

Leisure, Environment and the Quality of Life

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Introduction and Framework

The environment is omnipresent. It is everything and anything external to us that might have an impact on how we think, feel, and act. It is physical and social, natural and human made. It includes not just our immediate surroundings but also a kind of mental shell of spatially and temporally nested situations and contexts we carry around with us in the form of memories that condition our mental experience and outward actions. Likewise the environment is the subject of our thoughts and feelings and is changed by our individual and collective actions. Throughout this review my focus will be on the relationship between environmental factors and LRT participation and quality and I will take largely as given the claim that LRT necessarily contributes to the quality of life. Still, even to summarize and assess this slightly narrower domain requires some effort to frame and delimit this inquiry. My background and training is most closely aligned with the broad and interdisciplinary field of environmental psychology and, consequently, I tend to focus on individual-level phenomena, i.e., the way the environment influences individual perceptions, preferences, attitudes, behaviors etc. and to a lesser extent how individual attitudes, preferences and the like influence environmentally related behaviors and actions. Clearly there are other disciplinary approaches for examining the relationship between leisure and the environment (e.g., environmental sociology; see Dunlap & Michelson, 2002; Spaargaren et al., 2000), however, given the symposium's emphasis on leisure and quality of life a review anchored in environmental psychological is very pertinent. Moreover, as I have argued elsewhere (Williams & Patterson, 1996), environmental psychology is an eclectic interdisciplinary field that provides a useful base for organizing the broader body of environment-behavior studies.

Few would seriously dispute that the quality of the environment plays a critical role in quality of life in all parts of the world in terms of providing basic sustenance for life (food, shelter, etc.). The question being posed here is: how and to what extent does environmental quality support the more emotional and spiritual aspects of life we associate with the concept of leisure and how does LRT participation enhance or detract from environmental quality and sustainability? One promising way to frame such a broad assessment of leisure and the environment is to build on a recent international project, *The Millennium Ecosystem Assessment (MEA)*, launched by the United Nations (Alcamo et al., 2003; MEA, 2005a, 2005b). This assessment involves over 1300 scientists from nearly 100 nations directed by an advisory board representing various international scientific organizations as well as leaders from the private sector, civil society, and indigenous groups. The aim of this assessment is to address the needs of decision-makers for scientific information on the links between ecosystem change and human well-being. The MEA framework (see Figure 1) builds on the concept of ecosystem services taken from the emerging field of ecological economics. It identifies the

major components of the environment that support human well-being as well as offering a description of the major components of well-being. There are several important features to note about the MEA framework and findings.

One feature is that the model is evidence-based. The findings, which are just now being published (and translated into several languages including Arabic, Chinese, and Russian), offer extensive guidelines for decision-makers (most of these documents can be found at: www.millenniumassessment.org). Rather than repeating the extensive findings of the MEA, the framework itself provides a useful analytical tool to organize findings and place LRT within the overall context of environmental features and processes as well as the general constituents of human well-being. Within the framework the central organizing concept of human well-being is described as the "opportunity . . . to achieve what an individual values doing and being." This description is a very good approximation of definitions of leisure grounded in classic Greek traditions (Hemingway, 1988) and Eastern counterparts of leisure as well (Yeh, 1993; Walker & Deng, 2003/2004; see also Jackson this volume; Iwasaki, this volume). Thus, the framework will be used as a guide to organize a more detailed assessment of LRT specific implications for both the environment and human well-being.

Within the field of ecological economics and the MEA specifically, LRT are typically identified as "human services" (Costanza et al., 1997) or a subset of "cultural services" (Alcamo et al., 2003; Figure 1) provided by ecosystems. Other ecosystem services typically suggested in ecological economics include supporting services such as soil formation and nutrient cycling; regulating processes such as climate, water purification, and waste treatment; provisioning services such as food, water, genetic resources, and raw materials production. As identified in the MEA, the broad category of "cultural services" includes opportunities for non-commercial (non-material) benefits such as aesthetic, artistic, educational, spiritual, heritage, and scientific values as well as other recreation services.

Costanza et al. (1997) go so far as to estimate the annual economic value of all ecosystem services, which they put at US\$33 trillion or about 1.8 times global GNP (as of 1994). Recreation was valued at US\$0.8 trillion and cultural services at US\$3.0 trillion. Taken together recreation and cultural services constitute 11.5% of all ecosystem services (see also Bockstael et al., 2000; Arrow et al., 2000; and Farber et al., 2002, for reviews and critiques of the ecosystem services approach to valuing environmental goods in general and the Costanza et al. estimates in particular).

Using this framework as a guide (which includes LRT within the cultural services category) we can organize the research findings on the interrelationships between environmental qualities, well-being, and LRT around six evidence-based principles (Figure 2):

1. Environmental quality (built and natural) makes a vast and essential contribution to the quality of LRT and by extension the quality of life. LRT and cultural services contribute directly to overall well-being and with particular respect to health and social relations.

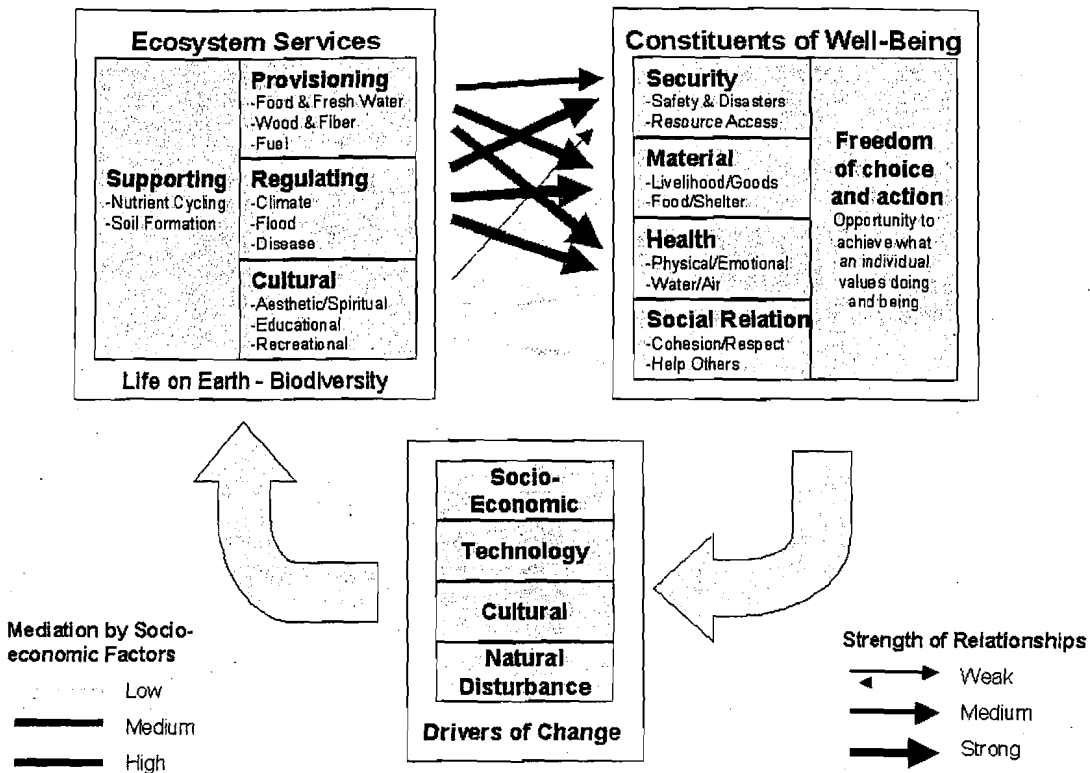


Figure 1. Ecosystem services and human well-being

Source: Millennium Ecosystem Assessment

2. LRT contributes to the development of pro-environmental attitudes, values, ethics and behaviors.
3. LRT is an important basis (as economic and political justification and social mobilization) for the protection of natural, historical, and cultural resources and landscapes.
4. Acting on (consuming) opportunities for LRT (to realize quality of life benefits) places demands on both the cultural/LRT service components of ecosystems as well as the supporting, provisioning and regulating services of ecosystems that degrade the quality of these services.
5. Some forms of LRT participation are more dependent on environmental quality for their quality and, likewise, some forms of participation are more benign where environmental impacts are concerned.
6. It is difficult to make generalizations about which activities are more dependent and/or benign; however, the specific impacts (positive or negative) are often different at different levels of social and spatial scale.

The overriding premise of the MEA is that *the condition of the environment makes a vast and essential contribution to the quality of life in general* (Principle 1). LRT and cultural services depend in complex ways on the supporting, provisioning, and regulating services of ecosystems. Moreover, cultural services are unique among ecosystem services in that they are not intrinsic to these ecosystems, but take their form and definition by virtue of human/cultural systems. Presumably only humans derive these services whereas all organisms depend on the supporting, provisioning, and regulating services of ecosystems. Interestingly, the MEA characterizes cultural services as relatively weak in their contribution to overall well-being compared to other ecosystem services. The MEA also characterizes them as subject to relatively low levels of mediation by socio-

to support the various constituents of human well-being (security, basic material for the good life, health, social relations, and ultimately freedom of choice and action). In essence the MEA framework equates well-being with opportunity for leisure with security, material well-being, health, and social relations as contributing to this broader notion of quality of life. To assess the evidence for Principle 1, Section II (below) reviews research findings that describe the role of environmental features and services in supporting LRT experiences and benefits.

Second, the MEA recognizes recursive relationships (i.e., drivers of ecosystem change) running from human well-being back to ecosystems and their services. The original MEA model distinguishes between indirect drivers such as socio-economic and technological forces and direct drivers such as natural disturbance and human induced changes in land use. For our purpose research findings pertaining to the feedback between LRT and environmental quality can be partitioned into four types (Figure 2). One type comes from an emerging body of literature in environmental education and conservation psychology, which seeks to establish the determinants of and methods for strengthening pro-environmental attitudes and behaviors such as recycling. In reviewing this body of research, there is some evidence that *LRT contributes to the development of pro-environmental attitudes, values, ethics and behaviors* (Principle 2). A second type of research seeks to establish the role and value of LRT as justifications for investments in environmental protection. Accordingly, *LRT is an important basis (as economic and political justification and social mobilization) for the protection of natural, historical, and cultural resources and landscapes* (Principle 3). A third type of research recognizes that, in consuming ecosystem services to achieve human well-being, there is some risk to

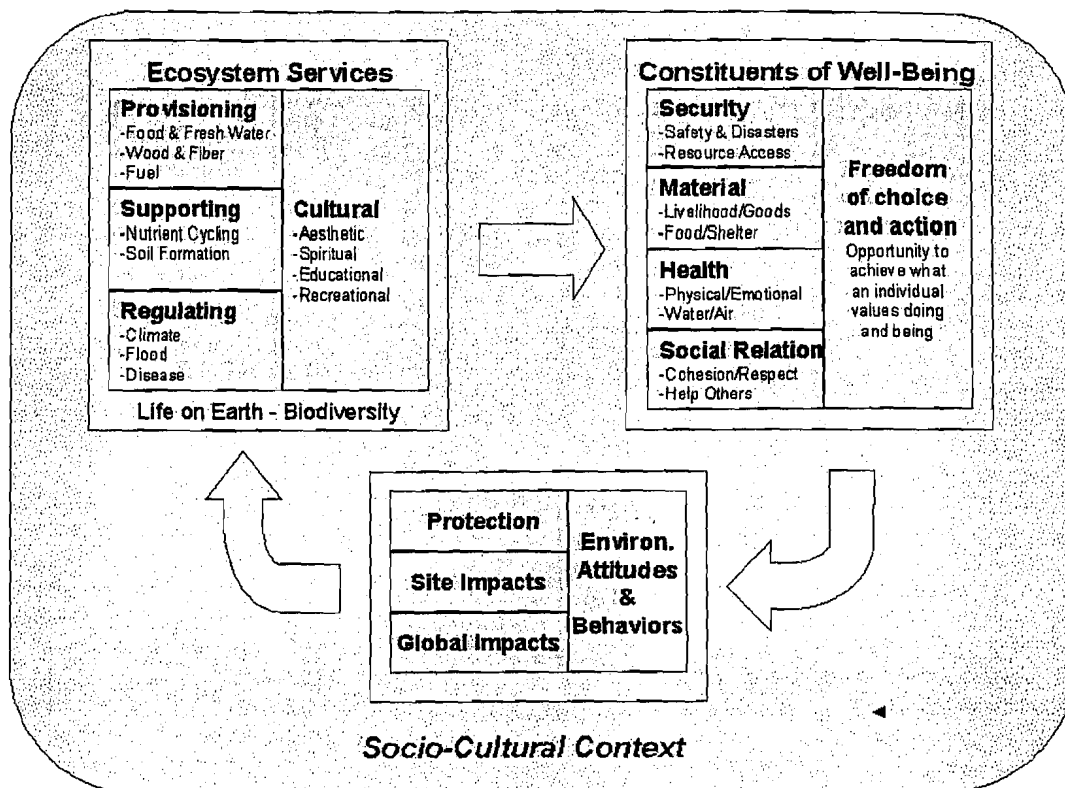


Figure 2. Leisure, Environment and human well-being

Adapted From: Millennium Ecosystem Assessment

the viability and sustainability of ecosystem services. Though the ecosystem services approach tends to focus on the benefit side of the ledger, there is ample evidence that acting on (consuming) opportunities to achieve what an individual values doing and being places demands on both the cultural/LRT service components of ecosystems as well as the supporting, provisioning and regulating services of ecosystems that degrade their quality (Principle 4). Section III (below) reviews the scientific evidence for Principles 2-4 as described above.

Finally, the MEA recognizes that due to regional, temporal, and scale factors making any broad, global generalizations about positive and negative impacts to quality of life is difficult if not meaningless. While most of the detailed description and evidence for the impact of the environment on LRT and the impact of LRT on the environment comes from site and activity specific research, an important contextual consideration is how to characterize the overall or aggregate impact. With respect to Principles 1-4 above, some forms of LRT participation are more dependent on environmental quality for their quality and, likewise, some forms of participation are more benign where environmental impacts are concerned (Principle 5). Similarly, it is difficult to make generalizations about which activities are more dependent and/or benign; however, the specific impacts (positive or negative) are often different at different levels of social and spatial scale (Principle 6).

Evidence for Impacts of the Environment on Quality of LRT

Broadly speaking Principle 1 refers to both the contributions of the various supporting, provisioning and regulating ecosystem services on the cultural (recreational)

services component as well as the effects of various biophysical (e.g., natural and built) and social features (e.g., service management) on LRT experiences, overall well-being, and the human/individual capacities to use and enjoy LRT services. What follows is a presentation of research findings organized into themes first suggested by Saegert and Winkel (1990) in their review of environmental psychology and modified and extended by Williams and Patterson (see Williams, 2004; Williams & Patterson, 1996). These authors identify four categories of human-environment relationships. This section describes the basic features of each category, how each has been or can be used to organize findings related to environment and leisure experience, and their respective strengths and weaknesses. They are distinguished from one another based on how each conceptualizes human experience or response to the environment.

Aesthetic/Therapeutic Relationships

This body of research builds on the assumption that biological and psychological survival motivates behavior. Research describes the way psychological responses to the environment have evolved to make humans more adaptive (Ulrich, 1993). In LRT these responses take two major forms: (a) how people cope with stressful environments and (b) how certain environments or environmental features serve restorative or therapeutic needs.

A common approach to understanding how organisms cope with stressful environments is to look for direct dose-response linkages between specific environmental stimuli (e.g., sound or temperature), and psychological functioning or well-being. For example, a dose-response model was used to explain the negative impact of aircraft noise on

outdoor recreation experiences (Mace et al., 1999; Tarrant et al., 1995). A dose-response perspective is also evident in the crowding, conflict, and social carrying-capacity literature, in which the stressor stimuli include the density of other people and/or a negative appraisal of their behavior (Miller & McCool, 2003; Vaske & Donnelly, 2002). From the stress perspective, LRT is recognized as both a context within which people find opportunities to cope with daily stressors (Baum, 1991; Driver & Knopf, 1976; Hull & Michaels, 1995; Ulrich, 1993; 1984; Ulrich et al., 1991a, 1991b; Wellman, 1979), as well as a context in which people sometimes encounter stress (e.g., crowding, environmental threats) and must adapt or cope in some way to stressors in the recreation environment, which may diminish the stress relieving value of LRT (Iwasaki & Schneider, 2003; Hammitt & Patterson, 1991).

Whereas the stress model portrays LRT as a way to overcome negative environmental conditions to maintain health and well-being (Saegert & Winkel, 1990), some research goes further to suggest certain environmental features and settings have an intrinsic capacity to promote physical healing and mental restoration (Hartig & Staats, 2003; Hartig et al., 1991; Herzog et al., 1997; 2002; Kaplan, 1995; Kaplan & Kaplan, 1989; Kellert & Wilson, 1993; Schweitzer et al., 2004). Accordingly, human responses to the environment are better adapted to natural stimuli, and therefore exposure to nature promotes well-being. While culture and experience play an important role in shaping environmental preferences (Yu, 1995), the restorative benefit of nature appears to operate across cultures (Ulrich, 1993). Still, as Ulrich et al. (1991) argue, Western cultures condition their inhabitants to prefer natural landscapes over cities (See also Hull, 1989), consequently stress responses, in particular, are largely mediated by cultural conditioning (in regard to crowding stress see also Altman, 1975).

In sum, the adaptive model of the environment-experience relationship has been very influential in establishing the health benefits of leisure (Driver et al., 1991a). These studies show that natural stimuli and moderate levels of stimulus complexity are highly preferred (Oriens & Heerwagen, 1992), contribute to well-being (Hartig & Staats, 2003), generalize across cultures (Hull & Revell, 1989; Balling & Falk, 1982; Yi, 1992), and can be measured reliably (Daniel & Vining, 1983; Hull, 1989). Overall, the adaptive model is particularly relevant to decision makers because it focuses on highly valued outcomes such as health and well-being, an understanding of the compatibility of the environment with fundamental human needs and human processes for effective coping in stressful situations (Saegert & Winkel, 1990). However, while the quality of the evidence is strong and convincing, by conceptualizing the environment as a natural (as opposed to socially defined) phenomenon and human well-being as primarily biological and adaptive, studies following the adaptive model fail to place their findings in the larger context of economic, social and political factors that structure environmental conditions and distribute power to control and manage the environment within society.

Opportunity Structure/Goal-directed Relationships

Within the opportunity structure or goal-directed model the environment is interpreted as a "setting for action" possessing the characteristics necessary for the

pursuit of specific activities such as rivers for rafting, snow for skiing, paths for walking, etc. (Ittleson et al., 1976; Holden, 2000). People are viewed as rational decision-makers rather than captives to the biological imperatives of the adaptive model. Research examines how people evaluate environmental attributes in arriving at a decision, action, or valuation, which makes this approach well-suited to the instrumental and rational traditions of environmental and program planning (Stokols, 1991). The social science of goal-directed behavior is quite well-developed, drawing heavily from psychological theories related to attitude formation, motivation and satisfaction, and decision-making (Ajzen, 1991; Manning, 1999); marketing and consumer behavior (Floyd & Gramann, 1997; Mallou et al., 2004) and microeconomics (Loomis, 2002; Hanley et al., 2002; Hearne & Salinas, 2002).

Environmental features are essential to satisfying most LRT goals, which are also referred to as motives or preferences (Asakawa et al., 2004; Douglas & Douglas, 2004; Gabr, 2004; Gospodini, 2001; Hearne & Salinas, 2002; Knopf, 1987; Manning, 1999; Moudon & Lee, 2003; Scarpa & Thiene, 2005; Suh & Gartner, 2004; Stewart et al., 2003; Stewart & Carpenter, 1989; Tse & Crofts, 2005; Uyarra et al., 2005; Virden & Knopf, 1989; Williams & Knopf, 1985). The goal-directed model hypothesizes specific relationships between psychological goals and environmental features that may or may not generalize across cultures and social groups. The specific goals people associate with various forms of LRT participation are generally learned (as opposed to innate) and pursued in situations (times and places) that people perceive to offer good opportunities for their satisfaction (Knopf, 1987). Because goal preferences are learned they are assumed to vary widely by personality, social background, culture, and geography. Thus, while the LRT goals people aspire to presumably vary across cultures (Yoshioka et al., 2002), it is also important to recognize that even within a particular society people often hold different preferences for environmental features to satisfy similar psychological goals (e.g., privacy, see Altman, 1975) and that different goals are often satisfied by similar environmental (setting) features (Knopf, 1983; Knopf et al., 1983; Kuentzel, 1990; Machlis et al., 1981; Pierskalla et al., 2004; Schreyer et al., 1985; Wallace & Smith, 1997; Williams et al., 1991).

Much of what has been learned from decades of research on the linkage between environmental conditions and the satisfaction of LRT specific goals has been incorporated into frameworks for describing and inventorying the LRT goals themselves (Driver et al., 1991b; Manfredi et al., 1996; Tinsley et al., 1986). These inventories of goals shows that across a wide range of LRT activities, participants are often seeking settings that provide relationships with nature, tranquility and privacy, escape from physical pressures and daily routine, physical rest, tension release, and social interaction. Other goals are more situation-specific such as exercise, learning, achievement, spiritual renewal, and sensation seeking (Driver et al., 1991b).

Just as there are inventories of LRT related goals, there are frameworks to describe and inventory the desired environmental features of LRT settings (Boyd & Butler, 1996; Butler & Waldbrook, 1991; Driver et al., 1987; Kaltenborn & Emmelin, 1993; Manning, 1999). The most widely used system is the Recreation Opportunity Spectrum (ROS), which organizes outdoor setting properties long

three parallel dimensions: biophysical (naturalness), social (density), and managerial (intensiveness) (Driver et al., 1987; Manning, 1999). Across a number of studies examining the links between ROS setting attributes and LRT goals, certain goals are more strongly linked to setting conditions than others. For example, skill development, challenge, escape, and achievement appear to be more dependent on low levels of development and less intensive management (though these relationships are often activity specific) whereas social goals such as family togetherness are not tied very closely to setting conditions (Shafer & Inglis, 2000; Williams & Knopf, 1985; Virden & Knopf, 1989). Beyond the ROS, similar schemes for describing important environmental factors have been developed for tourism (e.g., the Tourism Opportunity Spectrum, see Butler & Waldbrook, 1991) that show the importance of natural attractions such as coastal landscapes and beaches (Mathieu et al., 2003; Morgan, 1999) and wildlife (Donnelly et al., 2002; Orams, 1996). Others have noted the importance of such factors as climate (Lise & Tol, 2002; Uyarra et al., 2005) information and infrastructure development (Hearne & Salinas, 2002), events and heritage (Alexandros & Jaffry, 2005; Kim & Morrison, 2005), culture and culinary traditions (Tse & Crofts, 2005), and shopping (Yuksel, 2004) in tourism destinations.

Beyond tourism and outdoor recreation contexts, research has shown the value of urban/neighborhood environmental features such as open space (Zhang et al., 1998), waterfront and stream corridors (Asakakawa et al., 2004; Gabr, 2004; Gobster & Westphal, 2004), urban physical form and layout (Gospodini, 2001; Moudon & Lee, 2003), and environmental determinants of physical activity (Gordon-Larson et al., 2000; Huston et al., 2003). Likewise, research has documented design and environmental preferences for indoor and institutional settings to support LRT (Browder et al., 1998; Douglas & Douglas, 2004). Studies have also show the importance of social, ethnic, and cultural differences in LRT setting preferences (Bruger et al., 2000; Cordell et al., 2002; Gobster, 2002) and how certain natural features or environmental management practices may be experienced as undesirable by some user groups (Bixler & Floyd, 1997; Herzog & Kroppscott, 2004; Brunson & Shelby, 2002).

Inherent in the goal-directed model is the notion that environmental features are theoretically interchangeable (i.e., substitutable) and even reproducible, so long as the replacement provides a similar combination of goal-f fulfilling attributes. Psychological responses (e.g., satisfaction of LRT goals) are understood as instrumentally dependent on specific properties of the environment. Evidence supporting this model is relatively strong for services (the satisfaction of experience goals) that are generic, homogeneous, and substitutable (e.g., at an amusement park), but are less consistent when applied to the environmental services that are more ambiguous (e.g., environmental awareness) or unique (e.g., learning about a heritage site such as the Great Wall) (see Williams, 1989). Another advantage of the goal-directed approach is that it can be integrated with economic approaches to resource valuation (Peterson et al., 1988) and allows for segmenting various social groups by environmental preferences (Mallou et al. 2004; Virden & Walker, 1999; Vyncke, 2002). The weaknesses of this model, however, are that it provides limited understanding of the socioeconomic and socio-cultural factors influencing the distribution of opportunities for individual goal attainment, reduces all environmental

values to behavioral utilities, and generally ignores the symbolic construction of environment.

Socio-cultural (Symbolic) Relationships

In the socio-cultural approach environmental preferences extend well beyond biological imperatives and individual goal-oriented opportunities. Accordingly, LRT experiences (and meanings) are socially constructed within the cultural, historical, and geographical context of day-to-day life (Farnum et al., 2005; Greider & Garkovich, 1994; Stokols, 1991; Williams & Patterson, 1996). People are seen as social beings seeking out and creating meaning in the environment (Saegert & Winkel, 1990; Knopf, 1987). From a socio-cultural perspective, any single environmental feature may be perceived from a variety of social or cultural perspectives. Artic wilderness may, for example, symbolize ancestral ways of life, spiritual contemplation, valued commodities, tourist experiences, or essential livelihood to different groups of people (Williams, 2002b). Thus, an environment acquires varied and competing social and political meaning through its association over time with particular activities and groups (Johnson et al., 1997; Virden & Walker, 1999). As modern social relations have become more mobilized with sense of belonging and rootedness more diffused and fragmented across multiple places, LRT participation appears to offer people a way to negotiate multiple senses of place, home, and identity that enhance their sense of well-being (Williams & McIntyre, 2001; McIntyre et al., 2006). In addition, research is beginning to examine social and cultural differences in access to the economic and political resources necessary to define and direct the use of LRT settings; the basis of much inter-group conflict (McAvoy, 2002; Stokowski, 2002; Williams, 2002a).

The socio-cultural approach is very prominent in the tourism literature. This research has examined the social processes that define and shape images or identities of tourist destinations (Kolás, 2004; Saarinen, 1998; Suvantola, 2002; M. Young, 1999). These studies have looked at the constructions of travel risk (Carter, 1998), marginality and periphery (Shields, 1991), indigenous culture (Saarinen, 1999), urban waterfront (Iwata & del Rio, 2004), local heritage (Bessiere, 1998; Gruffudd et al., 1999; Herbert, 1996; Macdonald, 1997), ethnicity (Doorne et al., 2003; Oakes, 1993; Schnell, 2003; Shaw et al., 2004); literary settings (Herbert, 2001), national identity (Chang et al., 2004; Pretes, 2003), gambling (Stokowski, 1996), exotic pleasure (Cohen, 1995), escape (Rojek, 1993), cultural myths (Pretes, 1995), and political climate (Desswuffy, 2002). An important feature of this research is examination of role of communications and promotional materials in the construction of place or destination images (Chang, 1997; Dann, 1993; Cano & Prentice, 1998; Sarrinen, 1998; Schollmann et al., 2000).

In other leisure and recreation contexts, research has examined construction of "inclusiveness" in leisure settings for people with disabilities (Devine, 2004) and children (Karsten, 2002); social territory and belongingness in local and regional parks (Lee, 1972) and vacation home communities (Jordan, 1980; Lippard, 1997; Williams & Kaltenborn, 1999); cultural representations and ethnic histories of parks (Low et al., 2002) and public lands (Johnson, 1998); leisure and recreation places in national

identity (Arnesen, 1998; Campbell, 2003); social capital (Glover et al., 2005; Harshaw & Tindall, 2005) and citizenship (Hall, et al., 1999); and peak-bagging in regional landscape identities (Blake, 2002).

Socio-cultural studies emphasize the way landscape features and settings are symbolically constructed as LRT places, both through the meanings ascribed to them by users, tourists, and local residents and by the intensions of designers, developers, and promotional and managing agencies (Appleyard, 1979; Martin, 2004; Stokowski, 2002; M. Young, 1999). As a result LRT settings (places) are subject to complex, contested social processes in which various stakeholders struggle to manipulate and control place meanings, values, and uses (Harvey, 2003; Mitchell, 2001; Williams & Van Patten, 2006). These approaches are proving increasingly valuable to managers and policy makers as they struggle to balance the competing environmental priorities of diverse constituencies. Thus, for managing parks, protected areas, and tourism destinations, LRT can be a destabilizing force in the sustainability of landscapes and local culture or a potential vehicle for the their preservation (Williams, 2001; 2002b). In sum, the quality of the evidence supporting the basic role of symbolic construction of LRT settings in maintaining and enhancing a sense of collective identity and community is substantial, this approach risks underestimating the role and value of individual meanings and setting specific attachments that users form with favorite RLT settings.

Individual/Expressive Relationships

Like the socio-cultural model, the individual/expressive model emphasizes the learned and constructed character of environmental relationships. In this case, however, the construction of environmental relationships emphasizes the mediating role of individual histories and past encounters with places (Altman & Low, 1992; Tuan, 1977). Thus, individuals have the potential to assign unique and intangible meaning to environments or places (Brooks et al., in press; Eisenhauer et al., 2000; Fishwick & Vining, 1992; Schroeder, 2004). Greater contact and involvement with places produces emotional attachments or bonds (Hammit et al., 2004). Interest in individually held meanings emphasizes affective bonds to place that communicate or express a sense of identity to oneself and others (Giuliani & Feldman, 1993; Manzo, 2003, 2005; Trauer & Ryan, 2005; Williams & Kaltenborn, 1999). Building on a larger body of work examining attachments associated with home, neighborhood, and community (Altman & Low, 1992), a growing number of studies have applied place attachment and sense of place to LRT settings (Farnum et al., 2005) including parks and wilderness (Kyle, et al., 2004a, 2004b, 2003; Mitchell et al., 1993; Moore & Graefe, 1994; Williams et al., 1992; Williams & Vaske, 2003) tourism destinations (Cano & Prentice, 1998; Hwang, et al., 2005; Lee, 2001; Trauer & Ryan, 2005); neighborhood and cityscapes (Fuhrer & Kaiser, 1993; van der Land, 2005); and recreational homes (Kaltenborn, 1997; Jorgensen & Stedman, 2001; Stedman, 2003; McInyre et al., 2006).

This work shows how critically important personal attachments, senses of place, and place-based identities are to well-being (Manzo, 2003, 2005; Twigger-Ross & Uzzell, 1996), particularly so when these relationships are disrupted or lost (Brown & Perkins, 1992; Milligan, 1998; Fried, 2000).

To a large extent, leisure well-being is about establishing and expressing a sense of identity (Mannell & Kleiber, 1997; Haggard & Williams, 1991) and LRT affords participants opportunities to affirm identities through their affiliations and affections for specific LRT settings. Likewise, place attachments appear to be important mediating influences on perceptions of environmental quality and setting management preferences (Farnum et al., 2005; Hailu et al., 2005; Kyle et al., 2003, 2004a, 2004b; Vorkinn, 1998; Warzecha & Lime, 2000) and are thought to contribute to greater environmental concern and environmentally responsible behavior (Anderson, 2004; Cantrill, 1998; Vorkinn & Riese, 2001).

There is increasingly strong evidence that people develop attachments to LRT settings and that these relationships contribute to overall well-being by helping people establish a coherent sense of self purpose and meaning life. Individualized meanings of places both *enable* individuals to differentiate self from others in their primary social group or community (individuation) and, at the same time, *embed* the individual in a larger social context as place meanings are transmitted from a social group to the individual (Brandenburg & Carroll, 1995). At the same time, it is difficult to generalize about which settings and/or features of settings enhance opportunities for developing attachments and which users will develop the strongest attachments to any particular LRT setting. While the specifics are likely to vary by cultural background and personal history, the association of expressive meanings with LRT places demonstrates the importance of these site-specific relationships and bonds in quality of life. For LRT service managers and policy makers the thing to note is that people are likely to resist management efforts that tend to detract from their individual sense of self (Appleyard, 1979).

Some Concluding Observations for This Section

The preponderance of research provides strong evidence that environmental qualities play an essential role in defining quality RLT experiences, particularly in outdoor and tourism settings. Moreover, natural surroundings are often highly valued across a wide spectrum of cultures and social groups. There are, however, several important caveats that must be recognized. First, environmental experiences are by no means always positive as there are circumstances where people fear environmental conditions, especially where high levels of novelty and unpredictability are concerned (Bixler & Floyd, 1997; Herzog & Kutzli, 2002; Pollio & Heaps, 2004). Second, despite LRT's general dependence on environmental qualities, there is a great deal of variation by culture, socio-economic background, and the specific activities involved (Cordell et al., 2002; Ewert et al., 1993; Virden & Walker, 1999; Wolch & Zhang, 2004). Third, there are often many different experiences and benefits that can be derived from a given environmental setting, different settings may offer similar experiences, and those seeking various experiences in the same place may interfere with one another leading to conflict (Jacob & Schreyer, 1980; Schreyer et al., 1985; Wallace & Smith, 1997). So while the evidence is strong for the general proposition that the environment is often a critical and highly valued component of LRT well-being, it is difficult to generalize about relationships between specific environmental inputs and quality of life outcomes.

One additional caveat is that most of the evidence cited here involves the direct impact of cultural/recreational services on quality of life. One area not discussed is how the various types of supporting, regulating and provisioning services envisioned in the ecosystem services model contribute directly to the quality of LRT services and therefore quality of life. These issues are usually conceptualized as various environmental *threats* to LRT settings such as resource extraction, air pollution, and invasive species (Cole & Landres, 1996). One of these threats, the impact of LRT participation itself on supporting, regulating and provisioning services, will be addressed in the next section. Similarly the question of how people perceive environmental impacts and the effect they have on their LRT experiences will also be discussed in the next section.

Evidence for Impacts of LRT Participation on Environmental Quality

In addressing leisure and the environment we must look not just at the experiences, services, and benefits afforded by environmental features and settings, but also the demands that LRT participation makes on the environment. This section describes the research evidence for Principles 2 through 4, which address the impacts of LRT participation on environmental quality and therefore quality of life. In making demands on the environment LRT participation has both positive and negative consequences for ecosystems, for both the supporting (sustenance) services and cultural (LRT) services of ecosystems. These impacts originate from the direct use or consumption of LRT settings and indirectly in the form of consumptive demands on the sustenance base to support LRT-based consumption, particularly leisure related travel.

Studies of the impacts of LRT on the environment span diverse disciplines. Whereas most of the research on the role of LRT settings on quality of life comes from the social sciences, the impacts of LRT participation on the environment includes a broader array of environmental sciences. In addition, the enormous contextual complexity of environmental impacts of LRT makes generalization difficult. Given this breadth my focus will be to review work that looks most directly at this topic from a LRT perspective.

LRT and Pro-environmental Attitudes and Behavior

An important topic in environment and behavior studies is the origin and strength of pro-environmental attitudes and behaviors. Used here as a collective term, environmental attitudes include various conceptions of environmental ethics, environmental concern, and environmentally and ecologically responsible behaviors (such as energy conservation and recycling) or irresponsible behaviors (such as vandalism and littering). A commonly held assumption in the LRT literature is that leisure (particularly outdoor recreation) contributes to the formation of pro-environmental attitudes and behaviors (Principle 2) (Tarrant et al., 1999). Likewise there is also some research in the fields of environmental, outdoor, and experiential education seeking to show that nature/outdoor experiences and education programs contribute to the development of environmental concern and ethics (Kollmuss & Agyeman, 2002; Legault & Peletier, 2000; Ward, 1999) and that environmental concern translates into support for nature

protection (Carrus et al., 2005). From a psychological development perspective there is also some evidence suggesting that children exposed to nature in play and educational contexts tend to develop pro-environmental attitudes (Bixler et al., 2002; Chawla, 1999; Kahn, 1997).

Despite a well-defined literature examining the socio-economic and social-psychological determinants of pro-environmental attitudes and behaviors (Dietz et al., 1998), the specific role of LRT participation has been hard to isolate (Bixler et al., 2002; Chawla, 1999; Nord et al., 1998; Stewart & Craig, 2002; Tarrant et al., 1999; Teisl & O'Brien, 2003; Wellman et al., 1982). Part of the difficulty is that the different studies have looked at different forms of LRT participation producing inconsistent results (Teisl & O'Brien, 2003). Still participation in appreciative outdoor activities appears to have some positive impact on environmental attitudes (Jackson, 1986; Nord et al., 1998; Tarrant et al., 1999; Van Liere & Noe, 1981), but a few studies failed to confirm these findings (Geisler et al., 1977; Pinhey & Grimes, 1979; Wellman et al. 1982).

At the same time, the tourism literature harbors some doubt about the environmental ethics of tourists and tourism promoters (Holden, 2003, 2000; Fennell & Malloy, 1999; Lea, 1993; Smith & Duffy, 2003; Stark 2002) and consequently studies of the effectiveness of education to lessen their impact are common (Davis & Tisdell, 1999; Enzenbacher, 1992; Forestall, 1993; Grossberg et al., 2003; Jacobsen & Robles, 1992; Medio et al., 1997). Within the outdoor recreation management literature, there is also an extensive body of research evaluating various educational, persuasive, and behavior modification measures designed to get outdoor recreation participants to adopt more environmentally benign practices (Absher & Bright, 2004; Knopf & Andereck, 2004; Manfreda, 1992; Manning, 1999).

A number of studies have looked at environmental attitudes and pro-environmental behaviors across socio-economic, cultural, and national groups (Deng et al., 2006; Hayashi, 2002; Johnson et al., 2004a, 2004b; Kemmelmeier et al., 2002). This work suggests there are different cultural/societal propensities to support environmental concerns, but also that fundamental concepts of human-environment relationships vary across culture (Callicott, 1994; Fan, 2005; Guha & Martinez-Alier, 1997), making it difficult to generalize about the role of LRT in shaping pro-environmental behavior outside the specific socio-cultural context of individual studies. In sum, there is modest evidence to support the assertion that at least some forms of LRT participation contribute to the formation of pro-environmental attitudes.

LRT as Justification for Environmental Protection

LRT is an important basis (as economic and political justification and social mobilization) for the protection of environments, culture, and heritage (Principle 3). This is as much a historical claim as an empirically testable idea. The history of environmentalism and nature protection has been closely aligned with the recreation and parks movement, particularly in the USA (Nash, 1982; Sax, 1980; Wellman & Probst, 2004). Tourism and outdoor recreation were a particularly important justification for the establishment of national parks and other forms of nature protection, especially in the 19th and early 20th centuries. Likewise urban parks were seen as essential to the collective well-

being of working class (Taylor, 1999; Wellman & Probst, 2004). In that era parks and wilderness were less about ecological conservation and more about preserving heritage, bolstering national identity, and social control (Nash, 1982; Stormann, 1993; Taylor, 1999). Economic development has also justified some environmental protection efforts, particularly for the developing counties where tourism generated by designating protected areas is a central economic development strategy (de Oliveira, 2003; Neto, 2003).

In recent decades the LRT rationale for protection has been reversed. Environmentally oriented nongovernmental organizations (NGOs) have increasingly used ecotourism, not as the end goal of environmental protection, but as an economic and political rationale for meeting conservation goals and ecological sustainability (Burger, 2000; Luck & Kirstges, 2002; Miller & Auyong, 1991; Staiff & Bushell, 2004; Whelan, 1991). Despite the popularity of these arguments among governments, NGOs, and large international institutions, there is a significant literature describing the failures of (eco)tourism development to deliver on environmental objectives (Isaacs, 2000; Jim & Xu, 2003; Luck & Kirstges, 2002; McLaren, 2003; Neto, 2003; E. Young, 1999). Some have gone so far as to call into question the core premise of sustainable development (i.e., the inherent compatibility of social/economic and ecological sustainability) in favor of a more authoritarian approach to conservation (Terborgh, 1999; Oates, 1999; Brandon et al., 1998). Also, conservation goals have sometimes been pursued to the detriment of local, indigenous groups (Geisler, 2003; Negi & Nutiyal, 2003) and the economic benefits sometimes go unrealized (Ankomah & Crompton, 1990). Tourism is also seen as promoting cross-cultural understanding (Huxley, 2005), but the social and cultural impacts of tourism on local residents are mixed. While some studies report positive benefits to local residents (Kariel, 1989; Pizman et al., 1994; Trakolis, 2001), other studies document mixed or negative impacts of tourism on local culture and ways of life (Bleie, 2003; Cohen, 1995; Medina, 2003; Mitchell, 2001; Hill & Woodland, 2005; Palmer, 1994; Perex-Verdin et al., 2004; Stem et al., 2003; Stone & Wall, 2004; Teo, 1994; Tosun, 2002; Young, 1999) and ways to mitigate the negative social impacts of tourism (Honggang, 2003; Montanari, 1995; Nelson, 1994). Despite some failures, there remains widespread consensus that the success of conservation efforts depends on collaborative, participatory approaches that take human dimensions and local and indigenous concerns into account (Baur, 2003; Brechin et al., 2002; Turnbull, 2003; Watson et al., 2003; Wells & McShane, 2004; Wilshusen et al., 2002).

In sum, LRT continues to serve as a strong economic and political rationale for environmental protection, but it is difficult to empirically assess and weigh the actual economic and social benefits and costs that come with the establishment of protected areas. While some progress has been made to document these benefits and costs, findings vary from place to place and do not support general conclusions about the relative costs and benefits associated with protected areas.

Site Specific Impacts of LRT

Whereas the first two topics in this section suggest LRT generally posit positive impacts on the environment,

the remaining topics in this section focus on negative impacts at various scales. In this subsection I deal with site or setting impacts of LRT use. Going back to the ecosystem services framework, this can be understood as impacts directly on the LRT (cultural) services and/or the supporting services associated with LRT settings. Thus, LRT is a significant contributor to the degradation of environmental quality directly through the environmental impacts that come with the use of resources and landscapes as the settings or attractions for LRT participation (Principle 4a). However, it should be noted that LRT does not appear to be any more harmful than other forms of human activity (Butler, 2000).

As Cole (2004b) points out, despite being considered a non-consumptive use, LRT inevitably alters environmental features such as soil, vegetation, and wildlife and these kinds of impacts have been thoroughly studied (Buckley 2004; Cole, 2004a; Hammit & Cole, 1987; Holden, 2000; Knight & Gutzwiller, 1995; Liddle, 1997; Mathieson & Wall, 1982; Newsome et al., 2002). In addition, progress has been made in developing impact monitoring protocols, best management strategies, and educational and behavioral modification strategies to reduce impacts to vegetation and soils (Cole, 2004a). Knowledge is quite specific about how the amount, timing, and type of use impacts ecosystems at a site-specific level. Impacts generally follow a nonlinear (asymptotic) relationship, meaning most impact is caused by initial use. However, how this relationship generalizes to a larger landscape scale is poorly understood. In addition, as Butler (2000) argues, we know far more about wilderness and forest settings where impacts are relatively light and far less about more intensively used settings for tourism such as coastal areas, but this is beginning to change (see Alessa, 2004; Gormsen, 1997; Priskin, 2003a; Warnken & Bynes, 2004). Also, knowledge varies by type of activity, with hiking and wilderness camping impacts well documented (e.g., Andres-Abellan et al., 2005; Cole, 2004b; Cole et al., 1997), but only limited information on off-highway vehicles (Priskin, 2004, 2003a) and mountain bikes (Symmonds et al., 2000; Thurston & Reader, 2001).

How LRT participants perceive impacts varies by demographic and cultural background (Baysan, 2001; Perez-Verdin et al., 2004; Priskin, 2003b). While some studies show visitors can accurately perceive impacts (Priskin, 2003b) others show visitors often fail to recognize impacts they profess to abhor (Farrell et al., 2001). At the same time numerous studies have documented the negative effects of LRT induced landscape changes on visitor experiences (Cole et al., 1997; Eiswerth et al., 2005; Lynn & Brown, 2003) and the willingness of users to accept and adopt restrictions on their behavior (Cole et al., 1997; Manning et al., 2004; Manning, 1999) and even pay for mitigation measures (Baysan, 2001; Mathieu et al., 2003; Park et al., 2002; White & Lovett, 1999).

While much of the site impact work builds on studies in North America, many of the basic principles have been extended to LRT settings around the world. An internationally widespread approach to managing impacts has been to try to establish carrying capacities for recreation and tourism sites (Gartner, 1996; Inskip, 1991; Saverides, 2000; Shelby & Heberlein, 1986; Wahab & Pigram, 1997), but these approaches have also been criticized on a number of conceptual grounds (Lindberg & McCool, 1998; Lindberg et al., 1997; McCool & Lime, 2001; McCool &

Stankey, 2001) including problematic assumptions about cultural and institutional inclinations and capacities for applying regulatory measures (Williams, 2001). In addition, much of the work on impacts is based on case studies where it is often difficult to separate the effects of LRT from other human activities or natural processes (Butler, 2000). Still, at the site-level there is strong and considerable evidence that LRT use inevitably alters environmental features such as soil, vegetation, and wildlife.

Global Impacts of LRT Related Consumption

LRT is also a significant contributor to the degradation of environmental quality through leisure related consumption and travel (Principle 4b). Like any human endeavor, LRT often involves ancillary consumption of goods and services to facilitate, enjoy, and benefit from participation, but there is little direct research on the impact of LRT consumption on the environment. Although LRT is sometimes perceived or portrayed as a relatively clean and environmentally benign form of development (compared industrial development), the environmental impact research described above shows it is not inherently light on the land. Nor is it frugal in its demand for resources, particularly where leisure related travel is concerned (Gössling, 2002). But there are also deliberately frugal (e.g., voluntary simplicity) approaches to LRT (Buell, 2005; Cherrier & Murray, 2002; Pellow, 2005). And there are deliberately socially and ecologically beneficial forms of LRT, including for example, building homes, schools, and hospitals for poor or disadvantaged people (Cooney, 2001; Wearing, 2001) and volunteering to help with scientific research and nature restoration projects (Arai, 2000; Campbell & Smith, 2006; Probst et al. 2003; Van de Cruyssen, 2001). Social indicators research has also shown that subjective (psychological) well-being and environmentally responsible behaviors are compatible and associated with certain traits including an intrinsic value orientation, voluntary simplicity, and mindfulness (Brown & Kasser, 2005). But looking at LRT as a whole, there is little evidence to suggest it is necessarily more or less consumptive of resources than other human activities.

As a research topic, analyses of the environmental impacts of LRT consumption are often embedded in broader assessments of the conflict between environment and society (Schnaiberg & Gould, 1994) and the impacts of global scale consumption (Biesiot & Noorman, 1999; Cohen & Murphy, 2001; Røpke, 1999). Thus, we find various studies charting the environmental impacts of transportation, particularly the climatic impacts (Armstrong, 2001; Himanen et al., 2004; Schipper et al., 2001; Sommerville, 2004) and, ironically, assessments of potential climate change on tourism (Hall & Higham, 2005; Lise & Tol, 2002; Uyarra et al., 2005). According to Gössling (2005) a number of studies have suggested that between 60%-90% of the total climate impacts (CO₂ emissions) of a tourist's journey come from traveling to and from the destination with the rest coming from local transport, accommodations, and other activities and services (see Becken et al., 2002; Gössling, 2000; Høyer, 2002).

A few investigators have proposed approaches for evaluating the environmental costs of LRT related consumption, though usually as part of larger analyses of the impacts of household consumption on the environment (See Biesiot & Noorman, 1999; Cogoy, 1999; Røpke, 1999).

Gössling et al. (2002, 2005), however, have developed and evaluated methods of estimating the "eco-efficiency" (in CO₂ emissions/euro generated) of tourism. Based on this method and limited cases study evidence they show that tourism often has less favorable eco-efficiencies than the worldwide average of other economic activities. However, their case studies also show that the eco-efficiencies of tourism vary substantially, with travel distance and travel by air having the most unfavorable impact on efficiencies. Factors that make tourism relatively more efficient include longer stays and higher expenditures per day. Still, travel intensive forms of LRT significantly reduce any potential environmental benefits that come from using tourism as an environmentally friendly form of development. While they note that tourism as a development strategy for poorer countries often comes at a high cost in terms of eco-efficiency, they concede it is often one of the few options available and may be justified on social welfare grounds.

The global impact of consuming LRT services is not simply one claim on ecosystem services competing with other claims to support human well-being. LRT also generates particular ecological and social changes at a global scale, often associated with "regulating" services of ecosystems (e.g., climate, disease, and biotic distributions). Consuming recreation and cultural services can degrade these and other services when recreational travel contributes to greenhouse gas emissions, facilitates the transmission of diseases, or the migration of invasive and exotic species from one ecosystem to another.

In addition to literature describing the impacts of LRT related travel on climate and greenhouse gas emissions there is some literature describing other global consequences of the mass movement of people often associated with tourism (Mooney et al., 2005; McNeely, 2004). Two areas that have been explicitly linked to LRT are the spread of exotic species and the spread of human diseases. In particular, freshwater fishing and boating are important mechanisms for the spread of exotic aquatic species (Cambay, 2003; Hinkley & Chare, 2004; Kats & Ferrer, 2003; Muirhead & Macisaac, 2005). These have particular consequences for predation, competition, disease, hybridization, and habit destruction with significant costs to commercial activities including fisheries, hydropower, and inland water transportation (Mooney et al., 2005). Studies have also looked at the risk of spreading infectious diseases due to increases in commercial air travel (Mangili & Gendreau, 2005), ship traffic (Rooney et al., 2004), and the general public health consequences that come with global tourism (Richter, 2003; Wilson, 2003). The values of this work are to alert policymakers to these risks and help to identify potential strategies for mitigating these risks (Muirhead & Macisaac, 2005).

Concluding Observations for This Section

While there is an abundance of research on the environmental impacts of LRT, it is spread across a very diverse collection of disciplines, each with its own journals, language, models, and methods. Compared to research on the influence of environmental factors on LRT experience, the research comes from a wider array of geographic contexts. By its nature researching the impacts of LRT on the biophysical environment is less sensitive to cultural context, although the priorities and human consequences of

those impacts likely vary by culture and geographic conditions. The study of tourism impacts in particular is quite international in origin and scope. Nevertheless, the site-specific studies reflect predominantly North American origins and concerns.

Any summary assessment of the environmental impacts of LRT encounters four issues. First, it is difficult to make generalizations about which LRT activities produce the most impact. Second, it is difficult to "add up" or aggregate the impacts of different kinds. Third, the environmental benefits and costs of LRT are not evenly distributed across people and societies. For example, Cole (2004a) discusses the problem of generalizing from the site-level impacts of vegetation trampling. In one study vegetation loss from camping was less than 0.2% of the total at the scale of a watershed, yet in the campsites themselves vegetation loss often reached 90% of the site. Likewise, Gössling (2002) discusses the difficulty of assessing the cumulative or aggregate impacts of tourism on the environment. Fourth, environmental impacts are often not immediately evident making it difficult to isolate cause and effect (Butler, 2000). Finally, as noted earlier, a number of researchers discuss the uneven social distribution of impacts. The costs are often borne by the poorest and most vulnerable whereas the benefits are either spread globally or concentrated among well-off populations and nations (Gössling, 1999). In sum, the specific and aggregate impacts (positive or negative) are often different at different levels of social and spatial scale (Principle 6).

Conclusions

The state of knowledge on environmental determinants of LRT experiences and benefits is by definition more disciplined and easier to track. Still, while the work is extensive it is concentrated on the LRT participation of middle-class Westerners. Recent years, however, have seen more study of environmental influences on LRT among Asian cultures, but very little work on LRT in Africa. The state of knowledge on the LRT impacts on the environment is much harder to assess as the questions and issues are more interdisciplinary and the research results exhibit complex patterns across space, time, and scale. Thus, an important confounding issue in mapping out the relationship between LRT and the environment is to recognize that every action taken by LRT participants or policymakers has benefits and costs and these costs and benefits are not distributed equally across populations.

With respect to Principles 1-4 above, some forms of LRT participation are more dependent on environmental quality for their immediate quality and, likewise, some forms of participation are more benign or even beneficial in their impacts on environmental quality (Principle 5). The benefits associated with nature oriented LRT experiences would seem to be very dependent on the quality of environmental or ecological services. Other activities have very specific setting requirements (e.g., ball fields, ski lifts) yet some of these requirements are easily met through facility management. With respect to impacts of LRT on the environment some of the benefits to the environment by way of LRT promoting greater environmental concern and support may be moderated by the high levels of resources consumption that often accompany LRT participation. At the same time, some approaches to LRT involve a moral or

spiritual commitment to voluntary simplicity to minimize environmental impacts or sometimes involve volunteer efforts to deliberately enhance environmental quality.

An overall finding of this review is that the environment (as a kind of ecosystem service) contributes directly to human well-being defined as the capacity for leisure. But that finding is tempered by findings that show how acting on such capacities for LRT places potentially severe strains on the very ecosystem services that contribute to quality of life. At the same time, quality of life (e.g., leisure opportunities) can be understood as a necessary element in maintaining the flow of ecosystem services. One of the fundamental questions all this raises is whether greater access to LRT is, in the long run, sustainable from an environmental point of view. Some ecological economists have taken up such questions (Cohen & Murphy, 2001; Røpke, 1999), noting that prospects appear bleak if increasing wealth and free time continues to be largely channeled into ever more highly resource consumptive pursuits.

To protect environmental quality and therefore the quality-of-life benefits that accrue to individuals and society as a whole, LRT can and should play an important role for developing and strengthening pro-environmental behavior at individual level, as well encouraging and enlarging governmental and nongovernmental roles and responsibilities in environmental quality and sustainability (Principle 7). In the long run, LRT appears to be both an essential means in the struggle for environmental quality and quality of life and (as a synonym for quality of life) the very ends to which environmental quality is often pursued.

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