



Background paper

# The Impact of Sport and Outdoor Recreation (Friluftsliv) on the Natural Environment

April 30, 2018

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# 1 Background

Mistra, the Swedish Foundation for Strategic Environmental Research, is an independent foundation which supports research of strategic importance for a good living environment and sustainable development. As stated in Mistra's Statutes (see <http://www.mistra.org/en/about-mistra/statutes/>), Article 1, research funded by the foundation:

- ▶ shall promote the development of strong research environments of the highest international class with importance for Sweden's future competitiveness;
- ▶ the research shall find solutions to important environmental problems and for the sustainable development of society; and
- ▶ opportunities for achieving industrial applications shall be taken advantage of at a practical level.

In 2017, Mistra's board of trustees commissioned a background paper focusing on 'Sports and outdoor recreation (friluftsliv) in an environmental perspective' covering relevant topics with a view to publishing a call for research proposals. This background paper has been written by a group of experts representing different disciplines related to this topic

The Working Group applauds Mistra's leadership for recognizing the opportunities to advance the theoretical, empirical, and practical understanding of environmental sustainability in sport and outdoor recreation. We also echo the call for additional research on the application of environmental sustainability in the sport and outdoor recreation context. These contexts involve many people across various activities whether through passive or active participation. Engaging organizations and individuals through sport and outdoor recreation offers a unique opportunity to leverage the social platform of sport to encourage more sustainable behaviours while spectating and participating, but also in their everyday lives. To this end, Mistra's leadership to support further consideration and integration of environmental sustainability into sport and outdoor recreation in Sweden offers an opportunity to unite the nation's effort to align with the United Nation's 2030 Agenda for Sustainable Development.

Specifically, Sweden has an active population, and a large proportion engages in sport and outdoor activities. The country also attracts tourists from across the world to experience its unique nature and participate in various outdoor activities. Sport and outdoor recreation can bring many economic and social benefits to urban and rural areas, such as attracting businesses and generating employment opportunities. Nevertheless, these activities can generate a number of negative and positive environmental impacts. These impacts can occur on local and global scales, and have short and long-term impacts. Mistra has identified a potential opportunity for sport and outdoor recreation to contribute towards society's transformation for sustainable development. As a Working Group, we recognize Mistra's primary focus on environmental sustainability. This proposal primarily focuses on the environmental aspect of the broader sustainability concept. We would be amiss if we did not acknowledge the interwoven relationship between all three aspects

of sustainability – environmental, social, and economic – as a way to minimize the negative environmental impacts of sport and outdoor recreation. To this end, this proposal is to be based on an analysis of current research and of society’s knowledge needs. It should also inform the direction of future research and assist in providing solutions on how sport and outdoor recreation in Sweden could be made more environmentally sustainable.

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## The Assignment

Mistra commissioned a Working Group of five international experts in the field – Brian McCullough, Nils Asle Bergsgard, Andrea Collins, Andreas Muhar and Liisa Tyrväinen (see Appendix 1) – to draft a background paper to prepare the call. The Working Group’s tasks were as follows:

1. to provide an overview of international research in this area;
2. offer conclusions and recommendations on characteristics for a new research programme, and identify areas that are most relevant/should receive priority; and
3. propose in detail the orientation of a new research programme to be used to draft text for a future call for funding applications.

Mistra envisages the research programme will consider environmental sustainability from systems and individual perspectives; be interdisciplinary in nature, work towards solutions and contribute towards sustainable sport and outdoor recreation in Sweden. Mistra commissioned an earlier report (Arnberg, 2016), which provided the Working Group with an understanding of sport and outdoor recreation in Sweden, the policy and research landscape, and potential areas for future research.

## 2 Framing the Concepts and Issues at Hand

We considered various definitions and conceptualizations of the terms sport and outdoor recreation in order to ground the Working Group and operate from a common understanding. It is not unusual for sport and outdoor recreation to take on nuanced differences that are dependent on cultural and normative influences. The cultural and normative influences challenge practitioners, stakeholders, and individuals to more deeply integrating environmental sustainability into these activities. However, operating apart from these ingrained societal systems allows new practices to emerge (i.e., deinstitutionalization) and lead to more sustainable options and behaviours. As a result, it is necessary to outline how sport, outdoor recreation, and the environment have been conceptualized in various ways and synthesize these perspectives to operationalize these concepts.

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### Defining ‘Sport’

Sport is generally understood to include physical activities that go beyond being competitive. The United Nations Inter-Agency Taskforce on Sport for Development and Peace (2003) has defined sport as:

*all forms of physical activity that contribute to physical fitness, mental well-being, and social interaction. These include: play; recreation; organised, causal or competitive sport; and indigenous sports or games.*

Likewise, the Oxford English Dictionary has defined sport as “an activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment.” More specifically, the Swedish Sports Federation (Riksidrottsförbundet) report on Sport in Sweden describes sport as “physical activity that we undertake with a view to performing better, having fun or feeling good. Sport consists of training and fun, competition and display” (2012, p. 9). It is clear from these definitions that the concept includes physical attributes requiring skill, whether performed by an individual or team, for the purpose of self-improvement, competition, and/or entertainment. However, the conceptualisation of sport above applies to both passive sport and participatory sport. For example, the concept of sport can allude to the entertainment value of sport (i.e., passive sport or spectator sport), but the concept can also refer to the active participation in sport (e.g., playing football). These two aspects of sport focus on different stakeholder groups, participants or spectators, depending on the context in which sport is being examined, active or passive sport, respectively. Additionally, the business of sport refers to the commercialisation of sport whether concerned with active or passive sport and other auxiliary services (e.g., apparel, equipment, clubs, etc.)



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## Defining Friluftsliv – ‘Outdoor Recreation’

Differing from sport, outdoor recreation focuses on non-competitive activities that primarily occur in nature as the term suggests. Specific to the Swedish culture, outdoor recreation occurs “in the natural and cultural landscape to gain well-being and nature experiences without an involvement of competition” (Regeringen, 2010). The concept of outdoor recreation from a Scandinavian cultural perspective originates from the term ‘friluftsliv,’ a term adopted by Mistra for the purposes of this paper. The Scandinavian term, first used in a poem by the famous Norwegian author Henrik Ibsen in 1859, includes a range of activities. For nearly hundred years following Ibsen’s poem the term ‘friluftsliv’ included physical activities such as ‘mountain sport’, ‘nature-based tourism’, among other activities (Schanning, 2015). However, there was a movement towards a more essential and ideological definition, ‘excluding’ nature-based tourism, mountain sport and so forth from friluftsliv in the second half of the twentieth century (Horgen, 2017).

More broadly, outdoor recreation refers to activities that people undertake outdoors in places where they can access nature or green areas, both in urban or rural environments, mainly as part of their daily or weekend routines. Nature-based tourism, on the other hand, is a term that covers activities which people enjoy while on holiday and focus on engagement with nature (Bell et al., 2008). Typically, this means traveling to and staying overnight in locations close to or in national parks, forests, lakes, the sea or elsewhere in the countryside and participating in activities using these settings and compatible with their natural qualities. One of the reasons for the lack of distinct definitions is that they come close to each other: it is difficult to separate nature-based tourists from outdoor recreationists, it is also difficult to make a distinction between the specific activity from the broader services associated with that activity (Fredman & Tyrväinen, 2010). For statistical purposes, for example in Finland, nature-based tourism has been defined to include an overnight stay (Pouta et al., 2006).

These range of activities, whether sport or outdoor recreation, have impacts on the natural environment. This is especially true when considering the setting in which sport or outdoor recreation takes place. Some of these areas may be environmentally sensitive areas (i.e., nature preserves, national parks), customized landscapes (i.e., golf courses, ski slopes/resorts), and can attract large crowds of participants and/or spectators to an area with low carrying capacity, among other factors that may negatively impact the natural environment. Thus, it is necessary to examine these factors from a legitimized perspective such as the 17 Sustainable Development Goals included within the United Nations 2030 Agenda for Sustainable Development.

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## Main Discourses

The expansion of nature-based sport and outdoor recreation in the 20th century has led to increased awareness and concerns about their impacts on natural and social systems. In the early 1900s there were occasional discussions about the justification of technical interventions or to the landscape to provide outdoor recreation opportunities. However, globally significant scientific and societal discourses were triggered in the 1970s by the development of mass tourism. These discourses had different foci across geographic regions and scientific cultures, and so also explain the different current status of actual research.

The “recreation ecology” discourse, which has been dominant in the US and Australia (e.g., Liddle, 1997; Newsome et al., 2002), has primarily investigated the impacts of nature-based activities on the biophysical properties of ecosystems caused by aspects such as wildlife disturbance, trampling and water pollution

mainly in protected areas. Main proponents are researchers from natural sciences such as biology and ecology. This research has provided comprehensive understanding on the ecological impacts of outdoor recreation and their relationships with influential factors needed in land management to identify acceptable limits of change or in choosing management actions to avoid or minimize impacts (Marion et al., 2016).

In Central Europe, the mainstream discourse since the 1970s has been linked to a more general criticism of mass tourism with a focus on land consumption for dominant sport activities such as skiing in the Alps (Krippendorf, 1975); and has been driven by geographers, economists and political scientists.

However, since the 1980s there has been an increased consideration of impacts on social systems worldwide (e.g., Messerli, 1987), in particular on host communities in tourism destinations (marginalisation, folklorisation of cultural traditions, exploitation), but also on the tourists/recreationists themselves (crowding stress, conflicts between individual recreational activities). While the original environmental discourses focused on terms such as “ecological carrying capacity,” these new discourses also introduced concepts such as “social carrying capacity” (Graefe et al., 1984). New disciplinary perspectives were brought in by researchers from social sciences such as cultural anthropology and environmental psychology.

Parallel to the general widening of concepts in environmental sciences, since the 1990s discourses on the impacts of sport and outdoor recreation have developed into a more comprehensive “sustainability” perspective, taking into account not only local and onsite effects (local pollution, wildlife disturbance, land degradation), but also effects at a global level. Focal in this context today are the effects caused by traveling to the places where activities take place (CO<sub>2</sub> emissions, etc.). Only recently have the effects caused by the production and trade of sport equipment been included in both scientific and societal discourses (Subic et al., 2009). Thus, disciplinary contributions from industrial ecology (e.g. life cycle analysis) were added to the body of knowledge. As a consequence, tourism and leisure activities have been charged to be a relevant contributor to greenhouse gas emissions, and critical discourses about impacts of landscape-based sport and outdoor recreation are now embedded into the general climate change mitigation and adaptation discourses, addressing tourism and outdoor recreation simultaneously as drivers and victims of climate change (Hall & Higham, 2005, Reddy & Wilkes, 2012).

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## Policy Landscape

### Sweden

In Sweden the latest governmental reports on sport (Persson & Messing, 1999; SOU 2008: 59) and outdoor recreation (Regeringens proposition 2009/10: 238; Regeringens skrivelse 2012/13:51) supports the following primary narratives:

- ▶ sport and outdoor recreation as a part of public health initiatives;
- ▶ access to sport (especially organised sport) and outdoor recreation for all groups, including the general public’s right to access nature;
- ▶ importance of increasing knowledge and research;
- ▶ importance of facilitating outdoor recreation nearby peoples’ homes (villages and cities); and
- ▶ environmentally friendly outdoor recreation and preserving areas for friluftsliv.

There is also a public discourse on the positive relationship between engagement in outdoor recreation (friluftsliv) and environmental attitude and behaviour. That is, one becomes environmental friendly by being in nature (Fredman et al., 2013). Further, these activities, especially outdoor recreation, are also seen as part of an

industrial development. In particular, commercial form of outdoor recreation, nature-based tourism, is seen as a tool for diversification of rural livelihoods. Lastly, there is some discussion as to how these sectors should be governed. In Sweden, they are currently subjected to two different ministries with a limited amount of cooperation: sport is (together with public health) a part of Ministry of Health and Social Affairs, while outdoor recreation is under the remit of the Ministry of the Environment and Energy. There is discussion as to whether outdoor recreation would benefit from an administrative separation from its traditional pairing with nature conservation (Fredman et al., 2013). Outdoor recreation is often perceived to have a weak position in municipal planning when there are competing and conflicting land-use interests (Petersson Forsberg et al. 2014).

The report *Statens stöd till idrotten. Uppföljning 2016* ('The government support to sport. Follow up 2016,' Norberg, 2017) is a form of evaluation of the public goals for supporting sport presented in these governmental publications. Here, amongst other things, the biased access to sport and outdoor recreation in the Swedish society is emphasised: Even if half of the adult Swedish population is sufficiently physical active according to WHO's recommendation of 30 minutes per day, this activity pattern has a socially biased distribution. On the positive side, they find that a previously observed downfall in activity in children and youth organized sport has stagnated.

*Friluftsliv i förändring* (Friluftsliv in change) is the final report from a large research program on outdoor recreation that ended in 2012/2013 (Fredman et al., 2013). Several topics are discussed, amongst other outdoor recreation patterns, attitudes and behaviour of visitors, the social distribution of participation, societal and economic impacts as well as the unspecified position for outdoor recreation in the public administration. Still, the possibilities for outdoor recreation to generate economic ripple effects, considerable public health effects as well as the potential for new jobs within service sector are emphasised. In addition, the needs and possibilities for outdoor recreation to foster engagement in sustainability and environmental issues such as environmental education is discussed. However, authors also note that it "is important to nuance both 'friluftsliv' and 'engagement for the environment' since there is no automatic given relation between them" (our translation, p. 252).

In 2017 a Swedish Public Inquiry (SOU, 2017) presented a report to enhance the tourism and hospitality industry's contribution to economic, social and environmental sustainable development. This report has some overlapping features to our background paper. A whole chapter is devoted to 'nature tourism' seeing this area in relation to both 'ecotourism' and 'friluftsliv'. Further, several government agencies are identified and encouraged to take part in developing a sustainable nature-based tourism. In addition, it is interesting to observe that the report strongly emphasizes the need for research to develop knowledge-based tools and foster innovation in these areas. This sector is in a growth face and will, however, have larger environmental impact due to long travel distances and provision of modern services in rural areas compared to outdoor recreation occurring often nearby everyday living environments.

## United Nations

As previously mentioned, the United Nations has taken a leading role in promoting 17 Sustainable Development Goals (SDGs). The resulting document provides a guide to how SDGs and sport relate and how sport can be used to promote SDGs (United Nations, 2014). In this light and in support of the Paris Climate Agreement, the United Nations is also facilitating discussions among leading sport professionals to use sport to promote the goals of the Paris Climate Agreement. To this end, the United Nations is working with the sport sector to release a Declaration on Sport and the Environment in the near future (UNFCCC, 2017). The goal of this decla-

ration is to encourage more sport federations and organizations to embrace various environmental sustainability initiatives. In turn, these organizations can use their social platform to promote sustainable behaviours among sport fans at sporting events and in their everyday lives. While primarily focused on professionalized sport organizations, this declaration can be adopted by smaller less organized entities within the broader sector (i.e., sport and outdoor recreation).

## 3 Significance of Environmental Impact

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### Challenges from Sustainable Development Goals

The 17 Sustainable Development Goals (SDGs), which replaced the previous 8 Millennium Development Goals, outlined the new 2030 Agenda for Sustainable Development. The aim of the SDGs is “getting people and planet closer together and leave no one behind” (United Nations, 2014) and provide an opportunity to inspire global action for sustainable development worldwide, including the field of sport.

The Declaration of the 2030 Agenda for Sustainable Development clearly recognizes sport as an important and powerful role for social progress, global development and realization of the SDGs:

Sport is also an important enabler of sustainable development. We recognize the growing contribution of sport in the realization of development and peace in its promotion of tolerance and respect and the contributions it makes to the empowerment of women and of young people, individuals and communities as well as to health, education and social inclusion objectives. (A/RES/70/1, para 37)

The UN’s website lists all 17 SDG’s and provides a summary of how sport can contribute to the progression of each goal (United Nations, 2014). The SDGs can assist nations to consider ways in which to make a more sustainable society. Specifically, sport and outdoor recreation can be more sustainable and offers the opportunity to engage and educate new segments of the population. Moreover, there are additional benefits and issues that these SDGs can help address to promote a more sustainable society.

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### Influencing Environmental Impacts

#### The extent of sport and outdoor recreation

Outdoor recreation and sport have a significant impact on the Swedish society. A large number of people take part in these activities. According to Statistics Sweden’s report on leisure in 2014-15 (Statistics Sweden 2017), 74% of the population (i.e. 16-years and older) visited a forest or a field in 2014-2015, and 57% visited more than five times. This proportion has been stable between 2008-2015. Further, more than 80% of the population took part in sport and exercise at least once in the last twelve months, and 70% of males and 74% of females took part in sporting activities more than 20 times over the same period. It is especially outdoor sporting activities that are popular amongst the Swedish population. In addition, according to Statistics Sweden, 46% of the population attended a sporting event the last 12 month in 2006-07<sup>1</sup>.

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<sup>1</sup> <https://www.scb.se/hitta-statistik/sok/?query=konsum+fritid+2006&Tab=>

## The economic impact

The key drivers for increased interest towards outdoor recreation are urbanization (i.e. increased demand for nearby nature), promotion of public health (physical and mental health benefits from outdoor recreation), and increased recognition of economic values associated with visitation to protected and other nature areas (e.g. regional development through tourism). However, forming a comprehensive view about the economic importance of sport and outdoor recreation (and nature-based tourism) is difficult due to the lack of comprehensive statistics. The monitoring of visitor outdoor recreation, for example, is not conducted in a homogeneous way throughout Europe (Edwards et al, 2013). In Finland, the local economic impacts of visitors spending on income and employment involving all national parks and other designated areas on state-owned lands have been monitored in a systematic way since 2009. The benefits of protected areas to rural societies generated through nature-based tourism are significant and continue to grow (Vatanen and Kajala, 2014). In Sweden, there is currently no systematic visitor monitoring in use across the nation. Thus, there is a need for better data on the economic value of sport and outdoor recreation, and the environmental impacts of these activities.

There is a necessity to balance economic considerations with the growing participation in sport and outdoor recreation. By way of example, it is estimated that in 2010, 72,5 billion SEK (1,9 % of the Swedish GDP in 2010) were spent on outdoor recreation activities in Sweden and including Swedes' spending abroad is approximately 96,5 billion SEK (Fredman et al., 2013). It is especially spending on living, travelling, equipment and food that constitute the consumption. Likewise, with sport, Norberg (2017) indicates that spending for sport related activities was around 6800 SEK per inhabitant between 6 and 80 years in 2015. In sum, this indicates just above 60 billion SEK (1,3 % of the GDP). With regards to participatory sporting activity, the sum is just over 50 billion SEK. The major expenditures are travelling, membership/training fees and training clothes/shoes. Thus, there might be some overlapping figures between sport and outdoor recreation, for instance regarding equipment. Still, we can estimate that the sport and outdoor recreation sector together have a turnover of more than 140 billion SEK in 2016 (3% of Sweden's GDP). In addition to this is the value of all the unpaid voluntary work, especially in the sport sector. In Norway, voluntary work in sport is estimated to be 33 400 man-years of work in 2015 according to figures from Statistics Norway.<sup>2</sup> Converted to money this is calculated to be around 16 billion NOK. Since Sweden has nearly twice as many active members in organized sport compared to Norway, one estimate of the value of voluntary work in Swedish sport could be in the region of 30 billion SEK.

## Social and health impacts

The high activity level in the population also has social and health impacts. Around half of Swedes are fulfilling the goal from WHO on 30 minutes physical activity per day (Norberg, 2017). Being physically active has health benefits according to a literature review in a report with the telling name *Sports benefits for the society* ("Idrottens samhällsnytta", Faskunger & Sjöblom, 2017). However, this relationship is not that straight forward when it comes to participation in organized sport. Such participation *can* have positive health effects, however other factors such as skewed social distribution among the participants may be as relevant when it comes to health benefits as participation in organized sport is uneven. In addition, there are injuries and health problems related to performance sport. Further, when it comes to outdoor recreation there is also a skewed social participation. A challenge presents itself to reach specific segments of the population that would benefit most for more sport and outdoor recreation in terms of their physical wellbeing.

<sup>2</sup> <https://www.ssb.no/nasjonaltregnskap-og-konjunkturer/artikler-og-publikasjoner/idrettsbevegelsen-jobber-mest-frivillig>

The health and social impacts associated with sport and outdoor activities are widely discussed and debated. However, to date the link between health, social benefits and the positive environmental impact of sport and outdoor recreation has so far received limited attention by academics, organisers, and policy makers. There is, however, increased research evidence on both psychological and physiological health benefits from visiting nature areas (Tyrväinen et al., 2014; Hartig et al., 2014).

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## Future Trends and Development

### More diverse activities

As discussed above, there seems to have been a rather stable portion of Swedes that take part in outdoor recreation over the last decades (Statistics Sweden 2017; Fredman et al., 2013). However, some small changes are present in traditional activities like berry picking and fishing which are less popular, wandering in forests has increased in popularity, while alpine wandering has been stable (Fahlén & Ferry, in press). New and more adventure-based activities and lifestyle-based activities have become more popular, even if the portion taking part in such activities is still quite low compared to traditional 'friluftsliv' (Sandell & Boman, 2013). However, figures from Norway indicates that there are as many 15 years+ that takes part in so called lifestyle-based activities once a month as in organised sport (Breivik, 2013). In Finland, outdoor recreation statistics show that activities have become more diverse but the time spent on outdoor recreation has shortened (Sievänen & Neuvonen, 2011). When it comes to sporting activities the portion that exercise at least two times a week in Sweden has increased substantially over the last four decades from 28% in 1989 to 66% in 2013 across all age groups (Fahlén & Ferry, in press). This increase has mainly taken part outside organized sport, even if there has been a slight increase in active members in sport clubs from 1999 to 2012.

### Important sectors with environmental challenges

Given this picture and knowing that the trend is that the service sector is increasing in western countries, including nature-based tourism, sport and outdoor recreation will be important sectors in Swedish societies in the future, for instance for regional development. However, there are important economic and social aspects of sustainability that intersect with environmental sustainability. For instance, the skewed recruitment to these activities both based on social background factors – high educated more than less educated – and place of birth – Sweden born more than immigrants – implies challenges to both the health and social benefits from such activities. Such activities pose challenges for the planning authorities, for instance local autonomy versus central and state initiatives, local based traditional economic activity (forestry, agriculture, fishing and hunting) versus new and ecological based outdoor activities. A recent study by Stenseke and Hansen (2014) argues that Swedish management policies of landscapes and protected areas fall short of international standards when it comes to outdoor recreation. Moreover, Petersson-Forsberg (2014) also found that outdoor recreation interests are given low priority when it comes to decisions on physical planning practises in Swedish municipalities.

**Health concerns.** Increased health problems are linked to demographic changes, urbanization, and inactive lifestyles. In modern urbanised societies, acute and chronic stress, insufficient recovery from stress, obesity, and inadequate physical exercise are recognized as an increasing problem and a cause for long-term effects on health. In Europe, for example, the main work-related problems include musculoskeletal problems (59,8%) followed by stress, depression or anxiety (13,7%) (Europe in figures, 2011, p. 187). The increased activity level regarding sporting

activities in large cannot compensate for a more sedentary lifestyle (Breivik & Hellevik, 2013). Recently in Finland, the economic costs of physical inactivity, poor physical fitness and high amount of sedentary behaviour were assessed. The direct health care costs and costs of loss in work productivity were estimated to be annually 1,5 – 4,4, billion euros (Vasankari et al., 2018).

**Environmental challenges.** These social trends and developments imply several challenges from an environmental perspective. First, we see that transport and equipment/clothes makes a large contribution towards consumption when engaging in these activities. Both aspects have notable environmental impacts. Second, the planning for sport and outdoor recreation, especially in rural areas, poses particular challenges for sustainability. Outdoor recreation and nature-based tourism in rural Sweden conflicts in some ways the traditional culture and sustenance, with the result (up until now) that outdoor recreation and nature protection have been given low priority by local authorities. An increased commitment for these activities both from an economic, social and health perspective, will amplify these contradictions, and thus their environmental consequences. Third, the skewed social distribution of these activities has health and social implications, but also affects the composition of activities and thereby the environmental impacts. For instance, an ambition to increase sporting activities in nature among immigrants living in urban areas, requires better facilitation. Finally, there is need for better data on the economic and possible health effects of these activities in relation to an evaluation of their environmental impacts.

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## Thematic Conceptualisation of the Research Program

The research field itself is multifaceted and complex and can be operationalised in many different ways. For the actual context of the research program envisaged by Mistra, we propose a concept for the common systems, understanding that focuses on four main aspects and their interactions; environmental impact, stakeholder perspectives, governance, and future framework conditions (see Figure 1).

While in the centre of the research program there are the environmental impacts, for which it is relevant to develop innovative methods for integrative assessment, we also suggest focusing on two influencing factors, on stakeholders and their individual and collective behaviour, as well as on external conditions under which developments occur. This includes in particular as a research challenge to consider future trends that might not easily be foreseeable. The understanding of the interaction between these factors forms the basis for developing and implementing governance approaches to minimise the environmental impacts of sport and outdoor recreation and to facilitate positive impacts of sustainability (i.e., environmental, economic, and social).



**FIGURE 1.** Thematic conceptualisation of the research program.



## 4 Assessment of Environmental Impact

The organization, provision, and participation in sport and outdoor recreation activities can generate a range of environmental impacts. These impacts can vary in terms of their nature, timescale and geographical scale. Some of these environmental impacts will be explicit, for example, land use for facilities and venues, or emissions created by travelling. Other impacts will be more hidden, for example, carbon emissions generated in the production of sport and outdoor apparel or keeping indoor ice-rinks and hockey arenas cool. It has become increasingly important that those involved in sport and outdoor recreation appreciate the diverse range of environmental impacts it can place on the environment and put solutions in place to reduce any negative impacts.

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### Environmental Impacts of Sport and Outdoor Recreation [in Sweden and by Swedes]

All sports and outdoor recreational activities involve the use of natural resources (e.g. energy, water), and to some extent will have an impact on the environment. For example, the creation of 18-hole golf courses can disturb wildlife and lead to the modification of countryside landscapes (Salgot & Tapias, 2006; Wheeler & Nau-right 2006). Overall, the environmental impacts of outdoor recreation are largely linked to where services are located and how they are organized and provided on site. Green infrastructure in suburban and peri-urban areas provide easy access to outdoor recreation and promote physical activity, and has low costs linked to accessing the site. The supply of services and facilities within nature areas, however, have to be adequate to sustain high visitor numbers. In contrast, the transportation of visitors to outdoor recreation facilities combined with heating and lighting of overnight accommodation will involve the use of large amount of energy and result in the emission of greenhouse gases (Staffans & Merikoski, 2011). The development of facilities and overnight accommodation close to/in national parks for outdoor recreation can lead to increased number of visitations and lead to habitat and biodiversity loss. Off track sport and recreational activities can involve large numbers of competitors/participants, and there is potential disturbance to wildlife and damage to vegetation (Trendafilova, 2011). Sports and outdoor recreation can also generate waste materials and pollution, and impact on ecosystems. Table 1 provides a summary of the range of environmental impacts that can be generated by sports and outdoor recreation.

<b>Impact</b>	<b>Examples of environmental impacts</b>
Consumption of natural resources	Paper and card used for food and drink packaging; water and food consumption; production of materials for equipment and clothing
Consumption of non-renewable resources (e.g. fuel for energy and transportation)	Fuel used for heating of facilities and water; transportation (e.g. of participants and spectators); production of equipment and clothing
Damage to fragile ecosystems	Trampling on vegetation, soil erosion, changes in water quality
Emission of greenhouse gases	Consuming electricity and fuel
Habitat and biodiversity loss	Construction of facilities, disturbance of vulnerable species and habitats
Light pollution	Facilities and traffic, energy solutions
Loss of natural spaces and land use changes	Countryside is used to create alternative land uses (e.g. golf courses)
Noise pollution	Increased noise generated by a large number of machinery and vehicles; increased traffic congestion participants and spectators travelling, motorized outdoor activities
Water	Run off from artificial snow, leaking fuel and wastewater from sailing vessels into lakes, rivers and seas
Soil erosion	Trampling impact on hiking trails
Waste generated	Increased waste generated from construction of facilities, also from participants and spectators (food and drink packaging)

**TABLE 1:** Summary of environmental impacts attributable to sports and outdoor recreation.

While much has been published on the ecological impact of outdoor recreation (see Liddle, 1997; Hammit & Cole, 1998) and the effects of pollution (noise, light and water), less is known about the impacts of resource use. In particular, transportation and catering, and a better understanding of the types of strategies required to encourage more sustainable resource use when planning and hosting of sport and outdoor recreation is needed.

Sports and outdoor recreation often involves bringing a range of people together. For example; competitors/athletes, groups of friends, organized groups, officials, spectators, volunteers, sponsors and suppliers. Sports and outdoor recreational activities can also require the use of specific materials for equipment, facilities, merchandise, infrastructure, buildings, transportation and catering. The development of more environmentally sustainable sport and outdoor recreation in Sweden will require an enhanced understanding of their environmental impacts and managing the interactions between materials and people in order to minimise any negative impacts and maximize the sustainable benefits.

A small number of studies have examined the environmental impact of sport and outdoor recreation in Sweden. Research by Kardell (1974) reported that where 2,400 orienteers crossed a plantation of some 15,000 newly-planted spruce saplings, none of them were destroyed. A more recent report published by the Environmental Commission of the International Orienteering Federation's (2010), which conducted a review of environmental studies of orienteering across several European Countries (including Finland, Denmark, Sweden, Scotland) and Australia and Canada, also concluded that orienteering is a sport of low ecological impact. However, while the ecological impact of orienteering may be low, organized outdoor sport can involve large numbers of competitors/participants, the majority of which may travel by private car. Andersson and colleagues' (2016) analysis of the impact of the 2013 European athletics indoor championships in Gothenburg

found that 12% of the event footprint was due to travel and transportation. Further research is needed on the frequency and scale of outdoor orienteering events, competitors travel choices and their impacts.

Sport clubs are very much the foundation of the sport movement in Sweden. There currently exists no research on the environmental impact of organized sport at a community level, such as weekly soccer training and matches. These activities happen on a weekly basis and can involve families and teams travelling long distance often by private car.

In Sweden, the public have a Right of Public Access (Allemansrätten) to move freely in the countryside (i.e. forest, field, lakes, rivers and open water). Swedes spend a great deal of time outdoors in the countryside “friluftsliv” (“outdoor life”), for activities including skiing, orienteering, sailing, canoeing, fishing and swimming. However, consideration of the environmental impact of outdoor recreation on Sweden’s landscapes and protected areas is currently considered to fall behind international standards (Stenseke & Hansen, 2014). Furthermore, changes to outdoor recreation such as new activities, use of increased/high-tech equipment, and more people travelling and travelling further distances, even to remote areas, for new experiences will generate a new set of environmental impacts. To better plan and manage for this, there is need to further understand trends and future demands in order to ensure sustainable sport and outdoor recreation in Sweden. One of the key tools to regulate and guide patterns of outdoor recreation is land use and construction regulations.

In addition to the environmental impacts of sport, outdoor recreation and related travel, there is now increasing concern about the impact of certain environmental changes (e.g. climate change), and the challenges that this may present for future outdoor sport and recreation. People are now more mobile than ever and will travel further to participate in sport and outdoor recreation activities. This increased mobility combined with increased participation in sport and outdoor recreation not only contributes to environmental degradation (e.g. global warming through the emission of greenhouse gases from increased transportation) but is also a consequence of that increased mobility. For example, the need to travel further to access ski runs with sufficient levels of snow. There is a need for a greater understanding of the effects of global warming on sports and outdoor recreation and potential future challenges.

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## Activities and Services Causing the Most Significant Environmental Impacts

Different sports and outdoor recreational activities will have different impacts. There have been a small number of studies which have examined the environmental impact of several sporting events. These studies have consistently shown that travel is a significant contributor to the overall impact of organised sport events.

Collins et al (2012) used the ecological footprint to assess the global environmental impact of 1,9 million visitors that attended the UK Stages of the 2007 Tour de France. Visitors attending the event generated an ecological footprint of 57,990 global hectares (0,02 global hectares/spectator), with visitor travel accounting for 75% of the total footprint. A similar methodology was used to assess the environmental impact of visitors attending the 2004 FA Cup Final (see Collins et al., 2007). The 73,000 visitors attending the event generated an ecological footprint of 3,051 global hectares (0,04 global hectares/spectator), and travel accounted for 55% of the total footprint.

Dolf and Teehan (2015) applied a Life Cycle Analysis based approach to calculate the carbon footprint of the UBC Thunderbirds athletics team and spectator travel in Canada. Over an athletic season, its 40,000 spectators travelled an average dis-

tance of 186km/spectator, generating a total carbon footprint of 960 tCO<sub>2</sub>e (0,024 tCO<sub>2</sub>e/spectator). Scrucca et al. (2016) calculated that the 2014 World Orienteering Championship (Italy) generated a carbon footprint equal to 165,34 tCO<sub>2</sub>eq, of which 64,5% (106,65 tCO<sub>2</sub>eq) was attributable to travel by attendees and participants (i.e. athletes & staff members).

A Norwegian study detected the energy consumption (in joule) related to different leisure time activities (Hille, Aall, & Klepp 2007; Aall et al., 2011). Rather surprisingly, traditional outdoor recreation appears to be the third largest area of energy consumption, with the energy consumption involved in transport representing about one third of the total energy consumption. Sport and gyms scored lower when it comes to total energy consumption, however in terms of energy intensity (joule per hour) sport participation came above traditional outdoor recreation among the listed activities, while motorized outdoor recreation came on a second place (just beaten by redecoration).

While these studies provide valuable insights into the environmental impacts (e.g., carrying capacity, life cycle analysis, etc.) associated with sport events and key factors driving the scale of those impacts, few are considered alongside social and economic impacts. Whereas, most environmental impact researchers have focused on energy and greenhouse gases and not necessarily other forms or methodologies of assessing environmental impacts. More recently there have been studies which have used a Triple Bottom Line assessment approach to examine the environmental impacts of sport events alongside their economic and social impacts. For example, Andersson et al. (2016) applied a triple impact assessment model to measure the sustainability (environmental, social and economic) impacts of the 2013 European athletics indoor championship in Gothenburg. Their study reported that the ecological footprint for the 3-day event was 1,597 global hectares. The average ecological footprint per visitor was 0,104 global hectares (at the 3-day event), some three times the ecological footprint for the average Swedish resident over the same timeframe. The most significant contributors were; overnight accommodation (51%), food and drink and consumption (31%), and travel (12%). International air travel account for almost 50% of the travel component.

Key actions required to achieve sustainable outdoor recreation services (or nature-based tourism services) include compact land use and building patterns, efficient transportation infrastructure, low-impact energy solutions and waste management systems. These measures can reduce the use of energy and natural resources on-site (Kelly et al., 2007; Staffans et al., 2011). Research by Tyrväinen and colleagues (2014) suggests that sustainability practices linked to outdoor recreation in rural areas should not focus on tourists' efforts alone, as many factors can influence environmentally-friendly behaviour. Good design and planning of outdoor recreation services and enhancing implementation of sustainability practices and interventions are essential in promoting pro-environmental behaviour. In Finland, Metsähallitus (a state-owned enterprise) which governs and manages state owned land and water areas, applies sustainable tourism principles to all protected and designated areas that private tourism entrepreneur operating in the areas need to follow (Metsähallitus, 2016).

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## Assessing Environmental Impacts: Current Indicators and Methods

Indicators can measure, simplify and communicate important issues and trends on environmental impacts. They are also an effective approach to quantifying and measuring progress towards sustainable development. Currently, a range of indicators and methods are available to assess the environmental impact of sport and outdoor recreation related activities: carbon footprint, carrying capacity concept,

cost-benefit analysis, ecological footprint, environmental impact assessment, life cycle analysis, limits of acceptable changes, and triple impact assessments. Table 2 provides a description of each method.

Method	Description
Carbon Footprint (CF)	The total set of greenhouse gas emissions caused by an individual, event, organisation, or product, expressed as carbon dioxide equivalent.
Carrying Capacity Concept (CCC)	The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction.
Cost Benefit Analysis (CBA)	A systematic process for calculating and comparing benefits and costs of a decision, policy or project.
Ecological Footprint (EF)	A measure of human demand on nature, i.e., the biologically productive area needed to support people or an economy. It tracks this demand through an ecological accounting system. In short, it is a measure of human impact on Earth's ecosystem and reveals the dependence of the human economy on natural capital.
Environmental Impact Assessment (EIA)	An assessment of the environmental consequences (positive and negative) of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.
Life Cycle Analysis (LCA)	A technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling.
Limits of Acceptable Change (LAC)	The variation that is considered acceptable in a particular component or process of the ecological character of a wetland, without indicating change in ecological character that may lead to a reduction or loss of the criteria for which the site was Ramsar listed (a wetland of international importance). Sweden has 68 sites.
Triple Impact Assessments	A model aimed at measuring economic, socio-cultural, and environmental impacts from an event in a common monetary metric.

**TABLE 2:** Summary of methods currently available to assess environmental impacts of sport and outdoor recreation.

The 'carrying capacity' concept has been defined by the World Tourism Organisation as,

*“The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction”.*

Although the concept is helpful in understanding that a balance needs to be maintained in terms of the physical environment and quality of the experience of tourists to a particular destination, it has been considered problematic. First, empirically the environment is not a constant and will vary, for example, due to fluctuating in climate conditions. For this reason, Hixon (2008, p. 53) has argued that the concept has greater theoretical utility than practical value for ecologists. Second, it does not account for the impact of trade between areas, where one area is experiencing a shortage of one product and imports it from another area. A third criticism is that it does not account for technological innovations designed to overcome resource scarcity and enable more efficient use of resources or the development of substitutes.

One of the most common methods used to assess the environmental impacts of tourism related activities has been Environmental Impact Assessment (EIA). While assessment methods such as EIA can provide a valuable understanding of local environmental impacts and changes (positive and negative), they also have several limitations:

- ▶ different units of measurement are used to assess various environmental changes (e.g. air pollution or water pollution) and this makes comparisons difficult.
- ▶ some methods are also unable to identify which environmental changes have the most significant impacts. This presents certain challenges in terms of prioritising actions aimed at limiting resource use and environmental change (Collins et al 2009).
- ▶ EIA tends to be restricted to the geographical boundary of an event site, and so is less able to consider the environmental consequences beyond that boundary. For example, visitor travel including international air travel which is an important driver of the environmental impact of visitation (Gössling et al 2002).
- ▶ the scope of EIAs is limited to direct environmental impacts and can exclude a number of indirect environmental impacts. For example, production of building materials (e.g. buildings and infrastructure) and additional land and resource use for manufacturing activities (e.g. production of catering or sport apparel, equipment). For examples, see the corporate reports from Patagonia<sup>3</sup>, Nike<sup>4</sup>, and adidas<sup>5</sup>.
- ▶ EIAs require decision makers to make judgements about the significance of the environmental impacts.

More recently, a number of environmental indicators have been used to explore the direct and indirect impacts of tourism related activities. The most commonly used indicators in the area of sport have been the ecological and carbon footprint (including use of Life Cycle Analysis), and the primary focus has been events, infrastructure, spectators and travel. So far, there has been limited application of these indicators on sport at a club or community level. Given that almost half of Sweden's population (3,4 million) aged 7-70 years are a member of a sports club, and 2,4 million regularly compete in sport, suggests that this should be an important focus for future research.

Life Cycle Analysis (LCA) is a method which has been used to quantify the environmental impact of products and services. LCA has received increased attention due to its ability to provide greater transparency when assessing environmental impacts across all stages of a product or service lifecycle (i.e. resource extraction, processing/manufacturing, distribution, use and disposal). In the context of sport, LCA has been used by the University of British Columbia's Athletics and Recreation department to measure the potential climate change impacts of a basketball game (Dolf et al., 2011). Its application was intended not only to identify ways to reduce the environmental impacts of on and off-site sport activities, but to also develop a benchmark against which future events could be assessed.

The sport goods industry has grown significantly in recent years. In Europe, Sweden is one of the countries where people spend most on sports goods. A market report by the Sweden Chambers on Sport Clothes and Goods (Swedish Chambers, 2011) reported that in 2010, the Swedish sports industry was worth 21,8 billion SEK, and increase of 1,2 billion since 2009. The production of sports goods in Sweden had an estimated value of 930 million SEK in 2003 (the most recent year for complete production statistics were published), with fishing gear considered particularly important. A large proportion of Swedes wear sport clothing even when not actively participating in sport or outdoor recreation. In 2009, sport clothing was reported as having an estimated value of 7,7 billion SEK. The industry has undergone significant structural changes, and the majority of production now takes places elsewhere. This highlights the need for research that considers not only the environmental impacts associated with sport products and goods produced in

3 <http://www.patagonia.com/enviro-initiatives-book.html>

4 <https://sustainability.nike.com>

5 <https://www.adidas-group.com/en/sustainability/reporting/sustainability-reports/>

Sweden, but also those which are produced elsewhere in the world. Innovations in new sport products have led to the introduction of new manufacturing processes and high-performance materials and resulted in additional environmental impacts including increased disposal of waste due to many products having a shorter life cycle (Subric, Mouritz & Troynikov, 2009). The application of LCA to future Swedish sport products and apparel, could assist the industry's understanding of their potential climate change impacts and inform innovations around production and design, thereby reduce associated negative environmental impacts.

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## Priority Areas

Following on from the above, there are a number of areas that are recommended for future research within the theme of assessing environmental impacts. These would not only contribute towards enhancing our understanding of the environmental impacts associated with sport and outdoor recreation in Sweden but assist in the development of appropriate solutions aimed at enabling Sweden to develop sustainable sport and outdoor recreation in the future. They would also enable Sweden's sport and outdoor recreation to contribute towards achieving the UN's 17 Sustainable Development Goals.

The first priority area relates to *enhancing our understanding of the environmental impacts associated with resource use* by Swedish sport and outdoor recreation. A specific emphasis should be placed on researching the impact of travel undertaken for organised sport and outdoor recreation activities (i.e. one-off and regular events, events of different scales, and community and club level sport). An enhanced understanding of the scale of travel impacts, key driving factors, and factors influencing travel choices will assist in the development of more effective strategies aimed at reducing negative impacts in the future. It will also provide opportunities for developing benchmarks against which future events and activities can be assessed. The resource use impacts associated with motorised sports and those involving the use of technical equipment should also be considered a priority given their increasing prominence in Sweden. A range of environmental indicators and assessment methods currently exist for assessing the resource use impacts of sport and outdoor recreation. These should also be considered alongside other economic and social indicators in order to provide a more comprehensive assessment of the impact of sport and outdoor recreation.

The second priority area relates to *landscapes and protected areas*. There is a need for research on the environmental impact of outdoor recreation on Sweden's landscape and protected areas, including urban, peri-urban and rural areas, with a specific focus on future trends and planned activities, particularly those involving the increased use of high technical equipment. Moreover, activities and outdoor recreation patterns with high (or low) impact on environment should be more comprehensively identified. Alongside this, further research is needed on the effects global warming is currently having on sport and outdoor recreation activities in Sweden. Potential future challenges facing the industry need to be identified, alongside how they could be addressed.

The third priority area relates to the *environmental impacts associated with the production of Swedish sport and outdoor recreation goods*. Sport goods contribute significantly to the Swedish economy and is likely to increase in the future. There is a need for research which examines the environmental impact of sport goods produced by Swedish companies within and outside Sweden. An enhanced understanding of sport and outdoor products and their life cycle impacts can then be used to inform future design considerations, and the development of a more sustainable Swedish sports goods industry.



## 5 Behaviour and Decision Making of Individual and Collective Actors

Decision making and behavioural change is an important area of consideration when evaluating the sustainable development movement in sport and outdoor recreation. These aspects concern a variety of stakeholder groups because of the shared responsibility of all parties to reduce negative impacts and promote sustainable development goals in the sector (Sartore-Baldwin, McCullough, & Quatman-Yates, 2017). As such, it is important to explore the current state of sustainable behaviours of individuals in a variety of contexts including passive and active sport and outdoor recreational. Moreover, it is important to consider the influence of various behavioural barriers that may prevent or discourage sustainable behaviours. The decision-making processes of individuals as well as the practitioners including service providers responsible for implementing sustainable development initiatives and engaging spectators and participants is equally as important. Researchers have examined sustainable behaviours in multiple context with a variety of stakeholder groups. Their findings have helped create an initial understanding into the motivations and impediments that managers in organizations encounter or are confronted with as they consider implementing the UN's SDGs. Additionally, researchers have begun to examine the sustainable behaviours of participants and spectators as they seek to engage them in their various activities.

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### Getting Sport and Recreational Organizations Engaged

Sustainable development goals are becoming more commonplace in organized business, which is reflected in their organizational culture, policies, and behaviours. However, sport and outdoor recreation organizations have varying levels of engagement and commitments to sustainable development initiatives. Preliminary research which has examined the motivations to engage or refrain from engagement primarily focus on the lack of financial resources to pay for such initiatives and the lack of human resources and expertise to properly implement and manage such initiatives. Managers also are worried about negative reactions from stakeholders for simply engaging in sustainable development initiatives or not doing enough in their efforts (Casper, Pfahl, & McSherry, 2012). These organizations can be encouraged to engage in sustainable development goals as a result of various pressures (i.e., social, functional and political; McCullough & Cunningham, 2011).

Government mandates and other governing body policies that require increased sustainable development performance can lead to the implementation of such initiatives. Organizations can also be proactive and avoid reactionary responses to legal mandates requiring environmental initiatives. Pressure from stakehold-

ers and other community members or activist groups can apply social pressure on organizations to engage in sustainable development initiatives. In smaller less structured entities, members can apply pressure internally to get their organization to be more sustainable. Organizations can also reevaluate their current practices and as a result of organizational adaptability can improve the function of their organizational processes to include more sustainable operations and processes. Consequently, sport and outdoor recreation organizations that do engage in sustainable development goals, especially as a strategic initiative, can realize many benefits and outcomes. Primarily, these organizations can increase their competitive advantage, increase cost savings, boost goodwill perceptions and deepened customer loyalty (Casper, Pfahl, & McCullough, 2017; McCullough & Cunningham, 2010).

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## Theoretical Understanding of Environmentally Sustainable Behaviours

While it is impractical to completely eliminate the environmental impact while participating, spectating, or consuming sport and outdoor recreation, it is practical to promote more sustainable behaviours. As organizations increase their commitment and sophistication of their sustainable initiatives, they are creating campaigns to outwardly promote sustainable behaviours (McCullough, Pfahl, & Nguyen, 2016). These committed organizations launched campaigns to engage participants and spectators to behave in more sustainable ways (for example see UEFA's carbon offsetting program). However, to this point, initial environmental sustainability initiatives have been rather surface level efforts without much sophistication or evaluation. As a result, there is a need for theoretical models to evaluate the effectiveness of sustainability initiatives and messages on behavioural change and other key performance indicators (KPIs).

Trail (2015) has introduced a model to evaluate the effectiveness of these campaigns. His theoretical framework provides a basis for other research to increase understanding of the evaluation and sophistication of sustainability campaigns that are designed to engage participants, spectators, and others involved in sport and outdoor recreation activities. While other researchers have evaluated behaviours as a result of sustainability engagement campaigns (Casper et al., 2014), this new framework follows common marketing and consumer behaviour methodologies to evaluate the effectiveness of campaign messages and allows for recommendations to be made for modification to these messages based on market segmentation resulting from demographic and psychographic information. Additional research is necessary to understand the influences that result in more sustainable behaviours among sport spectators, participants, and managers.

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## Current Areas of Inquiry

There are unique aspects that need to be explored if this sector is to achieve lofty sustainable development goals and be used as a platform to influence everyday behaviours. There are differences between everyday sustainable behaviours and those that individuals encounter with when consuming sport or outdoor recreation whether participating or spectating. Environmental behavior is dependent on multiple motivations, which may be concurrent and not compatible. Therefore, visitors who claim environmental values do not necessarily purchase sustainable products or are willing to engage in sustainable practices. It has been previously reasoned that an individual's salient identity during specific activities may preclude environmental identity. How then can organizations and resulting sustainability campaigns or messaging activate an individual's environmental identity or bypass it through another means to encourage more sustainable behaviours among par-

ticipants and spectators? McCullough and Kellison (2016) explore this challenge using place identity as a possible bypass. Others have suggested leveraging fan or brand identification to encourage more sustainable behaviours from direct messaging campaigns (Casper et al. 2015). While others found that exposure and time in nature led to increased attitudes toward environmental conservation. Perhaps all these strategies may work to promote more sustainable behaviours among spectators and participants, but determining which strategies best serve which organizations (i.e., professional vs recreational-based organizations) best is still unknown and needs further examination.

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## Priority Areas

To this point, there are several research themes of interest to the authors of this document that may help guide future lines of inquiry. Specifically, the authors agree it is necessary to explore the behaviour and decision-making processes of individuals and collective actors not only to choose but also to provide and promote more sustainable options. Further, it is necessary to understand the barriers or the incentives that prevent or encourage sustainable behaviours and services. Lastly, it is important to factor that the specific context is necessary to delineate differences between day to day behaviours and those sport and outdoor recreation behaviours.

Researchers should identify the aspects and roles of key actors in systems that influence the sport and outdoor recreation sector, stakeholders, or individuals to act in more sustainable ways. These significant others are critical to ensure that more entities and individuals act in sustainable ways across the sector. However, there will be barriers that prevent sustainable behaviours and initiatives from being enacted. These obstacles should be identified and countered with factors of influence to the barriers of change (i.e., demographic, cultural/normative).

Further, the social influence of sport and outdoor recreation to promote sustainable behaviours should be examined. This serves as an advantage to the sector to demonstrate its influence to promote sustainable behaviours during sport and outdoor recreation. An obvious gap is the influence that sport entities can have to get an individual to engage in everyday sustainable behaviours (e.g., using mass transit, recycling, exercising, healthy eating, etc.). Research should examine the different stakeholders in the various sectors, participation sport, spectator sport and outdoor recreation, and how they act and can be influenced to more sustainable behaviour, especially regarding potential policies for steering consumption and governing collective stakeholders (see next section).

Future research inquiries should examine multiple contexts and levels of sport and outdoor recreation to provide frameworks that may be universally used within and across the sport and outdoor recreation sector. Researchers should examine the motivations and restrictions of the internal and external stakeholder groups, the effects of upper management support, or lack thereof, to implement or avoid sustainable initiatives, and the legitimacy, authority, and responsibility organizations have among its constituents to promote sustainable behaviours. This depth of understanding should help organizations at all levels engage, promote, and realize behavioural change within and without the organizational stakeholders.

## 6 Governance

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### Conceptualizing Sport Governance

Like many industry sectors, organizations in the sport sector are dependent on collaboration and coordination with other entities beyond itself. An advanced level of coordination is necessary to meet the ever-changing demands of various aspects of society. The process of oversight and management of these factors requires organizational governance, which “is a necessary and institutionalized component of all sporting codes from club level to national bodies, government agencies, sport services organizations and professional teams around the world” (Ferkins, Shilbury, & McDonald, 2005, p. 245). In short, the necessity for governance is exacerbated when the organization is confronted with a challenge or serious issue. As a result, governance puts in place a process “in which a single organization or a network of organizations (society/system), steers itself, allocates resources, and exercises coordination and control” (Ferkins & Shilbury, 2015, p. 93). In general, governance structures prioritize specific areas of interest for the organization’s survival. Within the sport sector this concept applies to how the organization can govern themselves internally and among external entities across and beyond the sport sector. Seeing it from the government’s side involving local sport associations is essential for developing sport activities in the Nordic countries (Bergsgard & Norberg, 2010). This dependency on a non-public actor (in our case sport organisations) is the cornerstone in what Salomon (2002) calls “the new governance.”

Governance in sport and outdoor recreation has received considerable attention by research academics. Primarily, sport governance operates to a certain level of autonomy. Specific to Scandinavian sport organizations, the political culture and mentality of autonomy presents its own specific challenges to achieving specific sustainable development goals that align with societal and cultural values. For instance, a study of sport facility policies and structures in the Nordic countries suggests that the substantial influence from the voluntary sport organizations (federations and clubs) act as a hindrance for truly implementing sport and outdoor recreation as public good for all (Bergsgard et al., 2017). The same was found in a study on the implementation of a large sport policy program in Sweden (Fahlen, Eliasson & Wickman, 2014). In this case both the public-non-public dimension and the central-local dimension comes into play, with the result that the local level should implement the program disregarded the central formulated policy goals for the program. That is, the political approach resulting in autonomy of private sport clubs and federations limits the advancement of sustainability in the sport sector. Book and Carlsson (2011) conclude that the political culture in Sweden has made it more challenging for the government to influence (i.e., top-down) policies and actions on behalf of sport organizations at all levels. The voluntary mentality surrounding sport foundations is further limiting due to the lack of capacity or abilities of the volunteers in many organizations to achieve specific sustainable development goals.

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## Sport Governance in Sweden

As a result, current sustainability efforts among sport organizations and federations are not aligned with other industry sectors in Sweden (Book & Carlsson, 2011). According to Book and Carlsson (2011), the autonomous culture surrounding the sport sector, as aforementioned, creates a mentality that disjoints the greater effort to achieving sustainability. Rather than embracing the 'eco' mentality conveyed at national or municipal levels, sport organizations are left to their own devices to choose to engage in environmentally sustainability initiatives and to the extent to which they engage in environmental sustainability initiatives. As national environmental policies provide direction to public and private organizations, researchers challenge the positive outcomes of these policies. Specifically, they note such policies have been characterized as "rather insignificant and limited, even if we take a departure in their self-image and their presentations in brochures and on websites" (Book & Carlsson, 2011, p. 408) of the Swedish Sports Confederation (Riksidrottsförbundet) by way of example.

Government and other NGO bodies are faced with the challenge to create policies that encourage and promote the implementation of sustainable development goals. The challenges are unique to the specific governing body. For instance, government policies are typically broad and not specific to sport and recreation organizations. This provides an opportunity for sport governing bodies to govern and create specific policies unique to their constituents. That is, more professionalized sport will require different considerations than more informal, recreational, or grass roots-based organizations. While these policies need to be catered to the cultural environment of Sweden, there are several examples of international policies related to sustainable development goals that can be leveraged by governing bodies, sport federations, organizations, and individuals throughout Sweden.

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## Governance of Outdoor Recreation

As previously discussed, outdoor recreation is subjected to another Ministry than sport, namely the Ministry of Environment and Energy. In one respect this area might be better recognized by legislation as an important target than sport, for example when it comes to planning, landscape conservation, diversity among other aspects. However, in practical planning situations outdoor recreation has been found to have a rather weak position when there are competing land use interests. Without precise planning norms where, how much and what type of areas should be reserved for outdoor recreation the existing legislation alone leaves much room for local interpretations in municipalities.

On the other hand, even if there are 23 non-public and voluntary based organisations with around 2 million members under the umbrella organisation *Svenskt Friluftsliv*, our impression is that the 3,1 million memberships in 71 national federations under the umbrella organisation *Riksidrottsförbundet* implies a far stronger organised sport sector. For instance, when the Swedish government in 2012 gave the responsibility to the coordinating organisation *Svenskt Friluftsliv* to distribute government funding to outdoor recreation organisation, the sum was rather small, 25 million SEK. To compare, the central government support for sport in 2012 was 1,866 billion SEK (Norberg, 2017). This dual feature indicates on the one side that outdoor recreation maybe better addressed in legislation and regulations, and on the other side that it is more difficult to govern due to lesser well organized national and local actors that facilitate this activity. For instance, Sweden has since 2008 regulated mountain guiding by importing the formal system from the Alps, while Norway still emphasize a layman tradition (Eikje, Horgen, & Arnegård, 2017).

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## International Examples of Sport Governance and Environmental Sustainability

The International Olympic Committee (IOC) joined the United Nations Environmental Programme in 1992 to commit the Olympic Movement to sustainable development. The commitment on behalf of the IOC to these goals translated to encouraging National Governing Olympic Committee and Organizing Committees for the Olympic Games to a deeper sense of responsibility and commitment to implement environmentally sound projects. This commitment was first implemented by the Lillehammer 1994 Olympic Games (Girginov, 2018). These programs have increased the sophistication, but also shared their shortcomings and failures, of environmental sustainability efforts. There have been other encouraging leadership among leagues/federations and individual organizations to govern and encourage environmental initiatives. Specifically, the IOC published resulting documents that guide other events and organizations to be more sustainable (i.e., Agenda 21, Sustainability through Sport, Agenda 20+20). While these examples are more focused on professionalized organizations, more attention is needed to those organizations that are not engaging and more volunteer-community based organizations.

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## Priority Areas

There will certainly be various governance challenges across the sport and outdoor recreation sector in Sweden as environmental sustainability is encouraged and pursued. Most specifically, the goal of various organizations and entities will vary with regards to their commitments to environmental sustainability. Additionally, the level of organization for each entity will determine the current governance processes in place. That is, the level of professionalization and orientation of the entity in a business-like manner will drastically vary from organizations that are purely individual or focus on a volunteer-reliant culture.

However, there are considerable opportunities that researchers and practitioners both note that sport and outdoor recreation organizations and federations can leverage when incorporating environmental sustainability. Previously researchers and practitioners note the social platform that sport has across society. It is believed that sport entities can leverage their platform to promote and advocate for sustainable development goals, environmental action, and behavioural change. Sport entities must first align these values with their organizational practices to ensure legitimacy and to better position themselves as an authority on such issues (McCullough, Trendafilova, & Picariello, 2016). However, aligning these values with organizational practices requires that proper governance and creation of policies that are followed to incorporate environmental sustainability into the daily operations of these organizations. To this end, areas of further examination are provided for future direction, from the perspective of the Working Group, to forward our understanding of sustainability in sport, recreation, and outdoor activities.

Special consideration in future research should consider the various gaps identified above to forward understanding of how to engage the entire sport sector inclusive of outdoor recreation. Engaging organizing committees can serve as a foundational aspect for engaging other stakeholders associated with each entity. Identifying the cross-scale governance processes that would work to engage each level of the sport sector are critical. Overall, these policies should be evaluated for the greatest extent of effectiveness to promote health and economic benefits while ensuring environmental protection by mitigating avoidable environmental impacts. To that end, the influence of incentives for engaging various stakeholder groups to ensure the success and longevity of these programs is also necessary for the suc-

cess of sustainability in sport and outdoor recreation. The shared responsibility to ensure sustainable future falls on many stakeholder groups at varying degrees. Thus, accountability is necessary to ensure that programs and initiatives are proactively incorporated into all sport sector entities.

Building upon this understanding, future research should consider examining the best ways to properly engage participants/patrons/fans in sustainable behaviours and initiatives. Regarding supply of services sustainable land-use policies and planning norms are key tools in providing easy access to sports and recreation services that help in achieving social and health benefits while keeping the environmental impacts of visitations low. These stakeholders can serve as a tremendous resource to extend the influence of sustainability campaigns into their everyday lives. How can the information on environmental impacts of sport and outdoor recreation be considered alongside health and economic impacts in decision making processes? Moreover, research should identify and explore the differences and similarities between spectator sport, participation sport and outdoor recreation when it comes to governance. That indicates to study tools that government can use and the means that the organisation themselves possess to steer the activity in a more environment friendly direction.

Along the line of these questions, additional information is needed to understand the influence that sport governance has on the implementation and success of environmental sustainability initiatives. This influence has been demonstrated from both top-down and bottom-up perspectives. Specific to the political and cultural aspects of Sweden, additional considerations should be given to the influence of the autonomous environment and interaction between governing bodies and subservient organizations.

## 7 Future Framework Conditions

Many external factors directly or indirectly affect the attraction and frequency of sport and outdoor recreation activities as well as the mode of organization, and thus also the magnitude of the environmental impacts. An analysis of the current situation is crucial for understanding the system; however, in the context of a research program, the estimation and consideration of future developments is crucial. We propose to implement the time horizon 2030 as a common standard across most individual research projects. This will be in accordance with the timelines of both the EU Agenda 2030 Climate and Energy Framework and the UN 2030 Agenda for Sustainable Development and thus demonstrate the potential contribution of sport and outdoor recreation to the achievement of the targets listed in these two agendas. The time span 2030 is also suited for the integration of stakeholders, as it is comprehensible within their individual life perspective.

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### Policies and Legal Constraints

**Direct effects.** Changing norms can have direct, immediate effects on certain activities and their environmental impacts, as would be the case e.g. with a ban of lead ammunition in sport shooting or with extended restrictions for snowmobiling and heli-skiing.

**Indirect effects.** Much more difficult to predict are indirect effects of (existing or foreseeable) rather general policies and strategies in the wider field of environmental protection and sustainability, as for example the UN Sustainable Development Goals or various national policies to reduce CO<sub>2</sub> emissions via taxation, subsidization of alternatives etc. or to favour public transport over individual transport. Moreover, compact city policies targeting to climate change mitigation often mean less nature areas for outdoor recreation within and nearby urban centres leading to need to travel longer distances to travel for suitable sites for recreation.

Within the research program it will be crucial to develop scenarios for future political and legal framework conditions in Sweden and to investigate their effects on sport and outdoor recreation.

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### Climate Change and Globalisation

Global trends can directly affect individual sports, as is the case with the effects of climate change on skiing. However, global change with its many different facets has been and will be affecting both the demand and the supply side of sport and outdoor recreation. Therefore, the research program needs to consider aspects such as:

- ▶ Competitiveness of Sweden in the international outdoor recreation market
- ▶ Sensitivity of different individual activities and modes of organisation



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## Emerging Technologies

In many sports new technologies are changing the type and intensity of environmental impacts. By way of example, the replacement of traditional bicycles by e-bikes significantly increases the daily range of bikers and thus also the penetration into previously undisturbed areas. This is particularly true for mountain biking. Other technological innovations might as well reduce impacts. This does not only refer to sports equipment, but also to applications of IT technology for sport and outdoor recreation including social media. Therefore, the research program should pay special attention to emerging technologies and their potential effects. Ideally, the research program should identify potential fields for future technology developments to reduce environmental impacts.

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## Societal and Economic Trends

There is a wide range of trends that will directly or indirectly affect the attraction as well as the environmental effects of sport and outdoor recreation, such as:

- ▶ Demographic change (urbanization, aging society, income distribution, educational levels, new cultural traditions from immigration etc.)
- ▶ Sharing economy (car sharing, sharing of sports equipment)
- ▶ Shifts from ownership of sports equipment to renting (currently significant in skiing)
- ▶ Individualisation vs. group activities (changes in engagement in sports clubs and voluntary work)

## 8 Methodological Approaches

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### Inter- and Transdisciplinary Co-production of Knowledge

The challenges in the thematic field of this envisaged research program are multifaceted. Their investigation requires the integration of theories and methods from a wide range of academic disciplines as well as the integration of knowledge and consideration of perspectives of many different system actors (stakeholders), both in the phase of program design and in the implementation of the individual research projects. It is also crucial to define what kind of knowledge can be created and contributed by different actors (Enengel et al., 2012).

A wide body of methodologies for inter- and transdisciplinary knowledge co-production has been developed in the past two decades (Bergmann, 2012; Frodeman, Klein, & Pacheco, 2012; Gibbs, 2015; Hadorn et al., 2008). This research program will adapt and further develop the existing methodologies for the specific field of sports and outdoor recreation and thus also contribute to the theoretical discourse on inter- and transdisciplinary.

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### Established and Required Interdisciplinary Co-operations

Some academic disciplines that are relevant for this research program have a long history of cooperation; however, this is not true for all of them. Interestingly, the two core disciplines whose names are reflected in the title of the research program, sports sciences and outdoor recreation research, so far had surprisingly little co-operation. Yet they have their own specific linkages to other disciplines.

Outdoor recreation research has already for a long time been well linked to environmental sciences, social sciences, psychology, natural resources management and planning disciplines; however, there has been little cooperation with industrial ecology (e.g. life-cycle assessment). Sports sciences have well-established links with social sciences and humanities, medicine and physiology, biomechanics and neurophysiology (Champely, Fargier, & Camy, 2017), and increasingly also with material sciences and industrial ecology. Yet in the past there has been limited cooperation with environmental sciences, planning or land-use related disciplines (transport planning, protected areas management, forestry, conservation planning etc.). At European universities, only a few academic research institutes exist at the interface of sports and environmental sciences (e.g., German Sports University Cologne; Seattle University Sport Business Leadership). Therefore, an increased cooperation between sports sciences and outdoor recreation research will provide additional interdisciplinary synergies beyond the time span of this research program.

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## Stakeholder Participation and Communication Chains

The complex interaction field of sport and outdoor recreation and the environment requires careful design of stakeholder participation for transdisciplinary knowledge co-production. A wide range of actors from different groups is involved in this system:

- ▶ Sports clubs, associations, interest groups, NGOs
- ▶ Individual competitors/athletes, recreationists, spectators, consumers, parents, children, persons with special needs
- ▶ Manufacturers and retailers of sports equipment, stationary and online retailing, sales staff
- ▶ Teachers, instructors, trainers, mountain guides
- ▶ Media (e.g., newspapers, sports magazines, social media)
- ▶ Public authorities and agencies (e.g., planning, transport, education, conservation, protected areas management)
- ▶ Event organizers, resort managers, facility managers

For each sub-project within the research program it will be crucial to identify the relevant communication chains. In the case of the environmental impacts of sports equipment (e.g. outdoor clothing), it is the production chain from the manufacturer via the retail trade to the consumer. In the case of a certain specialist activity (e.g. white-water kayaking), it will rather be along the specific training or service chain.

The organization mode of an activity is a decisive factor for identifying key actors. At club or school-based sports, people can easily be reached and involved via the key persons in a club or school (e.g., teachers, trainers), or via their specific communication channels such as newsletters or social media. In commercial sports the key actors are usually the service providers (e.g., mountain guides, rafting instructors). The most challenging mode can be found with those sports or outdoor activities, which are usually performed individually such as hiking, biking, or downhill skiing. Here it is very difficult to identify key actors for discussing and communicating environmental issues; therefore, multiple avenues for stakeholder activation and communication need to be explored. This could be via social media or via sports equipment retailers. However, the trends towards online shopping create a new communication challenge; so far very little research has been conducted on how online retailing can be involved in addressing environmental behaviour.

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## Research Design for Synthesis and Implementation

Results from individual research projects within the research program should not appear as unrelated to each other, but rather form the basis for an overall synthesis as well as for implementation. Applicants should demonstrate how they are planning to realize synthesis both within individual projects and across all projects of the research program and how the implementation of the research results can be facilitated (see Hoffmann et al., 2017).

## 9 Conclusion

Mistra commissioned a Working Group to examine the integration of environmental sustainability in sport and outdoor recreation. It was our task to summarize the current state of research in these two content areas and present gaps in the academy's understanding and recommend future research directions to better advance the research and practice of environmental sustainability in sport and outdoor recreation. Based on the research expertise of the Working Group members, we identified four key areas through a systems approach. These areas include the crux of the topic assessing environmental impact of sport and outdoor recreation, behaviour and decision-making of individual and collective actors, influences of governance on environmental sustainability, and future framework conditions.

We stress the importance and contribution of each content area. As noted, assessing the environmental impact of sport and outdoor recreation is foundational to understand how to properly address environmental sustainability in these areas. The subsequent content areas (i.e., behaviour and decision making, governance, and future framework conditions) serve as tools to address and reduce the environmental impact of sport and outdoor recreation. These tools are not the only ways to reduce environmental impacts, but the Working Group included these areas relying on our personal expertise and familiarity with environmental sustainability in sport and outdoor recreation. These tools may not carry the same weight in all organizations. Thus, researchers and practitioners should be cognizant that environmental programs are not vulnerable to isomorphic institutionalisation, which can lead to ineffective initiatives to achieving specific organizational environmental sustainability goals.

From these perspectives, the Working Group has identified gaps in the overall understanding of these topics as they relate to environmental sustainability in sport and outdoor recreation. To address these gaps, we recommend that other researchers develop systematic research agendas while taking into account the interdisciplinary aspects of environmental sustainability. The impacts of climate change are occurring rapidly and as a result, immediate action is needed in coordination among various academic disciplines and with sport and outdoor recreation practitioners, participations and other stakeholders. Further, the difference between the sectors – spectator sport, participation sport and outdoor recreation – should be acknowledged. However, future research ought to include all sectors with theoretical and methodological approaches that are applicable in all three (or at least two) of them.

This collaborative approach can provide more robust and meaningful interventions to reduce the impacts of climate change through more sustainable options, choices, and behaviours. Further, we stress the importance of translating theoretically based and empirically driven research into practical applications. These practical applications should result in tangible reductions in the environmental impact of sport and outdoor recreation. Moreover, the process to develop such initiatives should be easily understood, implemented, measured, analysed and adapted by academics and practitioners alike.

While this background paper provides a robust foundation for future directions of research, other areas where environmental sustainability interacts with sport and outdoor recreation should be considered. As noted in Section VIII, future developments and advancements in sport and outdoor recreation will present new challenges that are not currently encountered. Academic researchers, practitioners, and participants should remain diligent to address these new challenges swiftly.

Keeping in mind the character of a background document, we do not want to list particular research questions for the envisaged Mistra research program, nor do we suggest particular study cases (i.e. types of sports or outdoor recreation activities; study regions within Sweden) or modes of stakeholder integration. It should rather be up to the consortia applying for the grant to develop innovative approaches regarding the thematic foci, the methodological approaches as well as the organisational setup of the program, in order to simultaneously achieve scientific quality and solutions with societal relevance.

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# Appendix

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Brian McCullough is an Associate Professor in the Masters in Sport Business Leadership program at Seattle University. His research interests concentrate on the managerial decision-making processes involving environmental sustainability initiatives among upper management, determining the environmental impact of sport spectators, and using the context of sport to influence environmental behaviours of sport spectators' game day and everyday life. He has published his research in the *Journal of Sport Management*, *Sport Management Review*, *Sport & Communication*, *International Journal of Sport Management & Marketing*, *Quest among others*. He has also published a book, *Introduction to Environmental Sport Management*, and was the lead editor of *Routledge Handbook of Sport and the Environment*.

### **Nils Asle Bergsgard**

Nils Asle Bergsgard is a Professor (sociology) at the Department of Sport, Physical Education and Outdoor Studies, University College of Southeast Norway (USN), and head of the PhD-program in Culture Studies at USN. His research interests are sport sociology, sport policy and cultural policy. More specifically, his research has covered sport policy and politics both at local and national level, both grass root and elite sport, both national (Norwegian) and comparative studies. Based on this research he has published several articles on sport and cultural policy in international journals like *International Review for the Sociology of Sport*, *Sociology of Sport Journal*, *Sport in Society*, *International Journal of Cultural Policy*. In addition, he has co-authored several books, amongst others *Sport Policy – A Comparative analysis of stability and change*.

### **Andrea Collins**

Andrea Collins is a Lecturer at the School of Geography at Cardiff University (United Kingdom). Her main research focus is on the Ecological Footprint and assessing the environmental impacts of major sport events and festivals. She is currently involved in several research projects on the environmental and travel impacts of major sport events and festivals. Andrea has published her events research in *Urban Studies*, *Journal of Travel Research*, *Journal of Sustainable Tourism*, *Tourism Management* and *Tourism Economics*. Her research has directly informed the development of UK Sport's eventIMPACTS online toolkit for event organisers and policy makers, and Golf Environment Organisations International Voluntary Sustainability Standard for golf tournaments.

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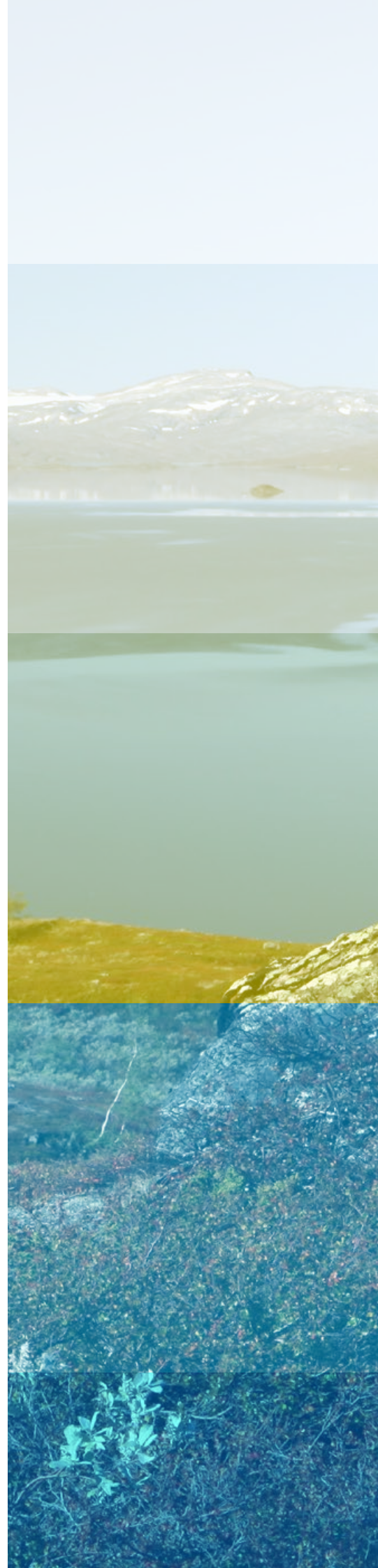
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