Interreg

EUROPEAN UNION

Danube Transnational Programme

URBforDAN

URBforDAN Mapping of Ecosystem Services

Făget, Cluj-Napoca, Romania

Developed by

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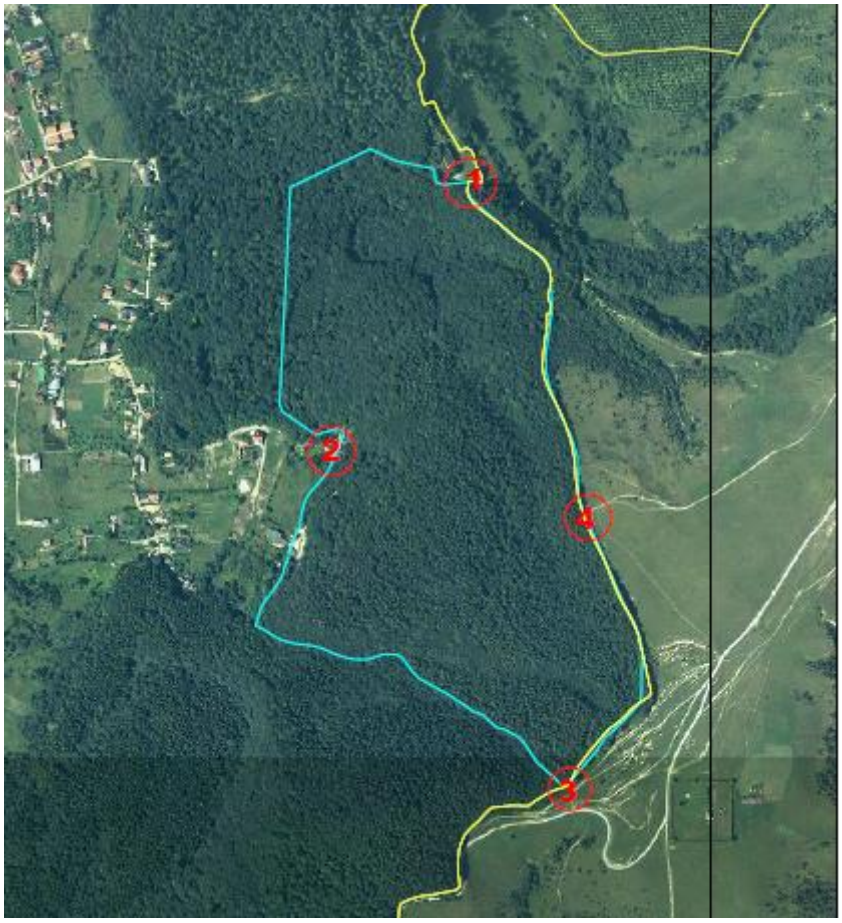
Table of content

1. INTRODUCTION

The strategic and focus area are situated in the south part of Cluj-Napoca, Făget area. It comprises of 41.88 ha, out of which appx 40 ha are public property of the City of Cluj-Napoca and the rest is privately owned. All the area is covered by forests. There is no protected area on the focus area, still a Natura 2000 site ROSCI0074 Făgetul Clujului (1,667 ha) lies near the focus area.



2. METHODOLOGY

At first, we carried out a background investigation in order to identify data sources and ecosystem services types. Some preliminary field visits were also required in order to better understand the specificity of the study area.

Data sources used were as followed:

- Forestry maps - the forest arrangement as presented by ROMSILVA (the Romanian state-owned enterprise responsible for dealing with the protection, preservation and development of publicly owned forests of the Romanian state, and the management of hunting and fishing grounds)

- Touristic map
- Climate data (including wind)
- Field mapping (GPS)

The whole process behind the mapping of the ecosystem services had also a participatory component, in each of the public workshops organized consistent input from the public has been collected, when the main ES services have been selected.

Methodology steps

1. *Georeferencing different map types*

In this step we used georeferencing in order to be able to use different map types. Included here are forestry and touristic maps.

Georeferencing is the basic step in the majority of GIS projects and basically involves defining the coordinate system for scanned maps. The forestry maps used had no grid with coordinates so a graphical georeferencing process was used. The main points used for georeferencing were stream confluences and road junctions.

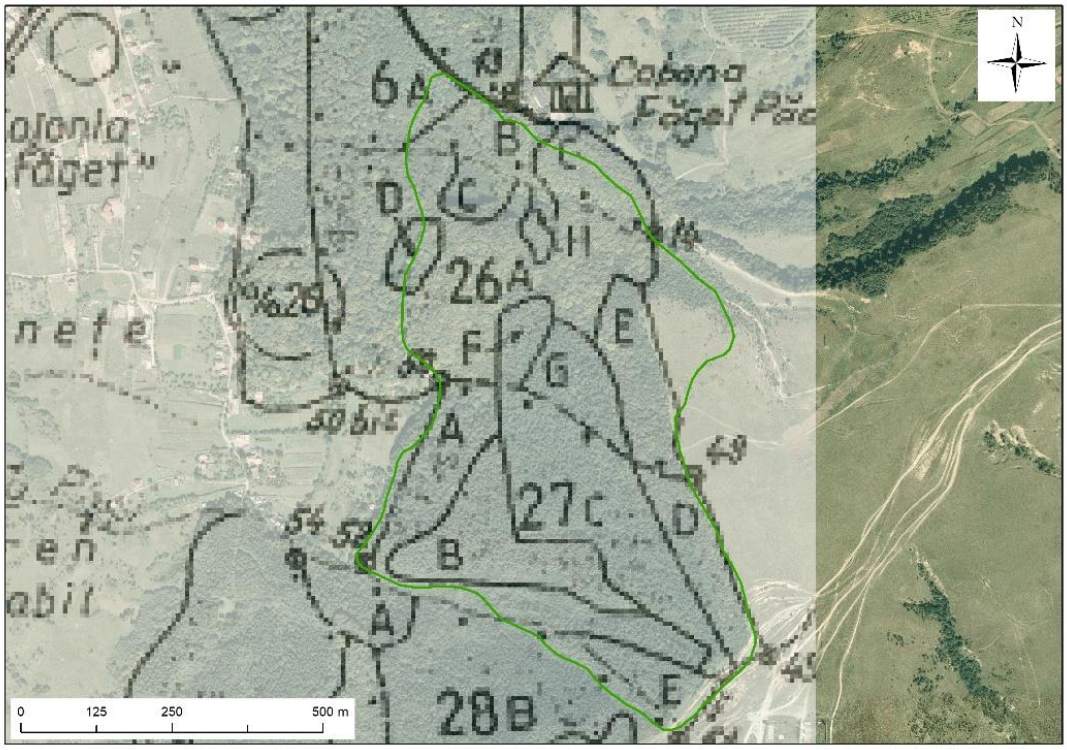


Figure 1. Georeferenced forestry map superimposed over an orthophoto of the study area

2. *Vectorizing data*

The second step in the project included the vectorizing of data based on the background maps.

The most important feature is made of different forest patches with different dominant species. As can be seen in **Figure 1** area is comprised out of several forest types, the most important dominant species being Fagus sylvatica (beech), Carpinus betulus (hornbeam) and sessile oak (Quercus petraea) but also with some made plantations of non non native species like the Douglas fir (Pseudotsuga menziesii). These patches of species are most relevant in the context of non-wood forest products as coniferous dominant areas are in general inappropriate for this ecosystem service in the local context.

Be vectorizing data a series of maps were developed including the wood, non-wood maps and climate ecosystem services maps.

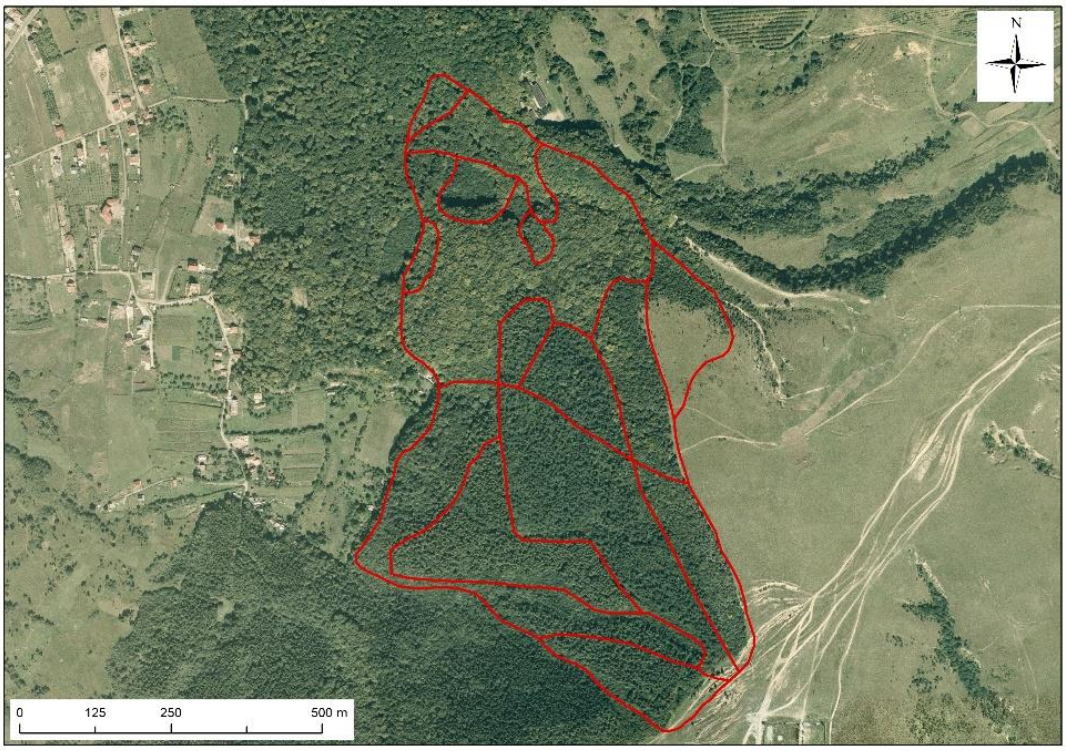


Figure 2. Vectorization of forestry parcels

3. *Field mapping*
4.

The field mapping stages included field visits and mapping of tracks, recreational areas and tourism areas by using a GPS. In this stage we followed and recorded tracks of the different paths and recreational areas. The data was later downloaded in GPX format (GPS Exchange File) a file type used by a large majority of GPS devices.

After that the data files were used in ArcGIS, first converted to shapefile and after processed in order to be used as representations. The processing included some geoprocessing operations like clip, conversions from lines to polygons and buffer.

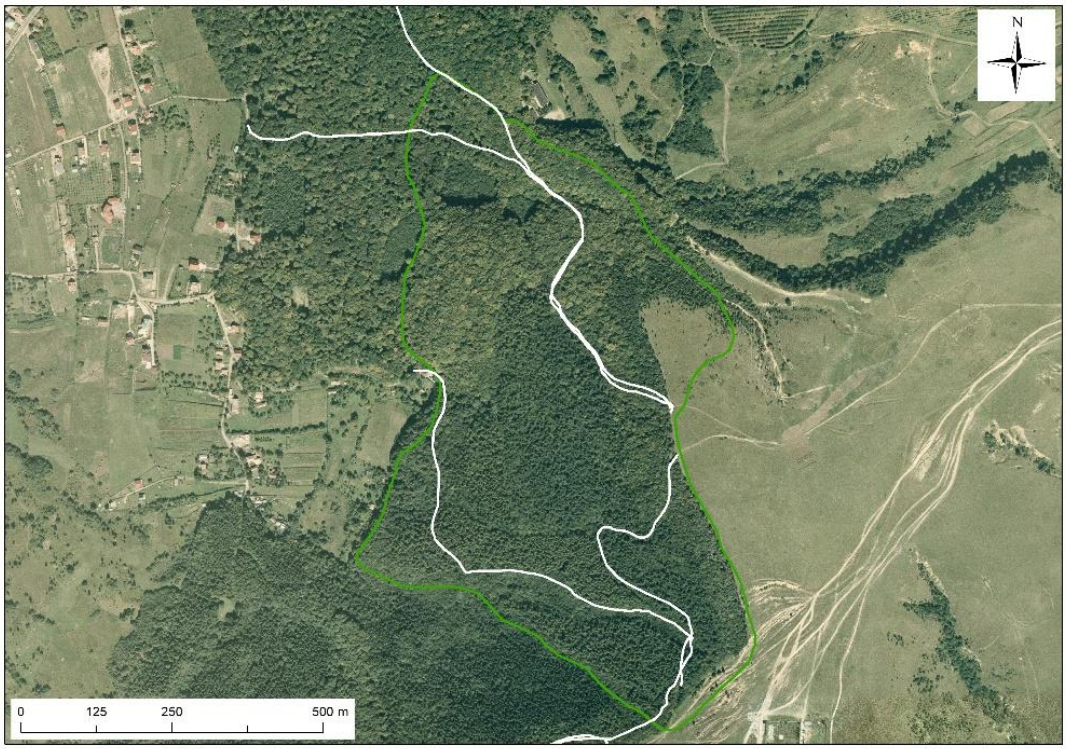


Figure 3. Tracks in the study area

5. Map preparation and data adjustment

The final steps included the preparation of the different Ecosystem service maps, based on the background data and field data. A general map layout was designed and based on that the different maps were made.

Before the final maps were made the data was compiled in order to fulfill the mapping guidelines. We developed several shapefiles (ESRI shapefile) according to the mapping recommendations including here the attribute values. Obnly after this step the final maps were exported as image files.

The coordinate system used is Stereo70 (EPSG 31700) the national coordinate system used in Romania.

3. RESULTS

3.1. Summary of mapped ES

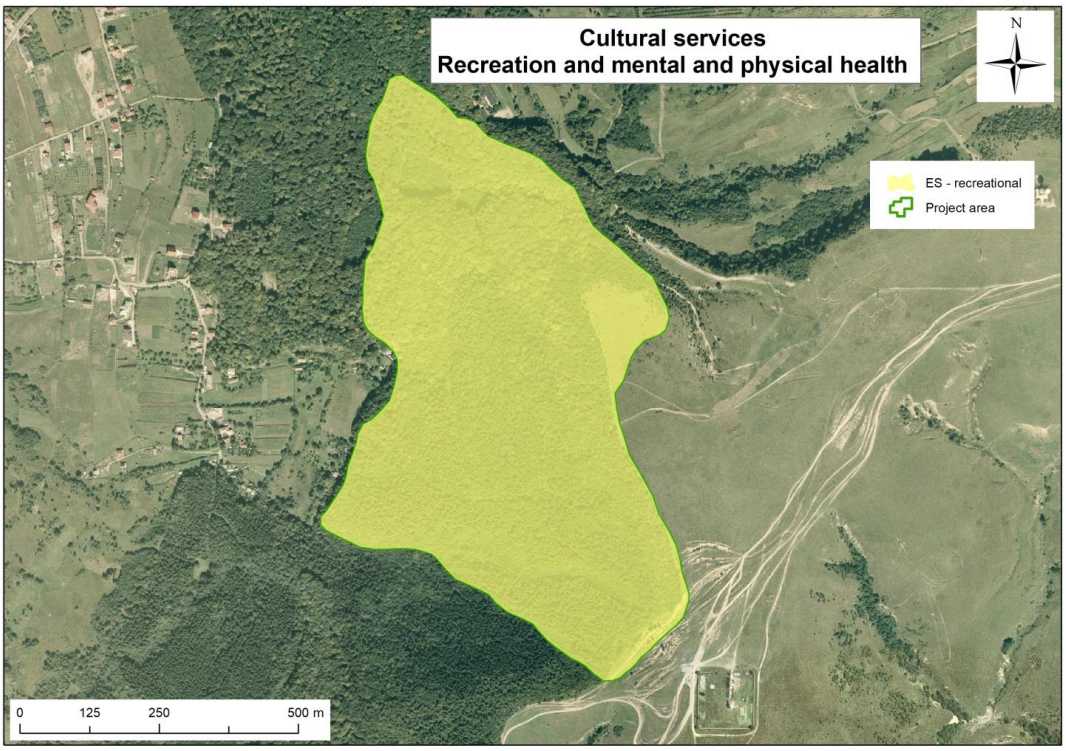
The main ES services identified are:

-Recreational
-Tourism
-Non-wood
-Climate
-Education
-Erosion

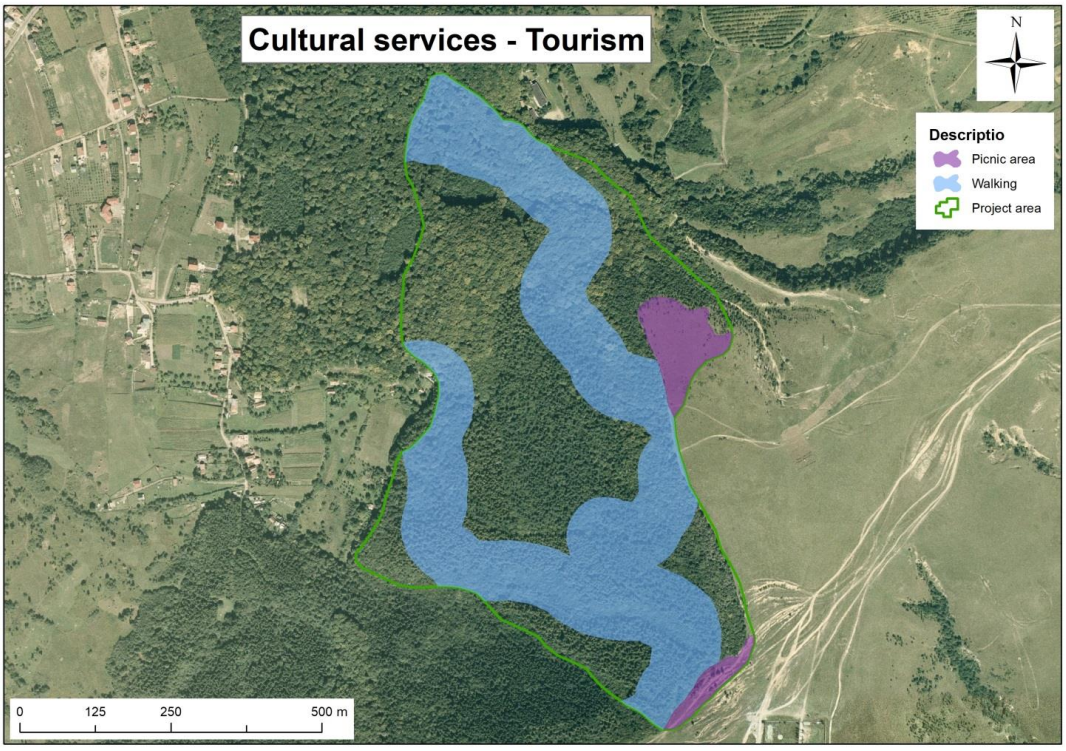
Table 1: Area and proportion of mapped ES given ranks of their importance (for the strategic area)

Type of ES	rank	ha	%
41_ recreational	**1**	**41,88**	**100**
12_wood		**41,88**	**100**
11_non wood		22,09	52,74
42_Tourism		22,33	53,3190067
21_Climate		9,13	21,800382
41_Education		2,4	5,73065903
22_Erosion		2,33	5,5635148

3.2. Recreational

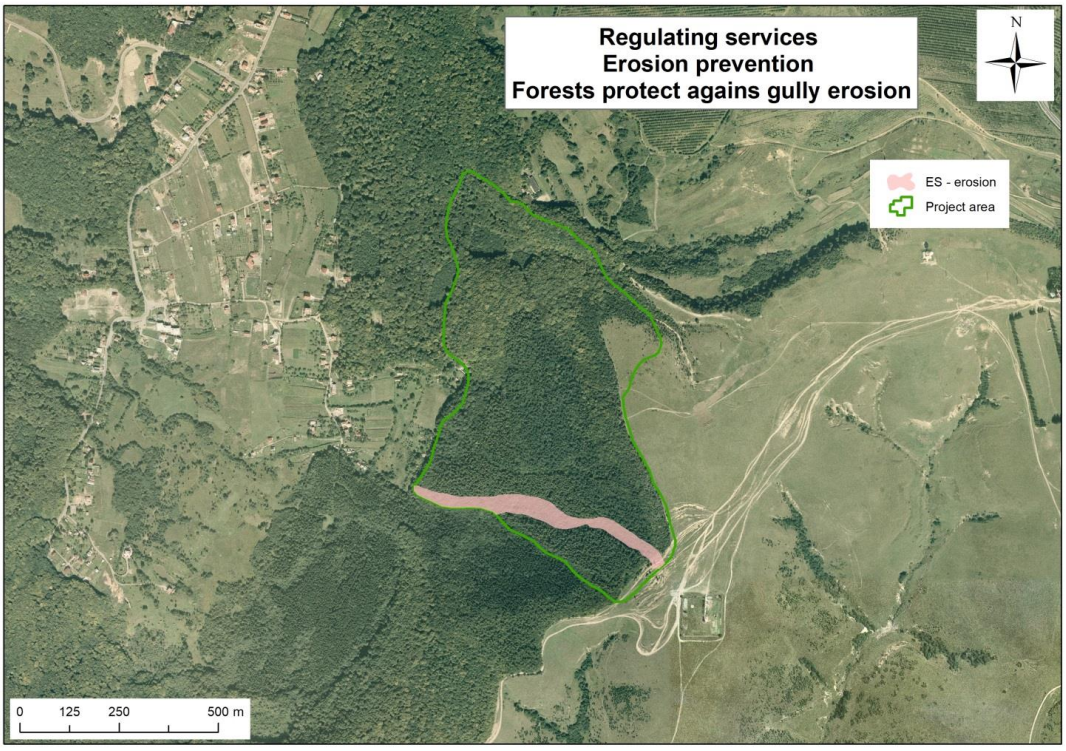


3.3. Tourism

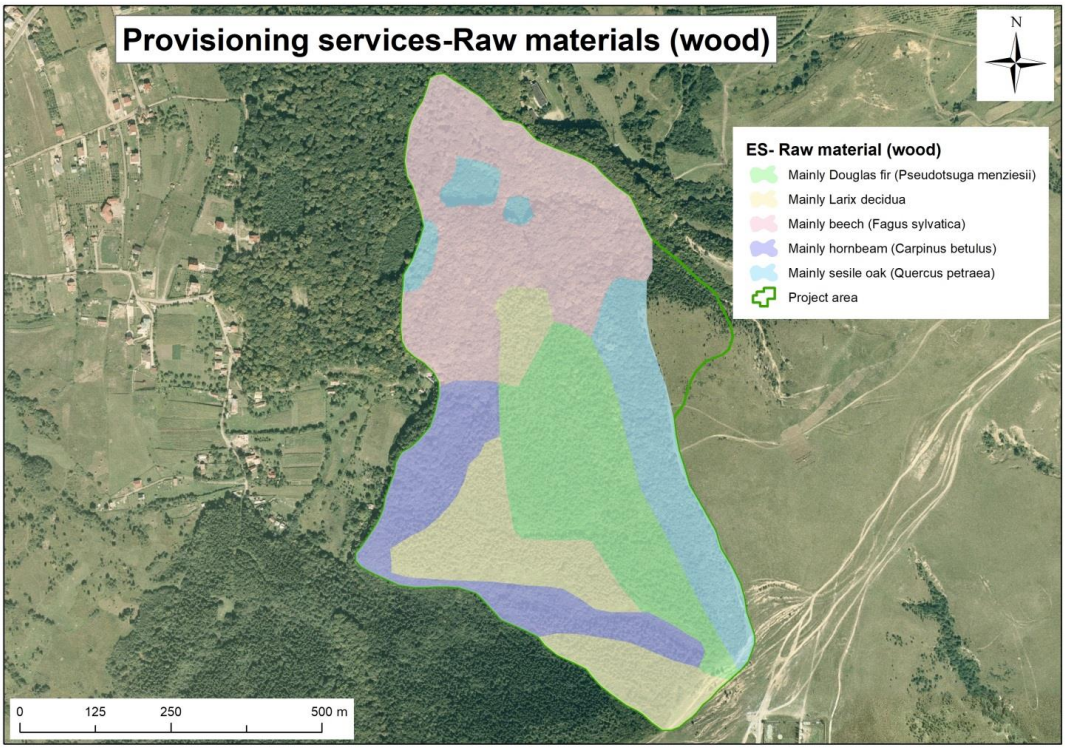


3.4. Non-wood

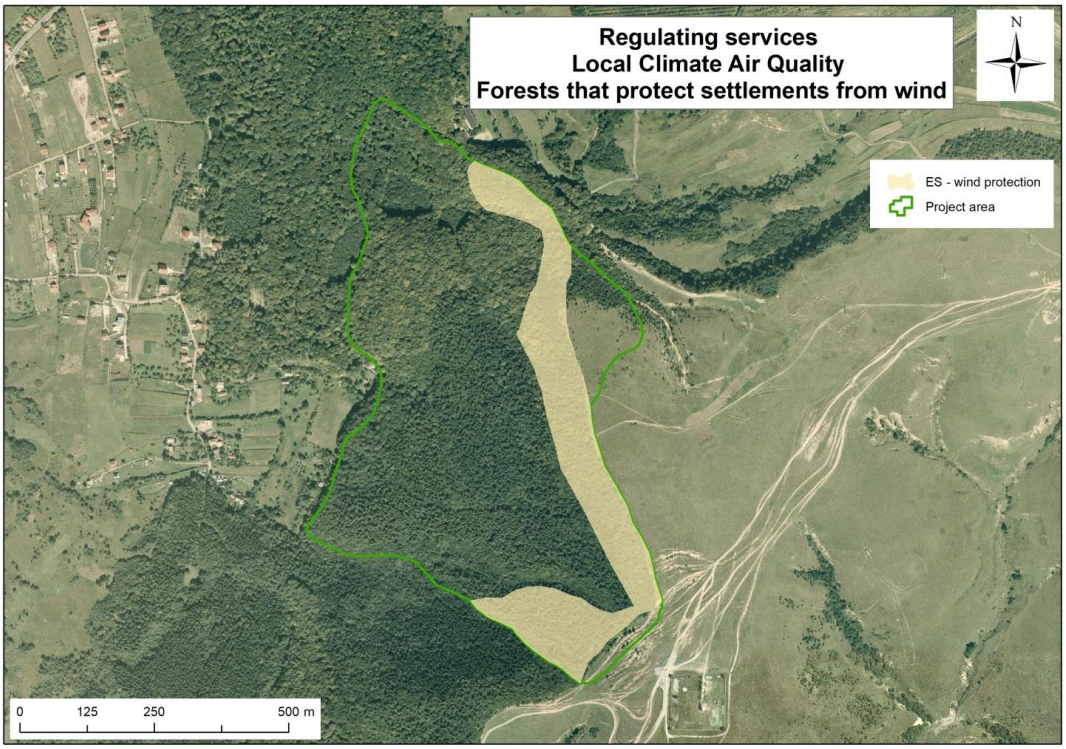
3.6 Erosion



3.7 Wood



3.5 Climate



4. DISCUSSION

Being a relatively small focus area, most of the ES services are overlapping. As in the first analysis, the area most ‘crowded’ would be the eastern part of the studied site. There were no conflicts identified for the time being.