Identification of Landscapes of National Importance using GIS

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INTRODUCTION

One of the aims of recognising landscapes of national importance is to encourage public authorities to adopt policies and measures at the local, regional and national level for protecting, managing and planning landscapes throughout national states. It covers unique and outstanding landscapes among the ordinary ones, that not only determine the quality of people's living environment but also contribute to national identity. Different approaches have been used so far internationally in identifying landscapes of national importance, assessing their characteristics, structure and landscape elements, recognising that both – quantitative assessment and expert judgement should be involved for this task. Within this study, the focus is on the quantitative part of the study, using GIS and revealing the traceable sequence of steps and criteria used.

MATERIALS AND METHODS

GIS approach was used to determine landscape areas of national importance, using a hexagon grid - (each in an area of 100 ha, 68,407 hexagons), which covers the territory of Latvia. The aggregation of spatial data in regular grids provides an opportunity to normalise different types of spatial data, as well as to address the use of irregularly shaped polygons (e.g., in the case of politically defined boundaries). The hexagon network, due to the shape, forms continuous coverage of the area, while at the same time the hexagon has a similar shape to a circle, which accordingly provides advantages in terms of defining and representing different spatial relationships. Territories of the most valuable landscapes of national significance are spatially separated, assigning values to hexagons in accordance with the landscape values in their territory. Each hexagon is assigned a value according to whether it overlaps with an area that meets one or more of the criteria for the most valuable landscapes of national importance. In the case of larger, continuous area units, the coincidence of areas is determined by the hexagon centroid, but in the case of smaller, individual area units (also point units), the intersect function is used. The criteria for the research part to be quantified include five thematic sections: natural heritage, cultural heritage and historical evidence, identity and community involvement, uniqueness and landscape quality, which can be quantified from the infrastructure created to highlight the visual aspects and aesthetics of landscape.

RESULTS

The part of the quantitative analysis data used to determine the value of the landscape by GIS has been realised in several sequent stages. First, after analysing the main criteria for the identification of landscapes of national importance from existing literature and research thematic areas, they were split into concrete criteria: 8 for natural heritage, 5 for cultural heritage and historical evidence, 6 for identity and community involvement, 4 for uniqueness and 1 for landscape quality. Each of the criteria was given an appropriate weight of 0.5 to 1.5 points (using 0.25 points as a step). Several of the criteria are exclusive and do not overlap; the total amount for most outstanding landscapes would be 12 points. This was followed by a phase of structuring and categorising large amounts of data to allow GIS analysis to be performed. Minor adjustments were made to the weights assigned to the criteria in the methodology during the analysis. Each area of 100 ha, 68,407 hexagons got weighted value, and those territories where the concentration of the highest values were identified, were reconsidered during the next stage as a landscape with national importance. As there were more than 100 such places of concentration, discussion on joint territories having less valuable hexagons in-between has been carried out.

DISCUSSION

A landscape character assessment technique that is scientifically sound, region-specific and stakeholder orientated, designed to describe landscape character, has been used often recently. It can be applied at a range of scales and it may also integrate landscape character analysis with biodiversity assessments, the analysis of historical character, and socio-economic functions such as recreation etc. Even so it is primarily concerned with documenting landscape character rather than assigning quality or values, implying a distinction between characterisation and judgement; identifying landscapes with national importance still involves the assessment and evaluation process. This is debated widely as the main concern is to carry out ordinary landscape quality in places where people live, recognising that only a limited number of societies will benefit from daily encounters of unique landscapes. However, the GIS method used and criteria applied provide transparent objectivity in the characterisation of landscape uniqueness, and even if it's relatively easy to recognise them by perception, having a society consensus, spatial aspects and the identification of borders for such landscapes would be much more difficult without GIS.

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KEYWORDS: Landscape, National, Evaluation criteria, Assessment, Identity