

Management of degraded trails in protected natural areas worldwide: a systematic review of scientific literature

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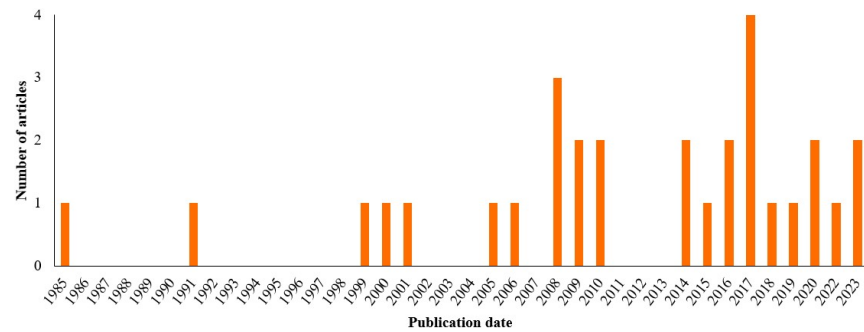
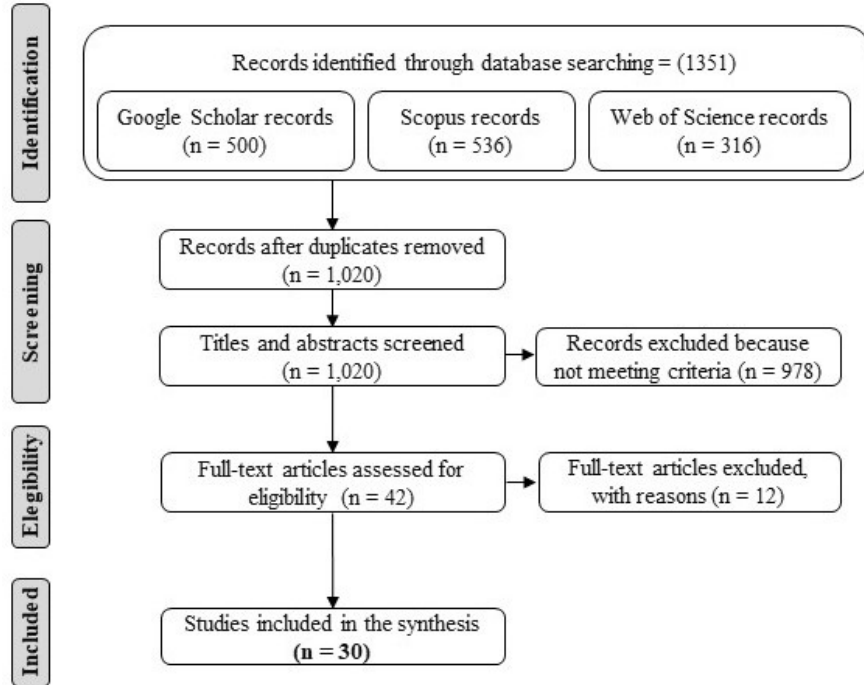
Abstract

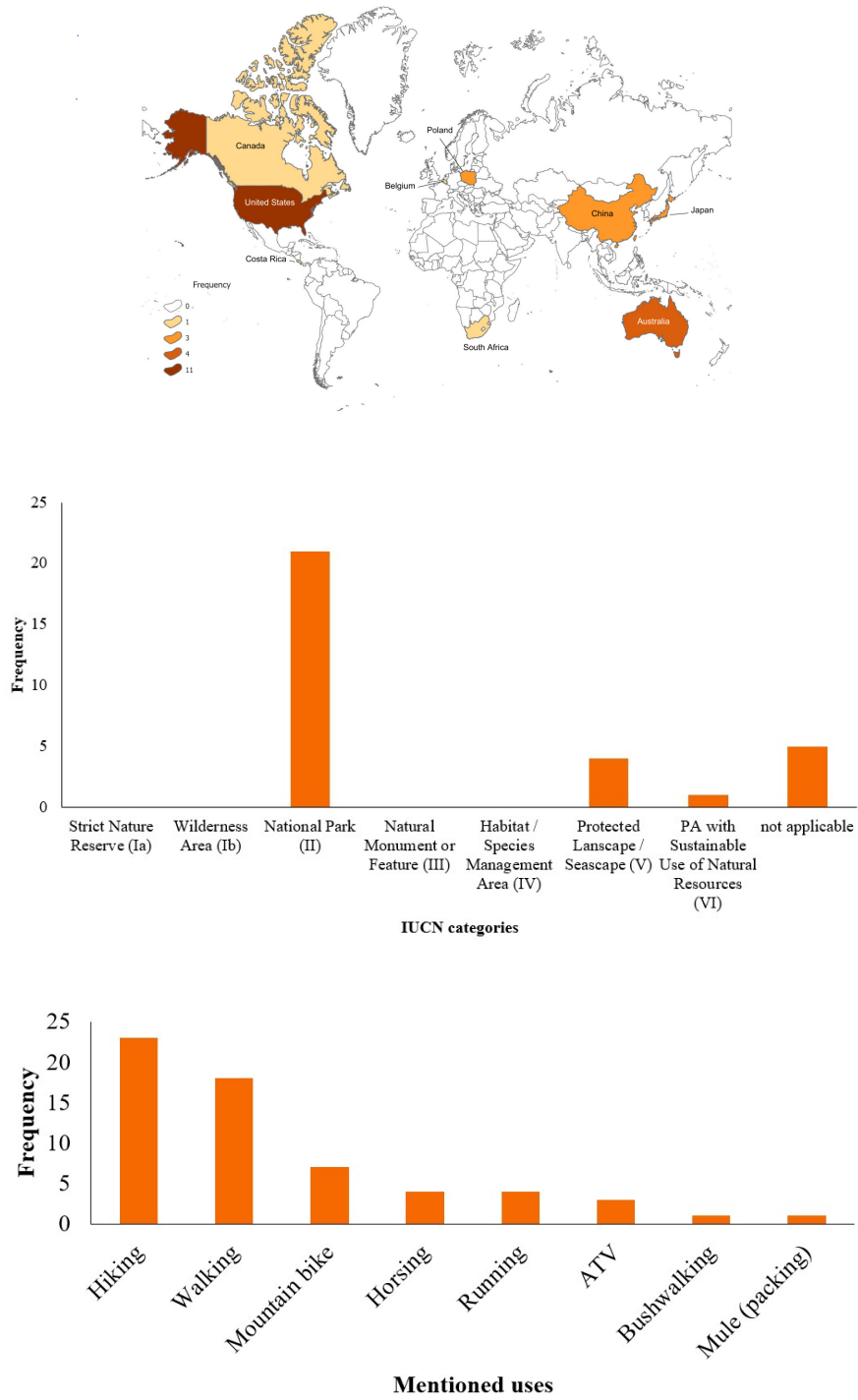
The increase in the use of trails for outdoor recreation observed in recent decades has led to greater pressure on existing trails and the creation of informal new trails, resulting in damage and degradation of these infrastructures. This degradation is concerning because many of these trails are located in protected natural areas, which aim to conserve natural resources and associated biodiversity. Concurrently, ecosystems worldwide have also been experiencing increased degradation, prompting the United Nations to declare the current decade as the Decade for Ecosystem Restoration. In this context, through a systematic review of the scientific literature, we aimed to better understand what science has discovered to enhance the management of degraded trails in protected natural areas worldwide. We observed that the number of research studies has been growing, particularly in the last decade, and is concentrated in countries with developed economies and by researchers from these countries. The terms used to describe a trail are quite diverse in the literature. Furthermore, some terms used in trail management, such as building or construction, maintenance, and repair, are uniformly utilized by authors. However, terms to address the reversal of trail degradation, such as restoration, recovery, and rehabilitation, are used quite variably among authors. Thus, future research could help clarify the use of these terms. We also noted that many studies have been dedicated to investigating the state of degradation of the trails in protected areas. However, only a minority of articles have addressed strategies to reverse the scenario of trail degradation, especially through experiments to identify the most effective strategies for different situations. This observation is concerning since the degradation of ecosystems and trails can become extremely costly or even irreversible. Therefore, further scientific studies are crucial to improve trail management, especially to reverse the scenario of trail degradation in protected natural areas.

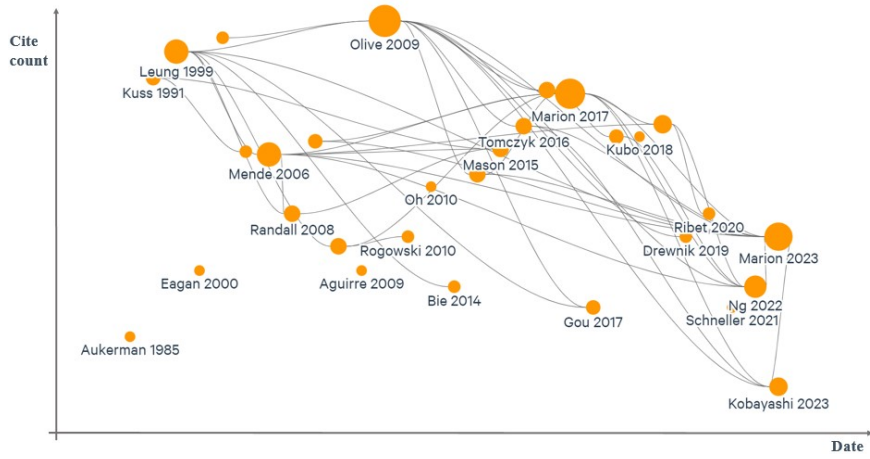
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Search string: [(trail OR trails) AND ("natural area*" OR "protected area*" OR "protected natural area" OR "park" OR "parks") AND ("restor*" OR "recover*" OR "rehabilit*" OR "repair" OR "maintenance" OR "maintain*" OR "build*")]







hiking trail
park trail
footpath
path
trail
foot trail
heritage trail
walk trail
recreation trail

