

## METHODOLOGICAL FRAMEWORK FOR THE LANDSCAPE ASSESSMENT IN SPECIALLY PROTECTED NATURE AREAS IN LATVIA

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### Abstract

Specially protected nature areas (SPNA) are valuable ecological, social, and economic resources; however, they are also susceptible to various changes that can irreversibly impact their natural and scenic values. Often, tourism infrastructure is developed within these protected areas, creating walking routes through the most beautiful landscapes and establishing other facilities to provide services. It is essential to develop a methodological framework for landscape assessment to identify the landscape values that can be utilized for tourism development and establish conditions for managing and administrating these areas to provide protection of the landscape values. This article presents the methodological framework developed within the LIFE LatViaNature project for landscape assessment in SPNAs. It evaluates the landscape quality of SPNAs to ensure their preservation, enhancement, and dynamic future development planning. In Latvia, there are 658 specially protected natural areas of various types and sizes, not all possessing scenic qualities. In most of these areas, the focus of protection is primarily associated with the ecological and biological values of the territory. The developed methodology can serve as a document and guidelines for landscape assessment within the framework of a nature protection plan for definite SPNA and for the development of thematic landscape plans in municipalities and planning regions. It can be utilized by territorial planners and landscape architects to conduct landscape assessments in specific areas.

**Keywords:** landscape assessment method, landscape values, landscape qualities, protected nature areas.

### Introduction

Specially protected natural areas (SPNA) serve as valuable ecological, social, and economic assets. However, they are also vulnerable to changes that may permanently alter their natural and scenic characteristics. In many cases, tourism infrastructure is introduced within these areas, including walking trails that showcase the most picturesque landscapes, observation towers, and other visitor facilities. Nature-based tourism and recreation in nature are growing trends significantly boosted by the COVID-19 outbreak in the spring of 2020 (Fredman & Margaryan, 2020), both internationally and in Latvia (Jūrmalis et al., 2022). Tourism and visitor management guidelines in protected areas are developed to protect nature from overload (Leung et al., 2018). To determine the landscape values that can be utilized for tourism development and prepare conditions for the management and administration of such areas, it is necessary to develop a methodological framework for landscape assessment in protected natural areas.

Adopting the European Landscape Convention (Council of Europe, 2000), which was also ratified by Latvia in 2007, human perception in landscape assessment became more relevant. Additionally, the landscape is recognized as a result of the interaction between humans and their environment, where natural processes and human needs are respected. Landscape assessment is also a significant stage in the implementation framework of the European Landscape Convention (Council of Europe, 2000), as it forms the basis for determining further measures in landscape protection, planning, and management. The European Landscape Convention does not prescribe a uniform approach for all European countries but rather highlights the specific characteristics of each country and the necessity for them to identify their objectives regarding landscape as a resource (Council of Europe, 2000).

Estonia has set preserving multifunctional and coherent landscapes as one of the Estonian Environmental Strategy 2030 objectives (Ministry of Environment, 2007). Other countries have developed landscape plans on different planning levels, like 'Landschaftsplan' in Germany or 'Atlas des Paysages' in France. In Switzerland, the landscape has historically been recognized as one of the foundations of its national identity (OFEV, 2020). In the Netherlands, general principles of landscape quality are integrated into national, regional, and municipal territorial strategies and planning. Landscape character assessment is conducted in England (Tudor, 2014) and Scotland (NatureScot, 2023).

In general, documents related to the assessment of landscapes in terms of territorial development include the following aspects:

- Landscape as a comprehensive system that includes ecological, socio-economic, and cultural aspects (Council of Europe, 2000; European Commission, 2019a).
  - Landscape as a natural resource for ensuring ecological and human living quality (European Commission, 2019b; 2020).
  - Landscape as a cultural environment, former of national identity and symbolism (UNESCO, 1972).
- However, none of the documents specify how these tasks should be implemented.

The Law of the Republic of Latvia on Specially Protected Nature Areas (Latvijas Republikas likums, 1993; Ministru Kabineta noteikumi Nr. 686, 2007) states that one of the objectives of the establishment, protection, and management of protected nature areas is 'to protect and preserve the diversity of nature (rare and typical natural ecosystems, habitats of protected species, unique, beautiful landscapes characteristic of Latvia...)'. It aims to protect and preserve Latvia's characteristic landscape and those elements essential

for ensuring the ecological functions of protected species and habitats, as well as the cultural environment and landscape diversity. It also seeks to conserve environments suitable for public recreation, tourism, and nature-friendly management practices.

As part of the LIFE Integrated Project LatViaNature, a new e-platform for the Nature conservation plans (NCP) of SPNAs in Latvia is slated for implementation by 2028. This platform will feature a dedicated section for protected areas of high landscape quality and tourism development potential, where information regarding these areas' landscape quality and tourism can be submitted. The developing methodological framework for the landscape assessment of specially protected areas will specify the types and formats of data to be included in this section.

The article presents the methodological framework for landscape assessment of SPNAs developed within the LIFE project LatViaNature. The methodology aims to identify the landscape quality of these protected areas, ensuring the preservation, enhancement, and dynamic (adaptable to changes) planning of future developments while respecting conservation goals and guaranteeing public benefits derived from the landscape resources available within these protected areas.

## Materials and Methods

### Study object

Specially protected nature areas (SPNA) in Latvia are territories that are under state protection due to their specific qualities – biological diversity, habitats for rare species, geological and geomorphological formations, characteristic, traditional and scenic. In Latvia, there are 658 specially protected natural areas of various types and sizes (nature reserves, nature parks, reserves, etc., excluding protected trees (mature trees) and protected, big stones), not all of which possess scenic qualities (NCARL, 2024) (Figure 1). Almost half of these territories – 333 are Natura 2000 areas.

In most of SPNAs, the protection focus is associated with the territory's ecological and biological values. However, there are SPNAs that also include scenic and cultural heritage values, making them popular destinations for recreation and tourism and placing additional pressure on the existing protected areas.

### Methods

Considering there is currently no unified methodology for landscape assessment in Latvia, including SPNAs, the methodological framework for the landscape assessment in SPNAs has been developed for its integration into Nature Conservation Plans (NCP) that will be elaborated for each nature protected area. The framework includes a two-step approach (Figure 2).

Landscape assessment in SPNAs is linked to the potential for tourism and recreational development. However, as mentioned earlier, the primary goal of many SPNAs is the preservation of biological and ecological values, with some areas even restricting visitor access entirely. Therefore, in the first step (Stage I), areas that do not require a landscape

assessment and those that do require assessment are identified because their qualities serve not only as significant ecological assets but also as important cultural-historical, scenic, and socio-economic resources.

A key issue for Stage I is data availability in public databases without needing field surveys. Therefore, the criteria for the areas that do not require landscape assessment were:

- 1) the purpose of the establishment and protection of the Specially Nature Protected Area designated only for biological and ecological values;
- 2) the purpose of the establishment and protection of the area does not allow free access for visitors (for example, the strict protection and regulated protection zones of a nature reserve), OR the area cannot be used for tourism and recreation because it is not accessible;
- 3) at least 85% of the territory consists of a closed, homogeneous landscape structure of a single type (for example, homogeneous forest without open patches, roads and other elements);
- 4) there are no protected cultural or natural monuments in the area.

In the next step (Stage II), the selected areas under requirement for landscape evaluation are assessed based on predefined evaluation criteria.

For the landscape assessment it has utilized and adapted several approaches already validated in Latvia and Europe (Simensen et al., 2018). Additionally, it incorporates the requirements outlined in existing regulatory acts, which stipulate that the nature protection plan must include a 'landscape assessment (in terms of aesthetic, ecological, and socio-economic aspects, as well as an analysis of the positive and negative impacts on the landscape as a whole within the protected area)' (Ministru Kabineta noteikumi Nr. 686, 2007).

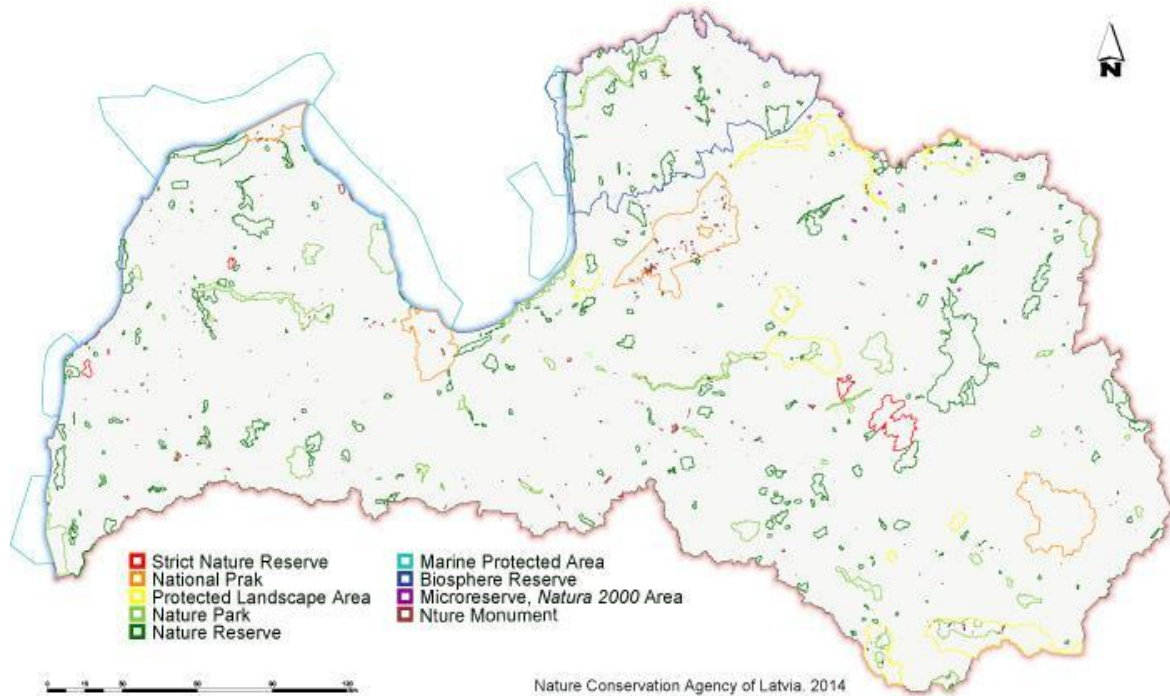
Therefore, the methodological framework for the landscape assessment part for SPNAs under requirement for landscape evaluation includes 3 sections: 1) general characteristic of surrounded landscape; 2) landscape values (qualities) and 3) positive and negative effects on the landscape, recommendations for development and impact mitigation. The methodological framework for landscape assessment in SPNAs is schematically illustrated in Figure 3.

For the general characteristics of the landscape of a particular SPNA, the Landscape Character Assessment (LCA) approach is used (Tudor, 2014). The LCA, developed in the United Kingdom, has been employed in the section on landscape assessment, which examines the general characterization of the landscape (Fairclough et al., 2018). Many other countries have also utilized this methodology for landscape evaluation, with criteria adapted to their specific goals and landscape characteristics. The LCA serves as a tool that integrates natural and cultural landscapes along with human perception, describing the spatial framework for

the implementation of the European Landscape Convention (Council of Europe, 2000). Within the Latvian National Research Program project 'Sustainable Management of Land Resources and

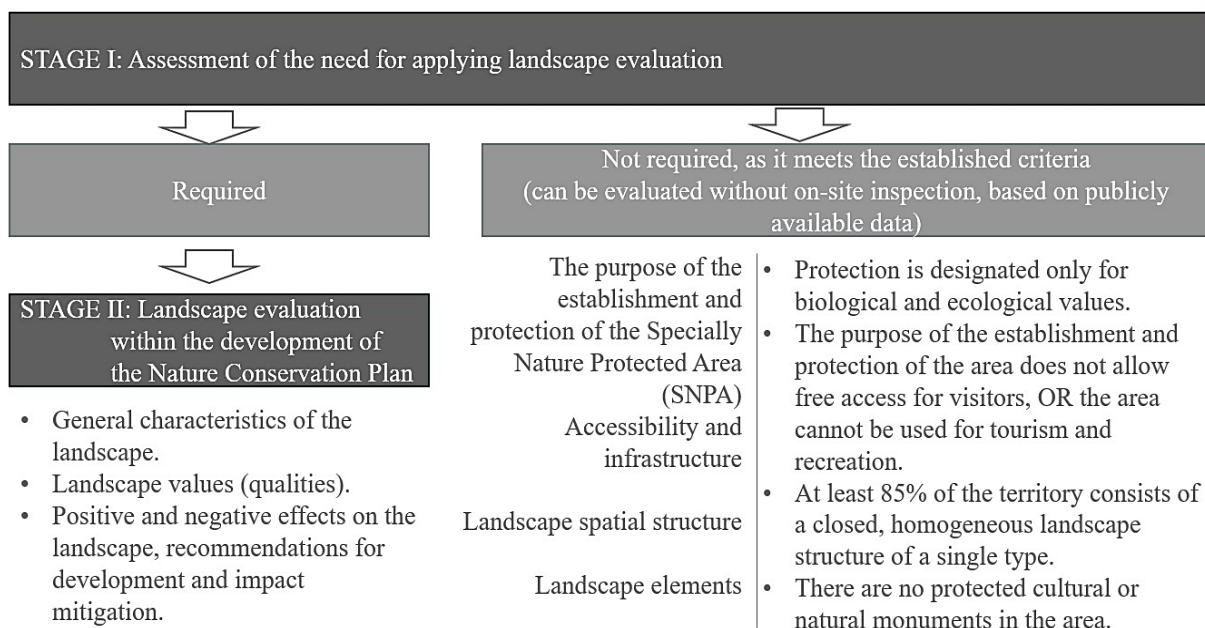
Landscapes: Assessment of Challenges, Methodological Solutions, and Proposals' (LandLat4Pol, 2023), a characterization of Latvian landscapes was conducted in 2023.

**Figure 1**  
*Specially Protected Nature Areas in Latvia*



Source: (NCARL, 2024).

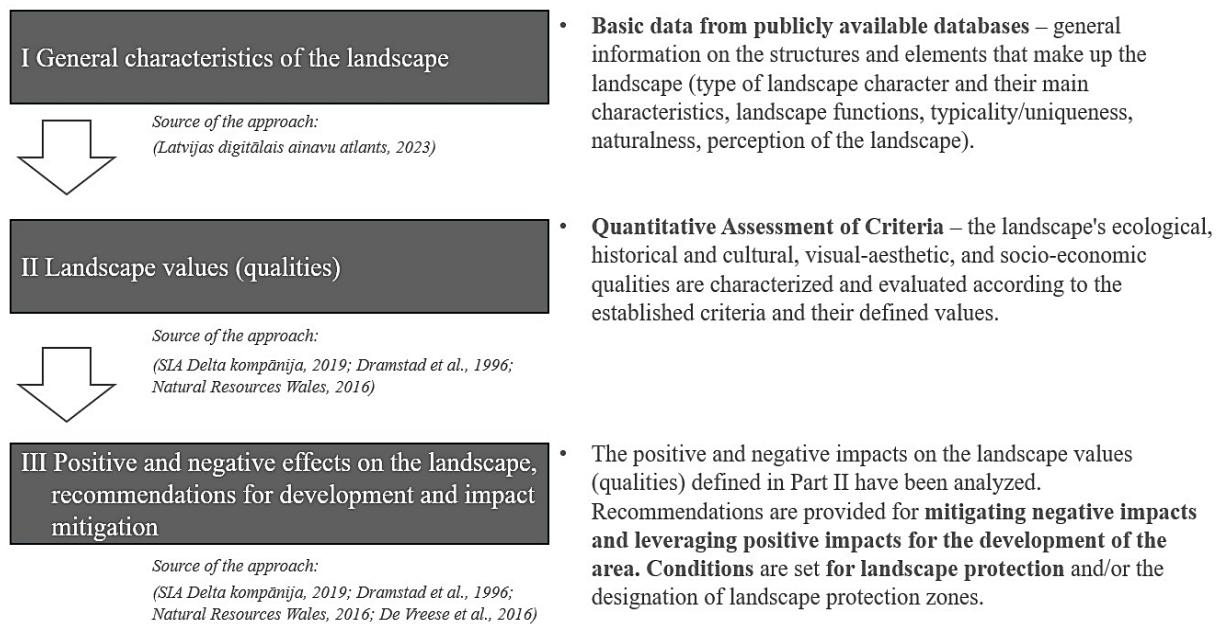
**Figure 2**  
*The methodological framework for selection of SPNAs that do not require and those that require landscape assessment within the Nature Conservation Plans*



Source: Developed by Authors.

**Figure 3**

*The methodological framework for the evaluation of SPNAs that required landscape assessment within the Nature Conservation Plans*



Source: Developed by Authors.

This characterization is based on the LCA methodology, which has been modified to suit Latvian conditions. As part of this project, a digital atlas of Latvian landscapes (Latvijas digitālais ainavu atlants, 2023) was created, providing accessible data collected and obtained regarding Latvian landscapes and methodological materials concerning landscape assessment approaches in Latvia (Stokmane et al., 2023). Data from the Atlas have been utilized for general landscape characterization of the definite SPNA.

Criteria established within the Zemgale Regional Landscape and Green Infrastructure Plan for 2020-2027 (SIA Delta kompānija, 2019) have been adapted and utilized for assessing and evaluating ecological and socio-economic qualities of the landscape. The criteria were developed as part of the Interreg Latvia-Lithuania program project 'Enhancing Green Infrastructure in the Landscapes of Lowland Rivers/ENGRAVE'. The characteristics and numerical values of the established criteria have been utilized and adapted to determine and evaluate the ecological, historical, cultural, socio-economic, and visual aesthetic qualities of landscapes within the landscape assessment for the NCPs. Several criteria for assessing landscape qualities have been supplemented by adapting methodologies and criteria developed in other European countries based on the Landscape Character Assessment approach, such as the visual quality assessment criteria for landscapes in Wales (Wascher, 2005). For landscape ecological quality assessment, basic approaches of landscape ecological planning were utilized (Dramstad et al.,

1996; Bennett, 2003). Visual assessment criteria were used for scenic quality assessment (Natural Resources Wales, 2016).

## Results and Discussion

In this section selected criteria for SPNAs required landscape assessment are discussed and presented with practical examples from the pilot-study area – Nature Park 'Istra' located in eastern part of Latvia, in Ludza district municipality. According to the developed methodological framework, the landscape assessment to be conducted for the selected SPNAs consists of a general characterization, analysis of landscape qualities, and recommendations for landscape management and maintenance.

### *I General characteristics of the landscape*

Existing landscape survey data from Latvia (Latvijas digitālais ainavu atlants, 2023) is utilized to develop the general landscape characterization. The objective of the general characterization is to describe the landscape's primary structural elements and characteristics to reflect its key visual and spatial features, functions and uses, typicality or uniqueness, as well as the perception of the landscape. The general landscape characterization is necessary to conduct the landscape assessment, identify qualities, and provide recommendations for landscape management following landscape quality objectives.

### *II Landscape values (qualities)*

Subsequently, the following landscape values or qualities are evaluated.

Landscape Ecological Qualities. The landscape structures and elements of SPNAs should be evaluated

not only as visual aesthetic, cultural, and socio-economic resources, but also as features ensuring landscape ecological quality due to the specifics of these areas. For the determination and assessment of landscape ecological qualities, both cartographic materials and various available data sources (such as Ozols.lv (Ozols, 2025), Mantojums.lv (Mantojums, 2025), lvm.geo.lv (LVM GEO, 2025), and biodiversity protection plans for the specially protected natural areas, if available) are analyzed, as well as field surveys conducted on-site. The assessment results are to be represented cartographically and supplemented with descriptions, including evaluations according to the following assessment criteria:

- landscape structures that provide significant landscape ecological functions (ecological connections with surrounding natural areas outside the SPNA; green network throughout the entire SPNA; habitat diversity and density; landscape structure diversity; fragmentation (visually observable)) (Figure 4);
- landscape elements that provide significant landscape ecological functions (mature trees, trees with multiple trunks and cavities, fallen mature trees, rare local species, alleys, edges, ruins of old houses, stones, topography variations, water streams, etc.) (Figure 5);
- naturalness (proportions of natural vegetation and land cover, biologically valuable grasslands, etc.);
- pollution (noise and light from roads, other infrastructure elements).

**Historical and Cultural Qualities.** These qualities are closely linked to a place's identity and recognizability, encompassing both material and immaterial values, such as traditional practices, processes, and customs (e.g., agricultural traditions, forestry, human-made structures, peat extraction/quarries, such as the remnants of old railway lines now transformed into greenways, as well as war/military heritage, including trenches and bunkers). The criteria groups utilized for the assessment include:

- 1) historical significance (presence of historic spatial structures – old roads, ancient villages, historic buildings; visually noticeable historic elements - anchor elements – manor houses, sacral buildings, mills, bridges, fort hill, etc.) (Figure 6);
- 2) uniqueness and recognizability (landscape of national importance, landscape protected areas);
- 3) cultural monuments (density, types, conditions);
- 4) sacred heritage (types and density of sacral buildings, cemeteries, conditions);
- 5) traditions, and processes (traditional land use for the definite region, other elements creating identity of the places).

Visual Aesthetic Qualities are analyzed using view analysis in the context of human perception. These individuals can include residents traversing the area as well as tourists.

**Figure 4**

*Fragmentation of landscape structures that provide significant landscape ecological functions – clear cutting patches. Forest in nature park 'Istra'*



**Figure 5**

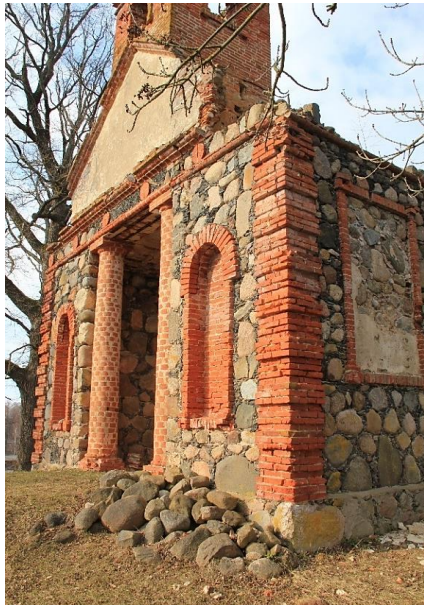
*Landscape elements that provide significant landscape ecological functions – an alley from mature trees (Tilia) that represents also cultural heritage value – an old alley to Istra manor's house*



Within the framework of view analysis, viewpoints, vistas, and the landscape structures and elements that determine the visual aesthetic quality of the view (high or low) are mapped and described. In natural areas, the most significant from a landscape perspective are the primary roads and routes frequented by tourists (Figure 7). The criteria groups utilized for the assessment include viewpoints, views from roads and river corridors, characterization of view expressiveness and visual quality, scenic landscapes (areas with high visual aesthetic view density) (Figure 8), and proportion of visually attractive roads.

**Figure 6**

*Landscape elements representing historic significance and recognition of the place – sacral building – Vecslabada's church*



Socio-economic qualities of a landscape are associated with its potential uses and the public benefits derived from the landscape as a significant resource. Considering that not all areas permit economic activities, with a priority placed on protecting nature and landscapes, the socio-economic qualities of the specially protected natural areas are evaluated in the context of their usage possibilities, primarily concerning tourism and recreation (Figure 8).

**Figure 7**

*Scenic landscape of lake Dzilezers of the nature park Istra. View from the Tiskova hill*



The criteria groups utilized for the assessment include:

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- function and purpose of use (diversity of land use types; purpose of establishment and protection of the definite SPNA);
- accessibility (density of populated places, distance to cities, public transport, bicycle routes);
- recreation, and tourism (location and density of recreation and tourism objects, elements and infrastructure; seasonal usage, public involvement).

**Figure 8**

*Scenic road in the forest serves as bicycle route through the area of the nature park 'Istra'*



## Conclusions

1. The developed methodology can be applied as a document and guidelines for landscape assessment within the framework of a nature conservation plan and for developing thematic landscape plans in municipalities and planning regions.
2. Territorial and landscape planners and landscape architects can use the methodology to conduct landscape assessments in specific areas.
3. Obtaining missing data, involving specialists from relevant fields, and utilizing various digital tools are essential.
4. Possible limitations of the method are connected to the data availability and subjectivity in the evaluation of some criteria, for example, scenic and aesthetic quality.

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