

Wildlife and public perceptions of opportunities for psychological restoration in local natural settings

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Abstract

1. Wildlife might be important to psychologically restorative values and disvalues of nature, as interactions with wildlife could trigger both positive and negative feelings. Research on positive experiences of human–wildlife interactions has largely involved participants who voluntarily sought out wildlife experiences or it has addressed encounters with non-threatening animals in urban green spaces. Less is known about the opportunities for psychological restoration in landscapes shared with mammals that are perceived to pose a threat to human activities and health.
2. This study provides a nuanced understanding of the role of wildlife in public perceptions of the restorative potential and experience of psychological restoration in local natural settings.
3. Twenty-eight participants (15 women, 13 men, 18–75 years) took part in focus group interviews subject to a reflexive thematic analysis. As an analytical framework, we used a theoretical model for how people appraise the relevance, implications, coping potential and norm congruence of human–wildlife interactions and how such appraisals may support or hinder the restoration experienced in local natural settings.
4. Relevance appraisals revealed shifts in consideration of the presence of wildlife from an integrated part of the natural scenery (background) to a distinct figure (foreground).
5. Implication appraisals revealed that wildlife encounters would hinder the experienced psychological restoration if the animal was appraised as dangerous, disgusting, causing a nuisance or destructive. Wildlife encounters would promote restoration if the animal displayed attractive traits, features or fascinating behaviour or movements, and if it opened engaging interaction situations.
6. Coping strategies perceived as feasible to deal with negative implications of wildlife involved avoidance of the local natural setting, preparatory behaviour displayed before a visit and precautionary behaviour displayed during the visit.

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7. Important public health effects might be gained if wildlife policy and management explicitly consider what animals mean to the perceived restorative potential of local natural settings.

KEYWORDS

coping, emotional appraisal, mental well-being, reflexive thematic analysis, wildlife

1 | INTRODUCTION

Psychological restoration involves processes by which people restore psychophysiological and cognitive resources that have become depleted while contending with the demands they face in their lives (Hartig, 2021). Many people value spending time in natural settings because it supports psychological restoration (Knopf, 1987). This support for restoration can be referred to as a cultural ecosystem service (Millennium Ecosystem Assessment, 2005; cf. Bratman et al., 2019). Such services are described as commonly immaterial, highly dependent on people's activities and personal experiences, and especially salient to people in their local natural settings (Plieninger et al., 2013). Alternatively, framed in terms of nature's contributions to people (Díaz et al., 2018), psychological restoration can be understood as a contributor to a valued relationship between people and natural settings. Recurrent restorative experiences appear to promote attachments to specific natural settings (e.g. Korpela & Hartig, 1996), as well as pro-environmental behaviour more generally (e.g. Hartig et al., 2007; for additional background on relational values, see Chan et al., 2016; Stålhammar & Thorén, 2019).

Nature experiences that promote place attachment and pro-environmental behaviour often involve wildlife, as exemplified by significant environmentalists (e.g. Carson, 1962; Leopold, 1949); however, wildlife may also engender relational disvalues (or ecosystem disservices), and these may stem from the denial of restoration, as when a person fears wildlife near one's home (Llisko et al., 2022). Recurrent and/or persistent fear of encountering wildlife may have negative implications for health and well-being (Johansson et al., 2021; Marselle et al., 2021).

Associations between perceived qualities of natural settings and experiences of psychological restoration have been a topic for investigation since the 1970s, but the presence of wildlife in these settings has received relatively little attention (Kaplan & Kaplan, 1989; Ulrich et al., 1991). Drawing on theory in environmental psychology, this study aims to provide a nuanced understanding of the role of wildlife for perceived restorative potential and restoration outcomes in landscapes shared by people and wildlife. The study contributes to the literature by examining the psychological underpinnings of how human-wildlife interactions influence the perceived restorative potential of local natural settings and the extent to which local residents experience psychological restoration while visiting them. These outcomes are important from public health and environmental management

perspectives, as experiences with wildlife seem to be associated with people's willingness to support nature conservation (e.g. Johansson, Sjöstrom, et al., 2012; White et al., 2017).

We focus on landscapes shared between humans and wildlife in a Swedish context, with particular interest in the perspectives of people who live close to natural settings and engage in recreational activities within those settings. In Sweden, local natural settings are accessible through the Right of Public Access (Swedish EPA, <https://www.naturvardsverket.se/en/topics/the-right-of-public-access/>). Appreciative activities in nature such as hiking, skiing or paddling through scenic landscapes are common, and nowadays many traditionally consumptive activities of berry and mushroom gathering have recreational purposes (Fredman et al., 2019). This means that unplanned human-wildlife interactions may occur in people's everyday lives when they visit local nature anticipating a restorative experience. The Swedish fauna includes a wide range of mammals, many small and elusive like voles, mice, weasels and pine martens, but also larger animals, such as brown bears, wolves, wild boar and moose that people fear to encounter (Dressel et al., 2021).

1.1 | Previous research

The literature on wildlife in local natural settings has focused mainly on the negative feelings that people associate with impacts of animals on their goals and activities, as well as associated social conflicts (Eklund et al., 2023), prerequisites for co-existence (König et al., 2020) and the introduction of adaptive management (Månsson et al., 2023). A more positive view on human-wildlife interactions and how such interactions would provide relational values in general (Methorst et al., 2020), and psychologically salutogenic effects specifically, has been called for (Buijs & Jacobs, 2021). Restorative experiences involving human-wildlife interactions are documented in research on wildlife tourism. Interviews with wildlife tourists have revealed how tour participants became absorbed in nature, experienced wonder and awe for animals, felt a sensual awakening and a state of flow (Curtin, 2009). Viewing animals also created space for contemplation, spiritual fulfilment and feelings of well-being. These descriptions match what are regarded as key features of the perceived restorative potential of natural settings, namely, the absence of threat, compatibility with intended activity, a sense of being away and content that attracts and holds attention without effort (Kaplan & Kaplan, 1989; Ulrich et al., 1991).

There are several limitations to the transferability of research outcomes from wildlife tourism to human–wildlife interactions in local natural settings (Perrin et al., 2018). Tourists have themselves decided to approach the animals by choosing to visit a specific place. By definition, the presence of wildlife thereby become highly compatible with their recreational activity. The sighting of an animal may even be arranged for in the setting, for example, by providing a viewing platform. Tourists may be in the company of a guide with experience of the animals and their behaviour. Tourists can also choose to withdraw and leave the setting. These are all aspects likely to reduce perceived vulnerability and limit feelings of fear, thereby better permitting restorative experiences (Johansson et al., 2021; Johansson, Karlsson, et al., 2012).

This set of distinctions between wildlife tourism and local residents resonates with Perrin et al.'s (2018) findings regarding memories of unplanned wildlife interactions in the field. In these situations, the most common response was fear, followed by relief on realising the situation had been managed and the interaction went well. The pattern of responding will, however, presumably depend on the type of interaction situation (Bell et al., 2018), if the wildlife is considered native in the area (Schebella et al., 2017), and the animal species in question. For example, using photographs of animals, Zhao and Gong (2022) found that animals experienced as unthreatening (swans, deer, pigeons) contributed to perceived restorative quality of urban greenspace, while a potentially threatening unleashed dog reduced perceived restorative quality.

Similarly, the presence of birds and birdsong has been reported to facilitate psychological restoration (Hedblom et al., 2017; Smalley et al., 2022), although not all birds are perceived in positive terms (Ratcliffe et al., 2013). White et al. (2017) focused on marine wildlife (birds and seals) and concluded that locations where wildlife exhibits a high level of interesting behaviour (e.g. diving, flocking and playing) as opposed to a low level of interesting behaviour (e.g. sleeping, nesting) would have higher restorative potential.

In sum, wildlife seems important to restorative values and dis-values of nature, as wildlife can influence the experience of a natural setting and interactions with wildlife can trigger both negative and positive feelings. However, the research on positive experiences of human–wildlife interactions has largely excluded animals categorised as fear-relevant (e.g. large carnivores, Arrindell, 2000), or involved participants who had voluntarily sought out a setting because of the anticipated wildlife experience. Previous research may therefore not necessarily apply to people who reside in landscapes shared with mammals that are commonly perceived to pose a threat to human activities and health.

1.2 | Analytical framework and research questions

The present study is inspired by a theoretical model for how psychological processes in interactions with wildlife may support or hinder restorative outcomes of visits in local natural settings (Figure 1;

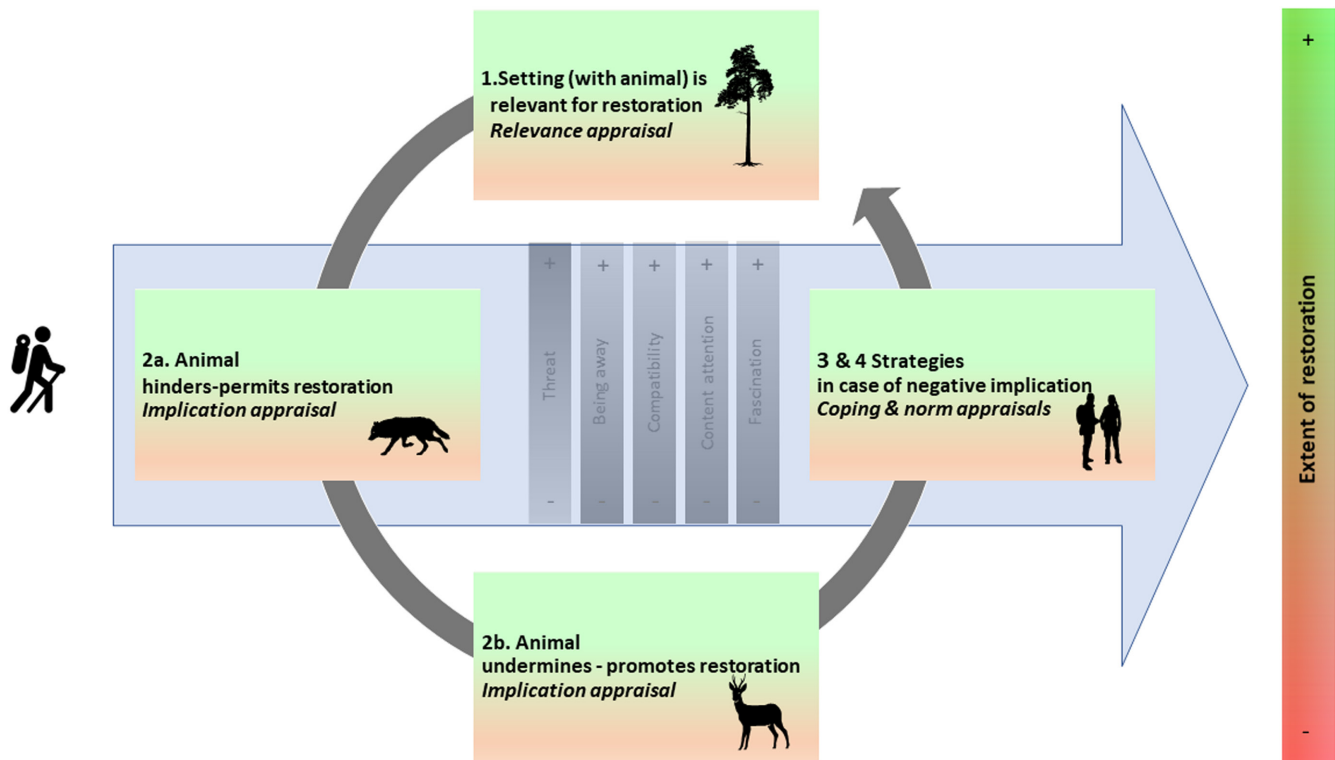


FIGURE 1 The process of appraisals of relevance, implication (permit and promote restoration), coping potential and norm congruence as a basis for the extent of psychological restoration gained from a visit to a local natural setting where an animal could be encountered.

Johansson et al., 2021). This model draws on established psychological theorising about human–environment interaction in general (the human–environment interaction model, Küller, 1991), restorative experiences in natural settings (stress recovery theory, Ulrich et al., 1991; attention restoration theory, Kaplan, 1995) and emotional appraisals (the component process model, Scherer, 2001). We used the model as an analytical framework to guide the formulation of research questions as well as reflection on and interpretation of the empirical data.

The model considers the extent of restoration gained from a visit in a local natural setting as dependent on emotional appraisals, implying that the individual's experience of any wildlife follows an appraisal process (Johansson et al., 2021). According to the component process model, this involves appraisals of perceived relevance, implications, coping potential and norm congruence of local animal presence (Scherer, 2001). The model also draws on the idea that there are two basic requirements for a restorative environment: The setting should both permit and promote restoration (Hartig, 2017).

Following from the component process model, the setting with an animal would first have to be considered by the individual as *relevant* to restoration. Do people appraise their local natural settings as relevant for psychological restoration? If so, is the presence of wildlife per se considered a relevant aspect of the restorative potential of these settings?

Second, the *implications* of the presence of an animal would be considered in the appraisal process. To permit restoration, there should be an absence of implications perceived to be of negative valence that spur avoidance. Are there distinctive characteristics of animals and situations that the individual might consider threatening, dangerous or disgusting? For restoration to occur, the presence of an animal should also promote restoration by attracting and gently holding people's attention when engaging with the environment (Kaplan, 1995; Ulrich et al., 1991). This implies that, if wildlife attracts a person's attention, the implications of their presence should be perceived to be of positive valence, driving approach responses. Does the presence of wildlife promote a sense of being away? Is it perceived to be compatible with the activity in which the individual is engaged? If the person can attend to the animal effortlessly, the implications of this fascination can then become a focus of appraisal (Kaplan, 1995; Ulrich et al., 1991). In that case, what animal features and behaviour are positively appraised and fascinating?

Ultimately, implication appraisals of human–wildlife interactions that permit and promote restoration would translate into greater restoration. However, if the individual finds the implications of the animal to be negative and difficult to cope with, then there would be an avoidance response, and the restorative process would not gain from further engagement with the animal. If the individual appraises that *coping* strategies are available that are congruent with the individual's *norms* (e.g. to not harm the animal), negative implications could be coped with and restoration may occur to some extent. What then is the perceived coping potential? Do possible coping strategies comply with people's norms?

2 | MATERIALS AND METHODS

2.1 | Participants and settings

Twenty-eight participants (15 women, 13 men, 18–75 years) took part in focus group interviews, held online due to the pandemic in 2021. Given the novelty of the topic, the focus group interview was deemed a suitable and resource efficient method to gather a multitude of diverse perspectives.

With the objective to obtain a broad variety of perspectives, we recruited people interested in nature and outdoor activities from three regions in Sweden (Jönköping, $n=10$, Falun, $n=9$, Östersund, $n=9$), by means of convenience sampling and snowballing. Employees at Jönköping University, Dalarna University (Falun) and Mid Sweden University (Östersund) were asked to participate and to spread an invitation in their private networks. In turn, following their interviews, all initial participants were asked to forward the invitation to people above 18 years in their network.

The regions were chosen to ensure different composition and density of wildlife species. The locations of the regions range from the boreonemoral zone (Jönköping) to the south boreal zone (Falun) and the middle boreal zone (Östersund) (Nordic Council of Ministers, 1984). Cities and towns are largely surrounded by coniferous forests. The area surrounding the city of Östersund is more mountainous compared to the other two study locations, but forest is still the dominant biome. The most common tree species are Norway spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*), mixed with birch (*Betula pendula* and *B. pubescens*), aspen (*Populus tremula*) and alder (*Alnus incana* and *A. glutinosa*). The regions are characterised by intensive forestry. The difference in latitude is relatively small (57°N for Jönköping, 60°N for Falun and 63°N for Östersund), which limits the effect of differences in primary production on wildlife densities. Common wildlife species are moose (*Alces alces*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), badger (*Meles meles*), beaver (*Castor fiber*), brown hare (*Lepus europaeus*), mountain hare (*Lepus timidus*) and squirrel (*Sciurus vulgaris*) (Anon, 2023). Large carnivores present in the area are brown bear (*Ursus actros*), golden eagle (*Aquila chrysaetos*), lynx (*Lynx lynx*), wolf (*Canis lupus*) and wolverine (*Gulo gulo*).

Four animals were used as model species in the discussions (roe deer, wild boar, wolf and squirrel). We chose these species because participants could be expected to have been directly or indirectly exposed to the animals to varying degrees where they live, and these animals would likely be assessed differently in terms of fear of an encounter. The areas around Jönköping have high densities of roe deer, and average densities of squirrels, wolves and wild boar. Areas around Falun have relatively high densities of wolves, average densities of squirrels and roe deer, but low densities of wild boar. Areas around Östersund have an average density of squirrels, and low densities of roe deer, wolves and wild boar. In a recent national study, 35% of respondents reported fear of encountering wolves, and 45% reported fear of encountering wild boar (Dressel et al., 2021), but fear is unlikely in encounters with roe deer and squirrel (Arrindell, 2000).

2.2 | Procedure

Potential participants were contacted by email and given written information about the study, which was described as a discussion on wildlife and outdoor recreation in local natural settings. The invitation clearly stated that participation was voluntary. Those who expressed interest in participating signed up for a discussion and received an online meeting link. The participants were divided into eight different groups of three to four persons. Due to technical problems with the online connection, one participant was interviewed individually. Participants were reimbursed with a gift voucher worth SEK 100/ca. EUR 10.

2.3 | Ethics statement

Before opening the discussion, the researcher repeated the topic of the discussion and that participation was voluntary. Participants were informed that the procedure followed, in all ways, ethical guidelines for psychological research (e.g. as given by the Helsinki Declaration, American Psychological Association and the Swedish Psychological Association), and that they could withdraw at any time without consequences. All consented by a written message to the interviewer. As the discussions did not address personal sensitive information as defined by the Swedish Ethical Review Authority (race or ethnic origin, political views, religious or philosophical

convictions, trade union membership, health, a person's sex life or sexual orientation, genetic or biometric information), no formal ethical approval was needed.

2.4 | Interview guide

The interviews were semistructured and lasted between 1 and 1½ h, and followed an interview guide. The guide was used as a road map to keep the discussion to the intended topic, rather than a blueprint. At the midpoint in the discussions, the four animals (squirrel, roe deer, wild boar, wolf) were introduced one by one as model species (Table 1). Towards the end of each interview, the interviewer gave a short summary of the discussion and asked the participants to confirm or reject that this was a true record of the discussion. If necessary, clarifications and additions were made.

2.5 | Analytical approach

All interviews were conducted by the first author (MJ) and resulted in 12 h of recorded interviews, transcribed verbatim using Atlas TI 7.0. In the analysis, the theoretical model guided the focus in a deductive way; however, the analysis also had an inductive component to gain the understanding of what meaning and expressions the appraisals might have for people in different contexts. The approach

TABLE 1 Overview of the interview guide.

Structure of interview	Purpose	Guiding questions
Introductory questions	Confirm participants' interest in nature and outdoor activities and familiarise them with the group discussion format.	<i>Have you ever gone out into the forest and countryside for relaxation in the past year? What was your main activity? Were you alone or with someone? What is a good place for this type of activity?</i>
First set of main questions	Encourage participants to talk about recreation, restorative experiences and wildlife in their own words.	<i>When you had chosen the location for your activity, did you wonder about the animals that could be there? Were there any animal types you were particularly interested in seeing/meeting or that you would particularly try to avoid? Did the animals influence your choice of location/activity? In what way? Have you ever been in a situation in which you experienced that a wild living animal contributed to you feeling restored or constrained your opportunities to feel restored in nature? In what way?</i>
Introduction of model species and second set of main questions	Facilitate participants' elaboration on various aspects of the potential presence and absence of these animals in local natural settings. Discussions were not limited exclusively to the four animals	<i>In the forest and countryside around where you live, squirrel / roe deer / wild boar / wolf are regularly occurring / never occurring. This means that you often / never see traces of droppings, hear the animal, or perhaps catch a quick glimpse of the animal. Does this have any significance for your opportunities for restoration? In what way?</i>
Interviewer summary and ending questions	Validate the interviewer's understanding of the topics discussed and give opportunity for clarifications and additions by the participants	<i>Would you say that my summary reflects the discussion we have had here today? Was there anything important that we have discussed that was omitted? Is there anything that we so far have not discussed today that you think should be added?</i>

was inspired by reflexive thematic analysis (Braun & Clarke, 2006, 2020). This is a qualitative approach that facilitates identification and analysis of patterns in which the researchers' perspective, in this case the theoretical pre-understanding, is essential in the analytical process.

Although deviating from the process of reflexive thematic analysis outlined by Braun and Clarke (2020), the research team included two steps in the analysis with the objective to establish a shared understanding of the interpretation of the discussions. In the early phase of the coding process, one of the co-authors independently coded all ($N = 241$) expressions of valence into negative–positive valence, as this was a code central to the underpinning theoretical idea of permitting and promoting restoration. Towards the end of the analytical process, all co-authors read the interviewer summaries to validate that this initial understanding, also confirmed by the participants, was represented in the interpretation of how wildlife may support or hinder psychological restoration.

In reflexive thematic analysis, the outcome is the result of an interpretive analysis, integrating the data set with the theoretical assumptions using the analytical skills and resources of the researcher (Byrne, 2022). The first author drove the analysis by (1) verbally summarising the topics discussed towards the end of the interviews and allowing the participants to reflect, add to and correct the researcher's first impressions; (2) collecting notes on first ideas; (3) reading and re-reading transcripts to become familiar with the content; and (4) developing codes and subsequently themes. Throughout the process, which in practice was iterative, one of the co-authors (AF) served as a discussion partner in reflecting on the content of codes and themes in relation to the theoretical framework and thereby the development of the holistic understanding.

The coding process was organic. It started with rather broad un-specific codes suggested by the theoretical framework (e.g. appraisal relevance, implication, valence). These were then divided into more narrow and specific codes, while in parallel new codes were added to cover aspects not foreseen by the framework (e.g. seasonality). The production of codes was both semantic in the sense that they presented the content as communicated by the respondent ('animal is cute') and latent as expressions associated with psychological constructs relevant to the theoretical framework (e.g. valence, approach/avoidance).

In the identification of themes, codes pertaining to similar theoretical constructs or situations/events were first clustered. Here, the theoretical framework informed the identification of thematic codes, especially as our starting point was that the restorative potential could be defined from the *relevance* of wildlife, the *implications* of their presence, the *absence of threat/danger (permitting restoration)* and the *presence of positively evaluated features that attract and hold attention (promoting restoration)*. Further themes were applied to references to *restoration outcomes* and *coping with threat/danger*. In the continued analytical process, these themes were refined to capture identified qualities and meanings. The internal homogeneity of the themes and the external heterogeneity among themes were

discussed, resulting in the merger of some subthemes (e.g. originally the experiences of being alone, in company with child and/or in company with dog were treated as separate subthemes).

3 | FINDINGS AND INTERPRETATION

3.1 | Relevance of setting and wildlife in supporting restoration

The first theme covers the participants' choice of local natural settings and how they attend to the wildlife. According to the component process model (Scherer, 2001), relevance is an appraisal of an expected impact on the well-being of the individual. In terms of relevance, our participants shifted between alternative views: wildlife as an integrated part of the natural scenery and the animal(s) as distinctive figure(s). That is, we discerned a figure-ground effect. When animals stood as distinct figures, participants saw them as relevant cues to the state of the local natural setting. Unexpected encounters added value to a recreational visit, though it appears that this value depends to some extent on the immediate social context. We elaborate on each of these observations regarding relevance appraisals below.

3.1.1 | Wildlife: A figure-ground effect

The discussions confirmed that 'nature' is relevant for recreation and psychological restoration. However, with most of the participants, discussion of wildlife shifted their focus over the course of the interview from thinking about nature as a holistic unit, or a specific place, to the animals as specific components of this place.

The participants' referred to the scenery of local natural settings and described the surrounding nature as a back-drop for diverse recreational activities (e.g. daily walks, with or without dogs, family picnics, trail running, horseback riding, canoeing, sleeping outdoors, skiing).

The participants initially discussed wildlife as an integrated part of the natural landscape and its spatiotemporal pattern associated with geographical zones and seasonal changes. Preferred landscape types and specific places were described as holding restorative potential. For most of the participants, wildlife did not come across as the main reason for visiting their local natural settings. Instead, wildlife seemed to be part of the scenery of nature, and references to the presence of animals were used to add colour to the picture of the setting described. The animals seemed to be taken for granted. As expressed by one of the participants towards the very end of the discussion: It is difficult to see the animals behind the trees. This stands in contrast to previous research on wildlife tourism (Curtin, 2009).

Maybe it was a little bit difficult to connect the animal presence to recreation, but maybe it says something more about me than, saying a specific animal

is important to my recreation, it's more something generally, that non-obtrusive animals are nice to have, yes

and further...

It has been interesting to talk about this [Animals and recreation] for me, for my own sake, they are just usual, and I was allowed to think about how I relate to it and it was very good to be able to do that, so thank you.

Interview 3: Participant from Falun

Participants with a specific interest in recreational activities directed towards animals, such as hunting, fishing and bird watching, emphasised wildlife early in the discussions, as the animals were the subject of their recreational activities. To them, the animal species of interest were highly relevant and something they were prepared to attend to as soon as they entered a nature setting, regardless of whether or not they were there to hunt, watch birds, etc.

3.1.2 | Wildlife is relevant to 'reading' the state of the local natural setting

As the discussions evolved, it became obvious that the participants were concerned with wildlife. Animals were considered highly relevant as part of the local ecosystem; they were understood to carry meaning and to have an existence value as part of the larger 'whole of nature'. Such perspectives reflect a mutualist wildlife value orientation, encompassing beliefs that humans and wildlife are meant to live in harmony and that animals have rights similar to those of humans (Teel & Manfredi, 2010).

Our participants noted the temporal patterns of wildlife presence and absence during the course of the day (e.g. wild boars described as nocturnal animals) and across the seasons (e.g. birds migrating south in the autumn, brown bears going into hibernation for the winter). These were referred to as the rhythms of nature and seem to represent symbolic encounters with wildlife (Bell et al., 2018). Such encounters were interpreted by participants as signs confirming that the local nature is in balance. If the pattern of presence and absence, or variation in density, were to be disrupted, or if new species appeared, they referred to imbalances. Our participants' elaboration on the meaning and consequences of such balance or imbalances are further described under implication appraisals.

3.1.3 | Wildlife encounters are relevant as bonus effects

In terms of relevancy, seeing traces, hearing a sound or catching a glimpse of an animal rarely observed in the local nature (see also Methorst et al., 2020) were described as unique and exclusive

experiences (similar to wildlife tourism). However, the unexpected and sudden appearance of a commonly observed animal is also appreciated. Such situations were recurrently formulated by our participants as a bonus effect, an added value of a nature visit, but not a necessary condition for restoration to occur. This is explained by one of the participants as follows:

I've maybe not thought of it, that I go out to see an animal, perhaps it's primarily a bonus and what you perhaps hope for, but I don't sort-of reckon on it, it's not why I perhaps go out but I, you think perhaps somewhere deep inside that it is, it's sort of a bit like the icing on the cake when you're out.

Interview 6: Participant from Östersund

The unique experience of the unexpected presence of animals negatively appraised in the local nature was also described as relevant and referred to as a disruption of recreational and restorative activities.

3.1.4 | Social context modifies the perceived relevancy of wildlife encounters

The relevance of animals may change depending on the social context. Participants said that they were more likely to pay attention to wildlife (e.g. stop to listen to bird song) if they were alone. When part of a group, the focus seemed to shift from the surrounding nature to the social aspects of the activity. However, in situations in which an animal suddenly appears, this shared experience was valued and remembered. It appears that this occurred with more spectacular encounters that 'cut through' the ongoing interactions with other people present.

Being in the company of children seems to be an exception. Children's curiosity about animals, even small common animals, is referred to as 'opening the eyes' and directs attention to wildlife.

I appreciate it more when I've seen roe deer close up with my children, because they become extra curious, it becomes, then it becomes like another dimension in some way when they discover things for the first time, more or less. So, in such a context, I can then, then I can perhaps more clearly see a, see it as a positive experience.

Interview 6: Participant from Östersund

This social interaction may also work the other way around. In their role as parents or grandparents, the participants report that they wish to convey knowledge and positive experiences of nature and wildlife to their children or grandchildren. They plan visits to locations with a specific goal to spot animals, and together with the children engage in watching animals. Positively valued childhood experiences of nature

shared with significant adults have been identified as an important factor in developing connectedness with nature and environmental concern (Chawla, 2007), and may have importance for social relations beyond any immediate, individual restorative outcomes (Hartig, 2021).

Company with a dog also makes wildlife presence more relevant. In the same way as with children, the dog tends to notice animals and react to them in a way that the participants would not have done on their own. A hunting dog in areas with wolves makes the presence of these animals more significant, as they pose a threat to dogs (Frank et al., 2022).

3.2 | Referents for implication appraisals

The second theme concerns how the participants characterised wildlife and the associated implications of their presence in local natural settings when asked about animals, recreation and restoration. In the component process model (Scherer, 2001), appraisal of implications is the evaluation of whether an event hinders or advances the well-being of the individual. Looking into the participants' implication appraisals, we first find that implications were considered with reference to animal species, the socio-ecological context, and the participants' own capacities.

3.2.1 | Animal species

Our participants attributed different social identities and traits to different animals (Sevillano & Fiske, 2016). These identities are expressed as implication appraisals of the animal species per se, referring to the perceived biological characteristics of the animal, such as their size, speed, place in the ecological hierarchy (predator or prey); qualities linked with animal features or behaviour (e.g. cute, aggressive, gracious movement); and the role of the animal in culture (e.g. traditional songs, myths and fairy tales). This latter kind is exemplified in a comment regarding a famous Swedish children's song about a squirrel in a spruce tree, 'Ekorn satt i granen':

Yes, I believe like you that many of us are really imprinted from childhood that the squirrel is something sweet and cute and a bit eager and so on, But it is like, it is an identity we gladly impose on it and that one thinks about when one sees it....

Interview 7: Participant from Jönköping

3.2.2 | Socio-ecological context

Appraisals also refer to the local socio-ecological context and the fit-misfit of the animal in this context. Participants discussed the suitability of current numbers and distribution of the animal in their local area, and whether the animal belonged to the natural fauna or was an

invasive species. The presence of social controversy over the animal could load the issue, as with opposing attitudes towards the presence of wolves that create tensions between friends and neighbours.

Ah, I'm neither for nor against that, I don't see it as a problem, for me. But I know, I know that it's a big problem with all other acquaintances, they, it's like it's not possible to discuss wolves at all. Either it's for or it's against. Eighty percent of the people you hang out with are completely against, it's not possible to have a discussion at all about wolves in particular.

Interview 2: Participant from Falun

3.2.3 | Individual capacity

The participants referred to their own capacities, such as their claimed familiarity with the animal, personal knowledge of the species and experiences of encountering the animal, as well as reflections on how to handle an encounter situation. Participants discussed whether they knew or did not know an animal. This is in accordance with research on perceived vulnerability in an encounter situation, involving appraisals of perceived danger, predictability of the animal and controllability of the individual's personal reaction in an encounter situation (Johansson, Karlsson, et al., 2012; Johansson et al., 2016).

Wolves are difficult for me to read, bears you know little by little, a little more, then you know man that you should perhaps avoid, in the spring-winter, where there is dense forest and a bit of shelter and so on.

Interview 1: Participant from Östersund

As outlined above, the participants made use of a broad range of referents in their implication appraisals, but for the present purpose, we are especially interested in understanding which implication appraisals relate to affective experiences of negative-positive valence, emotions and potential restorative outcomes given wildlife presence.

3.3 | Implication appraisals hindering or permitting restoration

A theoretically important aspect of the implication appraisal would be that the presence of the animal permits restoration; there must be an absence of perceived threat (Ulrich, 1983). However, participants often talked about the presence of animals as having negative valence; linking animal features and behaviour with danger, disgust and disease; or finding them annoying, irritating and/or destructive. The presence of animals could be perceived as a threat by indicating imbalance, but so too could the absence of animals. That is, if the spatio-temporal pattern of presence and absence, or variation in

density of locally occurring species, were to be disrupted, or if new species were present.

3.3.1 | Animals that may pose threat by danger, disgust and disease

The participants expressed most concern in relation to the potential danger of encounters with different animals: (large) carnivores (wolves); animals that could be aggressive and attack; and animals that could quickly run a person down (moose, wild boar). Reference was also made to animal traits, such as unpredictability, irrationality in temperament and growliness (e.g. wild boar). Seasonal patterns were referred to in conjunction with specific animals that are bold or animals that are more threatening during the season when they have offspring.

No, I know, for some reason, I think this is just the kind of thing where you, you get images in some way or what you're given, wolves feel a bit more dangerous, and they certainly wouldn't attack me I think purely theoretically, so I understand that it's, they'd probably move away from me, but I have some image that they are kind-of more dangerous animals. So that's why I'd probably get away from there.

Interview 8: Participant from Östersund

Participants referred to disgust and disease, pointing out, for example, that roe deer are hosts to disease-bearing ticks, and that snakes can be poisonous. Some participants even expressed feeling a strong phobic aversion.

Then maybe I should associate because I know that on roe deer trails, for example, that then maybe right away, they attract ticks and so, so maybe there can be more ticks then if you see it's a deer trail, so the connection is like that.

Interview 4: Participant from Jönköping

Danger, disgust and disease refer to the animal's presence being associated with negative valence and feelings of fear for oneself and other humans. The discussions also revealed that some animals, such as wolves and lynx, are perceived as threats to dogs, cats and sheep. Other animals are seen as a traffic hazard, for example, moose and wild boar.

3.3.2 | Annoying, irritating and destructive animal behaviour

Negative valence was expressed towards animals perceived to show annoying or irritating behaviour. These animals were not perceived

as a direct danger or threat, but rather as nuisances that interfered with attempts to relax. Here, the issue is exemplified by the presence of mosquitos:

And then mosquitoes are torture. We have one, we've had a site for chanterelle mushrooms since I was a child and we have, the worst thing about it is the mosquitoes. Everything else was peaceful, but the mosquitoes were really irritating.

Interview 7: Participant from Falun

Participants also expressed negative valence towards animals that impact on human goals and activities, described as pests that were destructive for humans. This did not necessarily refer to actual encounters, but it influenced views of the animals and a potential encounter situation, such as wolves preying on sheep, wild boar digging up fields and mushroom sites and roe deer grazing in people's gardens. Here, negative valence was associated with feelings of frustration and anger.

The negative feelings and expressions of avoidance elicited have in common that they would in theory temporarily hinder restoration in local natural settings, and block the remaining appraisals necessary for permitting and promoting restoration (Hartig, 2017).

3.3.3 | Indication of imbalances in nature

A special concern associated with negative valence involves the notion of imbalances. Examples are the presence of an animal that is considered to be in excessive numbers, reproduces too quickly and does not belong in the local natural setting. Such animals are described as being in the wrong place, and this includes animals seeking out new territories as well as invasive species. It could also be an animal stated to be implanted through management decisions.

I think they will be too many, I think. And I'm out picking mushrooms in those areas where there are a lot of wild boars, so you see these hogs, I'm not really afraid, like you say that they are at dawn and, and dusk that they are there most, eh, and I think it is strange that I never see them, but I don't think I've ever seen a wild boar wild, quite simply. But they are implanted and do not really belong to our fauna from the beginning and they spread so widely so much that I think it will be too much.

Interview 3: Participant from Falun

Imbalances could include references to specific animals that show unnatural behaviour, when they are seen or heard too close to

people and their activities. Some participants expressed a negative valence associated with feelings of threat–danger due to the absence of certain species. The lack of animals with positively valued traits and behaviour was in these cases considered to indicate disturbed ecological balance due to management decisions or anthropogenic climate change.

I get a feeling of anxiety when I, yes, see the consequences of climate change, if I knew then that... used to see these roe deer in this field and don't see them, don't see them because of, we've gone so far in, or that there should be really many roe deer but now it was the lack of it I said, but that it would make me feel uncomfortable and not, it would affect my restoration and my... feeling of harmony when I'm out, that it's not right and I should maybe do something in this...

Interview 6: Participant from Östersund

The predominant threat/danger appraisal seems to reflect the perceived threat of the animal traits/behaviour associated with disgust and danger in combination with the perceived lack of control over the interaction. Here, the distance between the person and the animal, the number of animals and knowledge of animal behaviour and how to act were mentioned. For small animals such as insects (e.g. mosquitos, black flies, wasps), the distance referred to as being too close is basically if the animal is in direct contact with the person. For the larger mammals, reference is made to human territories, such as roe deer in the garden, or wolves or wild boar in green spaces for human use or in a geographical area where they are not considered to belong ecologically. This can entail being a risk (of causing traffic accident), a danger (to humans and pet animals, livestock), causing disturbance (destruction of gardens, crops and golf courses) or nuisance (gulls). An expression for animals coming too close to humans in one way or the other was introduced by one of the participants as 'intrusive animals', referring to an unwanted and/or uncontrollable encounter situation.

3.4 | Implication appraisals undermining or promoting restoration

In terms of attention restoration theory (Kaplan, 1995), in making the implication appraisals, if the person finds that the presence of the animal is not only unthreatening but also compatible with ongoing activity, enhances the experience of being away and evokes fascination, then it will not only permit but also promote fascination. Our participants expressed positive valence in their implication appraisals of the presence of animals in terms of their traits and behaviour, their role in ecosystem balance and as an asset for hunting and eating. Appraisals likely promoting restorative experiences

cover the pleasure of having wildlife in nature, being able to view animals, their traits, features and traces, as well as situations that offer direct interaction (e.g. feeding, hunting) and situations in which the (unexpected) presence of animals is considered a bonus of the visits to the natural setting.

3.4.1 | Animal traits and features

Our participants gave diverse examples of animal traits and features that they appreciate and that they enjoy or would enjoy watching, with the squirrel described as attractive, charming, fun, lively and alert; the roe deer as beautiful and gracious; and the wolf as mysterious. The opportunity to catch a glimpse of something elusive, something that is rarely seen, to come across traces of an animal, to see or hear an animal and the unexpected and sudden appearance of the animal were accorded a positive valence. The experience of beauty when viewing animals that are attractive and often encountered was also mentioned (e.g. squirrels, roe deer). For animals more rarely encountered such as moose, wolves and brown bears, catching a glimpse was described by some as impressive and exciting, something one has on the bucket list, although this did not apply to everyone. Moments in which the animal is clearly visible from a chosen distance (i.e. the observer has control) and can be observed for an 'extended' time are valued. On such occasions, the experience of a mutual connection between observer and animal was described in positive terms.

I don't know, it feels a bit like a gift when animals let me see them, because it's not a goal in itself for them. So that's probably it, a bit of an honour to get, get to see them.

Interview 3: Participant from Falun

3.4.2 | Animal movements and behaviour

Animal movements and behaviour were appreciated and seemed to have a special capacity to attract the participants' attention and fascinate them. Participants referred to animals' skipping, jumping, swimming, hovering, skydiving and more. They expressed admiration for gracious movements—jumping high, running fast—that are easily caught by the human eye. Similarly, animals interacting with each other, referring to the social resemblance to humans, how animals interact in a group, how they appear together as flock and mother and baby interaction all captured interest.

Yes, I think the squirrels are great, it's so much fun to stop and watch a squirrel because you can, then, then you get stuck, then you watch until you lose sight of it, it's interesting like when it jumps and

bounces, makes you happy, because it is so bouncy and happy.

Interview 3: Participant from Falun

3.4.3 | Experiences of the local ecosystem being in balance

Participants referred to the important role of a specific animal to the local ecosystem, animals that are not appreciated, as a way to state that they still see that the animal has a value and a positive valence. There were also instances where participants reflected on the richness of the wildlife and the return of specific animal species in their local natural settings as having positive valence.

I think things have happened, I see birds of prey and owls and beavers and suchlike more often, in places I have not seen them before. I can, it is, I'm pretty sure without having anything in black and white or being able to show a result, so I'm pretty sure that something has happened that has caused them to find their way back in their natural environment, and then I also become like this, it's easy to just think that it feels very positive like that.

Interview 6: Participant from Östersund

3.5 | Experienced psychological restoration with wildlife encounters

With wildlife regarded as an integral part of nature, participants talked about being in nature as restorative, articulated as feelings of fascination, relaxation and harmony, accompanied by physiological reactions. Wildlife was discussed as a part of the general restorative outcome obtained from being in nature. At the same time, participants stated that animals attract attention, create micro-pauses and moments of fascination that make them stop and watch. Animals were appraised as relevant, with implications permitting and promoting psychological restoration. During the discussions, it also became evident for the participants themselves that the presence or absence of particular animals is associated with the restorative potential of the local nature, negative or positive valence of a potential encounter situation and thereby conditions for a restorative experience. Experiencing wildlife was described as something fundamental that triggers physiological activation and positive feelings.

... and to see a bird of prey so they say, there's something special there anyway, above all a bird of prey, you kind of go "aww", yes you get something in your body, there they are, they're sailing up there or they're

looking for something to catch down on the ground and so on—the pulse increases and you, yes, you, you become so enraptured about what is there, what, what diversity we have and what fantastic animals we have and those that also have taken a beating.

Interview 9: Participant from Östersund

Opportunities to see and to listen to animals are considered to be restorative and boost a person's level of energy, and such experiences may even overrule some damage (limited) caused by the presence of the animals, as illustrated by one of the participants who tried to grow vegetables in the garden.

... me and my wife have rather, we have quite big cultivation ambitions, but we, we had to think again, you have to do so with the deer. We have deer in our garden. So yes, at least every other evening we see them in our garden, -- So there's no point, it's just, it's just to give up.

Then a little later in the interview:

Nah, but that's how I think it is, I think it's fun to have them [the deer] around, again, this thing with our gardening ambitions, we've partially put that aside, – Nah, that... one becomes in some way happy when you see them.

Interview 1: Participant from Östersund

Participants described how they got enraptured and absorbed by watching animal behaviour. They talked about how they regularly and repeatedly seek such experiences, with one participant saying that she takes the same walk regularly to check in on the roe deer, while others find that it is the unexpected appearance of a wild animal that makes the difference.

I also think maybe that you, you capture them easily, with a look if you see them like that, that you, that it becomes quite natural to follow them, I think I would never have sort-of ignored or looked away from a squirrel that has been in my vicinity, then you've probably watched until it disappeared, I think. And then I think that it must nevertheless be quite...uh, healthy in some way that you get to lose yourself in what's happening right here and now, sort of. That, that you get away from things like "what should I do now" or "I have to go there" or "I have to, now I have to get to this". It's clear that there must be some kind of relaxation in it, that you in some...

Interview 6: Participant from Östersund

3.6 | When wildlife interferes with restorative potential: Coping and norms

3.6.1 | Experiences of vulnerability and stress

Participants also referred to occasions when the presence of animals was experienced to hinder and undermine restorative outcomes. This involved animals or interaction with animals to which they assigned a negative valence, with their close presence being associated with stress responses (e.g. Flykt et al., 2022). The participants described how the nuisance caused by, for example, mosquitoes hinders relaxation and how a potential encounter with feared animals (wolves, wild boars, brown bears, snakes) would trigger stress that counteracts psychological restoration. As one of the participants expressed it:

but if I were to meet a wild boar then I'd probably get a slightly higher pulse rate and not be able to, yes, regain energy as easily then, it would probably have been, been that I would have become more easily stressed when I get home later.

Interview 5: Participant from Jönköping

This seems, however, also to be a matter of perceived vulnerability. If participants found themselves at a safe distance from the animal, the view might be a fascinating experience, but in a position where they could not regulate the distance the same animal would trigger stress.

It can also be this, that if you're sitting in a car and wind the window down and hear a wolf, then it's fantastic, and these people that talk about the bears that are 20km outside Falun sit and wind down the window and sit in safety and look at the bear, fantastic. But then, if you're totally unprotected, then maybe you don't, I don't think there'd be, a restoration, and instead it triggers stress.

Interview 7: Participant from Falun

Accordingly, participants took measures to gain control over their interaction with wildlife of negative valence and referred to strategies used to cope with potential encounter situations. According to the component process model (Scherer, 2001), with the appraisal of coping potential, the individual appraises the possible behavioural adaptations that could be made in response to the eliciting event and whether that behaviour is in line with personal and societal norms.

3.6.2 | Use of coping strategies

The participants described how coping strategies had become an integral part of the day-to-day preparation or routine for recreational

and restorative activities. In that sense, these can be compared to those measures that livestock owners take to avoid ticks (Johansson et al., 2020) or large carnivores (Eklund et al., 2020). One strategy is simply to avoid natural settings where an encounter could be expected. If participants nevertheless decided to visit a place where a feared encounter could be expected, they stated that they would be alert, they would be prepared to avoid encounter situations, and they would have planned what to do if the animal should appear. Note that, here, it is the absence of these animals that is considered to support restoration.

Four general coping strategies were recurrently mentioned:

- a. Choose a different place or routes to avoid an encounter or offer better potential to manage an encounter, for example, a tree that could be climbed to avoid a wild boar. Participants also reported situations when they had changed location for the activity, not because of the negative valence associated with the animal but rather because of their own personal values and moral reasons. For example, animals with the year's offspring (e.g. roe deer with kid) should be avoided. Such behaviour should rather be interpreted as norm compatibility (Scherer, 2001).
- b. Carefully prepare and check for the presence of the animal and, if necessary, delay or relocate the visit. This may include attempts to learn about the animal's behaviour as well as to ask around to find out if the animal has been seen in the area recently.

In this particular area wolves have been seen, but then maybe we try to be in a different place this time that is not exactly there if you know they are there, so you should take a little extra step in doing a little research, look around, be a little more careful if I know that in that direction they've seen it, yes but then maybe we go the other way this time. Because you still counteract the probability of running into one somewhere.

Interview 1: Participant from Östersund

- c. Adopt protective behaviour during the activity, including different ways to make the animals aware of one's presence, thereby reducing the probability of an encounter (e.g. wearing bells or talking loudly during a forest walk).

I don't creep around, and I don't try to walk carefully, and I always walk with poles, uh and uh, I hit trees with the poles if I see when the forest changes, because it does. It can be more open or er, completely open and it changes all the time, when you enter a moss, bog or something like that, then, then I can shout "Hello, here I come!", or something like that so that they know I'm coming, because I don't want to surprise them.

Interview 3: Participant from Falun

- d. 'Avoid being alone and only go if in company with others'. However, the company of children and dogs may be something different—this could make participants feel more vulnerable and therefore motivate a stronger response, such as avoiding the area, place or route.

But when I, when I go out for example in (name of natural setting, deleted due to participant confidentiality), if I'm out walking alone, then I'm really afraid of bears. I don't want to go out into the woods alone.

Interview 3: Participant from Falun

In these coping strategies, the participants rely on their own responsibility and autonomy to regulate the likelihood of an interaction with a feared animal. A different strategy would be to regulate the number of animals by hunting, thereby reducing the likelihood of an interaction. Notably, this strategy also shifts the responsibility from the individual to a societal level and may deviate from societal norms.

Yes, I think like this, and this doesn't just apply to bears, but it is more of a moose, for example, that goes into a densely built-up area as well and that shows aggressive behaviour then it should be shot, period. That is my absolute opinion.

Interview 1: Participant from Östersund

The participants' reports on coping strategies illustrated that, in situations when coping strategies are aligned with personal and societal

norms, and can be successfully applied, stress associated with a potential animal encounter situation can be reduced or avoided, better enabling psychological restoration. Figure 2 summarises the findings regarding the emotional appraisal process in relation to the extent of psychological restoration thought to be gained from a visit to a local natural setting where a specific animal species is present.

4 | GENERAL DISCUSSION AND CONCLUSIONS

This study adds depth and nuance to our understanding of the role of wildlife in the restorative potential of local natural settings. Our findings contribute to the understanding of basic psychological benefits and harms stemming from wildlife presence in local environments they share with people (Buijs & Jacobs, 2021; Perrin et al., 2018). The findings indicate how further theoretical refinement will help to address the potential effects of wildlife in analyses of the restorative potential of natural settings (cf. Velarde et al., 2007). Not least, wildlife sometimes stand out as relatively dynamic figures against a stable background. This highlights the need for careful attention to the ways in which visitors to natural settings continuously update their appraisals of the setting in light of the appearance of different species. The research questions were derived from a theoretical model that relates wildlife to positive health outcomes as mediated by restorative processes among others (Johansson et al., 2021). To guide a deeper examination of these processes, our questions concerned the relevance of wildlife to the perceived restorative potential of local natural settings, the appraisals of the implications of animal presence for permitting and promoting restoration and how

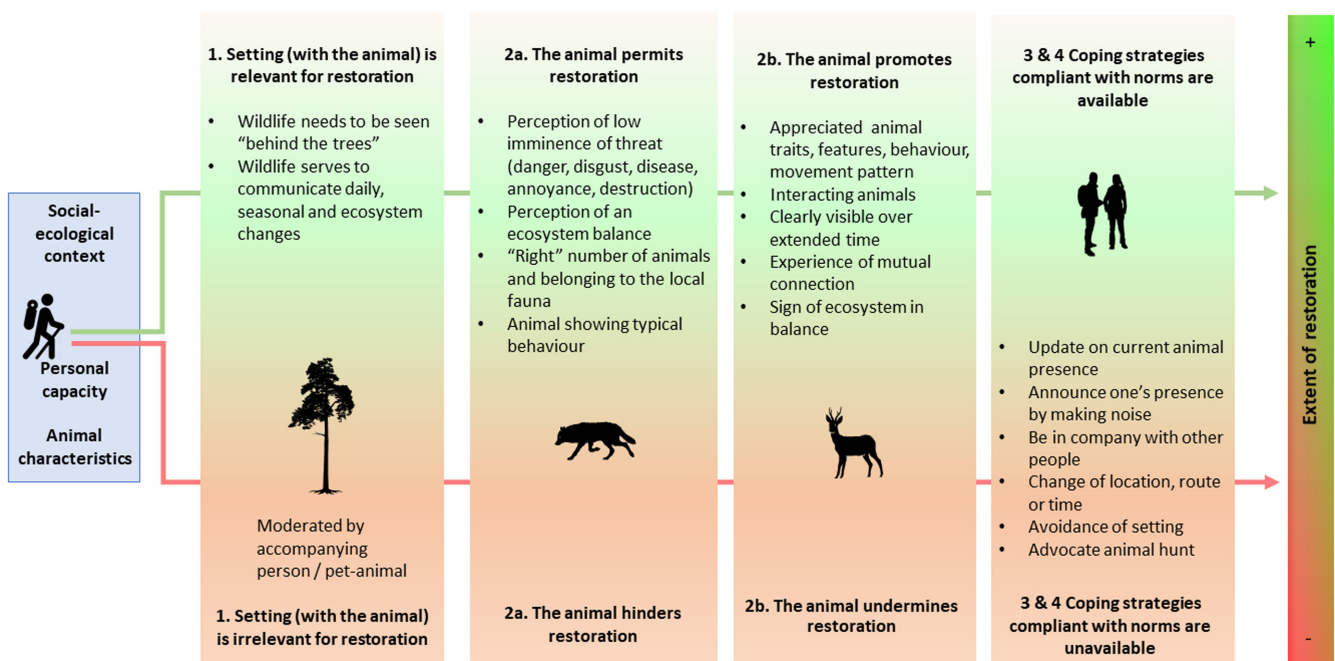


FIGURE 2 Overview of emotional appraisals as they relate to the extent of psychological restoration gained from a visit to a local natural setting with a specific animal species present, as drawn from focus group participants' descriptions.

the presence of wildlife is coped with if considered as hindering restoration.

Across the three regions from which we sampled, we consistently found participant reports indicating that local wildlife capture and hold their attention without effort or vigilance. Such reports accord with descriptions of a crucial component of restorative experience as described in two theories in environmental psychology which informed our work, attention restoration theory (Kaplan, 1995; Kaplan & Kaplan, 1989) and stress recovery theory (Ulrich, 1983; Ulrich et al., 1991).

Yet, while encounter situations are sometimes associated with relaxation and feelings of fascination, awe and wonder, and so are considered to support psychological restoration, our findings indicate that whether and how a person experiences restoration or not depends on the outcomes of ongoing appraisal processes. Our study thus provides further empirical support for the distinction between people's exposure to and experience of wildlife for well-being outcomes, also acknowledging the physical and social context in the exposure situation (cf. Marselle et al., 2021).

Our participants appraised the presence of wildlife as relevant to and highly compatible with the idea of local natural settings as places to get away from everyday demands and enjoy restorative experiences. However, wildlife was often discussed as part of the scenery of nature. This creates a situation where the potential salutogenic effects of wildlife seem to stand in the shadows, and the role of animal presence may not be visible to people until their presence negatively impacts on human interests (Buijs & Jacobs, 2021; Eklund et al., 2023). Yet, more focused observations of wildlife as figure rather than ground had relevance for psychological restoration. They appeared to create moments of fear, annoyance or irritation that disrupted and hindered restoration, or moments of awe and wonder that enriched and added value to a recreational activity, thus strengthening the restorative quality. This is in line with so-called immersive wildlife encounters (Bell et al., 2018). Speculatively, such moments also extend the relational values of encounters of psychological restoration (e.g. Chan et al., 2016). From the participants' descriptions, it seems that the appearance of some animals does more than evoke positive feelings. Encounters may also strengthen a sense of connectedness with nature, draw attention to the ecological status of the setting and facilitate intergenerational bonds (e.g. between grandparents and grandchildren).

Looking to implication appraisals, we identified a diverse set of aspects to consider with regard to whether animals disrupt or add value to the restorative potential of the local natural setting. In these appraisals, referents to the animal, the socio-ecological context and the individual's capacities seem to be generic with regard to the region in which the participant lived, but we noted differences across recreational activities and animal species. These findings reveal a more complex and dynamic picture of how people relate to local wildlife than has commonly been reported in wildlife tourism or psychological research involving factor analytical animal categorisations (e.g. Arrindell, 2000; Davey et al., 1998). Regardless of whether an animal is categorised or described as charismatic, fear

relevant or fear irrelevant, it may trigger both approach and avoidance responses in one and the same person, across situations and even simultaneously.

In light of theorising about restorative experience, the implication appraisals of wildlife must be considered in terms of two general requirements: Whether the presence of wildlife permits restoration and, if so, whether it then also promotes restoration (Hartig, 2017). While some animals were primarily described as dangerous or annoying to encounter and seemed to be more easily associated with negative valence (not permitting restoration or diminishing the otherwise restorative value of the setting), other animals were described as pleasurable and fascinating and seemed to be associated with positive valence (thus promoting restoration over and above what one could experience on the basis of the other setting features). However, no animal was discussed and appraised in a singularly positive or negative way. Instead, certain conditions had to be met for the presence of animals to permit restoration. Importantly, the interaction with the animal, especially the distance between the individual and the animal, should be perceived to be under the individual's own control to guarantee absence of threat. The participants described how they comfortable could move towards squirrels and roe deer to watch them from a close distance, whereas for moose, wolves and brown bears, the participants elaborated on how they took measures to keep a certain distance. This points to the role of coping appraisals. The distance considered comfortable varied between wildlife species, context and person.

The extent to which the presence of animals could promote restoration seems dependent upon the animal being considered as belonging to the natural fauna of the location, as this indicates that the ecosystem is in balance. The number of animals should be about right in relation to the local nature, alluding to norm appraisals. However, the extent to which the animal's traits, features and behaviour capture an individual's attention comes through as most important. These descriptions resemble those referring to the importance of interesting sounds (Hedblom et al., 2017) and behaviour (White et al., 2017). Fascination seems to occur in particular if the animal is clearly visible for an extended time and a mutual connection has been experienced to be established.

If wildlife does not permit restoration, our findings show that coping behaviour is adopted, with varying potential to obtain psychological restoration. Several strategies seemed to be used to adapt the participants' recreational behaviour to the potential presence of threatening encounters with wildlife. Although these strategies can allow the desired recreational activity to take place, they may challenge psychological restoration. If a person avoids spending time in local nature, this calls for alternative recreational activities and settings. Coping behaviour that was displayed before going out, such as choice of alternative local natural settings or time to reducing perceived risk of exposure, may support restoration, as would spending time on gaining information about the presence of animals in the usual setting. For coping behaviour that was displayed during the nature visit, the psychological restoration may be ambivalent, as the behaviour might interfere with the possibilities for immersive

experiences, such as having elevated attention directed towards a potential threatening animal encounter, talking loudly or being in the company of other people.

4.1 | Broader theoretical relevance of our findings

Whether framed in terms of ecosystem services (e.g. Bratman et al., 2019) or nature's contributions to people (e.g. Díaz et al., 2018), our findings shed light on values and disvalues of non-material relationships between people and animals, bringing them into the purview of the many disciplines that Echeverri et al. (2016) place in the meta-field of human-animal studies. Our findings provide a bridge between the two clusters of disciplines within human-animal studies described by Echeverri et al: One cluster in which research proceeds on the assumption that values and disvalues of non-material human-animal relationships can be measured and quantified, the other in which research emphasises the socially constructed character of animals and portrays human-animal relations as context dependent.

How do our findings, and the line of research that has produced them, provide this bridge? On the one side, research on psychological restoration assumes that it is a fundamental human need that must be satisfied for an individual to maintain adaptation and health (Hartig, 2017). This need has deep roots in human biological and cognitive functioning, and satisfaction of this need in specific instances is assumed to be measurable and quantifiable in terms of biological, cognitive and emotional parameters (Kaplan, 1995; Ulrich, 1983). Of the many possible combinations of motives that people have expressed for visiting natural settings, one long recognised as a core theme is restoration (Knopf, 1987). So, while diverse researchers have identified diverse valued experiences of nature, restoration constitutes a core component of such experiences. Given this, more specific states described in quantitative as well as qualitative research, such as oneness or awe, can be understood as contributors to and/or consequences of restoration (cf. Kaplan & Kaplan, 1989).

On the other side, with regard to context dependency, research on psychological restoration assumes that it has distinct environmental requirements, including not only the absence of threat but also some opportunity for positive engagement with the environment (e.g. Kaplan & Kaplan, 1989; Ulrich, 1983). That people commonly expect natural settings to fulfil these requirements cannot be understood simply as a matter of programming through biological evolution, but also as a reflection of the deep cultural and social roots of nature experience, not least in Western, Educated, Industrial, Rich and Democratic (i.e. WEIRD) societies (Henrich et al., 2010). In such societies, people commonly go 'out' to 'nature' for restoration, the need for which they realise in circumstances which by implication are taken to be 'not nature' (e.g. work and residential settings in an urban context). Like the concept of nature itself, the environment that serves restoration (i.e. the restorative environment) is inherently relational; the values respectively assigned to natural settings

as restorative versus the city as stressful (for example) are the present outcomes of a long-running interplay between biological and sociocultural evolutionary processes (see Hartig, 1993, 2021; cf. Ståhlhammar and Thorén's (2019) treatment of relational values in environmental psychology). Accordingly, the experience of wildlife as an aspect of a natural setting to which a person turns for restoration will also stand in relation to the experiences and knowledge the person has acquired with animals more generally, in the person's ordinary (often urban) circumstances and through media. Against this background, a person's restorative experience may gain progressively from the development of a particular relationship with a specific animals in the locality, exemplified by our one participant who took the same walk regularly to check in on the local roe deer.

As it stands, aside from the role of wildlife, the restorative value of nature experience has long served as a bridge for multidisciplinary efforts to protect people by protecting nature, as through ecological restoration (e.g. Miles et al., 1998) and representations of urban green space as a public health resource (Hartig et al., 2014). Here, we provide for human-wildlife studies an example not only of relevant cross-disciplinary research but also of the use of reference to restorative experience as a guiding principle for such research.

4.2 | Limitations and further research

The focus group interviews were confined to natural settings and wildlife species in the boreonemoral zone, the south boreal zone and the middle boreal zone in Sweden. The inclusion of three regions served to provide for diverse perspectives rather than a comparison between them. Further studies are needed to test for differences in the restorative potential for different animals, and the effect of variation in their local density. More diverse socio-ecological contexts would be desirable to establish the transferability of the findings across species and cultures. It should be recognised that the findings are purely descriptive and refers to the participants' perceived psychological restoration. In further research, it would be useful with an experimental approach and to combine self-reports with psychophysiological measures associated with restoration outcomes.

4.3 | Implications for practice

In environmental management, it seems important to explicitly address the presence of animals to change the perspective from having the animals in the background and, instead, bringing them into focus. Here, the focus should be on the perceived characteristics of the animal, the local socio-ecological context and people's capacity, that is, their values, experiences and know-how with regard to how to control and regulate human-wildlife interactions, rather than the presence or absence of an animal species. From a public health perspective, attention should be directed towards how people cope with local wildlife, and whether the strategies adopted serve psychological restoration. Addressing the experienced psychological

restorative outcomes of wildlife may open up for new perspectives of values and dis-values associated with wildlife in local natural settings. Important public health effects might be gained by opportunities for recreation and psychological restoration if wildlife policy and management explicitly consider what animals mean to the perceived restorative potential of local natural settings.

AUTHOR CONTRIBUTIONS

All authors have contributed funding acquisition, study concept and design. Maria Johansson was responsible for data acquisition and analysis. Anders Flykt, Terry Hartig and Jens Frank contributed to analysis. Maria Johansson drafted the manuscript with substantial inputs of graphic representations, and critical commentary from Anders Flykt, Jens Frank and Terry Hartig. All authors revised the text.

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CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

DATA AVAILABILITY STATEMENT

The original data cannot be publicly archived due to confidentiality. However, transcripts of interviewer's summaries translated into English are available from the first author upon request.

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