



Research Paper

Towards predicting wildness in the United Kingdom

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HIGHLIGHTS

- Bi-modal stimuli were used to assess how wild environments were perceived to be.
- Self-assessment Manikins were used to measure emotional responses to the stimuli.
- A unique dataset was used that enabled each stimulus to be presented in three experimental conditions.
- Objective measures allowed a Wildness Rating Prediction tool to be developed.
- The study showed wildness to be a more intellectual or cognitive construct than tranquillity.

ARTICLE INFO

Article history:

Received 20 October 2013
 Received in revised form
 15 September 2014
 Accepted 16 September 2014
 Available online 10 October 2014

Keywords:

Wildness
 Tranquillity
 Naturalness
 Remoteness
 Soundscape
 Perception

ABSTRACT

This paper reports the findings of a study that presented bi-modal audio-visual stimuli (video footage), to experimental subjects under controlled conditions, in order to obtain reliable estimates of perceived wildness, naturalness, felt remoteness and tranquillity. The research extends beyond the literature and demonstrates that unlike tranquillity, wildness appears to be a more intellectual or cognitive construct. However, it does relate well to remoteness and naturalness and is reduced by the presence of mechanical noise. By using the approach previously employed for the development of a Tranquillity Rating Prediction Tool (TRAPT), it has been demonstrated that a similar methodology is also appropriate for wildness. WRAPT (Wildness Rating Prediction Tool) is the first attempt to predict wildness from physical variables, the values of which can be readily obtained from field surveys supplemented by detailed maps where large areas require assessment. The findings of this study will be of interest to those responsible for managing and marketing protected areas such as National Parks, practitioners involved in carrying out landscape character assessments, cartographers wishing to incorporate reliable acoustic data within their vector or raster based stacks and landscape architects involved in designing wild and tranquil spaces across a range of scales.

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1. Introduction

The progressive decline of Britain's native woodlands over the last 3000 years and the establishment of successive layers of cultural landscapes have resulted in significant loss of biodiversity across all trophic levels. This is evidenced by the fact that at the end of the 14th Century apex predators such as the grey wolf and brown bear had vanished, and by the end of the 19th Century England's woodland cover had dropped to an all-time non-glacial low of <5% (Smith, 2010). This high rate of attrition was acknowledged by Habron (1998), who when writing about the visual perceptions of Scottish landscapes, stated that "in bio-physical terms, there is very

little, if any, wildland left in Scotland, as most of the landscape has been altered by human hand or grazing, and what does remain is now under pressure from recreational activities and the continued development of forestry".

This analysis applies equally to many of the UK's more remote areas where tourism in particular is bringing increasing numbers of visitors in search of 'natural environments'. In 2010 the Scottish Highlands attracted 2.1 million tourists who contributed over £500 million to the Scottish economy. Over half of these visitors (57%) reported the scenery and landscape as being the prime reasons for visiting the area ("2011 Scotland Visitor Survey: Regional results"). In the case of Dartmoor National Park, which is located approximately 600 miles south of the Scottish Highlands, 2.4 million tourists contributed over £110 million to the regional economy in 2012 ("National Parks: Facts and Figures"). These figures show that despite prolonged anthropocentric activity having reduced the British landscape to a simplified ecology, the desire of many to

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engage with what are considered to be unspoilt natural environments is strong.

The gradual change in our accepted norm of ecological and environmental conditions is often referred to as the Shifting Baseline Syndrome. This describes the incremental decline of standards that emerge as a result of each new generation lacking knowledge of the historical condition of their environment. The concept was first elucidated by Pauly (1995) and is useful when attempting to understand how and why various visual and acoustic attributes contribute to, or detract from, the perception of environmental qualities such as wildness or tranquillity. Both of these perceptive environmental characteristics feature on the websites and within the Management Plans of each of the UK's 15 National Parks, where they are often referred to as the most valued 'special qualities' of British landscapes (Dartmoor National Park, 2007). In fact they are so valued that the UK Government amended the 1995 Environment Act to specifically require all National Park Authorities to "place emphasis on conserving and enhancing the valued attributes of wide open spaces and the wildness and tranquillity perceived within them" (DEFRA, 2010).

It is worth noting that the wording used within the literature on remote and natural areas often introduces a degree of confusion by drawing on descriptors from the English language, such as wilderness, which often means different things to different people and does not translate uniformly across all dialects. This ambiguity was recognised by Scottish Natural Heritage in their Policy Statement 02/03 (2003), which specified that "while the term 'wilderness' is often used to describe the wilder parts of the globe, it is best avoided within Scotland because it implies a more pristine setting than we can ever experience in our countryside". However, in order to ensure that a polar opposite to wholly urban still exists, they align with Habron's descriptors and use the term 'wildland', which they define as; "uninhabited and often relatively inaccessible countryside, where the influence of human activity on the character and quality of the environment has been minimal", and 'wildness' as the perceptive quality that such places are measured by. This descriptor is conceptually easier to handle than terms such as 'untrammelled', which underpins the definition of wilderness in the USA's 1964 Wilderness Act. The terms wildland and wildness have therefore been applied throughout this paper and for reference have been included along with other key concepts in the Glossary of terms Supplemental file.

Previous qualitative studies into how wild spaces are characterised, such as Australia's National Wilderness Inventory (2003), have focussed on a set of generally accepted attributes of wildness that relate to perceived levels of remoteness and naturalness (Lesslie, Taylor, & Maslen, 1993). The degree of naturalness of a scene is broadly associated with vegetation and water, plus the amount of human-induced change present (Ode, Tveit, & Fry, 2008). Vegetation quality is judged by the percentage of natural vegetation present within the visual scene and its shape, level of succession, and the extent to which it conforms with traditional land use of the environment being appraised. The visual scale and degree of disturbance to both the landscape and the vegetation also contributes to perceived naturalness. Scale provides the observer with information about size, shape, diversity, openness and availability of resources, all of which are components of Appleton's Prospect-Refuge-Theory (1975), whereas disturbance allows the unity (coherence) of the scene to be gauged. The spatial arrangement of water within the scene and some idea or imagined ideal of what a traditional landscape may have looked like are also deemed to be important elements in the naturalness construct. Remoteness is simply taken to mean the distance from places of permanent occupation or established access routes.

Naturalness and remoteness were used by Carver, Comber, McMorran, and Nutter (2012) on behalf of Scottish Natural

Heritage (SNH), to underpin the development of a GIS model designed to map wildland contours across Scotland. As part of the project a uni-modal perception study was also carried out (SNH, 2012) to derive weighting factors for use within the model. This study employed photographs and a questionnaire to illicit responses from a large sample of volunteers. The results showed the presence of wildlife and noticeable geological and geographical features within the landscape (such as cliff faces and boulder fields) to be additional 'natural' elements that significantly contributed to the perception of wildness. Conversely built up areas, energy infrastructure (such as pylons, wind turbines and dams) and recreational infrastructure (such as four-wheel-drive tracks, hiking paths, ski lifts, and evidence of hunting), all influenced the visual perception of wildness in a negative way. These human artefacts introduce an element of visual discontinuity within the landscape that can result in a perceived lack of contextual coherence (i.e. the human artefacts can be perceived to be out of context). Elements within the landscape (and soundscape) that disturb the observer's affiliation with nature are also deemed to be out of context. This is especially the case if they conflict with the natural, cultural and historical richness of the environment or accepted stewardship practices.

Within this study contextual features have been defined as: man-made elements within the landscape (and soundscape) that do not disrupt the human affiliation with nature. When combined with the definition of naturalness provided in the Glossary of terms, the objective measure of 'natural and contextual features' (NCF) present within the visual scene can be determined.

From what has been said above it can be appreciated that visual scene perception involves utilising information from the global properties of the visual world, rather than simply from single objects located within it. Thus a wild land may for example consist of water, rocks and birds, but it only becomes a wild place once context is applied. This happens when the brain groups each of the components together and then seeks an existing contextual template (schemata) against which to compare them to. Kaplan and Kaplan (1989) referred to this context as configurational coherence, and simplified the term by explaining that it related to "the degree to which a scene hangs together". However, this is only part of the process, as our senses evolved to compensate for the weaknesses of each other, thereby enabling us to characterise our environment on more than just a uni-modal sensory input. Therefore in situations where no schemata exist to account for contextual discontinuity, additional senses are brought on-line to try and resolve the ambiguity. In the first instance this tends to fluctuate between vision and audition, until context of the sensory information received enables an environment to be adequately described. Therefore what we hear (or expect to hear) is a fundamental part of landscape characterisation. This is defined here as; the process by which an individual uses sensory cues, their previous experiences, and their knowledge of biological, natural and man-made indicators, to make a judgement on how to describe a location.

Landscape character assessment methodologies within the UK, rarely incorporate objective acoustic measures within their appraisals (Countryside Agency, 2002) of what Gobster, Nassauer, Daniel, and Fry (2007) describe as the 'scenic aesthetic' (i.e. landscape scenery). This is despite a growing body of scientific evidence that supports the argument that the perceptive process of environmental characterisation is much more than a uni-modal sensory construct. In fact, research involving brain scanning (fMRI) carried out by the University of Sheffield, has clearly shown audio-visual interaction to be a fundamental component of environmental perception, in particular the cognitive construction of tranquil space (Hunter et al., 2010).

The fact that wildness and tranquillity are frequently mentioned together within the management plans and marketing material of National Parks, and with policies related to the management

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