## **Abstract**

Land managers need to know the impacts of different recreational activities in different environments. Different impacts are critical in different ecosystems. Localized, direct, lasting impacts, which are cheap and easy to measure, such as trampling, have been studied much more than diffuse, indirect, intermittent impacts, which are difficult and expensive to measure, such as water-borne pathogens, noise disturbance to rare fauna or interference with plant-pollination ecology. The latter are more critical for conservation, but relevant research is uncommon and underfunded. The quantitative relationships between the type and intensity of recreational activity and the types and intensity of ecosystem response across a full range of global environments are not known for any type of impact, even pedestrian trampling. Managers must typically rely on summaries of studies of similar impacts in similar environments. For different management issues it may be more useful to review impacts by: (i) type of activity or equipment, e.g. off-road vehicles; (ii) type of impacts, e.g. weeds and pathogens; or (iii) ecosystem components affected, e.g. wildlife or water quality. We have recently reviewed each of these. Different sampling designs are required: (i) to differentiate impacts of tourism from other natural or anthropogenic changes; (ii) to track changes in environmental quality or conservation value over time; or (iii) to test impact mechanisms, e.g. possible increased predation by feral cats on small native mammals along little-used recreational hiking trails. Without much better knowledge of impacts, and management tools to minimize them, increasing tourism (including ecotourism) will damage parks in ways that are not predicted or detected until they become irreversible. Such knowledge needs both long-term skilled observation by rangers and professionally competent scientific studies by appropriately qualified parks staff or others. If parks are to be used for recreation and tourism as well as conservation, parks services will need funds for this work - from either taxpayers, visitors or commercial users.