



# City of Ljubljana Urban Forest Operational Management Plan - Šmarna gora

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City of  
Ljubljana



ZAVOD za GOZDOVE  
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# 1 INTRODUCTION

## 1.1 The Objective and Purpose of the Operational Plan

- **Objective**
  - To ensure multipurpose and sustainable use of the Šmarna gora urban forest;
  - To contribute to improvement in the management of the Šmarna gora urban forest in view of its great importance for a healthy living environment, recreation and leisure activities of residents of the municipalities of Ljubljana and Medvode.
  
- **Purpose**
  - The Operational Plan (OP) serves as the basis for a more detailed and specific treatment of the Šmarna gora urban forest. It is intended for the Contracting Authorities – the City of Ljubljana (COL) and the Municipality of Medvode (MM), since it emphasises their interests whilst representing an instrument for cooperation with the public, which is interested in this area, and the forest owners. It provides the basis for participation in tenders for obtaining (international) projects and financial resources. As such, the OP is a tool encouraging cooperation with the public forestry service and can boost changes in forest management. It is an instrument facilitating cooperation with institutions in charge of spatial planning, as well as a tool for the promotion of municipalities.
  - The Šmarna gora urban forest is a wildlife habitat and home of certain species of game. Management of game populations and their habitats is a complex issue. It is discussed in hunting management plans for hunting management areas and plans for hunting grounds as prepared by the Slovenia Forest Service, the hunting families and managers of special purpose hunting grounds. Although the Operational Plan does not cover this field (hence game is not mentioned as one of the objectives), it is nonetheless in line with the guidelines of the aforementioned documents.
  - The OP serves as the basis for the preparation of the Plan for the Arrangement and Providing Equipment for Special Purpose Forests, which is set out in the Ordinance proclaiming forests with a special purpose.
  - The OP represents the basis for amending and changing the forest management planning system. In fact, the current regulations do not allow for the preparation of forest management plans that would be adapted to the specifics of urban forests.
  
- **Connection to the superior plan**
  - The guidelines and measures set out in the OP for the Šmarna gora Urban Forest comply with the strategic guidelines set out in the Strategy for the Urban Forest Development of the City of Ljubljana (SP)..

## 1.2 Design of the Operational Plan, Commitments and Validity

- **Bases**
  - Forest Management Plan of the Ljubljana Forest Management Unit 2015–2024 (FMP of the Ljubljana FMU, 2015)
  - Forest Management Plan of the Medvode Forest Management Unit 2020–2029 (FMP of the Medvode FMU, 2020)

- Forest Management Plan of the Ljubljana Forest Management Area 2011–2020 (FMP of the Ljubljana FMA, 2011)
  - Municipal Spatial Plan of the City of Ljubljana – Strategic Part (MSP MOL SP, 2010)
  - Municipal Spatial Plan of the City of Ljubljana – Operative Part (MSP MOL OP, 2010)
  - Municipal Spatial Plan of the Municipality of Medvode (MSP MM, 2018)
- **Connection with Forest Management and Other Planning Bases**
    - The FMP of the Ljubljana FMU (2015) and the FMP of the Medvode FMU (2020) represent the underlying bases for forest management on Šmarna gora. However, the OP is more detailed and deals with content that is discussed in general in the FMP of the Ljubljana FMU and the FMP of the Medvode FMU. In cases where the OP determines content that is different from the contents defined in both FMPs, such content must be defined as “a proposal” and presented by the municipalities when restoring the FMPs for both FMUs.
    - The OP can be used as the basis for proposals when drawing up spatial plans, since various professional institutions, forest owners and the public participated in its preparation.
- **Commitment**
    - The OP is a compulsory basis for the COL and the MM as regards planning the use of funds and obtaining international or national projects which are in line with the content of the OP.
    - The OP is a tool for the municipalities in the preparation of initiatives at the beginning of the restoration of the FMPs for both FMUs. In this way, the OP directly and indirectly influences the work of the Slovenia Forest Service (SFS), which is responsible for forest planning, management and monitoring in accordance with the Forest Act (FA, 1993).
    - The OP is an instrument facilitating communication with forest owners regarding forest management and the basis for projects/ agreements and subsidies that support the provision of public benefits in privately-owned forests. Some guidelines for the management of privately-owned forests on Šmarna gora are derived from the emphasised social and ecological functions of the forest and/or from the legal regulations, as the COL proclaimed the wider urban forest area including their part of Šmarna gora as forests with a special purpose (FSP). The Ordinance on FSP defines a framework management regime which, however, is not sufficiently operational to implement the measures. According to the FA, forest management plans are forest management plans for forest management areas, forest management units and silvicultural plans. Part of the OP is also a drawn up plan for the arrangement and equipment of FSP, which is otherwise defined by the Ordinance and adopted by the COL's City Council.
- **Preparation of the OP**
    - SFS, the COL and the MM are responsible for the preparation of the OP, which was developed in 2021. Experts from research institutions, consulting companies, the public and forest owners were involved in the planning process through surveys and individual focus group meetings which were organised within the framework of the URBforDAN project.
- **Period of Validity**
    - The period of validity of the OP is five years. This is the period that is most appropriate as regards assessing the necessity of works to be performed, subsidising, etc. After this period, it is assessed whether the plan needs to be supplemented and the revision of

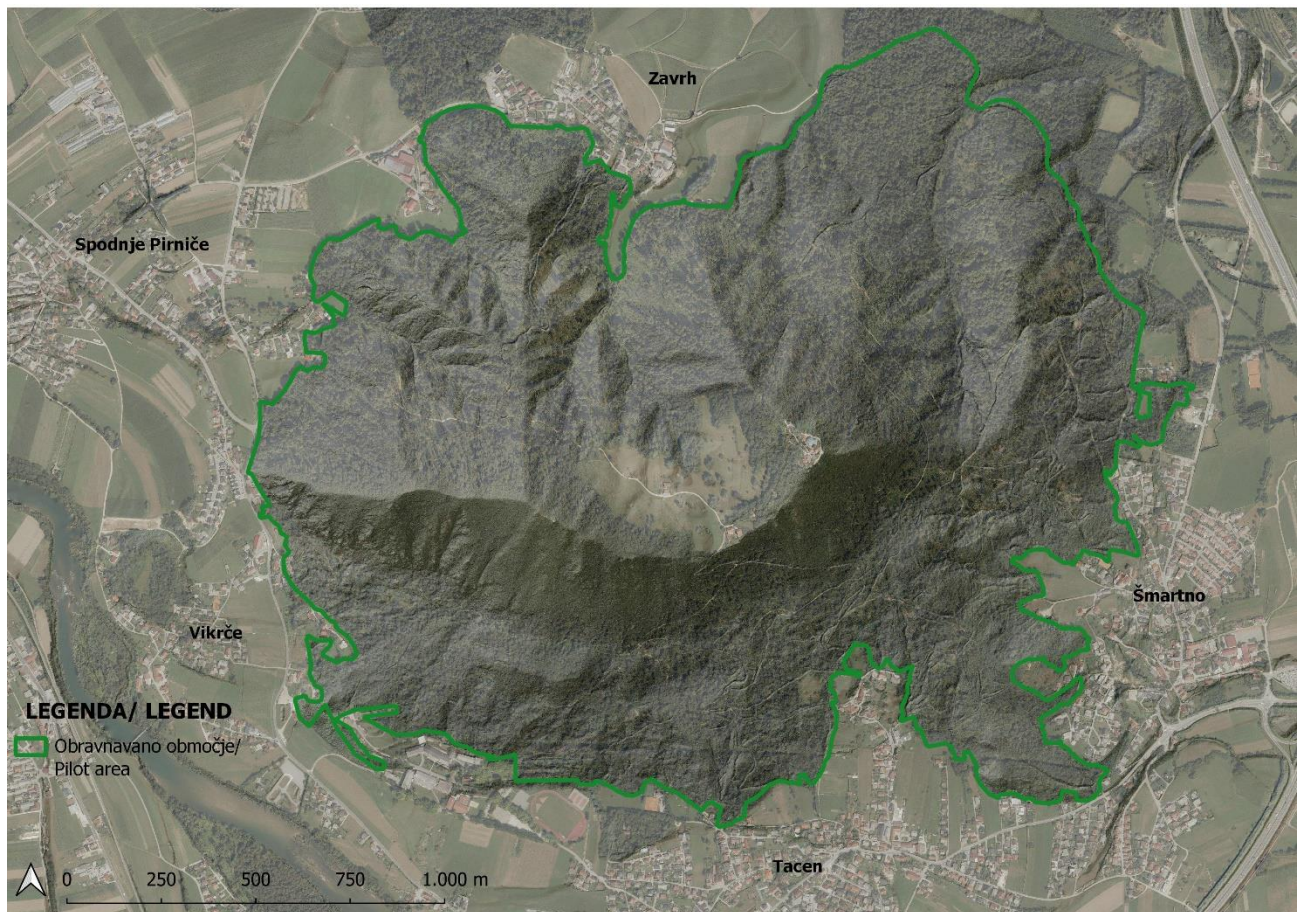
the plan is decided upon. COL and MM, in cooperation with the SFS, are responsible for the revision of the plan.

- **Implementation and Operational Planning**

- The OP is the basis for carrying out activities of COL and MM in the area of Šmarna gora. It includes the guidelines, planned actions and tools. Since the OP does not contain all of the implementation details, the activities defined in the OP can be specified in operational projects. This also applies to the period following the completion of the URBforDAN project.

- **The OP Area**

- The Šmarna gora urban forest is located between the settlements of Šmartno in the southeast, Tacen in the south (both COL), Vikrče and Spodnje Pirniče in the west and Zavrh in the north (all MM). In the northeast, it borders on the forests Skaručenska ravan and the Ljubljana-Jesenice motorway.



**Image 1: Šmarna gora urban forest, 368 ha**

## 2 THE IMPORTANCE OF THE ŠMARNNA GORA URBAN FOREST

The SP sets out the main objectives for their management. The entire surface area of urban forests in Ljubljana measures 2,151 hectares and includes several contiguous areas (SP, 2020), which differ somewhat in terms of natural circumstances, importance of forests and management objectives. The OP covers the area of Šmarna gora comprehensively and also includes the area belonging to the MM.

### 2.1 The Importance of the Šmarna Gora Urban Forest

#### The Importance of Forests

- **Recreation and Tourism**

Due to its relatively large surface area and close proximity to the urbanised areas of Ljubljana and Medvode, Šmarna gora is extremely important for leisure activities and recreation. The number of tourist visits is increasing in both Ljubljana and Medvode, which is why the forests on Šmarna gora are important for the promotion of sustainable tourism as well. Recreation is important throughout the entire area of Šmarna gora, although its importance is relatively greater in the areas of mountain trails, forest entry points and at the Šmarna gora summit.

- **Education**

Šmarna gora is important in terms of education, as it is regularly or occasionally visited by visitors from the nearby schools, kindergartens and other organised groups that carry out educational activities in the forest. In addition, the Šmarna gora urban forest is important for lifelong learning, as it is regularly visited by active elderly residents.

- **Local Climate Regulation**

The Šmarna gora urban forests have a significant impact on the quality of life in the surrounding settlements. They considerably reduce air pollution and are of great importance in regulating local climatic conditions. The Šmarna gora urban forests regulate the drainage of rainwater and contribute to the reduction of fine particulate matter air pollution, improve carbon sequestration and mitigate the urban heat island effect. What is more, the Šmarna gora urban forests protect the residents against noise from the motorway, as well as local and main access roads.

- **Protective Effects**

The Šmarna gora urban forests play an important protective role in preserving the soil and its fertility and reducing soil erosion hazards.

- **Nature Conservation**

The area of Šmarna gora is classified as a Natura 2000 site and as an ecologically important area (Mt Šmarna gora – Skaručenska ravan). As a whole, the solitary Šmarna gora, the second peak Grmada and the pertaining slopes is an area of natural value with subareas of specific natural value. The southern slope belongs to the 3B category of water protection areas at national level and is home to protective forests, whilst the northern slope below the summit is classified as the first, second and third category of water protection areas at the municipal level.

In addition, Šmarna gora is a habitat for several species of game (deer, wild boar, fox, field hare, beech marten, grey crow, etc.). Their populations are managed by the Šmarna gora hunting family, which acts as the manager of the Šmarna gora hunting grounds (including the area in question). The

management of the Šmarna gora hunting grounds is harmonised with the longterm and annual hunting management plan for the second Gorenjska hunting management area, as prepared by the Slovenian Forest Service. Although the Šmarna gora urban forest is an integral part of the Šmarna gora hunting grounds, hunting (or its management) is not carried out there due to the increased number of people visiting, the way its space is used and its placement into the urban environment. Thus the decision of the Ministry of Agriculture, Forestry and Food excludes the part of the Šmarna gora urban forest which lies in COL from the hunting area and determines the objectives of game and wildlife management. Extraordinary interventions as regards wildlife populations are allowed only if granted by a special decision of the Ministry of Agriculture, Forestry and Food.

- **Cultural Heritage**

Cultural heritage includes the anti-Turkish defence wall around the pilgrimage Church of the Mother of God at the Šmarna gora summit. There are several other cultural heritage sites and archaeological sites in the area.

- **Timber production and non- wood forest products**

The Šmarna gora urban forests are important in terms of timber production. Due to the tree species structure and degraded soil, the importance for harvesting of non-wood forest products is not significant.

- **Target Groups or Users**

1. **Residents of Ljubljana:** Šmarna gora provides all citizens and other visitors with a healthy natural environment and thus has a beneficial effect on people's physical and mental health.
2. **Forest owners:** a good 97% of forests on Šmarna gora are privately owned. Considerable differences in the interests and intensity of forest management are noticeable among the forest owners.
3. **User groups participating in leisure activities and recreation:** walkers, hikers, mountaineers, climbers, runners, dog walkers, families, etc.
4. **Educational institutions:** kindergartens, primary schools, scout associations, etc.
5. **Tourists:** as Šmarna gora is in close vicinity of Ljubljana and Medvode, it is attractive for tourist visits.



## 3 THE CONDITION AND USE OF THE ŠMARNNA GORA URBAN FOREST

### 3.1 Forest Condition and Management

- **Forest Surface Area and Ownership**

The Šmarna gora urban forest belongs to the Ljubljana FMA, the Ljubljana FMU and the Medvode FMU. In 2010, the COL issued the Ordinance on FSP which applies to the Šmarna gora urban forest, as well as to other important urban forests of Ljubljana in which measures are allowed to be undertaken (FMP of the Ljubljana FMU, 2015).

The surface area of the Šmarna gora urban forest totals 368 hectares, of which 358 hectares are privately owned forests (97%), almost 6 hectares are state-owned forests (2%) and 4 hectares (1%) are forests owned by local communities. The average size of a forest property is 0.71 hectare. The ownership structure is extremely fragmented (Figure 2), since the majority (62%) of owners own plots of less than 0.5 hectare (Figure 3).

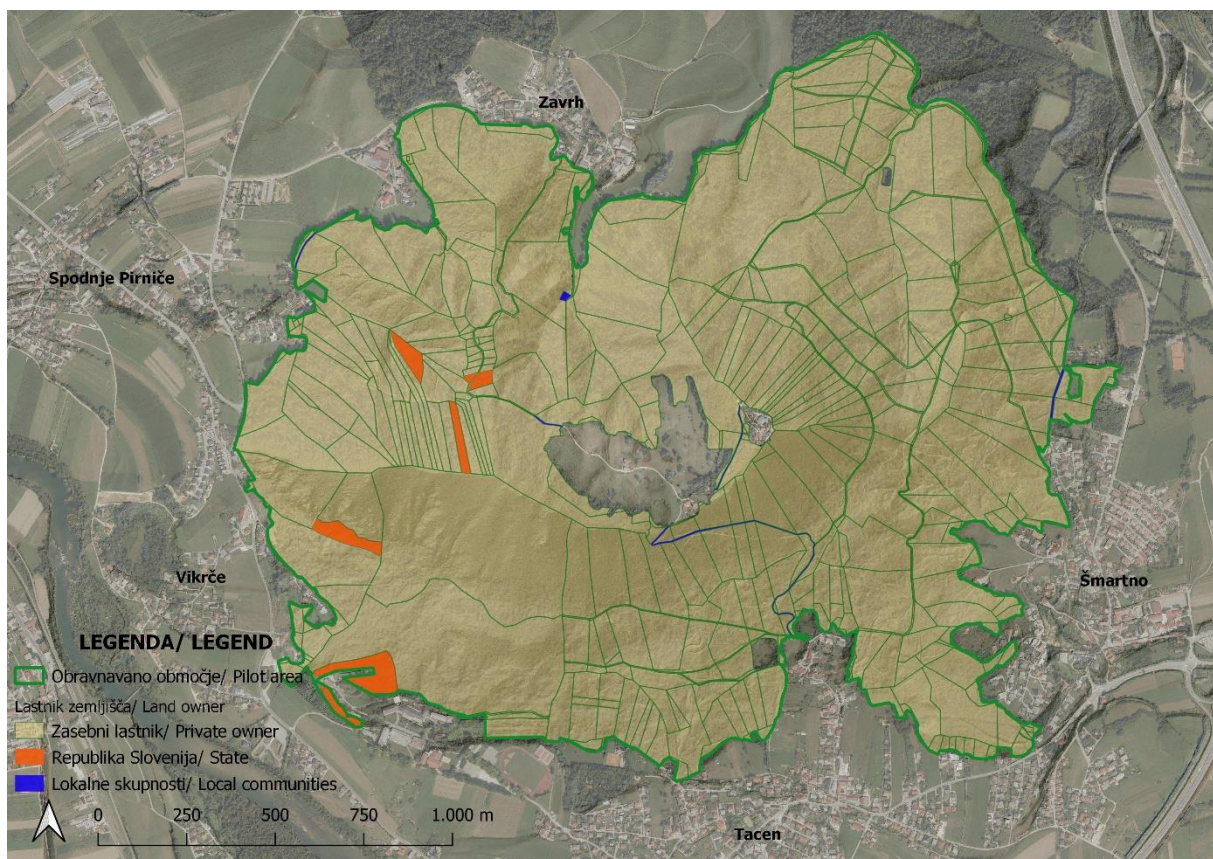
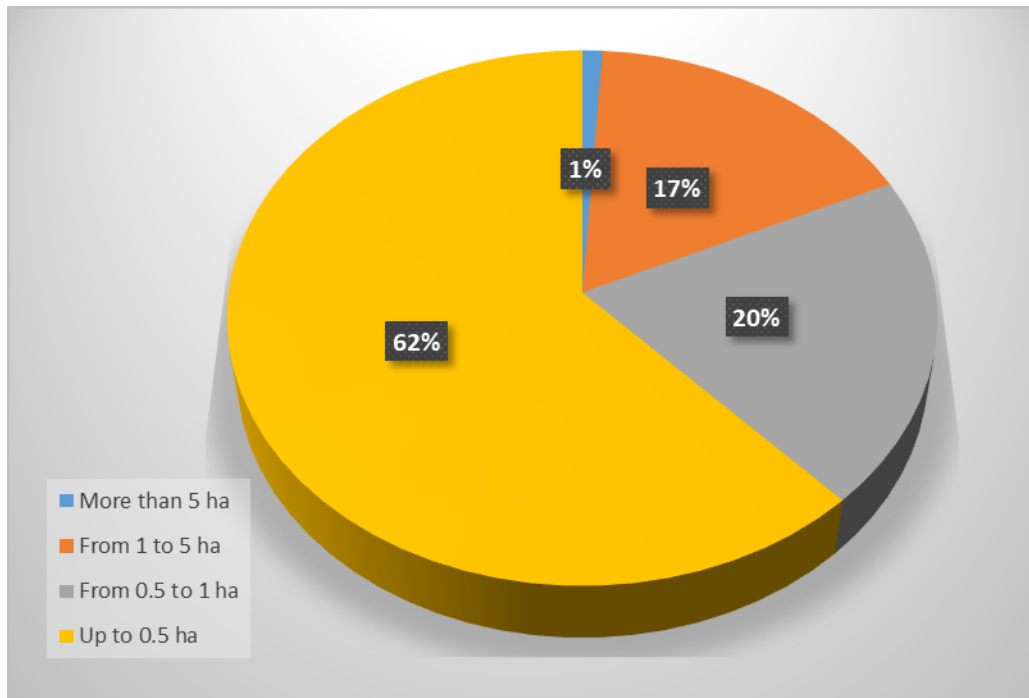


Figure 2: Ownership structure of the Šmarna gora urban forests



**Figure 3: Forest Holding Structure on Šmarna gora**

- **Forest Site and Stand Characteristics**

The predominant forest site types consists of hard fern and acidophilous beech grove communities with deer fern (*Blechno-Fagetum*) (22%), the pre-Dinaric and Dinaric hacquetia and foothill beech forest association (*Hacquetio-Fagetum*) (22%), followed by blueberry and acidophilous red pine forest association (*Myrtillo-Pinetum*) (14%), the white sedge and the pre-Alpine thermophilous beech forest association (*Carici albae-Fagetum*) (11%), the goat's beard and shady beech forest association (*Arunco-Fagetum*) (8%), the pre-Alpine and Alpine forests of European hop-hornbeam and other thermophilic deciduous trees (*Ostryo-Fraxinetum*) (7%), the pre-Alpine drooping bittercress and beech forest association (*Enneaphylo-Fagetum*) (4%), the black alder and grey alder forest association (*Alnetum glutinoso-incanae*) (4%), the pre-Dinaric and Dinaric forests of European hop-hornbeam and other thermophilic deciduous trees (*Quercu-Ostryetum*) (3%), the three-lobed bazzania and silver fir forest association (*Bazzanio-Abietetum*) (2%), as well as other forest associations in smaller percentages. As regards the developmental stages of forest stands, thick stage forest predominates by covering 43% of the forest area. Forest stands in regeneration are found on 32% of the area, pole stage forest on 20%, and young developmental phases on only 5% of the area (Figure 4). The average growing stock totals in 217 m<sup>3</sup>/ha and the annual increment in 7 m<sup>3</sup>/ha (FMP of the Ljubljana FMU, 2015; FMP of the Medvode FMU, 2020).

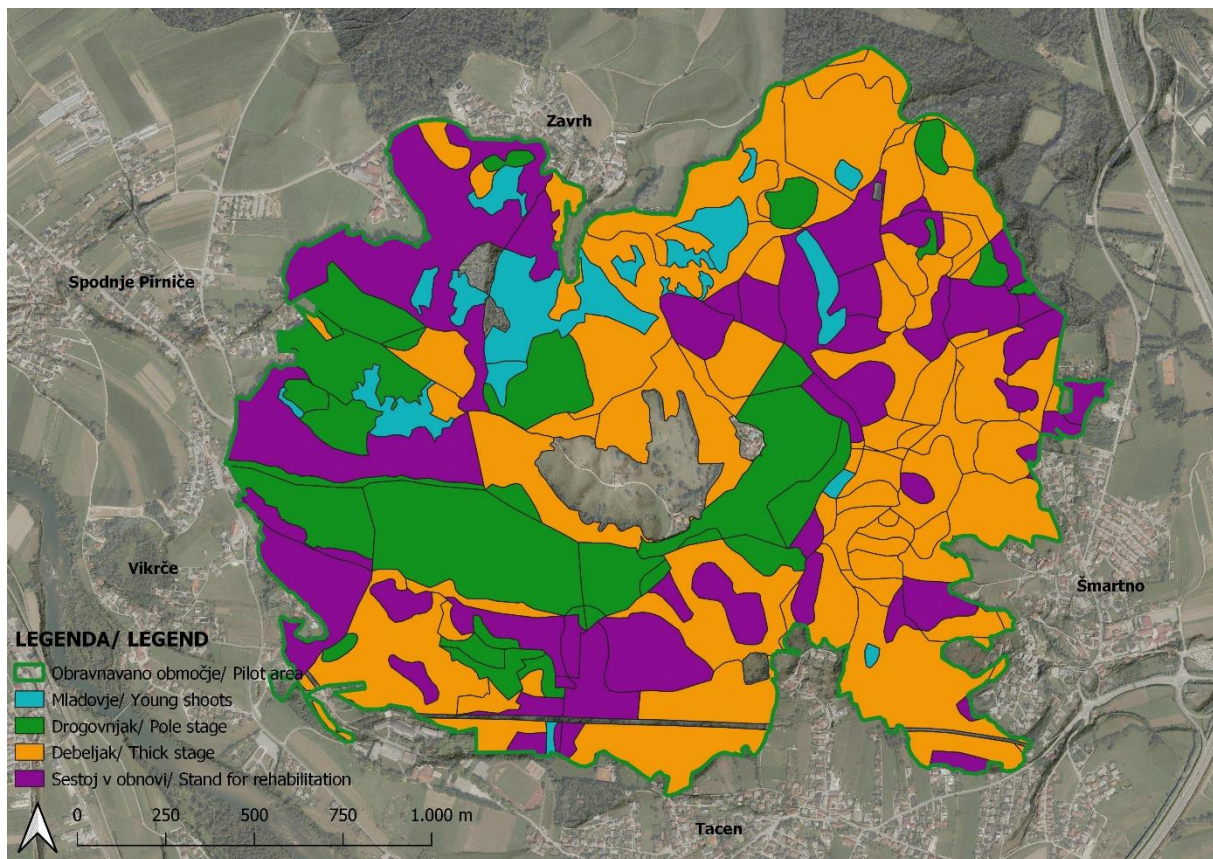


Figure 4: Development phases of the Šmarna gora urban forests

- **Forest Management Activities**

The average annual harvest in the period 2011-2020 totalled in 6.4 m<sup>3</sup>/ha (Table 1). Thinning represents 6% of all felling, regeneration logging 11%, felling of decrepit trees and sanitary cutting 81%, whilst felling for other reasons represents 2% of the total felling. Due to the ice- break of 2014, the highest possible volume of felling in the Ljubljana FMU increased by 52% in comparison with the previous planning period. On individual forest sites, it often exceeded the ten-year increment (80 m<sup>3</sup>/ha) (FMP of the Ljubljana FMU, 2015). In the Medvode FMU, sanitary felling and felling of weakened trees alone constituted 82.9% of the planned felling in the planning period 2010-2019 (FMP of the Medvode FMU, 2020). In the coming years, felling volume is likely to be high due to disturbances such as natural disasters and bark beetle gradation.

- **Timber Harvesting**

Felling is carried out in a classic way with a chainsaw, whilst timber extraction is performed with a tractor and a combination of manual work/tractor use in the entire area of Šmarna gora (FMP of the Ljubljana FMU, 2015; FMP of the Medvode FMU, 2020). In forests within Ljubljana, skidding on multi-purpose trails is prohibited (Ordinance on FSP, 2010), the transport of timber is carried out by using tractor – trailers or trucks (FMP of the Ljubljana FMU, 2015).

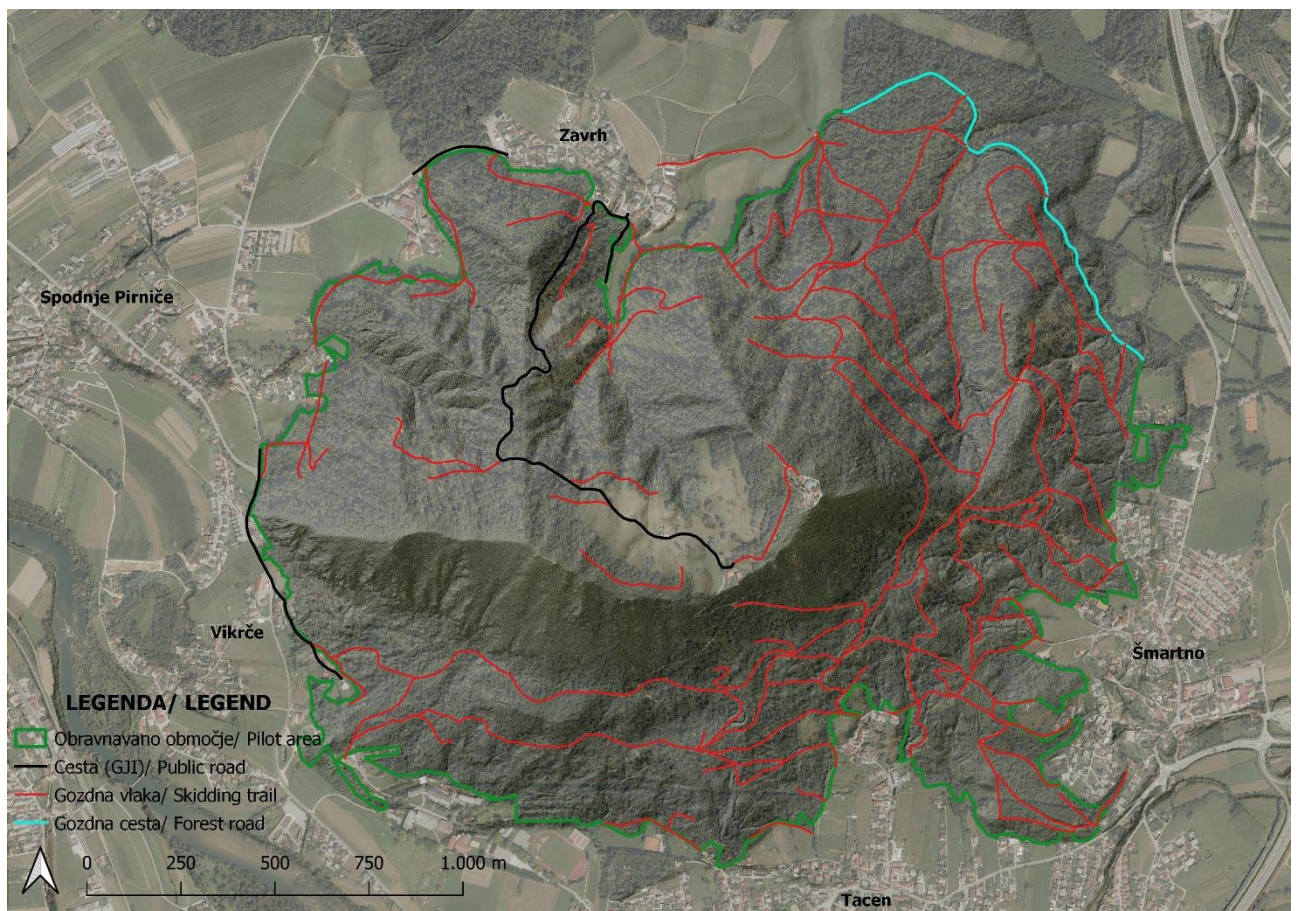
- **Openness of the Forest**

The openness of forest for timber extraction with a tractor is 67% (Figure 5). In the northeast, there is a 1.3 km forest road which runs from Šmartno to Zavrh. The most important roads for transport of

timber by truck are Vozna road from Zavrh to the top (length of 1.8 km), the cart track (length of 300 m) which branches off at the beginning of the road in Zavrh and runs under the forest to the south, the section of the local road to Zavrh, the section of the local road Vikrče–Spodnje Pirniče (length of 400 m) and the street up to the house number 27 b in Vikrče pod Turncem (length of 300 m).

**Table 1: Felling in the period 2011-2020**

Year	Total felling (m <sup>3</sup> )	m <sup>3</sup> /ha	Share of sanitary felling (in %)
2011	733	2.0	20
2012	929	2.5	17
2013	856	2.3	26
2014	6822	18.5	90
2015	2404	6.5	99
2016	8478	23.0	96
2017	766	2.1	32
2018	142	0.4	84
2019	1171	3.2	76
2020	1127	3.1	41
<b>Mean</b>	<b>2343</b>	<b>6.4</b>	<b>58</b>



**Figure 5: Openness of the Šmarna gora urban forests**

- **Effects and Problems**
  - High fragmentation and small forest holdings;

- Lack of communication between various forest property owners;
  - High number of visitors and increased pressure on the environment, especially during the Covid-19 epidemic, which contributes to soil erosion due to a large number of illegal and widened footpaths;
  - Unregulated access points;
  - Lack of parking spaces and the resulting parking on inappropriate locations;
  - Frequent natural disasters such as ice-break, wind-break and snow-break;
  - Bark beetle gradation;
  - ...
- **Damage and Threats**
    - In 2014, the forest stands were severely damaged by ice-break – 26.2% of the trees were damaged. The most damaged trees were pines, soft-leaved deciduous trees and beech. The data for the entire the Ljubljana FMU indicates that the level of tree damage, excluding the damaged caused by ice-break, is small, comprising 7.4% of all trees (FMP of the Ljubljana FMU, 2015). In the Medvode FMU, the share of tree damage is 18.3%. As a consequence of ice-break, the share of damaged branches is the highest (11.9%). Damage caused to the trunk and the lower part of the trunk was recorded on 6.0% of trees, whilst defoliation of branches was recorded on only 0.4% (FMP of the Medvode FMU, 2020).
    - The percentage of saplings of deciduous trees (> 15 cm) that were browsed by game animals is 22%. It is a concern for hardwood trees (European hop-hornbeam, chestnut) and noble deciduous trees (maple, ash), as their stand ingrowth is prevented. Game animals do not browse on spruce and rarely on beech (FMP of the Ljubljana FMU, 2015). In the Medvode FMU, the percentage of trees browsed by game animals is acceptable and enables successful overgrowth of all tree species. Browsing of saplings is evident with a greater number of tree species, with deer causing the most damage. This is confirmed by the fact that browsing of saplings is significantly reduced when they outgrow the height of the deer's muzzle (FMP of the Medvode FMU, 2020).

## 3.2 Recreational Use of the Šmarna gora Urban Forest

- **Visits to the Forest**

An online survey conducted in March 2021 as part of the URBforDAN project and published on the websites of the City of Ljubljana and the Municipality of Medvode, shows that the most frequent visitors of these forests are women (56%), with the predominant age group being 31 to 45 and representing 49% of all visitors (Figures 1 and 2; see Annex 1 for details). Most visitors cite hiking and spending their leisure time in nature with children and family as the reason for visiting Mt Šmarna gora. Most of them access it by car (69%, Figure 3).

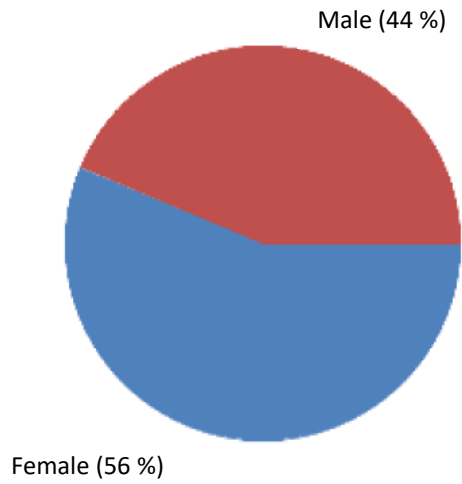


Figure 6: The structure of Šmarna gora visitors by gender

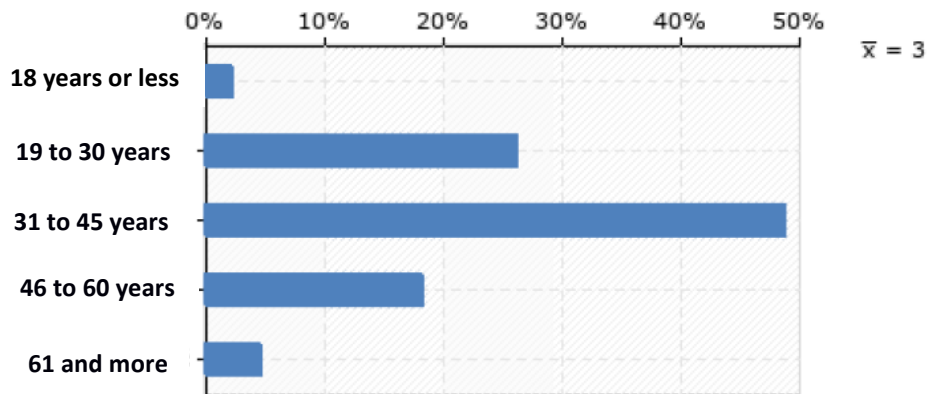


Figure 7: Age structure of Šmarna gora visitors

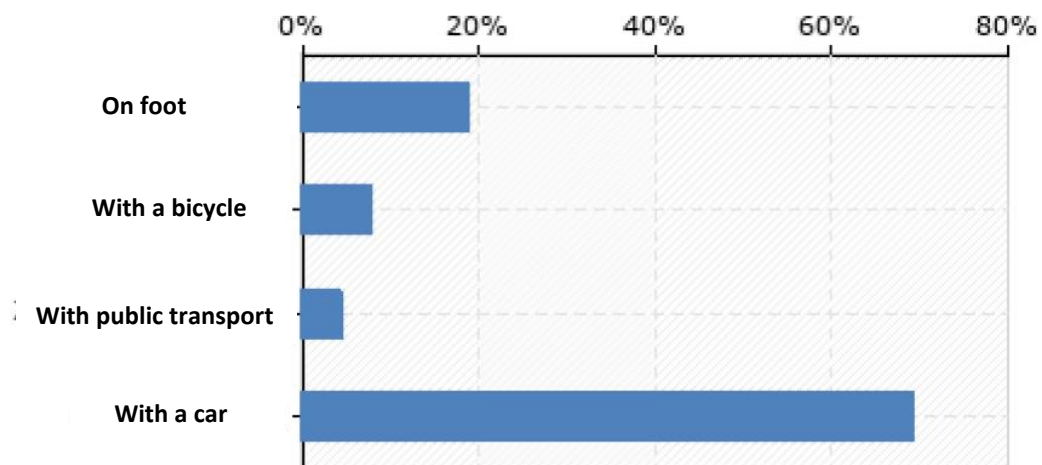


Figure 8: The most common ways of accessing Šmarna gora

- **Disagreements on Use**

Based on the conducted survey, the main disagreements were identified (URBforDAN online survey, 2021):

- Disagreements between other users and downhill cyclists; these disagreements are mostly related to safety issues due to speed, aggressive riding style, etc.;
- Disagreements between other users and dog walkers; they are mostly related to safety problems due to dogs walking freely (not kept on a leash), fear of dogs, leaving bags with dog excrement in the forest, etc.;
- Disagreements related to inappropriate or reckless behaviour of individual users. This occurs especially in fine weather on weekends and holidays, when the crowds are greatest;
- Disagreements between other users and forest owners; they are mostly related to inappropriate behaviour of individual users, opening of new footpaths and expansion of existing trails and consequent damage to the forest, non-compliance with safety instructions during the implementation of forestry works etc.;
- Disagreements between visitors and the locals. Most visitors access the foothills of Šmarna gora by car and not enough parking spaces are available for all. As a result, people park their cars all over, on meadows, on private paths or in the forest, leaving behind litter and ruts. They can also block access to the forest, which greatly annoys the locals.

- **Infrastructure**

- Accessibility (roads, footpaths, skid trails):
  - A 2.2. km Vozna road runs from Zavrh to the Church of the Mother of God at the top of Šmarna gora. In the MM, it has the status of a public good for the length of 1.2 km, in the COL it is 500 metres long up to the Upelj farm on the saddle, then it joins the skid trail that runs 500 m to the top. Both routes within the COL are in its' ownership. The road is narrow, macadam and in some places very steep, so it is only suitable for 4x4 off-road vehicles. As it is the only access road for motor vehicles to the top, it is important for both farms on the saddle (Gorjanc and Upelj) and for the restaurant on the top of Šmarna gora;
  - The forest road Šmartno-Dobrava (GC 046740, in the length of 1347 m) runs on the northeastern side of Šmarna gora under Debeli hrib and connects Zavrh and Šmartno;
  - The marked mountain trails with a total length of approximately 18 km are managed and maintained by the Šmarna gora Mountaineering Association;
  - In the Ljubljana side of Šmarna gora, skid trails owned by the COL run for a total length of 6.1 km.
- Urban Equipment
  - Benches are installed along mountain trails throughout the area. They are maintained by the Šmarna gora Mountaineering Association and private owners.
  - Outdoor fitness equipment and a children's playground at the top of Šmarna gora are maintained by the restaurant owner;
  - Mountain signposts attached to metal pipes or trees are located at intersections of mountain trails and markings are available along mountain trails. They are maintained by the Šmarna gora Mountaineering Association.
  - There are 14 information boards along the Forest Learning Trail along Grmada.

### 3.3 Important Facilities in the Šmarna Gora Urban Forest

- **Nature conservation and Protection**

- Natura 2000- SI3000120 Šmarna gora (SAC) for species of yellow-bellied toad (*Bombina variegata*), Jersey tiger (*Callimorpha quadripunctaria*), stag beetle (*Lucanus cervus*), stone crayfish (*Austropotamobius torrentium*) and Loesel's wide-lipped orchid (*Liparis loeselii*) and habitat types (6410) Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) with the predominant moor grass (*Molinia spp.*) and (8310) Caves not open to the public. This applies to the entire area of Šmarna gora;
- Ecologically important area 34400 Šmarna gora - Skaručenska ravan;
- Natural Value Id. No. 313 Solitary Šmarna gora with Mt Grmada and the pertaining slopes;
- Natural Value Id. No. 7776 Šmarna gora narcissus habitat on the meadows of the eastern slope of Grmada on the saddle and near the Gorjanc farm;
- Natural Value Id. No. 7780 Thermophilic forest shrub vegetation on the southern slope of Grmada;
- Natural Value Id. No. 7687 Beech short rotation coppice on Šmarna gora near Vikrče;
- Natural Value Id. No. 7688 The common oak at the pilgrimage path from Tacen to Šmarna gora;
- Natural Value Id. No. 8865 Thuja trees inside the defence walls of the Church of the Mother of God on Šmarna gora;
- Natural Value Id. Mo. 40069 Cave Matjaževa jama near Zavrh;
- The protective forests designated by government ordinance are mostly located on the southern slope of Mt Grmada and Šmarna gora (51 hectares), whilst a smaller percentage grows on the western slope above Spodnje Pirniče (alder forest, 3 hectares);
- 3B category of water protection area on national level on the southern slope of Mt Grmada and Šmarna gora extends from the municipal border in the west to Šmartno in the east;
- first, second and third category of water protection areas at municipal level on the northern slopes of Grmada and Šmarna gora (from Spodnje Pirniče to the eastern slope of Šmarna gora);
- Water catchments in Zavrh, Vikrče and at the police school in Tacen.

- **Cultural Heritage**

- Archaeological site at Gradišče nad Zavrhom (EŠD: 5903) – A prehistoric fort with remnants of possible antique construction at the very top;
- Archaeological site at Debeli hrib (EŠD: 26877) – Remnants of prehistoric and early medieval settlement (remnants of terraces, excavations and stone piles); finds of iron slag and charcoal testify to the exploitation of iron ore;
- Archaeological site at Šmarna gora (EŠD: 18798) – A small fort with defensive embankments. Whilst exploring the anti-Turkish defence walls, small antique objects and medieval skeletal graves were discovered;
- The Church of the Mother of God (EŠD: 752) – Behind the defence walls there is a central baroque building from the middle of the 18<sup>th</sup> century with a cupola above the nave, a smaller cupola above the presbytery (Gregor Maček) and frescoes by Matevž Langus;



- Fort (ESD: 5913) – Renovated defence wall with turrets around the Church of the Mother of God on Šmarna gora. The superimposed wall has a restored roof and gutters leading to the water reservoir. The church has one bell turret;
- The Gorjanc farm (EŠD: 751) – The homestead, formerly home to the Gorjanc Inn, is a brick ground-floor and basement house with Gothic profile windows and a portal, remodelled in the 19<sup>th</sup> century. Adjacent to the homestead is a two-storey brick cowshed with an L-shaped hayloft.
- Monument to the uprising against the occupying German forces (EŠD: 5698) – A monument in the shape of a stone mill wheel with an engraved inscription (Janez Valentinčič, 1956) stands on a paved platform at the place where the first shot was fired at a Nazi collaborator on 22 July 1941;
- Plague monument on the path leading up to Šmarna Gora (EŠD: 16322) – A stone pillar plague monument carved from conglomerate from the 17<sup>th</sup> century;
- Birth house of Jakob Aljaž (EŠD: 16322) – Birthplace of the Slovenian mountaineer, musician, priest and national awakener Jakob Aljaž (1845-1927). He dedicated himself to building mountain lodges and arranging mountain trails. A memorial plaque was erected in 1970 on the rear facade of the building.

## 4. OBJECTIVES AND GUIDELINES FOR THE MANAGEMENT OF THE ŠMARNNA GORA URBAN FOREST

Among the management objectives for all the urban forests of Ljubljana (Ljubljana Urban Forest Development Strategy, 2020), the following are especially important for the Šmarna gora area:

- **OBJECTIVE 1: Ensuring a healthy living environment for the citizens;**
- **OBJECTIVE 2: Providing opportunities for sustainable recreation and leisure activities and promotion of sustainable tourism;**
- **OBJECTIVE 3: Providing opportunities for education and lifelong learning;**
- **OBJECTIVE 4: Conservation of nature and cultural heritage;**
- **OBJECTIVE 5: Creating a conducive environment for forest owners.**

The following are important for achieving the stated objectives:

- guidelines of the FMP for the FMUs of Ljubljana and Medvode (FMP of the Ljubljana FMU, 2015; FMP of the Medvode FMU, 2020);
- guidelines of the SP (2015), which apply to the area of Šmarna gora as well;
- general guidelines of the OP (Chapter 4.2);
- project activities (Chapter 4.4).

It should be considered that this plan follows the forest management plans at all levels, since according to the Forest Act these are the legal bases for taking action in forests.

FSP areas are important for the realisation of certain objectives, as these areas show where individual management objectives are relatively more important (Chapter 4.3).

### 4.1 Superior Guidelines

#### **The Forest Management Plan of the Ljubljana Forest Management Unit 2015-2024 (SFS Ljubljana FMU, 2015)**

General guidelines that are important for the Šmarna gora urban forest (shortened and adapted):

- **Guidelines for the provision of ecological objectives**
  - The preservation of the diverse structure of forest stands;
  - The preservation of rare ecosystems and ecocells, non-forest areas in the forest landscape and taking care of existing forest edges;
  - The preservation or establishment of natural forest ecosystems and time-defined peaceful areas for the development of wild animal species, especially for rare, endangered and vulnerable species;
  - In areas with a pronounced function of protecting forest land and stands, the objective is a natural forest of group mixed stands, with a diverse age structure and a moderate growing stock.
- **Guidelines for ensuring social objectives**
  - Strict observance of detailed guidelines for individual social functions of the forest whilst performing all of the forestry works;
  - Cooperation with stakeholders, including those who are not forest owners, in management planning and implementation of measures;
  - It is essential to keep the public informed about forest management and the various aspects of forest use.
- **Guidelines for ensuring production targets**

- Ensure the optimal ratio of forest development stages;
- Increase the scope of tending logging and silvicultural works;
- Encourage involvement of forest owners, informing them better and raising their awareness;
- Prioritise measures in silvicultural plans;
- Restoration of the stands in a natural way and only exceptionally by planting or seeding;
- In forest protection, the emphasis should be on prevention;
- Raise awareness and inform users about public use of forests, but especially collectors of non-timber forest goods about the legal regulations governing these areas;
- Where social functions are extremely emphasised, primarily arrange the existing skid trails and other maintained public trails in the forest and forest area to be useful for forest management and public use;

### **Forest management plan of the Medvode Forest Management Unit 2020-2029 (SFS Ljubljana FMU, 2020)**

The general guidelines which are important for the Šmarna gora urban forest are the same as in the FMP of the Ljubljana FMU, but only additional ones are listed.

- **Guidelines for the provision of ecological objectives**

- All work related to forest management in water protection areas should be planned and carried out in accordance with the restrictions and requirements contained in the applicable regulations on the protection of water resources and their protective zones, as well as in other regulations on protection of drinking water;
- For any intervention in the forest and forest area that could permanently or temporarily affect the water regime or water status, it is necessary to obtain a water consent in accordance with the applicable legislation on water management;
- In erosion areas or areas where there is a risk of surface, deep and lateral erosion, the following is prohibited:
  - encroachment on the forest and forest area in a way that speeds up erosion and formation of washouts;
  - stripping of areas and deforestation of those forest stands which prevent landslides and snow avalanches, regulate runoff conditions or otherwise protect the lower lying areas from the harmful effects of erosion;
  - backfilling of springs and restricting the flow of watercourses and torrential waters;
  - uncontrolled collection or discharge of collected water on erosive or land prone to landslides;
  - restricting the flow of torrential waters, accelerating the erosion power of waters and deteriorating the conditions for environmental balance;
  - disposal and storage of timber and other materials;
  - backfilling with excavated or waste material;
  - removal of debris from the bottom and the scarp slopes, except to ensure the flow capacity of a washout;
  - timber skidding.
- In areas where intensive logging is planned or due to natural factors (infestations, tree diseases, wind-breaks, ice-breaks, etc.), sparse and bare forest areas must be adequately protected against erosion and all necessary measures must be envisaged and implemented to ensure adequate scarp slope stability and prevent or constrain an increased rainfall runoff or water, sediments and driftwood from such areas. Such measures must be harmonised with water management measures and a comprehensive system of water management and regulation.

- **Guidelines for ensuring social objectives**

- For any intervention in the forest and forest area, within nature protection areas or cultural heritage units, it is necessary to obtain prior consent of the competent authority in accordance with the applicable sectoral legislation;
- Cooperation with schools and associations in the forest management unit area and by using public media raise public awareness on forests, forestry and appropriate use of forests and forest areas.

**Guidelines for ensuring production targets**

- The choice of forest production technology must be adapted to the terrain and forest site conditions and have the least harmful impact on the environment. Timber extraction means which have the least negative impact on erosion, important habitats, forest sites or other protected areas (nature protection areas, protected cultural heritage units, etc.) are used for the transport of timber in problematic areas. In this case, timber extraction means include adapted and articulated forestry tractors with lower specific ground pressure, smaller turning radius, as well as timber extraction by using forestry trailers;
- In carrying out forestry works, special attention must be paid to ensuring safety (with warning signs, temporary closures, etc.), especially on steep slopes above hiking and excursion trails.

**Ordinance on the Municipal Spatial Plan of the City of Ljubljana – Strategic and Operative Part (Official Gazette of the Republic of Slovenia, No. 78/10)**

General guidelines that are important for the Šmarna gora urban forest (abbreviated and adapted):

- The Šmarna gora forest area in the City of Ljubljana belongs to the ŠG-301 spatial planning unit with the intended use of the Forest Area. In the strategic part, they are defined as the category of green areas, the category of urban forests and the category of special purpose forests. For the latter, management measures are considered to be adapted to the pronounced social functions. In such forests, any actions that negatively affect their ecological stability and endanger their forest function are prohibited. Given the emphasised recreational role, the development of such activities should be focused on not degrading the quality of the forest. It is permissible to build basic recreational infrastructure (such as properly marked paths, rest areas or lookout points).

The Municipal Spatial Plan of the City of Ljubljana – Operative Part defines:

- The forest areas as areas designated for forests and their management;
- Permissible interventions in forest areas:
  - facilities and works which increase fire safety of forests,
  - forestry investment and maintenance works in accordance with the law;
- Urban-planning conditions: It is permissible to construct sports grounds (only adrenaline and climbing park, ranges for paintball, archery, canopy walking, etc.). Such arrangements must not interfere with the areas of footpaths and memorials. It is also permissible to arrange rest places, learning and recreation trails, playgrounds for children, benches, tables and litter bins.
- Environmental conditions: Regulation of interventions listed in the urban-planning conditions is permissible in such a way as to preserve the condition of habitat types which are important in terms of nature conservation. Regulation of interventions specified in urban-planning conditions is not permitted in area of the inner zone of habitat type HT91K0 and in area of wetlands and thermophilic forest of mixed deciduous trees. It is also not permissible to illuminate the area.

The area in question includes the spatial planning units ŠG-222 with the intended use of "Other Agricultural Land," ŠG-508 with the intended use of "Best Agricultural Land," ŠG-364 with the intended use of "Area of Scattered Settlement" and ŠG-300 with the intended use of "Area for Tourism."

#### **Ordinance on the Municipal Spatial Plan of the Municipality of Medvode (2018)**

General guidelines that are important for the Šmarna gora urban forest (abbreviated and adapted):

- The forest area of Šmarna gora in the municipality of Medvode is located in spatial planning units PI\_1271, PI\_1276, PI\_1277 and PI\_1295, all with the intended use of "Forest Land." They are defined as areas intended for silviculture and economic exploitation of forests, where forestry is permitted and, under special conditions, recreation in nature. All facilities must be used and activities carried out in accordance with forest management plans. Prior to any interventions in the soil (e.g. construction of new skid trails, reconstruction or expansion of new skid trails or other interventions in the soil) in areas of registered cultural heritage, it is necessary to obtain the cultural protection consent of the competent unit of the Institute for the Protection of Cultural Heritage of Slovenia.. In the PI\_1276 unit, annual cultural events are allowed in the Turnec area, with prior consent of the competent body for the protection of natural and cultural heritage and the competent public forestry service.

## **4.2 General Guidelines for the Management of the Šmarna gora Urban Forest**

- **Forest Areas**

According to the ordinance on Ordinance on FSP, the forest area in the COL must not be reduced. In the area of the MM, the forest area is regulated in accordance with the FMP of the Medvode FMU.

- **Structure and Composition of Forest Stands**

The key guidelines regarding timber harvesting technology derive from the FMP of the Ljubljana FMU and the FMP of the Medvode FMU and the SP.

- **Forest site and silvicultural class: Suburban forests on acidophilous beech forest sites (sections T05, T06A, T07A, T08A, W01, W02, W03A, W04A):**

A gradual group management technique of forest silviculture is recommended, which adapts to the forest site and stand diversity by taking into account the multifunctional role of the forest.

The ratio of development stages has been disrupted, since the share of saplings is (1.4%) and stands in restoration (13%) is too low. With silvicultural measures, it is approaching to the model state, which according to the production period should approximate: 2% saplings, 20% poles, 60% sawlogs, 18% stand in restoration.

The restoration of stands takes place in areas that vary in size, usually ranging from a few acres to a hectare, exceptionally more. Damaged sawlogs with poor to defective base from thinned stands are aimed for restoration. The preservation of forests is good, the species diversity is substantial. Of coniferous trees we find spruce (20% growing stock), red pine (18%), as well as individual fir and larch trees, whilst from deciduous trees there is beech (22%), oak (22%), other hardwood deciduous trees (13%), noble deciduous trees (3 %) and soft deciduous trees (2%). The objective of silvicultural measures is to ensure group mixed stands with very good quality of harvested wood products.

Proportion of beech 28% (tufty to stand) with individual to stand admixture of spruce (18%), with individual to group admixture of red pine (18%), oak (18%), other hardwood deciduous trees (11%), soft deciduous (up to 2%) and with individual to tufty admixture of noble deciduous trees (3%) and an individual admixture of fir and other coniferous trees (up to 2%). Where spruce is being intensively regenerated, regeneration felling is carried out for restoration of weak strength due to the natural regeneration capacity of beech.

For the owners, the possibilities for increasing the value increment mainly lie in promoting tending to sawlogs, which improves the quality of assortments, and in the promotion of sessile oak, sycamore maple and spruce. The promotion of spruce should be limited to individual trees or groups and nests (a maximum 20% of growing stock). Continuous monitoring of tree health and timely removal of non-vital trees is essential. The vitality and stability of trees is an important criterion when choosing trees for felling.

- **Forest site and silvicultural class: foothill beech forest (sections I15, I16A, I17A):**

The stands of this forest site and silvicultural class were, due to the ice-break in 2014 and bark beetle gradations in the following year, severely damaged, so the most important silvicultural policy is to complete the restoration after the ice-break, establishment of forest order and ongoing forest monitoring. According to the model ratio of developmental stages, there is a shortage of saplings (6%/model 16%) and poles (22%/40%). Due to past natural disasters, the share of stands in restoration is too high (44%/17%) and this is one of the reasons why in the past the share of sawlogs was too high, almost the same as in the model state (28%/27%). Damaged sawlogs with poor to defective base from thinned stands are aimed for restoration, as well as other trees from stands that were thinned due to the ice-break or bark beetle. In areas of few saplings, seedlings are left for as long as the stands need to regenerate naturally. For a successful regeneration of beech, the regeneration cores in mixed stands of beech and spruce must have one stand height.

All fellings should be small in scale. Over the past decade, due to natural disasters and bark beetle infestations, the share of coniferous trees has decreased by 3.5%, whilst the share of beech has increased by almost 5%. The current ratio is almost equal to the target ratio for the next decade. These are slightly superficially and group mixed stands of beech (52%) with individual and group admixture of spruce (20%) and individual and tufty admixture of noble deciduous trees – mainly sycamore maple (10%) and individual admixture of fir (1%), pine (%), oak (5%) and other deciduous individual admixtures (7%). For the owners, the possibilities for increasing the value increment mainly lie in promoting tending to sawlogs, which improves the quality of assortments, and in the promotion of sessile oak, sycamore maple and spruce. The promotion of spruce should be limited to individual trees or groups and nests (a maximum 20% of growing stock). Continuous monitoring of tree health and timely removal of non-vital trees is essential. The vitality and stability of trees is an important criterion when choosing trees for felling.

- **Forest site and silvicultural class: Protective forests (sections I16B, I17B, T06B, T07B, T08B, W03B):**

All forests designated as protective forests by the Ordinance on Protective Forests and Special Purpose Forests are excluded as such.

The protective forests are dominated by poles (82%), whilst stands in restoration are at 7% and sawlogs at 1%. They grow on steep slopes at risk for landslides, so lower growing stocks are maintained to reduce the soil load. On extreme locations, species with a strong root system are preferred. In forests designated as protective by the Ordinance on Protective Forests and Special Purpose Forests (Official Gazette of the Republic of Slovenia, No. 88/05, No. 56/07, No. 29/09 and No. 91/10 and No. 1/13), interventions, as well as restoration, maintenance and protection works (which are an integral part of the protective forest management regime and are in accordance with the adopted forest management plans), may be carried out only on the basis of a previously obtained permit issued by the Ministry of Agriculture, Forestry and Food. Sanitary felling, felling of the so-called dangerous trees which endanger the underlying buildings and small-scale tending felling are permitted. The stands ought to be restored in a timely manner or the unstable and physiologically too old trees which can cause erosion processes need to be removed. The tree species composition comprises beech (35%), European hop-hornbeam (20%), red pine (12%), sessile oak, spruce and manna ash (all 6%), sycamore maple and European common hornbeam (5%) and other deciduous trees (5%). The composition is very

similar to the target one, as it is necessary to maintain the natural composition by reducing the proportion of spruce, increasing the proportion of hardwood deciduous trees and promoting beech.

The area of the Šmarna gora urban forest is extremely popular with visitors, so the felling of decrepit trees and sanitary cutting of dangerous trees must ensure that forest visitors along mountain and hiking trails can visit the forest as safely as possible.

- **Timber Harvesting Technology**

The key guidelines regarding timber harvesting technology are derived from the FMPs of the FMUs Ljubljana and Medvode and the SP:

- the predominant timber harvesting technology is the so-called traditional felling with a chainsaw and tractor timber extraction, whilst in protective forests manual or combined timber extraction methods are used. It is recommended to fell short timber or use the assortment method, but not the multiple method. Machine felling or cable timber extraction is only permitted in exceptional cases (deforestation, forest rehabilitation, sanitary felling) which require prompt action;
  - skid trails and paths in the forest and forest areas are, in addition to forest management, maintained for public use, especially for various forms of recreation (walking, running, cycling, horseback riding, etc.); therefore instead of skidding harvested wood products they ought to be mainly hauled with an adapted forestry tractor with a trailer. On skid trails intended only for timber extraction, the use of tractors with forestry trailers is encouraged (i.e. timber hauling instead of timber skidding);
  - logging, harvesting and timber extraction are carried out in dry weather, preferably in wintertime, with stable frozen ground;
  - while forestry works are taking place, it is necessary to mark the logging sites and install warning signs to ensure the safety of visitors;
  - implementation of above-standard forest order and reducing the amount of timber and logging waste which would otherwise remain along the well-maintained and marked trails after felling in areas of recreational infrastructure;
  - quick and efficient restoration of forests affected by natural disasters is necessary, as well as regular implementation of the necessary sanitary cutting and silvicultural works.
- **Nature Conservation and Protection**
    - Nature conservation is integrated into sustainable forest management. Special attention is devoted to natural and cultural heritage (see Chapter 4.3).
  - **Areas with Pronounced Features**
    - Management is focused on the simultaneous provision of ecological, social and harvesting functions. The general guidelines for areas with pronounced functions are defined in the FMP of the Ljubljana FMU (2015), FMP of the Medvode FMU (2020) and the Ordinance on FSP (2005). More detailed guidelines are given in Chapters 4.3 and 4.4.
  - **Forest Use**
    - Forest use is carried out in accordance with the concept of multi-purpose and sustainable management. Due to the large number of forest visits and considerable public importance, visitors must be directed to use the marked mountain trails to prevent spontaneous forest use. It is necessary to constantly inform and raise

awareness of visitors and to prevent possible disagreements between visitors, forest owners, forestry contractors and the different forest users. The orderliness and safety of public recreational trails must be ensured.

- Access to urban forest areas must be safe. Access to the main forest entry points must be provided by public transport or bicycles.

- **Infrastructure in Forest Areas**

- The 1.3 km long forest road Šmartno-Dobrava (047640) is located in the southeastern part and connects Zavrh and Šmartno. The construction of new forest roads is not planned for the next decade, although it is not banned;
- A 2.2 km Vozna road runs from Zavrh to the Church of the Mother of God at the top of Šmarna gora. The road is narrow, macadam and in some places very steep, so it is only suitable for 4x4 off-road vehicles. As it is the only access road for motor vehicles to the top, it is important for both farms on the saddle (Gorjanc and Upelj) and for the restaurant on the top of Šmarna gora;
- The openness of Šmarna gora for timber extraction with a tractor is 67%. Maintenance of the existing skid trail network is advantageous, even though the reconstruction and construction of the skid trails continues, as these works are necessary for the realisation of possible felling. According to the Ordinance on FSP of the COL, timber skidding is prohibited on multipurpose trails (ID 0458T07009; ID 0458T07012; ID 0458T07018; ID 0458T07021; ID 0458T05007; ID 0458W3001; ID 0458W3002 ID 0458W3003 ID 0458W3004 ID 0458W3005 ID 0458W3007; ID 0458W4002).
- Eight points and two info points with information boards and a map of the area and other necessary information will be arranged for the visitors;
- Installation of wooden orientation totems with signposts at all intersections of mountain trails;
- Marking of paths connecting entry points, in accordance with and in cooperation with the Šmarna gora Mountaineering Association;

- **Communication and Information the Public**

The draft plan is expected to be presented to the public in the summer or autumn of 2021 via an online publication. Activities related to the SP and the OP for the Šmarna gora Urban Forest will be presented:

- On websites of the COL, the MM and the URBforDAN project;
- In the municipal newsletter *Ljubljana*;
- On the online news sites of the COL and the MM;
- On social network profiles of the COL and the MM (Facebook, Instagram, YouTube channels);
- On workshops for forest owners;
- In articles published in professional journals;
- On workshops presenting examples of good practices;
- In presentations at international conferences.

- **Cooperation between Stakeholders**

SFS, the COL and the MM cooperated closely in the preparation of the plan. Representatives of consulting companies (Zavita d.o.o.) and research institutions (Biotechnical Faculty - Department of Forestry, the Slovenia Forestry Institute) participated in the preparation and revision of the plan. Users, visitors of Šmarna gora and forest owners also participated in formulating objectives, assessing the situation, setting priorities and measures through the following activities (materials are available from the authors of the plan):



- Online survey of visitors to Šmarna gora;
- Cooperation with the Šmarna gora Mountaineering Association, Tourist Association and the Šmarna gora District Community;
- In-depth interviews with forest owners.

### 4.3 Areas with important forest functions

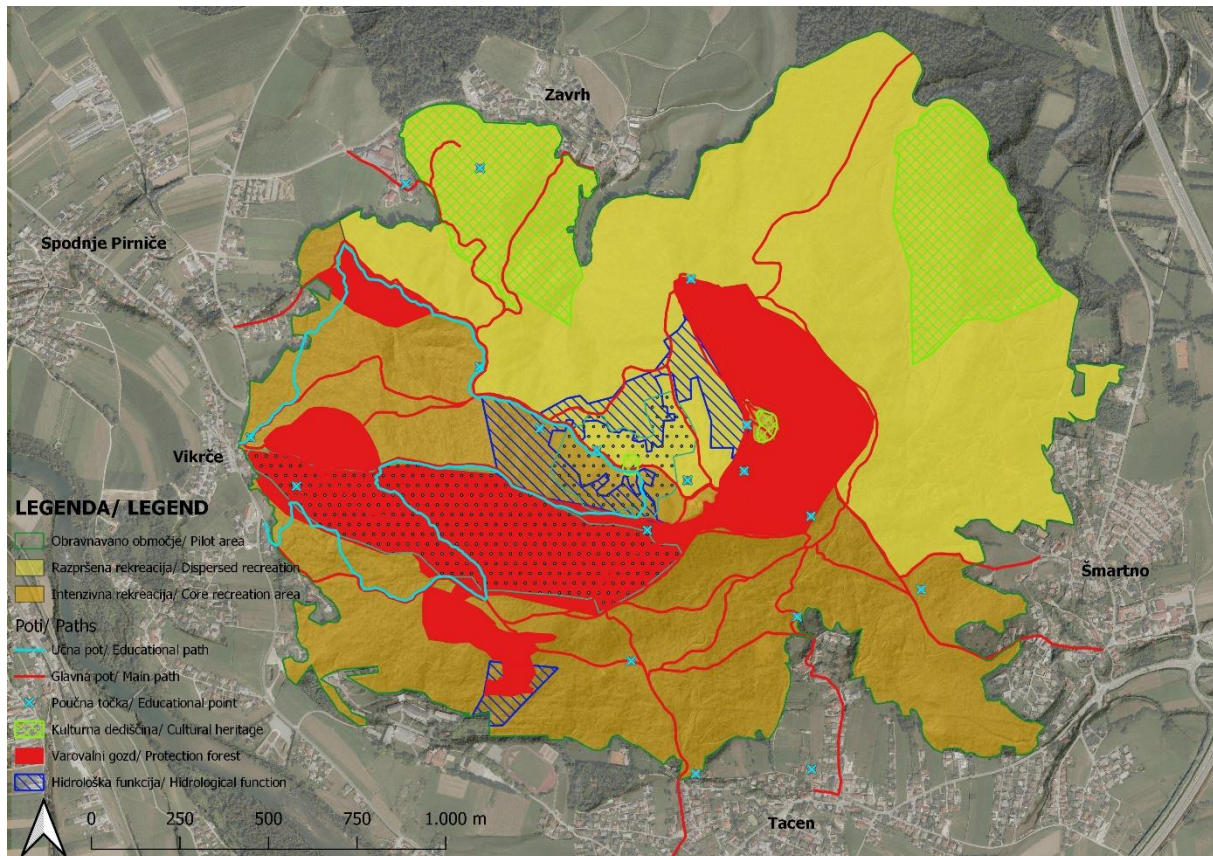


Figure 9: Areas Important for Selected Forest Functions

#### Areas Important for Recreation

- The entire area of Šmarna gora is important for recreation, although recreation activities are more concentrated in the southern part (up to Pot čez Peske in the west, through Vozna road to the last part of the pilgrimage path to the top, across Partizanska to the path leading to Kudrovec in Šmartno in the east), whilst they are more dispersed in the northern and eastern parts.

#### Areas Important for the Protection of Drinking Water Sources

- The area around the water catchment next to the Gorjanc Chapel at the top and the area around the water catchment by the police school in Tacen.

### **Areas Important for Education**

- Forest educational trail along Grmada with 14 stands and individual points related to cultural and natural sights which are scattered throughout the area and areas near educational institutions.

### **Areas Important for the Conservation of Nature and Cultural Heritage**

- Archaeological sites in the northern part of Šmarna gora, the top with the Church of the Mother of God, the Gorjanc farm and the narcissus habitat on the saddle, protective forests on the southern slope of Grmada and Šmarna gora

Guidelines in accordance with the FMP of the Ljubljana FMU (2015), the FMP of the Medvode FMU (2020) and the SP (2020).

## **4.4 Planned Activities**

This chapter presents the planned activities that are important for achieving the management objectives (Figure 7):

Objective 1 mainly depends on silvicultural measures which are conditioned by the interest of forest owners for active management. Therefore, the measures defined in the Forest Management Plan of the Ljubljana Forest Management Unit (2015) and the Forest Management Plan of the Medvode Forest Management Unit (2020) and activities which either increase the share of public forests (4.4.6) or encourage the forest owners to become more active in management (4.4.8) are important for this objective.

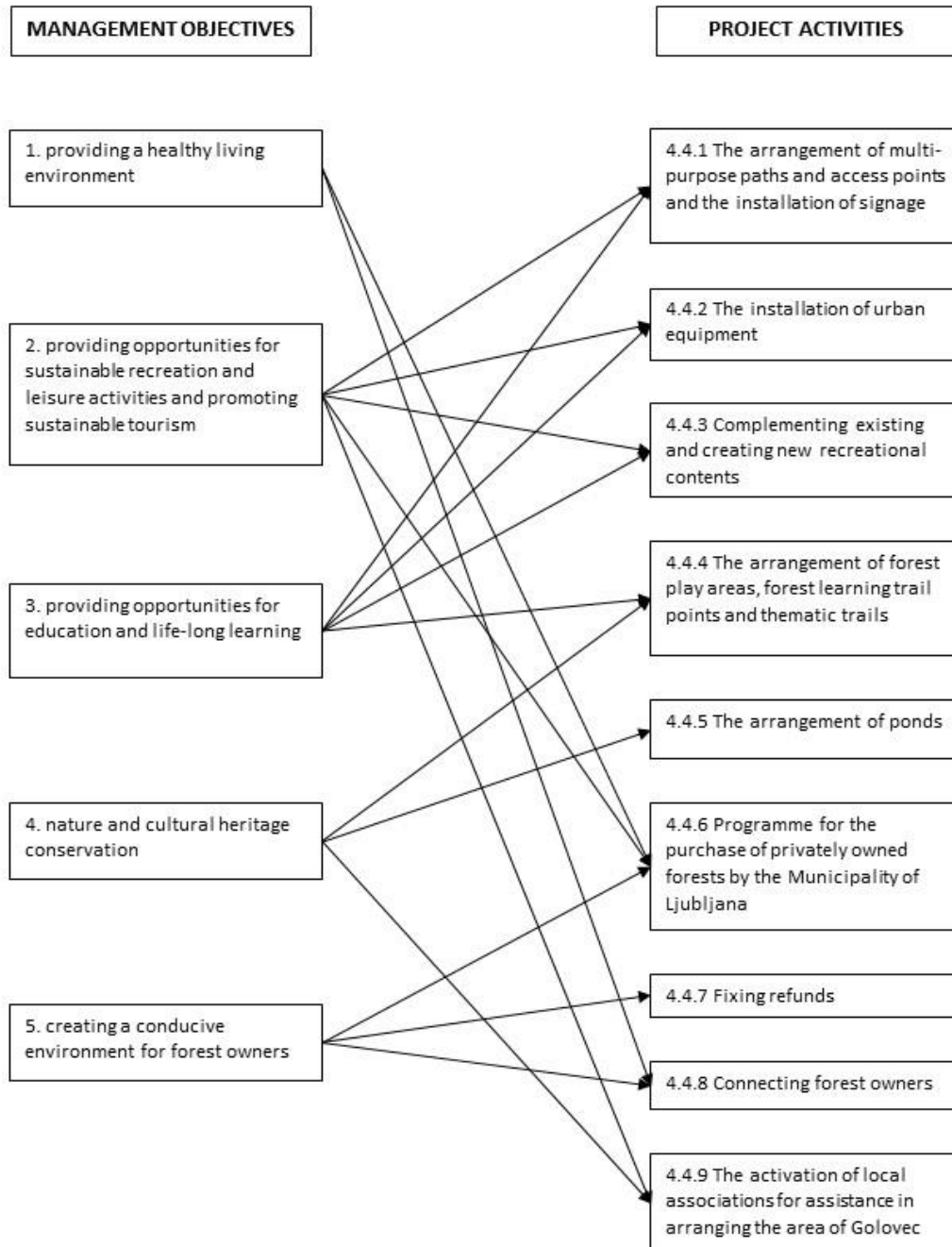
Objective 2 is a key objective for the management of the Šmarna gora urban forests. It is supported by activities 4.4.1, 4.4.2, 4.4.3, 4.4.6. and 4.4.9.

Objective 3 is ensured by arranging thematic points, upgrading the forest learning path, establishing forest learning points (4.4.4) and highlighted with content boards or other urban equipment (4.4.2). By establishing entry points (4.4.1) and complementing and establishing new recreational contents (4.4.3) we enable the conditions so that even the youngest visitors can use the forest area as much as possible.

Objective 4 is supported by activities 4.4.4, 4.4.5 and 4.4.9.

Objective 5 is supported by a number of instruments: the purchase of forests from disinterested owners to whom the forest mainly represents a burden (4.4.6), the integration of forest owners (4.4.8) and setting up a system of compensation for management restrictions linked mainly to the Ordinance on Special Purpose Forests (4.4.7).

**Figure 10: Connection between strategic objectives for Ljubljana's urban forests (Ljubljana Urban Forest Development Strategy (2020)) and project activities**



#### 4.4.1 Arrangement of Multi-Purpose Trails, Access Points and Installation of Signposts

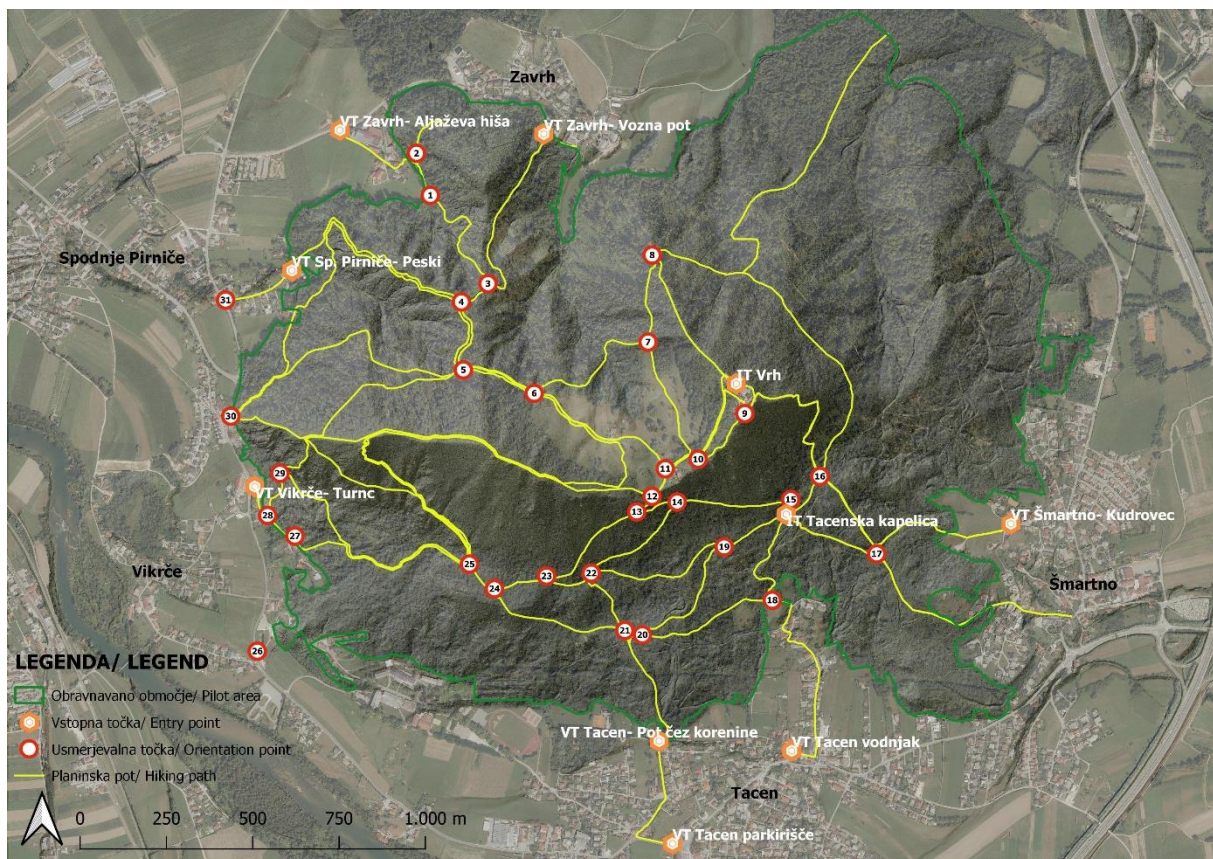


Figure 11: Arrangement of signposts in the area of the Šmarna gora urban forest 11

- **Conditions and Problems**

The entire Šmarna gora is interspersed with paths, trails and skid trails. Most of them are mountain trails, marked with mountaineering signs (mostly mounted on trees) and markings. Since occasional visitors are not aware of which marked mountain trails they can use, they usually follow the busiest trails. Parking is also problematic during peak hours, when there are not enough parking spaces available. As a result, visitors leave their vehicles on agricultural land or at the beginnings of skid trails, thereby causing damage to farmers or obstructing access to forests and agricultural land.

Due to the large number of visitors, erosion processes are present on some trails. What is more, in rainy periods the trails widen due to mud, which causes damage to forest soil and the forests themselves, as there is practically no more undergrowth, leaving the surface bare and exposed to erosion. Forest owners are affected by this, but the legislation does not envisage payment of compensation for this purpose. Most of these trails are not publicly owned, as they run through privately-owned forests.

At the moment, the number of visits is not regulated, which means visitors concentrate on some trails, while others are less burdened. Some trails are poorly marked, so they are not used by occasional visitors.

### **Target Condition**

- Uniform markings placed in key locations. Eight entry points and two info points with information boards and a map of the area and other necessary information to be arranged for the visitors. Wooden orientation totems with signposts are placed at all important intersections to direct visitors in the desired directions.
- Marked, renovated and properly maintained trails connect the entry points. The trails are arranged to increase their carrying capacity. This means that stairs are made if necessary and the trails are restricted and fortified. Where trails run along private land, the landscaping works are carried out in agreement with forest owners. With restoration, priority is given to the busiest trails and paths which are in the worst condition. Wherever possible, local natural materials are used when arranging the trails. Renovation and maintenance of trails is carried out by the Šmarna gora Mountaineering Association in accordance with the Mountain Trails Act.
- Marked regime of use on paths with exclusive use (e.g. pedestrians only).
- Information boards at the top of Šmarna gora and at intersections of the busiest trails from the direction of Tacen and Šmartno near the Tacen Chapel.
- Themed wooden totems with markings for special features or attractions (exceptional trees, the narcissus habitat, chapels, etc.)
- Forest etiquette on all wooden totems reminds visitors of the correct attitude towards nature and other visitors
- **Purpose**
  - Ensure well-maintained trails and basic safety on paths, remedy situations where forest paths expand uncontrollably due to lack of regulation, which causes soil compaction and erosion and prevents the regeneration of stands.
- **Priorities**
  - Installation of signposts, directing visitors, repair and arranging of trails, limiting spontaneous use and raising awareness of the importance of urban forests.
- **Most Important Functions**
  - Recreational and aesthetic
- **Possible Activities**
  - Multipurpose forest management and recreation
- **Undesirable or Prohibited Activities**
  - Driving motor vehicles which are not related to forest management
  - Riding bicycles on paths not intended for cycling or around forests
  - Timber skidding along the well-maintained public trails
  - Camping
  - Forest fires
  - Off-terrain movement
- **Silvicultural Measures**
  - Along the paths, development is focused on emphasising the aesthetic and educational functions of the forest. Old and thick trees, as well as trees with an interesting habitus, are preserved. Along the multipurpose paths, the diversity of autochthonous tree and shrub species is preserved as much as possible through silvicultural measures. Species that strengthen the stabilisation of the soil with their root system are promoted.
- **Timber Harvesting Measures**
  - The forest order is regulated within the 5-metre strip surrounding all forest paths. On all paths and skid trails owned by COL skidding harvested wood products is not allowed. This measure is also encouraged on other skid trails.
- **Infrastructure Measures**
  - Arrangement of trails and signposts, regulation of drainage.
- **Additional Plan/Sketch If Necessary**

- Project task for installing signposts and trail management contractor.
- **Costs**
- EUR 40,000 of investments according to the plan of arrangement and equipment of forests with a special purpose, which is part of the Operational Plan
- EUR 2,000 per year for trail maintenance and signposts
- **Funding**
- COL budget, EU funds
- **Coordinators**
- COL Department of Economic Activities and Transport and the URBforDAN Project Group
- **Stakeholders**
- Trail owners, the Šmarna gora Mountaineering Association
- **Timeframe**
- Investments made in the period from 2021 to 2024, followed by annual maintenance

#### 4.4.2 Installation of Urban Equipment

- **Conditions and Problems**
  - The urban equipment on Šmarna gora is deficient, not uniform, it is in relatively poor condition and its regular maintenance is not provided.
- **Target Condition**
  - Appropriate equipment of Šmarna gora with uniform urban equipment (uniform natural material, wood of local tree species, such as oak or chestnut) and uniform shape:
    - Benches are placed along the main trails and at exposed points;
    - At entry points, bicycle racks with possibility of bicycle locking are arranged;
    - A panoramic map with marked peaks on the north side of Šmarna gora with marked sides of the sky;
    - Landscape felling on Grmada;
    - Installation of urban equipment in accordance with the URbforDAN project plan, then supplementing the equipment in accordance with the needs and replacing damaged equipment.
- **Purpose**
  - To disperse and direct visitors along the entire network of marked trails and entry points.
- **Priorities**
  - To install urban equipment and ensure its regular maintenance
- **Most Important Forest Functions**
  - Recreational and aesthetic
- **Possible Activities**
  - Socialising, walking, meditation
- **Undesirable or Prohibited Activities**
  - Destruction of equipment, littering, unauthorised driving of motor vehicles on multipurpose skid trails
- **Silvicultural Measures**
  - Landscape felling to establish and maintain lookout points
- **Infrastructure Measures**
  - Installation of urban equipment
- **Additional Plan/Sketch If Necessary**
  - A drawing of urban equipment (benches, tables, stands, etc.) including dimensions. They enable a uniform image of the equipment throughout Šmarna gora, even if the contractors or managers change over time.
- **Costs**
  - Wooden bench (oak, chestnut) – production and delivery – EUR 336/piece \* 7 = EUR 2,325
  - Wooden bench (oak, chestnut) – production, delivery and installation - EUR 671/piece \* 7 = EUR 4,697
  - Bench renovation material – production and delivery – EUR 177/piece \* 4 = EUR 708
  - Wooden bicycle stands – EUR 659/piece \* 7 = EUR 4,613
  - A panoramic map with marked peaks = EUR 500
- **Funding**
  - UrbforDAN, COL
- **Coordinators**
  - Department of Economic Activities and Transport, COL
- **Stakeholders**
  - Owners, users, the Alpine Association of Slovenia
- **Timeframe**
  - Investments in 2021, followed by annual maintenance, in 2025 preparation of the concept for supplementing urban equipment

#### 4.4.3 Complementing the Existing and Creating New Recreational Content

- **Conditions and Problems**
  - The main recreational activities (hiking, running, climbing, education in nature) are mostly not targeted. In some places, simultaneous realisation of different activities can occur, which can lead to disagreements. Due to the large number of visitors, there is a lot of pressure on forests in some places.
- **Target Condition**
  - A wide range of recreational activities in the area has been identified, which will be coordinated so as not to mutually exclude each other. They will be time-coordinated and appropriately managed. Appropriate management means that persons carrying out an activity assume responsibility for the impact of the activity on the environment and other users of the Šmarna gora urban forest.
- **Purpose**
  - The purpose of the activity is appropriate organisation of the existing recreational activities in the area and establishing conditions for planning the expansion of activities on offer.
- **Priorities**
  - Determining suitable recreational activities with locations and methods of implementation and providing conditions for introducing new recreational activities.
  - Arrangement of the climbing area
  - Prohibition of cycling on skid trails and mountain trails on Šmarna gora.
- **Most Important Functions**
  - Recreational and educational
- **Possible Activities**
  - Arrangement of the climbing area: In the climbing area, climbing directions and starting points are to be determined. Climbing routes need to be cleaned and equipped, access routes need to be arranged. Old equipment that is no longer in use is to be removed from the walls. A board with climbing directions is to be placed in a suitable place. The arrangement is to be harmonised with the Alpine Association of Slovenia, the Slovenian Forest Service and the Institute of the Republic of Slovenia for Nature Conservation.
  - Arrangement of the lookout point on Grmada. A lookout point is to be arranged on Grmada. This can be arranged as a wooden platform or as smaller lookout tower. If necessary, landscape felling is carried out. The arrangement is to be harmonised with SFS and the Institute of the Republic of Slovenia for Nature Conservation.
  - Identification of possible/new recreational contents: forest play areas, a climbing area and a climbing kindergarten, lookouts, orientation, treasure hunt for children, etc.)
  - Determining locations and rules for introducing such recreational contents
  - Agreement with forest owners on introducing new recreational activities
  - Establishing new recreational activities in the area
- **Undesirable or Prohibited Activities**
  - Motorised activities, driving on footpaths
  - Cycling on skid trails and mountain trails. Cycling is only allowed on Vozna road, whilst downhill cyclists are actively redirected to other areas of urban and suburban forests with established cycling polygons.
- **Silvicultural Measures**
  - -
- **Timber Harvesting Measures**
  - -
- **Infrastructure Measures**
  - According to individual type of activity
- **Additional Plan/Sketch If Necessary**



- The plan/project is prepared for each new activity separately
- **Costs**
  - Lookout approximately EUR 3,000;
  - Landscape felling approximately EUR 1,000.
- **Funding**
  - COL or an investor
- **Coordinators**
  - Department of Economic Activities and Transport, COL
- **Stakeholders**
  - Owners and target groups
- **Timeframe**
  - Preparation of the concept for new contents in the period 2024–2027, implementation by 2030

#### 4.4.4 Arrangement of Forest Play Areas, Forest Learning Trail Points and Thematic Trails

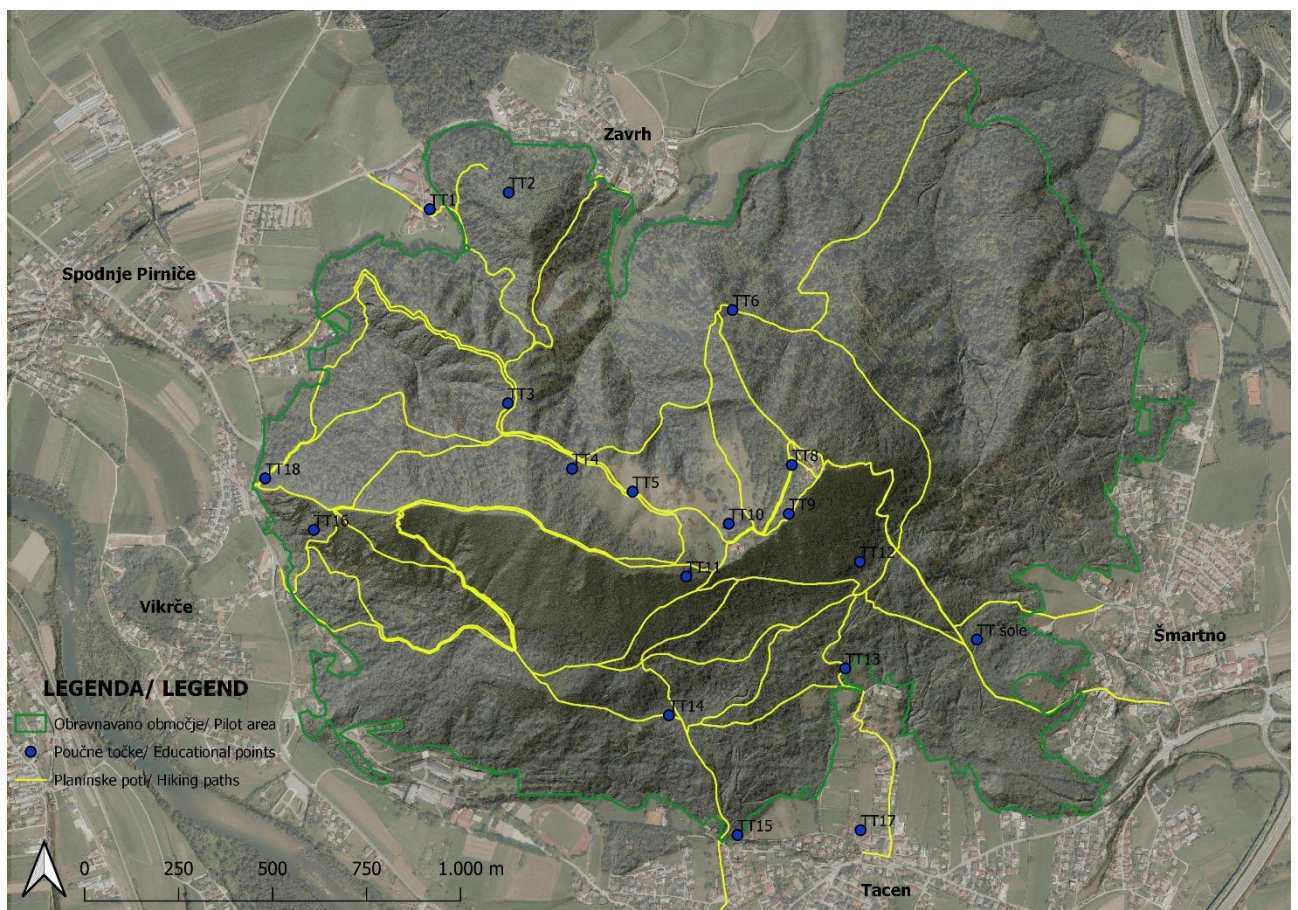


Figure12: Forest learning trail points in the area of Šmarna gora

- **Conditions and Problems**

The area of Šmarna gora is regularly or occasionally visited by the surrounding schools, kindergartens, scouts associations and other organised groups that carry out various educational activities in the forest. Moreover, urban forests are important for life-long learning, as they are regularly visited by the more active elderly people. When carrying out educational activities, the organisers (teachers, educators, guides, etc.) do not know where and under what conditions they

can carry them out, as areas are not designated for such purposes and no didactic aids are available. In addition, there is interest in reconstructing thematic learning trails in the urban forest. Sometimes conflicts occur with forest contractors carrying out their activities in accordance with the law, because the educational institutions cannot check in advance when and where forestry works will take place. Access points to the urban forest are not safe or suitable for all target groups (e.g. kindergartens, the elderly).

- **Target Condition**

Located or arranged thematic trails and forest learning trail points. A designated regime for using the listed areas with regulated ownership (ownership of municipalities or in agreement with the owner) and harmonisation and restriction of other uses (cycling, driving motor vehicles, etc.).

- **Purpose**

Provide conditions for safe and quality realisation of educational programmes in the urban forest.

- **Priorities**

- Arrangement of thematic points with didactic aids to highlight the importance of urban forests for recreation, health, timber and other forest products, the conservation of biodiversity, preservation of the quality and quantity of water resources, etc.;

- **Most Important Forest Functions**

- Education

- **Activities**

- Identification of thematic trail areas and forest learning points;
- If necessary, purchase of forest land or concluding a contract on use with forest owners;
- Arrangement of areas for safe realisation of educational activities;
- Determining a special mode of use and presentation to target groups: kindergartens, schools, scout associations, senior activity centres, etc.;
- Presentation of the Urban Forest Etiquette, the poster “The Urban Forest Enriches Us” and other didactic materials prepared within the framework of the URBFoR DAN project;
- Ongoing communication between the educational institutions, forest owners and the COL and maintenance of infrastructure;

- **Undesirable or Prohibited Activities**

In accordance with the general guidelines (Urban Forest Etiquette, Code of Conduct when Visiting Nature) and special regime of use;

- **Silvicultural Measures**

Management adapted to the educational function, removal of dangerous trees and branches, maintenance of trails, urban equipment and didactic aids

- **Additional Plan/Sketch If Necessary**

- **Costs**

- Annually for maintenance of urban equipment EUR 1,000

- **Funding**

- COL budget;

- **Coordinators**

- Department of Economic Activities and Transport, COL;

- **Stakeholders**

- Educational institutions: kindergartens, schools, scout associations, etc.

- **Timeframe**

- Investments in the period 2021 - 2023, followed by annual maintenance;

#### 4.4.5 Preservation of Non-Forested Areas

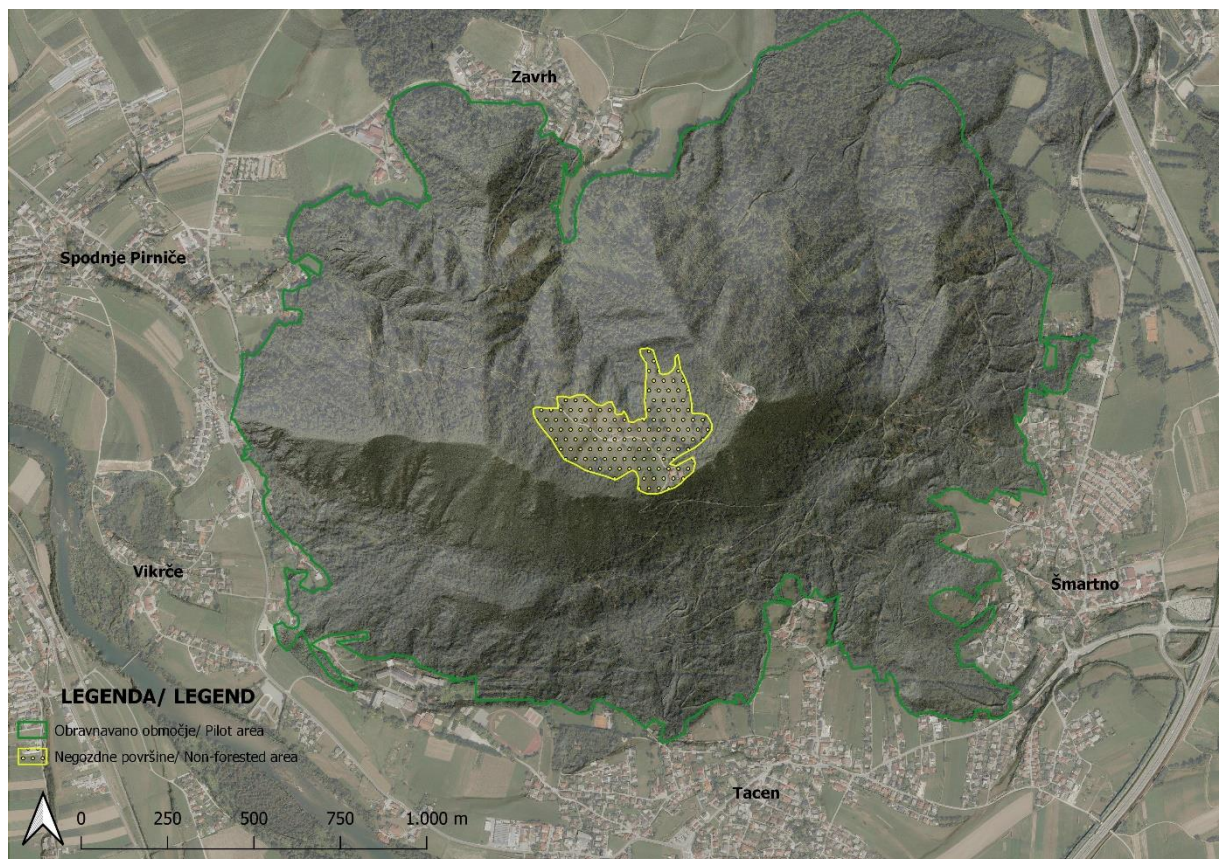


Figure 13: Map of Non-Forested Areas

- **Conditions and Problems**

The area of Šmarna gora is mostly covered by forest. The exception is agricultural land, which is located on the saddle and stretches along the northern slope of Grmada and the western slope of Šmarna gora. An important narcissus habitat can be found there. Agricultural land is partly grazed, but due to poor maintenance, most land is overgrown, which contributes to a loss of biodiversity and landscape values.

- **Target Condition**

Orderly and maintained agricultural land within the former scope and preserved narcissus habitats in good condition

- **Purpose**

Preserve biodiversity and landscape values, thus also attractiveness for visitors.

- **Priorities**

- Determining the extent of agricultural land
- Agreement with the owners on arranging such land plots
- Promoting the recovery of agricultural activity

- **Activities**

- Determining the extent of agricultural land
- Agreement with the owners on arranging such land plots
- Organisation of campaigns for cleaning up overgrown areas
- Regular maintenance of agricultural land

- **Undesirable or Prohibited Activities**

In accordance with the general guidelines (Urban Forest Etiquette, Code of Conduct when Visiting Nature) and special regime of use;

- **Silvicultural Measures**
- Elimination of overgrowth on agricultural land.
- **Additional Plan/Sketch If Necessary**
  
- **Costs**
- EUR 500 per year for realisation of agricultural land management campaigns;
- Subsidising the elimination of overgrowth on agricultural land from the budget of the Republic of Slovenia (EUR 5000/ha) <https://www.gov.si/zbirke/storitve/odprava-zarascanja-na-kmetijskih-zemljiscih/>
  
- **Funding**
- Budget of COL, the Republic of Slovenia;
- **Coordinators**
- Department of Economic Activities and Transport, COL;
- **Stakeholders**
- Users of Šmarna gora
- **Timeframe**
- Until 2023 – agreements and determining the method of arrangement, followed by annual maintenance;

#### 4.4.6 Forest Purchase Programme

- **Conditions and Problems**

97% of the Šmarna gora urban forests are privately owned. The network of roads, trails, footpaths and skid trails is very diversified in the area. Some of these trails and skid trails are owned by the municipalities, but many trails and skid trails run on privately-owned land. Many people visit this area for recreational purposes on a daily basis, regardless of the season. In accordance with the Ordinance on FSP, forest owners must remove logging waste along multipurpose trails. Moreover, they are not allowed to skid harvested wood products along such trails. The daily presence of visitors makes it difficult to carry out forestry works, since the visitors often do not comply with the restrictions and markings of logging sites, thus increasing the risk of accidents. In addition, recreational visitors use other trails and skid trails, not just those that are publicly owned. Although this is guaranteed by law, in some cases this means very intensive use which hinders normal forest management. In addition to the trails, the forest is also used as a forest classroom. The locations of forest classrooms are already used in their existing natural form. Due to the potential for additional landscaping and more intensive visits, it makes sense that they are in the public domain. In the long run, it should be ensured that more intensive forms of recreation take place on public land.

- **Target Condition**

Forest plots which are important for the promotion of social functions (e.g. recreation, education) should become public property.

- **Purpose**

Reducing disagreements resulting from the use of private forests and directing visitors to publicly owned infrastructure, introducing new contents that are sensible to implement in public areas only.

- **Priorities**

First, the purchase of land plots along trails and at locations of other recreational areas (forest classrooms, lookouts, quiet areas, etc.), on the forest edge and in areas where the existing municipal land is complete.

- **Most Important Forest Functions**

Recreation and education

- **Activities**

- Preparation of a priority list of land plots for purchase;
- Inviting plot owners to sell their land;
- Purchasing plots from owners who are willing to sell them;
- Inclusion of plots in the property plan of the COL;
- Additional plan/sketch if required.

- **Costs**

EUR 100,000 per year. The approximate purchase price is EUR 1/m<sup>2</sup>.

- **Funding**

- COL budget

- **Coordinators**

- Department of Economic Activities and Transport, Department for Real Estate, both the COL; the MM

- **Stakeholders**

- Owners in areas where the purchase of forests is envisaged and are included in the priority list for purchasing land plots;

- **Timeframe**

- Preparation of a priority purchasing plan until 2022, annual purchases in accordance with budgetary capacity

- **Notes**

- The COL will prepare a ownership plan for its forests, which will define the management of forests owned by the COL. Each year, the properties that will come into COL's ownership will be included in the ownership plan.

#### 4.4.7 Determination of Compensations

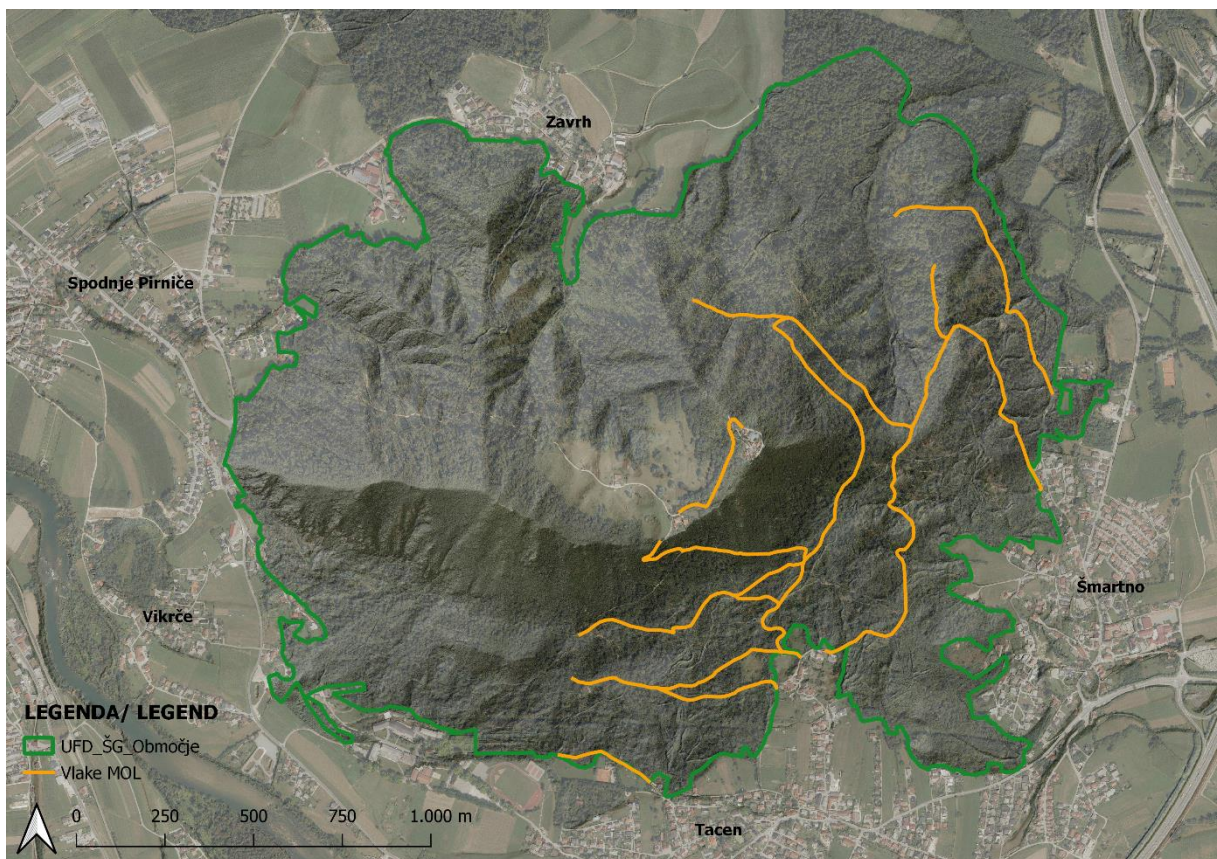


Figure 14: Logging waste removal area along multipurpose trails

- **Conditions and Problems**

Some forest owners may incur additional costs in forest management due to performing forestry works, as required by the Ordinance on FSP. The Ordinance stipulates that they are entitled to receive compensation for this. These have not been determined so far, causing dissatisfaction among the owners. The Ordinance on FSP sets out superior standards for the implementation of forest order along the trails. It is necessary to set up a system according to which owners who have increased forest management costs due to the designation of forests with a special purpose will receive appropriate compensation. Such a system is currently being set up in the COL, but it would also be sensible to use such system for the Šmarna gora urban forests which are in the MM.

- **Target Condition**

A regulated area in accordance with the provisions of the ordinance on Ordinance on FSP and satisfied forest owners who receive compensation due to increased forestry work costs.

- **Purpose**

Resolving disagreements between forest owners and the COL, which are the result of non-implementation of the Ordinance on Designating Forests with a Special Purpose as regards compensation to forest owners due to higher costs of forestry works or restriction of property rights and thus improved cooperation between landowners and the COL. Similar arrangements should be made in the MM as well.

- **Priorities**

- Establishing and implementing a compensation system;

- **Most Important Functions**

- Production and social;

- **Activities**

- Preparation of an expert basis for determining compensation and designing a compensation system;
- System testing and streamlining;
- Putting the system into practice;
- Communication with the owners;
- **Undesirable Activities**
- 
- **Silvicultural Measures**
- Continuing with sustainable forest management;
- **Timber Harvesting Measures**
- In accordance with the FMPs FMUs of Ljubljana and Medvode;
- **Infrastructure Measures**
- They are not needed;
- **Costs**
- up to EUR 10,000 per year;
- **Funding**
- Budget of the COL and the MM;
- **Coordinators**
- Department of Economic Activities and Transport, COL; MM
- **Stakeholders**
- Forest owners;
- **Timeframe**
- Preparation of the compensation scheme in 2021, after the approval of the scheme, implementation of the compensation system;

#### 4.4.8 Connecting Forest Owners

- **Conditions and Problems**

Owners of urban forests can be divided into two groups:

- Active owners – they manage their forests, whether it is due to income from forests, as a hobby, due to a sense of responsibility or tradition. These forest owners carry out forestry works themselves or have agreements with forestry contractors.
- Passive owners – these are the owners who have usually inherited forests, they do not manage them and usually only carry out sanitary felling which is prescribed by the Slovenian Forest Service. These owners do not carry out forestry works themselves; they usually do not have permanent agreements with forestry contractors, so we can say that their property is more of a burden than a benefit for them. However, they are not willing to sell it for various reasons. Such owners can become a target for dishonest forestry contractors and are often deceived when ordering forestry works in their forests. Due to lack of understanding, such owners usually do not even notice this has been the case.

As the area of forests owned by individual owners is small and most forest owners are no longer qualified for forestry works, it would be sensible to connect and organise them to ensure more efficient forest management.

- **Target Condition**
- Actively and sustainably managed urban forests.
- **Purpose**
- To connect forest owners in a joint initiative that would encourage more active management of urban forests.
- **Priorities**
- Connect Forest Owners

- **Most Important Functions**
  - Production
- **Activities**
  - Agreement on establishing an initiative and its legal form;
  - Preparation of constituent documents;
  - Establishment of the initiative;
  - Work programme preparation;
  - Communication with the owners, stakeholders, the COL, the MM and SFS;
- **Timber Harvesting Measures**
  - Organizing work in forests, getting more information on forestry contractors, greater control over the works carried out by forestry contractors;
- **Costs**
  - EUR 1,500 to set up the initiative
  - € 1,000 per year for operation
- **Funding**
  - Projects, owners, the COL
- **Coordinators**
  - The initiative
- **Stakeholders**
  - Department of Economic Activities and Transport, COL; SFS
- **Notes**
  - The COL offers administrative support to the initiative



#### 4.4.9 Activation of Local Associations for Assistance in Arranging Šmarna gora

- **Conditions and Challenges**

Many local associations and other entities are connected with Šmarna gora (mountaineering associations, sports associations, cycling associations, scouts associations, local communities, etc.). They carry out their activities in the area and are interested in keeping the area as tidy as possible and adapted to their needs. For this, they are also willing to contribute to the landscaping of the area through volunteer work. The key challenge is how to organise and coordinate the implementation of the works;

- **Target Condition**

- Local entities are actively involved in the implementation of volunteer landscaping work in the area of Šmarna gora. The municipalities coordinate the realisation of activities;

- **Purpose**

- Harness the potential of volunteer organisations, learning, gaining experience of young people in arranging recreational areas and intergenerational cooperation whilst increasing affiliation with the area;

- **Priorities**

- Determining the type of works that could be carried out by volunteers;

- **Most Important Functions**

- Recreation and education

- **Possible Activities**

- Work programme preparation;
- Negotiating with local entities if they are interested in carrying out the works;
- Realisation of the works;

- **Costs**

- EUR 3,000 per year for meal allowances and small inventory

- **Funding**

- COL, Slovenski državni gozdovi, d.o.o, sponsors

- **Coordinators**

- Department of Economic Activities and Transport, COL

- **Stakeholders**

- Local associations and other entities

## 5. IMPLEMENTATION AND MANAGEMENT

### 5.1 Realisation

The realisation of activities is mainly based on cooperation of the following institutions: SFS, the COL and the MM. The competencies of the former are defined in the Forest Act, while Department of Economic Activities and Transport of the COL and the MM are responsible for directing activities related to the social functions of forests, especially recreational and educational.

- List of main managers/coordinators of activities and their responsibilities
- SFS – preparation of forest management and silvicultural plans, selection of trees for felling, determining silvicultural and protection measures, planning of construction and maintenance of forest infrastructure, supervision of works, cooperation with forest owners, the initiative and COL;
- The COL and the MM – cooperation with forest owners, the initiative and SFS, maintenance of forest and recreational infrastructure, provision of communal services, planning, coordination and implementation of new infrastructure, purchase of forests, payment of compensation for restrictions on forestry works, assistance to forest owners in connecting and when carrying out forestry works;
- Forest owners – alone and in cooperation with the initiative – realisation of forestry works, care for forest stability, sustainable forest management;
- Subsidy system

The municipalities will support forest owners through:

- Supporting the initiative,
- Payments of compensation to the affected forest owners due to increased forestry work costs;
- Enabling the involvement of forest owners or initiatives in the realisation of works on Šmarna gora, which are financed from the budgets of the COL and the MM (felling, cutting branches, additional forest order measures, arranging and maintaining infrastructure, installing benches, maintenance of trails, realisation of silvicultural works, etc.);
- Tighter supervision of external forestry contractors;
- Above-standard maintenance of forest infrastructure;
- Assistance in the form of raising visitor awareness, providing information on the progress of forestry work, arranging closures of access to logging sites during felling and harvesting;
- Informing forest owners and the initiative of possible financial resources.

### 5.2 Forest Owners Association

Connected forest owners will be able to manage their forests more efficiently. The URBforDAN project motivates forest owners to connect in the form of an initiative, association or any other form of association. The support includes professional, substantive and administrative support in the preparation of all necessary activities and documentation for establishing and operation of the initiative for the duration of the project. Objectives of the initiative:

- Better communication with municipalities in implementing measures to ensure the social function of forests;
- Better communication with SFS and better supervision of the performed works (e.g. if the owners in one department connect for logging works and choose the same forestry contractor, Operational Management Plan for the Šmarna gora Urban Forest 42

the works can be performed more efficiently and for lower costs, the logging site is easier to secure during felling, the quality of the performed forestry works can be more efficiently inspected, unregistered felling is reduced, forest roads are jointly restored after felling and timber extraction, etc.);

- More efficient organisation of work in forests if forestry works are carried out in larger complete areas, as the costs of felling and timber extraction can be significantly reduced;
- Realisation of silvicultural works in the early stage of forest development significantly improves the quality of assortments and thus affects the price of timber on the market. In recent decades, silvicultural work has been carried out on a much smaller scale than until 1993, when silvicultural work in private forests was mostly carried out by the Ljubljana Forest Management Service. In the future, this will reflect in the stability of stands and their quality. The initiative could encourage forest owners to become more active in carrying out silvicultural and protection works, as such works would be subsidised;
- Recruitment of quality forestry contractors – the initiative, with the help of SFS, the Geodetic Institute of Slovenia, and municipalities, can influence the selection of the best forestry contractors for their forests. A list of forestry contractors who perform quality and fair work could be prepared with the help of these institutions;
- Better negotiating positions for forestry contractors and timber sales contractors (which is a similar story as with forestry contractors), as larger quantities of timber would sell better and timber could be better prepared to achieve higher prices;
- Facilitated implementation of neighbourhood assistance and the realisation of forestry works with local contractors – the initiative could intervene in neighbourhood assistance and advise on the selection of quality local forestry contractors (for whom this could become an important source of additional income);
- Group representation of interests for easier fulfilment of requirements and achievement of objectives – connected owners have more weight in asserting their interests, be it with forestry contractors, timber buyers, the Slovenian Forest Service or municipalities;
- Better control over the performed works – the initiative could organise additional inspections of logging sites and forest roads;
- Easier planning, construction and maintenance of forest infrastructure – within the initiative it is easier to plan, coordinate the course of new forest roads and prepare documentation for their construction, which means cheaper construction and maintenance, better supervision, more efficient negotiation with the municipalities on above-standard maintenance of forest infrastructure used by recreational visitors, etc.
- Energy utilisation of logging waste to generate higher revenues – currently logging waste is mostly not utilised. In case of larger logging sites, this pays off and owners could generate more income from their forests;
- Efficient flow of information – forest owners are currently not informed well enough. The initiative could make a significant contribution to better informing owners about important aspects of forest management and the possibility of using incentives from various sources;
- Transfer of good practices – the initiative could connect with other similar associations of forest owners in Slovenia or abroad and exchange experiences in forest management with them.

## 6. MONITORING

### 6.1 Monitoring and Supervision Indicators

- The effectiveness of realised activities and implemented measures for forest management is checked through individual planned activities (Chapter 4.5), in which the concrete measures and the target situation are specified. The following is checked: 1) implementation of measures, 2) achievement of target condition.
- The effectiveness of the implemented measures is checked every five years.
- Periodically a survey is conducted with a standard questionnaire among forest visitors to show how successful the implementation of the plan seems to them.

#### Monitoring and Supervision Indicators

Activity	Measure	Value	Timeframe
4.4.1 Arrangement of multipurpose trails and access points and installation of signposts	8 entry points with information boards and a map of the area and other necessary information to be arranged for the visitors.	8 information tables 38 tables on forest etiquette	Investments in the period 2020–2023, followed by annual maintenance
	Uniform markings placed in key locations	38 wooden orientation and thematic totems with signposts  2 information boards on Šmarna gora	Investments in the period 2020–2023, followed by annual maintenance
4.4.2 Installation of urban equipment	Installing benches and tables	18 benches /tables	Investments in 2020, followed by annual maintenance, in 2025 preparation of the concept for supplementing urban equipment
	Installing bike racks	7 bike racks	Investments in 2020, followed by annual maintenance, in 2025 preparation of the concept for supplementing urban equipment
	Installation of other urban equipment	1 lookout	Investments in 2020, followed by annual maintenance, in 2025 preparation of the concept for supplementing urban equipment
4.4.3 Complementing existing and creating new recreational contents	Identification of possible/new recreational contents	Depending on requirements and capacities	Preparation of the concept for new contents in the period

			2024–2027, implementation by 2030
4.4.4 Arrangement of Forest Play Areas, Forest Learning Trail Points and Thematic Trails	Arrangement of forest classrooms, forest play areas and renovation of thematic trails or arrangement of thematic points	Renovation and modernisation of the existing Forest Learning Path Establishing a new learning trail suitable for the youngest Establishing a trail modelled on the Golovec Urban Forest Health Trail	Investments in the period 2020–2023, followed by annual maintenance
4.4.5 Preservation of Non-Forested Areas	Determining the extent of agricultural land, reaching an agreement with the owners on their arrangement, organisation of campaigns for cleaning up and regular maintenance of overgrown areas.	EUR 500 per year for realisation of agricultural land management campaigns; Subsidising the elimination of overgrowth on agricultural land from the budget of the Republic of Slovenia (EUR 5000/ha)	Until 2023 – agreements and determining the method of arrangement, followed by annual maintenance;
4.4.6 Programme for the purchase of privately-owned forests by the COL	The purchase of land plots along trails and at locations of other recreational areas, on the forest edge and in areas where the existing municipal land is complete.	Annually purchase forests in the value of EUR 100,000. The approximate purchase price is EUR 1/m <sup>2</sup> .	Preparation of a priority purchasing plan until 2022, annual purchases in accordance with budgetary capacity
4.4.7 Determination of compensations	Establishing and implementing a compensation system;	Amount of compensation (EUR 10,000 per year)	Preparation of the compensation scheme in the period 2020–2023, after the approval of the scheme, implementation of the compensation system;
4.4.8 Connecting forest owners	Establishment of the initiative;	?	?
4.4.9 Activation of local associations for assistance in arranging Šmarna gora	Involve local associations and other entities in the regulation of Šmarna gora	Number of societies involved in the regulation of Šmarna gora	?

## 6.2 Revision of the Plan

After a period of five years, it is assessed whether the plan needs to be revised. This is necessary if major natural disasters have occurred in the intervening period, if new interests in forests have arisen

which have significantly changed their importance or if other reasons exist due to which the success of performed activities is not guaranteed. The COL, the MM and SFS are responsible for the audit.

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## 7. COSTS AND FINANCING

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The list of urban equipment with indicative prices (source of funding: URBforDAN project)

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EQUIPMENT TYPE	QUANTITY	PRICE PER UNIT	TOTAL EUR
Bench with installation (piece)	7	EUR 671	EUR 4,697
Bench (piece)	7	EUR 336	EUR 2,852
Bench restoration material (piece)	4	EUR 177	EUR 708
Mountain signposts (piece)	72	EUR 45	EUR 3,240
Other types of signposts according to the corporate design (piece)	125	EUR 10	EUR 1,250
Lookout (piece)	1	EUR 500	EUR 500
Bicycle stand (piece)	7	EUR 650	EUR 4,550
Wooden pillar with spacer and buried concrete foundation (piece)	40	EUR 330	EUR 13,200
Information board (piece)	10	EUR 1,200	EUR 12,000
<b>Total</b>			<b>EUR 80,100</b>

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## 8. SOURCES

Atlas of the Environment. Slovenian Environment Agency

[http://gis.arso.gov.si/atlasokolja/profile.aspx?id=Atlas\\_Okolja\\_AXL@Arso](http://gis.arso.gov.si/atlasokolja/profile.aspx?id=Atlas_Okolja_AXL@Arso) (18.6.2021)

Forest Management Plan of the Ljubljana Forest Management Unit, 2015. Forest Management Plan of the Ljubljana Forest Management Unit 2015-2024. Slovenian Forest Service, Ljubljana Regional Unit.

Forest Management Plan of the Medvode Forest Management Unit, 2020. Forest Management Plan of the Medvode Forest Management Unit 2020-2029. Slovenian Forest Service, Ljubljana Regional Unit.

Forest Management Plan of the Ljubljana Forest Management Area (2012). Forest Management Plan of the Ljubljana Forest Management Unit 2011-2020. Slovenian Forest Service, Ljubljana Regional Unit.

Ordinance on Designating Forests with a Special Purpose (2010). Ordinance on Designating Forests with a Special Purpose (2010). Official Gazette of the Republic of Slovenia, No. 60/2010 and following)

Municipal Spatial Plan of the Municipality of Medvode (2018). Ordinance on the Municipal Spatial Plan of the Municipality of Medvode (2018). (Official Gazette of the Republic of Slovenia, No. 45/18 and following)

Municipal Spatial Plan of the City of Ljubljana – Operative Part (2010) The Ordinance on the Municipal Spatial Plan of the City of Ljubljana – Implementation Part (2010). (Official Gazette of the Republic of Slovenia, No. 78/10 and following)

Municipal Spatial Plan of the City of Ljubljana – Strategic Part (2010) Municipal Spatial Plan of the City of Ljubljana – Strategic Part, 2010. (Official Gazette of the Republic of Slovenia, No. 78/10 and following)

Cultural Heritage Register Cultural Heritage Directorate

<https://gisportal.gov.si/portal/apps/webappviewer/index.html?id=df5b0c8a300145fda417eda6b0c2b52b> (5 July 2021)

Ljubljana Urban Forest Development Strategy 2020-2045 (2020). City of Ljubljana, Department for Economic Affairs and Finance.