



NATURE-BASED EXTREME SPORT PARTICIPATION AND ECO-SENSITIVITY: AN INTERPRETATIVE PHENOMENOLOGICAL STUDY IN SOUTH AFRICA

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ABSTRACT

Nature-based extreme sports are often framed through sensation seeking, thrill, and voluntary exposure to risk, yet this framing can obscure the meanings participants attach to prolonged engagement with demanding natural environments. This study explored how experienced South African participants interpreted the relationship between nature-based extreme sport participation and eco-sensitivity. In this article, eco-sensitivity refers to participants' reported environmental attention, affective connection with nature, recognition of ecological dependence, concern about degradation, and efforts to reduce personal impact. A qualitative design using interpretative phenomenological analysis was applied to semi-structured interviews conducted between 29 April and 4 July 2019 with 10 experienced participants, five men and five women, who represented 11 nature-based extreme sport activities and reported two to 22 years of experience. Four interconnected themes were identified: risk as a managed component of participation; connection rather than conquest; sensory sensitivity and experiences consistent with mindfulness and flow; and eco-sensitivity and self-reported pro-environmental orientation. Participants described risk as something to calculate and manage through competence, preparation, and situational judgement. They also described respect for natural forces, heightened bodily and environmental attention, and a stronger sense of ecological dependence. Reported pro-environmental practices were self-reported and were not independently observed. The findings provide an interpretive account of how participants made sense of environmental meanings within prolonged outdoor sport involvement. They do not establish a causal developmental mechanism. The results suggest propositions for athlete education, outdoor recreation management, environmental learning, and future longitudinal research.

Keywords: *eco-sensitivity; extreme sport; interpretative phenomenological analysis; nature connectedness; pro-environmental behaviour; risk management.*

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INTRODUCTION

Extreme sport remains difficult to define because the terms extreme sport, adventure sport, high-risk sport, and action sport are often used interchangeably. Definitions based only on sensation seeking or willingness to take risks can overlook physical demands, environmental uncertainty, technical requirements, and potentially serious consequences when an action is mismanaged (Cohen et al., 2018). Nature-based extreme sports are particularly distinctive because performance occurs in environments such as mountains, oceans, rivers, rock formations, and remote terrain where conditions may change rapidly.

Traditional accounts have frequently associated extreme sport participation with thrill seeking, adrenaline, and voluntary exposure to danger. Phenomenological research has challenged this interpretation. Experienced participants often describe risk as an unavoidable condition of participation rather than its central purpose, with competence, preparation, environmental knowledge, and calculated judgement shaping how risk is approached (Brymer, 2010). Related work has described rhythm, harmony, and intimate relationships with natural environments rather than a simple desire to dominate them (Brymer & Gray, 2009; Brymer & Gray, 2010). More recent research similarly found that mastery, connection, trust in personal skills, and flow were more prominent than risk seeking among experienced adventure recreation participants (Jackson et al., 2023).

The environmental dimension requires conceptual precision. In this study, eco-sensitivity is used as an operational and interpretive construct rather than as a validated psychometric scale. It refers to participants' reported sensitivity to environmental conditions, affective connection with natural settings, recognition of human ecological

dependence, concern about environmental degradation, and efforts to reduce personal impact. This construct overlaps with, but is not identical to, nature connectedness, environmental identity, environmental concern, or pro-environmental behaviour. Nature connectedness concerns an affective and experiential sense of belonging with the natural world (Mayer & Frantz, 2004). Environmental identity concerns the degree to which the natural environment forms part of the self-concept (Clayton, 2003). Environmental concern describes evaluative awareness and concern, whereas pro-environmental behaviour refers to actions intended to reduce environmental harm. Importantly, awareness and concern do not automatically translate into behaviour, and self-reported behaviour is not equivalent to directly observed behaviour (Kollmuss & Agyeman, 2002; Lange & Dewitte, 2019).

Direct experience with nature can be relevant to environmental sensitivity. Significant experiences in natural settings have long been identified as possible influences on later environmental concern (Chawla, 1998). The distinction between anthropocentric and ecocentric orientations is also useful because it separates instrumental valuation of nature from recognition of intrinsic environmental value and human membership within wider ecological systems (Thompson & Barton, 1994). The concept of biophilia adds a related proposition concerning human affiliation with living systems (Wilson, 1984).

In extreme sport contexts, repeated interaction with weather, temperature, terrain, water, altitude, vegetation, and other natural conditions is not incidental. These conditions directly affect movement, decision-making, safety, and performance. Research with extreme sport athletes has linked nature interaction with psychological well-being,



nature connectedness, and pro-environmental concern (MacIntyre et al., 2019). This suggests that nature-based sport can provide a setting in which environmental meanings are experienced alongside sporting competence, although the direction and durability of these relationships require careful testing.

Two psychological concepts are relevant to the embodied and attentional character of these experiences. Mindfulness involves awareness and attention to present experience (Brown & Ryan, 2003). Flow refers to deep task involvement in which attention, action, challenge, and skill become closely aligned (Csikszentmihalyi, 1990). Nature-based extreme sport often requires sustained attention to changing internal and external information. Quantitative work has also reported associations among nature relatedness, flow, environmental sensitivity, and environmental behaviour in nature-based leisure settings (Akçakese et al., 2024), while nature connectedness has been positively related to sustainable attitudes and behaviour among athletes (Jansen et al., 2024).

The empirical interviews in the present study were conducted in 2019. Research published after data collection is used here only to clarify the contemporary relevance of the findings and to situate the 2019 accounts within later scholarship. For example, longitudinal evidence published in 2026 found changes in actual pro-environmental behaviour following participation in a nature-based sporting event among some participants (Yamashita et al., 2026). That later evidence strengthens the rationale for prospective research, but it does not convert the present retrospective qualitative design into evidence of causal change.

A specific gap therefore remains. Existing studies identify links among extreme sport, nature connectedness, flow, and environmental

orientations, but less is known about how experienced participants themselves make sense of these relationships across prolonged engagement with demanding natural environments. The South African sample is analytically relevant because participants engaged with mountain, river, ocean, rock, and terrestrial settings. The study does not claim national representativeness. Instead, it examines whether a shared experiential pattern can be interpreted across varied nature-based activities within one national sample.

Accordingly, the research question was: How do experienced South African nature-based extreme sport participants make sense of the relationship between prolonged participation and eco-sensitivity? The study pursued three objectives: to identify perceived changes associated with prolonged participation; to explore awareness and sensitivity toward the body, natural environment, other people, and equipment; and to examine how participants described relationships among self, nature, and others.

METHOD

Research Design

This study employed a qualitative design because it sought to understand participants' meanings, perceptions, and lived experiences within their social and environmental contexts (Merriam & Tisdell, 2016). Interpretative phenomenological analysis (IPA) was used to examine how participants made sense of their experiences (Smith, 2004; Smith, 2011; Smith et al., 2009; Smith & Osborn, 2008). The revision also follows later guidance that high-quality IPA should provide a compelling experiential account, attend closely to participants' words, and show both



convergence and divergence across cases (Nizza et al., 2021).

The philosophical orientation was informed by phenomenological ideas concerning embodied experience and being in relation with the surrounding world (Heidegger, 1962; Merleau-Ponty, 1962). The study therefore treated the body, equipment, other people, and natural conditions as interconnected aspects of lived sporting experience rather than as isolated variables.

Participants and Sampling

The original study described recruitment as non-probability key-informant sampling. For methodological precision in the present article, the selection logic is reported as criterion-based purposive sampling because inclusion depended on predefined experiential criteria and direct participation in nature-based extreme sport. The archived material does not preserve a detailed recruitment-channel breakdown. The shared experiential boundary for the IPA sample was not membership in one sport. It was prolonged, skill-dependent participation in natural environments where environmental conditions directly shaped safety, decision-making, and performance. Cross-sport diversity was therefore treated as

contextual variation around a common lived phenomenon.

Eligible participants had to be South African citizens, at least 18 years old, and experienced in one or more nature-based extreme sport activities. Novice and first-time participants were excluded. Participants required at least two years of experience and regular involvement in training, expeditions, tours, races, or comparable activities. Eligible activities occurred primarily in natural environments and involved interaction with water, rock, air, or natural terrain. They combined physical demands, environmental uncertainty, technical demands, and potentially severe consequences when actions were poorly managed.

The final sample consisted of 10 participants, including five men and five women. Ages ranged from 25 to 47 years, with a mean age of 35.2 years. Reported sporting experience ranged from two to 22 years, with a mean of 9.7 years. The archived study material does not document independent verification of eligibility beyond participant-provided information, nor does it disaggregate years of experience by sport for participants who listed more than one activity. These constraints are acknowledged when interpreting the participant table.

Table 1. Participant Characteristics

Participant	Age	Gender	Experience*	Nature-Based Extreme Sport Activity
ESP001M	36	Male	6 years	White-water kayaking
ESP002M	38	Male	22 years	Downhill mountain biking
ESP003M	31	Male	7 years	Ocean rowing; mountain hiking
ESP004F	34	Female	2 years	High-altitude mountaineering
ESP005M	46	Male	15 years	Scooter safari
ESP006F	27	Female	8 years	Mountain running; rock climbing



Participant	Age	Gender	Experience*	Nature-Based Extreme Sport Activity
ESP007M	29	Male	8 years	Rock climbing; mountain running
ESP008F	47	Female	7 years	High-altitude mountaineering
ESP009F	39	Female	10 years	Adventure racing; river canoeing
ESP010F	25	Female	12 years	Ocean wave surfing

Data Collection

Data were collected between 29 April and 4 July 2019 through individual semi-structured interviews. Five interviews were conducted face-to-face and five by telephone. All interviews were conducted by the researcher who subsequently transcribed and analysed the material. The interview schedule functioned as a flexible guide. Participants were invited to describe personally meaningful experiences, while follow-up probes explored emerging topics.

The documented interview domains included motivations, perceptions of risk, interaction with natural environments, bodily and sensory awareness, relationships with equipment and other people, environmental attitudes, mindfulness, and experiences associated with deep concentration. The archived material available for preparation of this article does not preserve the verbatim wording of the 2019 interview questions or sufficient information to reconstruct whether the guide was formally piloted. The revised manuscript therefore reports the documented domains rather than inventing question wording that is not retained in the source record.

All interviews were audio-recorded with consent. Concise handwritten notes were taken where appropriate. Interviews lasted between

42 and 93 minutes, with a mean duration of 67.3 minutes. Each interview was manually transcribed. The researcher then reviewed each transcript while listening to the corresponding audio recording to improve accuracy and familiarity with the complete account. No formal comparison of interview mode was built into the original analysis, so the study cannot determine whether telephone and face-to-face interviewing influenced depth or disclosure.

Data Analysis

Analysis followed an iterative IPA procedure (Smith et al., 2009; Smith & Osborn, 2008). Each transcript was first read repeatedly as an individual case. Significant statements, recurring expressions, observations, and preliminary meanings were noted before exploratory notes were condensed into emerging themes. This case-first procedure was used to preserve the idiographic commitment of IPA before cross-case interpretation (Smith, 2004; Smith, 2011).

Related themes were then compared and clustered within each case. The same procedure was repeated across the remaining cases while allowing new themes, differences, and potentially contradictory meanings to emerge. Cross-case examination identified areas of convergence and divergence, after which themes were organised into a master



thematic structure. The four themes reported in this article represent a higher-order synthesis of the retained case analysis rather than four variables measured by an instrument.

The source material documents analysis by the primary researcher but does not document an independent second coder, external audit, or formal consensus-coding procedure. IPA does not depend on inter-rater agreement in the same way as some codebook approaches, but high-quality reporting still requires transparent links between interpretive claims and participants' words (Nizza et al., 2021). The present revision therefore narrows claims where the retained quotation record does not support stronger idiographic demonstration.

Trustworthiness and Reflexivity

Research quality was supported through repeated engagement with transcripts and audio recordings, systematic movement from individual cases to cross-case themes, and the use of participant quotations to anchor interpretations. The researcher recognised an active role as interviewer, transcriber, interpreter, and analyst. This reflects the double interpretative character of IPA, in which participants make sense of their experiences and the researcher subsequently interprets those accounts.

The archived manuscript does not contain enough detail to reconstruct a fuller 2019 positionality statement concerning the researcher's own extreme sport experience, environmental commitments, or theoretical assumptions. It also does not preserve a formal reflexive journal for reporting in the present article. Rather than reconstructing these details retrospectively, the revised manuscript identifies this limitation and keeps theoretical interpretations, including mindfulness, flow,

and eco-sensitivity, explicitly separate from direct measurement.

Temporal Context, Consent, and Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the Faculty of Humanities, University of Pretoria, on 25 February 2019 under reference number HUM20190116. Participants received study information and provided written informed consent before participation. Participation was voluntary, and participants consented to audio recording and the use of anonymised quotations in academic outputs. Coded identifiers were used during analysis and reporting.

The present journal manuscript was prepared after the original 2019 data collection and incorporates literature published through 2026. Later literature is used only for contextualisation and discussion. It does not alter the original interview content. The available ethics and manuscript records document consent for anonymised academic outputs but do not document a separate re-consent procedure specifically for the 2026 journal preparation. The manuscript therefore relies on the original academic-output consent and reports no identifying participant information.

RESULT

IPA identified interconnected experiences concerning risk, relationships with nature, sensory awareness, psychological states, and environmental sensitivity. For article presentation, the retained analysis was organised into four broader themes. Because the surviving quotation set is concise and predominantly convergent, the results do not claim that every participant followed an



identical trajectory. The themes represent recurrent meanings across the documented

accounts, with participant-level variation retained where the source material allows it.

Table 2. Main Themes, Interpretive Meaning, and Representative Participants

Main Theme	Interpretive Meaning	Representative Participants
Risk as a managed component	Risk was treated as a condition to assess and manage through preparation, skill, judgement, and adaptability.	ESP008F, ESP002M, ESP003M
Connection rather than conquest	Participants described respect, adaptation, environmental dependence, and attachment rather than human dominance.	ESP005M, ESP003M, ESP009F
Sensory sensitivity, mindfulness, and flow	Accounts emphasised bodily and environmental attention and deep concentration. These were interpreted as consistent with mindfulness and flow, not directly measured.	ESP003M, ESP007M
Eco-sensitivity and environmental orientation	Participants described environmental concern, ecological dependence, and self-reported reduced-impact practices.	ESP004F, ESP005M, ESP007M

Risk as a Managed Component of Participation

Across the retained accounts, participants generally distinguished between unavoidable danger and unnecessary risk-taking. The accounts did not position adrenaline or risk itself as the primary reason for participation. Instead, experienced participation involved preparation, technical competence, environmental knowledge, decision-making, and continuous assessment. The distinction between controllable and uncontrollable factors was central to this interpretation.

ESP008F: "The risk I can manage is me."

ESP008F's brief statement separated personal preparation from environmental forces such as weather and avalanches that could not be fully controlled. Her account located agency in preparation, equipment, physical readiness,

and partner selection rather than in control over nature itself.

ESP002M: "Risk management the whole time."

ESP002M similarly framed downhill mountain biking as continuous judgement rather than unrestricted risk acceptance. Participants described studying weather, terrain, routes, water conditions, equipment, and potential exit points, and they trained for the conditions they expected to encounter.

ESP003M: "Be prepared as much as possible... because things may change very quickly."

This account added adaptability to preparation. Expertise involved recognising that preparation could reduce uncertainty but could not eliminate it. Participants described changing routes, postponing objectives, or retreating when circumstances exceeded acceptable limits. The retained evidence therefore supports an interpretation of calculated



engagement with risk rather than reckless risk seeking.

From Conquering Nature to Connection with Nature

Several participants rejected language of conquering nature. Their accounts instead emphasised adaptation, self-regulation, environmental dependence, and respect for natural forces.

ESP005M: "It is definitely not conquering nature. I rather want to be at one with it."

ESP003M: "This is not you against the mountain, this is you against yourself."

These statements repositioned the challenge from human domination of a natural object toward self-management within an environment that retained its own force and unpredictability. Success depended on reading conditions and adapting behaviour rather than imposing control.

ESP009F: "Because you spend such a long time out there. You create a bond with it."

ESP009F connected repeated exposure with attachment. Participants also reported noticing pollution, littering, changing weather patterns, reduced water availability, and changes in mountain landscapes. Nature therefore appeared in their accounts as more than a venue for sport. It shaped safety, performance, emotion, and environmental meaning. The data support this relational interpretation, but they do not establish that every participant moved through a uniform developmental shift from conquest to connection.

Sensory Sensitivity, Mindfulness, and Flow

Nature-based extreme sport required continuous processing of bodily and

environmental information. Participants described heightened awareness of sound, sight, temperature, breathing, pain, fatigue, balance, movement, equipment, terrain, weather, and the condition of partners.

ESP003M: "Presence to what is happening to you right now."

This description is phenomenologically compatible with present-focused awareness, but mindfulness was not measured with a validated instrument. The term is therefore used as an interpretive comparison rather than a diagnostic or psychometric conclusion.

ESP007M: "I feel like you are your body."

ESP007M described a more integrated experience of the body within activity. Participants also described equipment as increasingly incorporated into skilled perception, with subtle changes recognised through sound, movement, touch, or resistance. Accounts of deep concentration were similarly consistent with flow, but flow was not directly scored or independently verified. The findings therefore concern lived descriptions that resemble these psychological concepts (Brown & Ryan, 2003; Csikszentmihalyi, 1990).

Eco-Sensitivity and Self-Reported Pro-Environmental Orientation

Participants described appreciation of natural elements, concern about environmental deterioration, recognition of human ecological dependence, and greater consideration of personal environmental impact. In this study, these meanings are interpreted as eco-sensitivity. The construct refers to the combination of environmental attention, affective connection, ecological concern, and reported responsibility rather than to a validated scale score.



ESP004F: "A part of you... an extension of you."

ESP005M: "Passing through nature and enjoying it without doing damage to it."

Participants also acknowledged that outdoor sport itself can create environmental impacts. They referred to waste, plastic use, pollution, trail use, and ecological pressure associated with visitor numbers. Reported practices included recycling, reducing single-use plastic, collecting litter, minimising waste, avoiding unnecessary disturbance to plants and animals, and considering environmental impacts in consumption decisions. These behaviours were reported in interviews and were not independently observed.

ESP007M: "We cannot carry on without nature."

This statement captured the ecological dependence that appeared across several accounts. The data suggest an experiential association among environmental attention, attachment, ecological dependence, concern, and self-reported low-impact practices. They do not demonstrate a causal sequence or prove behavioural change over time.

Cross-Case Variation and Evidentiary Boundaries

The sample differed substantially in sport type, environmental medium, and years of experience. The original analytic strategy treated these differences as contextual variation around the shared phenomenon of prolonged, skill-dependent participation in natural settings. The retained source material does not support a reliable sport-by-sport or experience-duration comparison, and the article therefore does not claim that mountaineers, paddlers, runners, climbers, cyclists, surfers, or other participants differed

systematically in eco-sensitivity. Likewise, the quotation set available for the present article does not preserve sufficiently detailed counter-cases to establish the prevalence of divergent environmental orientations. This limits the degree of idiographic contrast that can be demonstrated in the revised report.

DISCUSSION

This study offers an interpretive account of how experienced nature-based extreme sport participants made sense of risk, connection with nature, bodily and environmental attention, and eco-sensitivity. The central contribution is not evidence that extreme sport causes environmental responsibility. It is a phenomenological account of how environmental meanings were embedded in the participants' descriptions of skilled participation in natural settings.

Risk Management Rather Than Risk Seeking

The first theme challenges portrayals of extreme sport participants as primarily motivated by danger. Participants acknowledged serious risks but emphasised preparation, competence, judgement, and knowing when to stop. This interpretation aligns with phenomenological work in which risk is treated as an inherent condition rather than the primary objective of participation (Brymer, 2010; Brymer & Gray, 2009). It is also consistent with later evidence that mastery, connection, flow, and trust in personal abilities may be more salient than risk seeking among experienced adventure recreation participants (Jackson et al., 2023).

The present study adds environmental specificity to this interpretation. Participants



distinguished between controllable and uncontrollable elements. Weather, terrain, water, and other natural conditions could not be fully controlled, but preparation, knowledge, equipment, physical capacity, and judgement could be developed. Expertise was therefore described as confidence without an assumption of environmental dominance.

Nature Connectedness Without Assuming Sustainability

Participants commonly rejected the idea of conquering nature and instead described adaptation and self-management. This resonates with the distinction between anthropocentric and ecocentric orientations, particularly when participants positioned themselves as dependent on wider ecological systems rather than separate from them (Thompson & Barton, 1994). It also aligns with previous accounts of harmony and intimacy in extreme sport experiences (Brymer & Gray, 2009; Brymer & Gray, 2010) and with research linking extreme sport nature interactions to nature connectedness and environmental concern (MacIntyre et al., 2019).

However, nature connectedness should not be treated as equivalent to sustainability. A felt connection with nature is conceptually different from environmental identity, environmental concern, and actual pro-environmental behaviour (Clayton, 2003; Mayer & Frantz, 2004). The wider environmental literature also shows that awareness and intention do not automatically translate into behaviour (Kollmuss & Agyeman, 2002). Participants in the present study themselves acknowledged that outdoor recreation can create waste, trail pressure, and other impacts. Eco-sensitivity therefore included awareness of responsibility and contradiction rather than a claim that outdoor participation is intrinsically sustainable.

Sensory Awareness, Mindfulness, and Flow as Interpretive Concepts

A key feature of the accounts was continuous monitoring of bodily and environmental information. Safety depended on recognising weather changes, terrain, sound, temperature, fatigue, pain, breathing, equipment, and the condition of companions. These descriptions are consistent with present-focused attention associated with mindfulness (Brown & Ryan, 2003), but mindfulness was not measured directly.

Participants also described moments of deep concentration that were consistent with flow, a state involving close alignment of action, attention, challenge, and skill (Csikszentmihalyi, 1990). Later adventure recreation research has likewise reported strong flow experiences (Jackson et al., 2023), and recent nature-based leisure research has linked nature relatedness, flow, environmental sensitivity, and environmental behaviour (Akçakese et al., 2024). The present findings complement that work by showing how participants described attention from within lived sporting experience. They do not establish that mindfulness or flow caused eco-sensitivity.

Eco-Sensitivity as an Experiential Association

Eco-sensitivity in this study combined appreciation, environmental attention, recognition of ecological dependence, concern about degradation, and self-reported attempts to reduce impact. This interpretation is compatible with evidence that significant experiences in natural environments can influence environmental sensitivity (Chawla, 1998). It is also consistent with later work linking outdoor sport, nature connectedness, and environmental orientations (MacIntyre et al.,



2019; Jansen et al., 2024; Akçakese et al., 2024).

The strongest inferential boundary concerns behaviour. Participants reported recycling, reducing single-use plastic, collecting litter, and other practices, but the study did not independently observe these behaviours. Reviews of pro-environmental behaviour measurement show why this distinction matters, because self-report and observed behaviour answer different research questions and have different limitations (Lange & Dewitte, 2019). The present results therefore support claims about self-reported pro-environmental orientation, not verified behavioural change.

A tentative interpretive proposition can nevertheless be drawn from the accounts: environmental attention required for safety may contribute to familiarity with natural conditions; familiarity may support attachment and appreciation; attachment may coexist with stronger concern about degradation; and concern may be associated with reported efforts to reduce impact. This sequence is a hypothesis generated from the qualitative interpretation. It is not a validated model and should be tested prospectively. Longitudinal research published after the present data were collected provides one example of how actual behaviour change can be investigated over time (Yamashita et al., 2026).

Relationship Among Self, Nature, Equipment, and Others

Participants rarely described the body, equipment, environment, and other people as fully separate components. Natural conditions affected temperature, fatigue, movement, and decisions. Equipment mediated interaction with water, rock, altitude, or terrain. Partners

influenced safety and judgement. Environmental change required simultaneous adjustment across these elements.

This relational interpretation is compatible with the phenomenological foundations of the study (Heidegger, 1962; Merleau-Ponty, 1962). Participants' descriptions of equipment were particularly revealing because subtle changes could become recognisable through sound, movement, touch, or resistance. Trust in partners was similarly important because the actions of a climbing partner, guide, paddler, or teammate could affect safety. Nature-based extreme sport therefore appeared as a relational activity involving continuous interaction among body, environment, equipment, and other people.

Practical Implications

The findings suggest several practical propositions for outdoor sport and recreation. Environmental competence can be incorporated into sporting competence because participants already need to read terrain, weather, water, altitude, vegetation, and other conditions. Coaches and organisations could connect this practical environmental knowledge with environmental literacy, while recognising that the present study did not test an educational intervention.

Risk education could emphasise preparation, situational judgement, self-awareness, and willingness to withdraw rather than celebrating fearlessness. Reflective learning after expeditions, races, or training sessions could also address environmental observations, personal impact, and decisions made in response to natural conditions. Sport organisations and event organisers may use these findings as a rationale for testing minimum-impact practices, waste reduction,



responsible trail use, and protection of flora and fauna. These applications should be evaluated rather than assumed effective.

Limitations and Future Research

The study involved only 10 participants. This is compatible with an idiographic IPA design but does not permit statistical generalisation. Participants also represented 11 activities with different environmental settings, technical demands, and experience histories. The common experiential boundary provides a rationale for cross-case interpretation, but the heterogeneity limits sport-specific conclusions. The experience variable is also not disaggregated by activity for participants who reported more than one sport.

The inclusion of scooter safari reflects the original experiential eligibility criteria but represents a less conventional classification of nature-based extreme sport. Future research should use an explicit activity taxonomy and examine whether findings differ across motorised and non-motorised activities, sport types, and levels of experience.

The design relied on retrospective self-report. It cannot establish causal change in eco-sensitivity, mindfulness, flow, nature connectedness, or behaviour. Reported environmental practices were not independently observed. Future studies should combine interviews with validated measures and behavioural indicators, and should compare participants prospectively across time (Lange & Dewitte, 2019).

The dataset was collected in 2019, while the manuscript has been contextualised with literature through 2026. This strengthens contemporary interpretation but does not update the empirical accounts themselves. Future research should collect contemporary

data and examine whether environmental pressures, sport technologies, travel practices, and sustainability norms have changed participants' experiences.

Methodological reporting is also constrained by the archived source material, as detailed in the Method section. The retained quotation set is relatively brief, which limits the idiographic depth that can be demonstrated in publication. Future IPA studies should preserve a fuller audit trail, richer contextualised extracts, and explicit documentation of convergence and divergence in line with quality guidance (Nizza et al., 2021).

CONCLUSION

This study makes two principal contributions. First, experienced participants described risk as a condition to manage through preparation, competence, situational judgement, and adaptability rather than as the central purpose of nature-based extreme sport. Second, their accounts connected embodied environmental attention with respect for natural forces, affective connection, recognition of ecological dependence, and self-reported efforts to reduce environmental impact.

These findings should be interpreted as experiential associations within retrospective qualitative accounts. They do not show that nature-based extreme sport automatically develops eco-sensitivity or produces pro-environmental behaviour. The proposed pathway from attention to familiarity, attachment, concern, and reported low-impact practice is a tentative conceptual proposition for future testing.

The study therefore supports cautious practical applications in outdoor athlete education, recreation management, environmental learning, and sustainable sport practice. Longitudinal and mixed-method research



should test whether nature connectedness, mindfulness, flow, eco-sensitivity, and observable pro-environmental behaviour change as participation develops, and whether these patterns differ across activities and participant groups.

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DECLARATIONS

Author Contribution Statement

Author conducted the conceptualisation, methodology development, investigation, data collection, transcription, formal analysis, and interpretation. The author prepared, reviewed, and revised the manuscript and approved the final version for publication.

AI Disclosure Statement

The author used ChatGPT (OpenAI) to assist with language editing, manuscript organisation, academic presentation, and reference checking. The author did not use generative AI to generate or modify research data, participant responses, or empirical findings. The author reviewed and revised all AI-assisted content and takes full responsibility for the accuracy and integrity of the published article.

Conflicts of Interest

The author declares no financial or personal conflicts of interest related to this study.

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