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Systematic Map
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Advancing communication approaches in outdoor recreation to change visitors' behavior: addressing uneven focus and exploring opportunities

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Evidence on effectiveness of communication measures used to manage recreation and tourism in natural settings was distributed unevenly among every study attribute we assessed: spatial scales, geographic scopes, environmental settings, behavior types, and measures used. In terms of target behaviors studied there was greater research attention on directing visitors to designated areas or trails and to develop proper waste disposal. Similarly, some communication mediums were more frequently studied, with signs being the most used measure. Most of the communication measures developed to support sustainable behavior aimed to educate and increase awareness.

Why is this Evidence Synthesis Needed?

Nature-based tourism has grown rapidly in recent decades and environmental managers around the world are faced with a conundrum of facilitating quality nature experiences for visitors while limiting damage from high use and unsustainable behaviors. On-site communication, such as signage, aim to guide visitors to adopt more sustainable practices including minimizing wear and tear at campsites, avoid disturbing wildlife and prioritizing safety precautions. The research community has mainly focused on visitors' changes in knowledge and attitudes rather than behavioral change. Further, the lack of comparative analysis makes it difficult to determine if communication is an adequate intervention tool to limit damage from unsustainable behaviors and if so, what communication measure to implement and how to measure its effectiveness. To advance our understanding on this topic this systematic map focuses on studies measuring actual behavioral change considering both methodological designs and contextual factors. We mapped the distribution and abundance of studies assessing on-site communication measures to promote behavioral change towards more sustainable practices, with a particular emphasis on targeted behaviors, communication strategies, and study designs.

This Collaboration for Environmental Evidence systematic map summarizes evidence from 54 studies investigating written, oral or visual communication measures addressing challenges such as waste disposal, trail usage, campsite preservation, and promoting safe behavior in outdoor recreation and nature-based tourism. This map provides insights into the design, focus, and outcomes of the included studies.

Main Findings

What studies are included?

This systematic map includes 54 studies, with the oldest article dating back to 1969. The majority of studies emerge in the 2000s, reflecting a growing academic interest in investigating actual behavior change. The studies are published across 27 different journals, primarily focused on tourism, recreation, education/interpretation, conservation, and environmental management. The studies primarily utilize outcome measures that gather quantitative data through direct observations, cameras, or trail counters to track changes in behavior, and/or interviews and visitor surveys to explore reasons for non-compliance. The focus is primarily on documenting changes in visitor behavior, with only a few studies also investigating the impact on the state of the natural environment before and after implementation. The studies typically span a brief time frame, often during the peak tourist season. Researchers employ various theories to design communication interventions, although a significant portion of the studies do not specify any specific communication or behavioral theory guiding their research. The theory of planned behavior is a dominant theory used either alone or in combination with other theories, such as the elaboration likelihood model. There is limited information available regarding the specific visitor demographics targeted by these communication measures. The predominant communication medium is the passive use of signs, with awareness raising as the dominant mode, but emotions, identity, and social norms are also commonly utilized. The studies are heavily skewed towards the United States in terms of geographic distribution and the aquatic realm was the subject of substantially less research effort than the terrestrial realms.

What are the Implications of the Review Findings?

This systematic map offers an overview of studies assessing the role of on-site communications in promoting sustainable behavior in outdoor recreation. It outlines study distribution and abundance, serving as a foundation for comprehending diverse methods and messages in visitor and conservation management. This enables adaptation to specific contexts and behaviors. The map underscores the role of communications in educational and awareness-raising for sustainable practices. Additionally, studies suggest that embedding emotions and social norms into messages significantly influences behavior. The map demonstrates that applying behavioral and communication theories often encourages varied communication approaches. Moreover, it highlights the importance of considering other interventions and mediums beyond signs. Our primary focus was English sources, and the studies' settings were mostly North American National Parks, potentially limiting findings' applicability to distinct regions. It emphasizes the need to prioritize examining specific visitor groups, diverse environments, and conducting long-term assessments. Also, acknowledging the environmental implications of behavioral changes is crucial, given studies show adoption and non-compliance can lead to unforeseen outcomes. Communication stands as a vital and well used tool for mitigating visitor impact in natural areas, and evaluating strategy outcomes remains essential, together with contextual comparisons and considerations.



Waste: handling waste disposal, such as food waste, storage and litter is one of the most common behavior types targeted with communication measures in outdoor recreation.



People hiking: nature-based tourism has grown rapidly in recent decades and environmental managers around the world are faced with a conundrum of facilitating quality nature experiences for visitors while limiting damage from high use and unsustainable behaviors.

Synthesis Time Frame

The review authors mainly searched for studies published between 1987 and 2021. This CEE Systematic Map was published in July 2023.

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