

## Natural heritage as a source of ecosystem services for recreation and tourism in Bulgaria

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### 1. Introduction

According to the World Heritage Convention, Natural Heritage (NH) includes natural features consisting of physical formations, geological features, and physiographical formations, natural sites, or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation, or natural beauty (UNESCO 1972). It is a part of nature that has retained its social significance over time and has a carrier of material and/or spiritual benefits of extremely high value for the previous and current generations. The outstanding universal value at a national level can be represented as “natural significance”, which refers to the importance of ecosystems, biodiversity, and geodiversity for their existence value, as well as their scientific, social, aesthetic, and life-support value (Harrison and O'Donnell 2010). Ecosystems incorporate biotic and abiotic elements (i.e. biodiversity and geodiversity) and can be considered as the spatial units which can represent the NH of the particular area in terms of their values to people. The concept of ecosystem services (ES) describes these values as benefits derived by nature to people (MA 2005) and can be used as the scientific framework that links the natural heritage and the social systems. Recreation and tourism are among the activities that are very much dependent on the flows of benefits from nature, but on the other hand, they may generate negative impacts on ecosystems through pollution, intensified erosion, harm to wildlife or habitats, and biodiversity loss, etc. A response to these problems could be the approach of sustainable tourism which aims to balance the environmental, economic, and socio-cultural features of tourism development by maintaining environmental resources, the socio-cultural livelihoods of host communities, and providing stakeholder benefits (Schloegel 2007). In this respect, the assessment of ES can be an important tool in the process to bridge the conceptual gap between the ecological and social sciences, by linking the state of ecosystems with human well-being and activities.

The sustainable use of the NH for recreational purposes in Bulgaria is among the main problems addressed by the research project “Conceptualization, flexible methodology, and a pilot geospatial platform for access of the Bulgarian natural heritage to the European digital single market of knowledge and information services”, funded under project BG05M2OP001-1.001-0001 *Creation and development of “Heritage BG” Centre of Excellence* (<http://www.nasledstvo.bg/>). It aims to develop a methodology to promote the access of the Bulgarian natural heritage to the European Digital

Single Market of Knowledge and Information Services (<https://eufordigital.eu/discover-eu/eu-digital-single-market/>). In the frames of the International Geographic Conference “Geo Decade 2020-2030” on 24.11.2020, a scientific session HERITAGE.BG was carried out. The researchers from the Bulgarian Academy of Sciences and Sofia University “St. Kliment Ohridski”, presented part of the results from their joint work from the project.

In this Special Issue of JBGS, we present the papers of this scientific session. We believe that they will be of interest to the readers of the journal who are looking for innovative approaches for the development of recreational industries in Bulgaria, as well as for those who are interested in methodological and practical solutions concerning the application of the ecosystem-based approach for the development of green, nature-based and sustainable tourism.

## 2. Main topics of the special issue

The papers in this issue explore various aspects of the application of the ecosystem services concept to assess the recreational potential of natural heritage. They can be grouped into three main topics: 1) Methodological issues of the NH assessment as a source of ES for recreation and tourism; 2) Opportunities to solve specific challenges for the development of recreation and tourism; 3) Mapping of ecosystem services provided by NH at different scales and domains. Each paper is focused on one of the main topics but most of them have also a relation to the other topics (Table 1).

### 2.1. Methodological issues of the NH assessment as a source of ES for recreation and tourism

A methodological framework for mapping and assessment of ecosystem services provided by the natural heritage in Bulgaria for the needs of recreation and tourism is developed by Nedkov et al. (2021a). The conceptual framework of the ecosystem-based assessment of NH in Bulgaria is based on the assumption that the generation of NH for the needs of tourism can be presented as the linkages between the natural systems and tourism in the form of ES potential, flow, and demand. The paper presents a conceptual scheme

of an integrated ecosystem-based assessment of the NH for the needs of recreation and tourism in Bulgaria which incorporates the main principles of the MAES framework. The mapping and assessment procedures are fully developed for application at a national level while for the regional and local level few pilot studies mark some basic foundations for further development. A set of indicators for mapping and assessment at a national level are proposed and the methods for their quantification are arranged following the tiered approach.

The prioritization of ES provided by the NH, developed by Nedkov et al. (2021b) is designed to identify the ES and range them according to their significance for recreation and tourism. It is based on a five-stage approach that utilizes an Ecosystem Services Prioritization Matrix (ESPM) that sets the stage for the selection of measurable parameters of selected ES CICES classes to estimate their relevance to recreation and tourism. The study results in the identification of three groups of the importance of services: high, medium, and low priority. The first contains obligatory ES for each mapping and assessment activity, the second is for optional ES recommended at a regional level, and the third for local-level studies in cases when the assessment needs high details and accuracy.

The use of landscapes as spatial units in the ES mapping and assessment is rarely studied so far and the works of Silvestriev et al. (2021) and Prodanova (2021) provide approaches that integrate the methodologies from classical landscape ecology and the landscapes studies developed in Russia and some Eastern European countries. Prodanova (2021) uses a 5-level landscape classification to distinguish 41 contemporary landscape units that were incorporated in the ES assessment matrix together with selected ES relevant for recreation and ecotourism. The author proposes seven criteria for an expert-assessment process. The approach ensures the generation of maps representing the capacity of the landscape to provide ES relevant to recreation and tourism. The study presented by Silvestriev et al. (2021) aims to develop and test a methodology for assessing the potential of an established natural heritage site in Bulgaria. A holistic approach is applied, using landscapes as the main territorial unit and source of information. For practicing

**Table 1.** Summary of the Special Issue papers. R&T – recreation and tourism.

SI paper	Main topic	Related topic	Scale	Ecosystem services	Natural heritage aspect	Application to specific tourism	Specific challenges for R&T
Hristova and Stoycheva 2021	3	1	National	All	General	General	General
Nedkov et al. 2021a	1	3	National	All	General	General	General
Nedkov et al. 2021b	1	3	National	All	General	General	General
Nikolova et al. 2021a	2	-	National	Cultural	General	General	Optimization of regional tourism policy
Nikolova et al. 2021b	2	-	Local	-	Geodiversity, lakes	Mountain tourism	Climate change adaptation
Prodanova 2021	1	3	Local	Recreation	Landscape	Recreation, Ecotourism	General
Semerdzhieva and Borisova 2021	3	2	Local	Urban biodiversity: 'maintaining nursery populations and habitats	Urban green spaces	Nature-based daily outdoor recreation	General
Silvestriev et al. 2021	1	3	Local	Cultural	Mountain landscapes	Hiking, Nat education tourism, Ski touring	National park management
Zhyanski et al. 2021	2	3	Local	Cult. heritage, Aesthetic	Forest	Forest recreation	Forest recreation and legislation

representative types of mountain tourism: 'mountain hiking', 'nature education' tourism, 'ski touring' and 'mountaineering' a total of 15 ecosystem services were assessed based on 25 biophysical and social indicators. The ecosystem approach supports the identification of representative cultural ecosystem/landscape services and provides a good information basis for the practical organisation of tourism activities from the perspective of the sustainability of human-nature relationships. The results of the study are directed towards the responsible parties in support of the natural heritage conservation in Rila National Park through sustainable management the potential to provide cultural (recreational) ecosystem services.

## *2.2. Opportunities to solve specific challenges for the development of recreation and tourism*

The papers focused on this topic explore issues such as the role of the natural heritage in forest areas as a resource that can generate economic, social, and environmental benefits for society by providing a wide range of cultural ecosystem services. Another important issue is the risk of climate change for the Bulgarian natural heritage and the importance of assessing cultural ecosystem services of protected areas to develop nature-based tourism in Bulgaria.

The paper "Role of the cultural ecosystem services provided by natural heritage in forest territories for sustainable regional development" confirms that identifying the natural heritage in forest areas could be a powerful driver for regional development by creating significant positive effects. Such effects include: i) improving sustainable cultural tourism in forests; ii) diversifying forestry; iii) supporting sustainable development and management of forest areas. Furthermore, integrating the cultural services delivered from the forest areas into forest-related legislation can encourage job creation in different sectors and regions (Zhiyanski et al. 2021).

In "National natural heritage at risk: The Seven Rila Lakes" (Nikolova et al. 2021a), a climate change impact on the Seven Rila Lakes, one of the iconic sites of Bulgarian natural heritage, has been estimated. The results underline the need to identify the protected areas as natural heritage sites, draw up criteria for evaluating the threatened sites and generating a list of Bulgarian natural heritage at risk, and develop plans for adapting the natural heritage sites to climate change.

The paper "Recreational ecosystem services for the development of nature-based tourism in Bulgaria" presents an assessment of natural heritage potential to provide goods and services to develop different kinds of nature-based tourism in Bulgarian tourist regions. The results show that only 37 municipalities of 265 have no one natural heritage site, and all the rest have natural recourses to develop nature-based tourism of different types (Nikolova et al. 2021b). The results may help optimize the tourist regions' policy and development priorities regarding better and sustainable use of the natural heritage.

## *2.3. Mapping of ecosystem services provided by NH at different scales and domains*

The mapping of ecosystems is one of the three core elements of the MAES framework and the basis for such mapping at the national level in Bulgaria is provided in the work of Hristova and Stoycheva (2021). The study explores the relationship between CORINE Land Cover (CLC) classification and MAES typology to develop a basis for mapping ecosystems, which could ensure a spatial framework for mapping and assessment of the ecosystem services provided by the natural heritage. The results of the study complement the findings

from previous works and prove that the predominant ecosystems in Bulgaria are croplands and forests. However, the main contribution is that it reveals the distribution of ecosystem subtypes within the main ecosystem types and provides the basis for further ecosystem-based mapping of the natural heritage.

The work of Semerdzhieva and Borisova (2021) aims to assess which part of the landscape elements in the urban and peri-urban environment are most supportive to the maintenance of habitats and their biodiversity. Functional urban area with center city of Burgas is chosen for a case study as region with representative biodiversity from Bulgarian Natural Heritage. One of the sub-goals of the research is the connectivity of urban green infrastructure with green infrastructure at regional scale – i.e. linking the urban green infrastructure elements with the surrounding natural landscapes. Such an upscaling approach provides additional information about the character of the urban landscape mosaic and its ecological functions. A well-planned green infrastructure on a regional scale would provide a more natural and diverse environment for organisms, which is directly related to increasing biodiversity in cities and their surroundings. Semerdzhieva and Borisova (2021) assess the urban ecosystems in GIS environment using a unified indicator according to five criteria such as hemeroby index, the share of protected areas, fragmentation index, and presence of water and species richness. The results are presented on two spatial levels: within Functional urban areas by Urban Atlas spatial units and within the urban core area by grid cells (local climate zones). The results could support urban planning and help the optimization of the links between the natural elements and social benefits.

Mapping and assessment at a national level for selected high priority services reveal the areas with high potential of the NH to provide ES for recreation and tourism (Nedkov et al. 2021a; 2021b). Mapping of NH potential to provide ES at a local level is provided in two case studies. The potential of forest ecosystems to provide cultural ES in Velingrad municipality is studied by Zhiyanski et al. (2021), while the potential of the NH at the landscape level is mapped for the area of the Strazhata syncline upland and Melovete hills in North-Central Bulgaria by Prodanova (2021).

## **3. Conclusions**

The papers in this special issue cover various aspects of the sustainable use of the NH for recreation and tourism using the concept of ecosystem services as a platform to integrate them in a methodological framework. The NH is presented as a spatial phenomenon conceptualized by the flows of benefits from ecosystems to people, contributing to human well-being. Such an approach ensures integrated ecosystem-based assessment of the NH for recreation and tourism, which incorporates the main principles of the mapping and assessment framework developed at European through the MAES process (Maes et al. 2013; Burkhard et al. 2018; Brown et al. 2018). The papers focused on the opportunities to solve specific challenges for the development of recreation and tourism discuss important aspects related to climate change adaptation, integration of the recreational activities in the forest legislation, and optimization of the regional tourism policy. The case studies present mapping and assessment of ES provided by NH at a national and local level. The studies at a national scale cover a wide range of services, while those at a local scale focus on a low number of services studied in more detail.

The papers included in this issue represent only one part of the project results. You can find more publications, data, and other information about the natural and cultural heritage of Bulgaria can be on the website of the project [www.nasledstvo.bg](http://www.nasledstvo.bg).

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