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Nature observations between tourism, scientific data and pure appreciation

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Nature observations are at the core of both nature-based tourism and citizen science. The movement limitations associated with the Covid-19 pandemic have created a window during which tourism nose-dived, but online citizen science platforms flourished primarily through the posting of 'backyard' observations. Beyond citizen science, a return to nature during this period appears to have been important in supporting mental health, especially in city dwellers, and this has resulted in a renewed interest in studying nature appreciation. Here I attempt to bring together these different facets of nature watching research, defined by divergent philosophical underpinning and following different methodologies. I use the findings of tourism and citizen science studies to summarize observer motivations, and place these in a nature appreciation framework. I argue that this framework can be used towards maintaining a balance between diverse goals: reducing observer biases in citizen science, enhancing observer experience in nature-based tourism, and maximizing the therapeutic effects of being exposed to nature.

KEYWORDS

nature appreciation, birdwatching, nature-based tourism, nature watching, wildlife watching

1 Introduction

The generic phrase 'nature watching' is seldom used (e.g. [Abel, 1989](#)). Combinations along the lines of birdwatching, wildlife watching, game viewing, are more common, and suggest a divided field of practice and research. Stronger keywords pertaining to this conceptual area are either purpose-driven, like nature-based tourism ([Kuenzi and McNeely, 2008](#)), citizen science ([Hecker et al., 2018](#)), or purposefully avoiding practicality, such as nature appreciation ([Pepi, 1994](#)).

The sequential rise (and to some extent fall) of these disciplines has left them largely isolated from each other, despite the use of the same basic units: nature observations centered on one or a few interacting individual organisms. Such observations arguably elicit the same basic human emotions, subsequently serving as motivations for renewed experiences. These motivations have been the subject of intense scrutiny from both

tourism and citizen science studies, albeit mostly separately. Studies in both of these fields have indicated that there are strong biases towards observing some species rather than others, and both activities are also geographically clustered.

2 Geographic and taxonomic biases

Regarding the groups of organisms observed, one taxonomic group stands out. Both tourism and citizen science studies have been characterized by a strong representation of studies on birdwatching (Hvenegaard, 2002). A fair number of tourism studies also refer to big game viewing on land (Kerley et al., 2003), and the viewing of larger marine animals, especially marine mammals, typically from on board vessels (Cunningham et al., 2012). Fewer studies refer to other organisms – for example natural flower shows (James et al., 2014). Specialized tours looking at other groups are at this stage a niche market with limited potential. Generic, all-taxa platforms such as iNaturalist comprise large numbers of plant and insect observations (which can be observed at close range; Di Cecco et al., 2021), while the largest taxon-specific platforms are once again focused on birds (Rosenblatt et al., 2022).

Geographic clustering relates to the groups of organisms that are the main targets of nature watching in each region. Valentine and Birtles (2004) list the main regions where wildlife watching is a major contributor to local economies. These can essentially be classified into areas with high biodiversity, and those where it is possible to see large animals at close range. These two categories often overlap, and both are typically located at some distance from the major urban centers where most observers reside. Large body size is a key factor in determining observer preferences (Pahlad and Procheş, 2021), although a more specialized audience may in fact prefer smaller-bodied species (Randler et al., 2023). High biodiversity is less likely to be perceived *per se* (Procheş, 2022), but may often be appreciated in the form of unusual shapes and colors. A key distinction between the various nature observation contexts listed by Valentine and Birtles (2004) is that between guided and self-guided excursions, which will be specifically discussed lower down in this paper. As the authors note, these different approaches may also be more prevalent in specific regions. Guided tours may be making use of local expertise especially when the nature watchers are travelling abroad, but choosing this option could also possibly be linked to transportation, safety and communication concerns.

3 Recent constraints and opportunities

Recently, nature watching has received a boost that greatly benefitted its citizen science component at the expense of tourism. The lockdown measures associated with the Covid-19 pandemic prevented travel but at the same time prompted nature watchers to focus on the organisms that could be observed in their proximity (Randler et al., 2020). The increased public interest in nature as a

result of these circumstances did not wane once lockdown restrictions were lifted, but remained high and in some cases increased further when travel options were restored (Lenda et al., 2023; Newsome and Perera, 2023). The increased amount of time thus allocated to observing environments and organisms that were previously overlooked, provided an opportunity for reflection and a return to the basics of nature appreciation, at a time when the deprivation from long-established routine challenged mental health (Venter et al., 2021; Pichlerová et al., 2023). These recent developments also provide a new context to review the different approaches to nature watching, and potentially integrate them.

The aim of this paper is to re-examine nature watchers' motivations as highlighted in the tourism and citizen science research, while keeping in mind nature appreciation theory (Carlson, 1981). It also emphasizes some motivations and other factors (see Table 1) that have only received limited attention in the literature, including the use of equipment. These aspects are then used to build a conceptual model for some factors likely to be relevant in nature watching, and to suggest ways in which this model can be used to improve nature-based tourism, citizen science projects and the therapeutic effects of nature watching. In discussing citizen science, I am referring mainly to the iNaturalist platform, which has recently dominated the nature observation online scene.

4 Motivations and preferences

While this varies across countries and individuals, a sense of achievement (experienced as either relatively as competition, or in a more absolute way, as reputation) is essential in keeping nature watchers motivated. This is shown across multiple studies (reviewed by Randler and Großmann, 2022), and also visible in the very fabric of citizen science platforms. For example, on iNaturalist most observers will only post observations of a species once (Di Cecco et al., 2021) thus maximizing life list gains with minimum effort, and identifiers are encouraged with labels such as 'improving' and 'leading' after suggesting an identification (iNaturalist, 2024). Although identification is less relevant for this study, note that very often the identifiers are none others than the observers.

Less explored is the discovery aspect of nature watching. Ganzevoort and van den Born (2019) list 'surprise' as the most common response provided by nature watchers under their 'internal impact' categories. This value attached to unexpected sightings evidently places guided tours on a back foot, especially when considered in combination with competitiveness. A nature watcher who experiences achievement when making an unexpected discovery will be likely to place less value on a sighting whereby the organism observed was simply pointed out by a guide. Nevertheless, different nature watchers probably attach different levels of importance to unexpected discoveries. There are, for example indications that numerous citizen scientists post more observations resulting from active searching as opposed to opportunistic finds (Bowler et al., 2022).

These two factors, competitiveness and the value attached to surprise, could be at odds with each other when looking at the social aspect of nature watching. Indeed, many nature watchers attach value to socializing and meeting individuals with similar

TABLE 1 Key lists of factors associated with nature observers, observations and observation contexts.

Motivation categories	Wildlife viewing contexts	Internal impact categories	Key information for observations
McFarlane (1994)	Valentine and Birtles (2004)	Ganzevoort and van den Born (2019)	iNaturalist (2024; selected)
Affiliative	Unguided encounters with wildlife in natural areas	Surprise	Date specified
Achievement	Specialised wildlife tours	Relaxation	Location specified
Conservation	Managed locational attractions featuring a natural aggregation of wildlife	Fun	Has Photos or Sounds
Appreciative	Nature-based tours that include wildlife	Wonder	Has ID supported by two or more
Randler and Großmann (2022)	Research, conservation or education tours involving wildlife	Evidence related to a single subject	Date is accurate
Achievement/Competition	Sightseeing tours that include some element of incidental wildlife-watching	Tension	Location is accurate
Conservation	Accommodation or other tourism facilities that feature surrounding wildlife	Religious	Organism is wild
Social		Health	Evidence of organism
Appreciation/Enjoyment			Recent evidence of an organism
Detachment			
Reputation			

These include observers' motivations and ways of describing their experiences, the ways nature observation endeavors are organized, and information that determines the scientific value of observations.

interests (Randler and Großmann, 2022). Group nature watching reduces the chances of any given sighting being first made by any one individual, but increases the total number of sightings and may also increase the sense of achievement in the individual who first observes and organism, upon sharing it with the others. In this respect, it appears that nature watchers can be subdivided into categories, one of which is best described as natural history society members (listed as such by Bowler et al., 2022 – even though this study did not quantify the value attached to socializing in any other way).

One other factor recorded for iNaturalist observations is whether the organism is wild or captive/cultivated. When trying to record the geographic range of a species, only naturally-occurring individuals count. The distinction is however not clear-cut. Cultivated populations can occasionally produce offspring – this is what makes arboreta for example good sites to watch for invasiveness potential (Cheek et al., 2022). Also, species re-introduced to areas where they have previously occurred naturally may have to be at least initially, intensely managed. One example would be Mauritius skinks that have to be reared as juveniles, and can only survive predation and competition by invasive shrews once they have exceeded a certain size (Brown et al., 2014). Other 'wild' organisms, such as large re-introduced mammals may be vaccinated, or regularly re-located to different areas depending on food or water availability. Some of those that are not benefitting from such obvious support measures may be radio-collared, or at the very least there may be ground personnel who are aware where specific individuals are much of the time.

This knowledge can no doubt take away the 'discovery' feeling discussed above even if the animal is not directly pointed out to the observer by a guide.

5 Using equipment

A technical aspect considered by Bowler et al. (2022) is the use of equipment in nature observation. Traps and other collection equipment are certainly effective in terms of bringing in species unlikely to be seen otherwise. Equipment can also be used to enhance the perceived size or proximity of the organisms under observation (binoculars, magnifiers, microscopes), or to obtain permanent records of the organisms (photographic, video, or sound records – considered essential to move an observation to 'research grade'; iNaturalist, 2024).

However, where traps are involved, organisms are not viewed in their natural environment, which potentially diminishes the enjoyment of the experience. Trap-based observations may also mean that the organisms are only observed at a later stage (for example under the microscope in the case of small organisms), which relegates the experience from the 'now' to a 'subsequent review', which is arguably a less satisfying experience (Procheş, 2023). It is to be noted though that for certain groups of organisms, this is often the only way they can be detected, and that activities such as line fishing, resulting in the extraction of the target organisms from their environment are certainly viewed as greatly

rewarding. It can be argued that in such cases the element of surprise is even greater, and (more than) compensates for not being able to observe the organism in its natural setting. Similarly, extraction and visualization equipment such as traps, binoculars, etc. make the nature watching experience less direct, yet there can no doubt be a certain pride in owning and mastering such equipment, once again compensating for any loss in the authenticity of the experience (see Hyman and McMullin, 2018). Extraction from the natural environment using a trap or such may also kill the organism. Apart from ethical considerations, this may also have implications regarding the value of the observation (less useful, for example, in behavior-related projects), and is marked as such on iNaturalist’s list of things to record about an observation. Dead organisms, and even just direct or indirect evidence of the organisms’ presence (e.g. footprints) can also be observed in nature, and often constitute important evidence of the presence of shy and elusive species (iNaturalist, 2024).

6 Conceptual model

Nature watching can thus be characterized by the scientific value of observations, as well as the perceived value attached to these by the observer. The latter, in turn, incorporates the immediate satisfaction provided by nature observations, and the therapeutic effects nature watching may have in the medium- to long-term. These diverse benefits are aligned with a series of variables that can be attached to nature observations, such as novelty, completeness, verifiability, the perceived size and proximity of organisms, authenticity and immediacy in time and

space, each, in turn, determined by a diverse set of factors which I have attempted to summarize in Figure 1.

Different nature observation contexts are characterized by combinations of such factors. Perhaps the most poignant distinction is that between field observations made by both professional and citizen scientists using no equipment or portable equipment, and laboratory observations made post facto, typically by professionals, using high magnification equipment and sometimes separation and contrasting procedures. The use of portable magnification equipment enhances perceived proximity or size, and often results in observations that would be otherwise impossible or unlikely. Recording media enhances the scientific value of observations, but may deflect the observer’s attention from the act of observing ‘in the moment’ (Procheş, 2023). From a purely sensorial point of view, watching wildlife through a magnification device is similar to watching it via a web cam, which in turn is the live version of watching a wildlife documentary. There is, of course, the knowledge that this experience is unique to the individual, which restores its perceived value.

7 Discussion

Overall, the scientific value of observations is well aligned with the value perceived by observers, with approximately half the variables illustrated in Figure 1 being applicable to both. In some cases, the terms one would use to best describe these values may be different. For example, in terms of subjective, personal experience, naturalness may be better described as authenticity, a factor enhancing the nature viewing experience (Dudley, 2011). Naturalness is typically viewed as scientifically relevant, e.g. in mapping the indigenous ranges of species,

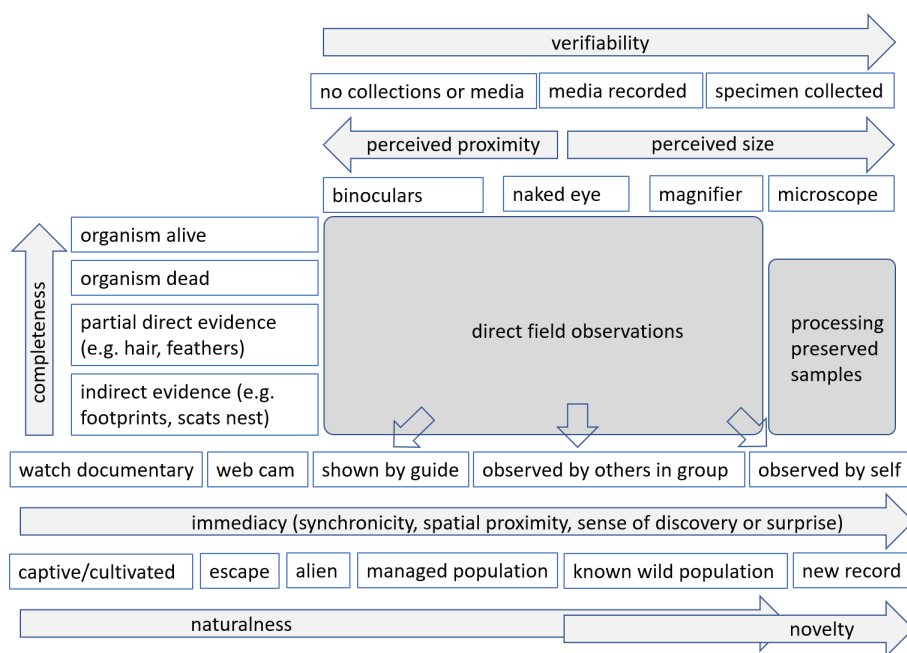


FIGURE 1

A conceptual model placing nature observations in the continuum between observers’ broader exposure to nature, and the production of citizen science data. The arrows represent key variables that influence the value of nature observations for citizen science (verifiability, completeness, naturalness, novelty), as well as for the observer (all variables).

albeit records of alien or managed populations may also be relevant in fields such as invasion biology and wildlife management. While verifiability is primarily aligned with the citizen science aspect of nature watching, it also provides evidence to be shared with peers which results in a sense of achievement (Randler and Großmann, 2022). At least two aspects emerging from the conceptual model deserve further dissection, one pertaining to nature-based tourism, and the other to both tourism and citizen science, and indirectly to nature watchers' well-being. First, the importance of the surprise/own discovery factor (Ganzevoort and van den Born, 2019) is well known to most tourism industry operators, who often provide guided and self-guided options, although it is perhaps insufficiently considered in formal planning at higher levels in the tourism industry (MacLeod, 2016). Site-based and regional surveys to determine the importance of this factor for specific tourist markets could be used to plan and potentially increase opportunities for self-guided discovery in many regions, while considering local constraints such as safety.

The second aspect refers to competitiveness. Following and emulating peers' nature watching achievements may be a major driver in the accumulation of citizen science data, and also in the growth of nature-based tourism. However, the impacts of such social interactions on mental health, when made via online platforms are essentially competitive and not unlike those of any other social media platform. These can create a sense of self-worth when perceiving one's contributions as an achievement, and vice-versa. Variations in the time spent on the platform can pose problems, depending on overall personality types and specific personal traits (Henzel and Håkansson, 2021). While observers self-regulate to some extent by limiting the scope and number of their contributions (Di Cecco et al., 2021), top-down interventions could also be beneficial. At this stage, citizen science platforms encourage maximizing data. However, the possibility of maximizing valuable data with minimum effort exists (Callaghan et al., 2023), and should perhaps be popularized.

8 Conclusions and recommendations

It would be easy to conclude this piece by encouraging a return to the simple and pure experience of nature appreciation in one's neighbourhood, free from competitiveness and costs. This is

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certainly an important option to the individual. On a broader scale though, a balance needs to be found between the societal needs of tourism-fuelled local economic development and conservation science, but without failing to incorporate nature's value to mental health, and associated complexities.

Recent research provides fascinating insights into what drives nature watchers. There is however limited information on how to harmonise these motivations with the needs of citizen science and the potential of nature-based tourism globally, regionally and locally. To achieve this, what is needed is a multi-pronged approach, incorporating the taxonomic and geographical components of nature watching, but also psychological and business expertise.

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