Future opportunities in recreation ecology research: Lessons learned from the USA

Christopher Monz[1]

Keywords: recreation ecology, visitor impacts, protected area management

Recent trends in outdoor recreation in the United States suggest that public interest in nature-based recreation and appreciation of natural areas continues to grow (Cordell 2008). Participation in most outdoor activities has increased significantly since 1960, with activities such as camping, bicycling, canoeing and skiing increasing as much as tenfold during this time (Cordell et al. 2008). Worldwide, participation in recreation and tourism in protected areas exhibit similar trends, although no global tabulation of park usage is available (De Lacy & Whitmore 2006). Associated with this increasing visitation are human disturbances and impacts to the environmental conditions of public parks, forests, wilderness, and private lands open to visitation.

Over the same timeframe, the field of recreation ecology has developed, largely in response to land managers' needs to maintain natural resource conditions in the face of rising demand for outdoor recreation opportunities. Despite a considerable effort that now amounts to over one thousand studies (Liddle 1997; Hammitt & Cole 1998; Newsome et al. 2001), most investigations seem to do little to move the field forward conceptually. Largely this is the result of studies not being theory-based and seldom building on previous work. To some degree, this reflects the fact that there have been few attempts to define the 'cutting-edge' of recreation ecology research or to articulate a vision for where it should go in the future.

This paper provides both a retrospective—a synthesis of what is well studied in recreation ecology—and a commentary on future directions that appear the most promising for continued development of the field. In order to fulfill these objectives, we provide a concise summary of the primary research generalisations in recreation ecology, and identify and describe four primary themes to guide the further development of recreation ecology research. With a focus on these future research themes, recreation ecology research will occupy a more primary role in sustainable recreation/tourism and protected area conservation strategies.

First, further theoretical development is needed, both in terms of testing existing theory and in developing new generalizations for parameters and systems thus far unexamined conceptually. The use-impact relationship (Hammitt & Cole 1998) stands as one of the few well-developed research generalisations and future work could continue to test this relationship and explore new response variables.

Second, recreation ecology has limited predictive capabilities and expansion of these capabilities is essential for further growth of the field. Many opportunities exist to expand predictive capabilities, including modelling specific stress responses of additional ecosystem attributes to spatially-based models that offer landscape level predictive capabilities of ecosystem responses under varying use scenarios. Liddle (1997) described this opportunity as a combination of the Cole & Bayfield (1993) experimental design and mapping techniques, but to date little work of this nature has been conducted.

Third, the effects of recreation on large-scale processes should be a consideration for protected area managers and scientists. In recreation ecology, we currently have knowledge of the stress response of variables at only one spatial scale– the small plot level. It has been suggested that some recreation impacts, such as grazing by recreational animals, displacement of wildlife, and exotic species introductions and dispersal, do have large spatial scale implications (Hammitt and Cole 1998; Cole 2002), but currently these impacts are some of the least studied. Moreover, emerging recreation activities, such as off highway vehicle use (OHVs), clearly have the potential to affect very large areas and alter ecosystem processes.

Last, the scope of recreation ecology needs to be broadened to include less easily observable responses and a wider geographic representation of research studies. Some relatively unstudied aspects include

[1] Department of Environment and Society and The Ecology Center, Utah State University, Logan, UT 84322, USA, chris.monz@usu

trampling effects on soil biota and the effects of harassment on the reproductive capacity of animal populations. In particular, the effects of recreation on ecological processes, such as biogeochemical cycling and plant-soil interactions, are poorly understood. Although some recreation ecology research has been conducted on every continent, relatively few studies have been conducted outside Europe, Australia and North America. Enlarging the geographic scope of work should provide insights into the generalisability of findings (Pickering et al. 2010), factors that cause variation in stress response, and unique impact issues.

References

Cole, D.N, & Bayfield, N.G. (1993) Recreational trampling of vegetation: standard experimental procedures. Biological Conservation 63:209-215.

Cole, D.N. (2002) Ecological impacts of wilderness recreation and their management. In: J. Hendee & C. Dawson (eds) Wilderness management: stewardship and protection of resources and values, p 413-459. Fulcrum Publishing, Golden, CO.

Cordell, H.K. (2008). The latest on trends in nature-based outdoor recreation and tourism. Forest History Today Spring:4-10

Cordell, H.K., Betz, C.J. & Green, G.T. (2008) Nature-based outdoor recreation trends and wilderness. International Journal of Wilderness 14(2):7-13.

De Lacy, T. & Whitmore, M. (2006) Tourism and recreation. In: M. Lockwood, G. Worboys & A. Kothari (eds) Managing protected areas: a global guide, p. 497-527. Earthscan, London.

Hammitt, W.E. & Cole, D.N. (1998) Wildland recreation: ecology and management. Second Edition. John Wiley, New York.

Liddle, M.J. (1997) Recreation ecology: the ecological impact of outdoor recreation and ecotourism. Chapman and Hall, London

Newsome, D., Moore, S.A. & Dowling, R.K. (2001) Natural area tourism: ecology, impacts, and management. Channel View Books, Clevedon.

Pickering, C.M., Hill, W., Newsome, D. & Leung, Y-F. (2010) Comparing hiking, mountain biking and horse riding impacts on vegetation and soils in Australia and the United States of America. Journal of Environmental Management (91/3), p 551-562.