Received: 2 December 2021 | Accepted: 17 June 2022

DOI: 10.1002/pan3.10387

PEOPLE AND NATURE | BRITISH ECOLOGICAL SOCIETY

RESEARCH ARTICLE

Communicating nature during lockdown – How conservation and outdoor organisations use social media to facilitate local nature experiences

Irma Arts[1,2] | Dominic Duckett[2] | Anke Fischer[3] | René van der Wal[4]

[1]School of Biological Sciences, Zoology Building, University of Aberdeen, Aberdeen, UK

[2]Social, Economic and Geographical Sciences Department, James Hutton Institute, Aberdeen, UK

[3]Division of Environmental Communication, Department of Urban and Rural Development, Swedish University of Agricultural Sciences, Uppsala, Sweden

[4]Department of Ecology, Swedish University of Agricultural Sciences, Uppsala, Sweden

Correspondence
Anke Fischer
Email: anke.fischer@slu.se

Irma Arts
Email: irma.arts88@gmail.com

Funding information
James Hutton Institute; University of Aberdeen

Handling Editor: Russell Hitchings

Abstract

1. Social media impact not only our communication and social interactions but also our relationships to the natural environment. Social media can increase understanding of our environment by offering information and sharing calls to action, while at the same time, they might present a glamourised, standardised picture of nature and distract from actual outdoor interactions.
2. The COVID-19 pandemic presents a unique opportunity to study the spaces created for interactions between the online and offline natural world, especially in countries where movement and thus outdoor activities were restricted during lockdowns. To understand these interactions, we investigated the social media communication of nature conservation and outdoor organisations by analysing Twitter posts of four prominent NGOs in Scotland.
3. We found that during the first COVID-19-induced UK lockdown in spring 2020, Scottish nature conservation and outdoor organisations made distinctive efforts in supporting followers to connect with nature in the face of restrictions. Organisations showed signs of moving towards community-building through sharing experiences often related to nearby nature, while calls for environmental action, more prominent in the previous year, receded in relative importance.
4. Emphasis was put on sensory engagement with, and finding solace in the rhythm of, nature. References to taking action to protect nature now became linked to a green recovery from the pandemic.
5. We conclude that NGOs used social media not as a space separate from the outdoors, but as an augmented space where online and offline interactions were interwoven and a space in which during the COVID-19 pandemic, new avenues for engagement were being explored.

KEYWORDS
environmental NGOs, human–nature interactions, lockdown, nature conservation, nearby nature, Scotland, Twitter

1 | INTRODUCTION

The COVID-19 pandemic has caused major changes to our lives. It has not only impacted how we interact with each other but also changed the contact we have with nature (Basile et al., 2021; Sánchez-Clavijo et al., 2021). Different forms of 'lockdown', in different parts of the world, limited people's movements and in some regions also the time spent outdoors. At the same time, there are strong arguments that being in nature and green spaces contributes to improved well-being and mental health of both adults and young people (Birch et al., 2020; Martin et al., 2020; Russell et al., 2013). Research strongly indicates that outdoor activities and exposure to nature can promote mental, emotional and social well-being (Keniger et al., 2013; Marselle et al., 2014; Sandifer et al., 2015). A lockdown, which limits people's access to outdoor spaces, can thus have considerable impact on people's well-being. The COVID-19 pandemic, and specifically the 2020 UK lockdown, therefore created an unprecedented situation where many people could not make use of their natural environment as usual, but instead were dependent on experiencing the outdoors either in the vicinity of their house or through new media technology.

One of the ways people encounter nature is through nature conservation and outdoor organisations by visiting reserves that these organisations manage and by interacting with information that the organisations provide. Such organisations have a significant following, with the UK's largest conservation NGO, the Royal Society for the Protection of Birds, having over 1 million members (RSPB, 2020). Conservation organisations are mission-driven (Mace, 2014; Maffey et al., 2015; Soulé, 1985), protecting wildlife and landscapes, and promoting a responsibility towards our natural world. To achieve this, these organisations seek to influence policies and campaign for change but also provide education and information to the general public. This contributes to a significant voice in determining what nature looks like as well as shaping the discourse around our relationships with natural environments. One way in which these discourses are now represented is online, via organisations' proprietary websites, e-newsletters and social media (Arts et al., 2015).

Verma et al. (2015) show two distinct usages of online media by nature organisations: to promote information on nature, stimulating observations and learning about species, and to let people connect with nature. A third way social media is used by such organisations is to campaign for environmental action (Büscher, 2016; Jacqmarcq, 2021). The content and impact of online environmental campaigns have received a lot of attention by researchers in the last decade, investigating their influence on environmental discourses, behaviour and societal change in general (see for example Checker, 2017; Mkono, 2018; Thorson & Wang, 2020), while online communication that focuses on people's connection with nature has been less well investigated. Yet, with lockdowns in place, online interactions with nature can potentially be crucial in supporting people's connection with nature and overall well-being. At the same time, connecting with nature through a (virtual) interface might not be the same as engaging with nature in the outdoors, with social media (and NGOs using it) having the tendency to promote spectacular images and extraordinary stories (Arts et al., 2021; Verma et al., 2015). This study therefore examines the content of conservation and outdoor organisations' social media to understand how online and offline engagement with nature is promoted.

2 | ONLINE INTERACTIONS WITH NATURE

In the debate on human–nature interactions in a western context, new media technology is often framed negatively (Shultis, 2015). Both in popular media and academic debate, concerns are raised that highlight the influence these technologies have, notably on (young) people's engagement with the natural environment, and specifically, their sense of place and connectedness with nature. In 'Last Child in the Woods', Louv (2009) argues that young people have, over time, lost exposure to outdoor experiences, leading to what he calls a 'nature-deficit disorder'. Technology is attributed a major role in this loss of experience (Soga & Gaston, 2016; see also Kareiva, 2008). Spending excessive time behind a screen, or 'videophilia' (Pergams & Zaradic, 2007), is commonly seen to be at the expense of time spent in the outdoors, and while technology can offer virtual or mediated encounters with nature, these experiences are regarded as qualitatively different. This assessment is based on the idea that technology separates people from their natural environment, leading to a disembodied experience of the outdoors (Schultz, 2002).

By contrast, direct, unmediated experiences are seen as an important contributor to an authentic and meaningful relation with nature (Fletcher, 2017; Sutherland, 2012). However, as Truong and Clayton (2020) point out, increased digital technology use might not be so much 'extinguishing experience', but instead generating different types of interactions and ways of engagement with nature. During the COVID-19 lockdown in the United Kingdom, when direct nature experiences were limited, virtual spaces remained available. These spaces included video games, where people could find an escape and relax in games such as Animal Crossing (Zhu, 2021), or videos with simulated nature that helped create feelings of connectedness (Van Houwelingen-Snippe et al., 2020). Our study focuses on interactions facilitated through social media spaces where photos, videos and stories related to nature are shared.

Social media platforms have become important means of communication, with around 4 billion users in the world, spending on average almost 2.5 hours per day on social media (Kemp, 2021). Although these platforms operate in a virtual space, content that is showcased or promoted is often linked to real-world places and activities, allowing for the interaction between direct and mediated nature experiences (Arts et al., 2021). With lockdown restrictions in place, new media technology offered alternative modes of encountering nature (Turnbull et al., 2020). In this study, we focus on the social media platform Twitter, a platform where people can share short texts (up to 280 characters), as well as visual media such as photos or short videos. Twitter states its own purpose as serving

the public conversation, bringing diverse perspectives together (Twitter, 2020). While the different social media platforms share an interest in encouraging engagement and conversation, Twitter in particular can be seen as a platform users go to for information and social interaction (Pelletier et al., 2020).

Outdoor and conservation organisations' communication on online platforms such as Twitter is determined by the features a platform offers, the use of the platform by individual users and the interactions made between an organisation and its online followers. Mobile media technologies are not neutral tools but are inscripted with particular purposes and affordances (Verbeek, 2005; Wilson, 2003). Social media platforms allow people and organisations to record, spread and amplify their own message (Boyd, 2011) but are also driven by commercial interests, emphasising those features that generate user data (Zuboff, 2019). As Büscher (2016) points out, by using social media platforms to connect to people, NGOs allow these platforms 'to partly determine how people experience their communication' (p. 730). This communication is shaped by the increased speed and fleeting character of shared information, encouraging visually attractive and dynamic content (Büscher, 2016).

The content that is created through the interaction between organisations and digital platform often reflects very specific representations of nature. Online observations of wildlife, for example, are often promoted through webcam footage, where species can be viewed live, exposing followers to the 'mundane reality rather than eventful action' (Verma et al., 2015 p. S654; see also Turnbull et al., 2020). These mundane encounters are seen as a positive way to build a connection with nature, grounded in a sense of place. Yet, critics have pointed out that digital images rely on physical and technological separation, 'delocalising' nature (Adams, 2019). In addition, digital technologies change the way we can look at and understand nature, by providing incredible detail and intimacy, but in doing so establish an 'omnipresent surveillance' of species with nature being subject to our 'anthropocentric gaze' (Alexander & Kerr, 2020; Turnbull et al., 2020).

Moreover, there is a question on whether new media actually shows mundane and unedited imagery. To let people experience an emotional or normative connection with nature or specific species, often, flora and fauna with charisma or images showing something extraordinary are used (Stinson, 2017; Verma et al., 2015). There are concerns that such spectacular imagery desensitises and discourages the experience of non-spectacular natural environments (Levi & Kocher, 1999; Truong & Clayton, 2020), and that online experiences will become a substitute for physical nature (Arts et al., 2015). To build a connection with nature, online representations tend to focus on the novel, as well as emotionalizing and personifying nature (Olafsson et al., 2021; Verma et al., 2015). These idealised images can turn nature into a resource for 'share-worthy' content (Smith, 2021; Stinson, 2017), something that is arguably encouraged by the affordances of social media platforms (Arts et al., 2021). Yet, studies have also shown that social media open up the possibility for people to tell alternative stories about nature, pay attention to marginalised experiences of nature and experience nature in novel ways (Arts et al., 2021; Conti & Heldt Cassel, 2020; Hawkins & Silver, 2017; Olafsson et al., 2021).

All these elements can play a role in representing nature through new media technology. NGOs' desire to use social media platforms in an effective way requires organisations to actively consider their social media strategy, including target public, messages and how to best get these across (Clampitt, 2017). As part of the resulting communication practice, NGOs also navigate potential side-effects that might arise, for example, by reflecting on the use of spectacular footage vs showing more mundane nature (Arts et al., 2015; Verma et al., 2015). To be regarded as functional, social media strategies have to be adapted to changes in contexts and environments (Clampitt, 2017). The COVID-19 lockdown presented a radical change of circumstances, which required NGOs to adapt their approaches to social media use.

The pandemic, thus, created a unique opportunity to have a closer look at organisations' social media content focused on nature engagement and the ways in which this content is created, promoted and shared. With these organisations playing an important role in determining what discourses of and interactions with nature are encouraged, we investigate (1) the type of nature that is promoted in organisations' social media pre-pandemic and during lockdown and (2) the interactions between organisations and social media platform features in creating this content.

3 | METHODS

3.1 | Conservation and outdoor organisations and their social media use

We included four conservation and outdoor organisations in Scotland in our study: the Royal Society for the Protection of Birds (RSPB) Scotland, John Muir Trust, Scottish Wildlife Trust, and Walkhighlands. These four organisations are well known institutions in Scotland and followed by large audiences (Table 1). All of them aim to bring nature closer to people, frequently tweeting about ways to interact with the outdoors and providing information on species and landscapes. In light of the high volume of tweets that such organisations produce and the time needed to analyse them, we limited our study to four NGOs.

The RSPB, John Muir Trust and the Scottish Wildlife Trust are conservation-oriented, while Walkhighlands mainly focuses on hillwalking and outdoor access. However, like the other three organisations it also communicates about the importance of experiencing nature and tries to connect people to the outdoors, which is the focus of this study. The four organisations interact with each other, for example by re-tweeting each other's posts or through joint campaigns. Table 2 provides a brief overview of the aims of the four organisations as well as the different media channels they use.

TABLE 1 Number of tweets posted and retweeted by each organisation from 1 April to 30 June 2019 and 2020

Account	No. followers	No. tweets – 2019	No. tweets – 2020
RSPB Scotland (@RSPBScotland)	32.4 K	579	729
John Muir Trust (@johnmuirtrust)	31.4 K	369	313
Scottish Wildlife Trust (@ScotWildlife)	39.9 K	187	298
Walkhighlands (@walkhighlands)	51.9 K	232	324 (180[a])

[a]Most of Walkhighlands' tweets in spring 2020 were threads, which are multiple tweets that make up one story. Counting a thread as 1, only 180 distinct stories remained. Number of followers as stated by Twitter in August 2020.

TABLE 2 Overview of the aims (as stated on their websites) and social media platforms used by the four organisations

Organisation	Aim	Social media
RSPB Scotland (Part of RSPB UK)	Nature conservation, species recovery	Twitter and Facebook (Youtube and Instagram UK-wide)
John Muir Trust	Connect people to wild places, protect wild places, rewild	Twitter, Facebook, Instagram and Youtube
Scottish Wildlife Trust	Protect and restore nature, inspire people to experience nature	Twitter, Facebook, Youtube
Walkhighlands	Encourage enjoyment of walking, social network of walkers	Twitter and Facebook

3.2 | Data collection

This study used Twitter data to understand the influence of social media on communicating about and engaging with nature. All four organisations used Twitter, which had on average the highest turnover in posts of all the platforms they used, with organisations issuing multiple messages per day, allowing for the analysis of a wider variety of posts. Moreover, Twitter as a platform allows for the downloading of historical data, which makes it possible to follow the development of messages over a period of time. All tweets posted and retweeted by the four organisations in Scotland were downloaded for the periods of April–June 2019 and April–June 2020. The period April to June was chosen as in 2020 it comprised the first COVID-19 lockdown in Scotland, which started on 23 March 2020 and only allowed people to leave their homes for essential business and for daily exercise (Sturgeon, 2020). Permitted exercise had to take place within a five-mile radius of one's house and no more than once a day. Around mid-June, restrictions on exercise were eased, and on 3 July the 5-mile travel ban was lifted. Tweets from the same period in 2019 were downloaded for comparison. The sets of tweets were used for both an automated content analysis using Leximancer (Section 3.3.1) and a qualitative content analysis where we read through and coded a selection of the tweets (Section 3.3.2).

To download the tweets, a Twitter developer account was created and permission from Twitter obtained. We developed a Python code to download all tweets to a .txt file, using the TwitterAPI package[1] and instructions by Simpson.[2] We imported the .txt file in Excel for further analysis and cleaned the data by removing all tweets that were replies rather than original tweets or retweets. We choose to remove the replies because without their context (i.e. the original tweets that were replied to) they had little meaning. Moreover, many of these replies were very short, for example, thanking the person posting for their contribution or commenting on the beauty of a picture (e.g. 'great picture' or 'so lovely'). We concluded that for our study, these would reveal little about the themes discussed by the organisations, which we mapped out in our analysis through an automated content analysis. Table 1 shows the number of tweets used for this analysis. By contrast, in our qualitative analysis (Section 3.3.2) all replies and conversations that followed from a tweet were taken into account, as this approach allowed us to place them in context of the original tweet.

In September 2020, after the first spring lockdown in Scotland, we interviewed four communication officers (one per organisation) to talk through their objectives for social media, whether the lockdown had changed any of their social media strategies, and how they perceived followers had interacted with the content. These interviews were held virtually via WebEx due to COVID-19 restrictions, were audio-recorded and transcribed verbatim. An information sheet was given to the participants and written informed consent was obtained.

3.3 | Data analysis

Overall, we used a mixed method approach, combining an automated and qualitative content analysis of tweets with interviews of communication officers to triangulate findings. Content analysis is the systematic reading of text to describe textual elements and to understand their potential meanings in the context of their use (Krippendorff, 2013). We used it, firstly, to identify themes the four

organisations talked about on Twitter and, secondly, to understand the interpretations of nature engagement expressed by the four organisations. To explore the content of the text, we initially read through all the tweets (n = 3031) and added a descriptive code to each tweet. These descriptive codes were than organised in broader categories, with five distinct categories emerging from this reading. These reflected the organisations' intentions with their tweets: campaigning and advocacy; promotion and organisation; providing nature information and experience; supporting local nature experience; and providing COVID-19 information.

3.3.1 | Automated content analysis using Leximancer

To get a better understanding of the differences between the 2019 and 2020 datasets, we used Leximancer Pty Ltd (2019) to map concepts within the tweets. Leximancer can be used for automated content analysis, which offers a way to identify relationships between individual words, concepts, and themes within a (large) body of relatively unstructured text (Thomas, 2014). It is based on word co-occurrence statistics, grouping words that generally 'travel together' throughout the text, clustering them in what Leximancer calls concepts (Leximancer Pty Ltd, 2019; Smith & Humphreys, 2006). To determine which keywords make up a concept, 'Leximancer weights how frequently words or word groups occur in sentences containing the concept, compared to how frequently they occur elsewhere' (Thomas, 2014, p.236). To give an example, one of our concepts, 'action', was built up by the word 'action' but also words like 'urgent', 'demand', 'campaign' and 'decision-making'. In an automated learning process, Leximancer's algorithm clustered these words together and labelled the concept 'action'.

In an initial read through the tweets, we noticed the tendency of organisations to repeat a tweet once or twice a few days apart. To filter out any repetition we selected the maximum 'duplicate text sensitivity' in Leximancer's text processing options (Leximancer Pty Ltd, 2019). From the generated list of concepts, we excluded concepts that had little meaning in the context of our study and used the Leximancer option to merge concepts that had a similar meaning, enabling otherwise obscured concepts to be brought to the fore. The excluded concepts comprised terms commonly used in tweets, such as 'here's' (for example referring to 'here's a photo of …'), RT (retweet), thanks (referring to 'thanks for joining' or 'thanks for your support') and latest (e.g. 'read our latest blog'), that Leximancer had identified as separate concepts. Other excluded concepts were those referring to a time (the concepts day, today, tomorrow, week, weekend and year), which were usually used in the context of 'join us today' or 'next week we have planned…'. The merged concepts were BBC Springwatch & Springwatch; photo & photos; place & places; Scotland, Scotland's & Scottish; share, shared & sharing; take & taking; work & working; nature & natures. The remaining concepts were then developed by a thesaurus learning process where words were weighted according to how frequently they co-occurred in a phrase relative to their frequency of occurrence elsewhere (Leximancer Pty Ltd, 2019).

Having identified individual concepts, Leximancer then detects the presence and frequency of co-occurrence between concepts within the text. It uses this measure of co-occurrence to generate a conceptual map with thematic clusters of concepts, representing the main themes contained within the text and providing information about how they are related to each other (Leximancer Pty Ltd, 2019). Leximancer automatically labels the themes by using the concept that is most connected within a theme. However, this description neither always makes analytical sense nor best describes the meaning of a theme as the algorithm is blind to the research context. Krippendorff (2013, p.41) points out that in content analysis, a text needs to be 'processed in reference to what is known about [its] use', to abductively infer its meaning. We therefore analysed the thematic clusters Leximancer produced and identified topics of conversation that nature conservation and outdoor organisations engage with and renamed the themes accordingly. The themes included 'Springwatch'; '(Climate) Action'; 'Scotland's Nature'; 'Wildlife'; 'Conservation'; 'Support'; 'Local'; 'Join'; 'Birds'; 'Garden'; 'Lockdown' and 'Photos' (Figure 1) and are further described in the results section.

3.3.2 | Qualitative content analysis

Although Leximancer's content analysis showed important themes that were present in the tweets in 2019 and 2020, to break down these themes further, the statistical algorithm-based analysis was supplemented with a qualitative analysis of a subset of the tweets. Qualitative or interpretive content analysis requires the close reading of text, to interpret and characterise the constructed narratives, allowing for more in-depth exploration of the socio-cultural context and latent content within the text (Caliandro & Gandini, 2017; Krippendorff, 2013). It allows to place the findings generated by Leximancer in context and to 'sense-check' whether the automated analysis makes semantic sense. Being interested in what way offline and online interactions with nature were promoted through social media during the pandemic, we analysed a subset of the 2020 tweets from all four organisations and focused on the tweets coded under the categories 'nature information and experience' and 'local nature experience'. Following Caliandro and Gandini (2017) we took a random sample of 10% of those tweets and analysed these 95 posts in-depth. These tweets were examined in relation to the opportunities and concerns regarding new media technology identified in Section 2; specifically, whether direct, sensory engagement was promoted, and spectacular or mundane nature was shown. For every tweet we established its purpose; whether the online content referred to offline activities in nature; to what extent mundane, localised nature was promoted; and how affective connections with nature were made. We also considered the audiences' engagement with the posts as expressed by likes, replies and retweets, with a particular focus on the anecdotes and stories shared in the replies.

Striking topics that emerged from this analysis were (a) health and well-being; (b) sharing reflections; and (c) encouraging sensory nature experiences (Section 4.2).

3.3.3 | Interview analysis

To understand how the Twitter content was shaped by the organisations' aims, thoughts and usage of the platforms, we analysed the interviews with the four communication officers in relation to five themes that covered both the way they used social media and the online-offline connections they made: (a) the purpose of using social media; (b) benefits of using social media; (c) disadvantages of social media; (d) interaction with followers and (e) differences between the different media platforms. The interviews were also used to provide context to the themes emerging from Leximancer's content analysis (Section 3.3.1). In addition, the interview analysis helped to inform our qualitative content analysis (Section 3.3.2), by providing an initial understanding of what purpose was given to tweets by the interviewees and what type of activities the organisations had wanted to promote.

For clarity, we dedicate each of the subsections of the results to one of our approaches to data analysis: Section 4.1 presents the findings of our Leximancer content analysis, while Section 4.2 focuses on the in-depth qualitative content analysis. Section 4.3 presents insights from the interviews. Each section builds on the results of the previous, providing more detail and context to the analysis.

3.4 | Research ethics

The methodology was approved by the ethics committee of the School of Biological Sciences of the University of Aberdeen. The main considerations were related to consent and anonymization, as common research practices fall short when using 'mined' data from social media sites (Townsend & Wallace, n.d.). Quoting a few words from a tweet can be enough to find the original text using a search engine. We accepted the likelihood that organisations will be identifiable as mentions of specific activities, such as '30 days wild' or 'Breakfastbirdwatch', are highly specific. We therefore obtained written informed consent from the communication officers interviewed for this study to name their organisation in our analysis.

Moreover, gathering data on specific accounts often automatically includes information on friends, followers and other associated users (Matzner & Ochs, 2017). Considering this, we decided not to download any meta-data apart from the link to the original tweet and time stamp, as we were only interested in the text of the tweets of our four focal organisations. In our qualitative content analysis; however, we also looked at comments on and retweets of the original tweets. We only read the data to understand the context of the tweet and did not gather any personal data of these accounts, store or quote any of these responses.

4 | RESULTS

4.1 | Changing focus: Growing attention to local nature experiences

Our initial analysis of the tweets showed five broad categories (Table 3). Tweets categorised as 'campaigning and advocacy' encouraged followers to join action against climate change and other environmental issues, and shared information about these issues. The category 'promotion and organisation' included posts that advertised products, services or specific projects, such as membership of the organisation or the attendance of specific events. Other tweets in this category sought nominations or votes for awards or highlighted volunteers, sponsors, and funders of projects. Where content linked to, for example, webcams or information on nature and outdoor activities, the tweet was included in the category 'nature information and

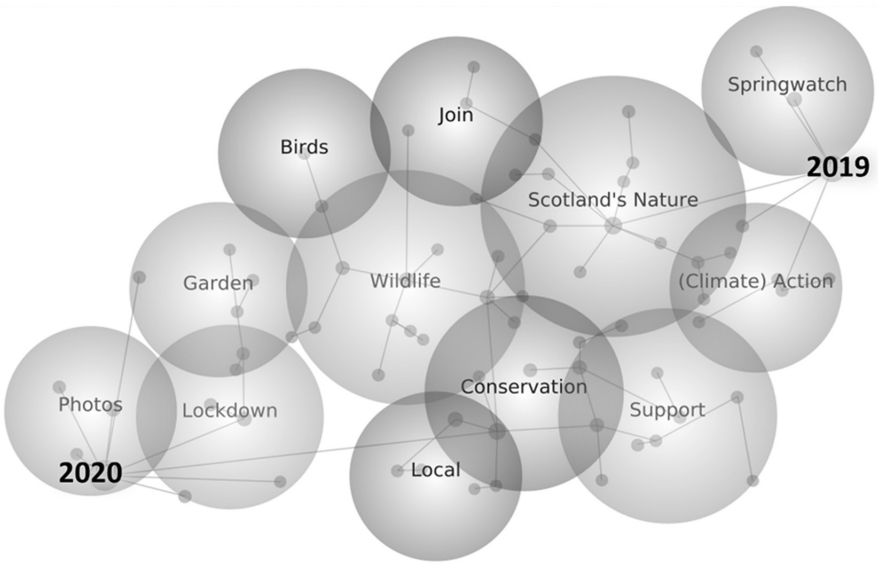

FIGURE 1 Overview of the themes generated by Leximancer. Themes more likely to be associated with tweets posted during lockdown (2020) are on the bottom left; those more likely to be associated with the spring of 2019 are on the top right. Size of circles does not represent the importance of the themes, the circles are merely graphical boundaries to encompass all concepts (grey dots) connected to a theme. The grey lines indicate the most-likely connections between concepts.

TABLE 3 Numbers of tweets sent by each of the four focal organisation during lockdown (2020) and the year before, categorised per theme. Arrows indicate whether the number of tweets went up or down in 2020, compared to 2019; arrows in black indicate categories for which the number of tweets during lockdown were at least double or half of that in the previous year. The theme 'Local nature experience' showed the biggest change, with a strong increase in tweets on this subject in 2020 for all four organisations.

Account Year [no. tweets]	Nature information & experience	Campaigning & advocacy	Promotion & organisation	Local nature experience	COVID-19 information
RSPB Scotland					
2019 [579]	322	133	85	39	0
2020 [729]	264 ▽	97 ▽	114 △	252 ▲	2
Walkhighlands					
2019 [232]	158	44	30	0	0
2020 [180][a]	124 ▽	14 ▼	18 ▽	9 ▲	15
John Muir Trust					
2019 [369]	144	114	110	1	0
2020 [313]	108 ▽	100 ▽	73 ▽	29 ▲	3
Scottish Wildlife Trust					
2019 [187]	66	72	38	11	0
2020 [298]	129 △	44 ▽	56 △	65 ▲	4

[a]For Walkhighlands the threads, not individual tweets, were counted, because several tweets made up one story (a thread).

experience' or 'local nature experience'. Tweets classified as 'nature information and experience' provided information on wildlife and nature areas, activities that could be done in nature or trivia and information about species or places. 'Local nature experience' also referred to activities and information on wildlife and nature, but specifically located in the vicinity of people's houses, such as wildlife in the garden or city as well as virtual nature, or indoor activities that linked to nature. The 'COVID-19 information' category included tweets that offered information about COVID-19 and the government guidance (e.g. to stay at home, only go out once a day and only within 5 miles of one's home).

One of the most prominent differences between the tweets in 2019 and 2020 was a marked shift in relation to the attention given to local nature, which increased in 2020.

To investigate the differences in more detail, we used Leximancer's content analysis, clustering identified concepts into themes (Figure 1) and comparing the tweets in 2019 and 2020, to show associations between year and themes. Themes to the right of Figure 1 (marked '2019') were more likely to be associated with the 2019 tweets. These included '(Climate) Action' and 'Springwatch'. To the left side of the figure (marked '2020'), we find the themes that were more likely to be associated with the 2020 tweets, such as 'Lockdown', 'Photos' and 'Garden'. The themes presented in the middle of Figure 1, such as 'Wildlife', 'Conservation' and 'Support', were as likely to be found in 2019 as in 2020. Note that the size of the circles covering one theme does not represent importance or prevalence of the themes.

Although Figure 1 gives a good visual representation of the themes, the table in the supporting information (Appendix S1) includes a more detailed overview of the concepts associated to the tweets of each year. Concepts that were associated with the main themes in 2020 and had a high likelihood (> 60%) to occur in the 2020 tweets were 'lockdown', 'photos', 'home', 'sharing', 'garden', 'local' and 'health'. These concepts referred to nature close to home, including suggestions of activities to do when needing to stay indoors and local, and highlighted the importance of local flora and fauna. They also included tweets that emphasised the participatory nature of Twitter, with the organisations encouraging followers to share photos, and underlining the possibility to share wildlife facts and nature experiences with each other. In 2019 the concepts most likely to occur were associated with the theme (Climate) Action (Figure 1) and included 'environment', 'future', 'climate', 'protect' and 'action'. These concepts drew attention to the call to (environmental) action that the organisations shared, including examples of people working towards a sustainable and better future, and suggestions of ways to participate in environmental action. Interestingly, there was a higher variety of concepts associated with 2020 than with 2019. This might be due to the fact that the pandemic led to the need to use a different lexicon and to propose and highlight different types of nature experiences. While, apart from 'lockdown', none of the concepts were exclusively found in 1 year or the other, the analysis does point towards a shift in focus in 2020, with less emphasis on environmental action while highlighting people's nature experiences in their neighbourhood.

4.2 | Engaging with nature during lockdown: reflections and sensory experiences

Considering a sub-section of the tweets for our in-depth qualitative analysis of individual tweets (Section 3.3.2), we found that the focus

on local nature experiences in 2020 translated into specific types of activities and engagement with nature promoted during lockdown. Some of the suggested activities in the tweets were online, such as watching wildlife webcams or nature films, or indoors, such as nature-inspired arts and crafts:

> Looking for an at-home nature activity? A lot of art is inspired by nature! Use materials from around the house like pens, paints and cardboard- you can even incorporate something from the garden like stones or leaves. We would love to see your wildlife-inspired creations!

Others were activities connected to local nature, with tweets for example mentioning watching wildlife in the garden:

> If you're doing more in the garden at the moment, or adding new plants to your balcony, choose some flowers loved by bees! Check out our tips for growing flowers that bees love.

In encouraging people to connect to local nature in whatever shape or form, one particular topic that was touched upon was the importance of nature for mental health. There were multiple blog posts written by staff or other conservation or outdoor professionals that reflected upon the effects lockdown had on their well-being, referring to the experience of everyday wildlife in the form of a bird in front of their window. Tweets mentioned the comfort people got from nature:

> Finding stillness in nature is both immersive and rejuvenating, and can bring nature close to hand. [Author] is finding solace under lockdown in the sights and sounds of her garden.

These reflections would often entail an acknowledgement of loss, not being able to visit wild or remote places but would also refer to refocusing or reconnecting to the more everyday or mundane nature that could be found around the house, finding beauty in that. It was not so much exotic species or spectacular landscapes that were shared, instead, more mundane wildlife and local places were mentioned. However, these more everyday encounters were sometimes made more exciting, by for example emphasising spectacular moments and presenting the exploration of nature as an adventure.

Followers were encouraged to share their discoveries, with tweets asking for specific observations or stories:

> We asked for you to send your signs of spring in our latest #WildInside eNewsletter. What signs of spring have you seen? Let us know.

> What's been coming to your garden feeders? #EverydayWildlife.

Multiple tweets also stressed the importance of sensory immersion in nature:

> Spring Watch - what have you spotted? [Conservation officer] has been out and about, getting a heart full of the sights, sounds and smells of spring.

Particular attention was given to sound. Followers were asked to listen to and share their experiences of the dawn chorus, and recordings were shared to enable listening to nature while at home. Sound, next to observations from one's window, was seen as a way to connect with nature and enjoy its restorative qualities, as the following tweet suggests:

> Why not make your at home activity today be to relax with sounds of nature? Yesterday [scientist] shared that scientists research has suggested that birdsong & bird calls are one of the most often mentioned natural sounds that people said helped them to recover from stress.

In sharing these stories and suggesting (sensory) activities, there also seemed to be an awareness that nature was not equally accessible to everyone. While many activities referred to people's gardens, there were also specific suggestions that nature could be observed from a '*… balcony, or just looking out of the window*', acknowledging that not everyone had the same access to a greenspace nearby. In our interviews with the four organisations, they mentioned this as another important driver to suggest a range of activities, both online and offline, to encourage connecting to nature and show that nature could be found anywhere.

4.3 | Engaging with nature during lockdown: Connecting to (local) nature

The shift in focus suggested by our Leximancer data analysis, less on campaigning and advocacy and more about local nature and well-being (Section 4.1), was reiterated and reflected upon by the communication officers in the interviews (see Section 3.3.3). Their goal for using social media was to harness the power of these platforms to facilitate people's engagement with nature. In general, the communication officers described Twitter as a platform to draw attention to environmental issues, hoping their posts would contribute to wider conversations on these issues. However, they felt that one of the main goals of sharing stories and activities on social media during the spring lockdown was to keep people connected to nature. One of the organisations, for example, started a new newsletter, as *'an attempt to address some of the isolation (…) the idea was to bring the wild in sight, to people who were locked down in cities'*. With children not being able to go to school, they also attempted to provide resources for learning, and focused on how to welcome nature into gardens and on balconies:

> We kind of intentionally set a lot of resources that were aimed at kind of helping people learn from home and make a kind of difference for wildlife within their garden.

One of our sample organisations mentioned that initially they had a discussion whether they should at all share pictures of nature in Scotland, as that might give the wrong message and perhaps encourage people to break lockdown restrictions. However, they felt that the news was so grim, that *'people still needed to see the places that bring them peace'*. One communication officer stated:

> We tried to say something positive about it (…) we still got to post our pictures of the outdoors, which I think a lot of people wanted to see, to being calm (…) but also we had integral in there the message that there is a crisis on and that you've got to stay at home.

Another of the organisation offered an hour of live chat every morning during the spring lockdown, trying to build community spirit by sharing stories of nature and discussing what animals people had seen in the garden, which they felt was appreciated by their followers as they received positive feedback. The communication officer interviewed argued that this might have been because the followers did not just talk with 'nameless, faceless channels' but were able to talk to other people that used the same hashtag at the same time in the morning. Conversely, this interaction was also experienced as pleasant by the communication officer: *'I don't really get to speak to anyone face to face a lot, so it is nice to have that kind of more tangible relationship with our audience and see what is going on. And develop a bit more like a personal voice on our social media as well, I think.'*

The emphasis for the organisations was on how to support followers when they could not go out into nature anymore. Two organisations specifically mentioned that social media was particularly good at building a community; and while they hoped to mobilise this community, for example, to campaign on environmental issues, during lockdown it was mainly used to inspire people and get them connected to the natural world. All the organisations expressed a desire to grow their community beyond those people already engaged with nature conservation or outdoor activities, to increase awareness of the importance of nature. Who exactly was included in this community, however, remained difficult to pinpoint. Nevertheless, two of the organisations mentioned that they felt that during the spring lockdown more people had joined this online community and more people emphasised the importance nature had for them:

> Suddenly people have woken up and collectively and in their communities have said, well actually this stuff is valuable to us. And everyone at our end of the playing field is trying to work out how we can maximize that. And work for some positive change, that positive energy sort of thing, and harness that positivity, that came out of something that is really horrible.

One of the communication officers remarked that people seemed to have shared more stories about what nature meant for them:

> We definitely did get some people kind of reflecting on what impact lockdown had had on their relationship with nature. Which obviously, we couldn't really compare it with anything else, but it was interesting to see, and I don't know if people would have discussed their relationship with nature and the importance of nature in that sense beforehand.

The organisations tried to harness this increased reflection and positive energy at the end of lockdown to discuss nature's importance and a green recovery, moving back to another of their main goals of using social media for these organisations: to call for action. Where in 2019 a large portion of the tweets had focused on environmental and climate action, this focus had been less sharp during lockdown. However, as the lockdown eased at the end of June 2020, communication officers mentioned they were keen to capitalise on people's eagerness to engage with nature and the momentum that had built during lockdown, to bring home the message that nature merited protection. Tweets for example referred to reflections on the future of nature: *'Our #NextForNature Twitter chat is in just half an hour! We would love for you to join us to tell us more about your reflections on lockdown and what you would like to see for nature and people as lockdown is eased.'*

The need to protect nature was now linked to a sustainable recovery from the pandemic, as mentioned directly in their tweets:

> In the aftermath of Covid-19, a green recovery is essential say the UN and WHO.

The importance of engaging with and protecting nature was emphasised for both people's individual lives as well as for moving towards a more sustainable post-pandemic world.

5 | DISCUSSION

Using social media to connect with nature has opened up a debate on the influence of digital platforms on our interactions with nature (Shultis, 2012). This discussion has various strands. Social media can be critically assessed on their influence on (political) discourse and how they shape the actions taken to protect nature (Büscher, 2016). Digital technologies have also been critiqued for their influence of our embodied experiences of nature, which are seen as important in building meaningful relations with nature (Soga & Gaston, 2016; Truong & Clayton, 2020). Our analysis showed that, while during the 2020 lockdown in Scotland the options to engage with nature were limited, nature conservation and outdoor organisations refocused their virtual communication to support their (online) community in making meaningful nature connections, grounded in local places and multisensory interactions, encouraging people to enjoy nature close to home.

5.1 | Being in nature

Our Leximancer analysis revealed that in 2020, the theme of everyday, more mundane nature, such as gardens and greenspace in people's neighbourhood, was more prevalent in organisations' tweets compared to the year before. Attention to the mundane is seen as an important way to open avenues to convey more diverse stories of nature (Saito, 1998). While tweets and their responses repeatedly spoke about a feeling of missing 'wilder' places, which were inaccessible during lockdown, they also emphasised that connections people had with nature in remoter and more spectacular places could also be created with nature closer to home. These connections with what Kaplan (1992, 2001) calls 'nearby nature' can be made in many forms, from being in nature to observing nature through a window. In their posts, organisations suggested that everyday encounters with species such as blackbirds or pigeons were also a way to connect to nature, implying that everyone, regardless of where they lived, could find nature around them. The variety of engagement that is encouraged matters, not only because during lockdown local encounters with nature can enhance well-being (Ribeiro et al., 2021; Sachs, 2020) but also because representations of nature inform the way we respond to current and future environmental challenges (Mörner & Olausson, 2017). One of the criticisms levelled at the representations produced through digital media is that they focus on the spectacular, which can lead to less rich and varied experiences (Büscher, 2013; Truong & Clayton, 2020). Less charismatic or more problematic nature often receive less attention (Mörner & Olausson, 2017; Kidd et al., 2018). A more diverse inclusion of reflections and representations of mundane or local nature all contribute to the multifaceted relationships people build with nature.

Reflecting on nature's influence on well-being and appreciating more mundane nature is something that seems to conflict with the way social media is often used and portrayed. Social media platforms are driven by immediacy, and continuously provide new information and updated timelines (Büscher, 2016). Our focal organisations were also aware of this, and sometimes wondered what impact they could actually make, as their tweets would just be one of many. Their motivations for posting were content driven, to motivate people to become engaged with nature, conservation and the organisation (Section 4.3). Yet, the fast-paced social media environment does require those who post to stand out. Posting on social media is a balancing act for these organisations, as platforms encourage aesthetically pleasing, entertaining and attractive images and stories. Even when posts are focused on local nature or mundane species such as garden birds, these are often still made extraordinary by, for example, showing spectacular visuals or zooming in on details such as hatched eggs, perspectives that are difficult to experience unaided by technologies (Verma et al., 2015). In the body of tweets we analysed, we recognised this tendency to emphasise the unproblematic, positively connotated and sometimes more spectacular moments in nature. This suggested that the tweets posted during lockdown did address the need to show more localised nature and offered space for people to talk about their everyday, more mundane, nature encounters – but within this constrained scope, tweets still concentrated on aspects of nature that are generally regarded as positive.

This opportunity to use social media platforms to promote more diverse interactions was also seen in the emphasis that was given to different sensory experiences. Social media tend to be very visual platforms, often promoting experiences through photo and videos. It is therefore not surprising that 'photos' was a prominent theme in our Leximancer analysis. However, our analysis of the tweets also highlighted the importance given to direct sensory engagement with everyday nature, with touch, smell and particularly sound adding to a visual experience of nature. While this emphasis blossomed in 2020, the acknowledgement of the importance of sound was not something completely new. In 2019, for example, one of the organisations released a song that consisted entirely of bird tunes, which entered the United Kingdom top 40. It was promoted several times on the organisation's Twitter feed and linked to an online campaign to 'let nature sing'. One objection to the use of digital technologies to connect with nature is that it might reduce sensory and embodied experiences (Truong & Clayton, 2020). However, in spring 2020, Twitter was thus used by our conservation and outdoor organisations to promote also non-visual sensory experiences instead of a detached and purely virtual and visual nature. This suggests that social media, although inscripted with possibilities for fast-paced, visual and spectacular exchanges, can also be used in more diverse ways.

5.2 | Social media: Action or connection?

Our Twitter analysis showed a distinct difference in focus between the tweets posted in 2019 and 2020. In 2019, environmental campaigns were prominent, while this receded into the background during the first lockdown (Section 4.1). This reflects the aims expressed by our sample conservation and outdoor organisations, wanting to concentrate on facilitating connections to (local) nature and supporting their followers during an uncertain time. This is an interesting shift, as campaigning tends to be described as an important objective for NGOs to use social media, but has not been without critique (see for example Büscher, 2016; Miller, 2017). Although Twitter might offer activists a platform to spread their messages (e.g. Checker, 2017; Mkono, 2018), concerns have been raised that online campaigning or activism leads to what has been described as 'clicktivism', as it involves little effort and risk to share a link or sign a petition (Halupka, 2014; Lim, 2013). This type of online campaigning has so far not shown much lasting effect or impact on political action, with meaningful engagement and mobilisation of action remaining absent (Büscher, 2016; Jacqmarcq, 2021; Miller, 2017; Thorson & Wang, 2020). Twitter can be used to connect people to others 'simply for the sake of connections' and 'being together' (Miller, 2017, p. 259), as social media have an 'expressive and/or connective function of communication', but 'does not particularly encourage meaningful conversation, dialogue or a public sphere, let alone social change'. However, during lockdown, 'simply' making connections and bringing people together, and closer to nature, was part of the aim of the organisations we examined. Our tweets showed that,

in the pandemic, people shared casual conversations and stories on the enjoyment of nature. These might have been a lifeline in a stressful time. Lockdown thus potentially helped organisations to pilot the use of social media in a more conversational way. The organisations we interviewed pointed out that it felt as if they were supporting a (growing) community, although we can understand their motivations also as part of a way to stay relevant and keep their own organisation, and nature conservation in general, salient in people's minds. Moreover, the question remains how the connections built between followers and organisations can move into a sphere where they generate action, especially considering that organisations sought to move towards promoting 'green recovery' at the end of the first lockdown.

Although the research presented here showed an interesting refocus of social media to communicate about nature, these communication approaches developed during exceptional circumstances. These circumstances arguably contributed to a renewed vocabulary to talk about nature, conservation and the outdoors. The 'crisis' situation of the first lockdown might have mobilised different behaviours and discourses to the ones that are usually presented. However, we are also aware that every year has its own context, and 2019 can be seen as the year of climate action, with youth calling for change through organising 'school strikes for climate'.

Our research looked at the United Kingdom, where in spring 2020, outdoor movement was restricted to once a day within a radius of 5 miles. Other countries might have implemented different rules. In Sweden, for example, outdoor access was not as severely restricted which resulted in people spending more time outdoors, especially, and in accordance with our findings, in areas close to home (Beery et al., 2021). More particularly, we looked at the *first* lockdown in the United Kingdom where positive stories of the effects of slowing down and reflections on daily routines were given attention. This could have made the followers of our organisations' accounts open to highlighting and reflecting upon the more everyday nature they encounter. Further research could unpack whether these social media conversations translated to direct outdoor engagement when lockdown was eased, and to which extent outdoor activities changed as a consequence of Twitter-mediated engagement with nature during lockdown. Our findings also offer interesting angles for further social media research which could aim to understand if the strategy adopted by our NGOs to focus on more localised interactions and an increased sense of community can be maintained over time, or if they are very specific product of the first lockdown. We view our approach to social media content analysis, combining algorithm driven content analysis of a larger body of tweets with in-depth qualitative content analysis of posts and interviews to understand the context in which tweets were posted, as a helpful method to follow these online–offline interactions.

6 | CONCLUSION

Lockdown sparked some identifiable changes in the way nature conservation and outdoor organisations used their social media to communicate about nature. We provided evidence of a sharper focus on local and everyday encounters with nature, reflecting on the importance nature can have in people's lives. These encounters were often a mixture of offline, sensory engagement and online sharing of experience. Seeing the digital world not as virtual or separate from nature, but as an augmentation of it allowed us to understand the influence of digital media in a more nuanced way.

While campaigning and calls for action had been prominent Twitter themes for conservation and outdoor organisations in 2019, this appeared to move to the background during the first lockdown in Scotland, as organisations focused on supporting followers in this unprecedented time. The interactions between organisations and followers during the lockdown period showed a potential avenue for building engagement and interaction on social media platforms, although it remains to be seen whether this engagement can actually be translated into building a (sustainable) community of interest.

AUTHOR CONTRIBUTIONS

Irma Arts: Conceptualization (lead), Methodology (lead), Investigation and Formal analysis, Writing – original draft, Visualisation; Dominic Duckett: Conceptualization, Methodology, Writing – review & editing; Anke Fischer: Conceptualization, Methodology, Writing – review & editing; René van der Wal: Conceptualization, Methodology, Writing – review & editing.

ACKNOWLEDGEMENTS

We would like to thank the interviewees for sharing their views and experiences with us, and Michelle Pinard and Tom Smith, as well as two anonymous reviewers and the associate editor for comments on earlier versions of this manuscript. This work was supported by the University of Aberdeen and the James Hutton Institute.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data on which this research is based are archived on secure servers at the authors' institution. Twitter data are publicly available and downloadable through Twitter's API. To preserve confidentiality (as promised in the context of the participants' informed consent), the data are not made publicly available

ORCID

Irma Arts https://orcid.org/0000-0003-3505-6947
Dominic Duckett https://orcid.org/0000-0001-5151-2776
Anke Fischer https://orcid.org/0000-0002-0034-3690
René van der Wal https://orcid.org/0000-0002-9175-0266

ENDNOTES

[1] https://geduldig.github.io/TwitterAPI/index.html
[2] https://westgrid.github.io/trainingMaterials/domains/dh/

REFERENCES

Adams, W. M. (2019). Geographies of conservation II: Technology, surveillance and conservation by algorithm. *Progress in Human Geography*, *43*, 337–350. https://doi.org/10.1177/0309132517740220

Alexander, N., & Kerr, B. H. (2020). *Animals strike curious poses*. https://reallifemag.com/animals-strike-curious-poses/

Arts, I., Fischer, A., Duckett, D., & Van der Wal, R. (2021). The Instagrammable outdoors – Investigating the sharing of nature experiences through visual social media. *People and Nature*, *3*, 1244–1256. https://doi.org/10.1002/pan3.10239

Arts, K., Van der Wal, R., & Adams, W. M. (2015). Digital technology and the conservation of nature. *Ambio*, *44*, S661–S673. https://doi.org/10.1007/s13280-015-0705-1

Basile, M., Russo, L. F., Russo, V. G., Senese, A., & Bernardo, N. (2021). Birds seen and not seen during the COVID-19 pandemic: The impact of lockdown measures on citizen science bird observations. *Biological Conservation*, *256*, 109079. https://doi.org/10.1016/j.biocon.2021.109079

Beery, T., Olsson, M. R., & Vitestam, M. (2021). Covid-19 and outdoor recreation management: Increased participation, connection to nature, and a look to climate adaptation. *Journal of Outdoor Recreation and Tourism*, *36*, 100457. https://doi.org/10.1016/j.jort.2021.100457

Birch, J., Rishbeth, C., & Payne, S. R. (2020). Nature doesn't judge you – How urban nature supports young people's mental health and wellbeing in a diverse UK city. *Health & Place*, *62*, 102296. https://doi.org/10.1016/j.healthplace.2020.102296

Boyd, D. (2011). Social network sites as networked publics: Affordances, dynamics, and implications. In Z. Papacharissi (Ed.), *A networked self. Identity, community, and culture on social network sites* (pp. 39–58). Routledge.

Büscher, B. (2013). Nature 2.0. *Geoforum*, *44*, 1–3. https://doi.org/10.1016/j.geoforum.2012.08.004

Büscher, B. (2016). Nature 2.0: Exploring and theorizing the links between new media and nature conservation. *New Media & Society*, *18*, 726–743. https://doi.org/10.1177/1461444814545841

Caliandro, A., & Gandini, A. (2017). *Qualitative research in digital environments: A research toolkit*. Routledge.

Checker, M. (2017). Stop FEMA now: Social media, activism and the sacrificed citizen. *Geoforum*, *79*, 124–133. https://doi.org/10.1016/j.geoforum.2016.07.004

Clampitt, P. G. (2017). *Social media strategy*. Sage.

Conti, E., & Heldt Cassel, S. (2020). Liminality in nature-based tourism experiences as mediated through social media. *Tourism Geographies*, *22*, 413–432.

Fletcher, R. (2017). Gaming conservation: Nature 2.0 confronts nature-deficit disorder. *Geoforum*, *79*, 153–162. https://doi.org/10.1016/j.geoforum.2016.02.009

Halupka, M. (2014). Clicktivism: A systematic heuristic. *Policy & Internet*, *6*, 115–132. https://doi.org/10.1002/1944-2866.POI355

Hawkins, R., & Silver, J. J. (2017). From selfie to #sealfie: Nature 2.0 and the digital cultural politics of an internationally contested resource. *Geoforum*, *79*, 114–123. https://doi.org/10.1016/j.geoforum.2016.06.019

Jacqmarcq, M. (2021). Environmental activism in the digital age. *Flux: International Relations Review*, *11*, 41–51.

Kaplan, R. (1992). The psychological benefits of nearby nature. In D. Relf (Ed.), *The role of horticulture in human well-being and social development* (pp. 125–133). Timber Press.

Kaplan, R. (2001). The nature of the view from home: Psychological benefits. *Environment and Behavior*, *33*, 507–542. https://doi.org/10.1177/00139160121973115

Kareiva, P. (2008). Ominous trends in nature recreation. *Proceedings of the National Academy of Sciences of the United States of America*, *105*(8), 2757–2758. https://doi.org/10.1073/pnas.0800474105

Kemp, S. (2021). Digital 2021: Global overview report. https://datareportal.com/reports/digital-2021-global-overview-report

Keniger, L. E., Gaston, K. J., Irvine, K. N., & Fuller, R. A. (2013). What are the benefits of interacting with nature? *International Journal of Environmental Research and Public Health*, *10*, 913–935. https://doi.org/10.3390/ijerph10030913

Kidd, L. R., Gregg, E. A., Bekessy, S. A., Robinson, J. A., & Garrard, G. E. (2018). Tweeting for their lives: Visibility of threatened species on twitter. *Journal for Nature Conservation*, *46*, 106–109. https://doi.org/10.1016/j.jnc.2018.10.001

Krippendorff, K. (2013). *Content analysis – An introduction to its methodology*. Sage.

Levi, D., & Kocher, S. (1999). Virtual Nature. *Environment and Behavior*, *31*, 203–226. https://doi.org/10.1177/00139169921972065

Leximancer Ltd. (2019). *Leximancer user guide*. https://static1.squarespace.com/static/539bebd7e4b045b6dc97e4f7/t/5e58d901137e3077d4409092/1582881372656/LeximancerUserGuide5.pdf

Lim, M. (2013). Many clicks but little sticks: Social media activism in Indonesia. *Journal of Contemporary Asia*, *43*, 636–657. https://doi.org/10.1080/00472336.2013.769386

Louv, R. (2009). *Last child in the woods*. Atlantic Books.

Mace, G. M. (2014). Whose conservation? *Science*, *345*, 1558–1560. https://doi.org/10.1126/science.1254704

Maffey, G., Homans, H., Banks, K., & Arts, K. (2015). Digital technology and human development: A charter for nature conservation. *Ambio*, *44*, S527–S537. https://doi.org/10.1007/s13280-015-0703-3

Marselle, M. R., Irvine, K. N., & Warber, S. L. (2014). Examining group walks in nature and multiple aspects of well-being: A large-scale study. *Ecopsychology*, *6*, 134–147. https://doi.org/10.1089/eco.2014.0027

Martin, L., White, M. P., Hunt, A., Richardson, M., Pahl, S., & Burt, J. (2020). Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *Journal of Environmental Psychology*, *68*, 101389. https://doi.org/10.1016/j.jenvp.2020.101389

Matzner, T., & Ochs, C. (2017). Sorting things out ethically: Privacy as a research issue beyond the individual. In M. Zimmer & K. Kinder-Kurlanda (Eds.), *Internet research ethics for the social age* (pp. 39–56). Peter Lang Publishing.

Miller, V. (2017). Phatic culture and the status quo: Reconsidering the purpose of social media activism. *Journal of Research into New Media Technologies*, *23*, 251–269.

Mkono, M. (2018). The age of digital activism in tourism: Evaluating the legacy and limitations of the Cecil anti-trophy hunting movement. *Journal of Sustainable Tourism*, *26*, 1608–1624. https://doi.org/10.1080/09669582.2018.1489399

Mörner, C., & Olausson, U. (2017). Hunting the beast on YouTube. *Nordicom Review*, *38*, 17–29. https://doi.org/10.1515/nor-2016-0038

Olafsson, A. S., Møller, M. S., Matthijssen, T., Gulsrud, N. M., Breman, B., & Buijs, A. (2021). Social media and experiences of nature: Towards a Plurality of Senses of Place. In A. Di Masso, C. M. Raymond, D. R. Williams, L. C. Manzo, & T. Von Wirth (Eds.), *Changing senses of place: Navigating global challenges* (pp. 271–283). Cambridge University Press.

Pelletier, M. J., Krallman, A., Adams, F. G., & Hancock, T. (2020). One size doesn't fit all: A uses and gratifications analysis of social media platforms. *Journal of Research in Interactive Marketing*, *14*, 269–284. https://doi.org/10.1108/JRIM-10-2019-0159

Pergams, O., & Zaradic, P. (2007). Videophilia: Implications for childhood development and conservation. *Journal of Developmental Processes*, *2*, 130–144.

Ribeiro, A. I., Triguero-mas, M., Jardim Santos, C., Gómez-Nieto, A., Cole, H., Anguelovski, I., Silva, F. M., & Baró, F. (2021). Exposure to nature and mental health outcomes during COVID-19 lockdown. A comparison between Portugal and Spain. *Environment International*, *154*, 106664. https://doi.org/10.1016/j.envint.2021.106664

RSPB. (2020).*Royal society for the protection of birds annual report*. https://www.rspb.org.uk/globalassets/downloads/annual-report-2020/rspb-annual-report-2020-interactive-pdf.pdf

Russell, R., Guerry, A. D., Balvanera, P., Gould, R. K., Basurto, X., Chan, K. M. A., Klain, S., Levine, J., & Tam, J. (2013). Humans and nature: How knowing and experiencing nature affect well-being. *Annual Review of Environment and Resources*, *38*, 473–502. https://doi.org/10.1146/annurev-environ-012312-110838

Sachs, N. (2020). Access to nature has always been important; with COVID-19, it is essential. *HERD: Health Environments Research & Design Journal*, *13*, 242–244. https://doi.org/10.1177/1937586720949792

Saito, Y. (1998). The aesthetics of unscenic nature. *The Journal of Aesthetics and Art Criticism*, *56*, 101–111. https://doi.org/10.2307/432249

Sánchez-Clavijo, L. M., Martínez-Callejas, S. J., Acevedo-Charry, O., Diaz-Pulido, A., Gómez-Valencia, B., Ocampo-Peñuela, N., Ocampo, D., Olaya-Rodríguez, M. H., Rey-Velasco, J. C., Soto-Vargas, C., & Ochoa-Quintero, J. M. (2021). Differential reporting of biodiversity in two citizen science platforms during COVID-19 lockdown in Colombia. *Biological Conservation*, *256*, 109077. https://doi.org/10.1016/j.biocon.2021.109077

Sandifer, P. A., Sutton-Grier, A. E., & Ward, B. P. (2015). Exploring connections among nature, biodiveristy, ecosystem services and human health and well-being: Opportunities to enhance health and biodiveristy conservation. *Ecosystem Services*, *12*, 1–15. https://doi.org/10.1016/j.ecoser.2014.12.007

Schultz, P. W. (2002). Inclusion with nature: The psychology of human-nature relations. In P. Schmuck, & W. P. Schultz (Eds.), *Psychology of sustainable development* (pp. 61–78). Kluwer Academic Publishers.

Shultis, J. (2012). The impact of technology on the wilderness experience: A review of common themes and approaches in three bodies of literature. In *Paper presented at the Wilderness visitor experiences: Progress in research and management conference*, Missoula, MT, USA.

Shultis, J. D. (2015). 'Completely empowering': A qualitative study of the impact of technology on the wilderness experience in New Zealand. In *Paper presented at the science and stewardship to protect and sustain wilderness values Tenth World Wilderness Congress symposium Salamanca*, Spain.

Smith, A. E., & Humphreys, M. S. (2006). Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping. *Behavior Research Methods*, *38*, 262–279.

Smith, S. P. (2021). Landscapes for 'likes': Capitalizing on travel with Instagram. *Social Semiotics*, *31*, 604–624. https://doi.org/10.1080/10350330.2019.1664579

Soga, M., & Gaston, K. J. (2016). Extinction of experience: The loss of human–nature interactions. *Frontiers in Ecology and the Environment*, *14*, 94–101. https://doi.org/10.1002/fee.1225

Soulé, M. E. (1985). What is Conservation Biology? A new synthetic discipline addresses the dynamics and problems of perturbed species, communities, and ecosystems. *Bioscience*, *35*, 727–734. https://doi.org/10.2307/1310054

Stinson, J. (2017). Re-creating Wilderness 2.0: Or getting back to work in a virtual nature. *Geoforum*, *79*, 174–187. https://doi.org/10.1016/j.geoforum.2016.09.002

Sturgeon, N. (2020). *Coronavirus (COVID-19) update: First Minister's speech 24 March 2020*. https://www.gov.scot/publications/first-ministers-update-covid-19/

Sutherland, I. (2012). Connection and inspiration: Phenomenology, mobile communications, place. In R. Wilken & G. Goggin (Eds.), *Mobile technology and place* (pp. 157–171). Routledge.

Thomas, D. A. (2014). Searching for significance in unstructured data: Text mining with Leximancer. *European Educational Research Journal*, *13*, 235–256. https://doi.org/10.2304/eerj.2014.13.2.235

Thorson, K., & Wang, L. (2020). Committed participation or flashes of action? Mobilizing public attention to climate on Twitter, 2011–2015. *Environmental Communication*, *14*, 347–363. https://doi.org/10.1080/17524032.2019.1666727

Townsend, L., & Wallace, C. (n.d.). *Social media reseach: A guide to ethics*. https://www.gla.ac.uk/media/media_487729_en.pdf

Truong, M. X. A., & Clayton, S. (2020). Technologically transformed experiences of nature: A challenge for environmental conservation? *Biological Conservation*, *244*, 108532. https://doi.org/10.1016/j.biocon.2020.108532

Turnbull, J., Searle, A., & Adams, W. M. (2020). Quarantine encounters with digital animals: More-than-human geographies of lockdown life. *Media Journal of Environmental*, *1*, 6.1–6.10.

Twitter. (2020). *Global impact report*. https://about.twitter.com/content/dam/about-twitter/en/company/global-impact-2020.pdf

Van Houwelingen-Snippe, J., van Rompay, T. J. L., & Ben Allouch, S. (2020). Feeling connected after experiencing digital nature: A survey study. *International Journal of Environmental Research and Public Health*, *17*, 6879. https://doi.org/10.3390/ijerph17186879

Verbeek, P. P. (2005). *What things do*. Pennsylvania State University Press.

Verma, A., Van der Wal, R., & Fischer, A. (2015). Microscope and spectacle: On the complexities of using new visual technologies to communicate about wildlife conservation. *Ambio*, *44*, S648–S660. https://doi.org/10.1007/s13280-015-0715-z

Wilson, M. (2003). Rhetoric of enrollment and acts of resistance: Information technology as text. In E. H. Wynn, E. A. Whitley, M. D. Myers, & J. I. DeGross (Eds.) *Global and organizational discourse about information technology* (pp. 225–248). Springer.

Zhu, L. (2021). The psychology behind video games during COVID-19 pandemic: A case study of Animal Crossing: New Horizons. *Human Behavior & Emerging Technologies*, *3*, 157–159. https://doi.org/10.1002/hbe2.221

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for the future at the new frontier of power*. Profile Books Ltd.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Arts, I., Duckett, D., Fischer, A., & van der Wal, R. (2022). Communicating nature during lockdown – How conservation and outdoor organisations use social media to facilitate local nature experiences. *People and Nature*, *4*, 1292–1304. https://doi.org/10.1002/pan3.10387