

Mistra Sport & Outdoors Towards Sustainable Solutions

**PROGRESS REPORT PHASE I
2020–2024**



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Foreword

Sports and recreation in the outdoors have deep roots in Swedish society, and tackling the environmental challenges from these activities is both timely and needed. Mistra Sport & Outdoors is a research program that co-creates knowledge and solutions for increased environmental sustainability together with key stakeholders in the sport and outdoor recreation sectors – and through the many organizations we also see great possibilities to reach the broader population. Sustainability is a complex topic, and collaboration between academia and practice is one important way forward to reach the global sustainability goals.

This report summarizes the first 45 months of Mistra Sport & Outdoors. It has been both a rewarding and curvy track to move along. Co-creation with academia takes time and calls for patience. The program started two weeks after the Covid-19 outbreak, which became a gamechanger for many of the studies planned but also opened new trajectories of transformation. Many sport and outdoor organizations operate with small budgets and volunteer staff, where time is the primary resource. This is also a reason the program has focused on igniting a ‘movement’ for more sustainable practices in the sport and outdoor recreation sectors. While Mistra Sport & Outdoors focuses on the Swedish context, research is an international endeavor and our alliance with the European Network of Outdoor Sports brought our work beyond the national arena.

Have we reached the goals? Largely yes, but there are also many insights brought over to the application for the second phase of the program. There is an unrevealed potential for transition in the sport and outdoor sectors, and a key is to focus on behavioral change at multiple levels. Sustainable solutions call for inclusive processes where stakeholders facilitating sport and outdoor recreation participation, such as municipalities, transport and apparel providers, are also involved. We want to thank the many individuals and organizations contributing to the first phase of Mistra Sport & Outdoors. The “co” added to “creation” make solutions more impactful and research more relevant.

Eva Thörnelöf, Chair of the board

Peter Fredman, Program director



Vision, goals, and organization

In Mistra Sport & Outdoors we understand sport and recreation in the outdoors (SOD) as fundamental elements of the development of modern societies. Social changes brought by SOD are comprehensive and deep: affecting anything from production systems and infra-structure to social interactions, personal habits, ideals, and lifestyles. SOD is also deeply linked to the formation of modern consumer markets, non-profit organizations, and politics. The impacts of the mega-phenomenon that SOD represents in contemporary societies can, therefore, only be understood if it is seen as a central feature of this evolving modernity and, thus, research can be a powerful tool to identify the path towards more sustainable practices. Hence, the *vision for Mistra Sport & Outdoors is to provide a role model in sport and outdoor recreation, on track towards sustainable development, minimizing negative environmental effects through co-creation between research and practice, learning processes and mobilization.*

During the first phase of the program, a central feature has been to work in close collaboration between research and stakeholders in the SOD sectors through a co-creation process to produce and apply new knowledge on sustainable solutions, which reduce negative impacts from transport, land and water use, equipment, and events. We have strived for a good balance in our work between the *sport* and *outdoor* recreation fields, which partly overlap but also follow different logics and administrative structures in Swedish society. Our *three main goals* have been to (i) produce research in sustain-

nable sports and outdoor recreation of high quality and local relevance, with a high potential to reach the international forefront, (ii) identify challenges, propose solutions and communicate these together with the SOD sectors to prepare for a movement for more sustainable practices, and (iii) develop a plan for a network-based center for research, development and policy support in favor of sustainable solutions in sport and outdoor recreation.

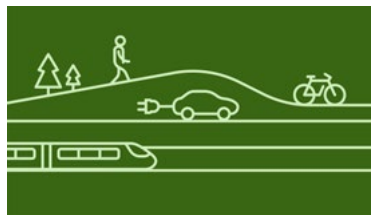
Our research has been organized in *six themes* focusing on 1) path dependencies and transformations, 2) transport and mobility, 3) land and water use, 4) materials and equipment, 5) events, and 6) behavior, policy, and future change. With support from *key partners*, we identified environmental challenges for each of these themes. Following this first step of the co-creation process, *ten learning groups* were formed with a mix of researchers and practitioners to develop knowledge and solutions. Most of these groups have been active since the second year of the program under the guidance of a professional facilitator. Although we are not yet at the end of the first phase (was extended for three months to June 2024 due to impact from the Covid-19 pandemic) we observe good progress on all three goals, providing fruitful stepping-stones for the second phase of Mistra Sport & Outdoors.

More details about the organization and progress of Mistra Sport & Outdoors are available at the website: www.mistrasportandoutdoors.se

Six themes



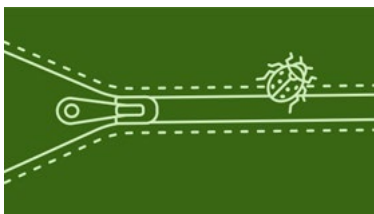
1. Path dependencies and transformations



2. Transport and mobility



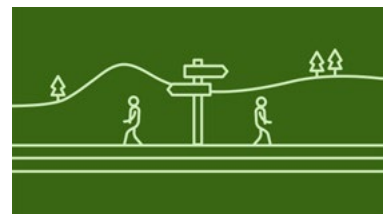
3. Land and water use



4. Materials and equipment



5. Events



6. Behavior, policy and future change



Sports, the outdoors and Covid-19 – a gamechanger

The Covid-19 pandemic hit the world just two weeks before Mistra Sport & Outdoors was launched in 2020. This left a deep mark in the sports and outdoor recreation sectors and brought uncertainty to many of the studies planned: events got cancelled, participation in indoor sports was regulated and travel was heavily restricted. At the same time, many places witnessed an increased interest in outdoor activities. Even if Sweden had a relatively liberal policy with respect to Covid-19 restrictions, the pandemic was a gamechanger for Mistra Sport & Outdoors. The crisis also showed us that it was possible to make rapid changes in ways that were previously not thought of. We soon realized there was great value in understanding the situation and how it might contribute to a movement for more sustainable sports and outdoor recreation. The topic was discussed at our first webinar, just two months after the program started, and at the very first meeting of the program board (May 2020) three projects were funded from the strategic reserve to better understand the effects of the pandemic on sports and outdoor recreation in Sweden,

and to create a knowledge base that already planned research in the program could benefit from. These projects generated several reports, articles and oral presentations at conferences and webinars. An interesting observation is that the pandemic “linked” the sport and outdoor recreation sectors as indoor sports were restricted and many activities moved to the outdoors. From an environmental perspective, the results indicate a reduction in long-distance travel (with reduced emissions as consequence), an increase in car travel (with increased emissions as consequence) and an increase in wear and tear and littering in popular natural areas. Digital alternatives to physical meetings have likely reduced the environmental burden. In the event sector economic and social perspectives were prioritized over environmental issues. We could also see indications of structural mobilization in the SOD sectors from the pandemic from which future change for more sustainable sports and outdoor recreation can be built.

Bridging to phase 2

There are many lessons learned from phase 1 which have formed our thinking towards the second phase of Mistra Sport & Outdoors. Our research has built capacity and identified mechanisms that set the stage for future sustainability initiatives in the SOD sectors, which is elaborated in the application for phase 2. The goal to start a movement for more environmentally sustainable practices triggered a series of discussions that gave us a new endeavor: to build on already existing movements in the Swedish SOD sectors, instead of creating our “own” movement. We have built scientific capacity through our PhDs and post-docs, and our research was communicated both written and orally in established peer-reviewed outlets.

The profound approach to co-creating solutions between academia and practice has conveyed valuable insights to the organization and design of such processes. It vitalized our research, but also caused some annoyance over time-consuming processes. In the first step of the co-creation process, we successfully identified and formulated the main environmental challenges associated with each of our six themes. This became the point of departure for our ten learning groups, with the ultimate task to identify and test solutions that have

potential to be scaled up within the SOD sectors (see section on co-creation below). Strict management and facilitation of the learning groups was a key to success at this stage. Another key factor was the active involvement from researchers and partner organizations since successful co-creation requires deep engagement.

Our third goal, to develop a plan for a network-based center in favor of sustainable solutions in the SOD sectors is an ongoing process that will be completed during the last six months of phase 1 (and then brought over to the second phase of the program). Meetings with central stakeholders and a discussion paper have paved the way to further elaborate this issue. During the first phase, the program has operated with a program board, a steering group, 6 research themes, 10 learning groups and an administrative team. There have been 43 partner organizations, and over 40 researchers (including 7 PhD and licentiate students) from eight different Swedish universities. Such a diverse organization has created momentum, but we also see potential to improve the organizational design to work more effectively towards a more sophisticated goal structure in the second phase.

Co-creation in Mistra Sport & Outdoors

Due to the complex environmental challenges at hand, Mistra Sport and Outdoors have chosen to co-create knowledge and solutions with research, organizations, and authorities in a four-step process, visualized in figure 1 below. This has created interdisciplinary synergies between academia and practice as well as the sport and outdoor recreation sectors, along the way to find and test solutions to the jointly identified challenges. More specifically, the achievements from the co-creation process during 2020–2024 includes:

- Identified challenges for more sustainable sport and outdoor recreation.
- Increased knowledge about solutions to identified challenges through learning groups with relevant stakeholders in a five-step process under professional facilitation.
- Developed solutions, which aspire to become innovative products, measures or policies that contribute to more environmentally sustainable SOD sectors.

Outcomes from the co-creation process

In the first phase of the program, we covered step 1 and 2 of the process. Through communication we also touched upon Step 3, whereas Step 4 is planned to be implemented during the second phase of Mistra Sport & Outdoors. In Step 1, *identifying challenges together*, researchers worked together with practitioners from the Swedish Sports Confederation, the Swedish Association for Outdoor Organizations, the Swedish Environmental Protection Agency, the Swedish Society for Nature Conservation, and the Scandinavian Outdoor Group to identify challenges related to environmental sustainability in each of the six themes (table 1).

In step 2, *develop knowledge and solutions/innovation*, ten learning groups were formed to work towards developing knowledge, understanding and solutions/innovations. Each group involved representatives from academia, the SOD sectors, authorities, firms, and/or interest organizations. Professional facilitators (experts in co-creation processes) facilitated the learning groups

Table 1. Identified challenges for each theme.

Theme	Identified challenges (Step 1)
1. Path dependencies and transformations	How and what change can we make in sport, outdoor recreation and the physical education and health subject for a more environmentally sustainable development?
2. Transport and mobility	How can we create environmentally sustainable and attractive transport solutions that provide fair and equal accessibility to sport and outdoor recreation for all groups in society?
3. Land and water use	How can we manage the impact from sport and outdoor recreation on land- and water environments in physical planning and management?
4. Materials and equipment	What can contribute to minimized environmental impact and more circular solutions over the life cycle, for materials and equipment within sport and outdoor recreation?
5. Events	How can we create environmentally sustainable events in sport and outdoor recreation?
6. Behavior, policy and future change	How can coordinated efforts be made leading to more streamlined decision-making to enhance the environmental sustainability within the sport and outdoor recreation sectors?

through a five-step process: *Plan, Study, Innovate, Test, and Implement*. All ten learning groups have planned and initiated research and studies to increase their knowledge base (*Plan, Study*). They have also started to analyze and spread the results from the studies. Eight of the learning groups have identified specific results/ideas that they focused on to develop into solutions (*Innovate*) and four of these have started to test their solutions (*Test*) to analyze the probability of successful implementation (table 2).

In step 3, *communicate and start a movement*, new knowledge and to some extent solutions that emerged during steps 1 and 2 were shared and communicated, both internally and externally, to initiate a movement towards a more environmentally sustainable SOD sectors. This is further described in the section about communication below.

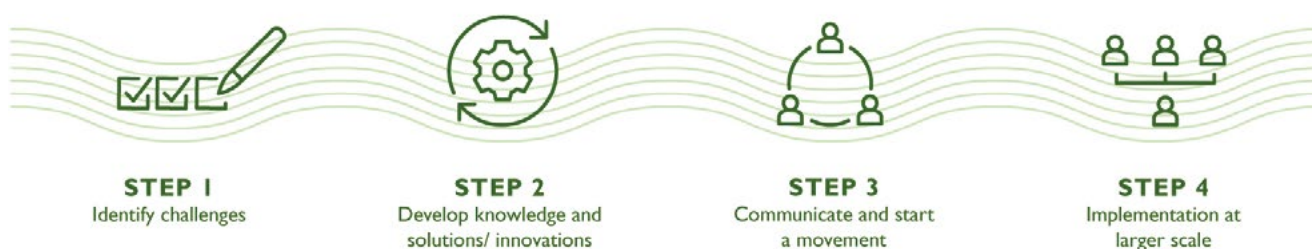


Figure 1. Mistra Sport & Outdoors co-creation process

Table 2. Outcomes from the second step of the co-creation model

Theme	Learning group outcome	Innovate / test / study	Societal contribution and beneficiaries
1. Path dependencies and transformations	Developed a course and study material focused on environmental sustainability for PE teachers.	Innovate	Increased knowledge on environmental sustainability in the school subject of Physical Education. <u>Beneficiaries:</u> PE teachers.
	Development of a <i>Pedagogical model for behavior changes</i> within the sport and outdoor recreation sectors.	Test	Ease and speed up organizations' environmental sustainability efforts. <u>Beneficiaries:</u> Sport and outdoor organizations.
2. Transport and mobility	Play Book <i>Hållbar Fritid: Att navigera mot ett hållbart idrotts- och friluftsliv</i> (upcoming Mistra Sport & Outdoors report).	Innovate	Through the collection of methods, concepts and results used in Mistra Themes 2 and 3, this aims at supporting planning for sustainable sports and outdoor recreation. <u>Beneficiaries:</u> primarily regional and local planning authorities.
3. Land and water use	Mistra Sport & Outdoors report (2023:2) <i>På väg mot en hållbar användning av mark och vatten inom idrotten och friluftslivet år 2030?</i>	Innovate	Provides a basis for strategic discussions among various social actors in sports, outdoor recreation, nature conservation and physical planning. <u>Beneficiaries:</u> Actors widely, with a stake in sports and recreational use of land and water.
	Workshop with the CAB of Jämtland county administration to make results visible and discuss the permit process and assessments of nature-based events and organized outdoor activities.	Innovate	Through collaboration we identified weaknesses and potentials for improvement regarding the assessment process and working methods for sustainability in the event permission process. Innovative models and tools for a transparent process can be developed and tested. <u>Beneficiaries:</u> authorities, event organizers.
	A recipe book for collaboration in multifunctional landscapes: <i>En recepthandbok för lokal samverkan: Hur flera aktörer samverkar för en hållbar plats.</i>	Test	Method for co-developing multifunctional areas and places with regards to environmental sustainability. <u>Beneficiaries:</u> Regions, municipalities, other relevant actors in multifunctional area.
4. Materials and equipment	Performance-label for secondhand shell jackets in outdoor secondhand stores.	Test	Concept (performance-label) for showcasing differences between experienced and measured functionality on second-hand jackets, enhancing circular economy. <u>Beneficiaries:</u> Second-hand vendors, consumers.
	Evaluate the environmental impact of sports facilities in Sweden and create a database which includes primary energy use, emissions, water use etc.	Study	Evaluate the environmental impact of sports facilities and analyze possible measures, which can help municipalities in reaching their sustainability goals. <u>Beneficiaries:</u> Municipalities, sport facility managers.
5. Events	Event management compass for sustainable events.	Innovate	Support and speed up environmental sustainability efforts via a tool with recommendations, solutions, policy tools, and an impact calculator. <u>Beneficiaries:</u> Event organizers including sport and outdoor organizations.
6. Behavior, policy and future change	An environmental education curriculum – “Miljöengagerad paddling” – developed together with the Swedish Canoe Federation (SCF).	Test	The curriculum is designed to better integrate environmental education objectives in paddle training of paddle instructors and educators. <u>Beneficiaries:</u> SCF training programs reach canoe organizations all over Sweden.

Lessons learned from co-creation in Mistra sport & Outdoors

Working with the co-creation process has been both rewarding and challenging. It creates a space where people from different backgrounds with different thinking and modus operandi meet, which can be very inspiring. However, co-creation takes time and involves many steps that researchers and practitioners may not be used to from their ordinary work. To better understand our co-creation process and the outcomes from it, an external expert was assigned to review the work on step 1 and 2 (see Appendix 2 for the full report) and an internal evaluation report was written by the learning group in theme 2 focusing on sustainable transport and mobility (Mistra Sport & Outdoors, report 2022:1). The most important take away messages from these reports are:

Strengths of the co-creation process:

- Mistra Sport & Outdoors has well developed and functioning routines with regards to co-creation activities and internal communication, and participants are in general satisfied with current co-creation practices.
- The 4-stage process description of co-creation (figure 1) has been helpful in establishing a joint direction and vocabulary with regards to co-creation in Mistra Sport & Outdoors.
- Extensive coordination and facilitation of the co-creation process has been crucial for ensuring continuous and progressive co-creation activities.
- Mistra Sport & Outdoors webinars have functioned well as an additional co-creation mechanism, both within the organizing team, as well as with internal and external participants.

Improvement potential:

- Some co-creation activities have been perceived as time-consuming.
- During Step 1 (identification of challenges) the program-level activities have interfered with the development of co-creation activities at the learning group-level.
- The boundaries of the Mistra Sport & Outdoors program, and the roles of researchers and partner organizations, in relation to research and implementation has been unclear.
- There is a need for increased focus on innovation, what it means, how to move from idea to innovation, as well as fostering reasonable expectations, identifying necessary resources and responsibilities for implementation in society.
- When evaluating the implementation potential of solutions, the perspective of environmental sustainability needs to be accompanied by economic and social sustainability to increase the probability of usefulness.
- The learning group's future role and purpose might need modification in order to facilitate Mistra Sport & Outdoors goals related to Step 3 and 4 in the co-creation process.
- Limited cross-linkages between themes and learning groups in the program may hamper knowledge sharing, learning and the development of solutions with a high degree of novelty.
- It is important that Mistra Sport & Outdoors can engage relevant partner organisations in a flexible way throughout the entire program.

Program meeting at Bosön, April 2023.



Communication

The role or the purpose of the external communication in Mistra Sport & Outdoors, phase 1, has been to create awareness for and credibility of the program, support the collaboration process within the program, create joint ownership (with our partners) around the issues in the program, make knowledge and solutions from the program available and initiate conversations and dialogue about environmental issues in the SOD sectors – towards a movement for more sustainable practices. Internal communication is the basis on which external communication can function, especially in an interdisciplinary program with a complex task such as Mistra Sport & Outdoors.

The main target groups for the communication have been our collaboration partners, our researchers, our program board and our funder Mistra: individuals and organizations that already have an interest in the program and are willing to adapt and spread knowledge and solutions further to their networks and channels. Other external target groups in phase 1 were reached via press releases, webinars, and social media: non-profit organizations in sport, outdoor recreation and the green movement, commercial companies in the field of outdoor clothing and sportswear and allied equipment, as well as nature-based tourism, municipalities, government agencies and departments.

The long-term goals that our communication have supported are (i) that our collaboration partners participate in some way or another in the work to create a movement for sustainability in the SOD sectors and

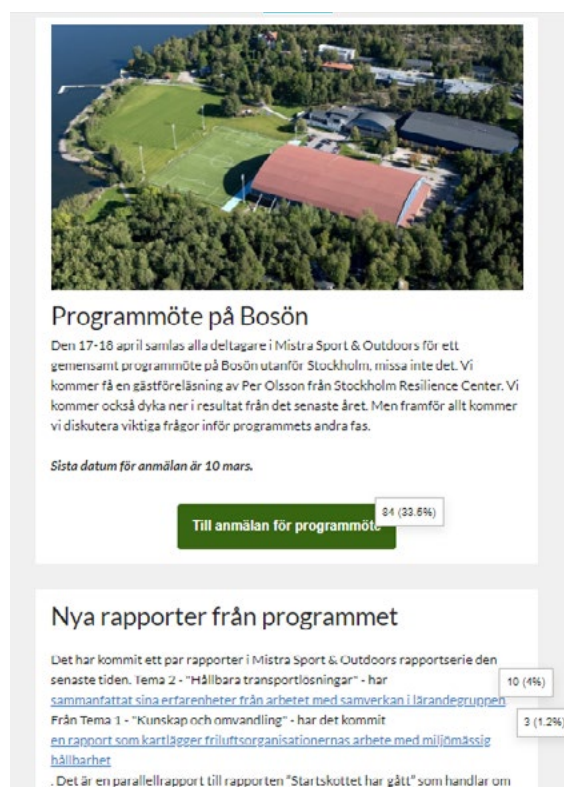
(ii) that our target group think that Mistra Sport & Outdoors is a resource for knowledge and solutions for more environmentally friendly sports and outdoor recreation practices.

In the beginning of phase 1, a *Communication Plan* – together with an activity plan, an internal communication plan, a “messages guideline” and a graphic profile/visual identity for the program – was developed. We also commissioned a channel analysis, according to the target groups that were defined in the program plan. The management team and the board approved the plan, and it was decided that it should be a ‘living document’ depending on what the annual assessment showed.

We have evaluated and developed the communication activities continuously. The annual assessment was based on a survey that our partners (researchers and organizations) responded to in 2021, 2022 and 2023, as well as statistics from our digital channels and evaluations from other communication activities such as the webinars. A self-evaluation survey shows that we fulfilled the long-term goals for 2020–2024 since all partners (researchers and organizations) report that they think Mistra Sport & Outdoors is a good resource for knowledge and solutions based on their engagement in different activities over the years. We have also achieved short-term communication goals such as an increased number of followers on social media, and positive feedback from our webinars.



Program newsletter from March 2023.



Internal communication

Our internal communication included program meetings (workshops for information, understanding and mutual learning) and newsletters. We have sent 14 internal newsletters so far in phase 1. Over 90 percent of our researchers and partners have been reading the letter and according to the survey respondents, they think the letter has an important function. Responses about the letters have been that they are informative, relevant, stimulating and give good overviews and summaries of what is happening in the program. Another useful tool for the internal communication has been the common Teams platform. This is where all our researchers and partners have had access to visual identity, templates, pictures, illustrations etcetera.

External communication

Early in phase 1 we produced films about Mistra Sport & Outdoors and our six themes to create awareness about the program (links to the films are available on our website). This way we could effectively explain the main features of our work and why Mistra Sport & Outdoors is needed. The website www.mistrasportandoutdoors.se has been the main platform for the program and the hub of external communication. We wanted all target groups to be able to find something of value to their interest, especially those who can use or implement knowledge and solutions in the long term. We put much effort into keeping the website updated. More than 60 “news”, 23 blog posts, 13 “success examples”

(framgångsexempel), and 13 reports in Mistra Sport & Outdoors report series have been published so far. We have had over 40 000 visits on our web, approximately 106 000 page views and 19 000 unique visitors (December 2023). Most popular is the head page followed by the pages featuring research themes, about the program, publications, and news.

We started the social media channels Facebook and LinkedIn in March 2020. We have 822 followers on LinkedIn and 259 followers on Facebook (December 2023). In the beginning we put the same effort in both channels, but along the way LinkedIn turned out to have more spread and interactions, and is now our main social media outlet.

The Mistra Sport & Outdoors webinar series has been a popular way to follow the program. Our 12 webinars have had over 1300 registrations and the recordings 2 700 views (see Appendix 6 for statistics of webinar participants). According to our surveys, the majority think that the webinars give an overall update of the program, that it is a good mix of research and practice and a good mix of lectures and interaction. Many of the respondents think they are good for spreading knowledge and for gaining more knowledge about a certain subject. Comments we have received about our webinars: *“Fulfills an important function to discuss specific issues and topics”, “Gives good knowledge to build my organization’s image”*.

The Mistra Sport & Outdoors blog has been a platform for our researchers and partners to get their voice



Flyer from one of our webinars.

heard about sustainability and environmental issues in the SOD sectors, with a more personal touch than other outlets. So far, we have had 22 posts written by partners or representatives from our target group. They were spread via our web, program letter and social media, but also via the organization of the writer. The blog has been part of the strategy to initiate conversations and dialogue, and it has been a good way to involve our actors in an open activity. So far, our blogs have had about 600 views.

We have published several press releases and especially those about our covid-19 studies got a lot of attention. We have also had a handful of debate articles published. According to our media monitoring tool we have had 10 000 media exposures (total number of media-hits based on our key words). We have also had 0,4 million “engagements”, which is the total amount of engagement activities based on all the posts that has been gathered.

The annual reporting has also been part of our communication strategy. The ambition has been to design our annual reports as a summary of our work each year – a product to be proud of internally and to be used as a “show off” externally. We thematized the reports to reflect how the program has progressed. The 2020 report focused on what Mistra Sport & Outdoors is, the six Mistra Sport & Outdoors themes and the studies on Covid-19. The 2021 report focused on the learning groups and the challenges they work on as well as connected research activities. The 2022 report focused on findings from research and learning groups. According to our communication evaluation survey, a majority of our researchers and partners are satisfied with the annual reports: they are informative, give a good overview of what happens in the program, have attractive format, and a good balance between general information and featured texts.

Our communication strategy has also been to actively participate in and co-arrange events hosted by other organizations. Through this approach we got the opportunity to contribute to the debate about environmentally sustainable SOD in several external contexts. This includes, for example, Svenska Turistföreningens Klimattoppmöte (2023), Tankesmedjan för friluftsliv (2022 and 2023), Sustainable Fashion Week and Sustainable Outdoors Professionals (2022 and 2023), Almedalen (2022 and 2023), Idrottslärarstämman (2023), Träffpunkt Idrott (2023), KTH Climate Action Centres “Idrott och klimatet” (2022), Forskarfredag (2021), Friluftslivets år slutkonferens (2021).



The first three annual reports by Mistra Sport & Outdoors.

Spinoffs from phase I

Large programs, such as Mistra Sport & Outdoors, typically generate “spinoff activities” inspired and/or supported by program participants to various degrees. Perhaps the most prominent spinoff is the involvement by Mistra Sport & Outdoors to develop a sustainability policy for the Swedish Association for Outdoor Recreation Organizations (Svenskt Friluftsliv) in 2021. Following this policy, environmental sustainability was added as a criterion in the call to receive national project funding for Swedish outdoor organizations in 2022. Consequently, 14 projects were funded in 2023 which focused on sustainability. A content analysis showed that most organizations used the funding to build capacity, recruit staff, inform members, and for baseline monitoring. There are good reasons to believe that this process has ignited a movement toward more environmentally sustainable practices in the Swedish outdoor life sector. This will be further monitored and evaluated in the second phase of the program.

Additional spinoffs from Mistra Sport & outdoors are:

- “Roadmap to Paris in landscapes beyond the road network – A study of potential climate impact reduction and feasibility of measures based on sufficiency and efficiency in the Swedish Tourist Association”. This project assesses the mitigation potential of sufficiency measures that the Swedish Tourist Association (STF) considers implementing in their mountain stations in the Swedish backcountry, that offer accommodation and restaurant services.
- The “Durability Project”. The Sports Tech Research Centre, with the support of W.L. Gore have started a spin-off project to assess the end-of-life and categorize failure modes for different types of rainwear, from both consumer and workwear perspectives. Currently over 45 companies and organizations from around the world are involved. The aim is to develop a common methodology to define and measure durability, which can be used to create a branch-wide benchmark for further development of membrane garments.
- Granted research application EU Horizon MSCA Doctoral Networks: *Visitor monitoring and management in protected and recreational areas: new challenges, novel solutions for the Anthropocene (VIMAS)*. Ten PhD positions in six countries to start in 2024, two of which will be at Mid Sweden University and associated with Mistra Sport & Outdoors phase 2.
- Project partner and member of the reference group: *Sustainable coastal recreation – the role and potential of voluntary associations in transitions to sustainable coastal leisure (COASTREC)*. Case studies in collaboration with Mistra Sport & Outdoors in phase 2.
- Two of our researchers have been appointed by the IOC and the OECD to be part of an international expert group for development of sustainable events.
- Mistra Sport & Outdoors has become a member of the European Network of Outdoors Sports (ENOS). Participation in the SEE project for sustainable environmental education. Involvement in application on policies for sustainable outdoor sports to be submitted to EU Erasmus+ program.
- Ukrainian researcher Olga Milinchuk received special funding from Mistra and has been affiliated with the program to study the how nature guides implement sustainability in their guiding practices.
- Partner in *ReConnect. Reconciling fragmented and contested landscape* (funded by Biodiversa). The project aims to reduce tensions in multi-functional landscapes and reconnect different values, policies, and ecosystems, and thus support inclusive, cross-sectoral approaches to nature conservation in line with new whole-of-society approach of the new Global Biodiversity Framework.
- *Green Access. Accessing urban nature. Opportunities and challenges of territorialisation processes in relation to environmental justice and the promotion of multifunctional green commons* funded by Formas. The project focuses on how urban densification impacts social-ecological multi-functionality.
- Contributions to the committees for biodiversity and global environmental change at the Royal Swedish Academy of Agriculture and Forestry
- Submitted application to Impact Innovation: *SUSTAINGOV (Systemic, sustainable, and societal impact through transformational governance and systems innovation)*. Results and conclusion on spatial planning in Mistra Sport & Outdoors and the Jämtland case contributed to the application.
- Granted application for a three-year project in Sweden and Norway from the Swedish-Norwegian Foundation for Equine Research on creating a more environmentally sustainable equine sport.





Theme 1: Path dependencies and transformations

Understanding use of knowledge in sport and outdoor recreation

Theme leaders: Prof. Sverker Sörlin, KTH Royal Institute of Technology and Prof. Susanna Hedenborg, Malmö University.

Learning group: Knowledge and transformation (7 practitioners, 3 researchers).

The overarching challenge identified for Theme 1 was: *How and what transformation can we create in sports, outdoor recreation and in the school subject physical education and health for an environmentally sustainable development?* Two underlying questions specified the challenge: What has transformative work looked like in the past? What obstacles exist and have existed for transformation?

In phase 1, researchers have demonstrated how norms, experiences, perceptions, and practices within the sector appear supportive of or hindering for a transformation. In what ways the different logics of practice in movement culture influence 'sense of coherence' was developed in studies of how Swedish organized sport and outdoor recreation's work on environmental sustainability. To exemplify, an important logic of practice for many sport participants is performance and it is likely that this logic could be used to spur sport competitors to change their behavior. Another logic governs participation in outdoor activities, experiencing (nature), which can be used as a base for sustainability work. The logics of practice in movement culture are, however, complex. The main results show that the organizations have problems managing transportation to and from

activities, trainings, events, and competitions. They also lack sufficient economic resources and time to work on environmental sustainability. There are facilitating factors too. The outdoor organizations are strengthened by members interested in nature and the environment, and they 'already' work sustainably in many aspects. The objective in sport is most often training and competition, not spending time in nature, and the strength is connected to the sport organizations' work on social sustainability.

Other studies show how sportification may have contributed to the growing environmental impact of sport but also that it might be used as a tool of positive social change. Sport sets performance limits for ethical reasons, such as doping controls, and our studies and studies by others suggest that sport could or should

How and what transformation can we create in sports, outdoor recreation and in the school subject physical education and health for an environmentally sustainable development?

set limits for environmental reasons too. Sportification leads to a striving for equal opportunities and the performance logic of practice is dominant for the sport practitioners who train in artificial landscapes, at the expense of perspectives such as nature experience and environmental sustainability. Further, environmental issues remain disconnected from sports facilities in a general sense and more specifically in relation to artificial sports and outdoor facilities.

In theme 1, the learning group initiated a process of entering sustainability and transformation into the mission and everyday practices of the organizations through a co-creation process. After identifying weaknesses in knowledge use related to norms, experiences, perceptions, and practices we crafted a model for transforming the sector based on the trans-theoretical and the COM-B model for behavioral change. These models are used to support SOD organizations to absorb knowledge for transformation and change practices toward sustainability. The model is tested and evaluated on a small-scale during autumn 2023 and will build a base for preparations for implementing (and studying) the model on larger scale in phase 2 of the program. In addition, researchers from our theme have delivered university courses on sport, outdoor recreation and environmental sustainability.

A major insight is that it is useful to frame the sustainability challenges of the SOD sectors as an Anthropocene issue. The overarching challenge is to reduce the accelerating pressure on planetary life-sustaining systems and to avoid crossing planetary boundaries. In this work, every nation and every sector of that nation has its share of responsibility. Using an Anthropocene lens the performance of the SOD sectors can and should be monitored on its sustainability indicators. The program has a mission to develop such indicators and to articulate the Anthropocene framework for the sectors' future goal-setting and self-projecting narrative. Based on our findings from research and co-creation activities in theme 1, additional new insights related to factors hindering or facilitating transformation are:

- The SOD sectors asks for policies from 'above' that better account for environmental sustainability. This is welcome, however paradoxical, as the SOD sectors is based on democratic processes. In addition, organizations in the SOD sectors already have policies for environmental sustainability but have had difficulties converting these into practice.
- The sportification process is built on presumptions related to performance. However, the process includes several regulating factors accepted in sports and can open for a broader acceptance of regulations related to sustainability.

- The heritage dimensions of landscapes shaped by sport and outdoor recreation are underdeveloped resources for sustainability. Such *movement heritage* could be used to highlight examples of long-term sustainable landscape use by many different actors, and the responsibilities of present-day users to manage such heritage.
- The school subject Physical education and health does not in itself give room for the environmental perspective, but it is woven into outdoor activities by interested teachers. In addition, several teachers believe that the curriculum does not specify the environmental perspective as content, and that it is therefore difficult (or not even the task of the subject) to include the environmental perspective, even though it is one of four perspectives that the curriculum states must pervade the teaching.
- Gender, race and ethnicity influence historical perceptions of space and sustainability and in school masculinized student athletes reproduce the negative impact elite sport exerts on the environment, missing the chance to shape future environmental leaders.



“Startskottet har gått” – one of the reports from theme 1.

Theme 2: Transport and mobility

Potentials for sustainable transport and mobility in outdoor recreation and sports-event planning

Theme leader: Associate Prof. Anders Larsson, University of Gothenburg.

Learning group: Sustainable transport solutions (11 practitioners, 4 researchers).

Sports and outdoor recreation are established fields of research and the same can be said about transport and mobility studies, but in combination there is limited work to be found both nationally and internationally. To navigate this relatively uncharted territory, our research and co-creation work has been guided by the overarching question: *How can we create environmentally sustainable and attractive transport solutions that provide a fair and equal accessibility to sport and outdoor recreation for all groups in society?* The learning group has been a key environment for the development of the research through a series of 12 workshops in the period 2021–2023.

The first phase of the learning-group process resulted in the identification of four research projects based on the joint work of researchers and practitioners:

- A. Develop a geographical index for sustainable travel to support the planning of sports and outdoor facilities.
- B. Study the potential of the Swedish sports movement to engage in the transition to more sustainable travel practices.
- C. Investigate the potential and limitations of public transport to provide sustainable access to outdoor recreation sites.
- D. Understand the social catchment areas of venues for sports and leisure activities.

As indicated above, most of the activity is related to the work in the learning group with participants from Västtrafik public transport planning authority, municipal and regional outdoor recreation and sports planning authorities, Swedish National Sports Federation (RF) Swedish Transport Administration, Väst kuststiftelsen, Swedish Tourist Association (STF), Swedish Association for Regions and Municipalities (SKR). Collaboration with other themes in Mistra Sport & Outdoors includes supporting theme 6 in their back-casting exercise with focus on transportation and working with theme 3 to produce a joint playbook on new methods in spatial planning for sports and outdoor recreation. Although academic publications are still in the pipeline and expected to be published in 2024, there are a large number of achievements and societal benefits that can be observed from research and learning group activities.

Study A is concerned with the development of an index of sustainable accessibility to everyday sports and outdoor activities, comparing various sustainable trans-

How can we create environmentally sustainable and attractive transport solutions that provide a fair and equal accessibility to sport and outdoor recreation for all groups in society?

port alternatives (i.e. walk, cycle, public transport) to the car. The expected outcome is a tool to support planning and management of sports and outdoor facilities from a sustainable travel perspective. A prototype tested in Lilla Edet and Uppsala municipalities will be available at the end of phase one. Along the research process, focus has been on the investigation and collection of the most adequate data sources and workflows to calculate multimodal accessibility at the national level, testing data and comparing openly available national data sources. This work has been performed in collaboration with the Swedish Sports Confederation (RF) and The Swedish Association of Local Authorities and Regions (SKR) in the development of a national database of sports facilities as well as with the abovementioned municipalities. It has become clear as this work has developed that there is a significant lack of structured geographical data on the location of facilities for sport and outdoors activities, especially on the municipal level. So, the impact of the work has gone beyond the creation of a support tool towards bringing forward a wider need for standardized national information for planning.

Study B engages specifically with the link between sport practices and travel. It employs a practice theory framework on the every-day activities and its relationship with mobility in four different sports (football, orienteering, equestrian sports and martial arts) in two Swedish locations with different geographical contexts. Data is collected via 40–50 interviews with different types of active members of clubs in the above sports. This is completed with document studies of policies and strategies from the local to the national level. Completed results are expected in spring 2024. The car is the dominant mode of transport and in many cases a prerequisite for the current way of organizing training and competitions. As a general rule, the longer the trip the more likely that travel is organized together by the club, often with bus. Using the traditional public transport network of buses and trains is an option used,



but it is considered complicated to book and unreliable for longer trips. Transition to more sustainable mobility solutions might include needs for relatively wide-ranging changes. However, the interviews indicate that each sport has very different and specific practices, requiring different measures to change travel behavior. This might include changes not only in travel but in the sport practices themselves. The research in this study is conducted in close collaboration with the Swedish Sports Confederation (RF).

During the co-creation process several members of the learning-group brought up aspects of how public transport can or should be able to support access to outdoor recreation as an alternative to the car. This became especially evident during Covid-19, when restrictions led to an unprecedented rise in visits to recreational areas. In study C we are looking closer at how visitors travel to places for outdoor recreation. A survey of local and regional travel to several outdoor recreational sites in south-west Sweden was conducted. The data is currently being analyzed, and we would like to point to some indicative results. The sites studied are natural reserves with organized trails. Some located close to a large conurbation, while others are found in more rural settings. The supply of public transport is usually very limited. On weekends, when most visits are made, many areas have no public transport access at all. As a result, almost two thirds of all trips were made by car. Even areas with several bus arrivals per hour saw the same levels of car transport. A shift away from the car is obviously problematic if there are no realistic alternative public transport options. However, this is not only a matter of geographical access. A vast majority of

the respondents to the survey indicate that they never considered any alternative mode of transport for their trip. From a planning perspective transport and outdoor recreation need to be much more integrated already from early phases of new projects to provide more sustainable alternatives for everyone to be able to access nature.

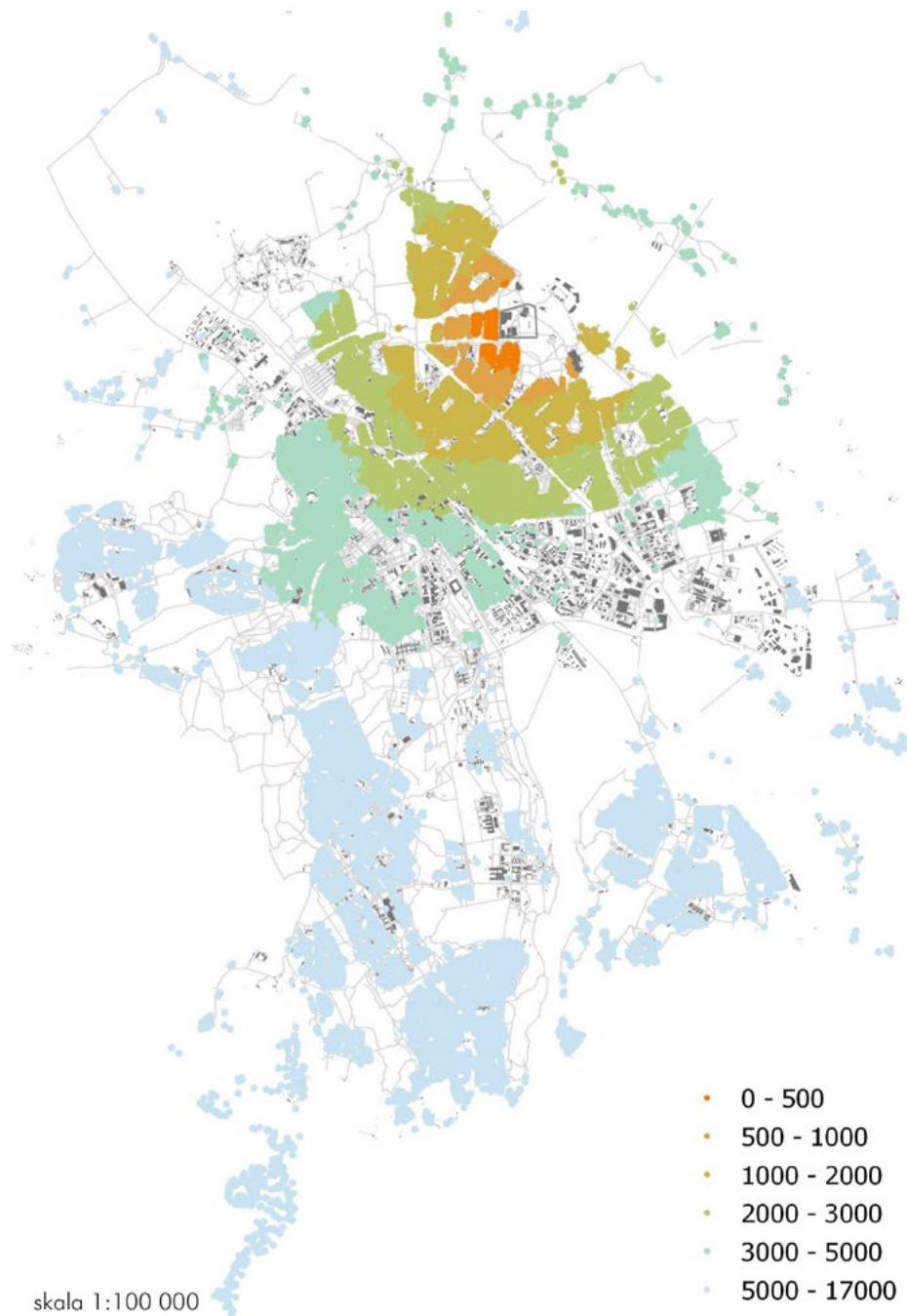
Study D uses similar methodology and spatial data as study A. The aim is to understand travel and catchment areas of sports facilities. Both actual travel times as well as the handling of sport facilities and mobility in planning documents are studied and compared. Specific focus is on the relation between accessibility and socio-demographic conditions. The work is done in collaboration with the city of Uppsala and RF-SISU. Preliminary results of a case study of users of a facility for ice-sports indicate that the average distance between home location and the facility is 10 kilometers. Almost 75 percent of all members live more than 5 kilometers from the facility. This has clear implications for the possibility to access this facility with other modes of transport than the car. From a socioeconomic perspective it is possible to see how inhabitants in nearby less wealthy areas are not associated with the sports associations that are using the facility. Another important aspect of creating safe and attractive environments for sports is the design of the sport facilities. This is found to be poor in terms of supporting active transportation (biking and walking) which is discussed. Interviews are conducted with representatives from the city and SISU.

Theme 2 is also co-supervising a PhD study, carried out in collaboration with theme 3. The focus is on peri-urban outdoor recreation, addressing the environ-

mental paradox of outdoor recreation – situations when greenhouse gas generating and/or energy-intensive vehicles are used for reaching recreational landscapes for a desired nature-contact during one's leisure time. The results highlight that to find sustainable solutions,

people's single-day recreational walks should be seen as one of many projects in everyday life, including preparation, planning and travelling. A monograph is in progress.

Social catchment areas of venues for sports and leisure activities in the city of Uppsala.



Theme 3: Land and water use

Sport and outdoor recreation through the lens of land and water use – Ecological effects and spatial planning options

Theme leader: Prof. Marie Stenseke, University of Gothenburg.

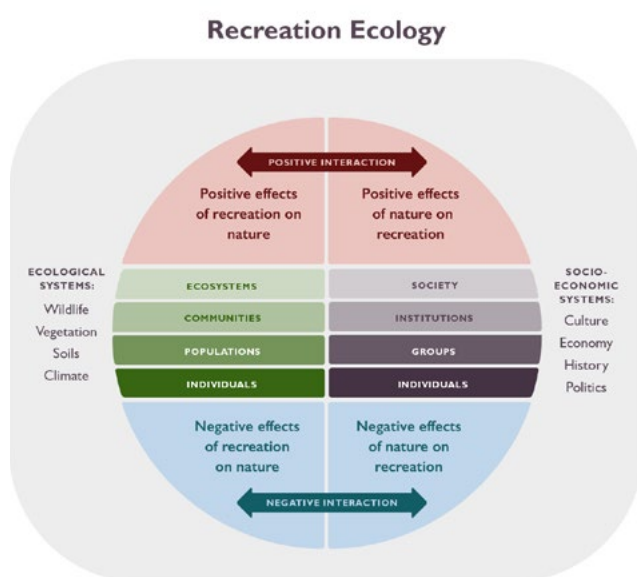
Learning groups: National group (9 practitioners, 3 researchers), coastal landscape (9 practitioners, 3 researchers), mountain landscape (6 practitioners, 4 researchers), and urban landscape (10 practitioners, 3 researchers).

Two underlying questions specified the challenge tackled in theme 3: *How do sports and outdoor facilities and activities affect land and water environments in different landscapes? How can the environmental impact be managed in relation to the need for accessibility and shared use of land and water environments in different landscapes?* Most of the work has been carried out in three area specific contexts; peri-urban, mountains and coastal, to deliver relevant results for key stakeholders and practitioners in different landscape types. This work has been complemented by, and linked to, work on the national level. Four learning groups have been matching these contexts. The theme work has been coordinated through monthly meetings for all researchers involved. The main contribution from the theme is highlighting how weak or non-existent considerations of outdoor recreation and sports in spatial planning is, which is reflected in a lack of consistent and appropriate strategies, organisation, processes, and tools for enhancing a more environmentally friendly use of land and water. As an outcome, there is a joint article in progress, investigating how outdoor recreation and sports with specific

How do sports and outdoor facilities and activities affect land and water environments in different landscapes?

How can the environmental impact be managed in relation to the need for accessibility and shared use of land and water environments in different landscapes?

attention to environmental impacts, have been addressed in local and regional spatial planning. Another important contribution is that the researchers have developed a scientific foundation for comprehensively assess relations between land- and water environments and sports and outdoor recreation, drawing on recreation ecology and related fields. The resultant model can be applied to planning and management practice, and it has provided the theoretical framework for a recently granted EU-project on visitor management. Through knowledge co-creation processes, together with local, regional and national stakeholders, promising ways forward has been presented and to some degree also tested. In collaboration with Naturkartan (The OutdoorMap), a digital guide to the Swedish outdoors with 300 000 app users, a Q&A function has been developed to study the interaction between visitors and recreational area managers. This provides geo-referenced (place, trail, area) information with feedback loops (like, share, report) between managers and users. It provides a tool for managers to better inform, interpret, announce, and understand visitors that supports more environmentally friendly behavior among recreationists. Results from this work will provide a backdrop for research in phase 2 on the use of digital data to improve sustainable visitor management in nature areas.



Framework for human – nature interaction in recreation.
Modified by S.Wall-Reinius from Miller et al. 2022,
<https://doi.org/10.1016/j.jort.2021.100455>, and Lischka et al.,
2018, <https://doi.org/10.1016/j.biocon.2018.06.020>

The mountain node

In the mountain node, focus has been to review existing research, identify knowledge needs and to improve processes and working methods in land use planning with a focus on environmental impacts from outdoor recreation and sports and goal conflicts in the Swedish mountains, particularly in the Jämtland mountains. In

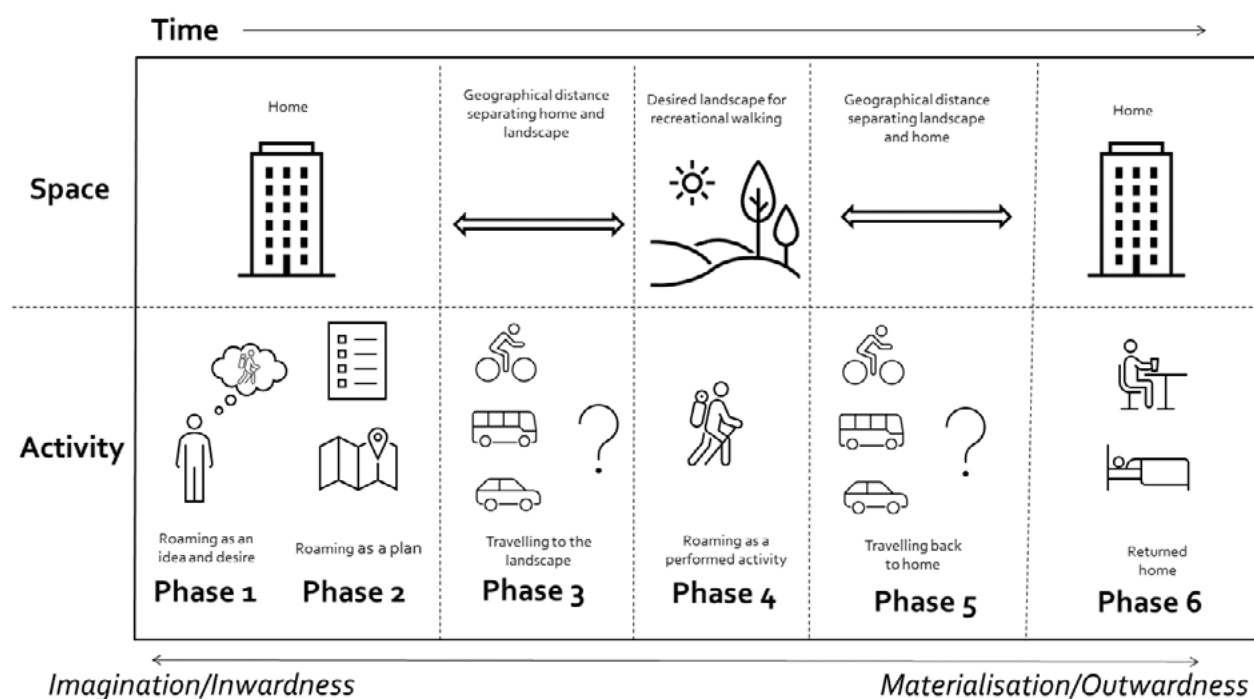
this work, the researchers have worked closely with the learning group. A research overview, focusing on recreational impacts on land, water, plants and animals has been carried out and this report has proved to be valuable for, in particular, the County Administration Board (CAB) as knowledge base in managerial work on nature protection (e.g. regulation of Vålådalen Nature Reserve). Other key activities have included investigation of visitors' experiences of environmental impacts and exploring success factors, and solutions in the management of motorized activities. Several other research activities concern how socio-ecological impacts on nature are perceived and handled among actors in nature-based events and organized outdoor activities. This has been done in collaboration with theme 5. The research has contributed to how challenges can be handled and solved; new insights reveal that the CAB, event participants, and event managers tend to view the events as isolated occurrences, failing to connect them to the broader context of spatial planning and of tourism and recreation strategies in the region. Consequently, these actors do not recognize impacts as integral to sustainable development, leading them to disclaim responsibility for behavioural or managerial changes. Together with the CAB and other actors, we have identified areas of improvement in working methods and in the permit processes for events. The mountain node has also investigated if and how recreational impacts are described and managed in spatial planning at municipal and regional levels, concluding that the fragmented organisation and unclear division of responsibilities in

relation to outdoor recreation makes it challenging to get a comprehensive picture of the consequences, and to collaborate around management.

The peri-urban node

The peri-urban node has focused on how rapid urban densification changes urban-rural relations, with focus on sports and outdoor recreation, using the peri-urban Stockholm as a case. The learning group, including researchers, has designed and used a multi-step knowledge co-creation process to develop a method for improving how sports and outdoor recreation is handled in planning and practical management of complex and multifunctional, co-governed landscapes. A publication on the insights the process has provided about how to support diverse constellations of actors in jointly identifying pathways for promoting and sustainably manage multiple landscape functions is in progress. The next step is to test and further develop the method by pilot studies in different contexts of multifunctional landscapes. An outcome of the co-creation processes in Stockholm and a clear indication of the importance of continuous science-policy exchange, is that participating in the dialogues and collaboration in the peri-urban learning group, is listed as one important measure in the action plan for outdoor recreation developed by the Stockholm CAB. Furthermore, the node has provided a written knowledge overview of the status of the field recreation ecology, based on scientific literature and Swedish governmental reports, which has been presented and discussed with a large variety of stakeholders.

Phases of space and activity of an outdoor recreation walk.





Residents' perceptions of peri-urban green spaces (their content as well as planning and management) are an important focus, where the node explores different methods for understanding these relationships, e.g. through mental mapping. Several minor case studies have been performed, addressing for example the role of nature in peri-urban sports and outdoor recreation in protected areas, and biodiversity positive recreation management, using golf courses as an example.

The coastal node

The coastal node has studied both the inclusion of outdoor recreation in spatial planning and conservation planning in coastal near areas, and recreational walking as a project both planning, transport and performance. These studies are somewhat delayed since the assigned researcher quit and had to be replaced. The work is now in progress and studies of planning documents from five municipalities on the West Coast have been conducted, together with interviews with employees from municipalities, CAB and Väst kuststiftelsen. Preliminary analysis shows that there is a lack of collaboration regarding outdoor recreation between different actors, not the least on the municipal level. There is also an important question emerging regarding what role outdoor recreation plays in planning on different levels. A post-doctoral researcher is also currently working on a paper about the role of outdoor recreation in the creation of a nature reserve on the islands of Marstrand, through studying the documentation of the processes behind the nature reserve. This paper will also be submitted in spring 2024.

As for walking, there is an ongoing PhD study, carried out in collaboration with theme 2, on peri-urban

outdoor recreation, addressing the environmental paradox of outdoor recreation – situations when greenhouse gas generating and/or energy-intensive vehicles are used for reaching recreational landscapes for a desired nature-contact during one's leisure time. Two sets of interviews have been carried out, focusing on recreational walks. The results highlight that to find sustainable solutions, people's single-day recreational walks should be seen as one among many projects in everyday life, including preparation, planning and travelling. These results have been communicated to actors and is also used in a co-creation project on communicating biodiversity, funded by the Region of Västra Götaland. A monograph is in progress.

The national learning group

The national learning group has brought together key actors for discussing how to steer towards sustainable use of land and water for outdoor life. Through a systematic transdisciplinary work on scenarios on the prospects regarding the use of land and water for sports and outdoor activities in Sweden, including measures and proposals to steer towards sustainable land and water use a report has been published, that provide a basis for strategic discussions and development with various social actors in sports, outdoor recreation, nature conservation and physical planning. The results have been communicated through various events. One example of concrete outcome is that the city of Gothenburg has used the report in the follow-up of their outdoor recreation program. A scientific paper on the process and its results is in progress.

Theme 4: Materials and equipment

Sustainable sport and outdoor equipment – Smarter materials and material flows

Theme leader: Prof. Mikael Bäckström, Mid Sweden University.

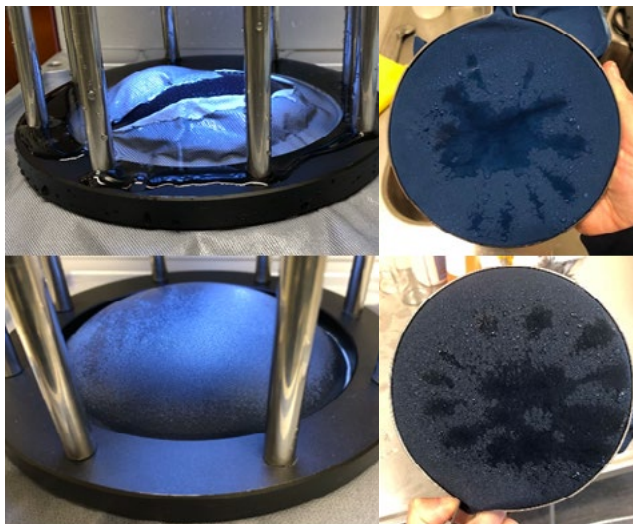
Learning groups: Material and equipment (3 practitioners, 6 researchers). Facilities and surfaces (4 practitioners, 4 researchers).

The challenge of theme 4 was to investigate the different ways that materials and equipment impact our environment, and to identify ways to reduce our impact. The clothes we wear, the new golf clubs we buy to improve our game, and the places where we practice our activities, all have an impact on the environment. The research was governed by the overarching questions: *How can we measure the environmental impact of our consumption and use of sporting equipment? How can we increase our understanding of the environmental performance of circular economy measures relating to sporting equipment? How can the environmental impact of sporting facilities be reduced?*

Functionality of sport and outdoor products and circular economy measures

Researchers and partners in the co-creation group defined functionality as a key criterion in assessing the sustainability of sporting equipment. Functionality in the context of sporting goods relates to both its performance and practicality. That is, how well a product serves its intended purpose in a way that enhances the user's experience. In the context of sustainability, the concept of durability is also key – that a product can retain its functionality over time.

We decided to focus on hard shell jackets as a typical example of a functional outdoor product, which can be used for a multitude of sports and outdoor activities, but which is often found available on the second-hand market, for a variety of reasons. Previous research



Functionality testing of used jackets in laboratory.

How can we measure the environmental impact of our consumption and use of sporting equipment?

How can we increase our understanding of the environmental performance of circular economy measures relating to sporting equipment?

How can the environmental impact of sporting facilities be reduced?

about sustainable clothing conducted by Mistra Future Fashion showed that doubling the lifespan of a garment reduces its carbon footprint by almost 50 percent. Based on this, we focussed on two approaches – defining the functionality of shell jackets, to be able to assess the performance of used jackets, and an LCA approach looking closely at the impact of circular economy measures, which combined can offer the potential to reduce the total impact of equipment.

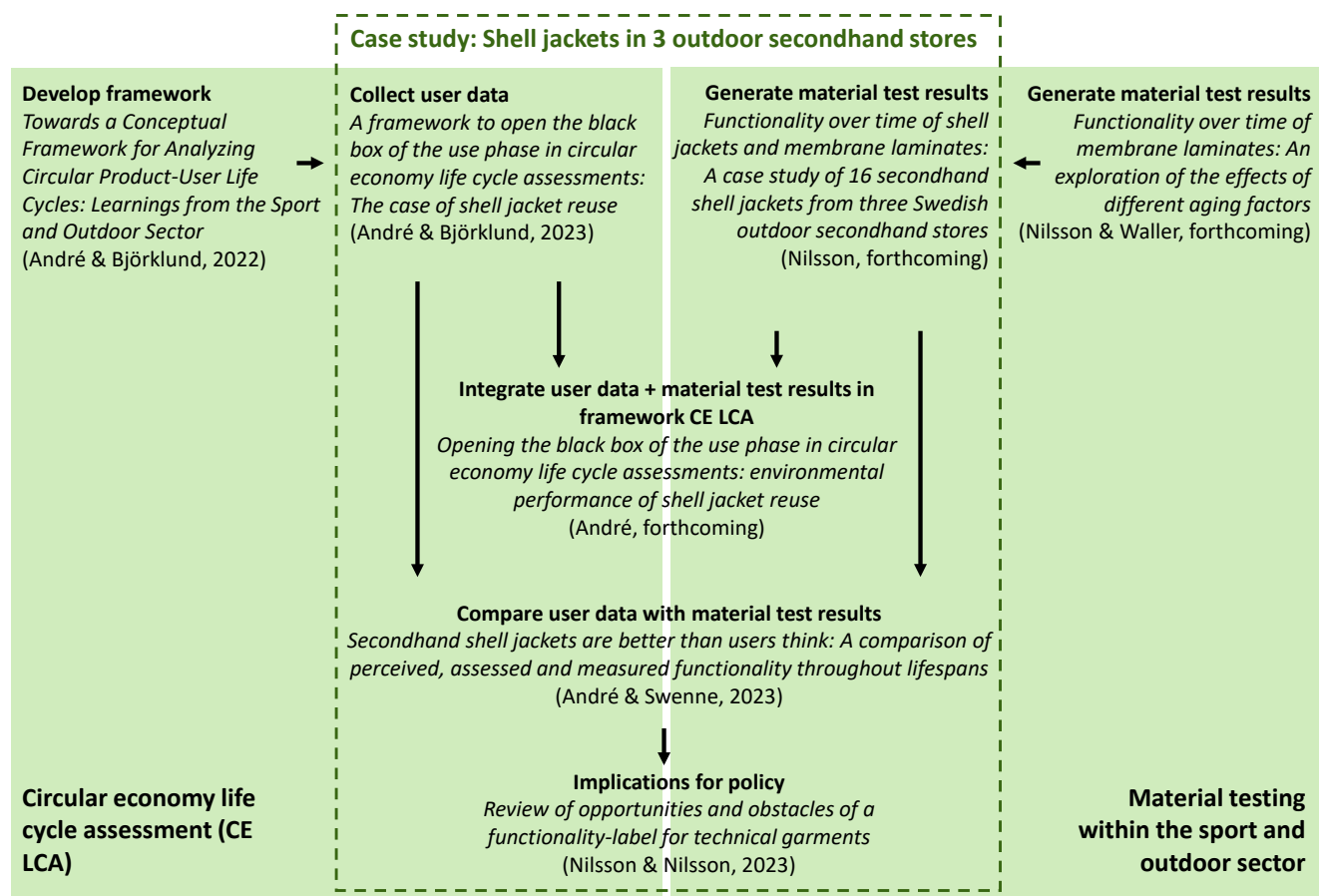
There is no standardized method for measuring the quality of a second-hand garment, so we identified, in conjunction with the learning group, a need to develop tests, which can provide us with information on a jacket's performance that can encourage re-sale and second-hand purchases and enable this increase in service life that can reduce the products' environmental impact. We developed a testing protocol for shell jackets, comprising visual inspection and traditional textile testing methods. We assessed second-hand shell jackets purchased from Swedish second-hand retailers and determined their performance in four key functional areas: air permeability, water repellence, water penetration resistance, and breathability. This measured function was compared with the original stated performance of the jackets and used to determine how the different components of functionality deteriorate over time and correlated with the reduction in sale price from the "as new", to second hand market price. We found that while a jacket's air permeability remains relatively constant,

its water repellence, water penetration resistance and breathability does decrease over time, but at different rates. Even after 10 years, the jackets we tested still had over 50 percent of their original function remaining. The resale value of the jackets was often set by the second-hand store at a lower price than the residual functionality would suggest, indicating that physical functionality is only part of the value of a functional garment, and other aspects, including appearance, also play a role in determining economic value.

In LCA, it is recommended to account for products' functionality deterioration over time, but in practice this is seldom done. Integrating measurements of functionality to CE LCA, we can gain better insights about the potential benefits or drawbacks of CE measures. Questions relating both to the life length and deterioration of sports equipment due to various environmental factors, and how life cycle environmental impact may vary in different circular solutions while considering both functionality over time and user behaviour were investigated. One important output of this research was the development of a framework for data collection and analysis, with the objective of contributing to deeper and more accurate understanding of the environme-

ntal performance of circular economy measures such as reusing, repairing, and sharing. The framework aimed to facilitate accounting for influential, but often overlooked factors, such as functionality deterioration over the lifecycle, rebound effects and real data on user behaviour. The framework was utilized to collect data concerning a case study on second-hand shell jackets, which revealed novel insights on several aspects of the use phase of new and second-hand shell jackets. One surprising finding was that shell jackets, which had a reuse phase enabled by the second-hand stores were used less overall, than those that were used by one user throughout the entire lifetime. In addition, a rebound effect of reuse was identified – the possibility to re-sell shell jackets second hand seems to intensify new consumption for some users.

The data and insights gained from using the framework on the case study were also utilized to conduct a CE LCA, demonstrating for instance the importance of real data on user behaviour, rebound effects and methodological choices for the outcomes of reuse/second hand as a strategy for reducing environmental impact. An implication of the finding that shell jackets with a reuse phase in their lifecycle are used less than jackets



Overview of the research concerning circular economy measures and functionality of sport and outdoor products.

without a reuse phase, was that “circular” lifecycles are a “second best”, environmentally, compared to relatively long “linear” lifecycles. Overall, the results called for a more cautious stance with regard to the environmental promise of circular economy measures such as reuse.

To build on these results, we have identified a need for a standardised method for assessing the residual functionality of jackets, whether for primary, or second-hand use. Confirming a jacket’s performance level may encourage first-hand users to keep using a product for longer and encourage second-hand consumption by providing reassurance as to a product’s performance. Many standard textile-testing methods are destructive in nature, which make them impractical for such an application, so a new testing protocol needs to be developed, as does a means of communicating residual functionality to the consumer. We have conducted a pre-study into the possibilities of developing this concept further within the context of the second-hand market.

Sports surfaces and facilities

The rapid demand for additional sports facilities and sportification processes in society are entangled with environments in complex ways, which underlines the need for more research on how sustainability comes into play in where we choose to play our sports. In the learning group focusing on surfaces and facilities we studied these environmental effects with a special focus on football surfaces and artificial snow.

Football is a growing sport globally and it is the most popular sport in Sweden with more than 4000 facilities.

Artificial turf was first introduced during the 60s as an alternative playing surface to natural grass, and quickly gained popularity: today, artificial turf comprises about 25 percent of all football surfaces in Sweden and is expected to increase in the future. However, the use of artificial turf brings with it a specific set of environmental challenges, not limited to the fact that each full-sized field contains around 135 tonnes of plastic material, and most of these incorporate granulate material made of rubber, which is a primary contributor to microplastic waste. The granulate material will be banned for sale within the EU in the coming years, which is an additional challenge to all involved in the procurement, operation and use of artificial turf facilities. Due to this, we performed a study to identify the environmental conflicts that exist at all stages of the artificial turf lifecycle. The aim was to map out the perspectives, challenges, and interests of the different stakeholders, at all levels, from the sport’s governing bodies and associations to manufacturers and end-users. The analysis identified and discussed 14 different environmental-related themes, which were divided into four main clusters: market aspects, technological aspects, design aspects, and human aspects. The results provide insights on the complex relationship between the artificial turf sector and its effect on the environment.

To contribute more knowledge regarding geographical challenges, a LCA study investigating the environmental impacts of the maintenance of football surfaces comparing various types of football fields in different locations, from the south to the north of Sweden, is currently ongoing. In this study data is being collected

Artificial turf.



about energy flows, material flows, and the utilization of the fields. The results could be used to optimize the usage of the existing artificial turf surfaces.

In collaboration with theme 6, the investigation into the environmental challenges related to artificial turf was broadened to investigate a policy and behavioural perspective through interviews with different actors and questionnaires sent out to players. The results from the data collected was interpreted using the value-action-gap framework, to investigate barriers that prevent actors within artificial turf, who were noted as being generally positive towards sustainable practices, from acting in accordance with their intentions.

Identifying sustainable practices is also of interest within the winter sports community. In contrast to football, where the playing season is increasing in length, the inverse is true for the natural snow season in Sweden. As our winters are getting warmer as a consequence of climate change, many ski areas are having to rely on the use of snowmaking and the use of alternative solutions, such as storing snow over the summer to use as a base in the early season, or even the use of “plastic snow” to ensure that they are able to open for skiers as soon as temperatures start to drop, and to eke

out the season in the spring to give the maximum number of ski days, and to increase revenue. We are currently conducting interviews with those responsible for the maintenance and running of different ski resorts and facilities, as well as collecting data from users of these facilities to try and map the different practices employed, determine their sustainability from an environmental perspective, and to assess people’s attitudes towards them. The first results from the study should be available in spring 2024.



Theme 5: Events

Event management in sport and outdoor recreation

Theme leader: Associate Prof. Robert Pettersson, Mid Sweden University.

Learning group: Sustainable events (4 practitioners, 5 researchers).

Sport and outdoor activities have seen an impressive rise in the event context, thanks to a growing demand for unique and immersive experiences, wellbeing and healthy lifestyles. However, it also introduces challenges related to environmental sustainability. Research in theme 5 is dedicated to fostering more environmentally sustainable events in the SOD sectors and big efforts have been put into the work with external relations and the learning group. The overall question was: *How can we create environmentally sustainable events in sport and outdoor recreation?* Large focus has been on external relations and communication, where one of the main outreach activities was the webinar organized in 2022, where results and reflections were presented in a produced and streamed “live-show” with the learning group.

Because of the large effect from the Covid-19 on events, researchers in theme 5 studied impacts and sustainability strategies during the pandemic. A survey sent out in association with Swedish Sport Association showed that environmental issues were given lower priority compared to economic and social issues during the pandemic. The study underscores the heavy reliance of these clubs on their events, suggesting that diversifying event portfolios could enhance economic and, therefore, environmental, resilience during crises.

How can we create environmentally sustainable events in sport and outdoor recreation?

Theme 3 and theme 5 have a shared full-time PhD-student. The student’s work consists of four planned articles that employ qualitative research to examine four different actor groups in Jämtland: The County Administration Board, residents living near event venues, event participants, and event organisers. The PhD investigates how physical impacts on the natural environment resulting from nature-based events and organized outdoor activities, such as trail marathons, mountain bike races or orienteering, are perceived. These physical impacts, including trail and soil disturbances, reveal that the County Administration Board, participants, and event management tend to view the events as isolated occurrences, failing to connect them to the broader context of tourism and recreation in the region. Consequently, these actors do not recognize impacts as integral to development, leading them to disclaim responsibility for behavioural or managerial changes. The responsibility for nature protection

The learning group gathered at the webinar about sustainable events.



Table 3. Consumption patterns among participants of Göteborgsvarvet 2022.

Category	New products	Recycled products	SEK /participant
Training shoes	67 %	1 %	1594
Training clothes	48 %	1 %	692
Nutritional supplements	29 %	n.a.	256
Electronic devices	14 %	1 %	400
Water belt/bag	11 %	0 %	58
Headlamp	6 %	0 %	47
Training trips (domestic)	2 %	n.a.	127

instead falls upon those residing in proximity to the event locations, who must engage with their knowledge to address these issues.

At the initial phase of Mistra Sport & Outdoors, research revealed that participating in events fosters a sense of identity, comprehension, and enjoyment among attendees. Such events serve as social arenas where participants converge, learn, and share experiences. These gatherings are also viewed as significant contributors to participants' happiness and well-being, offering social, psychological, and physical benefits. However, research within theme 5 highlights that the consumption of leisure-related products and transportation are two crucial areas where sports and outdoors event practices generate considerable environmental impact. Using the running event Göteborgsvarvet 2022 as a case study, showcases the consumption patterns and notably highlights the almost complete absence of second-hand markets for runners (table 3). This suggests that while the spending associated with these events constitutes

business opportunities, the environmental footprint from such consumption is significant. These impacts will be analyzed further in an upcoming publication analyzing the climate impacts of the consumption.

Given that sports in Sweden are still rather non-commercialized in comparison to other markets, it is anticipated that a commercialization trend, along with the associated consumption, will grow in the future. Moreover, transportation emerges as a key climate concern, especially during events where participants travel extensively. This challenge is prevalent not just during training but is even more pronounced for events requiring significant travel. In conclusion, both event participants and organizers need to be aware of the environmental impacts of sports and outdoor activities and address them in a holistic and well-planned manner. It is also imperative for all involved parties to proactively work towards minimizing their environmental impacts by influencing participant behaviors.

During the last year of phase 1 researchers in theme 5 identified the orienteering event O-Ringen as a good case in the intersection between sport and outdoors. It is one of the largest orienteering events in the world with around 15 000 participants running for five days. Two broader perspectives were studied during the 2023 event O-Ringen: i) sustainable and local perceptions during event planning, and ii) transports during the event. Studying sustainable and local perceptions offered vital insights into the event's connection with environmental sustainability. The research at O-Ringen aimed to explore how the event adapts to its setting and disseminates local knowledge during pre-event preparations. Initially, interviews were conducted with O-Ringen's project leaders, followed by interviews with municipal employees involved in the event setup. These discussions shed light on their sustainability goals, their

The O-Ringen orienteering event 2023.



approach to sustainability, and the eco-friendly solutions they prioritized. Furthermore, the fieldwork included several weeks of participant observations during the pre-event setup at different locations. It revealed how local insights influenced planning and the event's sustainability promotion. During the event itself, observations and conversations with volunteers and participants provided insights into their perceptions of the event's impacts. This comprehensive fieldwork highlighted the prioritization of sustainability from various organizational perspectives, not just from those directly involved. The study unveiled a recurring sustainability narrative within the organization and among volunteers, offering a unique perspective on sustainability in event management.

The other study of O-Ringen was based on surveys to participants before and after the event. The aim was to explore different strategies for initiating a change towards more pro-environmental behaviors by participants. The primary objective was to look at travel behaviors, but other consumption behaviors were also included (food and waste). The preliminary results of the study (analysis underway) show that it is difficult to initiate changes in behaviors. However, we find that it is important to address participants' sense of community, their identity as participants at O-Ringen and/or environmental consciousness, and their perceived

ability to make an impact (i.e. self-efficacy). Long-term commitment to address pro-environmental behavior is necessary to initiate change, both during the event itself, but also before and after the event so that these behaviors are put at the fore. Orienteering events have shown to be a relevant study object combining sport and outdoors why these events are fruitful to continue study in phase 2.



Theme 6: Behavior, policy, and future change

Towards sustainable development in the sport and outdoor recreation sectors

Theme leader: Prof. Dimitri Ioannides, Mid Sweden University.

Learning group: Behaviour, policy, and future change (5 practitioners, 4 researchers).

Theme 6 addresses the way that coordinated efforts can be developed leading to streamlined decision-making to enhance environmental sustainability within the sports and outdoor recreation sectors. Specifically, *it examines the combination of policies, strategies, tools, and practices that can most effectively lead to a society-wide movement for environmentally sustainable sport and outdoor recreation.* Further, it seeks to explain how the sport and outdoor recreation sectors can guide consumers, businesses, and organizations to embrace a more sustainable behaviour. Other than the theme leader, four researchers have been hired by the project. These include three senior researchers and one licentiate student.

To begin with, one of the senior researchers in theme 6 has collaborated closely with theme 4 in an examination of the policy context relating to the use of artificial turf in sports' facilities throughout Sweden. Specifically, this study identifies that environmental sustainability in managing artificial turf is governed by a complex policy terrain ranging from the supra-national to the national and local levels. This scenario leads to barriers in seeking to implement sustainable practices. This study resulted in a peer-reviewed article, which uses the value-action gap model to interpret the results of interviews with stakeholders. Based on this, themes 6 and 4 have continued their collaborative efforts and are examining the policy context relating to the production of artificial snow. Data are being gathered during the

Examines the combination of policies, strategies, tools, and practices that can most effectively lead to a society-wide movement for environmentally sustainable sport and outdoor recreation.

fall of 2023 and the hope is to generate an additional manuscript, ready for submission by the end of March 2024. The value of these studies is that they demonstrate the complexity surrounding many aspects of the sport and outdoor recreation sectors, which encumbers the ability to easily generate solutions for more sustainable practices. Gaining understanding about such barriers is useful step before coming up with realistic actions to overcome these and generate implementable policies for environmental sustainability.

On the environmental behaviour front, theme 6 has been involved in several projects. First, a state-of-the-art report on pro-environmental behaviour was produced by the first senior researcher and others as a Mistra Sport and Outdoors report. This document served as a backdrop to a series of research endeavours, which began in late 2022. Specifically, during the summer of



2023, the second senior researcher in theme 6 collaborated with researchers from theme 5, to investigate sustainable behaviours at the orienteering event O-Ringen in Åre. This study was finalized in August 2023. Drawing on theories on behavioural change, an experimental design was used to study the role of psychological determinants and a message targeting key behavioural determinants (e.g., efficacy beliefs) for environmental behaviours at the event. The study will improve the understanding of drivers of environmental behaviours among event participants, thereby advancing research on the role of socio-cultural factors in environmental psychology. It will also provide insights for O-Ringen and event organizers more generally. A scientific publication should be finalized early 2024.

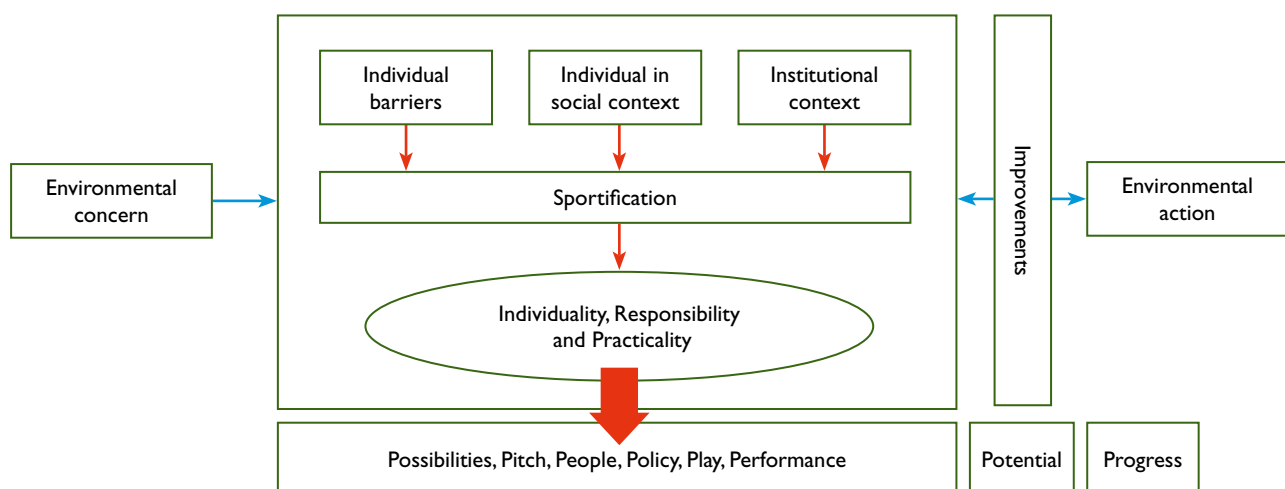
Additionally, the second senior researcher has conducted a nationwide survey study – finalized in June 2023 – on environmental behaviours connected to physical activity of the public at-large. Drawing on theories on human motivation and identity, the aim has been to study to what extent a physically active lifestyle is compatible with an ecologically sustainable lifestyle by considering psychological drivers and environmental behaviours. This study will provide insights on psychological processes relevant for environmental behaviours in the domain of sports and outdoors, clarifying how drivers of physical activity are relevant in environmental psychology. It has implications for how a physically active and ecologically sustainable lifestyle may be supported. A scientific publication is expected to be finalized in March 2024. Additional projects of note in which the second senior researcher is involved include: the development of a pedagogical behavioural model

in collaboration with the Learning Group (LG) in theme 1; integrating a consumption perspective on functional clothing as part of a circular economy business model that has been initiated in collaboration with the LG in theme 4; supporting the Swedish Tourist Association (STF) for a survey and other initiatives conducted as part of Klimatelefanten (a project aimed at reducing the climate impact from transportation); and support to students working on perceived versus actual functionality of shell jackets at Mid Sweden University.

Meanwhile, the third senior researcher has collaborated with the Swedish Canoe Federation to support responsible environmental behaviour through paddle educational activities. The project focuses on the Swedish Canoe Federation's deliberate initiative to develop kayak training, which embraces environmental issues. Activities include design of a new paddle curriculum for canoe instructors, training of instructors, and an evaluation of its effects. These actions aim to gain more knowledge about the contextual conditions required for individual transformation in outdoor contexts. The theoretical framework builds upon the assumptions that the potential contribution of such training relates to its abilities to control critical factors that place individual outdoor practices into context. A scientific article is expected to be finalized early 2024.

The final major project focuses on promoting sustainable mobility behaviours among mountain bike (MTB) tourists, when accessing peripheral mountain bike destinations. This project, which is run by the licentiate student, aims to understand eco-centric orientations concerning MTB tourists' mobility choices as well as explore the factors influencing their decisions, their in-

Adaptation of Blake's (1999) value-gap model based on interview results about environmental behavior.



infrastructural needs, and the attributes of their preferred sustainable mobility choices. The project consists of two research studies: the first uses a quantitative approach to analyze the willingness and determinants of sustainable mobility behaviours, while the second qualitative approach examines the behavioural discrepancies among mountain bike tourists with eco-centric dispositions. Data collection for the first study began in July 2023 and is expected to yield results by mid-December 2023. The second study, for which 20 participants have already been registered, will be designed based on the results of the first. The project's key contribution is to inform policymakers about necessary steps to improve sustainable accessibility to (selected) mountain bike destinations in Sweden, while concurrently seeking to improve sustainable mobility behaviours by mountain bike tourists themselves.

Beyond the aforementioned activities it is important to mention the actions of the learning group in theme 6. Earlier in 2023, the group had a physical meeting where a back-casting exercise was run relating to improving the sustainability of transportation in Sweden by 2035. This exercise led to several ideas for projects that can be continued if Mistra Sport & Outdoors receives funding for a second phase. For instance, it would be productive to try to better understand people's motivation to cycle

to work and the barriers, which dissuade them from doing so. The group was also interested in understanding social media's role in fuelling overcrowding in certain natural areas. A possible follow-up study would be to look at how nature guides play a role in attracting people to places that become hotspots. A key realisation emerging from the meetings with the theme 6 learning group was that the issues discussed and investigated have many implications for all the other learning groups. Thus, connections and mobility across learning groups should be considered in the future.

A key strength of theme 6, whose overriding purpose has been to be a cross-cutting work package collaborating with several if not all other themes is that this ambition has been largely met. Of note have been the strong collaborative efforts between theme 6 and themes 3 and 4 and, more recently, with the other three themes. The ongoing research endeavours in theme 6 should lead to several peer-reviewed publications during 2024. Based on the quality of the researchers and the endeavours they have been engaged in so far, the actions within theme 6 meet the scientific goals of Mistra Sports & Outdoors.



The Strategic Reserve

Ten percent of the Mistra funding (5,6 million SEK) was set aside as a strategic reserve for the program board. The purpose of the reserve is to give the board space to maneuver content and direction of the program. Already at the first board meeting in May 2020, three projects were granted to study the effects of the Covid-19 pandemic on sports, recreation in the outdoors and events. The board also decided early in phase 1 to allocate 2.46 million SEK for facilitation of the

learning-groups. In 2022, two calls for additional funding were launched within the program, which resulted in eight projects, most of which strengthened already ongoing activities.. The strategic reserve also funded an external review of the co-creation process and a discussion paper to explore ideas towards a research center beyond the program. Table 4 provides an overview of the strategic reserve and Appendix 3 presents summaries of the research activities funded.

Table 4. Overview of projects funded from the strategic reserve.

Project	Funding (SEK)	Aim
Effects from Covid-19 on sports, physical activity and outdoor life	364 545	Map and better understand the consequences of the Covid-19 pandemic in Sweden regarding sports, physical activity, and outdoor recreation.
Covid-19 and events	427 664	Describe impacts of the pandemic on sport events, how event organizers adapted to the situation, and potential innovations that came out of this period when events could not be organized.
Mapping visits to nature during Covid-19	307 312	Capture spatial and in-depth information about recreational activities and trends during the pandemic.
Co-creation between school, sports and environment	134 478	Investigate how environmental sustainability is expressed in Swedish schools in general, and the conditions for implementation of environmental sustainability in physical education.
Sustainable events at the crossroad between sports and outdoor life	158 653	Explore how the O-Ringen orienteering event adapts to its setting and disseminates local knowledge during pre-event preparations.
Aging of plastic materials used in sports and outdoor equipment	115 443	Characterize plastic materials used on outdoor and sports equipment, both new and old, fossil and bio-based, to determine the potential degradation of the polymer materials under different conditions, such as UV, temperature and wear.
Pedagogic model for behavioral change in sport- and outdoor organizations	150 000	Develop and test tools to enable and ease change for a more sustainable development of sports and outdoor organisations.
Sport, Performance & Sustainability (support for open access publishing)	70 000	To analyze not only how sportification may have contributed to the growing environmental impact of sport but also whether it might be used as a tool of positive social change.
Functionality-label for secondhand shell jackets	300 000	Conduct a pilot study to implement research findings into innovation through a functionality-label for secondhand shell jackets.
Initiating changing travel behaviors in connection to O-Ringen 2023, Åre	280 000	Examine the role of identity and efficacy processes at individual and collective levels to improve the understanding of drivers of environmental behaviors among event participants.
Drivers of pro-environmental behaviors and attitudes within and outside the organized sport and outdoor sectors in Sweden	100 000	Investigate how the interaction of psychological and contextual factors shape public pro-environmental actions and attitudes related to the sport and outdoor sectors
Ecological sustainability in outdoor recreation organizations	230 000	Increase knowledge about the work on ecological sustainability in a selection of organizations connected to the umbrella organization Swedish Outdoor Activities.
External evaluation of the co-creation process	209 000	Utvärdering av samverkansarbetet inom Mistra Sport & Outdoors. Magnus Ljung, Institutionen för människa och samhälle, Sveriges lantbruksuniversitet, SLU
Discussion paper about research center	103 760	Diskussionsunderlag inför fortsatt arbete med Mistra Sport & Outdoors-net. Klas Sandell.



Building scientific capacity

Mistra Sport & Outdoors has contributed to build knowledge and academic capacity in sport science, as well as the study field of outdoor recreation. Sport Science is a multi-disciplinary academic field. Environmental research in sports science has for a long time primarily dealt with how the human body is affected by high altitude, heat, cold and air pollution. More recently environmental effects of events and mega-events have been studied. In phase 1 of Mistra Sport & Outdoors we have advanced the knowledge and future scientific capacity with studies on how sport organizations work and perceive sustainability policies, participants in various sport contexts experience (and chose) outdoor and indoor facilities, environmental sustainability is taught (or not) in physical education, sportification as a process hinders a change towards a more sustainable sport sector. Of special interest for phase 2 of Mistra Sport & Outdoors is a mapping out and analysis of how leaders and participants in sport activities are motivated by different logics of practices and how these may or may not facilitate environmental change.

Outdoor recreation (friluftsliv) is not a discipline in Swedish academia, it is a multi-disciplinary study area attracting researchers with various backgrounds. Much previous research has focused on the sociology of participation, nature connectedness, physical planning, and economic values. With Mistra Sport & Outdoors

we have advanced the knowledge and future scientific capacity with respect to environmental behavior, recreation ecology, outdoor events, and transportation planning related to outdoor recreation participation. A special study how outdoor recreation organizations in Sweden work on environmental sustainability reveal an experiential logic based on nature relations and being with animals, which can be a main driver to protect nature and the environment. This will be a key steppingstone for the second phase of Mistra Sport & Outdoors.

During phase 1 we arranged seven academic seminars under the label “Mistra Sport & Outdoors Academy”, focusing on: the science of co-creation, defining and the logics behind sports and outdoor recreation (friluftsliv), impact on SOD from Covid-19, social movements, how to change behavior, ability among organizations to embrace sustainability, and recreation ecology. Academy seminars were open to all researchers in the program, several with renowned invited speakers¹, and one seminar was co-organized with Mistra Environmental Communication. A main take-away from these seminars is a discussion about re-defining sports and outdoor recreation based on environmental relations: as politics, as social phenomena, and as personal and pedagogical meaning.

We organized a doctoral course, *The environmental challenges of sports and outdoor life*, for PhD students

¹ Professor Brian McCullough, Professor Klas Sandell, Professor Sverker Sörlin, Docent Kathrin Uba, Dr. Martin Westin, Professor Anke Fischer.



involved in the program (Appendix 4). The course covered in-depth knowledge about the environmental impact and environmental challenges of sports and outdoor life historically and today and how these activities can be understood in relation to time and space. Important starting points were sports and outdoor life as social phenomena, popular movements, and policy areas. The course also aimed for the participants to practice a critical examination of the SOD sectors based on questions about transport and mobility, ecological effects and physical planning of land and water, materials and equipment, events and arrangements of various kinds, as well as creative approaches and instruments for a more innovative and sustainable development. Several senior researchers from Mistra Sport & Outdoors participated in the course as teachers.

Eight Licentiate or PhD projects have been carried out covering a wide range of areas (year in bracket is estimated graduation²):

- Teachers' perceptions of environmental sustainability in the school subject physical education and health (Andreas Isgren, Dalarna University, 2024)
- Historical perspectives on gender and ethnicity in the construction of nature conservation areas (Liubov Timonina, KTH Royal Institute of Technology, 2025)
- Challenges for environmental sustainability work in the sport sector in relation to the establishment of a new sport (Johan Carlsson, Malmö University, 2025)
- In what way and how outdoor recreation in urban areas can become more environmentally sustainable (Oskar Abrahamsson, Gothenburg University, 2024)
- Perceptions of how events such as mountain marathons affect nature and landscapes (Axel Eriksson, Mid Sweden University, 2024)
- In what way technical and perceived functionality change over time in different materials (Louisa Nilsson Mid Sweden University, 2024)
- Collaborative work in relation to the production of action plans for outdoor recreation (Kristin Malmcrona Friberg, KTH Royal Institute of Technology, 2025)
- Sustainable mobility behaviours among mountain bike (MTB) tourists at Åre destination (Samudika Weliweriyage, Mid Sweden University, 2024).

² In the Swedish university system, a Licentiate degree involves 24 months of thesis- and course work and a Doctor degree 48 months of thesis and course work.



Deliverables and scientific output

Mistra Sport & Outdoors started April 1, 2020, and the first three years and eight months of the program has resulted in a considerable number of deliverables, from research, co-creation and communication. All deliverables are presented in Appendix 1a–d. Given the impact from the Covid-19 pandemic and time-consuming co-creation activities, the scientific output from Mistra Sport & Outdoors has been somewhat slower compared with a “traditional” research program operating under normal circumstances. From our scientific production, we like to highlight the following selection of peer reviewed publications:

André, H., Björklund, A., (2022). Towards a Conceptual Framework for Analyzing Circular Product-User Life Cycles: Learnings from the Sport and Outdoor Sector. *Procedia CIRP*, 105:225–230.

Life cycle assessment (LCA) research on the performance of circular economy (CE) measures such as reuse, repair and remanufacturing has been criticized for inadequate consideration of functional equivalency of circular compared to new products, allocation between use phases, displacement rates, rebound effects, product use and user behavior. For such reasons, it has been argued that our understanding of the environmental performance of CE is poor and over-optimistic. Motivated by these criticisms, this paper presents an outline of a conceptual framework developed to improve CE LCA research. The framework was developed through literature review, workshops and ongoing CE LCAs in the sport and outdoor sectors. The paper overviews challenges related to mentioned criticisms and possible approaches to addressing them, presents a model for how aspects influential to CE LCA results interrelate,

and proposes a structure for describing product-user life cycles more accurately. The outlined conceptual framework could be an important step towards improving CE LCAs and, ultimately, our understanding of environmental outcomes of CE.

André, H., Björklund, A., (2023). A framework to open the black box of the use phase in circular economy life cycle assessments: the case of shell jacket reuse. *Journal of Industrial Ecology* 27(4):1137–1150.

Life cycle assessments of circular economy measures (CE LCA) of consumer products have been criticized for oversimplifying important aspects of the use phase, e.g. user behavior and rebound effects, limiting our understanding of the environmental performance of circular economy measures. This study tests the usefulness of a framework designed to facilitate accounting for such aspects, by applying the framework on a case study of reuse of shell jackets enabled by “premium second-hand” outdoor stores. Methods for collecting use phase data were user surveys and interviews with store managers. Results show that secondhand shell jackets have a significantly lower frequency of use during their first use span compared to the second and to shell jackets in the linear reference scenario. This implies that reuse in this case does not function as a mere use extension of otherwise similar use phases as is commonly assumed. The generation of such insights, which hitherto have been lacking in CE LCAs, points to the usefulness of the framework as a tool for opening the “black box” of the use phase in CE LCAs to improve understanding of the environmental performance of circular economy measures.

Backman, E., & Svensson, D. (2022). Where does environmental sustainability fit in the changing landscapes of outdoor sports? An analysis of logics of practice in artificial sport landscapes. *Sport, Education and Society*, 28(6), 1–14.

In this paper, artificially constructed landscapes and the outdoor sport activities that take place therein are explored. The purpose is to identify what individual athletes perceive as meaningful logics when practicing sport in artificial landscapes and to analyze and discuss potential environmental consequences of these logics. Cross-country skiing and canoe slalom, two sports that historically have been dependent on specific geographies and contexts are in focus. Our findings indicate that the logic of performance is dominant for the sport practitioners who train in artificial landscapes, at the expense of perspectives such as nature experience and environmental sustainability, which may lead to an unsustainable relationship to the environment. If performance is key, then the role of the training landscape is first and foremost to present the best possible conditions for performance. But if the athlete/exerciser see their training as a means of experiencing nature, then other values than performance and comparability can become more important, and activities can lead to a more sustainable relationship.

de Bernardi, C., & Waller, J. H. (2022). A quest for greener grass: Value-action gap in the management of artificial turf pitches in Sweden. *Journal of Cleaner Production*, 380, 134861.

Artificial turf is a popular substitute for natural grass and is widely used for playgrounds, landscaping and on sports fields. From a sustainability viewpoint, artificial turf has been increasingly criticized for being dangerous to both people and the environment, with microplastic pollution being a key issue. This study investigated barriers preventing actors within artificial turf, who are generally positive towards sustainable practices, from acting in accordance with their intentions – the value-action gap. Using this as a frame of reference, we conducted semi-structured interviews with municipalities, companies, and sports associations, made a qualitative survey of soccer players, and analyzed policy documents and reports. Sustainability in the management of artificial turf was found to be dependent on several factors, including a complex policy terrain, which includes different kinds of policies over several policy levels, leading to many obstacles. Knowledge about the technical attributes and materials used in artificial turf has a large influence on the decisions taken by the actors, but understanding of what the right decisions are is not always evident.

Eriksson, A. Pettersson, R. & Wall-Reinius, S. (2023). Environmental Concerns in Nature-based Events: The Permit Process for Organised Outdoor Recreation

and Sport, *Scandinavian Journal of Hospitality and Tourism*, DOI: 10.1080/15022250.2023.2231892

Jämtland in Northern Sweden is one of the most tourism and event-intense regions in the country. With this study, we aim to gain in-depth knowledge of how environmental impacts are understood and valued in the regional assessment process for nature-based events and organized outdoor recreation. We analyze permit documents from the County Administrative Board of Jämtland from 2011 to 2020. The results show that most events were approved, and none were rejected solely due to environmental concerns. Assessments were instead balanced against other considerations, such as local development and economic gains. We argue that these priorities make nature a commercial arena for events, visitors and recreationists. This paper sheds light on human use and the associated environmental effects that further increase the pressure on nature. We end with managerial implications and propose that the permit process can be improved and integrated into spatial planning.

Hedenborg, S., Fredman, P., Skriver Hansen, A. & Wolf-Watz, D. (2022), Outdoorification of sports and recreation: a leisure transformation under the COVID-19 pandemic in Sweden, *Annals of Leisure Research*, DOI: 10.1080/11745398.2022.2101497

Following the outbreak of the COVID-19 pandemic, most European countries imposed lockdowns, whereas Sweden introduced soft restrictions. Sports and physical activity could continue if conducted ‘safely’ and outdoor activities were even promoted if restrictions on the number of participants were not violated. The aim of this article is to demonstrate how the pandemic led to transitions and transformations of typical indoor sports activities to the outdoors and to outdoor recreation, or what we call an outdoorification process of sports and recreation, and how the changes were perceived by the population. Sweden is used as a case study. The inquiry is based on three studies involving more than 100 semi-structured interviews, two national questionnaire surveys and a regional-based PPGIS study. Based on the results, we argue that the outdoorification process is likely to influence how sport and recreation is understood and practiced also in the years after the pandemic.

Hill, R., Díaz, S., Pascual, U., Stenseke, M., Molnár, Z., & Van Velden, J. (2021). Nature’s contributions to people: Weaving plural perspectives. *One Earth*, 4(7), 910–915.

“Nature’s contributions to people” (NCP) is designed to provide space for the recognition of diverse and evolving culturally mediated ideas about what people derive from, and co-produce with, nature. Its origins, along with the IPBES conceptual framework in which it is embedded, is transdisciplinary, action-oriented, and inclusive and also embraces pluralism. NCP provides both generalizing and context-specific perspectives and

analytical tools that can be interwoven and enables diverse actors to represent nature-people interactions for different scales, audiences, and decision-makers. NCP therefore can be used to understand and communicate the ways in which ongoing biodiversity decline may affect the complex relationships between people and nature. This Primer presents NCP in accessible language, highlights its unique contribution as a tool for plural valuation of nature in conservation assessments, clarifies common misconceptions, and provides examples of the innovative ways NCP has already been applied around the world.

Skriver-Hansen, A., Wolf-Watz, D., Fredman, P. & Beery, T. (2022). Outdoor recreation in Sweden during and after the Covid-19 pandemic – management and policy implications, *Journal of Environmental Planning and Management*, DOI: 10.1080/09640568.2022.2029736.

This paper reports results from three studies concerning outdoor recreation participation and trends during the COVID-19 pandemic in Sweden. The studies, undertaken at national, regional and local levels, used surveys, interviews and PPGIS approaches, to build a solid knowledge base. Results are analyzed with particular attention given to management and policy implications based on the following observations: increased outdoor recreation participation, changes in lifestyle and routines, new visitor profiles and activity trends, spatial changes, visitor displacement, spatial redistribution, and indications of post-pandemic outdoor recreation behavior. The Swedish case is of special interest because of high accessibility to nature areas and few restrictions to recreate in nature due to the pandemic. Hence, this study could serve as a reference for other countries with more COVID-19 related restrictions and less accessible nature for recreation.

Svensson, D., Backman, E., Hedenborg, S. & Sörlin, S. (eds.) (2023). *Sport, Performance and Sustainability*. London: Routledge.

In this book the logic of ‘faster, higher, and stronger’ and the technoscientific revolution that has driven

tremendous growth in the sports economy and in sport performance over the last 100 years is explored. Authors ask whether this logic needs revisiting in the light of the climate crisis and sport’s environmental responsibilities. Drawing on multi-disciplinary work in sport history, sport pedagogy, sport philosophy, sport science, and environmental history, authors consider not only how sportification may have contributed to the growing environmental impact of sport but also whether it might be used as a tool of positive social change. It reflects on the ways that sport sets performance limits for other ethical reasons, such as doping controls, and asks whether sport could or should set limits for environmental reasons too. “Sport, performance and sustainability” touches on key themes in sport studies, including digitization, activism, social media, empowerment, youth sport, and physical education.

Winell, E., Armbrecht, J., Lundberg, E., & Nilsson, J. (2023). How are fans affected by the commercialization of elite sports? A review of the literature and a research agenda. *Sport, Business and Management: An International Journal*, 13(1), 118–137.

This paper provides a comprehensive understanding of existing research examining the effects of commercialization on elite sports fans. Through a structured review of 42 scholarly articles from 1992 to 2020, the study categorizes the impacts into four distinct themes: fan identity, fan attitudes, fan emotions, and fan behaviors. Despite the identification of these themes, it was observed that studies within each are dispersed and there remains a substantial need for further research in each domain. Highlighting the multifaceted nature of commercialization, the study proposes a roadmap for future inquiries. It underscores the significance of acknowledging multiple stakeholders’ interests while addressing the repercussions of commercializing elite sports. The review exposes the lack of studies focusing on environmental impacts of a more commercial sport and event industry. In particular relations between events and tourism, transportation, the environment and well-being are missing.



Program board, administration, theme leaders, and partner organizations

A complete list of program participants and partners are presented in Appendix 5.

Program board

Eva Thörnelöf, Chair of the Board
Ulf Silvander, Senior advisor
Christiane Dolva Törnberg, HM Foundation
Maria Johansson, Lund University
Ludde Edgren, Mid Sweden University
Josefine Åhrman, Swedish Association for Outdoor Organizations (from March 2023)
Malin Järf, Swedish Sports Confederation (from November 2023)
Peter Mattsson, Swedish Sports Confederation (April 2020–October 2023)

Administration (all at Mid Sweden University)

Peter Fredman, Program director
Karin Berg, Co-creation specialist
Sandra Wäger, Communication
Märit Christensson, Administration
Per-Richard Lindgren, budget and accounting

Theme leaders

Sverker Sörlin, KTH Royal Institute of Technology
Susanna Hedenborg, Malmö University
Anders Larsson, University of Gothenburg
Marie Stenseke, University of Gothenburg
Mikael Bäckström, Mid Sweden University
Robert Pettersson, Mid Sweden University
Dimitri Ioannides, Mid Sweden University

Partner organizations

A Swedish Classic (sport events)
Berg Municipality
City of Gothenburg
City of Gothenburg, Parks and landscape Administration
City of Gothenburg – Sports and Association administration
County Administrative Board of Halland County
County Administrative Board of Jämtland
County Administrative Board of Stockholm

County Administrative Board of Västra Götaland
Ecoloop
Federation of Swedish Farmers (LRF)
Federation of Swedish Farmers (LRF Mälardalen)
Fritidsbanken
Got Event
Järfälla Municipality
Kungälv Municipality
Lilla Edet
Outdoormap AB
Patagonia
Region Stockholm
Region Västerbotten
Scandinavian Outdoor Group
Scandinavian Turfgrass and Environment Research Foundation, STERF
Swedish Agency for Marine and Water Management
Swedish Association for Outdoor Organizations
Swedish Canoe Federation
Swedish Society for Nature Conservation
Swedish Equestrian Federation
Swedish Forest Agency
Swedish Football Association
Swedish Orienteering Federation
Swedish Outdoor Association
Swedish Outdoor Association – Mälardalen
Swedish Parasports Federation
Swedish Ski Association
Swedish Society for Nature Conservation
Swedish Sports Confederation (RF)
Swedish Tourist Association (STF)
Swedish University Sports Federation
Sveriges Fritids- och Kulturchefsörening
The Keep Sweden Tidy Foundation
Thule Group AB
Västkuststiftelsen
Västtrafik
Åre Municipality

Attachment

On the following pages you can find deliverables for year 2020–2023.

Deliverables for year 2020	Type of deliverable	Theme
Publications		
Svensson, D., Backman, E., Hedenborg, S. & Sörlin, S. (2020). Idrottens växande ekologiska fotavtryck—Sportifiering, inomhustrend, miljöpåverkan. In: Sport management, del 3. Idrottens marknader och konsumtionskultur, red. Åsa Bäckström, Karin Book, Bo Carlsson & P.-G. Fahlström (Stockholm: SISU Idrottsböcker, 2020), 172-191	Book chapter	1
Armbrecht, J., Lundberg, E., Andersson, T.D. & Mykletun, R.J. (2020). 20 Years of Nordic event and festival research: a review and future research agenda, Scandinavian Journal of Hospitality and Tourism	Article	5
Fredman, P., & Margaryan, L. (2020). 20 years of Nordic nature-based tourism research: a review and future research agenda. Scandinavian Journal of Hospitality and Tourism, 1-12	Article	
Other outcome		
Hedenborg, S (tillsammans med S Karlén, J Radman, K Andersson): Sport Science Meet-up Conference, November 2020.	Presentation at conference	1
Hedenborg, S., Radmann, A. & Svensson, D. 2020. 'Sports and Covid-19', roundtable session at the Global Institute for Research, Education and Scholarship (GIREs) international conference: Sport: Business or Lifestyle? The Impact and Trajectory of Modern Athletics. Digital conference, via Zoom, October 3, 2020.	Presentation at conference	1
Svensson, D. 2020. Vandring och de globala hållbarhetsmålen, Discussion with Camilla Brudin Borg and Mikael Östblom. Episode of the Mälmedvetenskap podcast, from the University of Gothenburg and Chalmers University of Technology. Recorded October 3rd, 2020	Podcast	1
Svensson, D. 2020. Vandring, japanska skogsbad och natur på recept. Discussion with Eva Sahlin and Lisa Haeger. Episode of the Inside the Box podcast, from the University of Gothenburg and the Museum of World Culture. Recorded September 21 st , 2020.	Podcast	1
Sörlin, S. 2020. Skidåkning – kulturarv på väg att tina bort? Vetenskapspodden, Vetenskapsradion, SR, 2020-02-28.	Podcast	1
Sörlin, S., "Skidglädje i snöabstinensens tidevarv", rec. av Kari J. Spjeldnaes, På ski fordi: Om gleden ved å gå på ski: Forsøk till en beskrivelse (Oslo: Pax forlag, 2018). DN kultur 2020-02-24.	Publication in media	1
Koch, D., Legeby, A., 2020. Preliminär rapport: Vår Stad - hur förändrar en kris våra vanor? (Preliminary Report). KTH, Stockholm.	Report	2
Hansen, A. 21 aug 2020, Sveriges radio Vetenskapspodden, Andreas Skriver Hansen participated in the pod and talked about on his study of the effects of the pandemic situation on outdoor recreation activities.	Podcast	3
Hansen, A. & Stenseke, M. 13 mars 2020, Friluftsrådet i Västra Götaland. Andreas Skriver Hansen and Marie Stenseke presented an overview over the Mistra Sport and Outdoors in general, and on Theme 3 in more detail.	Seminar outside academia	3
Hansen, A. 08 juli 2020 Sveriges radio, Nyheter, Interview with Andreas Skriver Hansen on his study of the effects of the pandemic situation on outdoor recreation activities.	Radio interview	3
Hansen, A. 13 aug. 2020, Forskning och framsteg. Article based on an interview with Andreas Skriver Hansen on his study of the effects of the pandemic situation on outdoor recreation activities.	Popular science articles	3
Hansen, A. 16 juli 2020 DN, Article based on an interview with Andreas Skriver Hansen on his study of the effects of the pandemic situation on outdoor recreation activities.	Publication in media	3
Hansen, A. 23 december 2020, Sveriges radio, Vetenskapsradion Klotet, Interview with Andreas Skriver Hansen on his study of the effects of the pandemic situation on outdoor recreation activities.	Radio interview	3

Hansen, A. 8 oktober 2020, Friluftsrådet i Västra Götaland. Andreas Skriver Hansen presented his study of the effects of the pandemic situation on outdoor recreation activities, and gave an update on the research program	Seminar outside academia	3
Srivastav, A. & Xenos, S. 2020. Environmental Assessment of Kayak using MFA & LCA: A case study at Melker of Sweden. KTH, School of Architecture and the Built Environment (ABE), Sustainable development, Environmental science and Engineering. Master thesis.	Master thesis	4
Workshop: 3 Dec 2020. "Hur kan vi tänka kring cirkulära affärsmodeller?"	Workshop	4
Armbrecht, J., Lundberg, E. & Skriver Hansen, E. (2020). Mistra Sport and Outdoor: the Covid-19 projects. Lecture at the Center for Tourism, Gothenburg, 2 Dec 2020	Lecture	5
Pettersson, R (2020). I en roddbåt till Kina - så reser vi efter corona. Webinar. Mid Sweden University, 15 June 2020.	Webinar	5
Pettersson, R (2020). Vilka scenarier ser vi framför oss? MISTRA webinar, 12 June 2020.	Webinar	5
Pettersson, R. (2020). Hållbara evenemang i balans 2030. Digital seminar. Region Jämtland Härjedalen och Östersunds kommun, 8 Oct. 2020.	Seminar outside academia	5
Pettersson, R. (2020). Turism och corona. Besöksnäringen på agendan. National conference, Tillväxtverket (TVV) and Sveriges Kommuner och Regioner (SKR), 25 Nov. 2020.	Seminar outside academia	5
Revised WP description for theme 6, Mistra Sport & Outdoors program plan (see Fredman et al., 2020).	Other	6
Fredman, P., Sörlin, S., Larsson, A., Stenseke, M., Bäckström, M., Pettersson, R., Ioannides, D. Frimodig, C. & Wåger S. 2020. Mistra Sport & Outdoors. Towards Sustainable Solutions. Program Plan 2020-2024, Part A. Mistra Sport & Outdoors, Rapport 2020:1	Report	
Fredman, P. Föredrag om Mistra sport & Outdoors på Myndighetsmöte för friluftsliv, Naturvårdsverket, 21 oktober, 2020.	Seminar outside academia	
Fredman, P. Medverkan på Sciecn afternoon (Forskarfredag), Mittuniversitetets vetenskapsvecka, 27 november, 2020	Presentation	
Blogg, april 2020: Peter Mattsson, Riksidrottsförbundet, ser fram emot nya upptäckter.	Blog post	
Blogg, juli 2020: Susanne Söderholm, Svenska orienteringsförbundet: "Låt inte kreativiteten sina på vägen tillbaka från Corona"	Blog post	
Blogg, maj 2020: Christina Frimodig, samverkansledare, tror på att utveckla kunskap och lösningar tillsammans.	Blog post	
Blogg, mars 2020: Peter Fredman, programchef, välkomnar till Mistra Sport & Outdoors!	Blog post	
Blogg, november 2020: Andreas Hellohf, Naturskyddsföreningen; "Dags att ta nästa steg i samverkans-processen".	Blog post	
Blogg, november 2020: Sandra Wåger, kommunikationsansvarig: "Tänk om det kan fortsätta i denna anda?"	Blog post	
Blogg, september 2020: Ingela Hiltula, Naturvårdsverket: "Kommer det att gå?"	Blog post	
Framgångsexempel, dec. 2020 – Vi borstar av oss! RF-SISU Västra Götaland	Other	
Framgångsexempel, februari 2020 – Större medvetenhet och minskad klimatpåverkan inom alpinsporten	Other	
Framgångsexempel, mars 2020 – Utlåning och återbruk i Fritidsbanken	Other	
Framgångsexempel, sept 2020 – Äventyr året runt för alla med Friluftsrämjandet	Other	
Webbinarium, Mistra Sport & Outdoors 2020-06-12. Vägen tillbaka från Corona. Ett webbinarium med fokus på miljö och hållbarhet inom idrott och friluftsliv	Webinar	
Challenges identified for learning group in theme 1, 2, 3, 4, 5 and 6.	Other	

Deliverables for year 2021	Type of deliverable	Theme
Publications		
Fredman, P. & Wolf-Watz, D. (2021). Impact from Covid-19 on outdoor recreation in Sweden. In: Aas, Ø., Breiby, M., Selvaag, S.K., Eriksson, P-A. & Børrestad, B. (editors). The 10th MMV Conference: Managing outdoor recreation experiences in the Anthropocene – Resources, markets, innovations. Norwegian University of Life Sciences, MINA fagrapport 73. 418 p.	Conference	
Fredman, P. (2021). Impact from Covid-19 on outdoor recreation in Sweden. 10th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas, Lillehammer, Norway, Aug. 16-19, 2021.	Conference	
Norberg, Johan R.; Svensson, Daniel; Jansson, Alexander & Hedenborg, Susanna (2021). 'The Impact of the Covid-19 Pandemic on Sport in Sweden'. In: Time Out: National Perspectives on Sport and the Covid-19 Lockdown, eds. Jörg Krieger, April Henning, Lindsay Pieper & Paul Dimeo. Common Ground Research Networks, pp. 15-28.	Scientific book chapter	1
Svensson, D. (2021). 'Borås och idrotten: Historiska nedslag och framtida uppslag', in Borås 400 år – från knalle till e-handel. Fässingen: Från Borås och de sju häraderna, vol. 57, ed. Anngerd Lönn. Borås: De sju häradernas kulturhistoriska förening, pp. 129-143.	Scientific book chapter	1
Svensson, D., Sörlin, S. & Saltzman, K. (2021). "Pathways to the trail – landscape, walking and heritage in a Scandinavian border region", Norsk Geografisk Tidsskrift – Norwegian Journal of Geography, 75:5, 243-255. DOI: 10.1080/00291951.2021.1998216.	Article	1
Svensson, Daniel & Radmann, Aage (2021). "Keeping distance? Adaptation strategies to the covid-19 pandemic among sport event organizers in Sweden". Journal of Global Sport Management, 8:3, 594-611.	Article	1
Larsson, A., Elldér, E., Vafeiadis, E., Curtis, C., Steiner, A. (2021) A multi-modal, multi-activity, multi-scalar analysis for sustainable accessibility planning. Paper presenterat på World Symposium on Transport and Land Use Research 2021, Portland, Oregon, USA, August 9-13, 2021.	Conference	2
Liao, Y., Yeh, S., Gil, J. (2021). Feasibility of estimating travel demand using geolocations of social media data. Transportation.	Article	2
Beery, T. H., Quaas, M., & Stenseke, M. (2021). Nature's Contributions to People: On the Relation Between Valuations and Actions. Frontiers in Ecology and Evolution, 9, 411.	Article	3
Hill, R., Díaz, S., Pascual, U., Stenseke, M., Molnár, Z., & Van Velden, J. (2021). Nature's contributions to people: Weaving plural perspectives. One Earth, 4(7), 910-915.	Article	3
Armbrecht, J. (2021) Event quality, perceived value, satisfaction and behavioural intentions in an event context. Scandinavian Journal of Hospitality and Tourism.	Article	5
Armbrecht, E., Lundberg, E., Pettersson, R. & Zillinger, M. (2021). Sport clubs and events recovery in Sweden, in Crisis Management and Recovery for Events: Impacts and Strategies, ed. by V. Ziakas, V. Antchak and D. Getz.	Scientific book chapter	5
Lundberg, E., & Andersson, T. D. (2021). Subjective Well-Being (SWB) of Sport Event Participants - Causes and Effects. Event Management.	Article	5
Andersson, T., J. Armbrecht and E. Lundberg (2021). Hosting event session Advancements in Event & Festival Research, Nordic Symposium. Akureyri, Iceland 21-23 sept 2021.	Conference	5
Andersson, T., J. Armbrecht and E. Lundberg (2021). The relevance of evaluation models for legacy of events used by a regional tourism office. Seminar at the Nordic Symposium. Akureyri, Iceland 21-23 sept 2021.	Conference	5

Eriksson, A. (2021). Nature Impacts from a Participant Sports Event – Preliminary Results from a Swedish Mountain Marathon. Seminar at the Nordic Symposium. Akureyri, Iceland 21-23 sept 2021.	Conference	5, 3
Setoodegan, P., L. Margaryan, and R. Pettersson (2021). Time to get the ball rolling - Sports and outdoor events as drivers for immigrants' social integration. Seminar at the Nordic Symposium. Akureyri, Iceland 21-23 sept 2021.	Conference	5
Other outcome		
Lundberg, E., & Andersson, T. D. (2021). Subjective Well-Being (SWB) of Sport Event Participants: Causes and Effects. Event Management, 26(1). DOI.	Scientific research article	5
Backman, E. & Svensson, D. (manuscript) Where does environmental sustainability fit in the changing landscapes of outdoor sports? An analysis of logics of practice in artificial sport landscapes, submitted to scientific journal November 2021.	Submitted manuscript	1
Backman, E. (accepted) Idrottsanläggningar i förändring – konsekvenser för utövare och miljö. Kapitel i Centrum för Idrottsforskning rapport om idrottsanläggningar, submitted December 2021.	Report	1
Larneby, M. (2021). Lecture: "Sport and sustainable development - Able-bodiedness, accessibility and equality" in the master's course "Sport and sustainable development", Malmö University, January, 2021.	Teaching activity	1
Larneby, M. (2021). Lecture: "Social sustainability, sport and the environment" in the course "Environmental Challenges in Sport and Outdoor Recreation", Malmö University, October 20, 2021.	Teaching activity	1
Sörlin, S., Faculty Opponent on public defense 10 September 2021 of Isak Lidström, På skidor i kulturella gränsland: Samiska spår i skidsportens historia [Skiing in cultural borderlands: Studies on the Sámi history of ski sport in Sweden]. PhD diss. Malmö Studies in Sport Sciences, Vol. 39 (Malmö University 2021).	Faculty opponent, PhD diss	1
Sörlin, S., Faculty Opponent on public defense of Iver Mytting, The forest's 'blue blazes' – The emergence of Osloomarka as a recreational area [Skogens blå band – Fremveksten av Osloomarka som friluftslivsområde], PhD diss. Norwegian School of Sports Sciences, 22 January 2021.	Faculty opponent, PhD diss	1
Svensson, D. (2021). Invited session 'Sustainable sport and outdoor recreation', September 10th 2021 at ECSS Virtual Congress, September 8-10 (online).	Presentation	1
Svensson, D. Andréasson, S., Karlén, S. & Wickström, E. (2021). Idrottens utveckling', panel discussion at Navet, Borås, May 27th 2021.	Panel discussion	1
Svensson, D., Hedenborg, S., Krieger, J., Rosén, A. & Jaenes Sánchez, J.C. (2021). 'Digital adjustments of sport as consequences of the Corona pandemic', with. Webinar, European College of Sport Science (ECSS), via Zoom, June 9, 2021.	Webinar	1
Backman, E., Larneby, M., Isgren Karlsson A. (2021). Medverkan på Mistra Sport & Outdoors webinarium: Miljömässig hållbarhet i skolämnet idrott och hälsa, 2021-11-13.	Webinar	1
Sörlin, S., "Därför gillar vi inte att trängas i naturen". Intervju (av Sverker Lenas) om ensamhet och naturupplevelse. DN Insidan 2021-06-17	Publication in media	1
Sörlin, S., "Så tränade Marit Bjørgen för att bli världens bästa kvinnliga skidåkare genom tiderna" [review of Guro Strøm Solli, The Development Process of the Most Successful Winter Olympian in History (Trondheim: NTNU, 2020)]. DN Kultur 2021-03-03.	Publication in media	1
Sörlin, S., "Vinterstudion har blivit vår katedral för den utrotningshotade årstiden". https://www.sydsvenskan.se/2021-02-21/vinterstudion-har-blivit-var-katedral-for-den . Sydsvenska Dagbladet Kultur 2021-02-21.	Publication in media	1

Sörlin, S., föreläsning om utvecklingslinjer inom bildning och hållbarhet för ledare inom idrottens studieförbund SISU, online 29 november 2021. Motsvarande föreläsning även framförd vid ett flertal tillfällen under 2021 för andra studieförbund, folkhögskolor, universitetsinstitutioner m. fl.	Teaching activity	1
Sörlin, S., Vetenskapspodden, samtal om skidåkningens framtid under klimatförändringarna, med Lena Nordlund. SR P1 2021-01-02, ca 40 min.	Podcast	1
Sörlin, S., Gomorron världen, "Snö". Intervju av Lena Bejerot. SR P1 2021-01-03. 8 min	Radio interview	1
Doktorandkurs inom Mistra Sport and outdoors, föreläsningar av temaledare inom programmet, doktoranders arbete med artiklar. 2021–2022.	Phd course	1
Fristående kurs på grundnivå (distans) vid MAU, 7.5: Environmental Challenges in Sport and Outdoor Recreation ht 2021	Freestanding course Bachelor's level	1
Svensson, D., Hedenborg, S., Krieger, J., Rosén, A. & Sanchez, C. (2021). Digital adjustments of sport as consequences of the Corona pandemic. Webinar, European College of Sport Science (ECSS), via Zoom, June 9, 2021.	Online presentation	1
Andersson, K., Fabri, A., Fredman, P., Hedenborg, S., Jansson, A., Karlén, S., Radmann, J. & D. Wolf-Watz (2021). Idrotten och friluftslivet under coronapandemin. Resultat från två undersökningar om coronapandemins effekter på idrott, fysisk aktivitet och friluftsliv. Mistra Sport & Outdoors, rapport 2021:2.	Report	1
Gil, J (2021) Exploring limits and potentials of Mobile Application Data for the study of human mobility. Towards urban analytics 2.0 - The Alan Turing Institute. 26 November 2021.	Presentation	2
Larsson, A (2021) Presentation av Mistra Sport and Outdoors och diskussion kring samverkan kring friluftsliv och kollektivtrafikresor. Nationella nätverket för regionala friluftsstrategier. 2 april 2021	Presentation	2
Larsson, A (2021) Presentation av Mistra Sport and Outdoors och diskussion kring samverkan kring friluftsliv och kollektivtrafikresor. Länsstyrelsen Västra Götaland. 7 oktober 2021.	Presentation	2
Andersson, H. (2021) The role of peri-urban nature in outdoor sports and outdoor recreation: insights from Rudan nature reserve in Stockholm. MSc Thesis, KTH Royal Institute of Technology	Master's thesis	3
Stenseke, M. (2021). Hotet mot den biologiska mångfalden och vad vi kan göra för att vända trenden. Altinget 27 April 2021.	Presentation	3
Stenseke, M. (2021). Digital discussion on literature: Biologisk mångfald, naturnyttor och ekosystemtjänster, The Royal Swedish Academy of Agriculture and Forestry. 29 Oct 2021.	Podcast	3
Andersson, E. 2021. Two seminars on Recreational ecology.	Seminar	3
Active participation in Stockholm CAB's process for turning the county's outdoor recreation strategy into municipal action plans.	Strategy process/other	3
Hansen, A.S., Falla Arce, J. & Lindberg, I. (2021). Friluftslivet under coronapandemin. Kartläggning av friluftsvanor och vistelse i naturen under coronapandemin i Västra Götaland. Mistra Sport & Outdoors, rapport 2021:1	Report	3
Danielski, I. (2021) The development of artificial turf in Swedish football fields from the perspective of different stakeholders. MISTRA Report, November 2021.	Report	4
André, H. (2021). A framework for describing and analyzing outdoor product lifecycles. Digital workshop. Scandinavian Outdoor Group, 2 June 2021.	Workshop	4
Waller, J. & Danielski, I. (2021). Målkonflikter och policy inom konstgräs. Digital Meeting of the Beställargrupp för Konstgräs, 4 June 2021	Digital meeting	4
Swenne, L. & Danielski, I. (2021) Material inom idrotten och friluftslivet – Vägar till mindre miljöpåverkan MISTRA webinar, 14 September 2021.	Webinar	4
Armbrecht, E., Lundberg, E., Pettersson, R. & Zillinger, M. (2021) Covid-19 och hållbara evenemang. Mistra Sport & Outdoors, Rapport 2021:3	Report	5

Armbrecht, J., Lundberg, E. & Zillinger M (2021). Covid-19 and sustainable events. MISTRA academic seminar 23 of March 2021.	Academic seminar	5
Eriksson, A. (2021). Målet med strategierna är att de ska kunna skalas upp, vare sig det är en vulkankrater som Lagoa do Fogo eller en bergstopp som Ottfjället. Mistra Sport and Outdoors.	Blog post	5
Eriksson, A. (2021). Radioinslag: Forskning ska ge mer hållbara evenemang i fjällen. SR Jämtland, 4 augusti 2022.	Radio interview	5
Eriksson, A. (2021). TV-inslag: Forskningsstudie ska ge mer hållbara fjällevenemang. SVT Jämtland, 1 augusti 2022.	TV interview	5
Margaryan, L. (2021). Artikel på bbc.com: The Swedish law of wanderlust.	Popular science article	5
Pettersson, R & E. Lundberg (2021) . Framtidens evenemang. Modererande och presentation vid webinar 14 april 2021: Evenemangsforum. Riksidrottsförbundet.	Webinar	5
Pettersson, R (2021). Covid-19 och hållbara evenemang. MISTRA webinar 10 februari 2021.	Webinar	5
Pettersson, R. (2021). Hållbara evenemang som en del av det turistiska systemet. UR-Samtiden. SVT.	Teaching activity	5
Pettersson, R. (2021). Hållbara evenemang. Presentation vid webinar 23 mars 2021: Framtidens vinnande evenemang. Interreg.	Webinar	5
Pettersson, R. (2021). Hållbara evenemang. Text och presentation vid svensk-norskt webinar Hållbara gränsöverskridande evenemang.	Presentation	5
Pettersson, R., Armbrecht, J., Lundberg, E. & Zillinger, M. (2021). Covid-19 och hållbara evenemang. Påverkan, anpassning och framtid för evenemang inom idrott och friluftsliv. Mistra Sport & Outdoors, rapport 2021:3	Report	5
De Bernardi, C. (2021). Målkonflikter och policy inom konstgräs. Mistra sport and outdoors webinarium "Grönare gräs på andra sidan? – Hållbarhet inom konstgräs från ett policyperspektiv". 5 May 2021.	Webinar	6
De Bernardi, C. & Waller, J. (2021). Målkonflikter och policy inom konstgräs. Beställargruppen för konstgräs webinarium. 4 Jun 2021.	Webinar	6
Linde, S. (2021). Ett hållbart klimat? Politik, extremväder och väljarnas syn på miljöfrågan. Presentation på Mistra Sport & Outdoors Academy, 9 nov, 2021.	Presentation	6
Fredman, P. (2021). Post-COVID perspectives on hiking trends in Sweden. Senderismo: actualidad y tendencias en tiempos COVID. Grupo Investigación Deportes De Montaña: Salud, Inclusión y Sociedad. UCV. Catholic University of Valencia, Sept. 10, 2021.	Presentation	
Blogg, 2021-03-15: Robert Pettersson, evenemangsforskare: "I vilken enhet mäter vi glädje?"	Blog post	
Blogg, 2021-05-21: Daniel Wolf-Watz, friluftsforskare: "Friluftslivets år och pandemi – bäddat för en boom med möjligheter"	Blog post	
Blogg, 2021-08-24: Ulf Silvander, Svenskt Friluftsliv; "Nu gäller det att justera vårt beteende i relation till Moder natur så att vi även fortsättningsvis får en plats i kedjan!"	Blog post	
Blogg, 2021-09-07: Axel Eriksson, doktorand; "Målet med strategierna är att de ska kunna skalas upp, vare sig det är en vulkankrater som Lagoa do Fogo eller en bergstopp som Ottfjället"	Blog post	
Blogg, 2021-10-18: Charlotte Sundvall, hållbarhetsansvarig på RF; "Minskade utsläpp och ökad tillgänglighet inom idrottsrörelsen"	Blog post	
Framgångsexempel, maj 2021 – Byggde optimistjollar med insamlad plast	Other	
Framgångsexempel, september 2021 - Ettan fotboll tar "Hållbarhetsmatchen"	Other	
Framgångsexempel, december 2021 - Ridsport på naturens villkor	Other	
Fredman, P. (2021). Presentation av Mistra Sport & Outdoors för Mistras styrelse, 2021-12-08.	Presentation	
Fredman, P. (2021). Presentation av Mistra Sport & Outdoors på Svenska fjälledarorganisationens årsmöte, 2021-05-30.	Presentation	

Fredman, P. (2021). Presentation av Mistra Sport & Outdoors för Naturmiljöenheten, Miljödepartementet, 2021-05-03.	Presentation	
Fredman, P. (2021). Presentation av Mistra Sport & Outdoors för Myndighetsnätverk för friluftsliv, 2021-02-12.	Presentation	
Fredman, P. (2021). 'Besöksförvaltning – Färre konflikter med upplevelsen i fokus!' Presentation på LU Land frukostseminarium, Lund University, 2 juni, 2021.	Presentation	
Fredman, P. (2021). 'Friluftsliv och hållbar utveckling genom samverkan'. Presentation på Luften är Fri, slutkonferens friluftslivets år, Åre, 7 december, 2021.	Presentation	
Fredman, P. (2021). 'Friluftslivet före och efter pandemin'. Lecture at the Swedish national radio (Utbildningsradion), Aug. 2021.	Teaching activity	
Fredman, P. (2021). 'Hållbar naturturism, friluftsliv och idrott – före, under och efter Covid-19'. Presentation på Outdoordestination Vänern, 21 oktober, 2021.	Presentation	
Fredman, P. (2021). 'Vi har blivit många i naturen! Och vad gör vi åt det?' Presentation på Tankesmedja för friluftsliv, Naturvårdsverket, Sept. 7, 2021.	Presentation	
Fredman, Peter, Klas Sandell, Marie Stenseke, Sverker Sörlin (2021). "Pandemin har visat att vi behöver stärka friluftslivet", DN Debatt 2021-06-26.	Debate article	
Mistra Sport & Outdoors, Årsrapport 2020. www.mistrasportandoutdoors.se/Publikationer/	Report	
Webbinarium, Mistra Sport & Outdoors 2021-02-10: Idrotten, friluftslivet & covid-19. Ett webinarium om ändrade vanor och framtida beteenden.	Webinar	
Webbinarium, Mistra Sport & Outdoors 2021-05-05: Grönare gräs på andra sidan? Ett webinarium om hållbarhet inom konstgräs från ett policyperspektiv.	Webinar	
Webbinarium, Mistra Sport & Outdoors 2021-09-14: Material inom idrotten och friluftslivet. Ett webinarium om vägar till mindre miljöpåverkan.	Webinar	
Webbinarium, Mistra Sport & Outdoors 2021-11-30: Miljömässig hållbarhet i skolämnet idrott och hälsa. Ett webinarium med fokus på hur miljömässig hållbarhet kan bli en del av undervisningen inom idrott och hälsa.	Webinar	
Webbinarium, Sustainable Fashion Week, 2021-10-11: Cirkulära initiativ i friluftsbanschen	Webinar	
10 learning-teams are established and have started working with "knowledge" and "finding solutions" to the challenges identified. Nine out of ten learning groups have started their study activities, digital meetings about the results and co-operation about the study results.		
Additional outcome (where Mistra Sport & Outdoors is a minor contributor)		
Lundberg, E., & Andersson, T. D. (2021). Subjective Well-Being (SWB) of Sport Event Participants: Causes and Effects. Event Management, 26(1). DOI.	Scientific research article	5

Deliverables for year 2022	Type of deliverable	Theme
Publications		
Hansen, A. S., Beery, T., Fredman, P., & Wolf-Watz, D. (2022). Outdoor recreation in Sweden during and after the Covid-19 pandemic—management and policy implications. Journal of Environmental Planning and Management, 1-22.	Article	
Hedenborg, S., Fredman, P., Hansen, A. S., & Wolf-Watz, D. (2022). Outdoorification of sports and recreation: a leisure transformation under the COVID-19 pandemic in Sweden. Annals of Leisure Research, 1-19.	Article	
Fredman, P., Bäckström, M., Frimodig, C., Ioannides, D., Larsson, A., Pettersson, R., Stenseke, M., Sörlin, S. & Wåger, S. (2022). Co-creating sustainable solutions in outdoor recreation and sports. In: Liviņa, A., Klepers, A. (eds.) The 11th Conference on Monitoring and Management of Visitors in Recreational and Protected Areas (MMV), Book of abstracts. pp. 233.	Scientific conference paper	
Hedenborg, S. & Svensson, D. (2022). Idrottsrörelsen och coronakrisen – Ställa in, ställa om, ställa upp. In: Statens stöd till idrotten – uppföljning 2021, 2022:1, ed. Johan R Norberg. Stockholm: The Swedish Research Council for Sport Science, pp. 125-138.	Scientific book chapter	1
Backman, E (2022). Konstgjorda idrottsanläggningar - Konsekvenser för utövare och miljö. I: Norberg, J., Dartsch Nilsson, C., & Philblad, J. (red) Idrottsanläggningar – idag och imorgon: om behov, tillgänglighet och konkurrerande intressen. Centrum för idrottsforskning. Elanders Sverige AB. pp. 107-119.	Scientific book chapter	1
Backman, E. & Svensson, D. (2022). Where does environmental sustainability fit in the changing landscapes of outdoor sports? An analysis of logics of practice in artificial sport landscapes. Sport, Education and Society.	Article	1
Hedenborg, S.; Svensson, D. & Radmann, A. (2022). Global challenges and innovations in sport: effects of Covid-19 on sport. Sport in Society	Article	1
Andersson, K., Jansson, A., Hedenborg, S., & Svensson, D. (2022). Changes in physical activity in Sweden during covid-19: a comparative cross-sectional analysis, presented at the European College of Sport Science (ECSS), 1st September 2022, Sevilla, Spain.	Conference	1
Sörlin, S. (2022). Nature, Skiing and Swedish Nationalism. In: Tribal Identities: Nationalism, Europe, Sport, ed. James A. Mangan (London: Routledge), pp. 147-163.	Scientific book chapter	1
Svensson, D.; Saltzman, K. & Sörlin, S. (eds.) (2022). Pathways: Exploring the Routes of a Movement Heritage. Cambridge: White Horse Press.	Scientific book	1
Svensson, D., Saltzman, K. & Sörlin, S. (2022). Movement Heritage and Path Dependence: Layering the Past. In: Pathways: Exploring the Routes of a Movement Heritage, eds. Daniel Svensson, Katarina Saltzman & Sverker Sörlin. Cambridge: White Horse Press, pp. 1–30.	Scientific book chapter	1
Svensson, Daniel (2022). 'Träningslandskapet: Anton Santessons försök till reformering av linggymnastiken och några tankar om dess betydelse för svensk idrott'. In: Tvärsnitt: Historiska perspektiv från Malmö universitet/Cross-Sections: Historical Perspectives from Malmö University, eds. Joakim Glaser, Julia Håkansson, Martin Lund & Emma Lundin. Malmö: Malmö University Press, pp. 235-250.	Scientific book chapter	1
Book, K., Andersson, K and Hedenborg, S (2022). "New Spatial Practices in Organised Sport following Covid-19: the Swedish Case, Sport in Society, 1343-1358.	Article	1
Legeby, A., Koch, D., Duarte, F., Heine, C., Benson, T., Fugiglando, U., Ratti, C., (2022). New urban habits in Stockholm following COVID-19. Urban Studies	Article	2

Skriver Hansen, A. (2022). Outdoor recreation and Covid-19 - post pandemic consequences for nature area planning and management, PLANNORD, Aalborg, 24-26 August 2022.	Scientific conference	3
André, H. and A. Björklund, (2022). Towards a Conceptual Framework for Analyzing Circular Product-User Life Cycles: Learnings from the Sport and Outdoor Sector. Procedia CIRP, 105: 225-230.	Article	4
de Bernardi, C., & Waller, J. H. (2022). The conflicts of greener grass: the regulation of artificial turf in Sweden, ECSS Congress, Seville, Spain	Conference Presentation	4
Margaryan, L. & Eriksson, A. (2022). 'Invisible' impacts and hybrid spaces of nature-based events: The case of a trail running marathon Fjällmaraton in Sweden, in V. Ziakas & D. Getz (red). Pedagogic Cases for Event Management and Event Tourism. Goodfellow Publishers. (In print).	Scientific book chapter	5
De Bernardi, C., & Waller, J. H. (2022). A quest for greener grass: Value-action gap in the management of artificial turf pitches in Sweden. Journal of Cleaner Production, 380, 134861.	Article	6, 4
Eriksson, Axel, Pettersson, Robert & Wall-Reinius, Sandra. 2022. Sport, events and organised outdoor activities - environmental considerations in permission processes. 30th Nordic Symposium on Tourism and Hospitality Research. Provoo, Finland, 26-29 September 2022.	Conference Presentation	3, 5
Other outcome		
Backman, E., & Isgren Karlsson, A. (2022). Miljömässig hållbarhet i skolämnet idrott och hälsa. Workshop vid Idrotts- och hälsokonventet på Gymnastik- och idrottshögskolan, Stockholm, 31 okt-1 nov 2022.	Workshop	1
Hedenborg, S. (2022) Green sports? Sport organizations work and challenges for an environmentally sustainable future. Keynote at SVEBI, Malmö, 14-15 jun, 2022.	Keynote	1
Larneby, M., Radmann, J. & Hedenborg, S. (2022). Comprehensible and meaningful, but complex to manage. Swedish sport federations' work with environmental sustainability, presented at the European College of Sport Science (ECSS), 1st September 2022, Sevilla, Spain.	Presentation	1
Liubov, T. (2022). Reordering Nature: friluftsliv, women's emancipation & spatial planning. Department of History of Ideas, presentation at the Higher seminar, Umeå University, March 14.	Presentation	1
Svensson, D. (2022). Sport, Performance and Sustainability: Perspectives from Mistra Sport & Outdoors', presented February 15 th , 2022, at the Department of Food and Nutrition and Sport Science, University of Gothenburg (online).	Presentation	1
Svensson, D. (2022). Sport, performance and sustainability, presented 15th June 2022 at SVEBI annual conference, Malmö University.	Presentation	1
Svensson, D., Backman, E. & Hedenborg, S. (2022). Same Planet, Different Ball Parks? Exploring Intersections between Sport and Environmental History' (with Erik Backman & Susanna Hedenborg), Online Roundtable, presented 4th July 2022 at ESEH Bristol.	Presentation	1
Sörlin, S. (2022). "An Integrative Field in the Integrative Humanities – emerging dimensions of the History of Sport", opening keynote lecture, Annual conference of the International Society for the History of Physical Education and Sport (ISHPES), Norwegian School of Sport Sciences, Oslo, June 29 th 2022.	Keynote	1
Isgren Karlsson, A. (2022). Idrottslärares syn på och attityder till digital teknologi i friluftsliv. Presented at Kroppsøvningsfaget og Idrettsfag i bevegelse – perspektiver og konsekvenser, NIH	Conference presentation	1
Isgren Karlsson, A. (2022). Physical education teachers' perceptions and attitudes towards digital technology in outdoor education. Presented at BERA, Liverpool.	Conference presentation	1

Svensson, D. (2022). Studio Ett, SR P1, on the effects of covid-19 on Swedish sports, January 11, 2022.	Radio talk	1
Sörlin, S. (2022) SR P1 Radio. "Annandag jul-morgon", theme on snow. 2022-12-26, 90 min.	Radio talk	1
Svensson, D. (2022). ISHPES Roundtable Greening Sport, online, 10 September 2022. Organized by ISHPES and Hokkaido University.	Online presentation	1
Svensson, D. (2022). Review of Sport and Sustainable Development: An Introduction (Stavros Triantafyllidis & Cheryl Mallen, eds., Abingdon, Oxon: Routledge 2022), reviewed in Idrottsforum.org/Nordic sport science forum, 2022.	Book review	1
Svensson, D. (2022). Review of Idrett og bærekraft: Perspektiver på miljø- og samfunnsansvar i idrettens organisasjoner [Sport and Sustainability: Perspectives on Environmental and Societal Responsibilities in Sport Organizations] (Dag Vidar Hanstad, Morten Renslo Sandvik & Anna-Maria Strittmatter, eds., Bergen: Fagbokforlaget, 2021), reviewed in Idrottsforum.org/Nordic sport science forum, 2022.	Book review	1
Larneby, M., Radmann, J. & Hedenborg, S. (2022). Startskottet har gått – Specialidrottsförbundens arbete med ekologisk hållbarhet. (Rapport 2022:1). Mistra Sport & Outdoors.	Report	2
Larsson, A. Legeby, A., Gil, J., Abrahamsson, O. (2022) Från goda idéer till gemensamma forskningsfrågor - Kartläggning av det första steget i samverkansprocessen inom Mistra Sport & Outdoors Tema 2 – Hållbara transportlösningar (Rapport 2022:2)	Report	2
Larsson, A (2022) Presentation på seminarium kring idrott och hållbarhet på SKRs konferens: Mötesplats samhällsbyggande, Moderna Museet, Stockholm den 21 Juni 2022.	Presentation	2
Larsson (2022) Presentation av arbetet med hållbart resande till friluftslivsplatser i Mistra Tema 2. Vårmöte med det nationella nätverket för regional planering, friluftsliv och hållbart resande. Digitalt möte den 29 Mars 2022.	Presentation	2
Larsson Anders (2022) Presentation hållbart resande och friluftsliv. Länsstyrelsens i Västra Götaland regionala friluftsråd. Digitalt möte 22 September 2022.	Presentation	2
Larsson, Legeby & Gil (2022) Presentation på webinarium om hållbarhet och idrott arrangerat av Stockholm Climate Action Center och Svenska Olympiska kommittén den 17 februari 2022	Webinar	2
Simon-Bellamy, Carine. 2022. Visitor perspectives and experiences on outdoor recreation impacts, planning and management: A case study of the Jämtland triangle, Sweden. Mastersuppsats, Mittuniversitetet	Maser thesis	3
Jonsson, A & Rihm, J. 2022. I skuggan av friluftslivet. En studie kring det kust-marina friluftslivets miljöpåverkan och möjliga åtgärdsstrategier för ett hållbart friluftsliv. Kandidatuppsats i geografi, Göteborgs universitet.	Bachelor thesis	3
Abrahamsson, O. 2022. Halvtidsseminarium: Planning for sustainable temporary encounters: Walking as recreation in the Anthropocene. Göteborgs universitet, 8 december 2022.	Seminar	3
Abrahamsson, O. 2022. Vistelser till fots i det tätortsnära (skogs)landskapet: De tillfälliga upplevelsernas betydelser. Skogsstyrelsen, 27 oktober, digitalt.	Presentation	3
Abrahamsson, O. 2022. Walking with non-humans: Exploring meaningful encounters during excursions to recreational landscapes. Gothenburg Global Biodiversity Centre, 27 juni, digital	Presentation	3
Abrahamsson, Oskar. 2022. Walking with non-humans: Exploring meaningful encounters during excursions to recreational landscapes. The 9th Nordic Geographers Meeting. Joensuu, Finland, 19-22 juni 2022.	Presentation	3
Andersson, E. 2022. Gröna lapptäcken, deras ekologi och förvaltning. Kunskapsseminarium om funktionell grön infrastruktur i urbana miljöer och tätortsmiljöer. Länsstyrelserna och SLU, 26 november 2022, Alnarp.	Seminar	3

Ankre, R, Sandberg, M, Skriver Hansen, A, Beery T. Wolf-Wats, D. 2022. Samverkan och miljöpåverkan i rekreationslandskapen – utmaningar och möjligheter, Mittuniversitetet och forskningstemat "Hållbar användning av mark och vatten" i Mistra Sport & Outdoors. 11 april 2022, hybrid	Presentation	3
Ankre, R. 2022. The average visitor doesn't exist – visitor monitoring in nature-based areas. Gästföreläsning 15 september 2022 på doktorandkursen "Advances in Tourism-related Resources" (ansvarig Dimitri Ioannides).	Teaching activity	3
Borgström, S., Andersson E. & Andersson H. (2022). Rekreationsekologi. En kunskapsöversikt. Seminarium och workshop med Naturvårdsverket, 23 augusti 2022, digitalt.	Seminar and workshop	3
Eriksson, A. 2022. Halvtidsseminarium: The fine balance of nature - Perceptions of Environmental Impact of Nature-based Events. Mittuniversitetet, 23 September 2022.	Seminar	3
Kotze, Shelley & Abrahamsson, Oskar. 2022. Walking as a pedagogical tool in higher education: Moving beyond COVID-19. The RGS-IBG Annual International Conference 2022. Newcastle, Storbritannien, 30 augusti-2 september 2022. Digitalt.	Presentation at conference	3
Andersson, A., Andersson H., samt övriga kollegor från tema 3. (2022). Webbinarium: Friluftsliv, naturvård och naturvärden. Mistra Sport and Outdoors, 15 mars 2022.	Webinar	3
Eriksson, A. 2022. Webbinarium 13 september om hållbara evenemang där Axel Eriksson presenterade studien som genomförs tillsammans med Robert Pettersson och Sandra Wall-Reinius.	Webinar	3
Ankre, R. 2022. Hur kan vi designa ett hållbart friluftsliv som är tillgängligt för alla? Panelsamtal, 15 okt 2022 Jamtli, Östersund: www.sustainableoutdoor.se	Panel discussion	3
Workshop med Lärandegrupp och Länsstyrelsen Jämtlands län för att synliggöra resultat och diskutera bedömningar av organiserat friluftsliv och event i naturområden. 21 november, Mittuniversitetet, Campus Östersund. Arrangörer Sandra Wall-Reinius, Axel Eriksson, Robert Pettersson, Åsa Sund samt Nils Sundqvist, Katharina Amundsson, Annelie Johansson, Annica Idestrom vid Länsstyrelsen Jämtlands län.	Workshop	3
Fyra samkunskapande workshops med lärandegruppen peri-urban där kunskap utbyts och utvecklats gemensamt: 16 mars – val av geografiskt studieområde samt beslut om principer för samkunskapande. 20 juni – Fältbesök i studieområdet, diskussion om lösningar och målkonflikter. 26 september – Intressentanalys. 17 november – Landskapsanalys.	Workshops	3
Västerhavsveckan, studentarbete + poster 20220811-12: Andreas Skriver Hansen, Angeline Jonsson och Johanna Rihm pratar om hållbart friluftsliv.	Presentation	3
Biologisk mångfald, samhället och människor LRF, 220411.	Presentation	3
Scenariovandring vid Naturvårdsverkets tankesmedja för friluftsliv 10 november 2022 (medarrangör)	Activity at conference	3
André, H. & Swenne, L. 2022. Environmental impact and sustainable development potential of SOD activities in Sweden. Product Lifetimes and the Environment (PLATE), 31 May-2 June, Aalto University, Finland.	Presentation at conference	4
14 september. John Armbricht & Erik Lundberg, Consumption behavior among involved runners. CFT-seminarium, Göteborg.	Seminar	5
23 september. Axel Eriksson, vetenskapligt seminarium (halvtidsseminarium); The fine balance of nature - Perceptions of Environmental Impact of Nature-based Events. Campus Östersund.	Seminar	5
28 september Erik Lundberg på 30th Nordic Symposium of Hospitality and Tourism Research.	Presentation at conference	5
28 september John Armbricht på 30th Nordic Symposium of Hospitality and Tourism Research.	Presentation at conference	5

28 september Axel Eriksson och Robert Pettersson på 30th Nordic Symposium of Hospitality and Tourism Research.	Presentation at conference	5
29 mars 2022 – Robert presenterar på temat Hållbara evenemang i webinar "Leder, evenemang och turism" (slutkonferens för LET-projektet). Visit Värmland.	Webinar	5
6 april. Robert föredrag under programdag MISTRA; Innovation.	Presentation	5
9 april. Robert deltar i SLAOs branschdagar och diskuterar bland annat fossilfri skidåkning med Svante Axelsson från Fossilfritt Sverige. LinkedIn.	Meeting	5
9 september. Robert pratar attraktiva och hållbara evenemang på seminarium "Näringslivsbolaget i Sundsvall on tour. Sundsvall.	Seminar outside academia	5
13 september. MISTRA Webinar via live-sändning.	Webinar	5
Workshop med Länsstyrelsen i Jämtlands län kring processen runt tillståndsgivning av evenemang i naturmiljö.	Workshop	5
De Bernardi, C. & Waller, J. H. 2022. The grass is always greener in the neighbour's turf - A study of actors working with artificial turf in Sweden. Oral online presentation at the CCTR22 (Seventh International Conference on Climate, Tourism and Recreation), 2 March 2022	Presentation at conference	6
De Bernardi, C. & Waller, J. H. 2022. The Conflicts of Greener Grass: The Regulation of Artificial Turf in Sweden. Poster presentation in person at the ECSS Sevilla 2022 (European College of Sport Science Annual Congress), 31 Aug 2022.	Presentation at conference	6
Ioannides, D. 2022. The effects of Covid-19 on Sweden's peripheral regions: A recipe for overtourism? Oral presentation at the International Geographical Union meeting, Paris, 20th July 2022.	Presentation	6
Ioannides, D. 2022. Can outdoor recreation in remote areas be environmentally sustainable? Oral presentation at the International Polar Tourism Research Network meeting, Ushuaia (Argentina), 10th April 2022.	Presentation	6
De Bernardi, C. & Waller, J. H. Value-action gap" och konstgräs: därför är det inte alltid så lätt att göra rätt. Online muntlig presentation på Beställargruppens slutkonferens i Malmö. 30 Nov 2022.	Presentation at conference	6
Fredman, P. 2022. Co-creation between academia and society for more sustainable sports and outdoor recreation. A discussion seminar based on experiences from the Swedish Mistra Sport & Outdoors program. Swiss Federal Institute for Forest, Snow and Landscape Research, WSL, Zurich Switzerland, 2022-04-28.	Seminar	
Fredman, P. & Swenne, L. 2022. Vad är MISTRA Sport & Outdoors och hur kan friluftslivet bidra till en mer hållbar framtid? Presentation på ordförandeträff Svenskt Friluftsliv, 2022-02-08.	Presentation	
Fredman, P. 2022. Monitoring hikers in Sweden with the OutdoorMap. Lecture at Research Network on New Technologies applied for Hiking, Universidad Católica de Valencia San Vicente Mártir, Grupo Investigación Deportes De Montaña: Salud, Inclusión y Sociedad. 2022-10-21.	Teaching activity	
Webbinarium 15 mars 2022: Friluftsliv, naturvård och naturvärden – ett webinarium om en relation i förändring	Webinar	
Webbinarium 11 maj 2022: Startskottet har gått – hur tar vi miljöarbetet vidare inom idrotten och friluftslivet?	Webinar	
Webbinarium 13 september 2022: Arrangörer, deltagare och besökare - Hur kan vi skapa hållbara evenemang inom idrotten och friluftslivet?	Webinar	
Webbinarium 15 november 2022: Ingen bil, inget friluftsliv? Om hållbar tillgänglighet till friluftsliv i vardagen	Webinar	
Blogg: Maria Strandberg, direktör på STERF; Golfbanan som klassrum – ett sätt att lära oss sätta värde på naturen	Blog post	
Blogg: Daniel Svensson, forskare; "Environmental turn" inom idrotten	Blog post	

Blogg: Åsa & Åsa, hållbarhetskonsulter; Tio tips till ökad miljömässig hållbarhet för idrottsföreningar och evenemangsarrangörer	Blog post	
Blogg: Kersti Beck Larsson, företagare; "Naturturism och hållbarhet"	Blog post	
Blogg: Marie Larneby, forskare; Startskottet har gått! Om storslalomåkande 10-åringar och miljömässig hållbarhet i svensk idrott	Blog post	
Blogg: Erik Lundberg, forskare; Från Olympiska spel till den lokala skidtävlingen	Blog post	
Framgångsexempel: Framgångsexempel - Patagonia, den motsträviga klädtillverkaren	Other	
Framgångsexempel: Sportfiskarna jobbar med påverkan för bättre vattenmiljö och ett mer hållbart fiske	Other	
Framgångsexempel: Samverkan mellan forskning och praktik för att möta golfens hållbarhetsutmaningar	Other	
Debattartikel i Altinget, 31 augusti: "Så kan idrotten bli mer ekologiskt hållbar", https://www.altinget.se/artikel/saa-kan-idrotten-blir-mer-ekologiskt-haallbar	Debate article	
Larsson, Legeby & Gil (2022) Presentation på webinarium "Ingen bil inget friluftsliv?" inom Mistra Sport & Outdoors den 15 november 2022	Webinar	
Additional outcome (where Mistra Sport & Outdoors is a minor contributor)		
Svensson, D. (2022). Finnskogsleden 30 år, with Monica Björklund, Louise Brunborg-Naess and Olov Henriksson, at Torsby Finnskogcentrum, May 11th 2022.	Presentation of study	1
Svensson, D. (2022). Landscapes of performance: the role of local geography and history in performance tests of Swedish ski talents, presented 30th June 2022 at ISHPES Congress, Sport and History: Continuity and Change, June 29-July 2, 2022, Oslo, Norway.	Presentation at congress	1
Svensson, D. (2022). Rörelsearvet: Stigar och leder som kulturarv, at Hindås station, June 13th 2022.	Lecture	1
Svensson, D. (2022). Träningslandskapet: Anton Santessons försök till reformering av Ling-gymnastiken, presented 9th August 2022 at Nordiska historikermötet, Göteborg.	Presentation	1
Sörlin, S. (2022). På skidor i kulturella gränsland. Rec. av Isak Lidström, På skidor i kulturella gränsland: Samiska spår i skidsportens historia, diss., Historisk Tidskrift, vol. 142, no. 1, pp. 87-93.	Article	1
Sörlin, S. (2022). Faculty Opponent on public defense, June 22, 2022 of: Gudmund Skjeldal, «Kjærlighet», «Sportsgrubbe», og «Cirkusartister»: Amatørførestillingar i norsk idrettsoffentlegheit 1866–1907. PhD diss. (Oslo: Norwegian School of Sport Sciences), Oslo, June 22nd 2022.	Faculty opponent	1
Larsson, A., Elldér, E., Vafeidis, E., Curtis, C., Sterner, A. (2022) Exploring the potential for sustainable accessibility across settlement types. A Swedish case. Transportation Research Part D: Transport and Environment, 107, 103297	Article	2

Deliverables for year 2023 (until Nov 1)	Type of deliverable	Theme
Publications		
Larneby, M. (Submitted). 'I Live With and By Nature.' Swedish Professional and Lifestyle Alpine Skiers' Narratives on Skiing, Nature, and Snow from the 1960s to 2023. Sport History Review.	Article (submitted)	1
Larneby, M., Hedenborg, S., Fredman, P. & Radmann, J. (Submitted). For nature, performance, and competition. Swedish sport federation and outdoor recreation organizations' work with environmental sustainability. Annals of Leisure Research.	Article (submitted)	1
Larneby, M. (2023). School sport education and sustainability: Towards ecological and inclusive student-athletes? In (eds.) D. Svensson, E. Backman, S. Hedenborg and S. Sörlin. Sport, Performance and Sustainability. Chapter 8. Routledge.	Scientific book chapter	1
Svensson, D., Backman, E., Hedenborg, S. & Sörlin, S. (eds.) (2023). Sport, Performance and Sustainability. London: Routledge. Open access at Routledge.	Book	1
Isgren Karlsson A, Alatalo T, Nyberg G & Backman E (2023) Exploring physical education teachers' perceptions and attitudes towards digital technology in outdoor education, Journal of Adventure Education and Outdoor Learning, 23:4, 510-524	Article	1
Isgren Karlsson A & Backman E (2023) Environmental Sustainability in Physical Education. A Study of Physical Education Teachers' Perceptions and Attitudes Towards Environmental Sustainability in Physical Education. In: (Eds) Daniel Svensson, Erik Backman, Susanna Hedenborg, Sverker Sörlin, Sport, Performance and Sustainability, Taylor and Francis, s. 109-130.	Book chapter	1
Backman E, Svensson D & Danielski I (2023) The Changing Landscape of Sport Facilities. Consequences for Practitioners and the Environment, In: (Eds) Daniel Svensson, Erik Backman, Susanna Hedenborg, Sverker Sörlin, Sport, Performance and Sustainability, Taylor and Francis, s. 50-66.	Book chapter	1
Svensson, D. (2023). Landscapes of performance: using local geography for the testing of sport school pupils in Sweden, 1971-2023.	Article (submitted)	1
Svensson, D. (2023). Coaching during covid: coaches' perspectives on pandemic effects on training at Swedish ski schools. Sport in Society (in review).	Article (submitted)	1
Carlsson, J. (2023). Environmental Sustainability in a Fast-Emerging Sport – The sportification of padel. I Svensson, D. edt, Backman, E. edt, Hedenborg, S. edt, & Sörlin, S. edt. Sport, performance and sustainability. Routledge.	Book chapter	1
Backman E, Larneby M, & Rudelius R (submitted), Should environmental sustainability be a part of physical education? Analysing Swedish teachers' voices through a Bernsteinian perspective. Sport, Education and Society	Article (submitted)	1
Abrahamsson, O. 2023. Sustainable travels for outdoor recreation? More than just a matter of transportation. Conference proceedings. 31 Nordic Symposium on Tourism and Hospitality Research-Book of Abstracts. pp 218-222.	Conference proceeding	2, 3
Ankre, R., Wall-Reinius, S. & Olausson, F. (2023). Where do we find strategic planning for sustainable outdoor recreation? An analysis of planning practices of five Swedish mountain municipalities. Conference proceedings. 31 Nordic Symposium on Tourism and Hospitality Research-Book of Abstracts. pp 201-204.	Conference proceeding	3
Eriksson, A. & Balslev Clausen, H. 2023 Nature always recovers! A degrowth perspective on environmental impact of nature-based events, seen from the participants' perspective.	Article, accepted	3
Jacobsson, Oscar (2023). Vision and reality. Municipal planning, outdoor recreation and nature conservation on the islands of Marstrand, Sweden. 31 Nordic Symposium on Tourism and Hospitality Research-Book of Abstracts. pp 195-198	Conference proceeding	3

Otto, J., Borgström, S., Haase, D. & E. Andersson. (Forthcoming). Capturing resident's perceptions of green spaces in densifying urban landscapes - the potentials of mental mapping. Urban Forestry & Urban Greening.	In press.	3
Stenseke, M. 2023. Towards a sustainable use of land and water? 2030 scenarios for outdoor recreation and sports. 31 Nordic Symposium on Tourism and Hospitality Research-Book of Abstracts. pp. 203-206	Conference proceeding	3
André, H., Björklund, A., 2023. A framework to open the black box of the use phase in circular economy life cycle assessments: the case of shell jacket reuse. Journal of Industrial Ecology 27(4).	Article	4
André, H., Swenne, L., 2023. Secondhand shell jackets are better than users think: A comparison of perceived, assessed and measured functionality throughout lifespans, Product Lifetimes and the Environment (PLATE). Aalto University, Helsinki, Finland.	Conference Presentation	4
Backman, Erik, Daniel Svensson, and Itai Danielski. "The Changing Landscape of Sport Facilities: Consequences for Practitioners and the Environment." (2023): 50-65.	Book chapter	4
Eriksson, A. (2023). 'If they touch our cloudberry, that means war': Rural liveability and acceptance of environmental impacts from event tourism. In: Tourist Studies, 14687976231200902. pp 1-18.	Article	5, 3
Nilsson, K., Nilsson, L., forthcoming. A review of opportunities and obstacles of introducing a performance-label for secondhand technical garments. Mid Sweden University. Manuscript.	Submitted Article	4
Nilsson, L., forthcoming. Functionality over time of shell jackets and membrane laminates: A case study of 16 secondhand shell jackets from three Swedish outdoor secondhand stores. Manuscript.	Submitted Article	4
André, H. (forthcoming). Opening the black box of the use phase in circular economy life cycle assessments: environmental performance of shell jacket reuse. Manuscript.	Submitted Article	4
Eriksson, A., R. Pettersson and S. Wall-Reinius (2023). "Environmental concerns in nature-based events: the permitprocess for organised outdoor recreation and sport", in: Scandinavian Journal of Hospitality and Tourism, pp 1-19.	Article	5, 3
Lanzendorf, T., & Margaryan, L. (2023). Environmental Leverage through Sport Event Portfolios. In J. Whitfield, M. Gouthro, & M. Moital (Eds.). The Routledge Handbook of Events and Sustainability. Routledge.	Book chapter	5
Winell, E., Armbrrecht, J., Lundberg, E. and Nilsson, J. (2023). "How are fans affected by the commercialization of elite sports? A review of the literature and a research agenda", in: Sport, Business and Management, Vol. 13 No. 1, pp. 118-137.	Article	5
Fredman, P. (2023) A framework for indicators of recreational values in forests. Presentation at 31st Nordic Symposium on Tourism and Hospitality Research, Östersund, Sweden September 19-21, 2023	Conference proceeding	
Presentation by Axel Eriksson at the 31st Nordic Symposium on Tourism and Hospitality Research. How Environmental Impacts from Events become Accepted and Arguments to move beyond the Triple Bottom Line sustainability.	Conference Presentation	5, 3
Presentation by Research Tommy D Andersson, John Armbrrecht and Erik Lundberg at the 31st Nordic Symposium on Tourism and Hospitality. Needs motivation and intentional activities in an event context.	Conference Presentation	5
Presentation by Martin Wallstam, Kai Kronenberg and Robert Pettersson at the 31st Nordic Symposium on Tourism and Hospitality Research. Non-use value as a means for policymakers to make sense of the social value of events	Conference Presentation	5
Presentation by Axel Eriksson & Oskar Abrahamsson at the 31st Nordic Symposium on Tourism and Hospitality Research. Phenomenology of environmental impact during nature-based events.	Presentation at conference	5, 3, 2

Other outcome		
Pettersson, Robert, Eriksson, Axel, Lanzendorf, Tami (2023) En guide till miljömässiga effekter av evenemang	Report	3
Stenseke et al. (2023): På väg mot en hållbar användning av mark och vatten inom idrotten och friluftslivet år 2030? Ett scenarioarbete med åtgärdsförslag. MISTRA Sport & Outdoors, 2023:2	Mistra Sport and outdoor report	3
Stenseke, M. 2023. Managing landscape values and nature's contributions to people. Changing heritage landscapes. Contemporary challenges confronting conservation and tourism beyond the nature-culture dicotomy, Seminar series at the University of Padua	Invited speaker	3
Stenseke, M. 2023. Naturens värde - för vem och ur vilket perspektiv? Knivstakonferensen, The Uppsala Country administration board	Invited speaker	3
Wall-Reinus, S., Borgström, S., Stenseke, M., Ankre, R., Andersson, E., & Fredman, P. (2023). Environmental impacts from recreational activities: towards novel paths in spatial planning. Session organiser. Nordic Symposium on Tourism and Hospitality Research, September 2023, Östersund, Sweden	Session organiser	3
Wall-Reinius, S., & van den Brink, P. (2023). Rekreation och miljöpåverkan i fjällen. En sammanfattning av forskning om ekologiska effekter av friluftsliv, turism och sport. Report 2023:5, Mistra Sport & Outdoors, Mittuniversitetet	Report	3
Wall-Reinius, S & Nordin, S. Critical issues in governance of mountain tourism impacts in subarctic Sweden	Book chapter (submitted)	3
Waller, J. Durability of rain jackets - workshop session at Outdoor by ISPO trade fair, Munich 2023	Trade fair workshop	4
Bäckström, M. "Durability from different angles" Presentation and panel discussion on functionality and durability in rainwear at European Outdoor Summit, Berlin, 2023	Panel Discussion at Trade meeting.	4
Lanzendorf, T., Högemann, H. & Margaryan, L. (2023). Environmental impacts of events with a focus on orienteering. MISTRA Report 6.	Report	5
Robert Pettersson, Axel Eriksson (19 juli 2023) Press release about events and the permit process.	Press release	5
Axel Eriksson (31 juli 2023) News Feature Sveriges Radio SR Jämtland about the permit process	News feature radio	5
Axel Eriksson (31 juli 2023) News feature SVT Jämtland about the permit process	News feature TV	5
Axel Eriksson (31 juli 2023) News Feature Sveriges Radio SR Jämtland about O-ringen	News feature radio	5
Axel Eriksson (1 augusti 2023) News Feature Sveriges Radio SR Jämtland about damage to the ground and vegetation after O-ringen	News feature radio	5
Axel Eriksson (1 augusti 2023) Article in Länstidningen Jämtland about nature based events in Jämtland	Article in local news paper	5
Event Session hosted by Mistra researchers Tommy D. Andersson, John Ambrecht and Erik Lundberg during the 31st Nordic Symposium on Tourism and Hospitality Research, 19-21 Oct. 2023. Advancements in Event & Festival Research - a sustainable future 31st Nordic Symposium on Tourism and Hospitality Research.	Presentation at conference	5
Dialogue with the Swedish Orienteering Association and O-Ringen about studies during O-Ringen 2023	Other	5
de Bernardi, C., Linde, S. & Ioannides, D. (2023). Pro-environmental behaviour in sport and outdoor activities: A literature review. Mistra Sport & Outdoors Rapport	Report	6
Fredman, P. (2023) Besöksförvaltning – En spaning inåt och utåt. Presentation at Tankesmedja för friluftsliv, Naturvårdsverket, Stockholm, 2023-11-08.	Conference presentation	
Fredman, P. (2023) Mistra Sport & Outdoors. Presentation at Mistras träffpunkt i Almedalen, 2023-06-28.	Seminar	

Fredman, P. (2023) Skogens rekreativsvärden. En förstudie med förslag till indikatorer. Presentation at webinar, National Board of Forestry, 2023-05-08	Webbinar	
Fredman, P. (2023) Mistra Sport and Outdoors – vägar till ökad hållbarhet inom idrotten och friluftslivet. Lecture at Träffpunkt Idrott 2023-03-09.	Conference presentation	
Fredman, P. (2023) Skogens rekreativsvärden – några tankar och perspektiv för framtiden. Lecture at Kungl. Skogs och Lantbruksakademien, KSLA, 2023-02-16.	Seminar	
Fredman, P. (2023) Forskning om friluftsliv – nytta i praktiken! Lecture for Västskustiftelsen, 2023-02-10.	Webbinar	
Fredman, P., Siren, A., Lehto, C., Lindhagen, A. & Hedblom, M. 2023. Skogens rekreativsvärden. En förstudie med förslag till indikatorer. Skogsstyrelsen, rapport 2023/08.	Report	
Additional outcome (where MistraSport & Outdoors is a minor contributor)		
Lopes, F., Gil, J., & Stavroulaki, I. (2023). Simplified geodata models for integrated urban and public transport planning. AGILE: GIScience Series, 4, 1–9	Conference article	2
Ferreira & Larsson (2023) Towards accessibility planning 3.0 in Portugal (and elsewhere): a manifesto for change inspired by children's studies. disP-The Planning Review, 59 (1), 49-67	Scientific article	2
Legeby, A., & Pech, C. (2023). Social values and social infrastructures: a multi-perspective approach to place. Buildings and Cities, 4(1), pp. 801–816.	Article	2
Ankre, R. COASTREC project, www.telemarksforsking.no	Research project 2023-2025	3
Karestrand, A. (2023). Land use management in an indigenous rights context: Reindeer herding and tourism. Master thesis Center for sami studies. UiT the Arctic university of Norway	Master thesis	3
Stenseke, M. (2023). Diorama—An Opening for Addressing the Global Challenges. Tijdschrift voor economische en sociale geografie.	Scientific	3
Asah, S. T., Maris, V., Subramanian, S. M., Blahna, D. J., Stenseke, M., & Chacón-Cascante, A. (2023). Value exclusion in social–scientific approaches for assessing and valuing ecosystem features: Implications for behavioral compliance. BioScience, 73(9), 663-670.	Scientific	3
Fredman, P., Sievänen, T., Jensen, F.S., Gundersen, V., Wall-Reinius, S., Lexhagen, M., Lundberg, C., Sandell, K., Vistad, O.I. & Wolf-Watz, D. (2023). Approaches to foresight recreation and tourism in nature. In: Mandic, A. & Walia, S.K. (Eds.) The Routledge Handbook of Nature-based Tourism Development. Routledge, 584 p.	Scientific book chapter	

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