
Chapter 8

Sustainable mountain bike trails

Towards a holistic approach

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Introduction

Since the turn of the century, we have witnessed a marked shift from passive to more active forms of leisure as individuals increasingly prioritise experiences over consumerism. This trend coincides with a period of significant growth in the popularity of mountain biking (Wilkes-Allemann et al., 2022). As individuals seek to participate within experience landscapes through mountain biking (Gibbs & Holloway, 2018), the growing demand for mountain bike trails brings challenges for planning and land management and raises wider environmental concerns. Concurrently, adventure tourism continues to gain popularity, with mountain bike tourism, in particular, representing a growing global market (Buning et al., 2019; DMBINS, 2019). Alpine tourist destinations are increasingly diversifying due to climate change and shifting seasonality, with mountain bike tourism assuming greater economic importance (Pröbstl-Haider et al. 2021). Positioned against the backdrop of broader societal debates regarding climate change and habitat loss (Cherrington & Black, 2020), the topic of trail sustainability has therefore assumed greater significance within both the mountain bike sector and society at large.

This chapter seeks to explore the topic of sustainable trails from a broad conceptualisation of sustainability which embraces different and often contradictory dimensions as well as the interrelatedness of these. Central to this chapter is the belief that siloed approaches to research and practice are slowing the rate of progress and that a multidisciplinary approach is required which should be embedded within a more radical, regenerative conceptualisation of sustainability. With this in mind, the chapter will explore current theoretical perspectives and practices and consider the extent to which traditional and contemporary perspectives on sustainability might be limiting progress within the area of sustainable mountain bike trails. Drawing upon recent advances from sustainability science, I advocate for the use of conceptualisations that encompass both inner and outer dimensions (Ives et al., 2020) and for the application of a broadly delineated construct of regenerative sustainability (Gibbons, 2020).

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Traditional vs regenerative sustainability paradigms and their relevance to mountain bike trails

Early sustainability paradigms were predominantly anthropocentric in nature and focused largely on improving efficiency, reducing harm, and mitigating (human) damage to the environment (Du Plessis & Cole, 2011). This approach was underpinned by a reductionist view, in which human behaviour was analysed in isolation from other lifeforms and ecosystems (Gibbons, 2020). For instance, much of the current knowledge base regarding trail sustainability has emerged from research focussing on soil disturbance, although environmental impact can extend to wider ecological components including vegetation (Weiss et al., 2016; Pickering, 2022), disturbance of wildlife (Wyttenbach et al., 2016), and effects upon water quality (Kidd et al., 2014; Cooke and Xia, 2020). It is now well established that all trail-based activities cause a degree of degradation of soil, with the effect generally being curvilinear (Hammit et al., 2015) and moderated by an interaction between environmental factors, user type, and user behaviour. Recent attempts have also been made to promote repeatable evaluation of the physical condition and sustainability of trail systems through measurement of attributes, including the composition of tread substrates, vegetation type, soil moisture, and tread drainage (Marion & Wimpey 2017; Marion et al., 2022).

However, a recent review of soil erosion on mountain trails resulting from leisure activities argues that the clear asymptotic relationship between trail use and degradation occurring in some environments but not in others highlights the need to better understand the natural factors which mediate this relationship and the behaviour of users (Salesa & Cerdà, 2020). Thus, it is only through an integrated approach which measures multiple variables longitudinally, including local geomorphic conditions, trail characteristics (e.g., grade, slope alignment, surface materials), weather conditions, ground and soil conditions, usage (e.g. volume, frequency, and patterns of use) rider behaviours (e.g., riding styles, braking technique, adherence to the trail) and considers the interaction between them can we properly establish the environmental impact of mountain bike trail use within local contexts. Indeed, the current reductionist approach, and associated conceptual (im)precision, may constrain integrative enquiry (Ives et al., 2020) and cannot fully elucidate the sum of impacts across the wider environment. Furthermore, current approaches are generally limited to describing and quantifying impacts and there is a need to develop and measure the efficacy of strategies for mitigation at a minimum (Salesa & Cerda, 2020).

Here, the idea of regeneration represents a paradigm shift for sustainability, adopting a holistic worldview that transcends previous forms of sustainability whilst aiming to promote the thriving and flourishing of complex living systems (Gibbons, 2020). Central to the regenerative approach is the belief that sustainability comprises both inner and outer dimensions. Inner sustainability

refers to the mindset of individual agents, including their beliefs, values, attitudes, and emotions. In mountain biking, for instance, rider behaviours are arguably the most important determinant of the ecological impact of trail use and therefore need to be fully understood in order to progress the discourse of sustainable trails. In terms of trail use, current trends suggest that trail and enduro riding are becoming the most prevalent (Vital, 2020; Campbell et al., 2021; IMBA, 2021) and these riding styles encompass the use of a wide range of trails, including machine built, hand-dug and wild, or natural, with enduro tending towards more natural, downhill-orientated tracks. We also know that a majority of mountain bikers will continue to ride in wet conditions, although there are country-specific variations (Campbell et al., 2021; IMBA, 2021).

Outer dimensions of sustainability, on the other hand, represent the observable elements of sustainability, including those relating to governance, ecosystems, and human-environmental systems. Indeed, one of the most contentious issues surrounding the use of trails by mountain bikes at present is that of trail status, or designation. Trail access laws differ across countries and trail designations are often ambiguous due to the lexicon applied to unofficial trails, which includes terms such as unauthorised, unofficial, illegal, illegitimate, unsanctioned, wild, rogue, guerrilla, pirate, or grey trails, among others. Unauthorised trail building has always been part of mountain bike culture, but with growing numbers of riders the potential for negative impacts increases. However, while purpose-built trail centres and bike parks can divert mountain bikers away from more sensitive areas, thereby protecting ecosystems and reducing conflict (Taylor & Sand, 2021), they may not satisfy all riders' appetites for natural technical trails (Gibbs & Holloway, 2018). Certainly, previous research has shown that most European riders admit to using illegal or unauthorised trails (Zajc & Berzelak, 2016; Campbell et al., 2021) and, perhaps unsurprisingly, use of unauthorised trails is greatest in countries where riders report a shortage of appropriate legal trails.

Recently, the COVID-19 pandemic afforded a unique insight into how these inner and outer factors can intersect and overlap, as we witnessed how the impact of enforcing widespread restrictions on mountain bikers (outer), in this case of movement, leads to the proliferation of unauthorised trail building (inner) (Primack and Terry, 2021; O'Keeffe, 2022), supporting the notion that mountain bikers a desire to ride certain types of trails and to create them where they don't currently exist. During the pandemic there was also a significant increase in the use of trails located in or close to urban areas (Tiessen, 2022; Smith et al., 2022), and while this may not have been driven by fully autonomous motives, locating trails close to where people live and work promotes wider sustainability by reducing vehicular travel to reach trails and increasing equity of access.

With that being said, little is understood about the motives for building and using such trails, although anecdotal evidence suggests that unsanctioned

trails are often initiated by underrepresented groups who are unsatisfied with sanctioned trails, often citing predictable man-made features and perceived sanitation as undesirable elements of official trails (AMB Magazine, 2021). Arguably, then, by crafting trails which promote opportunities to engage with nature in ways which satisfy individual needs (and desire for more technical trails) unauthorised trail builders are promoting their own well-being and sense of flourishing. The extent to which this might develop various dimensions of sustainability, especially within the group domain, and ultimately lead to wider pro-environmental behaviours is currently unclear but needs to be considered as a potentially important outcome.

In considering the complex and overlapping nature of inner and outer motivators for sustainability, it is therefore important not to assume that unauthorised trails are inherently less sustainable than authorised trails, as this assumption is predicated upon somewhat limited evidence and assumes a predominantly ecocentric perspective. Again, there is a need for multidisciplinary evidence attending to the local context surrounding these trails. Unauthorised building of technical trail features certainly has the potential to create environmental issues, as well as safety concerns where existing trails have been inappropriately modified, but simply removing unauthorised trails or features fails to address positive social benefits that emerge from mountain bikers' perspectives (Pickering et al., 2010).

Trail design, building, and maintenance from a regenerative perspective

From a management or legislative perspective, it is imperative that mountain bike practitioners consciously consider all aspects of sustainability to ensure an informed decision-making process. To facilitate this, there is a need to develop frameworks to guide the decision-making process underpinning the response to unauthorised trail building, which may be embedded within contemporary or regenerative paradigms. While local access legislation is central to this debate, planners and trail builders should be cognisant that prohibition is likely to be counterproductive and may push riders towards a disengagement tipping point leading to a reduction in feelings and acts of care towards other users and the environment (Brown, 2016).

In Scotland, where access laws are especially progressive, the National Access Forum, who work in collaboration with Developing Mountain Biking in Scotland, land management and ownership bodies (Forestry and Land Scotland, Scottish Land and Estates, and Scottish National Farmers Union), and other recreation bodies (British Horse Society, Ramblers Scotland) developed a guide to unauthorised trail building (National Access Forum Scotland, 2018). This document is intended to help mountain bikers engage with landowners and land managers, and the guidance also contains several practical steps and guidance on several of the key issues and problems relating to the

construction of trails. In addition, the International Mountain Bicycling Association (IMBA) currently advocates for more trails close to home, citing the significant benefits that these have for mental health and quality of life, providing economic benefits and creating community (IMBA, 2022, 2023). Bentonville, Arkansas, serves as an exemplary case study for this, and the potential for creating new social and economic communities from the co-location of people and trails (Heil, 2017). In this sense, ‘unauthorised’ trails can, under certain circumstances, make an important contribution to local economies, provide physical and mental health benefits, offer sporting challenges, and provide a connection with nature (National Access Forum Scotland, 2018).

As I have already suggested, the regenerative paradigm asserts that inner dimensions are the root of outer sustainability and that it is only by attending to these inner dimensions that positive effects on the wider biosphere can be realised. Despite the persisting belief that mountain bikers are motivated by a sense of risk and danger, there is a growing body of evidence to demonstrate that enjoyment of nature is a much more powerful source of motivation (Roberts, 2018; Campbell et al., 2021). Given the immediacy of many mountain bike trails to natural environments (see Figure 8.1), this is perhaps unsurprising. Extreme sports certainly have the potential to cultivate a strong affinity to, and connection with, nature and the natural environment (MacIntyre et al., 2019) and may act as a precursor to undertaking environmentally sustainable



Figure 8.1 Mountain bike trails in Aviemore, Scotland. Credit: Ross Bell/Developing Mountain Biking in Scotland.

practices (Brymer et al., 2009; Brymer & Gray, 2010). Roberts et al. (2018) reported that nearly 90% of mountain bikers believe their involvement in the sport makes them feel more connected to nature and the world around them. More recently, we demonstrated that European mountain bikers not only believe that use of mountain bike trails has increased their appreciation of and willingness to protect nature, but that a large majority claim to have taken direct action to do so (Campbell et al., 2021).

When viewed from the perspective of regenerative sustainability, it appears likely that participation in mountain biking is influencing an internal dimension of sustainability (evidenced through reported attitudes) and driving pro-environmental behaviours that extend beyond the boundaries of the trail itself. Adopting this perspective may therefore promote research to better understand and to capitalise on this process. Here, there is an apparent paradox between mountain bikers' desire to use and to protect nature. While contemporary sustainability would consider the trade-off between potential environmental impact and sustainability of human well-being, regenerative sustainability affords an opportunity to think differently about human-nature relationships and pro-environmentalism and to look beyond the direct impacts occurring from participation in leisure activity or nature-based sport (Hanna et al., 2019).

We can draw upon various examples relating to mountain bike trails where inner sustainability (attitudes) appears to drive outer sustainability (pro-environmental behaviours). For example, Trash Free Trails (TFT) is a community-focused, non-profit organisation which aims to reconnect people with nature through the simple yet meaningful act of removing single-use pollution from wild places. In 2022, TFT removed over 7000 kg of rubbish from 9775 km of trails through 2810 volunteer hours (Trash Free Trails, 2022). Similarly, the Marin Tidy Trails initiative also seeks to mobilise the mountain bike community in removing litter from trails through trail-tidy days and campaigning (Marin, 2022). This reflects work I have conducted elsewhere, whereby, in explaining their enjoyment of riding mountain bike trails, participants cited characteristics which encompassed a broad range of environmental, social, and economic aspects (Campbell et al., 2021).

Within these initiatives, the planning, design, and construction of mountain bike trails are integral to their regenerative potential. This is formalised in the International Mountain Bicycling Association's (IMBA) Guide to a Quality Trail Experience (GQTE), which states that:

One of the core principles of the GQTE is to balance these components of trail sustainability in every project that is undertaken. If achieved, this balance will provide the type of quality trail outcomes that riders seek, ultimately resulting in a truly sustainable riding opportunity.

(IMBA, 2017, p. xvi)

This idea of balancing the different aspects of sustainability also allows us to move beyond the mechanics of sustainable construction techniques, or of maximising mitigation, to a position where environmental impacts might be weighed up against other aspects of sustainability, since:

The most overlooked aspect of the trail development process is social sustainability, and a primary goal of the GQTE is to elevate awareness and consideration of this component. Each trail user seeks a specific experience, and while this seems simple enough to achieve, the complicated reality is that various types of users may be seeking dramatically different experiences on the same trail on the same day, and some users may have varying expectations of the trail itself depending upon their unique recreational objectives on any given day. Failure to consider or provide for a wide range of desired user outcomes (experiences and associated benefits) is easily evidenced by overcrowded trails, trails with little use, trail users who feel 'pushed out' by other users, and the creation of unauthorized routes. Even if a trail is properly designed to provide a desired user outcome by minimizing resource protection, it can still fail to be socially sustainable. If the location of the trail is unsupportable from a political or social standpoint, the long-term sustainability can be called into question as a case of "right trail, wrong place." Different bike cultures, influenced by topography, weather, the bike industry, and innumerable other factors, exist in some areas, racing is a critical component of the local scene; in others, pushing the boundaries of technical riding drives the community. Using the network of trail stakeholders to identify the dominant culture of a specific area will foster the development of proper trail user objectives, ultimately leading to establishing the right trail in the right place.

(IMBA, 2017, p.165)

Applying the concept of whole ecosystems to the trails, it therefore becomes relatively easy to advocate for a position which considers the sustainability of wider trail networks rather than of individual trails within planning. It is for this reason that Marion et al. (2022, p.1) suggests that

In the context of larger trail networks, there should be an equilibrium or harmony between human uses and the long-term protection and maintenance of the trail network's infrastructure, its environmental and cultural resource conditions, and broader social, health, and economic benefits to surrounding communities.

However, this raises an important question regarding whether all trails need to meet the same threshold in order to formally qualify as 'sustainable'.

Certainly, from an environmental perspective we know that local conditions interact with build level to dictate the carrying capacity and therefore the level of build required, and this may vary significantly across the wider trail network. For instance, hand-built trails (see Figure 8.2) may be appropriate in some areas, whereas in others, a mechanised build (see Figure 8.3) may



Figure 8.2 A hand-built trail, '3G' in Innerleithen, Scotland. Credit Ian Linton/
Developing Mountain Biking in Scotland.



Figure 8.3 A machine-built trail, 'Silverstone' in Hemsedal, Norway. Credit: Lars
Storheim.

be preferable. Planning becomes central to ensuring sustainability across networks (guidance from IMBA touches upon this) and DMBinS recommends involving the riding community in this process to ensure that trails can be provided which meet their needs. Integration of professional and voluntary trail builders should be encouraged and, where possible, trail associations and unofficial trails crews should contribute to the creation of the right trails in the right place. By acknowledging that not all trails need to be equal, it is possible to identify areas where trails will necessarily be short lived (e.g., due to commercial harvesting operations), and consider the implications for the build level of (steep, natural fall line) trails which will not need to withstand lots of traffic or years of use (NAF, 2018). With this in mind, it has been argued that land managers potentially need to consider providing trails in sacrifice areas to alleviate the stress imposed on fragile ecosystems while recognising that decisions taken in one area are likely to affect neighbouring areas over time due to shifts in mountain biking opportunities. (Mosedale, 2002).

Conversely, where protection is prioritised, there are a number of innovative approaches which promote environmental sustainability. For example, Vivabike Festival in Valposchiavo have been expanding their mountain biking offer in Switzerland without creating new trails through a process of 'trail recycling', whereby largely unused historic paths are converted into a viable network of mountain bike trails. This emerging practice represents a sustainable way to create an attractive trail network without having to interfere with the landscape, since the trails are already historically and ecologically embedded in the landscape (Take Care of Your Trails, 2021).

In considering these examples, it is clear that trail planners and builders bear ultimate responsibility for shaping both the user experience and the potential environmental impact (Taylor & Sand, 2021). As the trail-building sector seeks to become more professional, there is therefore a need for quality education and training to ensure the sustainability of high-quality mountain bike trails. To date, the IMBA guide (2017) represents the most comprehensive guide to improving the design and construction of mountain bike trails. However, the results of a comprehensive trail-building sector survey undertaken in 2020 as part of the European Commission-funded 'Developing Intereuropean Resources for Trail Builder Training' (DIRTT) project indicates that as many as 65% of companies operating in the trail sector have difficulty recruiting employees with the appropriate skills and competence, while over half felt there was insufficient training available to meet the needs of their organisation (Campbell et al., 2021). There was also a strong demand for a certification program, with 79% of respondents believing that the introduction of certification would lead to an increase in the quality and sustainability of mountain bike trails.

The purpose of DIRTT was to create a pan-European education and training offering to address the limitations of current training and to develop the necessary skills within the trail-building sector. Due to the pan-European composition of the project partners, local context was explicit, leading to the

development of a global framework which can be applied at the local level according to contextual factors including geology, topography, legislation, weather, build levels, type, and end users. This was a deliberate departure from a previous one-size-fits-all approach, opting instead for a common quality assurance framework that can be interpreted and applied locally. Here, the focus is on the end-user experience as the starting point to delivering the right trail in the right place. The project developed a formal credit-bearing vocational course of study, combining online education with practical residential sessions, as well as a structure and resources to facilitate stand-alone training within each partner country according to their needs. Development of pedagogical training principles is embedded within the training to promote quality instruction and to maximise opportunities for experienced trail builders to share their knowledge. Similar developments are taking place within the United States, with Vermont University launching a sustainable trail certificate in 2023 and Northwest Arkansas Community College's Foundation having recently been awarded an \$8 million grant to establish a trails trade school (Trobach, 2023).

Sustainability and the (increasing) role of trail associations

Increased participation in mountain biking and the potential conflict between user groups and land managers has spawned a marked growth in civic recreation-based stewardship and advocacy groups aimed at preserving, creating, and restoring recreational resources (Schild, 2019). The mobilisation of collective actors in the shape of trail associations has been shown to be pivotal in negotiating and addressing trade-offs between different groups of stakeholders (Wilkes-Allemann et al., 2022). While there is no official database of trail associations, the online trail management platform TrailForks list approximately 3000 trail associations worldwide (Trailforks, 2023). Vermont Trail Association, who claim to be the largest, boast a current membership of nearly 10,000 members, growing by nearly a quarter between 2020 and 2022 (VMBA, 2023).

Trail associations serve to mobilise the riding community by harnessing social capital and a willingness to contribute to trail maintenance. The value of volunteering for developing a sense of community in sports settings has previously been demonstrated (Cuskelly & O'Brien, 2013) and trail associations have an important role to play in developing sustainable mountain bike communities. While individual associations have specific mission statements, these most commonly focus on securing access to or enhancing mountain biking opportunities, building, and maintaining trails, promoting responsible mountain biking and trail use, and advocating on behalf of mountain bikers, with community building also being a relatively frequent aspiration (Schild, 2019). Therefore, while there is an important focus on the environment, it could be argued that the central purpose of trail associations promotes all aspects of sustainability: environmental, social, economic, and cultural.

Voluntary participation in recreation and conservation projects has previously been shown to improve aspects of participant well-being (Molsher & Townsend, 2016), enhance awareness of environmental issues (Asah & Blahna, 2012; Molsher & Townsend, 2016), and lead to attitudinal shifts (indicative of increased inner sustainability) and improved stewardship (Dresner & Fischer, 2013; Schild, 2018). Whether this leads to wider pro-environmental behaviours is not currently clear, and there is currently a lack of empirical evidence derived from participants volunteering in the construction or maintenance of mountain bike trails. However, alongside environmental reasons, the social and fun aspects of volunteer trail-building activity have been shown to be important motivations for participation which might contribute to the development of inner dimensions of sustainability (Kamei et al., 2016).

From a practical perspective, Wilkes-Allemann et al. (2022) outline the critical role that formalised trail associations played in successfully liaising and negotiating with other stakeholders and representing the interests of mountain bikers within three European countries. For example, IMBA's annual Take Care of Your Trails campaign, originating from Scotland, promotes volunteer-based trail maintenance and highlights all trail repair, clean-up and build efforts from trail crews and volunteers across Europe. In 2022 alone, over 6900 volunteer hours were contributed through this initiative (IMBA, 2023). Adopting or assuming responsibility for trails is therefore key to initiating negotiations around ownership and use, while the challenge of funding the establishment and maintenance of the trail raises competing interest and can constrain the process. Many trail associations offer membership or contribution systems to attract funding direct from the riding community, with funds being directed back into local trail infrastructure. Additionally, through their formalised structures and governance, trail associations provide a valuable link between governing bodies, industry, and riders, by providing a degree of assurance and professionalism that allows alignment of brand and consumer values.

While trail associations are clearly an important element in the issue of trail sustainability, they may not fully represent the needs of all riders. There are challenges relating to the potential for over-sanitisation of trails and the effect that this may have on more experienced and established groups of riders. This is where the integration of trail associations with higher-level planning and trail network coordinators becomes important. Similarly, the 'No dig no ride' philosophy that is permeating into the unofficial trail-building community may, on the face of it, appear to be a positive development intended to support the building and maintenance of trails, but also has the potential to divide the riding community. The underlying message is one of gatekeeping, with echoes of the attitudes previously displayed towards mountain bikers from other users of the outdoors. This may undermine inner dimensions of sustainability, alienate individual riders, and fuel a counterculture that creates further division and distrust among mountain bikers.

Conclusion: Can inclusion and sustainability co-exist in mountain biking?

Historically, the sustainability of mountain bike trails has generally been located within an anthropocentric perspective, with the lens shifting between conventional and contemporary paradigms (Gibbons, 2020) according to the extent to which rider experience (human wellbeing) or trail quality (ecological well-being) is prioritised. On the ground, this agenda has largely been driven by issues relating to social conflict (Cherrington, 2021) and as a relative newcomer to the world of nature sports, significant efforts have been certainly made to measure and evidence the environmental impacts of mountain biking relative to other users. However, mountain biking has quickly transitioned to being a firmly established and legitimate nature sport, affording the opportunity to move beyond this defensive position to one which focuses on the important nuance of sustainability. In this chapter, I have provided evidence of an emergent holistic approach to sustainability in mountain bike trail building which considers the local context, rather than adopting a one-size-fits-all approach. Indeed, moving away from thinking dualistically about humans and the environment and embracing socio-natures and emergent ecologies (Cherrington & Black, 2020) may provide a more useful basis from which to explore mountain bike trail sustainability.

Increasingly, the mountain bike industry is mobilising to promote this holistic approach. For example, several mountain bike manufacturers have recently launched initiatives to promote more sustainable mountain bike trails, and while environmental considerations are those that are the most heavily marketed, there is also a strong focus on developing communities and promoting greater use of trails by wider sections of society. For example, Trek established their foundation in 2021 to:

...help protect land, develop trail systems for public use, and provide more riders access to great places to ride. The trail systems this helps fund will remain open, protected, and free for all to use. In addition to providing communities and mountain bikers with new and better trail networks, grants from The Trek Foundation help protect the surrounding land from development.

(Trek, 2021, no pagination)

In a similar vein, Fox Factory created the Trail Trust to:

bring together diverse communities to build, maintain, and expand access to trails... to meaningfully enhance trail/land access and maintenance. We seek to diversify the population that participates in the cycling and power sports industries, which have historically seen inadequate representation.

(Trail Trust, n.d., no pagination)

Through their Pay Dirt scheme, Santa Cruz are also committed to increasing access to trails by supporting the work of people who make it happen. Via this project, the mountain bike manufacturer pledges to donate \$1 million towards trail projects, local organisations, events, and programs that are geared towards creating and strengthening opportunities for people to get out on the trails (Santa Cruz, 2023). Finally, Specialized have operated their soil searching initiative since 2018 to create sustainable trail systems around the world through ambassadors, dig days, and fundraisers to assist communities in maintaining and growing their trail networks (Specialized, 2023). This initiative supported over 11,000 volunteer hours across 2019 and 2020.

Clearly, there is a growing body of evidence to suggest that the mountain bike community and industry are largely environmentally conscious and are seeking to promote the sustainability of trails through a range of innovative initiatives. These initiatives, though different in their approach and outcomes, are united by a shared mission to enable direct action via political investment and social structures that can capitalise on pro-environmental attitudes. Practical approaches supporting the creation and maintenance of more sustainable trails through trail builder education and accreditation, mobilisation of volunteers through trail associations, industry-led initiatives, and a focus on greater access to trails closer to home are encouraging. However, there remains a need for a collective shift in thinking to embrace a more holistic conceptualisation of trail sustainability which encompasses the wider biosphere and the potential to move beyond mitigation, towards regeneration through promotion of inner dimensions of sustainability. This conceptual shift requires a new, more holistic research agenda to generate the evidence base required to help realise the goal of regeneration.

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