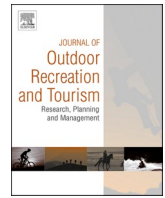




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# Covid-19 and outdoor recreation management: Increased participation, connection to nature, and a look to climate adaptation

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## ABSTRACT

Outdoor recreation management perspectives were investigated based on the general perception of increased public outdoor recreation participation during the Covid-19 pandemic and supported by survey research at local, regional, and national levels in Sweden. There is an interest in how outdoor recreation professionals perceived outdoor recreation by the public during the pandemic and whether professionals could identify specific implications from the Covid-19/outdoor recreation experience. Climate adaptation literature supports the idea that current global challenge coupled with projections for ongoing challenge requires a pro-active approach; this turn to climate adaptation for potential consideration or guidance is based on characteristics that the Covid-19 pandemic shares with climate change. Outdoor recreational professionals' review of a recent public survey and subsequent semi-structured interviews with this group were conducted to obtain outdoor recreation professionals' detailed perceptions on survey outcomes. Results show that the professionals confirm a rapid and significant increase in outdoor recreation participation. Further, professionals identified critical trends in the increase of new or inexperienced outdoor recreation participants. A positive and proactive list of implications emerged as themes of the interviews. A review and synthesis of the themes support the national goals for outdoor recreation in Sweden. Further, results indicate a current opportunity for outdoor recreation to address concerns for diminishing nature experience and support connectedness to nature. The connectedness to nature outcome further strengthens the comparison with climate adaptation strategy given the potential relationship between connectedness to nature and pro-environmental behavior.

## Management implications

In areas such as Sweden, where Covid-19 led to increased public participation in outdoor recreation, managers need to focus on key aspects of the increased public participation. Specific management implications include:

1. Serving the new and inexperienced users. Education and communication to guide new users are needed. Infrastructure must respond via providing adequate opportunity for basic outdoor recreation activities, for example, social gatherings in nature, grilling, and walking.
2. Proximate access for the public should be a priority. Addressing needs for immediately proximate outdoor recreation to the public is critical.

3. Facilitating connectedness to nature. The role that outdoor recreation managers play in making nature experience accessible to the public should be recognized as an important contribution to connection to nature efforts.

## 1. Introduction

Many of the societal changes brought about by the Covid-19 pandemic have been immediate, dynamic, and disruptive. This disruption has had a profound impact on the daily lives of billions of people (Giuntella et al., 2021). From health care to education to local and global markets, the pandemic has created rapid and significant change across all sectors of society. One key example is how daily patterns of life changed abruptly for so many (Haleem & Javaid, 2020); for example, one change in daily lifestyle patterns is mobility (Nouvellet et al., 2021). Many people have found themselves far more restricted to their

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residence and near home environments (Hale et al., 2021), and for some, this has resulted in a turn to nearby nature for recreation, exercise, and wellness (Koop, 2020; Randler et al., 2020).

Interest in a turn to nature during the challenge of Covid-19 is highly relevant to contemporary environmental social science as numerous fields of study have identified a current and ongoing concern about a diminished human experience of nature and the implications for this loss. This loss phenomenon has been referred to as *extinction of experience* and has been described as resulting in a decline in ways of learning and thinking about the natural world (Krasny, 2015; Miller, 2005; Nabhan, St. Antoine, Kellert, & Wilson, 1993; Pyle, 1993; Soga & Gaston, 2016; Thomashow, 2002). This concern for a loss of nature experience is at the heart of connectedness to nature study (Ives et al., 2017). Connectedness to nature (hereafter C2N) can be defined as the experience of and direct encounter with nature and the possible affective, cognitive, physical, and social elements that support a relationship between the individual and nature developing from these experiences (Beery & Wolf-Watz, 2014). With the onset of Covid-19 came observations from many locations that seemed to counter the trend of declining nature experience (Andersson et al., 2021; Derks et al., 2020; Grima et al., 2020; Skriver Hansen et al., 2021; McGinlay et al., 2020; Rose et al., 2020; Uchiyama & Kohsaka, 2020; van Leeuwen et al., 2020; Venter et al., 2020); this change of trend is of great interest to connectedness to nature research and practice.

Given observations that seemed to support this trend of turning to nature to adjust to the uncertainty and disruption of Covid-19, an explorative investigation was conducted. The explorative study used a local survey to investigate possible Covid-19 related changes in outdoor recreation behavior by residents of the Southern Sweden municipality of Kristianstad. The study was undertaken by two students in the Kristianstad University Landscape Science program. Questions were developed, in part, based on consultation with a survey underway in West Sweden (Skriver Hansen et al., 2021). The study data was collected in September 2020 using multiple online channels, including Facebook (including outreach to specific community Facebook groups), Instagram, hkr.se, and local newspaper and radio coverage promoting participation. Further, participants were encouraged to share the survey link, creating an additional snowball distribution effect. The researchers received a total of 967 completed surveys appropriate for analysis. Analyzed responses and descriptive statistics detailing changes in recreational habits among survey participants were reported (Rask Olsson & Vitestam, 2020). Specifically, the results of this survey indicated that one-third of residents reported a change in their outdoor recreation behavior from pre-Covid-19 behavior; survey participants who indicated a change in their outdoor recreation behavior described the changes as being out in nature for a longer time, being out more often, being out in new places, and being out with friends and family (Rask Olsson & Vitestam, 2020). In addition to information indicating increased participation, survey participants' preference for close-to-home activity was another essential outcome of the study. Eighty-four percent of all participants answered that the places most often visited for outdoor recreation during the pandemic were sites within immediate access to the home (yards and closely proximate green areas). Forty-seven percent indicated frequent visitation to sites within 30 min of residence, and 32% indicated frequent visitation to sites 30–60 min from home; sites further than 60 min from home were frequented by just 9% of survey participants (Rask Olsson & Vitestam, 2020). One additional finding of interest was the specific activity participation information indicating that 78% of participants identified "walking" as the most frequent outdoor recreation activity during the pandemic (the other top activities were: exercise—27%, beach recreation—23%, Garden work—21%, and picnic/grilling—20%) (Rask Olsson & Vitestam, 2020).

The key outcomes of the survey and concern about residents potentially missed by the survey (given social media and snowball sampling methods, results may have favored residents already highly

engaged in outdoor recreation) motivated this current study. The local survey results, coupled with a national Swedish survey (Andersson et al., 2021) and a regional study (Skriver Hansen et al., 2021), along with widespread popular press coverage of outdoor recreation participation during the pandemic, have created questions for outdoor recreation management. For example, the basic question as to whether managers experienced these outcomes in their work emerged. And further, interest in what kind of short and long-term implications from outdoor recreation management might result from the Covid-19 situation? Specifically, the following research questions were developed:

- RQ1. How do the experience and observations of outdoor recreation professionals align with the results of the public survey?
- RQ2. What observations and management actions provide perspective on nature-based outdoor recreation during the pandemic?
- RQ3. Do outdoor recreation professionals see implications for potential future changes in nature-based outdoor recreation patterns or management based on the pandemic?

This paper will present the research conducted to explore these questions and consider the outdoor recreation management implications. Three key elements will provide a background for this study:

1. Covid-19 related impacts in Sweden.
2. An investigation of recent outdoor recreation management study in Sweden.
3. A consideration of how the science of climate adaptation may be helpful for consideration during the highly dynamic time brought on by the Covid-19 pandemic.

## 2. Background

### 2.1. Covid-19 and Sweden

The global phenomenon of pandemic response has primarily been a matter of individual nations developing national policies. The World Health Organization (WHO) serves a worldwide coordination role; this individual nation response has also characterized the vaccination roll-out (Holder, 2021). Given this situation, it is important to consider the Swedish national response to Covid-19 as a part of the foundation for this study (Beery, 2020).

As of 04 May 2021, Sweden had reported 973 602 cases of Covid-19 and 14 048 deaths from the virus (WHOa, 2021). Given the high rate of infection and high death rate compared to its Nordic neighbors, the Swedish national response to Covid-19 has generated a great deal of international interest and scorn (Goodman, 2020; Savage, 2020). Sweden's largely voluntary approach has been seen as an outlier (Franssen, 2020), quite different from the strict lockdown approaches seen in many other countries, including significant differences in response compared to the other Nordic nations (Otmami, 2020). While specific guidelines have been established for public gatherings and restaurants/bars, the Swedish response to the pandemic has relied heavily upon voluntary social distancing guidelines (Public Health Agency of Sweden, 2020). For example, the promotion of working from home when possible, avoidance of unnecessary public transport use, and reduction of long-distance domestic travel are three measures that authorities have promoted. Swedish schools for children in preschool, elementary school, and middle school have all remained open. High school, vocational and university level education have instituted distance-based instruction (Ludvigsson et al., 2021). While guidelines have mainly been voluntary in a domestic context, entry regulations and travel restrictions have severely reduced travel to, from, and within Sweden during the pandemic (Ministry of Justice, 2020; Schengennisinfo, 2021; SR 2020).

## 2.2. Outdoor recreation context

The consideration of outdoor recreation during Covid-19 in a Swedish context must start with a review of the translation of outdoor recreation. The term *friluftsliv* is a Scandinavian language term that functionally translates in English to *nature-based outdoor recreation*. This definition provides a sense of the depth of the idea beyond simply a form of recreation, yet is an over-simplification (Beery, 2013); many definitions include a developmental dimension inclusive of a relationship with nature (Beery, 2013; Sandell & Öhman, 2010). This unique idea highlights a highly developed sense of the societal value of outdoor recreation, which is seen in the science and practice of outdoor recreation in Sweden; for example, a national policy for outdoor recreation exists in Sweden (Swedish Government Writ. 2012/13:51). As part of the policy, ten national goals have been established for guiding outdoor recreation planning and management decisions, for example, *Accessible nature for everyone*, *Accessible nature for outdoor recreation*, *Attractive urban nature*, *Accessible nature for outdoor recreation*, and even: *Good knowledge about outdoor recreation* (Sveriges Miljömål, 2021). This final goal highlights the need for research to support outdoor recreation, opportunity, planning, and management. Two practical examples of this supportive climate for research and practice can be seen in the yearly national “Think-tank for outdoor recreation” conference hosted by the Swedish EPA (Naturvårdsverket, 2021a), and the outdoor recreation information node, Outdoor Recreation Research at Mid Sweden University (Friluftsforskning, 2021).

This favorable context for research in outdoor recreation in Sweden has made for a rapid response to Covid-19. For example, the beginning of the MISTRA Sport and Outdoor research project coincided with the Covid-19 outbreak in Sweden and led to a flexible shift by the research team to take on Covid-19 questions as they emerged (Mistra, 2021). The MISTRA national survey found that outdoor recreation has increased since the outbreak of the Covid-19 pandemic: more than 50% of the respondents in the study state that they have visited nature more frequently during weekdays, and 45% note having increased their outdoor time also during weekends and longer holidays. Another part of the MISTRA project, a regional study in the west of Sweden (Västra Götaland), noted that 49% of their survey respondents indicated having experienced changes in their recreational habits during the pandemic (Skriver Hansen et al., 2021).

This key variable in the Swedish studies, an increased outdoor recreation visitation during Covid-19, appears to be widespread. A study of Europe Nature Protected Areas (including two Swedish national parks very close to the study area in this paper) reported increased visitation, with some sites experiencing an almost 100% increase in visitors on certain days relative to expectations for that time of year (McGinlay et al., 2020). McGinlay et al., 2020 also reported a changing profile of the user. In Germany, an influx of more and novice visitors to forest sites has been noted (Derks et al., 2020). A study from the Netherlands noted the growing popularity of self-organized outdoor leisure activities such as hiking, running, and cycling during the pandemic (van Leeuwen et al., 2020). In the American state of Vermont, new outdoor recreation users and emphasis on the importance of nature for people during Covid-19 have been observed (Grima et al., 2020; Morse et al., 2020). Increased visitation in Japanese parks has also been observed during the Covid-19 period (Uchiyama & Kohsaka, 2020). This sample of research indicates that the turn to nature and outdoor recreation is globally widespread. It is important to note that other reports are showing that Covid-19 restrictions may have had the opposite effect on outdoor recreation participation (Rice et al., 2020), reminding us that local, regional, and national guidelines/laws and response to those guidelines/laws during the pandemic may have varied considerably.

## 2.3. Climate adaptation as a guide

Given the novelty of the Covid-19 situation (MacGregor, 2020), with

few guides to help society adjust, manage, and plan, a turn to the science and practice of climate adaptation may support Covid-19 related outdoor recreation management strategy; this turn for potential support or guidance is based on some key characteristics that the Covid-19 pandemic shares with climate change. For example, both Covid-19 and climate change are global phenomena with distinct regional and even local manifestations, have anthropogenic aspects, are highly dynamic, have enormous economic implications, and pose severe threats to human health and well-being. See Table 1. While it is not the intention of this research to address the key metrics in Table 1, they are presented to make the case for how response to Covid-19 is well situated to learn from climate adaptation efforts. There exists research and review to consider how climate response can learn from efforts to tackle the Covid-19 pandemic (Cartier, K. M. S., 2020; Margulis, 2020), it is argued in this study that this learning can go the other direction as well.

As people worldwide hope for a post-Covid-19 era to begin, the question of what has changed and how we move forward in constructive ways emerges. Similarly, a positive-oriented approach to climate adaptation looks to the various specific challenges imposed upon a region or community by current and projected climate change (Aguilar et al., 2018) and asks the question: *what can we do to improve life today that may be able to make us more resilient in the future?* (Beery, 2019). Recreation managers can ask this same question regarding Covid-19. Both climate change and Covid-19 are crises with immediate impacts and projections for long-term change and disruption and therefore create the need for planning with immediate and future human resilience and wellbeing in mind. Moreover, beyond Covid-19, experts in zoonotic disease predict the potential for more frequent pandemic events (Fan et al., 2019), thus highlighting the importance of adaptation efforts.

Given all the similarities, a look at climate change adaptation planning literature provides good examples of the relationship between outdoor recreation management and climate adaptation that may be useful for consideration regarding the Covid-19 pandemic. For example,

**Table 1**  
Key metrics in a comparison of Covid-19 and climate change

Covid-19	Key Metric	Climate Change
All continents (except Antarctica) reporting health impacts (ECDC, 2021)	global phenomena	All continents impacted (IPCC, 2014)
Human/wild animal interaction at live animal markets as a potential contributing factor (WHO, 2021b)	anthropogenic aspects	Human activity causing rapid increases in at release of atmospheric concentrations of carbon dioxide and other heat-trapping greenhouse gases (NASA, 2021)
Disease spread, disease progression, variants and mutation, efficacy of vaccines (WHO, 2021c)	highly dynamic situation	Uncertainty in the factors relating GHG emissions, human behavior, cumulative environmental effects (Gillis, 2017; Kunreuther et al., 2014; Moore, 2018)
Global economy shrunk by 4.4% in 2020 (Jones et al., 2021)	economic implications	Estimates of economic impact in the hundreds of billions of US dollars annually by the end of the century under high emissions (Martinich & Crimmins, 2019)
3 209 109 deaths, reported to World Health Organization as of May 4, 2021 (WHO, 2021a)	catastrophic threats to human health	Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhea, and heat stress (WHO, 2018)

A 2015 meta-analysis of urban climate change adaptation planning highlighted multifunctional green infrastructure efforts such as storm-water management, heat island mitigation, and outdoor recreation opportunity likely to be beneficial to an urban area regardless of the severity and timing of climatic change (Hansen et al., 2019; Lovell & Taylor, 2013). Other examples of using multifunctional green infrastructure to link outdoor recreation opportunities and climate resilience can be found in climate adaptation literature (Cortinovis et al., 2019; Demuzere et al., 2014). Beery (2019) highlighted the need for outdoor recreation to be a key part of multifunctional urban landscapes through close to home and accessible outdoor recreation land management efforts as a part of climate adaptation strategy. O'Toole et al. (2019) provided specific and tangible actions to detail how outdoor recreation may play an essential role in climate adaptation relative to forest resources in North America. This immediate and long-term role that outdoor recreation may play in combatting the negative impacts of climate change via creative multifunctional landscape initiatives may serve us in our Covid-19 response and planning by providing accessible opportunities for outdoor recreation.

### 3. Methods

#### 3.1. Phenomenological case study

The research is presented as a descriptive phenomenological case study, focusing on one municipality using multiple data sources to consider the phenomena in detail (Baxter & Jack, 2008). Kristianstad Municipality is a useful case for comparison and insight from results to other municipalities in Sweden given the strength of local governments in terms of planning (Beery et al., 2016) and, specifically, climate adaptation planning (Wamsler & Brink, 2014). Moreover, use of Kristianstad municipality is a valuable case for the climate adaptation linkage given the area's high vulnerability to flooding coupled with sea-level rise projections (Johannesson & Hahn, 2013; Hieronymus & Kalén, 2020); the Region Scania (Fig. 1) is highly vulnerable to sea-level rise given high coastal population density, low coastlines, and projections for rise (Hieronymus & Kalén, 2020). These vulnerability factors are shared with communities across the planet, given coastal population demographics (Nilsson, 2017).

Phenomenology was chosen as part of the methodology to investigate the lived experience of outdoor recreation management during the novel situation created by the Covid-19 pandemic; our interest was to capture perspectives of the people involved to understand better the social phenomena (VanManen, 1997). True to a phenomenological approach, a guiding theoretical framework has not been used (Groenewald, 2004). This exploratory approach fits with the novelty of the situation. Rather than a theoretical framework, we aimed to use our initial understanding of the situation coupled with related and helpful insights from climate adaptation to shape our ongoing inquiry and describe the



Fig. 1. General Location of Kristianstad Municipality in Sweden.

situation as accurately as possible from the perspectives of our participants, the outdoor recreation professionals involved (Welman & Kruger, 1999).

#### 3.2. Participants

Purposeful sampling was used to identify eleven outdoor recreation professionals as possible participants. Note, there is not a general outdoor recreation manager role defined, nor is there knowledge of the exact number of recreation professionals working in Kristianstad municipality; the purposeful sampling attempted to capture important voices via outreach and review of outdoor recreation management activity in the municipality. All potential participants worked within outdoor recreation management or promotion in or closely adjacent to Kristianstad Municipality (see Fig. 1). All participants were outdoor recreation professionals with some level of management responsibility.

#### 3.3. Semi-structured interviews

A semi-structured interview method with predefined questions was used. Flexible prompts allowing for individualized follow-up and response clarification, detailed descriptions, and narrative were allowed and encouraged (Patton, 2002). Each participant was asked the same series of questions. Interviewers used flexible follow-up questions to explore participant responses in greater detail and varied from interview to interview based on participant response to the scripted questions (Patton, 2002). The research team applied ethical guidelines to protect participant identity, gain permission for interview recordings, and allow participants to end their involvement at any time.

#### 3.4. Analysis

The phenomenological analysis consists of investigation of the parts in search of the whole (Groenewald, 2004), a systematic process to identify essential features and relationships (Coffey & Atkinson, 1996). The process is presented through 6 key steps that lead from the raw data of the transcripts to the final general and unique themes based on Hycner (1999):

1. Transcription of recordings and deep reading of text.
2. Bracketing and phenomenological reduction.
3. Delineating units of meaning.
4. Clustering of units of meaning to form themes.
5. Review of themes based on interview questions.
6. Extracting general and unique themes from all the interviews and making a composite summary (Adapted from Groenewald, 2004).

### 4. Results

Eight interviews with nine outdoor management professionals were conducted, with a response rate of 81% (from the initial outreach to eleven potential participants). All the potential participants worked to some degree with outdoor recreation management within a 60-min radius of the population center of Kristianstad in synch with the noted outdoor recreation site proximity of local survey participants. This sampling allowed the study to maintain a specific local recreation focus (municipality) while acknowledging that recreational resources cross political boundaries; this border blurring also allowed a park management professional from Sweden's national parks to be included in the study.

Four participants were male, and five participants were female. Eight of the nine participants were professional outdoor recreation managers; one participant managed an outdoor recreation business. Most of the participants were based in or had a significant portion of their work focused on outdoor recreation management in Kristianstad municipality, while two worked just over the southern border. Four participants



had recreation management responsibilities, including, but not limited to, Kristianstad (see Table 2).

The interviews were conducted in mid-December 2020, through Skype or Zoom based on Covid-19 precautions; interviews lasted for an average of 33 min each. The interviews were transcribed and read carefully by the three researchers before the analysis process. The analysis process resulted in nine key themes. “Key themes” refers to themes present (detailed participant response) in at least 5 of the interviews—additional analysis considered how the themes interacted with one another. Table 3 presents the themes, the number of participants associated with each particular theme and examples of theme data (participant quotes).

It is important to note (and perhaps obvious) that the themes do not stand alone but rather overlap and are intertwined. This careful consideration of themes is an aspect of the analysis process where unique data are considered. In this research, the uniqueness was not outlier results, but rather examples of how interconnected the “new user” theme was with the other themes (see Table 4).

### 5. Discussion

The first part of the discussion will use interview results to address the first two research questions and the interaction between the two:

- RQ1. How do the experience and observations of outdoor recreation professionals align with the results of the public survey?
- RQ2. What observations and management actions provide perspective on nature-based outdoor recreation during the pandemic?

Based on the first part of the discussion, the third research question will be addressed:

- RQ3. Do outdoor recreation professionals see implications for potential future changes in nature-based outdoor recreation patterns or management based on the pandemic?

The review of RQ3 will include consideration of how all the various themes interact and overlap to inform future management. The themes will be used to present implications. The usefulness of climate adaptation to guide management as suggested in the introduction will be addressed. The significance of connectedness to nature as an overall implication of this research will be presented and explored.

#### 5.1. Research question one: Accuracy of the local survey

Responses to the first research question were overwhelmingly affirmative. The public survey results reviewed by the outdoor recreation manager participants, showing an increase in outdoor recreation participation, were affirmed. Most interview participants provided a straightforward affirmation of the survey results; for example, one interview participant noted that they had experienced double the typical number of visitors at municipal sites while another interview participant compared the high visitation to the type of visitation experienced in higher population areas in Sweden. In addition to the general trend, a few specific outdoor recreational sites were noted repeatedly in the discussion of increased visitation, for example, the park Ekenabben on the edge of the population center of Kristianstad and Stenshuvud

**Table 2**  
Participants' outdoor recreation management roles

Regional government outdoor recreation management (2)	Regional trail system management (2)	Municipal professional public recreation and conservation land management (3)
Outdoor recreation business management (1)	National park management (1)	

**Table 3**  
Interview results: Themes, description, and participant quotes as examples

Theme [total #/9]	Description, note (#) = participant
Alignment [9/9]	Alignment refers to participants response to whether the survey results matched their professional experience. <ul style="list-style-type: none"> <li>• <i>The thing that makes the survey data so interesting is that the results Confirm our feelings and observation, that they are accurate.</i> (1)</li> <li>• <i>There were no surprising results, rather they provide evidence to the picture we have of increased interest and that close-by areas are the areas with the most visitors.</i> (3)</li> <li>• <i>So many more that are out and primarily, walking.</i> (7)</li> <li>• <i>To go for a walk, to just get out for a while. To get fresh air with the kids, this is what much of it is about.</i> (5)</li> </ul>
Positive outcome [8/9]	Participants indicating a positive outcome of the rapid changes despite management challenges. <ul style="list-style-type: none"> <li>• <i>The value of this moment is getting people out!</i> (8)</li> <li>• <i>And actually it is an honor for me to work for more people getting out in nature, so really my dream scenario is already in place ...</i> (2)</li> <li>• <i>No doubt, we want to people out in nature!</i> (5)</li> </ul>
Site and staffing changes [8/9]	Participant noting implications for new/adjusted management. Noted implications included the need for reinforcement for bird protection areas, basic wear and tear management, needs for new infrastructure, increased staffing, and more. <ul style="list-style-type: none"> <li>• <i>We will most likely hire more staff.</i> (5)</li> <li>• <i>We had to release clearance on invasive species. Much of the nature conservation measures, such as clearing of pastures was curtailed.</i> (5)</li> <li>• <i>Then we can consider whether we need more equipment and infrastructure. Do we need more grill sites? And how can we solve the problem ...</i> (7)</li> </ul>
New users [7/9]	Observation of new users by survey participants. <ul style="list-style-type: none"> <li>• <i>We have received many more and new questions that we have not had earlier, so we have observed that it is new people getting out that have not regularly recreated in nature.</i> (3)</li> <li>• <i>There are more people that perhaps are not out otherwise. And it often appears that these people may not feel at home in these sites or they ask questions about what to do or where to go.</i> (6)</li> </ul>
High pressure [6/9]	Certain sites were noted to have increased user numbers and/or other signs of site-based pressure. Even caution to attribute all pressure on people. <ul style="list-style-type: none"> <li>• <i>And that is something that we noticed a great deal this past summer. At certain sites there was an incredible pressure.</i> (6)</li> <li>• <i>... we have had big challenges with crowded beaches.</i> (2)</li> <li>• <i>Perhaps the most clear is the wear on the trails we see from the increased visitation ... we have a number of protected species that have definitively been impacted ...</i> (5)</li> <li>• <i>If we are talking erosion, there is nothing to compare to wild boar.</i> (8)</li> </ul>
Visitor channeling [6/9]	Identified efforts to manage numbers of visitors or encourage shifts from certain crowded sites to less used sites. <ul style="list-style-type: none"> <li>• <i>Scania's nature is big and the Scanian Trail provides 800 km, so we need to spread people out. So, there is a lot we have done to provide information and channel visitors.</i> (3)</li> <li>• <i>Vi have always seen a steady rise in people in nature before the pandemic, but it has exploded now since this past spring and I can say there has been a greater focus on channeling visitors ...</i> (4)</li> <li>• <i>... and we have worked very hard to raise awareness of more areas to visit. Before (Covid) we used to feature the "nature site of the month" on Facebook and other channels. Then we went with the "five sites of the week" in an effort to spread people out.</i> (1)</li> </ul>
Activity increase [6/9]	Certain activities were identified as having increased. For example increase in outdoor birthday parties, children's parties, and grilling parties. <ul style="list-style-type: none"> <li>• <i>People want to grill, oh, how they want to grill! I cannot verify but the grill sites have been full and sometimes there has even been a line to use the grill sites.</i> (2)</li> <li>• <i>Twice I have noticed birthday parties with birthday hikes with balloons, glitter, and pink blankets along X-trail.</i> (6)</li> </ul>
Near nature [6/9]	Participants noting observation of the importance of near nature to meet public needs during C19 restrictions. <ul style="list-style-type: none"> <li>• <i>I think that the greatest increase in outdoor recreation has been in the backyard, the park next door, the playground three blocks away ...</i> (6)</li> <li>• <i>... People have stayed within their region. People have simply discovered their own region in a greater degree.</i> (1)</li> </ul>
Allemansrätt <sup>1</sup> [5/9]	Participants discussing threats or concerns for allemansrätt given changes in outdoor activity patterns. And further, the need for more allemansrätt education. <ul style="list-style-type: none"> <li>• <i>... it has functioned more that we remind people how allemansrätt functions and covering existing guidelines.</i> (4)</li> <li>• <i>We must work much more with allemansrätt and those questions.</i> (1)</li> </ul>

<sup>1</sup> Allemansrätt: Translates to “the right of public access.” While guidelines for specific activities exist, they are best captured by the guiding ethic used by the Swedish Environmental Protection Agency (Naturvårdsverket): Don't disturb, don't destroy (Beery, 2018).

**Table 4**  
Interconnectedness of the new user theme

Examples of combined themes	Data examples
Allemansrätt and the new user	<ul style="list-style-type: none"> <li>• <i>If a person is unexperienced and are not familiar with allemansrätt is a reason for emerging problems. (6)</i></li> </ul>
Site management and the new user	<ul style="list-style-type: none"> <li>• <i>People want them (grill sites) and people want an entrance, they want an entrance to nature. (7)</i></li> </ul>
Activity and the new user	<ul style="list-style-type: none"> <li>• <i>If a person is unexperienced and has not spent a lot of time in nature, perhaps they don't know what to do in nature? But to grill is very concrete and simple and most have done it before at home ... I think is provides a little security ... (2)</i></li> </ul>
Positive and new user	<ul style="list-style-type: none"> <li>• <i>There are a lot of unexperienced people getting out that might not have otherwise and that is positive. (5)</i></li> </ul>

#### National Park (South of Kristianstad).

As noted in the results, almost all interview participants described observing individuals and groups believed to be new to a site or activity. Characteristics of new users were descriptions of inexperience. Many interview participants described new activities or increased certain activities related to groups—such as birthday parties and other social events. Grilling at an outdoor site was seen to have significantly increased and described as a possible “entry activity” for the use of specific sites. Some interview participants described the perception that social groups were meeting outdoors to be in a Covid-19 “safe zone” as much as possible.

The increase in users coupled with the perception of new users created concern among interview participants for allemansrätt or the universal access laws and traditions. While participants did not note specific problems, a general sense of concern for allemansrätt communication and a potential increased need for allemansrätt outreach was discussed.

#### 5.2. Research questions two: Management during the pandemic

The rapid onset of Covid-19 resulting in increased users, new users, and new activities demanded immediate management action, as evidenced by the results. One such action was an effort to channel visitors to other sites to reduce congestion. Channeling was done physically on-site via information and online; managers used websites to inspire visits to less-visited/less known sites. Increased effort to manage garbage was another example of immediate management that was necessitated by the Covid-19 increase. The quick shift of duties was yet another related immediate management example. For example, consider the shift away from invasive, exotic vegetation management to general crowd control efforts at one site. Specific reinforcement labor was also needed to manage the changes; for example, one site hired two security guards to deal with crowding and congestion in their parking lot. Despite this example of increased security, only three participants identified specific conflicts between users as a theme; one severe case of conflict was noted, a knife fight over parking places at one an outdoor recreation site parking lot.

The theme of new users led to immediate management action of increased provision of guided tours and beginner group activities at specific sites. This reflexivity captured the positive approach despite the challenge of rapid response. The results indicate an appreciation for unexpected results, with eight out of nine participants readily acknowledging the positive aspects of increased public outdoor recreation participation.

#### 5.3. Research question three: Implications for management into the future

As noted, managers responded quickly to Covid-19, and made management changes during the disruption. Many of these changes provide insight for moving forward regarding the potential for ongoing Covid-19 restrictions and in general. Future broad health risks, political

instability, and climate change impacts provide three reminders of these dynamic times (Gillis, 2017; Kunreuther, 2014; Moore et al., 2018; WHOc). Despite the dynamics and uncertainty, several critical and overlapping implications can be drawn from the results of the research presented here:

1. **New users:** The increase in new users and people with less-nature-based outdoor recreation experience was also intertwined with many other themes. The challenge and opportunity of new users underscore the value of education and communication. For example, outdoor ethics (like allemansrätt in Sweden) may need to be taught or reinforced for new audiences with less familiarity with these topics and behaviors. New users may require instruction and guidance to increase comfort in the outdoors (for example, essential risk management or wayfinding). Also, new users may bring insight and fresh perspectives to enrich outdoor ethics and outdoor recreation. It may be that a combination of education and new communication or methods are needed to make this outreach accessible. New users may not be connected to existing outdoor recreation resources. New messages, new techniques, and new platforms for outreach must be considered in concert, and users need to be a part of re-envisioning outdoor recreation. We can turn to existing programs designed to support the new user for inspiration, such as the Swedish program Schysst. This Swedish-based program is managed by the Nature Protection Organization (Natuskyddsforeningen, 2021a) and applies methods for encouraging new outdoor recreation participants to enjoy outdoor recreation. Further, the process also provides a model for outdoor ethics education for new users (Natuskyddsforeningen, 2021b). An increase in users and increases in certain activities points to the need for outdoor recreational infrastructure to respond.
2. **Outdoor recreational infrastructure:** With the anticipated ongoing increased use of nature-based outdoor recreation sites, sustainable outdoor recreation infrastructure is needed. The science of sustainable trail design can inspire such innovation (Marion & Wimpey, 2017). Another source of inspiration can come from mountain bike trail builders that have worked to accommodate the rapid rise in mountain biking, in part via the design and construction of sustainable trails (IMBA, 2019). Applying ideas from sustainable trail building may be needed to design parks and near-nature areas for increased use. The science of climate adaptation may be helpful here with consideration of resilience in new recreational infrastructure design (Halofsky et al., in press; O'Toole et al., 2019). For example, increasing infrastructure resilience can be applied to gateway activity structures, such as picnic/grill sites; designs are needed to serve more people, allow for social distancing between groups while also preserving quality nature experiences of a particular place. Recreational infrastructure implications are closely related to the following implications of landscape multifunctionality.
3. **Nearby nature access and multifunctional landscapes:** Related to the need for sustainable infrastructure to accommodate increased use is the demand for nearby nature access. We have been reminded that people often want or need to recreate close to home—out the door access. This need fits very well with other efforts to design and redesign green spaces to meet multiple needs (Beery, 2019; Beery et al., 2017). Multifunctional landscapes that can support climate adaptation, biodiversity conservation, and public health and well-being can serve needs arising from our experience of Covid-19; parks, trails, and public greenspace facilitate flexibility and allow people to spread out, socialize, seek solitude, and meet other critical needs. A recent study of multifunctional landscapes provides reminders of critical benefits essential for human well-being (Fagerholm et al., 2020). Proximate recreational access should come as a part of multifunctional landscape design that can address increased biodiversity, noise reduction, food production, social distancing

guidelines, and climate-oriented adaptations such as stormwater management and urban cooling (Egerer et al., 2021).

#### 5.4. Connectedness to nature

As a part of an overall consideration of the research data, themes, and associated implications, the potential for outdoor recreation management lessons from Covid-19 to serve ongoing connectedness to nature efforts emerged as an overarching outcome from this research. Recent research into the psychological aspects of C2N and individual responses to the pandemic (Haasova et al., 2020), conclude that C2N is “a valuable construct and a steppingstone to further our understanding about individual behaviors in global crises originating in human-nature interactions.”

As noted in the introduction, concern for a loss of nature experience is at the heart of connectedness to nature study (Ives et al., 2017). Therefore, the widespread experience of increased nature experience during the pandemic is of great interest. The core element of experience in nature seems to have increased for many during Covid-19; the pandemic has provided an opportunity for more people to experience themselves as a part of earth systems and cycles. For some, the connection is alarming; the origins and negative impacts of Covid-19 have reminded us that our connectedness may come with significant risk and loss. For others, the experience of nature has been a positive response to the restrictions and limitations, support during loss, and disruption.

A recent model proposed to explain the impacts of the Covid-19 pandemic on human–nature interactions and builds a conceptual framework for understanding how the pandemic could affect the dynamics of these interactions. The adapted COM-B model is used to consider human behavior (Soga et al., 2021) and is structured using the categories of capabilities, opportunities, and motivations that contribute to human-nature interactions (Behavior):

- **Capability:** An individual’s psychological and physical capacity to engage in interactions with nature.
- **Opportunity:** Factors that facilitate or make an interaction with nature possible.
- **Motivation:** A person’s brain processes that energize and direct behavior.

While a guiding framework at the onset of the study was not proposed, the COM-B model is a valuable fit to help understand and use the

results. The model supports consideration of how the noted local, regional, and national studies of outdoor recreation behavior during Covid-19 (Andersson, 2021; Rask Olsson & Vitestam, 2020; Skriver Hansen et al., 2021) coupled with the results and implications of this current study may impact human-nature interactions (see Fig. 2).

When we expand the COM-B model and add complexity, we can highlight the specific outcomes of this research and their interactions with other sectors of society more clearly (See Fig. 3). Drawing upon McDonagh et al.’s (2018) use of COM-B, the Swedish national outdoor recreation goals can be highlighted at the system level (Sveriges Miljömål, 2021), the specific results from this research at the provider (management) level, and results from the national/regional/local studies to provide individual level perspective. More detailed information is provided in Table 5 to provide examples of how the Swedish national goals fit within the model.

##### 5.4.1. The importance of experience in nature

The observation of increased human–nature interactions by outdoor recreation managers is of great interest as experience in nature is a crucial building block of C2N (Ives et al., 2017; Pritchard et al., 2020; Rosa et al., 2018; Wells & Lekies, 2006). Important for this study is the focus on outdoor recreational managers/professionals’ role in supporting C2N. A focus on the COM-B model, new capabilities, new opportunities, and new motivations fits very well with ongoing connectedness to nature efforts. As noted in the introduction, it was proposed that the concept of outdoor recreation in the Nordic tradition (friluftsliv) often includes a developmental dimension inclusive of a relationship with nature (Beery, 2013; Sandell & Öhman, 2010). This description effectively links outdoor recreation experience and C2N. Previous research of Swedish outdoor recreation and C2N supports the connection; Beery (2013) noted significant associations, specifically identifying recreational activities with C2N, for example, walking (for pleasure and exercise), garden work, and picnic/grilling. These activities, and the potential locations for them, mirror the results of this study. Thus, given the current situation, it can be hoped that many new outdoor recreation participants, or people who have recently increased their participation, will experience the positive benefits of increased nature experience and, in so doing, strengthen their C2N.

While a direct link between C2N and pro-environmental behaviors is complex (Beery & Wolf-Watz, 2014), there is strong evidence to support the relationship (Anderson & Krettenauer, 2021; Rosa et al., 2018; Whitburn et al., 2019). The noted key C2N element is time in nature, and outdoor recreation is one vital avenue for supporting time in nature

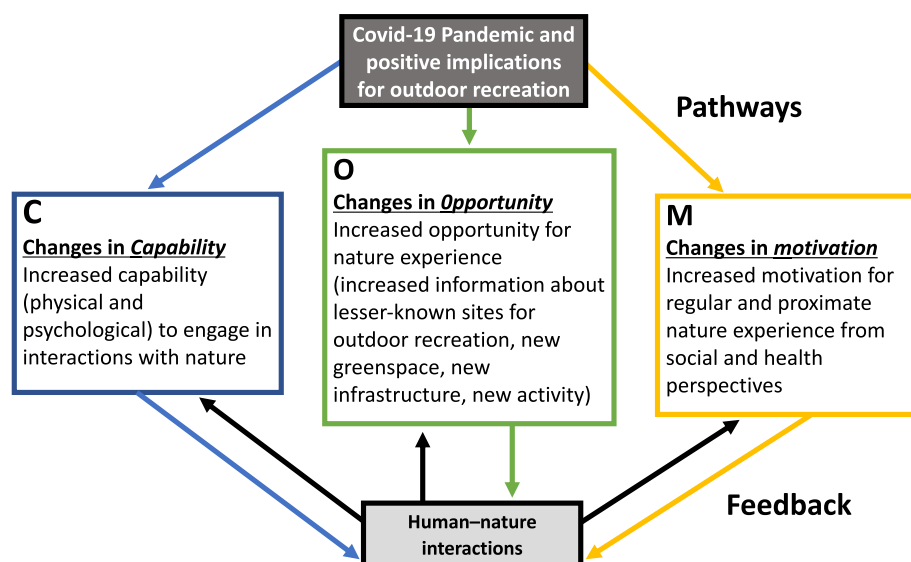


Fig. 2. Adapted COM-B model 1: Covid-19 and human-nature interactions

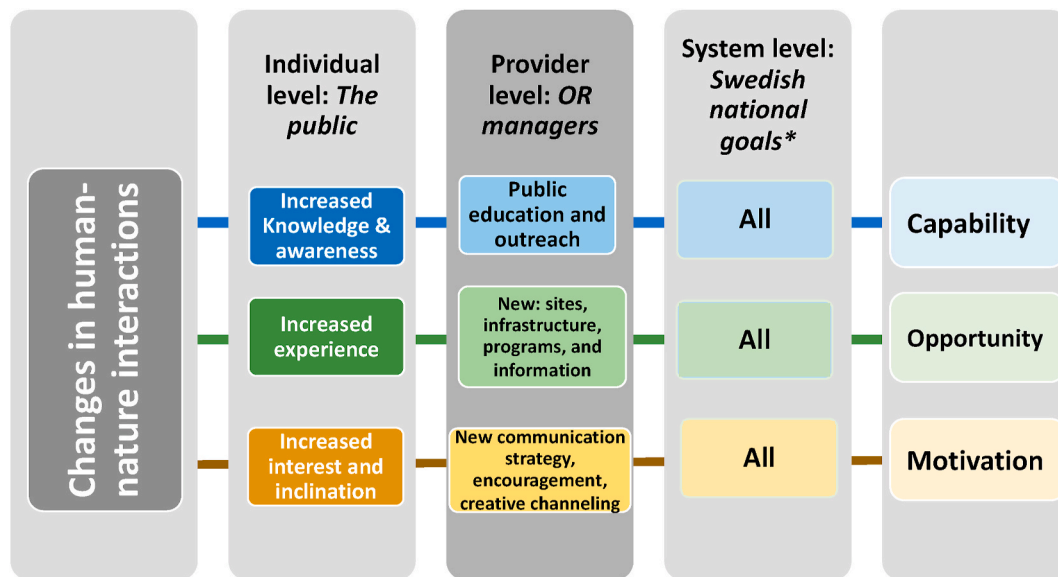


Fig. 3. Adapted COM-B model 2: Covid-19 and human-nature interactions  
 \*See examples Table 5

**Table 5**  
 Three examples of how the ten Swedish National Outdoor Recreation Goals fit within the COM-B model from a recreation management perspective.

<b>Accessible nature for all (Goal 1)</b>
C: Information to support public knowledge and experience of easy public access.
O: Creation/modification of existing sites/infrastructure to support increased use.
M: Strategies designed to boost public interest in nearby nature use.
<b>Allemansrätten (Goal 3)</b>
C: Quality outdoor ethics education and information provided to the public.
O: Public has good access to private land for outdoor recreation.
M: Public positive to support of outdoor ethics guidelines.
<b>Outdoor recreation for public health (Goal 9)</b>
C: Public health messaging included in nature-based outdoor recreation outreach.
O: New information and infrastructure in response to public health needs/interest.
M: Public health messages used to encourage public OR participation.

(Beery, 2013). This potential for outdoor recreation to support C2N based partly on changes in outdoor recreation behavior brought about by the pandemic is consistent with results emphasizing the importance of linking Covid-19 response with climate action (Botzen et al., 2021).

### 5.5. Limitations

The results presented here provide a focused case study that captures the experience of nine outdoor recreational professionals reflecting upon a public outreach survey in one municipal area in Southern Sweden. Moreover, while it is acknowledged that caution should be used in generalizing the results, the concept of transferability is useful. Transferability encourages the reader to consider the variables presented in the study and evaluate external validity. The purposeful sampling and detailed interview data create contextual details to allow the reader to judge how well the match to other settings may be (Blomberg & Volpe, 2019). It can also be noted that the researchers experienced a level of saturation in interview responses, as evidenced by results showing

numerous recurring themes and four of the top themes represented in data from seven to nine of the nine interviews. The alignment of results from local, regional, and national surveys that formed the motivation for this study also adds to the results' potential transferability. Further, as noted previously, the vulnerability of Kristianstad to projected sea-level rise may provide insights to other communities in coastal regions facing similar threats.

Another limitation was the exclusive focus on human experience and the specific focus on the management of outdoor recreation participants. Given the nature of many outdoor recreation managers, there are often other duties or focus, such as biodiversity conservation or nature restoration; these management duties often overlap, as we noted in the case of one site adjusting staff efforts from invasive plant management to crowd management. Nonetheless, the focus in this current study was primarily on the managers' perspectives of the participant experience in an outdoor recreation context.



## 6. Conclusion

This study used recreation managers' review of public survey data conducted in Sweden during Covid-19 to consider implications for outdoor recreation management brought about by the Covid-19 pandemic. In general, the earlier survey data reported increased public outdoor recreation participation, and the recreation managers affirmed this increase. A part of the recreation manager's awareness of change was the immediate response in recreation management, both in overall strategy and daily practical aspects, from channeling visitors to managing busy parking lots. The increase in outdoor recreation site use and public participation created many challenges for managers; however, despite the challenge, there was an overwhelmingly positive response to this increase in outdoor recreation participation. Managers' positive outlook and dynamic response were very much in the spirit of proactive climate adaptation, i.e., efforts to respond to change to meet current needs while planning for ongoing or projected future challenges.

Outdoor recreation managers saw implications and had ideas for moving forward given the experience of Covid-19. The following statement from one participant is telling regarding the overall connectedness to nature implication: I think that both the survey and the use of trails, and the increased interest we see digitally and physically on-site support each other ... I strongly believe that nature has found a stronger place in everyday life (3). This forward focus is the critical outcome of this research. Managers identified a focus on new or inexperienced outdoor recreation participants; attention ranged from the need for education (such as outdoor ethics) to the provision of accessible sites for simple activities such as walking or grilling. When the implications from managers were considered in concert, the opportunity to support C2N efforts was a clear outcome of this study. For many, Covid-19 seems to have contributed to a certain level of reversing a general societal loss of nature experience. The outcomes support a potential pathway to increased connectedness to nature. We need to capitalize on potentially positive outcomes, such as an increased opportunity for connectedness to nature, and use them to support human well-being and the potential for pro-environmental behaviors. In so doing, we may see that Covid-19 has positive implications for our efforts to respond to climate change. While the initial approach in this study was to draw upon climate adaptation strategy as a guide for Covid-19 response, it is clear that the linkage between climate adaptation and Covid-19 response goes in both directions.

## CRedit authorship contribution statement

**Thomas Beery:** Research conception, planning, data collection, Formal analysis, article writing. **Matilda Rask Olsson:** Planning, data collection, GIS map creation, results consultation. **Moa Vitestam:** Planning, data collection, GIS map creation, results consultation.

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