in recreational land uses and limits. There is no evidence that this report was implemented in specific areas, and the role of CCS was such that it had no direct management responsibility for facilities. Nevertheless, the commissioning of this study was an indication that by the 1970s the UK authorities such as CCS and its counterpart for England and Wales, the Countryside Commission, along with the Forestry Commission and the National Park Authorities had recognised the problems resulting from heavy and excessive use of areas under their jurisdiction or for which they had a research and advisory responsibility.

The next initiative was less research focused and more an example of applied management and planning. This was the adoption of the “honeypot” approach to facility provision, and could be regarded as the application of a system-wide management approach. It involved the establishment of so-called “honeypot” recreation facilities, often country parks (Butler 1969), specifically designed to take pressure off more sensitive and vulnerable sites. It was an important initiative, even though it was ultimately unsuccessful, in that it was a clear acknowledgement that congestion and overcrowding were occurring at a number of important sites and that action was needed to resolve this problem. In one sense the honeypots were successful, in that they did attract large numbers of visitors. There, is however, little or no evidence that visitation to the vulnerable sites decreased as a result of their popularity, and some suggestion that their establishment in fact increased overall demand and participation for country park type facilities. (In some respects one might compare the establishment of honeypots to the establishment of development or intensive recreation zones within parks and other designated areas. They were intended to draw off and contain heavy and in some cases uses inappropriate to the

more sensitive and significant ecological and heritage sites or areas, but as often happens in parks, demand for such areas increases and requires expansion or creation of additional such zones).

The decades of the 1980s and 1990s have been marked by an abandonment of such system wide approaches in general and by the substitution of individual site or park management attempts to deal with capacity problems. Considerable efforts have been made to persuade users to give up the car as a means of access to and within parks and other protected areas, substituting public transport for access to areas and pedestrian access within them. These have succeeded in some areas where public transport has been convenient, reliable and existing (relatively few in the UK today), and in some areas, such as locations in the Peak District National Park, appear to have reduced visitor numbers at peak periods. Downsides have included the imposition of necessary restrictions upon potential users, in some cases increased costs of access, and in some cases demand diverted to other areas. The nature of National Parks in the United Kingdom (Ravenscroft and Parker, 2000) is such that most of the area within their boundaries is privately owned and managed, and national park status is essentially a form of planning control. The application of management policies is essentially through a plan for each park, which is established and managed by a committee with local and national representation and which has to operate by agreement and consensus, with some funding for management applications. In all UK national parks there are communities engaged in a variety of land uses including farming, forestry, quarrying and mineral extraction, power production, sports, industrial, military, leisure, and residential activities. Reducing or limiting access or activities in such areas is extremely difficult and generally confined, if present at all, to specific sites. In National Forest Parks and National Nature Reserves, where the primary function of the area is not commercial or leisure related (i.e. timber production or nature protection respectively), more stringent management restrictions could be applied. Such is the more limited appeal and less easily accessible locations of these latter two types of areas that the application of such restrictions has not really been necessary on ecological grounds to date, except in a very few locations. A considerable range of other sites and properties exist which are open to the public and which serve some protection function, ranging from individual private houses and gardens to large areas of land owned by bodies such as the National Trusts.

Facility-level Approaches

A limited review of selected natural and cultural heritage and protected areas produced a mixed set of responses. Virtually all sites indicated experiencing what were viewed as incidences of overuse in almost all of the past ten years, with, as would be expected the most frequent occurrences being on holiday weekends and in the peak summer months. Overfull car parks, long lines at facilities, road congestion, no accommodation vacancies and waiting lists for reserved facilities (e.g. guided trips and walks) were given as indicators of congestion and overuse. The concept of carrying capacity itself was frequently mentioned but was not incorporated into official plans or management guidelines per se. That is to say, there was general acknowledgement that a facility's carrying capacity (albeit normally undefined) was exceeded on some occasions, but no specific carrying capacity figures were established to confirm or judge this against. In this situation one might conclude that

management was still operating along 1960 vintage principles, namely that excessive use on a few occasions was acceptable, because, and this is a key point, there was a strong interest in maintaining or increasing visitor numbers to almost all sites. This issue is returned to below.

The actions taken fell into two distinct categories, neither of them unusual or novel, namely, reducing visitor numbers and increasing the resistance of the feature to use. The most common response to excessive numbers was to take local and specific action to reduce numbers on a temporary basis. Only in one case was an action taken with what might be defined as a long term (beyond two years!) view. These actions included closing access facilities such as car parks when officially full and diverting later visitors elsewhere, instituting temporary closures of main features, rationing access in a variety of forms, controlling entry on a time basis, requiring entry to be in parties/groups rather than individually, and rotating access to features. This latter approach relates also to increasing resistance to use.

The only example of an action that was intended to have more than an immediate short term effect was to delete a specific location from publicity information and maps. This was the case of Steel Riggs, a site on Hadrian's Wall, which was experiencing over 500,000 visits annually, and the action was taken not only to reduce visitation at this site but to spread use over other sites (Butler 1996). This specific site is still not publicised although it remains open for visitation, and visitor numbers have declined, although specific figures were not available.

The closing of car parks when full is a fairly common action, occasioned as much, it would appear by practical issues (avoidance of accidents, safety, and police requirement) as by desire to reduce visitation. The effects are not always desirable as visitors often park elsewhere rather than not visiting the site, sometimes in more hazardous locations, sometimes annoying and inconveniencing local residents, sometimes in other inappropriate locations, and sometimes simply wait at the entrance until the car park is opened, thus not reducing visitation at all. Closing car parks without advance warning, both in terms of time and distance, i.e. so that visitors do not arrive to discover a car park full, is rarely successful, especially in situations where there are few alternative sites and visitors may have travelled considerable distances. Denying access in such a way works much more effectively if early announcements can be made, for example, in the way that the Ontario Provincial Parks system announces on local radio and television when campsites at specific parks are full for upcoming dates, particularly summer holiday weekends.

The temporary closure of main features is similar to that of closing car parks and tends to have similar effects. If done suddenly and without warning, it is generally only effective in deterring small numbers of visitors and results in considerable discontent and complaints. Visitors will wait until the facility re-opens, and thus at best, numbers are moved from the busiest time of the day to quieter times, but overall visitation may not decrease appreciably. Visitor enjoyment may increase as crowding at peak times may be decreased. Controlling access by limiting entry to groups is quite common and allows for easier management and control of behaviour, but requires interpretive or other staff and an awareness and acceptance of such management, which may not always be present among visitors. If some benefits can

be seen from such management, then acceptance is likely to be higher than if it seems arbitrarily imposed.

Limiting attendance through pre-booking and through allocation of entry times is increasing in popularity. The new Queen's Gallery, to be opened at Buckingham Palace this summer is adopting this technique to manage anticipated large numbers. Visitors will be limited to entry numbers of 50 every fifteen minutes, although no maximum time within the Gallery is being imposed at this time. Various other institutions, including galleries in other European cities such as Florence, have adopted this method of reducing line ups and congestion. Adoption of such a technique in natural areas is very limited, although a similar approach has been used on occasion at one rare bird observation site, where visitors have to utilise a relatively small building to observe the birds.

In the second category, actions include replacing natural paths with stone, tarmac, wood and other surfaces, confining access to such specific paths rather than allowing universal access, denying access to specific features, supporting or hardening features with artificial elements, substituting re-creations for original artefacts, using honeypots to relieve pressure on the most sensitive features, stocking and breeding of species, and using exotic vegetation which is hardier than indigenous species. The use of a specific technique varied with the nature and primary function of the facility, in a nature reserve the use of exotics would not take place, while this might be quite acceptable in a country park or historic property, where other exotics are already present.

The use of hardening materials for paths and other access points is well established and generally well accepted in many areas. The use of local stone or wood chips makes such an action less aesthetically jarring than the use of concrete or tarmac, but at entry points or hazardous situations such as waterfalls or lookouts, more extreme measures may have to be taken. In most cases visitor acceptance is high as the benefits are obvious. The channelling of visitors to specific paths is also common, sand dune areas in particular are highly prone to lateral as well as vertical erosion and whole dune systems can be threatened by uncontrolled erosion through unofficial footpath development.

Denying access to specific features because of visitor impacts is not always popular, but has occurred in extreme situations. Two well known examples are Stonehenge and the Major Oak in Sherwood Forest. Stonehenge has had direct access to the stones prohibited for several years, and visitors are required to keep on a perimeter path to avoid further ground compression and the stones loosening. While visitors are often disappointed the interpretation makes the reason for the ban clear. Occasional promotional tourist advertisements showing visitors climbing over the stones does not help the situation. Long term proposals for dealing with overuse at Stonehenge include building an artificial set of stones on a nearby site, an approach not generally possible, although a precursor of this approach exists at Lascaux Caves in France (and perhaps in all Disney theme parks). The second example is a long-standing ban on access to the Major Oak in Sherwood Forest, a very old tree supposedly associated with Robin Hood, and which visitors used to be able to climb and enter (it is hollow). Again, ground compression and overuse has caused immediate access to be prohibited

over twenty years ago, and an interpretive sign explains the reasons. The tree has also been subjected to considerable support over the years including the use of iron and concrete to keep it standing, again without appearing to diminish its appeal to visitors. Such a step can probably only be taken for very specific features which are well known and irreplaceable.

Substitution of natural features by artificial ones was not found, although this practice does occur in the context of cultural heritage, often unannounced and for security as much as overuse reasons. The average visitor has to assume that the Mona Lisa, the Vatican Chapel ceiling, and, dare one say the Elgin Marbles, are the originals, as most visitors would be unable to differentiate a good copy from the original, particularly at times of excessive visitation and hurried short opportunities for viewing. The use of honeypots, as noted above in the discussion of system wide actions, is not common but has been used in a few situations. Promotion of less visited features to draw people away from vulnerable popular sites is one example. In the context of natural features, the publicity given to the original nesting site at Loch Garten of the first breeding Ospreys in Scotland this century attracts casual visitors to the interpretive centre there and obviates the need for people to search for the other nesting pairs of the birds elsewhere in Scotland. Excellent management and interpretation at this site has so far prevented any signs of overuse or disturbance to the birds themselves, although parking in the vicinity can be a problem on some occasions. As the site has increased in popularity over the four decades that the birds have nested there, the need for more comprehensive and extensive site management has become apparent. A supportive local landowner, absence of immediate local population, little local traffic, and a specific form of visitor, along with close hands-on management has so far succeeded in avoiding any major problems, despite heavy visitation over a short period.

Implications

While a variety of methods have been used to deal with the problems of overuse, congestion, over-capacity and unwanted impacts, there is little evidence of consistent application or overall planning for these problems. This is not intended to be critical of management of these areas, many are managed to a very high standard and visitor satisfaction appears to be high and is expressed in increased visitor numbers in most locations (see below). What is clear is that the solutions or attempted solutions to capacity related problems are mostly ad hoc, unresearched and of limited success. They may succeed in resolving a specific problem, loosening of stones at Stonehenge for example, but rarely deal with the cause of the problem, excessive numbers. Actions which tackle this specific problem tend simply to move visitors to different times or to other areas of the site. In a very few cases only do they move visitors to other areas.

Protected areas in the United Kingdom face considerable problems in dealing with visitation. There is a high population with a considerable degree of mobility and a reasonably high standard of living. There are several million foreign visitors who wish to visit the more visible and well known sites, compounding the problem of domestic visitation. Few sites are inaccessible and awareness is relatively high. In many cases, especially in the case of historic properties, which may have natural

features associated with them, reliance on visitor expenditure and admissions is key to their survival, given the expense of upkeep and management. Reduction of visitor numbers is not something which is desired in many cases unless the problem of overuse is extremely severe. Rather the concerns are with dealing with short term excessive use on a limited number of occasions. Perhaps fortunately, some of the most vulnerable and important sites are less well known and less accessible, and therefore less visited. One has to conclude, however, that such a situation is likely to change in the future as almost all of the factors influencing participation in leisure seem to indicate increased rather than decreased future use.

Problems resulting from the probability of increased visitation are likely to be compounded by what appears to be a widespread belief among facility operators and managers that constant or increased visitation is desirable. For those operating commercial leisure facilities this is rational economic thinking, normally more visitation means greater return on investment and greater profit (although even in facilities such as theme parks it is acknowledged that there is a maximum number of guests who can be comfortably and in some cases safely accommodated, particularly on rides). For those operating venues which have public access as their primary objective, increasing numbers is also rational, as the greater the public access, the more they are achieving their goals, again within safety and comfort limits. For those operating and managing sites where the primary function is preservation of natural or cultural heritage (nature reserves, some areas within national parks, historic properties and ancient monuments), then accepting or pursuing ever increasing numbers up to safety and comfort limits is both irrational and could be contrary to their purpose. Yet even within some of these establishments, constant or increasing visitor numbers are still seen as desirable, even when overuse is admitted. The reason behind this is almost entirely political (in the broad sense). Job security depends in many cases on doing what is seen as a satisfactory job, and this is measured most often, if at all, in relation to visitation. Declining visitor numbers is generally perceived by those in central headquarters as a sign of decreasing public interest, thus meaning there is little to be gained politically by keeping the facility open or by investing additional funds. Increased visitation, on the other hand, is taken as indicative of increased public interest, "voting with their feet" was one expression used, and therefore financial and moral support could be justified. Deliberately decreasing visitor numbers, even to safeguard a specific feature, was rare and only undertaken after extensive investigation and approval from a higher level. As long as this mind set remains, tackling overuse and capacity related issues is unlikely to be widely or enthusiastically practised, except in extreme cases.

Conclusion

This paper has attempted to review the issue of carrying capacity in some protected areas and to its application in general. The argument put forward for maintaining the concept and application of carrying capacity principals should not be seen as denying the validity of visitor management approaches such as those discussed above. This author has also proposed an approach (Butler and Waldbrook, 1991) based on the Recreation Opportunity Spectrum model and certainly does not deny that LAC, VIMP and other approaches have considerable validity in their application in many natural

areas. The research and effort needed to implement such techniques is often considerable, however, and the necessary data and knowledge may not always be available, thus the application of these approaches may not be practical in poorly funded sites with little opportunity for research, particularly where public and political support for such sites is limited and may not be supported by legislation and where centrally based expertise and support may also be lacking or minimal. In such situations the protection of the site and its elements may end up as a simple choice between unlimited or limited use, with little scope for the application of opportunity spectrums, management of visitors or visitor preference surveys, or the determination of realistic carrying capacity levels, if these exist. In such situations, most managers seem to resort to 'seat of the pants' management, relying on gut feelings in the absence of alternatives. In these cases, more often than not, they resort to applying the principals of carrying capacity, limiting numbers or access in order to preserve the features they are charged with protecting.

McCool and Lime (2001:385) argue that "It is now time to bury the concept of a numerical tourism and recreation carrying capacity" because the variables involved are too numerous, the assumptions and tests which need to be met do not occur in reality and that it is an illusion that it is a scientific question not a moral choice. It is precisely because carrying capacity **is** partly a moral choice as well as partly a scientific question that it is important that it be studied and acceptable maximum levels of use (and perhaps visitation) be established on a site specific basis. If we do not accept that we have a moral as well as a scientific obligation to protect and maintain some specific sites and features for future generations, then we are abrogating all responsibility for the future. The Canadian National Parks system used to have as its definitive objective "To preserve unimpaired for future generations" the parks within its charge (Indian Affairs and Northern Development 1956: i). Difficult, if not impossible though this noble aspiration may have been to achieve, it was at least definitive and clear, much more so than managing for change, when what is acceptable obviously changes from generation to generation. Surely some things are worth protecting so that they can continue to exist in as natural a state as possible, rather than being managed subject to changes in fashion and taste? If we believe so, and that is, one would assume, why protected areas exist, then we must be prepared to protect them from excessive overuse/overvisitation, which implies that we believe there is a limit to the amount of use they can withstand, and ipso facto, that there is a carrying capacity. The fact that we still cannot measure it effectively or accurately is a feeble excuse for replacing it with something else. To twist de Bono's analogy, we would be substituting questions which need to be answered with questions which can be answered. Future generations may not be content that we took such a step.

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