



SUSTAINABLE TOURISM ACTION PLAN

D.T2.2.3. Public Institution Nature Park
Medvednica (PP09)

Version 3
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Bliznec 70, 10 000 Zagreb

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LIST OF ACRONYMS

(H)GSS	(Croatian) Mountain Rescue Service
a.s.l.	above sea level
BU	business unit
CEETO	Central Europe Eco-Tourism
d.o.o.	limited liability company
etc.	other
EUR	euro
FIS	<i>Fédération Internationale de Ski</i>
HRK	Croatian kuna
MUP	Ministry of the Interior
NPM	Nature Park Medvednica
OG	Official Gazette
PI	public institution
POVS	Area important for conservation of species and habitat types
PUZ	Police Department Zagreb
RTV	Radio Television
SC	ski club
sl.	similar
SPUO	strategic environmental impact assessment
SUO	environmental impact study
SWOT	Strengths, Weaknesses, Opportunities, Threats
TC	Tourist Community
UPU	urban development plan
VCM	Visitors Centre Medvedgrad
WWF	<i>World Wildlife Fund</i>



ZET	Zagreb Electric Tram
ZP	protected area



1. DESCRIPTION OF THE AREA

NATURE PARK MEDVEDNICA - BASIC INFORMATION

Basic features	Mountain range (1.035 m a.s.l.) near Zagreb, well-preserved forests and forest communities, 8 forest reserves, recreational area of Zagreb.									
Management	Public institution „Nature Park Medvednica“									
Declaration of the protection of the area	Law declaring the western part of Medvednica as nature park (OG 24/81) Law amending the Law declaring the western part of Medvednica as nature park (OG 25/09)									
Area	17.398 ha of that 81 % i.e. 14.550 ha is covered by forests 50% private forests, 50% state forests	<table border="1"> <caption>Forest Ownership</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Private Forests</td> <td>50%</td> </tr> <tr> <td>Croatian Forests</td> <td>50%</td> </tr> </tbody> </table>	Category	Percentage	Private Forests	50%	Croatian Forests	50%		
Category	Percentage									
Private Forests	50%									
Croatian Forests	50%									
Height above sea level	120 - 1.035 m a.s.l.									
Highest peak	Sljeme									
Alignment	Southwest-northeast in the length of 42 km									
Administrative affiliation	City of Zagreb, Krapina-Zagorje county, Zagreb county	<table border="1"> <caption>Administrative Affiliation</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Zg County</td> <td>23%</td> </tr> <tr> <td>KZ County</td> <td>30%</td> </tr> <tr> <td>Zg City</td> <td>47%</td> </tr> </tbody> </table>	Category	Percentage	Zg County	23%	KZ County	30%	Zg City	47%
Category	Percentage									
Zg County	23%									
KZ County	30%									
Zg City	47%									
Number of inhabitants within the boundaries of the PP (estimate, 2001)	around 7,400 (according to the Management plan of the NP Medvednica)									
Accessibility	by foot motor vehicles bicycle cable car (in the construction phase) public transportation (ZET bus from the direction of Zagreb)									
Quarries	3									
Cultural goods	historical urban units - settlements, historical structures (civil and sacral) ethnological heritage, archaeological heritage, memorial heritage (cemeteries)									
Other protected areas within boundaries of the NP Medvednica										
Special reserve (forest vegetation)	Babji zub - Ponikve, Bliznec - Šumrev grob, Gračec - Lukovica - Rebar, Markovčak - Bistra, Mikulić potok - Vrabečka gora, Pušinjak - Gorščica, Rauchova lugarnica - Desna Trnava, Tusti vrh - Kremenjak									
Significant landscape	Linden on Medvednica									
Nature monument (rare types of trees)	Gubec linden, Common yew at Horvatove stube, Common yew in Šupljak									

Nature monument (geomorphological)	Veternica
Monument of park architecture	Gornja Bistra - Park around castle, Stubički Golubovec - Park along the castle



Figure 1. Nature Park Medvednica in relation to the City of Zagreb (yellow - peak zone; red - boundary of the NPM (Source: Google earth, Biportal - accessed on 27 March 2019)

Nature Park Medvednica (NPM) is located just north of the Croatian capital - Zagreb (Figure 1). The Nature Park area consists of two distinct, but complementary, landscape areas:

- narrow area - complete forest complex, where in smaller fragments also appear meadow surfaces - between Podsused and Kašina pass, which makes 78% of the Nature Park area.
- access (transitional) zone - it surrounds the forest complex from all sides, and it is characterized by typical Prigorje and Zagorje landscapes with parts of urban and suburban settlements and villages, agricultural areas and isolated smaller forest areas. This zone makes 22% of the Nature Park area.

Medvednica has an exceptional value for the City of Zagreb, not only from an ecological aspect (erosion soil protection, preventing floods, impact on climate, air and water quality) but also from aesthetic, recreational, health and tourist aspect. Due to its exceptional natural beauty and proximity to the capital, it has become a favourite excursion destination of Zagreb citizens.

Since Medvednica has traditionally been exceptionally well-visited, in the Park have developed numerous and varied facilities for visitors - from educational trails and programs to information centres and major tourist attractions such as Zrinski mine (mine), Veternica cave and the old medieval Medvedgrad fortress.

Medvednica has about 70 hiking trails and 9 interconnected round bike trails. The highest peak of Medvednica, Sljeme is a famous ski resort with organized and well-equipped tourist facilities. Sljeme is the host of FIS Ski World Cup race “Snow Queen Trophy”, both men and ladies slalom race.



2. VALUES OF THE NATURE PARK MEDVEDNICA

2.1. Biodiversity

Biodiversity is one of the most important features of Medvednica and is manifested in a large number of plant and animal species and diverse habitats. The number of 1,205 plant species shows not only well-preserved habitats but also flora richness. Although forests and forest communities prevail, other habitats fragmentarily appear, such as meadows, lawns, underground habitats (about 60 speleological objects), water habitats (80 streams and 200 springs), and also those that have developed as a result of human actions - orchards, vineyards and rural areas. Forests, as the underlying phenomenon of the NPM, are represented by 12 forest communities which show a clear distribution of types depending on elevation and exposure, and due to their value at the Medvednica area were declared 8 special forest reserves. There are 91 strictly protected species registered in the Park. One of them is common yew (*Taxus baccata*), and the yew tree on Krumpirište, which is more than 1000 years old, is considered to be the most beautiful yew tree on Medvednica. There are 81 species of fungi recorded on Medvednica, many of which are rare and endangered, and therefore protected by law, including 21 species not found elsewhere in Croatia.

Many species of mammals, from small rodents such as mice, rabbits, dormice and voles, to big ungulates such as roes and wild boars, inhabit the forests of Medvednica. Small and medium-sized carnivores have also been recorded: wildcat, fox, marten and weasel. Bats are particularly interesting, of which 24 species are recorded on Medvednica (all protected by law). We can find them in caves, abandoned mines, quarries, tree hollows and house attics, and they use meadows, forests, cultivated and aquatic areas as hunting habitats. Among bird species stands out the European dipper who lives along Medvednica streams and almost never leaves its stream and immediate surroundings. Before, 2-3 pairs of dippers used to live by each Medvednica stream, and today, due to regulation of water streams and water pollution, their number has decreased. The fauna of Medvednica hill streams contains a number of endangered and endemic species. Although the fish are relatively rare, there are Danube barbel (*Barbus balcanicus*), schneider (*Alburnoides bipunctatus*), European chub (*Leuciscus cephalus*) and brown trout (*Salmo trutta* var. *fario*). Out of the amphibians stand out common toad (*Bufo bufo*), yellow-bellied toad (*Bombina variegata*) that lives in the puddles on forest paths and black-and-yellow fire salamander (*Salamandra salamandra*) that lives in shady and damp places.

2.2. Ecological Network

Area of the NPM was proclaimed as the area of the ecological network in 2013, as an important area for the conservation of species and habitat types (POVS) HR2000583 Medvednica. According to the Regulation on the ecological network, the area is important for the conservation of 20 target species (3 species of butterflies, 1 species of dragonflies, 5 species of beetles, 2 species of amphibians, 1 species of crustaceans, 1 species of fish and 7 species of bats) (Figure 2) i 9 target habitat types (6 forest habitat types, caves and pits open to the public, rocky habitats and communities that develop along river streams and along the forest edges) (Image 2).



Stag beetle
(*Lucanus cervus*)



Stone crayfish
(*Austropotamobius torrentium*)



Yellow-bellied toad
(*Bombina variegata*)



Lesser horseshoe bat
(*Rhinolophus hipposideros*)

Figure 2 Examples of target species of the ecological network HR2000583 Medvednica (Source: Archive PINPM)

2.3. Geological values

Due to its turbulent and diverse geological history, on Medvednica we can find all three basic types of rocks: igneous (formed by the cooling of lava), sedimentary (formed by the deposition of fragments of other rocks or plant and animal debris in the deep seas) and metamorphic (made of both groups of existing rock types, subject to increased pressure and temperature). The main body of the mountain is made of metamorphic rocks, mostly greenschist, which is kind of a symbol of Medvednica and is featured on the facade of Tomislavov dom and the Chapel of Our Lady of Sljeme, Queen of Croats.

Medvednica belongs to the area of old mining activity. There are numerous traces of mining works - the remains of smelting furnaces, clumps of iron slag, and abandoned mines, such as the Zrinski mine, which is arranged for visiting.

At the same time, there are speleological sites in the Park area, of which is the most important the Veternica cave. It is over 7,000 feet long, and the first 380 meters are available for visitors.

Earthquakes on the southern and northern sides of Medvednica are quite common. Villages Kašina and Planina were the focal point of the strongest earthquake in 1880.

2.4. Cultural heritage

In the wider area of Medvednica, natural and cultural-historical values interlace and depend on each other. To the dwellers at its foot, this great beneficial mountain has been presenting wood and coal, salt and stone, silver and water and their mill - in general, the source of life and protection. The slopes of the mountain exposed to the sun with their many springs and streams, forests, mountain meadows, wildlife and fertile fields in the lower regions have been inviting humans to settle here from the earliest days. Among the cultural assets of the PPM area are the stone fortresses built around the 13th century on the inaccessible peaks of the hills, in which the population was flown before the fierce invasions of light cavalry nomadic hordes from the east. That period saw the construction of the castles of Medvedgrad on the central, Susedgrad on the western and Zelingrad on the easternmost part of the mountain. Later on, this system of fortifications played an important role in preventing the Turkish invasions further to the west. The Cultural Heritage Register located in the PPM area also includes objects of sacral architectural heritage (churches), profane architectural heritage (mills and watermills, Mountaineering Club Runolist) and other protected cultural assets (Mining Garden and Rudnik Zrinski).



3. Tourism

Tourism started to develop in the NPM in the second half of the 19th century with a change of lifestyle (the expansion of Zagreb, industrialization). Infrastructure for visitors has begun to develop, such as hiking trails, mountain lodges and houses, excursion sites, shelters, roads and various companies were founded.

Visiting features of the Nature Park Medvednica

Considering the time of stay on Medvednica, there are three types of visitations as part of the whole system:

- **Excursion system**

refers to one-day stay (rest, recreation, sports, education). In the Medvednica area, it is the most common way of visiting. Although excursion movements are largely outside the reach of tourist records, it is estimated that potential active excursionists are unevenly distributed not only according to months (seasons) but also according to zones.

- **Stationary system**

refers to multiple-day stay (rest, recreation, sports, education), and it is realized mainly through the organized stay of children, pensioners and athletes and individual stay in own arrangement. Accommodation capacities and other accompanying facilities in the surrounding area are concentrated mainly in the wider peak area of Medvednica. Out of the 16 facilities (mountain huts, houses and hotels), 14 of them provide accommodation services (rooms, collective beds, apartments) with a total of 500 beds.

- **Transit system**

refers to various pilgrimage directions.

Number of visitors

Based on the conducted research on the structure and views of visitors and their economic valuation of the NPM (May 2007 to May 2008), an estimated number was calculated of annual visitors to the Nature Park which amounts to 1,005,000 visitors. However, it is impossible to determine the exact number of Park visitors because there are more than 90 entrances to the Park.

Estimated number of visitors is based on visits to various programs, the number of tickets sold for some of the tourist attractions at Medvednica, data obtained by counting traffic (road and pedestrian traffic) and etc. According to the number of tickets sold and the number of children who participated in various education programs, organized and implemented by the employees of Public institution NPM, there is an increase in the number of visitors (Figure 3). There was also an increase in the number of foreign visitors to Medvedgrad.

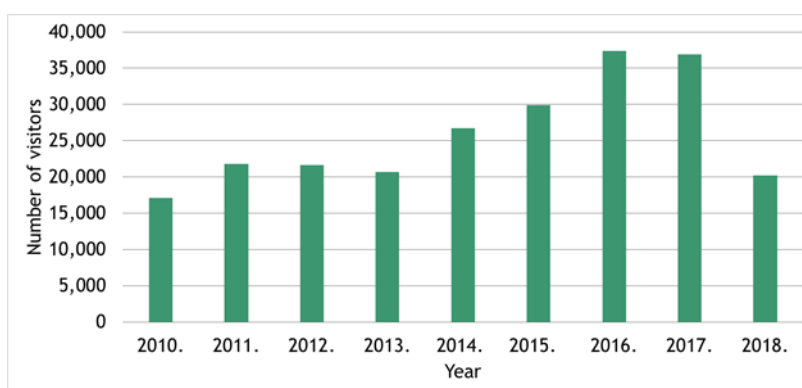


Figure 3 Number of NPM visitors in the period from 2010 to 2017 (data based on the number of sold tickets and number of children involved in educational activities) (Source: PINPM)

Visitor structure

The Nature Park Medvednica is mainly gravitated by domestic visitors from the immediate vicinity (City of Zagreb, Krapina-Zagorje and Zagreb county). Most of the visitors are young and middle-aged, highly educated and employed, and they come to the NPM on the weekends, several times a year, most often in the company of friends and family. 80% of visitors spend half a day in the Park, and the three most frequently visited sites are Puntijarka, Vidikovac-TV Tower and Grafičar.

Park visitors are looking for a nature experience in a wide range of activities (walking, hiking, free climbing, cycling, skiing, hunting, field teaching, paintball, kiting, visiting various sports and cultural tourist events and more). The main motives are staying in nature, socializing with friends and education about the natural and cultural values of the Park.

Visitor infrastructure

Public institution regularly works on maintaining the visitor infrastructure, such as educational paths, info centres and other attractions on sites with an emphasized natural and/or cultural value (Figure 4 and 5). The two largest tourist attractions are Veternica cave and Zrinski mine.

Table 1 Visitor infrastructure in the NPM (source: Management plan of the Nature Park Medvednica, 2010)

TYPE OF FACILITY	LOCATION
Info centre	Bliznec
Supervisory stations	Bistra, Pila
Educational trail Miroslavec	Šestine
Forest trail Bliznec	Bliznec
Educational trail Bistra	Bistra
Educational trail Slani potok	Slani potok
Educational trail Slap Sopot	Slap Sopot
Educational trail Kameni svati	Kameni Svati
Bike trails (15; in reconstruction)	Nature Park Medvednica



Climbing site Gorsko zrcalo	Markuševečka Trnava
Zrinski mine	Rudarski vrt, Malo Sljeme
Veternica cave	Gornji Stenjevec
Geological columns	Bliznec, Bistra
Educational trail Horvatove stube	Markovčak
Hiking trails (67)	Nature Park Medvednica
Pilgrimage paths	Nature Park Medvednica
Medvedgrad	Mali Plazur

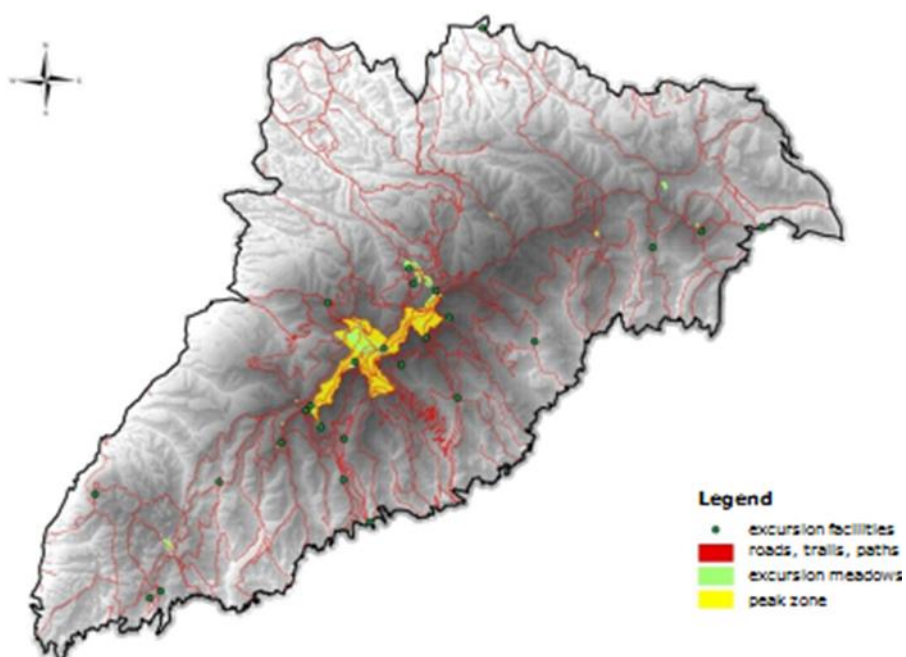


Figure 4 Visitor infrastructure at the NPM area (green spots - tourist facilities, red lines - roads, hiking and walking trails and bike trails, yellow - peak zone, green - excursion meadows (source: Management plan of the Nature Park Medvednica, 2010)

4. AVAILABILITY AND TRANSPORT

Visitors of the NPM have several possibilities of movement around the NPM: by foot (marked hiking trails), public transport, motor vehicles (e.g. personal cars, motorcycles, etc.) or bicycles.

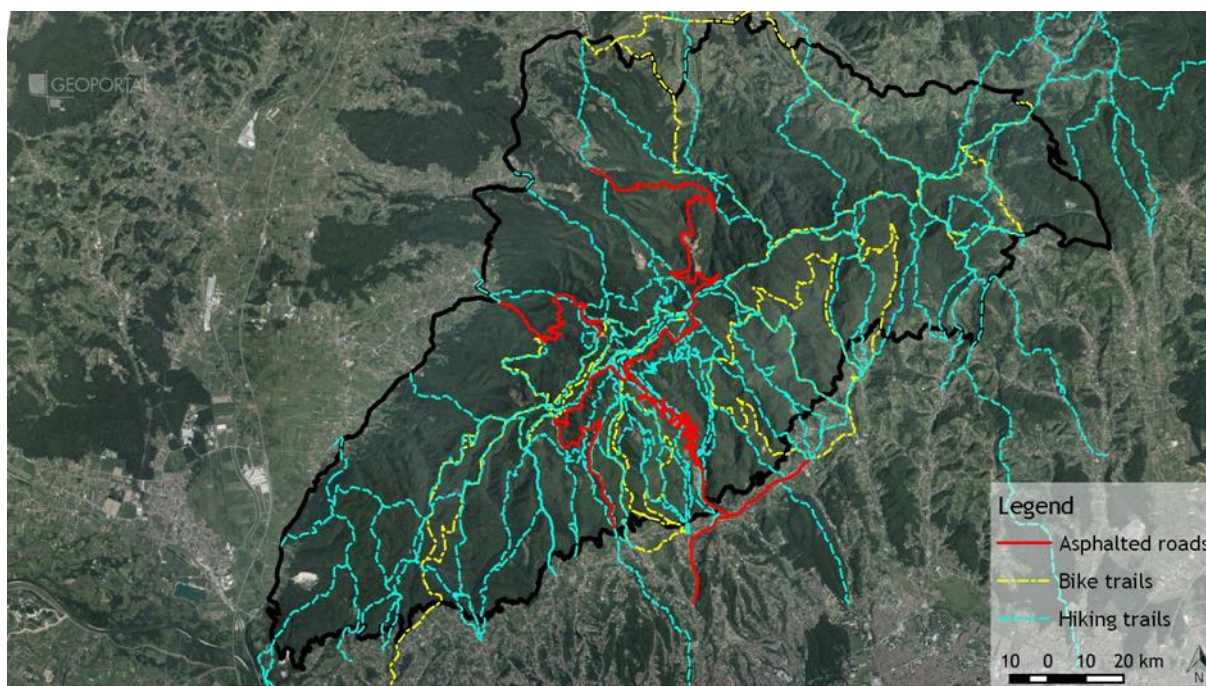


Figure 5 Network of traffic (road and bicycle) and pedestrian infrastructure of the Nature Park Medvednica (source: Bioportal, accessed on 14 March 2019)

Public transport

Bus lines

Public transport is organized from the direction of Zagreb and is managed by the company Zagreb Electric Tram d.o.o. (ZET). ZET bus lines run to the starting points of most hiking trails (which are located in Zagreb, at the foothill of Medvednica).

Bus line 140 runs between the turnaround Mihaljevac and peak Sljeme on Medvednica (Tomislavov dom) on average every 2 hours on working day, in the period between 6:20 and 21:50 (from the direction of Mihaljevac), i.e. 7:15 and 22:40 (from the direction of Sljeme). On weekends, the lines are more frequent - on average every hour. It is an extraordinary circular line that drives to Medvednica because the cable car is out of function, on the route shown below (Figure 6).

Public transport by bus lines from the direction of Zagorje runs only to the foothill of Medvednica.

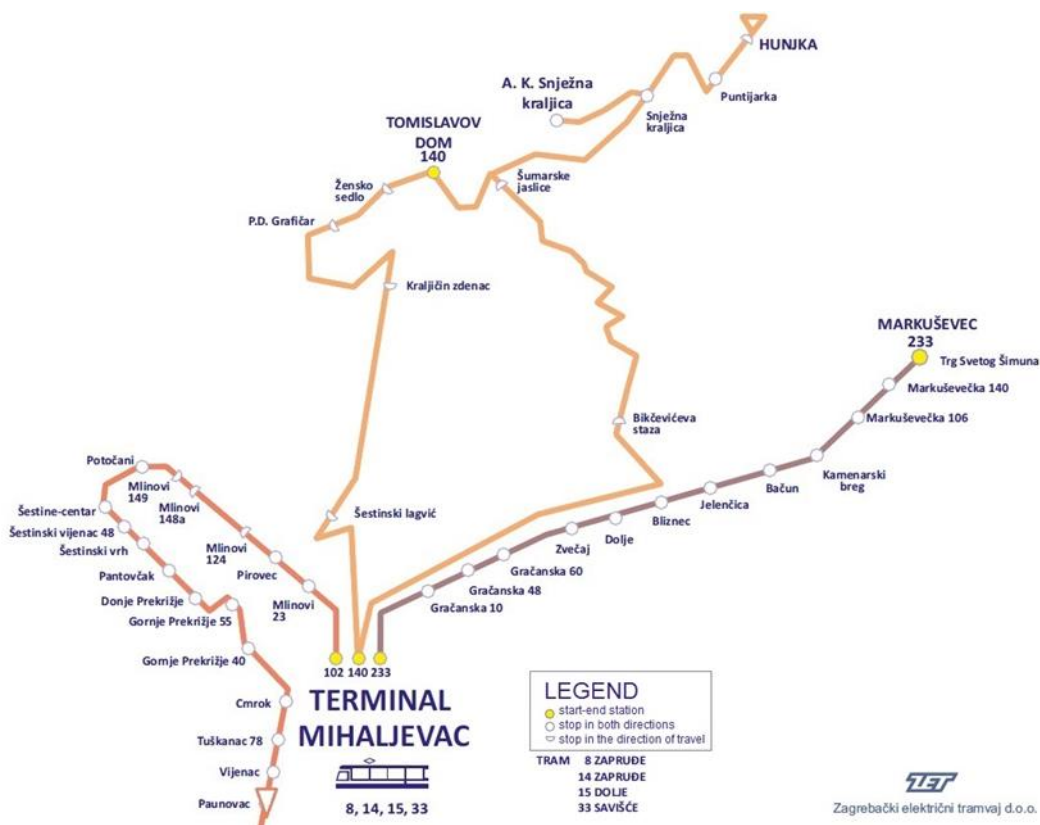


Figure 6 Traffic route of the bus line 140 Mihaljevac - Sljeme (orange line) (Source: modified image, downloaded on 15 March 2019 from the website <http://www.zet.hr/UserDocImages/Prilozi/PDF/Autobusni%20terminali%202018/MIHALJEVAC-2.2018..pdf>)

Cable car

Cable car Zagreb - Sljeme was 4,017 m long and it operated between 1963 and 2007 on the line Vila Rebar (Dolje) - Sljeme. The cable car and the tram system were an integral part of public transport that linked the city and the peak area. The bottom station was located about 15-minute walk from the tram turnaround Dolje, and the upper station was at the peak Sljeme. The City Office for Physical Planning, Construction of the City, Building, Utility Services and Transport started at the beginning of 2019 the construction of a new cable car with a plan to complete it by the middle of 2020, and its purpose is multiple:

- the function of cable car,
- the function of accommodation of vehicles outside the Park boundaries (construction of two underground garages), and
- the function of the local centre Gračani and its surroundings.

The location of the new bottom station Dolje is moved - it is planned to be located close to the tram turnaround Dolje, as well as the location of the upper station that is planned to be at the very top. In addition, a new intermediate station is planned at the Brestovac area.



TAXI transportation

Although the possibility of TAXI transportation is available, at this time it is not known how much this type of transport is used. The potential for the use exists, and in this way, it could contribute to reducing traffic jams and solving parking problems.

Access with motor vehicles (personal cars, motorcycles, etc.)

Motor vehicles can reach the NPM area:

- from the direction of Zagreb - Sljeme road (in the category of county road) which is one-way from Bliznec to the top and then back down towards Šestine
- from the direction of Stubičke Toplice - county road 2219, which is two-way to the forest nursery where it joins Sljeme road
- from the direction of Bistra - the unclassified asphalted road to the lower part of the Red slope and Krumpirište.

In the period from 2009 to 2012, a traffic counter was installed at the main entrance Bliznec, which showed that year by year car traffic is significantly increasing (Figure 7).

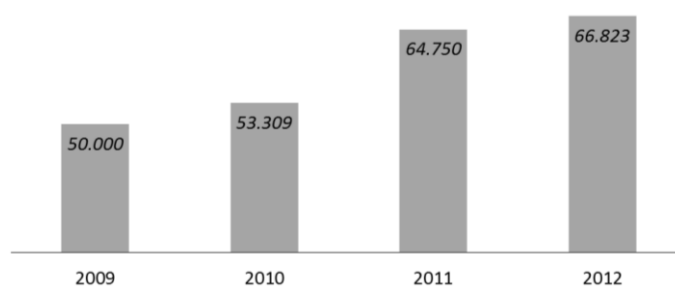


Figure 7 Traffic counter results in the period from 2009 to 2012 on location of lugarnica Bliznec (Source: PINPM)

As a part of the CEETO project, with the aim of solving the traffic problem in the NPM area, two vehicle counters and 3 live streaming cameras were set up (Figure 8):

- Traffic counters
 - Bliznec - headquarters of the Public institution „Nature Park Medvednica“
 - Hunjka - on Sljeme round in front of the facility „Mala Hunjka“
- Live streaming cameras
 - parking lot at the Hotel Tomislavov Dom
 - parking lot at the abandoned facility „Dom Željezničara“
 - Info centre Bliznec.

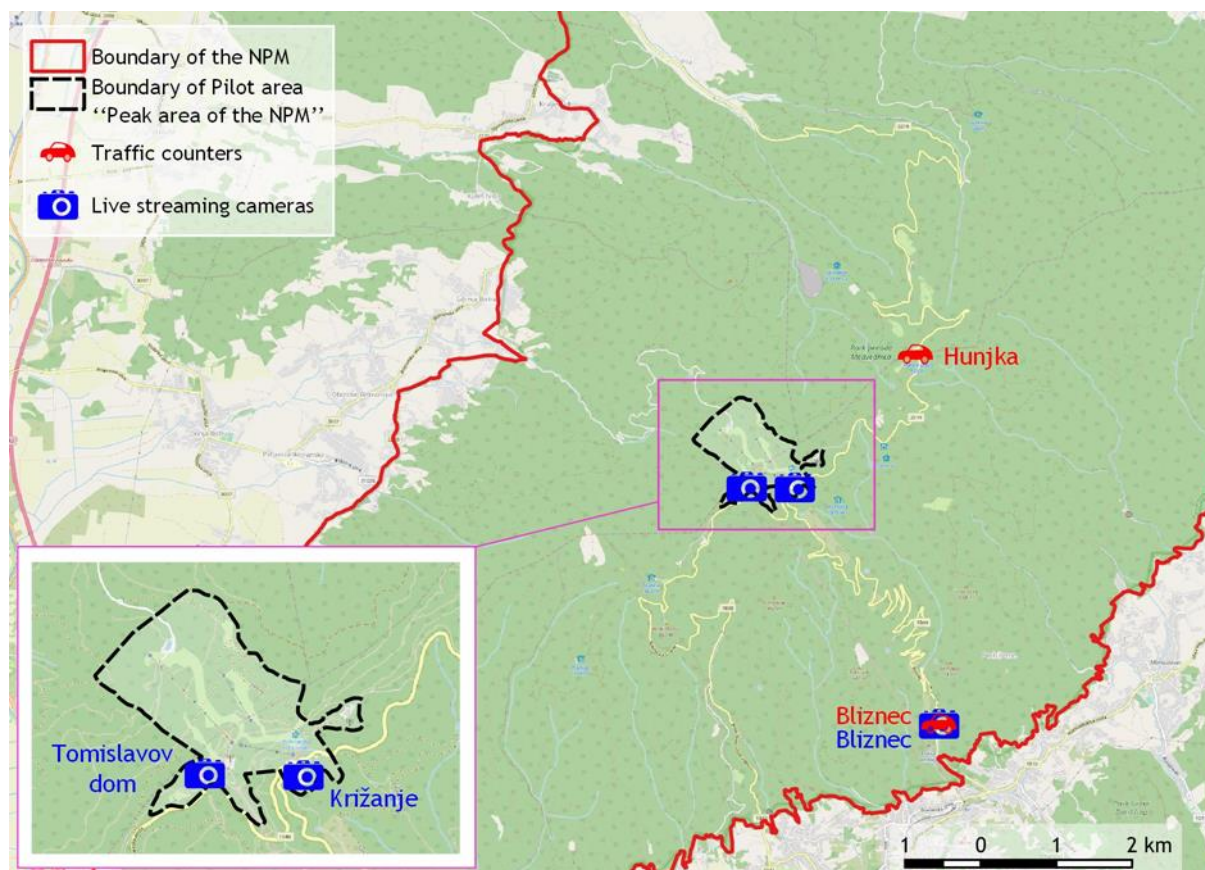


Figure 8 Locations of traffic counters and live streaming cameras set up within the CEETO project

Parking is available on several locations:

- at the foothill of Zagreb side - Bliznec, and the parking lot is also organized at the turnaround Mihaljevac
- at the foothill of Zagorje side - the parking lot Pila and at the Red slope
- in the wider peak area of the NPM - partly along the mountain huts, within the parking spaces of the catering facilities and in the peak zone. Between Grafičar and Hunjka in 2005 there were 135 registered parking spaces next to certain facilities. Existing parking area in the wider peak area cannot satisfy all visitors who come on holidays and weekends by car.

Hiking trails

Hiking and walking trails are part of recreational routes throughout Medvednica. Numerous paths serve as a link to the foothill of Medvednica and the peak area (above 750 m a.s.l.) where there is the largest number of mountain huts and facilities for excursionists, hikers and other users.

In the area of NPM, there are about 70 marked hiking trails from different directions.

Bike trails

Although asphalted roads are not regulated as cyclists, cyclists often use them. In addition, a network of partially marked "mountain" bike trails from different directions has been arranged. According to the Ordinance on the internal order of the NPM (new is currently in development) bicycle ride is not permitted on hiking trails, but visitors who are cyclists often violate this rule.



5. EDUCATIONAL, INTERPRETATIVE AND PROMOTIONAL ACTIVITIES

Educating and informing the public, with the aim of raising public awareness about total values of Medvednica, are two important instruments in promoting conservation and protection of natural and cultural values. Education and interpretation are the first steps in the process of social change - they lead to the understanding of natural and cultural values, and then to change of views and behaviours of the public, i.e. assuming responsibility and actively engaging in protection.

The Public institution "Nature Park Medvednica" since the very beginning perceived a predominant function of the Nature Park Medvednica in the system of Croatian protected areas, which is the communication with the general public. With the development of a whole range of infrastructure for visitors as well as a diverse interpretation program communication takes place with visitors and the general public directly and indirectly (educational education programs, professional guiding, educational paths, websites, multimedia, "events", exhibitions, promotional materials and others).

Education in the Park is primarily directed at school children and students, but also at visitors of the Park and its main users, as well as at general public, which involves creating and constant adaptation of the whole program (educational education programs, professional guiding, lectures, workshops, etc.).

Educational Education programs aim to offer:

- completing the knowledge,
- participation in various researches,
- observation of the plant and animal world,
- monitoring and observation of the state and changes of Medvednica ecosystem.

The purpose of such targeted programs, under guidance of experts, is to improve the visitor's attitude toward the environment. Familiarizing with the values of the Nature Park must be designed to encourage reflection about the need and sense of protecting the environment in general. For the realization of education programs, both content and spatial enrichment of the offer is needed.

The largest number of education program users in the period from 2015 to 2017 is related to the location of Medvedgrad and a significant increase in interest for the same is visible. As part of the project "Improving visitor capacity for sustainable management of the Nature Park Medvednica", which is in progress and implemented by the PI NPM, the reconstruction of the Visitor Centre Medvedgrad (VCM) is underway and further increase in the number of visitors in this area can be expected in the future.

At the same time, the users of education programs at location Zrinski mine and Veternica cave which are charged are equally represented as the users of programs which are free of charge (Figure 9).

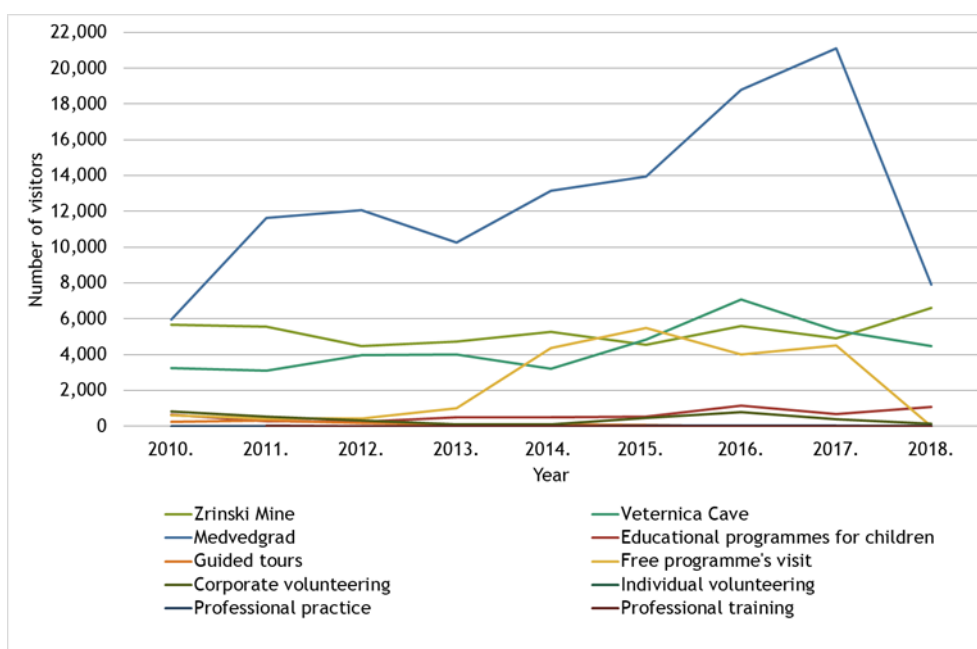


Figure 9 Number of users of individual education programs carried out by the Public institution Nature Park Medvednica in the period from 2010 to 2018

Means of information

Means of public information play an important role in protecting the natural and cultural values of the Park. By providing information to the general public, the media can create support, pressure or engagement of the public, which is why it is necessary to continually cooperate with them.

Public institution manages the website <https://www.pp-medvednica.hr/> which provides basic information on management, price list, natural and cultural values of the Park, tourist offer etc. and it regularly reports about important information, notices and announcements (Figure 10). It also manages Facebook page and Instagram.

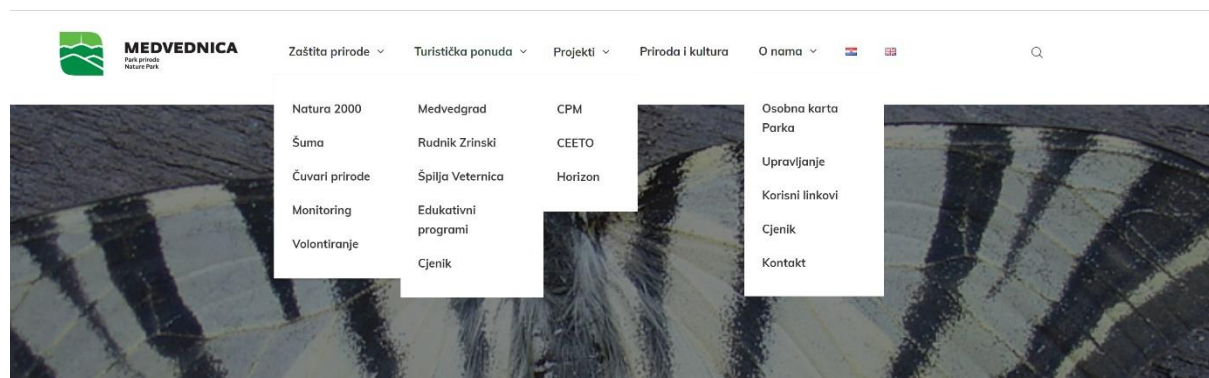


Figure 10 Website structure of the Public institution „Nature Park Medvednica“



6. DESCRIPTION OF THE PILOT AREA „PEAK AREA OF THE NPM“

Pilot area „Peak area of the NPM“¹ (Figure 11) is located at the very peak area of the Nature Park Medvednica (NPM) and it covers the coverage area of the Urban development plan (UDP) of state significance “Peak zone” (UDP Peak zone) and Urban development plan of state significance “Ski complex”, Medvednica (UDP Ski complex). According to the Spatial plan of the Nature Park Medvednica (OG 89/14) the Pilot area is located within the zone 2d - *Zone of moderate protection - Peak zone*² and zone 3d - *Zone of use - ski resort zone*³.

Problems of the Pilot area are related to the overload of visitors, especially during the ski season. Wider area of the Pilot area to the north side of the NPM (towards the Municipality Bistra) along water streams is also under pressure of activities that take place in the peak area and represents “buffer area” (but it is not the subject of this Action plan).

¹ Since very similar terms are used in the text related to the peak area of NPM, explanation is given for a better understanding:

- Pilot area „Peak area of the NPM “ - refers to the narrow part of the wider peak area of Medvednica in the boundary as shown in the images in the text (**Error! Reference source not found.**, **Error! Reference source not found.**) and covers the coverage area of UPU Peak zone and UPU Ski Complex
- Peak zone - according to the Spatial plan of the NPM, refers to the zone of moderate protection 2d, and it is also used as a name of UPU Peak zone
- Wider peak area - refers to the wider area along the Medvednica ridge, and this Action Plan does not strictly define its boundaries

² Part of the area from the second zone is separated as a place where intensive sports and recreational, excursion and tourism activities take place. These are primarily the areas of the peak zone with increased frequency of visits, with the exception of solid facilities. The goal of the management of these areas is active management for the purpose of preservation of the ecosystem and cultural landscape while maintaining sustainable use of space. At the same time, special emphasis is placed on the management of visitors, improvement of visitor infrastructure in terms of reducing pressure on ecosystems, and the development of a mode of use that permits sport-recreational and excursion activities to be carried out in a way that does not endanger the protection aims.

³ This zone includes ski resorts in the peak zone of the Nature Park Medvednica.

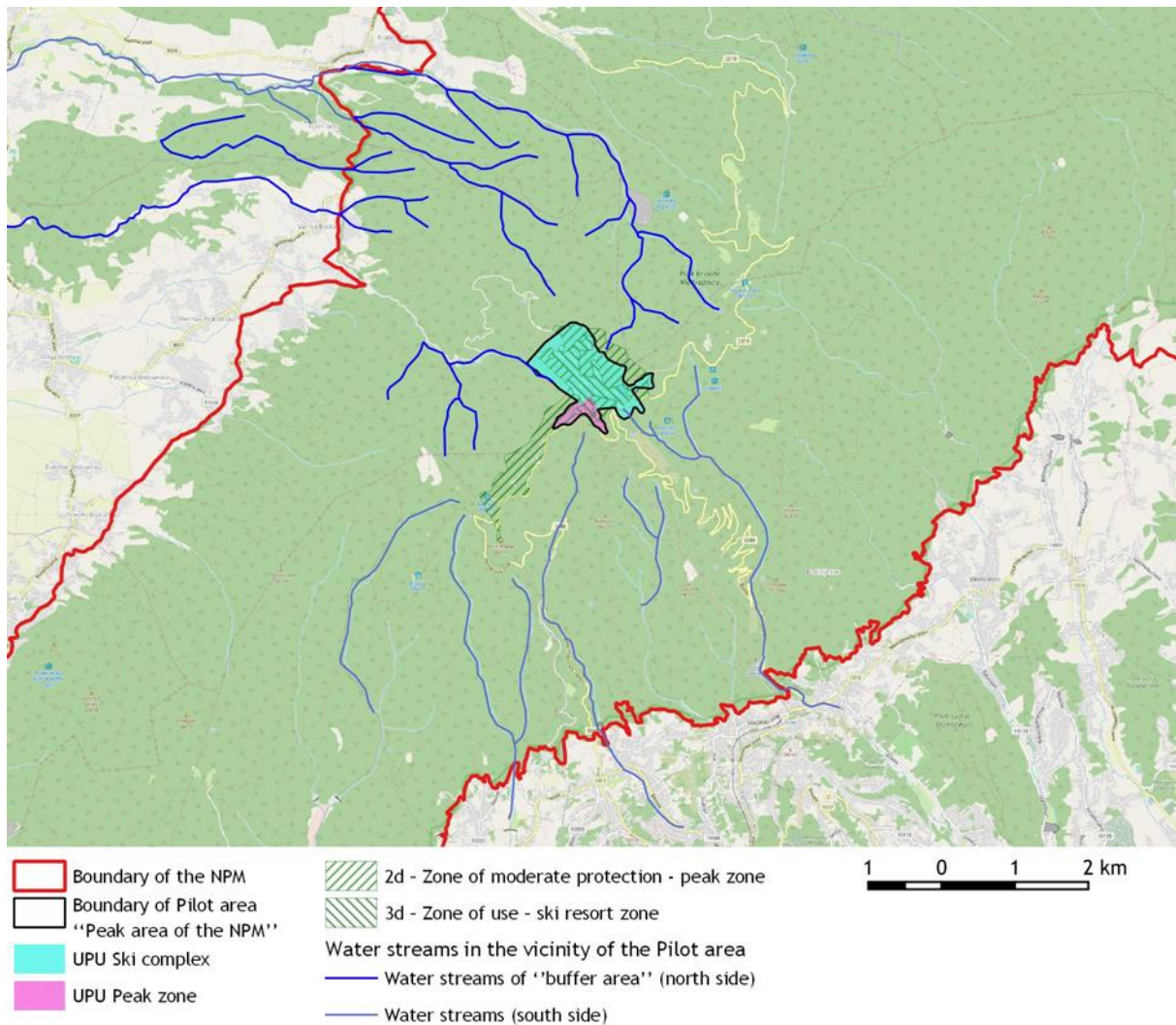


Figure 11 Overview map of the wider Pilot area "Peak area of the NPM"

The Pilot area is located in the very peak area of the NPM, in the area of the City of Zagreb, Zagreb county and Krapina-Zagorje county. It covers the area around the top of Sljeme with existing buildings: infrastructure facilities (upper station of ZET cable car (17), TV tower (14) and MUP emitter (13)), ski clubs and ski schools facilities, catering facilities (Zlatni Medvjed (8), Vidikovac (7)), accommodation facilities (hotel Tomislavov dom (5), apartment facility Snježna kraljica (4) mountain huts and excursion sites (Dom Željezničara (3), Grofica (1)), ski resort and accompanying buildings and etc (Figure 12). The dominant natural character of Medvednica at the peak area is changed by man's presence and tourist-recreational way of use.

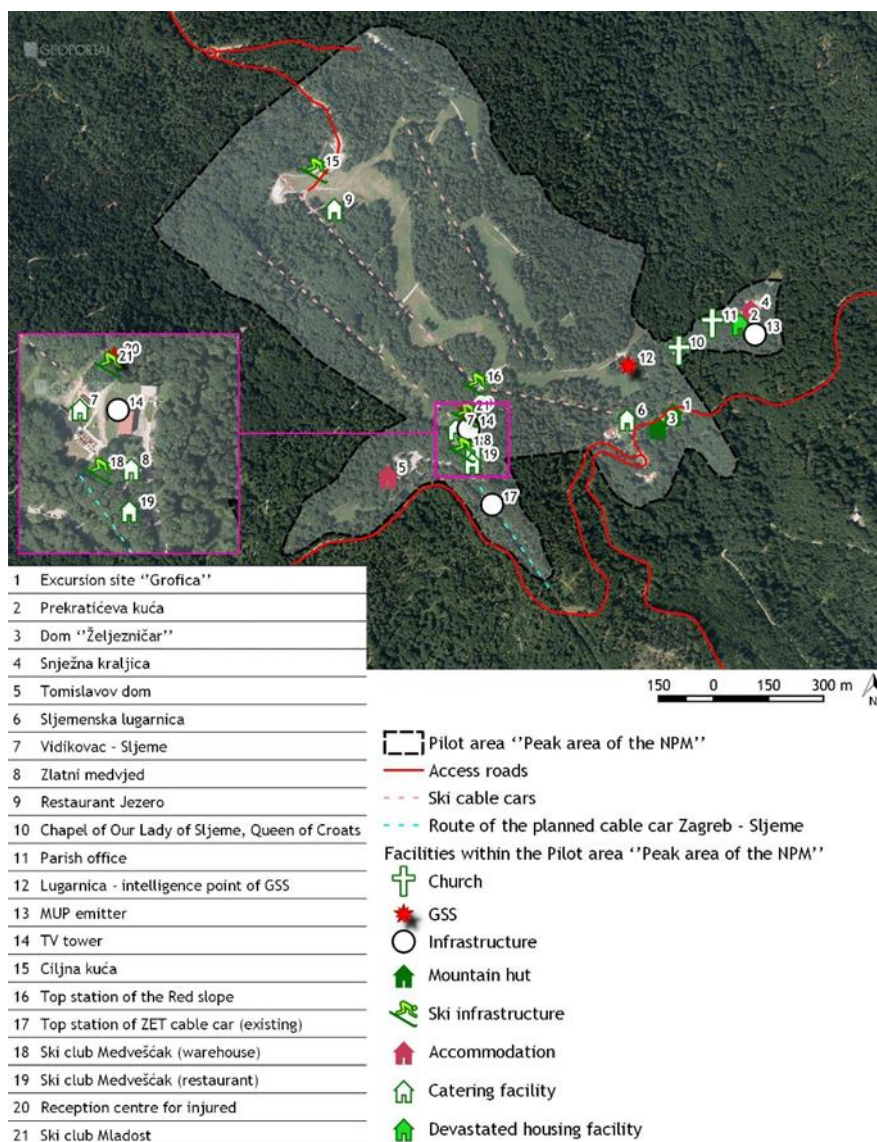


Figure 12 Pilot area „Peak area of the NPM“

6.1. Historical significance of the Pilot area „Peak area of the NPM“

The development of peak plateau area is linked to the popularization of mountaineering in the second half of the 19th century when Medvednica became Zagreb excursion site.

In 1870 the first wooden viewpoint of 4m height was built at the highest point of Medvednica, which represents the first mountainous facility in the history of Croatian mountaineering. Seven years later (1877) a new, bigger viewpoint was built - a wooden pyramid according to the project of Milan Lenucij (8 m high), and the first mountain hut - "Gradska kuća" with rooms for mountaineer needs. Numerous hiking trails and huts were constructed in this period, and in the late 19th century Sljeme road was also built.



Between the two World Wars, the tourist recreational function of area was more intensively developed, and mountain huts were built. The first ski jump was built in 1934, and in 1935 (after being destroyed by fire in 1934) Tomislavov dom was built at today's location.

After World War II construction of mountain huts continued and ski slopes were arranged (1946 Red slope) and ski cable car was built. With the opening of the first ski cable car "Panjevina" in 1954, begins the development of ski terrains on the northern slopes of Sljeme, and the system of cable cars, which is spatially equal to the one that we have today, was established in the seventies of the last century. The roof of the upper cable car station "Panjevina" is a terrace of catering facility and today is the only one still in function of the so-called viewpoint towards Zagorje. Nine years later (1963), was built large cable car (4,017 m long) from the Tunnel. The cable car was the largest and most important infrastructure facility that popularized Sljeme and made it a weekend destination of Zagreb citizens. In this way, sport and recreation also became one of the significant features of the Medvednica area.

The Sljeme cable car further stimulated the development of skiing facilities. At the end of the 1960s, ski terrains were arranged and expanded, so there was a need to build lifts on the White meadow and the Green slope, and later on the White and the Red slope.

6.2. Existing condition

The meadows areas from the top of Sljeme towards the north side (Red, Green, Blue, White slope and Krumpirište meadow) are partially arraigned and covered with grass as well as the meadow surfaces from the top of Sljeme towards the eastern side (White slope and Činovnik meadow).

Condition of facilities

- the upper and bottom station of the cable car at the Red slope today is in function as well as the accompanying infrastructure facilities,
- the complex of buildings for snowmaking the slopes is linked to the artificial lake-accumulation for water supply, which is carried out with a reinforced concrete wall (dam) towards the downhill, next to which is a catering facility (unmaintained and not in function for a long time), service facilities and asphalted access above which in the winter season are placed assembly stands for spectators of skiing competitions,
- "Snježna kraljica", an apartment facility built at the site of the former Dom izviđača, is in good condition and in function with maintained outdoor areas and public lighting,
- Prekratićeva kuća between „Snježna kraljica“ and Parish office, made of wood, is in ruinous condition and presents a danger to visitors,
- the environment of the Chapel of Our Lady of Sljeme, Queen of Croats is maintained, as well as access steps, the Parish office is in good condition but with unsuitable extensions,
- Dom željezničara is unmaintained, the roof is in a poor condition, especially the southern terrace, and the environment is uncared for and overgrown,
- Excursion site "Grofica" consists of several buildings connected by canopies directly to the road, formally uneven, and the area below the houses is not adequately maintained,
- Mountain hut "Junac" on Činovnik meadow (Croatian Mountain Rescue Service - GSS intelligence point) was created by upgrading smaller facilities with outdoor seating areas; smaller facilities of the ski school for children "Žuti mačak", catering kiosks and sanitary nodes are formally uneven.



- Complex around the old lugarnica Sljeme is arranged and fenced, and a newer catering facility is in function,
- Communal base BU "Hortikultura" of Croatian Forests L.t.d. along the Leustek trail, includes a newer building and an accompanying auxiliary facility with a gravelled outer space.
- ZET upper station is an abandoned building out of function for a longer period of time, with unkept environment. There are several infrastructural structures on the lot, some of which are in function (substation), and some need their function to be established (shutters, containers, shutters)
- TV tower building is in good condition, with well-kept environment,
- Facility of Intervention Base Sljeme - reception centre for the injured and facility of the ski club Mladost are wooden buildings of a recent date and are in good condition,
- Group of facilities Zlatni medvjed, ski and snowboard clubs comprise of several buildings of different purpose (catering-tourist, club), unequal quality, built in different periods and by upgrading.
- Vidikovac is a larger catering facility with an attractive terrace and an exceptional view. From its northern side there is the upper station of cable car Panjevina, nowadays out of function
- Tomislav dom represents a significant accommodation facility of high category (hotel ***) with catering offer, pool and recreational facilities, open terraces and parking lot.
- State of the traffic infrastructure
- the main access roads are asphalted, and the auxiliary approaches are made of macadam, parking lots are undefined,
- paths and approaches are marked, but unevenly arranged.

Ski slopes and skiing activities

The ski slopes start at the peak area of Sljeme and are located on the northern and partly eastern foothills of Medvednica. An accumulation lake of approx. 4,500 m³ was built in the service of snowmaking the slopes at the bottom of the Red slope. The ski slopes have downhill of different difficulty, depending on the terrain configuration. The majority of visitors of the Park in winter are recreational skiers. The ski slopes occupy about 16 ha of area with a total of about 4.3 km of ski slopes (Table 2).

Table 2 . Description of ski slopes at the Sljeme Ski resort

SLOPE	SLOPE DESCRIPTION	LENGTH (m)	HEIGHT DIFFERENCE (m)
Red slope	used by experienced skiers	1,030	290
White meadow	used by recreationalists and kids (with a very mild southeast downhill that ends on the Činovnik meadow)	400	80
White slope	Used by recreationists	550	85
Red slope		400	100
Blue slope		1,170	200
Panjevina	Out of function	730	300

Source: SUO of ski resort reconstruction on Medvednica Note: Mentioned data varies depending on the source

Three ski cable cars, 2 lifts (on the White meadow and the Green slope) and three-seat cable car (on the Red slope), have a total capacity of about 3,300 skiers per hour. Red slope, White meadow, Green slope and part of Blue slope are equipped with an artificial snowmaking system. The ski slopes are maintained with modern ski slope machines. The skiing system also enables night skiing on the Red slope and the White meadow. Working hours of ski resort are from 8:00 to 16:00 (Monday to Sunday) and on Tuesday and Thursday night skiing is also organized from 19:00 to 22:00.

The most famous competition at Sljeme is Snježna kraljica/Snow Queen Trophy, which has been held since 2005 within the FIS Ski World Cup. The race takes place at the Red slope in early January. Men's slalom is most commonly a night race, and the lighting around the slope is also used for recreational night skiing. Since 2008, in addition to female slalom, male slalom was also introduced (Figure 13). The competition did not take place in 2014 and 2016 due to unfavourable weather conditions, i.e. lack of snow.

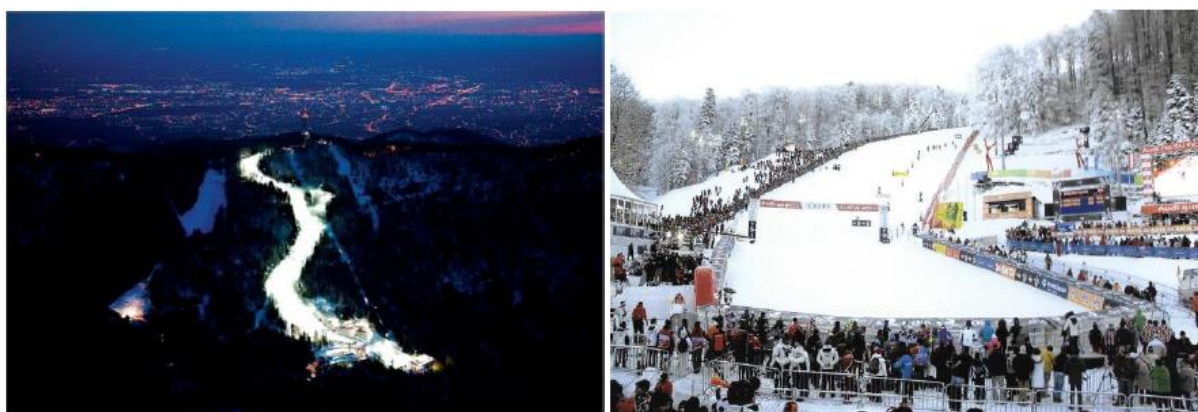


Figure 13 Ski FIS race (left: male slalom - night, right female slalom) (Source: Urban development plan of significance "Skiing complex", Medvednica, 2017)

6.3. Environmental features and values of the Pilot area „Peak area of the NPM“

The peak area of Medvednica is located on the highest parts of the mountain ridge (over 750 m a.s.l.) of elongated shape extending in the direction of NE - SW. Numerous transverse reefs have their origin in the main longitudinal ridge, that with numerous river valleys create a highly dynamic, pectinate orographic relief type with. This complex and dynamic relief is overgrown with a thick beech forest, whose distinctive dominance and homogeneity is one of the basic elements of the identity of this area, and certain communities belong to rare and endangered habitat types. On the peak area prevail forests of common beech with fir which are abundant with the richness of plant species and wild animal species.

The characteristic features of the peak area of Medvednica are also fewer open areas of meadows and lawns, of which stand out the lawns at the area of skiing slopes, on the northern slope of Medvednica, and smaller meadows: meadow next to Tomislavov dom, Činovnik meadow, Krumpirište and etc. Meadow next to Tomislavov dom is recognized by spatial plan as a particularly valuable from the point of view of biodiversity.

At the peak Sljeme is a finding site of strictly protected plant species groundcedar (*Diphasiastrum complanatum* (L.) Holub)), while a strictly protected and sensitive plant species martagon lily (*Lilium martagon* L.) has been recorded in the close proximity. Groundcedar is a fern, which prefers humid coniferous forests, from lowland to moderate altitudes in the mountains. Martagon lily grows in deciduous forests, such as beech forest, and it especially prefers forests that are located on limestone base.



There are several springs and water streams in the surrounding area: from the northern side - Jelenja voda (water well with zone of sanitary protection of water source) - the water source of Bistra stream and from the south side - Javorov zdenac (used as a water well) - water source of Kraljevečki potok, Bliznec. The fauna of Medvednica hill streams contains a number of endangered and endemic species. At the location of Javorov zdenac was recorded a species of plecoptera (*Leuctra prima* Kremplny) - an indicator of the aquatic habitat quality of this site.

In the Pilot area are represented acidic brown soils which belong to the category of forest soils. The soils are vulnerable to erosion especially in combination with the geological base found in this area.

According to the zonation of the Nature Park Medvednica defined by the Spatial plan of the Nature Park Medvednica, the Pilot area is mostly located within the zone of use (ski resort) and the zone of moderate protection (peak zone), and the marginal parts enter into the zones of special reserves of forest vegetation and forest complex (Figure 14).

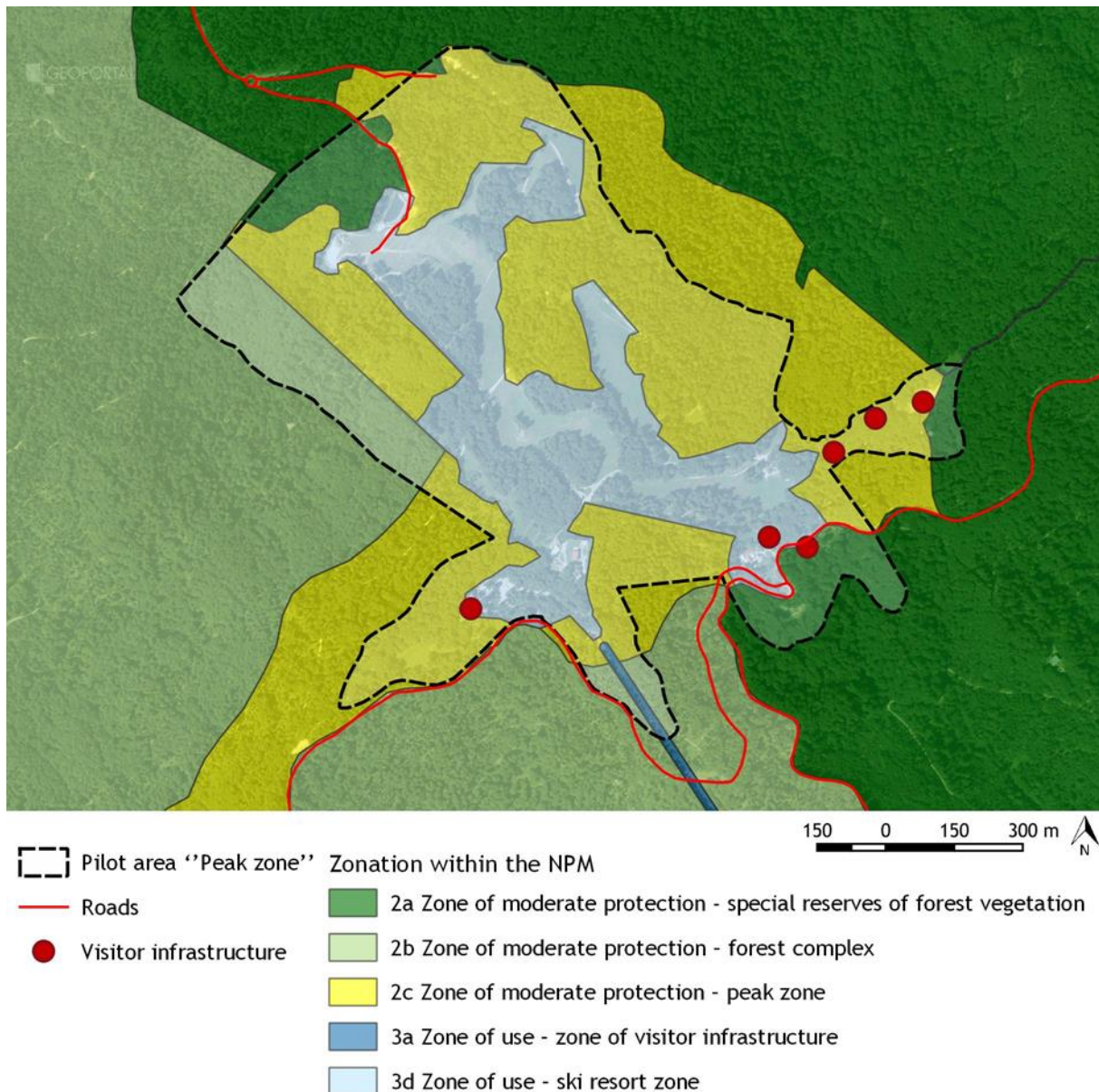


Figure 14 Zonation of the Nature Park Medvednica - at the Pilot area „Peak area of the NPM“

6.4. Access to the Pilot area „Peak area of the NPM“ and traffic communication within it

In the existing situation the Pilot area can be accessed by (Error! Reference source not found.:

- Motor vehicles (e.g. personal cars, motorcycles and etc.)
 - county road 2219 from the direction of Stubičke Toplice which connects to Sljeme road;
 - Sljeme road from the direction of Bliznec (Zagreb) to the foothill of Tomislavov dom, from where the road is separated which then directly accesses Tomislavov dom and the parking lot below the hotel. From the arraigned plateau of the parking lot for personal cars and buses there is a service



road which leads to the TV Tower at the top and an access-pedestrian road which is used for supplying and delivering to the catering facilities at the top of Sljeme. Also, from this road an access-pedestrian road is separated in the direction of the upper station of ZET cable car. Most roads are asphalted or have a paving of typical elements. The access road to certain buildings and sites is only possible for emergency and service vehicles, by branches from the Sljeme road, forest road and walking/hiking paths;

- non-classified asphalted road from the direction of Bistra to the rotor from which is accessed the existing location of the lake (retentions for snowmaking) and the lower part of the Red slope. The macadam road leads northeast of the rotor to the location of an unpaved parking lot, located north of Krumpirište. The traffic connection of the Krumpirište zone towards the peak (connecting to Sljeme road) is via Erber's trail.

Parking within the Pilot area is provided on arranged parking plateau below the Hotel Tomislavov dom, on an unpaved parking lot north of Krumpirište and next to catering facilities. Since the existing capacity of parking spaces cannot accommodate all the visitors who come to Sljeme by cars on holidays and weekends, a large number of cars are parked longitudinally along the roads.

Urban development plans (UDP) which define the manner and conditions of using the Pilot Area "Peak area of the NPM" predict the arrangement of up to 15 parking spaces below Tomislavov dom and 78 parking spaces at location north of Krumpirište. Since the planned capacity also cannot meet the demand for parking spaces, UPU is encouraging the use of public transport.

In addition, the parking area is arranged at the foothill of the Bliznec (from the Zagreb side) and Pila (from the Zagorje side).

- public transport
 - extraordinary bus line 140 from the direction of Zagreb which runs on the Sljeme road to the peak zone - Tomislavov dom where the bus station is located (as described before in chapter 1.3.)
 - TAXI service
- walking and bike trails
 - they continue to the traffic network and lead to facilities located at the top of Sljeme and in the vicinity of Tomislavov dom and beyond.

As previously mentioned, City Office for Physical Planning, Construction of the City, Building, Utility Services and Transport started at the beginning of 2019 the **construction of a new cable car** with a plan to complete it by the middle of 2020. The cable car will connect the City of Zagreb and the peak zone. Bottom station Dolje is planned to be located in the immediate vicinity of the tram turnaround Dolje, and the upper station at the very top - at the site of today's viewpoint. In addition, a new intermediate station is planned at the Brestovac area. Urban Planning Plan (UPP) Ski resort has determined the reservation space and the position study of the future cable car from Bistra direction.

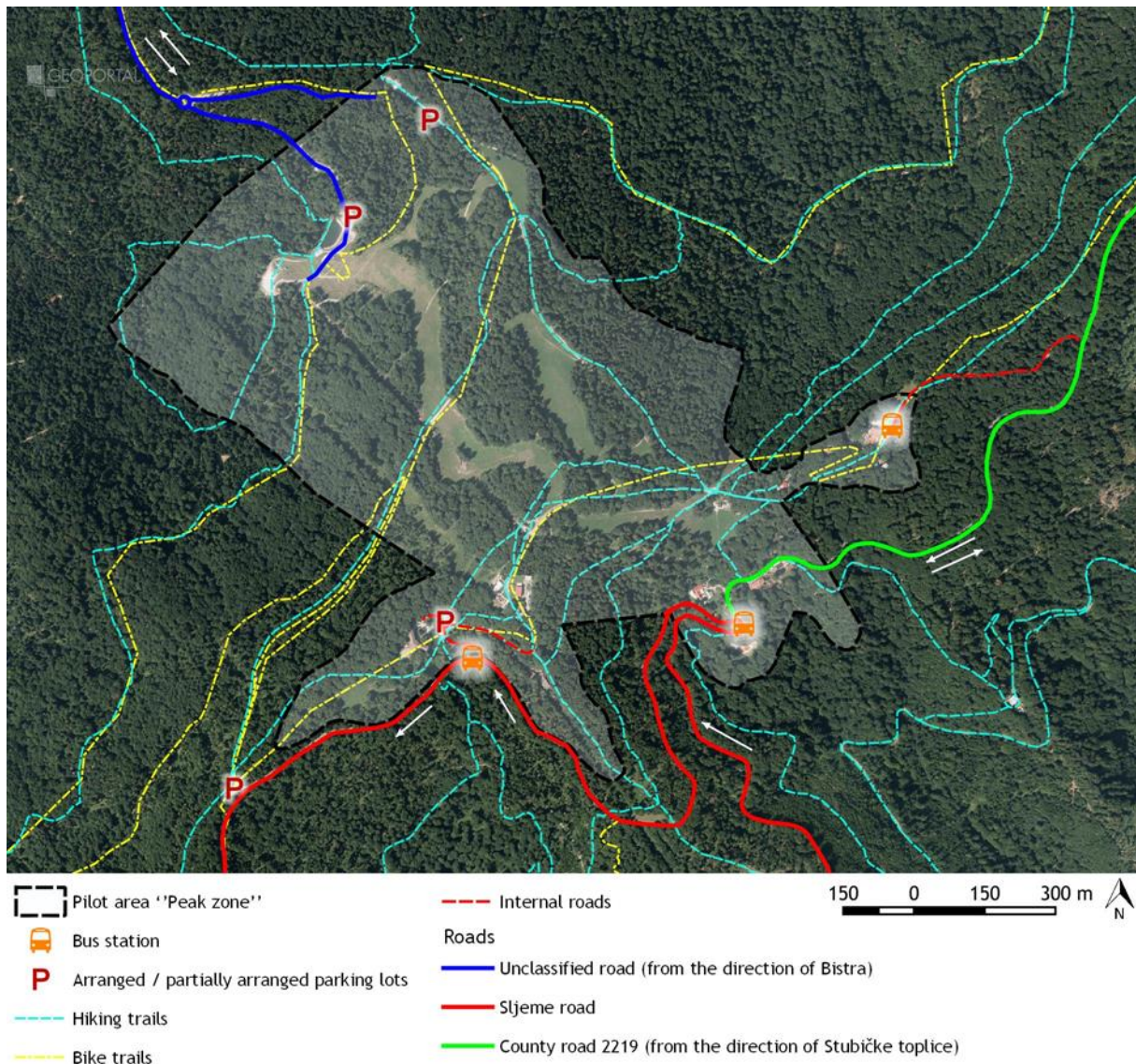


Figure 15 Access and traffic communication within the Pilot area „Peak area of the NPM“

6.5. Issues of the Pilot area „Peak area of the NPM“

Issues of the Pilot area are primarily related to the overload of the number of visitors and in this regard to the generated traffic, especially during the weekend and ski season, resulting in environmental problems within the Pilot area as well as in the surrounding area - "buffer zone".

Overload of the number of visitors

During the winter the Pilot area is particularly attractive due to the ski centre that further attracts tourists from the area of Zagreb, Zagreb and Krapina-Zagorje county, but also from the wider area. In addition to the recreational skiers, ski competitions are also organized in this area that additionally generate number of visitors. Artificial snowmaking also allows longer skiing season, which lasts about 4 months (from November/December to March/April depending on weather conditions).



In the ski season 2017/2018, a total of 33,744 tickets were sold, of which a lot more tickets were sold in February compared to other months. It is also noted that most of the sold tickets refer to weekends (47.7% on average), then working days - day skiing (34.7% on average) and working days - night skiing (16.9% on average). The number of sold seasonal and multi-day tickets is negligible (Figure 16).

The most important ski competition FIS "Snow Queen Trophy" is a two-day event during which the Pilot area visits about 15,000 visitors.

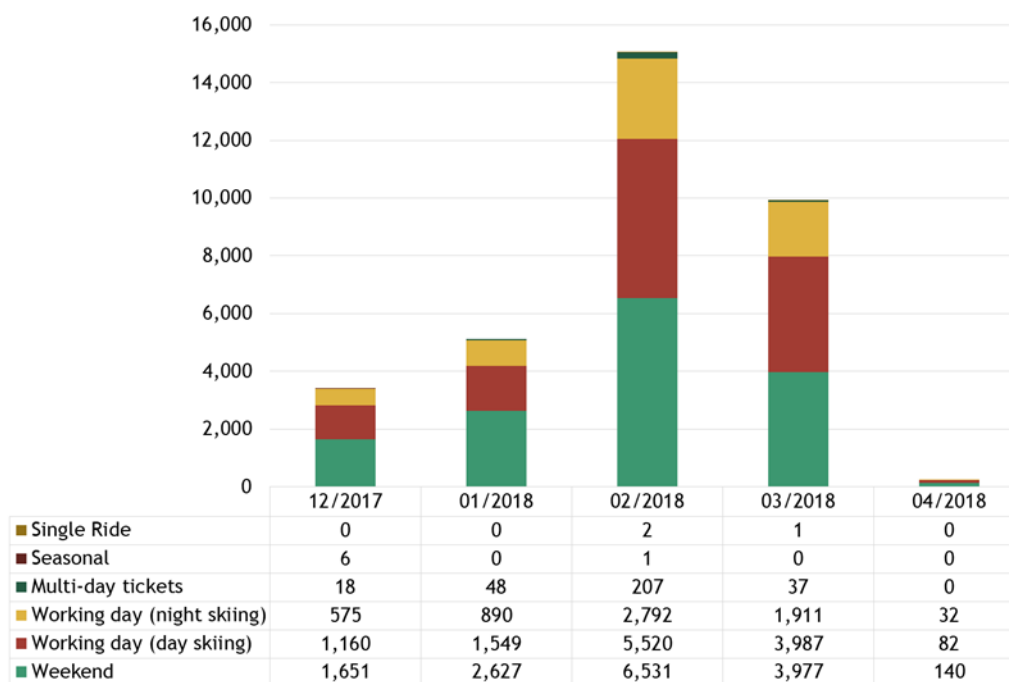


Figure 16 Number of sold ski-tickets during the ski season 2017/2018 (Source: Reports for December 2017, January-April 2018, Sports facilities management)

According to the type of sold tickets, it can be noticed that adults (64%) are dominant in the structure of ski resort users, while children (up to 15 years) are represented by 25.8% on average, and seniors (older than 65) 10.4 % on average (Figure 17).

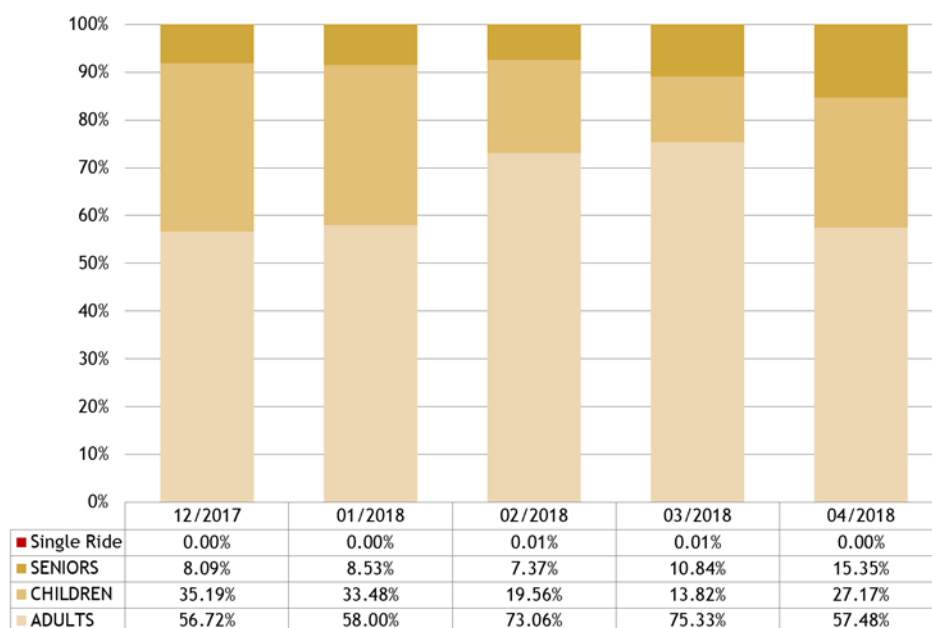


Figure 17 Structure of ski resort users according to the type of purchased ski-ticket (children, adults, seniors) during the ski season 2017/2018 (Source: Source: Reports for December 2017, January-April 2018, Sports facilities management)

Traffic load

A large number of visitors at the Pilot area also generates a large number of cars and other motor vehicles. The roads have uneven levels of final processing, state of final layer and width. The paths and approaches are partly retained in the natural state and partly processed with the final layer (macadam, asphalt, cube or profile). There are currently 135 parking spaces in the Peak zone area, which is not enough in winter when ski slopes start to function and the number of visitors arriving by car is increased. The vehicles are then left on all available surfaces, and mostly next to the pavement of main road (even up to more than 750 m away from the peak Sljeme) and access roads, which makes difficult normal traffic flow, supply, emergency assistance and firefighter access, plant service and snow clearing (Figure 18 and 19).

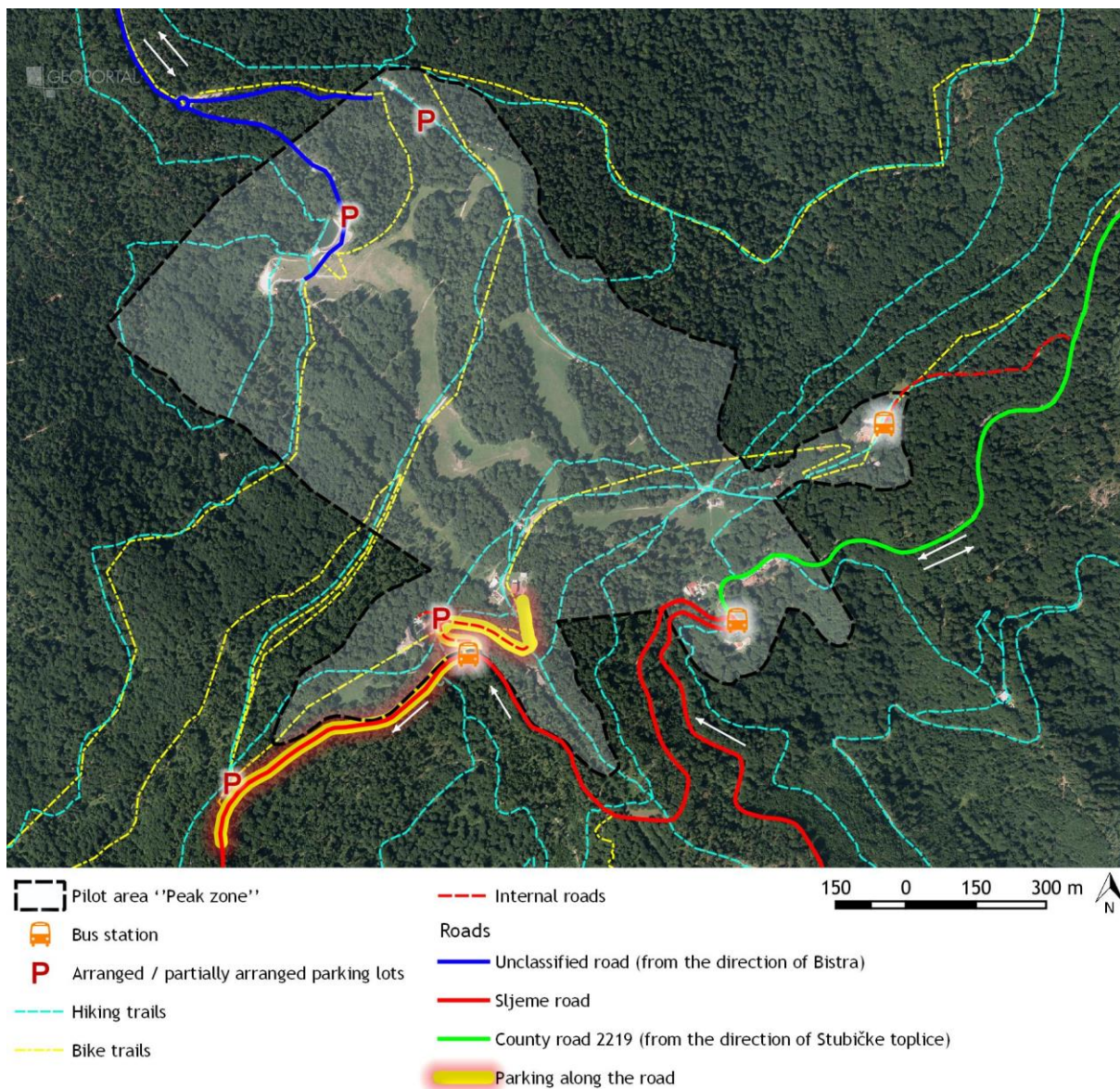


Figure 18 Parking along Sljeme road and internal roads in times of big crowds



Figure 19 Issues of parking along the road during the ski season

Lack of parking spaces as well as uncontrolled arrivals by personal cars represent one of the biggest problems in the winter period for functioning of entire recreational complex within the Pilot area, but also an environmental pressure (pollution of air, soil, etc.) and dissatisfaction of visitors.

During the "Snow Queen Trophy" competition, Sljeme road is closed for personal vehicles, and transport is organized by ZET and traffic problems were solved by such traffic regulation. However, the closure of the road for passenger transport is an exception related only to such major manifestations. The public institution has no possibility to restrict or regulate traffic flow through the Park via Sljeme road as it is categorized as a county road.

Another problem is the lack of sufficient parking spaces at the driveway to the Park or at the main entrances to the Park, and visitors frequently leave personal vehicles on inadequate surfaces.

Although a bus line from the direction of Zagreb is organized, the frequency of driving schedule is not enough to meet the needs of a large number of visitors, but also with regard to the equipment the skiers carry with them.

Environmental problems related to tourism in the Pilot Area „Peak area of the NPM“

The problems described above, generated by a large number of visitors, and the inability of adequate parking, naturally represent pressure to the environment of the Nature Park. Improper parking on green areas often results in damage to trees and degradation of local habitat conditions - damage to the upper (humus) layer of soil occurs, which can result in leaching of nutrients and humus during snow melting and



reducing of soil productivity in the affected area. A large number of cars, especially in situations where there are crowds also has as a result air pollution by exhaust gases, and the study of the concentration of salt in the soil in the NPM area, which was carried out by the Faculty of Agriculture in 2015 and 2016, showed that impacts on the soil are also present in the form of releases and accumulation of pollutants into the soil (the concentration of salt in the soil along the Sljeme road is significantly higher than at control points within the forest complex).

In addition, the ski resort itself generates certain impacts. After the winter, the surface layer of ski slopes is exposed to erosion influences. Water due to snow melting or rain carries fertile ground from the steep parts of slopes, leaving parts of the slopes bare. The slopes during other months differ from the other green areas, and the reason is that all technical measures to prevent erosion were not fully taken. One of the causes is also pulling of the logs by the tractors across the ski slopes. Soil contamination (increased concentration of nitrate) occurs due to the use of snow stabilizers. The floristic researches of community composition in these meadows have shown that such intensive use causes changes in vegetation and reduced biodiversity of the area, but there are no data on recorded changes of surface water quality and drinking water quality.

7. VISITOR STRUCTURE AND VIEWS

7.1. Results of previous surveys

The structure and views of the NP Medvednica visitors (source: Visitor structure and views, and economic valuation of the Nature Park Medvednica, 2009)

In the period from May 2007 to May 2008, research of the structure and views of the NPM visitors was conducted on a sample of 926 visitors. Based on the conducted research, the following conclusions were made:

- Nature Park Medvednica is mostly visited by domestic visitors (99.53%)
- population from the immediate vicinity (the City of Zagreb and the Zagreb county) is the largest source of demand for the NPM (91.72%)
- most of the Park's visitors are young and middle-aged, medium (42.9%) and highly educated (40.52%), and employed (67%)
- most visitors come to the Park on the weekend (80.5%), several times a year (37.4%). Only 5.3% of respondents answered that they were in the Park for the first time.
- most visitors visit the Park in company of friends (50%) and family (34%)
- 42% of visitors received information via informal sources (by oral recommendation from friends and relatives) and from the official channels follow the Internet (12.4%), newspaper articles (10.5%) and RTV reports (2.7%)
- 74% of visitors stay half a day in the Park, and almost a quarter of the respondents stay all day in the Park
- the three most visited sites in the Park are Puntijarka, Vidikovac - TV Tower and Grafičar
- 43% of visitors come with personal vehicle to the Park



- the majority of visitors were satisfied with the offer in the Park, the level of satisfaction with the offer for which is responsible the Public institution "Nature Park Medvednica" is somewhat higher, except in case of Info centre and Infomat
- 57% of visitors are satisfied with the general signalling of the Park
- among the surveyed visitors, the following motives are the primary: staying in nature, socializing with family and friends, rest and recreation
- total number of estimated visitors per year in the Nature Park Medvednica amounts to 1,005,000 visitors.

The structure and views of the NP Medvednica visitors (source: Visitor structure and views, and economic valuation of the Nature Park Medvednica, 2012)

- Nature Park Medvednica is mostly visited by domestic visitors (99.09 % as opposed to 99.53 % in 2009)
- population from the immediate vicinity (the City of Zagreb and the Zagreb county) is the largest source of demand for the Nature Park "Medvednica" (91.92 %, and 91.72 % in 2009)
- most of the Park's visitors are younger than 35 years (57.66%, and 59.88% in 2009), medium educated (32.62%, and 42.9% in 2009) and highly educated (35.1% and 40.52% in 2009), and employed (50.77%, and 67% in 2009)
- most visitors come several times a year (30.78%, and 34.7% in 2009), while 12.89% were for the first time at Medvednica (only 5.3% in 2009)
- most visitors come with friends (40.85%, and 50% in 2009) and with the family (24.42%, and 34% in 2009)
- 30.6% of visitors found the information on events in the Park via the Internet, as opposed to 2009, when the percentage was only 12.4%. Recommendation from relatives got 20.88% and in 2009 it was 42%, while 22.04% of visitors have the habit of coming to Medvednica as opposed to 2009 when the percentage was higher, i.e. 29.27%
- the majority of visitors arrive on Saturdays (37.47%) and stay half a day (59.12%)
- the three most visited sites are the TV Tower - Vidikovac, Puntijarka and Grafičar
- 41% of visitors come to the Park by personal vehicle (in 2009 it was 43%)
- most visitors were satisfied with the offer at the Park
- 55.4% of respondents are satisfied with the general signalling of the Park
- main reasons for arrival are: stay in nature (30.86%), socializing with family and friends and rest (23.97%) and recreation (20.23%).



7.2. Description of the research methodology (at the Pilot area „Peak area of the NPM“)

For the purposes of the preparation of this Action Plan, research has been conducted with the aim of gathering information on the habits and views of the Pilot area visitors, primarily the ski resorts, and also other peak zone contents, as well as their perception of influence on the natural values of the Nature Park Medvednica and the role of the Public institution which manages the NPM within its competencies. The research was conducted by the survey method, and the basic topic and the number of respondents required were determined by the project assignment. The main theme and template of the survey was prepared by the Public Institution and coordinated with the stakeholders at the workshop of the Stakeholder’s Forum held in July 2018, after which the survey was amended, and the final version was made.

Designing the survey

Since this action plan proposes activities aimed at ensuring the continuation of the development of tourism and recreational activities, taking into account the natural values of the NPM, but also carrying out of educational activities, the survey is designed to gather information on:

- visitor habits related to the way and frequency of arrival to the peak zone and getting information on the condition of the ski resort
- visitor perception of Medvednica as a protected area and the role of the Public Institution in management of this protected area
- visitor views on the existing way of organization of arrivals and possible solutions for improvement
- visitor structure with regard to age, work status and place of residence.

Attachment 1. Survey questionnaire in English language

Conducting the survey

The survey was conducted on a sample of 406 respondents:

- by direct questioning (field surveying i.e. oral surveying at a frequent location within the Pilot area)
- by indirect questioning (on-line surveying, gathering surveys by distribution at other locations where area users are gathering (ski clubs and catering facilities) (Figure 20).

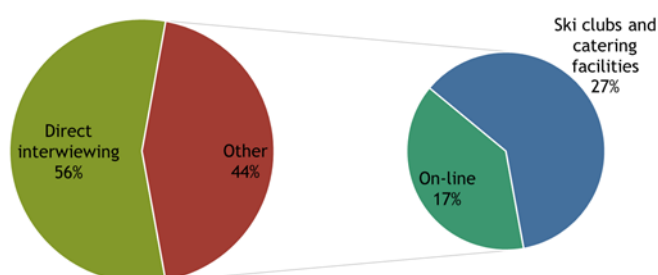


Figure 20 Relationship between the sample number of respondents covered by direct and indirect questioning



Direct questioning - field surveying

Field surveying was carried out in the period from 26 January 2019 to 17 February 2019, targeting the periods when visiting peak area is most frequent (weekends, night skiing, competitions). The number of surveyed respondents was equally divided according to days of surveying with the expected lower number during the working day, and in total 56% of respondents' samples were included (Figure 21).

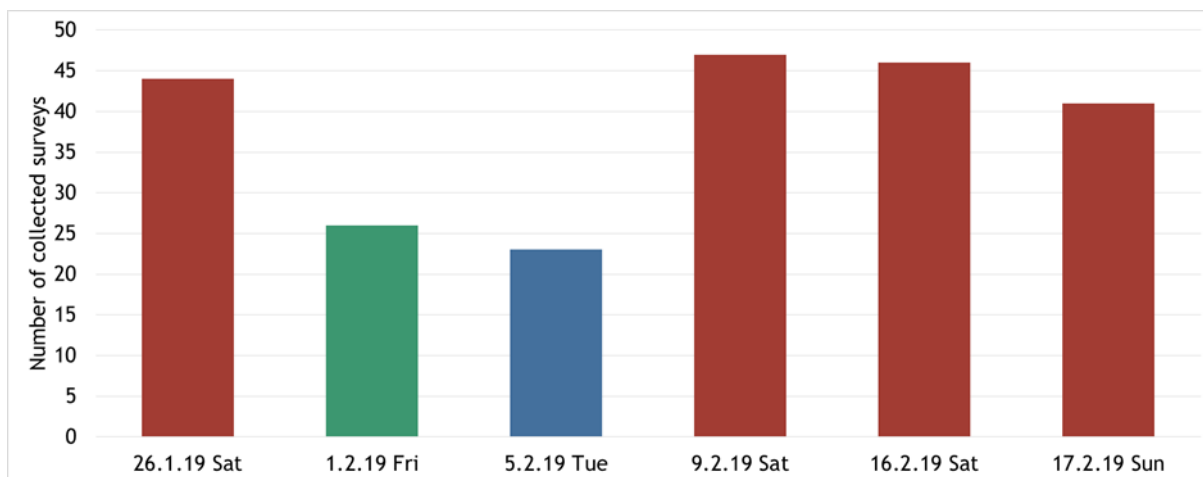


Figure 21 Number of collected surveys during on-field surveying per days (red: weekend, green: day skiing, blue: night skiing)

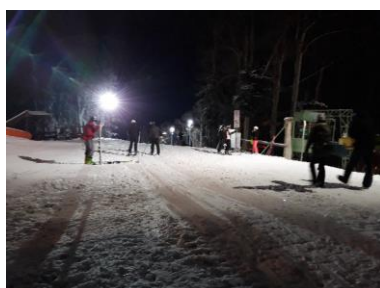
After examining the way of use of the Pilot area and the location of user gathering, field survey location was determined - at the viewpoint, next to the catering facility, the ski equipment rental and the trail leading to the ski slopes. In this way, the survey covers those users who purposely come to the Pilot area (Figure 22Error! Reference source not found.).



26 January 2019 Saturday



01 February 2019 Friday



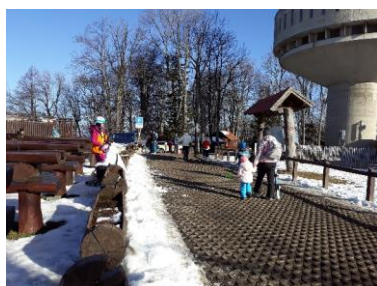
05 February 2019



09 February 2019 Saturday



16 February 2019 Saturday



17 February 2019 Sunday

Figure 22 Photodocumentation from the field surveying

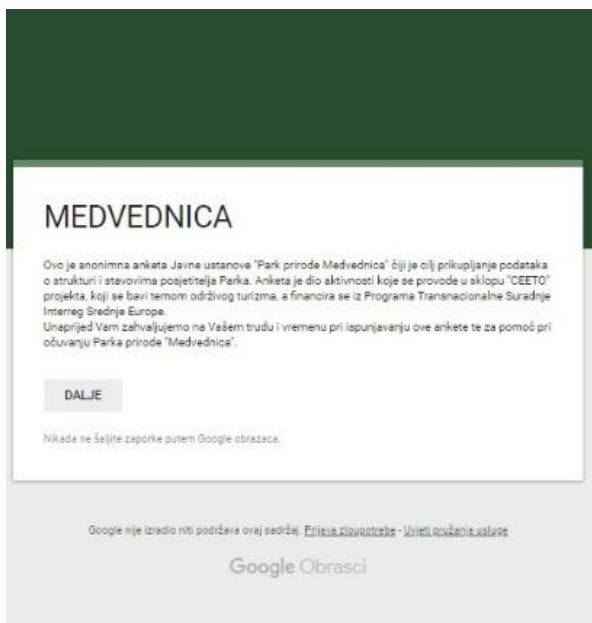
Indirect questioning

- Surveys collected at ski clubs and catering facilities

Surveys were distributed at one ski club (which is also a member of the Stakeholder's Forum) and at one catering facility. In this way, mainly were involved users of Pilot area who purposefully and deliberately come here in the winter period (ski schools, competitions and similar) and make up 27% of respondents.

- On-line surveying

In order to collect data on the structure and views of a wide group of visitors who potentially also come to the zone covered by the Pilot area but are not exclusively connected to the same, an on-line survey was made which included 17% of respondents' sample (Figure 23).



Iz kojeg smjera ste došli (na skijalište)?

- Iz smjera Zagreba
- Iz smjera Stubičkih toplica
- Iz smjera Bistre

Kako ste došli do vršne zone Parka prirode Medvednica?

- Javni prijevoz (ZET)
- Organizirani prijevoz
- Osobni automobil
- Kombinirani prijevoz (osobni automobil + javni prijevoz)
- Ostalo: _____

Iz kojeg razloga ste odabrali ovu vrstu prijevoza/dolaska?

Vaš odgovor: _____

Ako ste došli automobilom ili kombiniranim prijevozom, gdje ste parkirali?

- Parkiralište Mihaljevac
- Parkiralište Gračani
- Parkiralište Bliznec
- Parkiralište Pila
- Parkiralište u vršnoj zoni
- Duž ceste
- Ostalo: _____



Kad se govori o upravljanju Medvednicom, koja od navedenih ustanova Vas prvo asocira na to?

Grad Zagreb

Hrvatske šume

Javna ustanova za zaštićena područja

Skijalište Sljeme

Ne znam

Niti jedna od navedenih

Što mislite, treba li štiti prirodu Medvednice?

DA

NE

NE ZNAM

Ako DA - što mislite, od kojih utjecaja ju treba štiti?

	DA	NE	NE ZNAM
Gradnje	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prevelikog broja automobila	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prevelikog broja posjetitelja	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Svijetlosnog onečišćenja	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Umjetnog snijega	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sječe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Smeta li Vam broj automobila na Medvednici?

DA

NE

Kako ocjenjujete sljedeća moguća rješenja organizacije pristupa skijalištu? (-2=izrazito beskorisno, -1=beskorisno, 0=neutralno, +1=korisno, +2=izrazito korisno)

	-2	-1	0	1	2	Ne znam
Izgradnja nove žičare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dodatna parkirna mjesta u podnožju, uz organizaciju prijevoza do vršne zone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zabrana parkiranja u vršnoj zoni	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ograničeno parkiranje u vršnoj zoni (uz rezervaciju)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Info-semafori (s informacijama o stanju parkirnih mjesta u vršnoj zoni i pristupnim cestama)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Web-stranica (s informacijama o stanju parkirnih mjesta u vršnoj zoni i pristupnim cestama)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mobilnu aplikaciju (s informacijama o stanju parkirnih mjesta u vršnoj zoni i pristupnim cestama)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Koliko biste bili spremni platiti dnevnu parkirnu kartu na rezerviranom parkirnom mjestu na vršnoj zoni?

200 kn

100 kn

60 kn

Ne bih bio/bila spreman/na platiti dnevnu kartu

Ne znam

Figure 23 Appearance of on-line survey

Data processing

The data were parallelly with surveying entered in the Excel table, from which further analysis was performed. There may be some inconsistencies in the results regarding certain questions due to non-completing the whole survey. The analysis only took into consideration the questions that were answered. In general, it can be said that most respondents have completed the whole survey, and unanswered questions are more frequent in an indirect questioning (on-line surveying or independent completing of the survey). The reason for this may be not understanding the question, insufficient time to complete, etc. Regarding questions 4 and 5, which relate to parking habits if the respondents used personal car for transport, certain percentage of unanswered questions actually applies to those respondents who did not use personal car or combined transport so such responses were marked as "not applicable" (Figure 24).

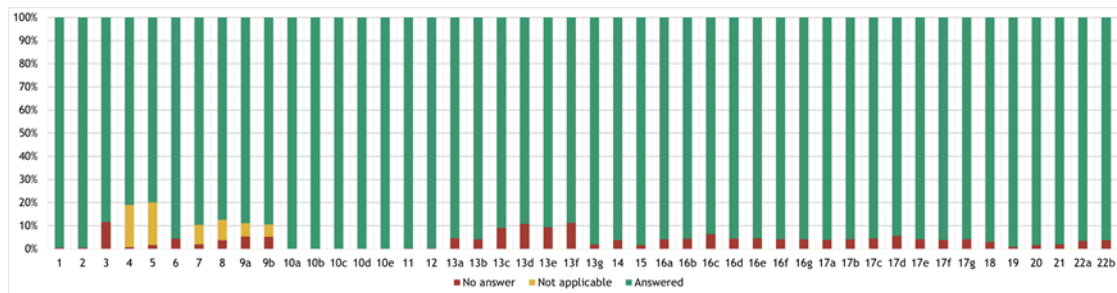


Figure 24 Share of unanswered questions in the survey

8. SUSTAINABLE TOURISM ACTION PLAN

8.1. The Vision of Sustainable Tourism in the Nature Park of Medvednica

Nature Park Medvednica is well known touristic destination. The visitor program informs and explains the nature protection and cultural heritage as well as good business of local entrepreneurs and increased quality of life of the local population.

The primary role of PINPM is to preserve the natural and cultural heritage of the Park and its biological and landscape diversity, and to systematically collect and interpret Park information, highlighting its special qualities and to educate current and future generations. However, the Institution should also be involved in the development of sustainable tourism in the Park, supporting tourism projects and initiatives in the Park through active co-operation with the tourism sector (TCs and agencies), marketing and promotion of joint programs. Such co-operation would not lead to the overlap of the area of activity of the tourism sector and the Institution, but to their mutual complementation and expansion of sustainable tourist offer at the Park. The emphasis of such co-operation should be to make it mutually useful for both the tourism sector and the Park itself, or the Institution that manages it.

8.2. Stakeholder’s Forum

In June 2013, PINPM founded Nature Park Medvednica Stakeholder’s Forum because of the nomination for the European Charter for sustainable tourism (Europarc), which implies that since then it organizes and coordinates the work of the Forum and the activities that result from its operations. The work of the Forum is based on building of trust, but the greatest emphasis is on taking over leadership and responsibility for removing the problems that stakeholders face in their business. The stakeholders of the Forum jointly created smaller projects whose goals and expected results were useful to all stakeholders, including the NPM visitors. The NPM Stakeholder’s Forum has actively participated in the drafting of the proposal for Sustainable Tourism Strategy.

A dozen forum meetings were held, attended by seventy different institutions operating within and beyond boundaries of the Park, with total of 119 different representatives. The members of the Forum are various institutions for the protection of nature and cultural heritage, tourist sector (tourist boards and the Ministry



of Tourism of the Republic of Croatia), fire brigades, police, catering and hotel industry and the local community.

Crucially important for the implementation of the CEETO Project and this Action Plan are Stakeholders - members of the Forum who can within their competencies recognize the problems and act in a way that will in the future ensure implementation of tourism and recreational activities in sustainable manner. They are also users of the area, such as institution Sports Facilities Management, Sljeme Ski Resort, Croatian Ski Association, ski clubs, or have the authority to manage roads, public transport and others (Table 3).

Table 3 Selected stakeholders - members of the Stakeholder's Forum directly involved in the CEETO project and drafting of the Action Plan

STAKEHOLDERS (MEMBERS OF THE STAKEHOLDER'S FORUM)	CONTACT INFORMATION		
Sports services			
Institution Sports Facilities Management - Sljeme Ski resort	igor.ziljak@sportskiobjekti.hr	Igor Žiljak	
	veronika.antic-vodopivec@sportskiobjekti.hr	Veronika Antić	
	alexei.puninski@sportskiobjekti.hr	Alexei Puninski	
Croatian Ski Association	fleiss@croski.hr	Reno Fleiss	
	pavlek@croski.hr	Vedran Pavlek	
	raos@croski.hr croski@crosku.hr	Damir Raos	
Ski club Sljeme Zagreb	info@sk-sljeme.hr	Gordan Mlinarić	
Emergency interventions			
Croatian Mountain Rescue Service (HGSS) - Branch Zagreb	kabic@gss.hr	Dubravko Kavčić	
	ana.baksic@gmail.com	Ana Bakšić	
	stanica-zagreb@gss.hr		
Traffic services			
Zagreb Electric Tram	javnost@zet.hr	Bator Ivan	
	marketing@zet.hr	Batinić Martina	
	eskoko@zet.hr	Elizabeta Skoko	
City Office for Physical Planning, Construction of the City, Building, Utility Services and Transport			
	Sector for roads	krunoslav.tepes@zagreb.hr	Krunoslav Tepeš
	Municipal services	mladen.vidmar@zagreb.hr	Mladen Vidmar
	Sector for traffic	tihomir.barisic@zagreb.hr	Krunoslav Tkalčić
Ministry of Interior - Police department Zagreb - Road traffic service	kmisic@mup.hr	Krešimir Mišić	



Zagreb Holding - Zagreb roads	zgceste@zgh.hr	Ante Todorć
Zagreb Holding - Zagrebparking	infozgp@zgh.hr	Ana Preost
Local community		
Municipality Bistra	kresimir.gulic@bistra.hr , opcina-bistra@bistra.hr	Krešimir Gulić
Accommodation and catering services		
Hotel Tomislavov Dom	antonia.eman@zgh.hr , davorin.blagojevic@zgh.hr	Antonia Eman Davorin Blagojević
Catering facility Vidikovac - Sljeme	vidikovac.sljeme@gmail.com	Darko Sobota
Catering facility Kućica	hrvoje.popovic@icloud.com	Hrvoje Popović
Catering facility Stara Lugarnica	staralugarnica@net.hr	Ljerka Opuhač
Tourist apartments Snježna kraljica	snjezna.kraljica@zgh.hr , valentina.novosel@zgh.hr	Valentina Novosel
Forestry		
Croatian Forests, Forest Management Zagreb, Forestry Zagreb	zagreb@hrsume.hr , ivica.dugacki@hrsume.hr	Ivica Dugački
Croatian Forests, Horticulture Zagreb	damir.dramalija@hrsume.hr	Damir Dramalija
Protection of the environment and nature		
WWF ADRIA	astefan@wwf-panda.org akrvaric@wwfadria.org	Andrea Štefan Ana Krvarić
Ministry of Environment and Energy, Department for Nature Protection	daniel.springer@mzoe.hr , marijana.kapa@mzoe.hr	Daniel Springer Marijana Kapa
City of Zagreb, City Office for Economy, Energy and Environment protection	latica.ivkovic@zagreb.hr	Latica Ivković
Tourist services		
Tourist Board of the City of Zagreb	dguvo@zagreb-touristinfo.hr	Davor Guvo
Mountain communities		
Croatian Mountain Guides Association	zeljko.gobec@sgvh.hr	Željko Gobec
Zagreb Mountain Association	planinarski-savez@zg.htnet.hr	

8.3. Work of the Stakeholder's Forum on the CEETO Project - Action Plan

As part of the CEETO project, four Stakeholder's Forum meetings have been held so far, including a workshop with selected stakeholders, which was also the 21st meeting of the Nature Park Medvednica Stakeholder's Forum. The aim of this workshop was to develop the Action Plan in the Nature Park Medvednica, with an emphasis on defining the role of individual stakeholders (institutions) in the project, identifying problems



and possible solutions and ultimately proposing specific measures. The area problems as well as suggested solutions were defined at the workshop.

Crowds in the peak zone due to inadequately parked cars along the main road and other roads. Inadequately marked parking spaces at Tomislavov dom and insufficient capacity for reception of cars at the bottom cable car station Dolje.

Possible solutions:

- it is necessary to define the number of parking spaces and adequately mark them
- enable the road in the peak zone to be two-way (from Tomislavov dom to the Dom Željezničar)
- extend the Sljeme road and enable longitudinal parking
- limit the number of visitors to the peak zone
- encourage the use of public transport
- regulate and direct traffic and parking (traffic officers)
- re-introduce circular route of mini-buses and vans in the peak zone to transport skiers with equipment to the ski resort (for this activity it is necessary to enable traffic in both directions in the peak zone and longitudinal parking)
- buses and vehicles in the event organization should not be prevented from coming to Sljeme
- promotion through reservation via e-mail to reduce the number of vehicles (filling vacant spaces with personal vehicles)
- re-introduce additional bus rides as needed during the time of large crowds in order to relieve large numbers of people in the peak zone.

Impassability and unsafety of the road due to snow - the road is not co-ordinately closed if it is not cleaned.

Possible solutions:

- earlier coming of snowploughs from the road maintenance service in order to make the road safe for early morning arrival to the ski resort (the ski resort operates from 9am)
- enable the road in the peak zone to be two-way (from Tomislavov dom to Dom Željezničar)
- introduce the option of transport by mini-buses to the peak zone in case of road closure
- in the case of accidents on the road, enable detours through unmarked macadam paths.

Inadequate communication between the road maintenance service and police as well as communication with stakeholders regarding weather conditions at Sljeme (visitors have no insight into road conditions and weather conditions at Sljeme).

Sljeme Ski resort on Facebook publishes the condition and has a telephone line, but is mostly overloaded during the ski season. There are cameras from the ski resort (4 in the peak zone at Vidikovac and at the Zlatni medvjed) but they often do not convey a picture due to weather conditions.



Possible solutions:

- earlier coming of snowploughs from the road maintenance service in order to make the road safe for early morning arrival to the ski resort (the ski resort operates from 9am)
- ensure better communication between stakeholders as well with visitors who should receive timely and accurate information from the field
- establish a central point (info centre) - a person who would respond to inquiries of the citizens from 0 to 24 h and would be in constant communication with all institutions and stakeholders
- influence that all relevant institutions in their annual programs/plans include activities related to better road, traffic and similar management for better coordination and financing of the required activities.

Inadequate maintenance of the turnaround for ZET buses (they are often depots for materials of Croatian Forests because they are land owners)

Possible solutions:

- ensure better coordination with Croatian Forests during maintenance of depots which are used at the same time as bus stations
- enter in the concession that wood depot should be handled by 1 November
- by the reconstruction of the bus turnaround ensure better technical conditions for turning of the buses.

Lack of facilities and shelters for future visitors that will come by cable car (capacity of cable car will be 1,600 people per hour and the reception area is 2,500 people in the peak zone. The problem will be descending a large number of people by cable care when the ski resort closes)

Possible solutions:

- develop additional facilities and shelter for visitors.

Insufficient communication with the media

Possible solutions:

- improve the relationship with the media and regularly invite them to meetings and education to minimize the unfounded "bombastic" titles which negatively impact on arrival of visitors
- continue media promotion through radio and TV channels and publish information in cases of closed road.

Other suggestions

- set traffic counters to multiple locations to track visitor statistics
- enrich the summer offer of the NPM - summer sledging, adrenaline park, "zip-line" in order to make use of the infrastructure
- arrange the running track



- arrange the hall next to Tomislavov dom for exercises, which will increase the number of athletes who are preparing for the competition
- set up cameras (it is necessary to obtain police permission after determining the exact locations and camera numbers).

8.4. SWOT Analysis

This SWOT analysis results from the Sustainable tourism action plan and is complemented by the results of conducted workshop with the Stakeholder's Forum and surveys. The SWOT analysis is communicated to the members of the Stakeholder's Forum at workshop of presenting this Action Plan.

Table 4 Swot analysis

STRENGTHS	WEAKNESSES
<p>An attractive and preserved natural and cultural heritage of Medvednica</p> <p>Pleasant microclimate (summers are cooler than in town, winters are snowy, colourful colours during spring and fall).</p> <p>Large number of facilities for an active holiday in nature - ski slopes, bike trails, health resort north of the NPM.</p> <p>Faithful visitors - Medvednica is regularly visited by a large number of excursionists, recreationalists and hikers from Zagreb and surrounding counties, as well as from abroad.</p> <p>Good partnerships - WWF, Europarc, Dinaric Arch Parks.</p>	<p>A large number of stakeholders who manage the infrastructure for visitors (services and facilities).</p> <p>Inadequate transport infrastructure (ZET cable car).</p> <p>The expressed seasonality of visiting the NPM.</p> <p>Traffic - excessive traffic loads on the weekends and during the ski season, lack of parking spaces, traffic jams, pollution caused by traffic (soil, air, noise), noise that threatens the health and sense of visitor satisfaction.</p> <p>Concentration of most objects and visitors in the wider peak area of Medvednica.</p>
OPPORTUNITIES	THREATS
<p>Increasingly larger number of new trends in tourism, e.g. visiting protected areas (so called "green tourism"), health, cultural, adventure and active tourism.</p> <p>Stakeholder's Forum - an opportunity for growth in a "powerful" body that can proactively solve current issues, e.g. traffic signalling, parking lots, traffic connections.</p> <p>Construction of cable car has started - the possibility for solving many traffic problems.</p>	<p>Increased pressure of visitors and reduced quality of visits as a result.</p> <p>Too many non-cooperating participants, two levels of institutional framework (city and state) - overlapping and vagueness of jurisdiction.</p>



8.5. Europarc Federation and ECST

EUROPARC Federation is a network of protected European areas, founded in 1973. EUROPARC functions as an independent non-governmental organization whose main task is to improve the management of protected areas in Europe through international co-operation, exchange of experiences and ideas and by influencing on the environmental management policy of European countries.

Through the award of the European Charter for Sustainable Tourism in Protected Areas (ECST), EUROPARC seeks to preserve cultural and natural values by encouraging quality sustainable tourism, encouraging partnerships for support of local living needs, raising awareness of the need for sustainability and promoting international cooperation.

The Charter contains a number of principles that define and recognize good practice in developing and managing sustainable tourism in the most renowned landscapes in Europe:

1. give priority to nature protection
2. contribute to sustainable development
3. involve stakeholders
4. effectively plan sustainable tourism
5. carry on continuous improvement.

(<https://www.europarc.org/sustainable-tourism/charter-principles/>; https://www.europarc.org/wp-content/uploads/2015/12/ECST_2015.pdf)

After being nominated for the Charter for Sustainable Tourism, the Public Institution “Medvednica Nature Park” established a forum for Stakeholders, developed a Strategy for Sustainable Tourism of PPMs filled the comprehensive application and verified ground data - thus it received Europarc’s Charter on Sustainable Tourism in December 2014.

In 2015 Europarc Federation published a publication named “Sustainable Tourism in Protected Areas, good for Parks, good for People” which represents the updated European Charter for Sustainable Tourism in Protected Areas: http://www.europarc.org/wp-content/uploads/2015/12/ECST_2015.pdf. The publication includes the vision, principles and objectives (Table 4).

Table 5 Key Issues and Activities of the European Charter for Sustainable Tourism in Protected Areas

KEY TOPICS	KEY ACTIONS
1. Protecting valuable landscapes, biodiversity and cultural heritage	1.1 Influencing land use planning and the control of potentially damaging developments; 1.2 Influencing the location, type and design of tourism developments; 1.3 Managing visitor flows, activities and behavior in sensitive areas and sites.



<p>2. Supporting conservation through tourism</p>	<p>2.1 Encouraging visitors and tourism businesses to support conservation, through donations, volunteering and other activity;</p> <p>2.2 Using revenues obtained from tourism-related activity to support conservation</p> <p>2.3 Establishing, supporting and promoting tourism-related investments, projects and activities that help to conserve the natural and cultural heritage.</p>
<p>3. Reducing carbon footprint, pollution and wasteful resource use</p>	<p>3.1 Working with tourism businesses to improve environmental management, including use of energy and water, waste management, and noise and light pollution;</p> <p>3.2 Promoting the use of public transport and other alternatives to cars</p>
<p>4. Providing safe access, quality facilities and special experiences of the protected area, available to all visitors</p>	<p>4.1 Providing a wide range of access opportunities, with attention to safety and risk management;</p> <p>4.2 Improving the quality of visitor facilities and services;</p> <p>4.3 Providing visitors with specific tourism offers which involve discovery, interpretation and appreciation of the area's special natural and cultural heritage;</p> <p>4.4 Providing facilities and information for visitors with special needs.</p>
<p>5. Effectively communicating the area to visitors</p>	<p>5.1 Ensuring that marketing materials and activities promote the area effectively and responsibly;</p> <p>5.2 Providing good quality and effective visitor information and interpretation;</p> <p>5.3 Ensuring that tourism businesses and other local stakeholders are well informed about the area and provide relevant and accurate information to visitors;</p> <p>5.4 Providing specific information and interpretation for young people, schools and student groups.</p>
<p>6. Ensuring social cohesion</p>	<p>6.1 Anticipating, monitoring and minimising any existing and potential conflicts with local residents;</p> <p>6.2 Maintaining good communication and engagement between local residents, businesses, visitors and the protected area authority;</p> <p>6.3 Encouraging and developing appropriate partnership activity with and between stakeholders.</p>
<p>7. Strengthening prosperity in the local community</p>	<p>7.1 Promoting the provision and identity of local produce and services and their purchase and use by visitors and tourism businesses;</p> <p>7.2 Supporting the economic viability and performance of local tourism businesses and provision of local employment in tourism.</p>
<p>8. Providing training and capacity building</p>	<p>8.1 Providing relevant training for staff of the protected area authority in sustainable tourism development and management;</p> <p>8.2 Providing and encouraging relevant training and capacity building for tourism businesses and other stakeholders in sustainable tourism.</p>
<p>9. Monitoring tourism performance and impacts</p>	<p>9.1 Monitoring of visitors - volumes, patterns, spending and satisfaction;</p> <p>9.2 Monitoring of tourism businesses - performance and needs;</p> <p>9.3 Monitoring of tourism impacts - on the environment, economy and community;</p> <p>9.4 Monitoring progress in implementing the action plan.</p>



10. Communicating actions and engaging with the Charter	<p>10.1 Communicating sustainable tourism actions and results to local stakeholders and more widely at a local, regional and national level;</p> <p>10.2 Promoting and making visible the award of the Charter;</p> <p>10.3 Engaging with EUROPARC and the Charter Network, participate in related events and activities;</p> <p>10.4 Taking steps for re-application and renewal of the Charter.</p>
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Source: European Charter for Sustainable Tourism in Protected Areas, Europarc 2015, http://www.europarc.org/wp-content/uploads/2015/12/ECST_2015.pdf

8.6. Key objectives

PINPM recognized the three main objectives that are consistent with the topics in Table 4 and are primary and secondary activities implemented by the Public Institution.

Objective 1. Protection of natural and cultural values, topics 1 and 2, 3

Objective 2. Visits management, topics 4, 5 and 6

Objective 3. Communication with stakeholders, topics 5, 6, 7 and 8

For each of the above key objectives, the activities that need to be implemented in the NPM area are defined with the aim of achieving each and every objective, with a timeline of their implementation as well as the stakeholders involvement in the implementation and co-financing of each activity.

8.7. Elaboration of activities

This Sustainable Tourism Action Plan identified three goals of sustainable tourism, within which 18 activities were elaborated which partially interlink and supplement each other. For each activity is defined the role of NPM in its implementation, a list of stakeholders involved in their implementation within their competence, and outcome indicators i.e. indicators for monitoring implementation.

The activities are defined with regard to the identified problems and possibilities of their solutions that have arisen as a result of the workshop with the members of the Stakeholder's Forum (Chapter 8) and conducted research on the structure, habits and views of visitors (Chapter 7).

Table 6 Objectives and activities

Objectives and activities

Objective 1	Protection of natural and cultural values
ECST Key actions	1.1
Activity 1.1	Continue with the monitoring of the Veternica cave



Activity description	Monitoring of underground fauna, bats, measuring climatic parameters. Establishing new researches related to hydrology, geology and similar.
Role of NPM	Implementation
Partners	Research Associations, Scientists
Period	2019-2023
Outcome indicators	Monitoring performed. Cave is a favorable underground habitat. Monitoring reports produced.
Cost	50.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 1	Protection of natural and cultural values
ECST Key actions	1.1
Activity 1.2	Continue with the monitoring of the Zrinski mine
Activity description	Overview of the mining corridors stability. Measuring climatic parameters.
Role of NPM	Implementation
Partners	Faculty of Mining, Geology and Petroleum Engineering, External experts
Period	2019-2023
Outcome indicators	Measured and sub structured corridors implemented. Monitoring reported.
Cost	70.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 1	Protection of natural and cultural values
ECST Key actions	1.1, 1.3
Activity 1.3	Continue with the monitoring of the ski slopes
Activity description	Water and snow monitoring from ski resorts. Monitoring the status of amphibians and turtles. Soil analysis.
Role of NPM	Implementation
Partners	Scientists
Period	2019-2023



Outcome indicators	Monitoring implemented. All components are in favorable condition. Monitoring reported.
Cost	120.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects



Objective 1	Protection of natural and cultural values
ECST Key actions	1.2, 1.3, 2.3, 4.1, 4.2, 4.3, 4.4
Activity 1.4	Reconstruction of the Visitor Center Medvedgrad
Activity description	Creating the Visitor Center Medvedgrad (reconstruction of walls and buildings, decoration of the exhibition space, souvenir shops and catering premises)
Role of NPM	Implementation
Partners	External contractors
Period	2019
Outcome indicators	Visitors Center Medvedgrad established. Restored buildings and walls. Exhibition halls established in South Kula, Small and Large Palace. Equipped souvenir shop and catering facility.
Cost	1.837.153,20 EUR
Financing options	EU Financing, the Environmental Protection and Energy Efficiency Fund, the Joint Funds of Parks

Objective 2	Visits management
ECST Key actions	1.3, 3.2, 4.1, 4.2
Activity 2.1	Reconstruction of Sljeme cable car
Activity description	Construction of new cable car.
Role of NPM	Support
Partners	City of Zagreb
Period	2019-2020
Outcome indicators	Constructed cable car and put into operation. Positive assessment of the increased volume of visiting on environment.
Cost	60.000.000,00 EUR
Financing options	EU Financing, the Environmental Protection and Energy Efficiency Fund, the Joint Funds of Parks

Objective 2	Visits management
ECST Key actions	1.2, 1.3, 3.2, 4.1, 4.2, 4.3
Activity 2.2	Establish a bicycle offer in PPM



Activity description	To achieve sustainable development of cycling - standardization of 8 + 1 bicycle paths. Develop strategy and action plan for cycling. Adapt the existing book of standards for bicycle paths. Create and provide bicycle signaling. Get electric bikes and bicycle rentals.
Role of NPM	Implementation
Partners	External contractors
Period	2019
Outcome indicators	8 + 1 cycling trails in NP Medvednica. Strategy and Action plan for cycling. Updated standards book. 10 cycling boards and 7 electric bicycles. Promotion of bike trails and rentals in Park.
Cost	75.066,70 EUR
Financing options	EU Financing, the Environmental Protection and Energy Efficiency Fund, the Joint Funds of Parks

Objective 2	Visits management
ECST Key actions	2.3, 9.1
Activity 2.3	NPM visitor survey
Activity description	Track movement and control visitors - provide visitors counter. Software research and data processing. Create a Visitor management study.
Role of NPM	Implementation
Partners	External contractors
Period	2019
Outcome indicators	Visitor tracking equipment provided. Visitor movement data collected. Collected data analyzed. Visitor management study created.
Cost	110.250,00 EUR
Financing options	EU Financing, the Environmental Protection and Energy Efficiency Fund, the Joint Funds of Parks

Objective 2	Visits management
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ECST Key actions	4.1, 4.2, 4.3, 5.2
Activity 2.4	Improve the CPM touristic value
Activity description	Create a Marketing plan for Medvedgrad Visitors Center. Create a Marketing plan for online communication. Visitor Center Brand improvement. Create a Medvedgrad Visitor Center website. Organize a professional visit to Medvedgrad Visitor Center for Schools and Travel Agencies.
Role of NPM	Implementation
Partners	External contractors
Period	2019
Outcome indicators	A VCM Marketing Plan was developed. An online communication plan was developed. Basic communication materials of VCM printed. A professional visit to VCM organized for schools and travel agencies.
Cost	74.666,67 EUR
Financing options	EU Financing, the Environmental Protection and Energy Efficiency Fund, the Joint Funds of Parks

Objective 2	Visits management
ECST Key actions	4.1, 4.2, 4.3, 5.2.
Activity 2.5	Improve NPM touristic offer
Activity description	Establishment of interpretation and visitor signalization. Production of educational and promotional items. Production of three touristic packages.
Role of NPM	Implementation
Partners	External contractors
Period	2019
Outcome indicators	Interpretation and visitor signalization is implemented. Number of educational and promotional items.
Cost	89.717,33 EUR
Financing options	EU Financing, the Environmental Protection and Energy Efficiency Fund, the Joint Funds of Parks

Objective 2	Visits management
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ECST Key actions	1.3, 4.2, 5.2
Activity 2.6	Improve traffic signs outside the Park
Activity description	Development and installation of traffic and tourist signs.
Role of NPM	Partner
Partners	City of Zagreb
Period	2019-2020
Outcome indicators	Signs provided.
Cost	10.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 2	Visits management
ECST Key actions	1.3, 4.2, 4.3, 4.4, 5.2
Activity 2.7	Visitors' infrastructure regularly maintained and adapted to new demands
Activity description	Maintenance of existing educational trails, benches, desks and rest stops.
Role of NPM	Implementation
Partners	City of Zagreb
Period	2019-2023
Outcome indicators	Infrastructure is in function. High visitors' satisfaction.
Cost	10.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 2	Visits management
ECST Key actions	1.1, 1.3, 2.3, 3.1, 3.2, 4.1, 4.4
Activity 2.8	Improve and upgrade traffic solutions for accessing the peak zone and traffic at standstill
Activity description	Create Traffic study which will analyse the possibility of re-categorization of the Sljeme road from the direction of Zagreb following the opening of the cable car. Traffic study will analyse the traffic regulation options, setting signalling, traffic at standstill in the foothill and the Pilot area, and options for organized transport.
Role of NPM	Support
Partners	City of Zagreb, ZET
Period	2019-2023



Outcome indicators	Traffic study elaborated. Decreased number of inadequately parked cars in the peak zone. Increased number of ZET public transport busses driving to the peak zone.
Cost	60.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 3	Communication with stakeholders
ECST Key actions	1.3, 4.2, 4.3, 4.4, 5.1, 5.2, 5.3, 5.4, 10.1, 10.2
Activity 3.1	Redesign of the Nature Park Medvednica website
Activity description	Through the website inform the visitors about the activities being carried out. Website is interactive and visitor oriented.
Role of NPM	Implementation
Partners	External contractors
Period	2019
Outcome indicators	New website is functioning. Number of approaches to the website. Number of PINPM activities announcements on the website.
Cost	10.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 3	Communication with stakeholders
ECST Key actions	1.3, 2.1, 2.3, 3.1, 3.2, 4.2, 4.3, 4.4, 5.1, 5.2, 5.3, 6.2, 6.3, 7.1, 10.1, 10.2
Activity 3.2	Regularly create and publish leaflets, posters and other promotional and educational materials
Activity description	Create promotional and educational materials with information on the activities being carried out. Create promotional and educational materials with information i what way the visitors can contribute to the conservation of the natural values of the NPM and the peak zone (e.g. encouraging the use of public or organized transport, avoiding arrival with car in the peak zone and the other). Distribute promotional and educational materials in cooperation with key stakeholders.
Role of NPM	Implementation
Partners	ZET, Institution Sports Facilities Management - Sljeme Ski resort, City of Zagreb, catering and accommodation facilities, ski schools and ski clubs, tourist agencies
Period	2019-2023



Outcome indicators	Number of published and distributed educational materials (leaflets, posters and other). Number of stakeholders involved in distribution of materials.
Cost	100.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 3	Communication with stakeholders
ECST Key actions	3.2, 4.4, 5.1, 5.2, 5.3, 7.2, 10.1, 10.2
Activity 3.3	Encourage media participation in education and information on the protection of natural and cultural heritage in the Nature Park Medvednica and establish a permanent partnership
Activity description	Organize educational and promotional tours for media representatives. Notify the media about the activities (examples of good practice) that are being carried out and the results that contribute to the preservation of natural and cultural values. In cooperation with the media encourage the use of public and organized transport.
Role of NPM	Implementation
Partners	ZET, City of Zagreb, MUP-Police department Zagreb, media
Period	2019-2023
Outcome indicators	Number of educational and promotional tours for media representatives. Number of media involved in education and information. Number of broadcast media notifications. Number of signed partnership agreements.
Cost	30.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 3	Communication with stakeholders
ECST Key actions	1.1, 1.3, 2.3, 3.1, 3.2, 5.3, 6.2, 6.3, 7.1, 7.2, 8.2, 9.2
Activity 3.4	Support Forum members and other stakeholders in developing visitor content which protect and contribute to the values of the Park
Activity description	During intensive ski season, develop activities and offers at other locations outside the Pilot area, and encourage and guide direct visitors who did not come to these locations for skiing (e.g. arrangements with caterers).
Role of NPM	Implementation and support.
Partners	Stakeholders' Forum, catering facilities, tourist boards, Sljeme Ski resort
Period	2019-2023
Outcome indicators	Number of contents which were developed by members of the Forum in collaboration with the PINPM.



Cost	30.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 3	Communication with stakeholders
ECST Key actions	2.3., 3.1., 5.3., 6.2., 6.3., 8.2., 10.1.
Activity 3.5	Educate the members of the Stakeholder's Forum and the wider public on sustainable tourism and other relevant topics
Activity description	Informing and educating stakeholders and the general public about the activities being carried out and about examples of good practice and/or the consequences of bad practices with the emphasis on the role of the PINPM.
Role of NPM	Implementation
Partners	Stakeholders' Forum, City of Zagreb, WWF, Ministry of environmental protection and energy
Period	2019-2023
Outcome indicators	Number of meetings held with the members of the Stakeholder's Forum on the topic of sustainable tourism. Number of activities which were developed by members of the Forum in collaboration with the PINPM.
Cost	20.000,00 EUR
Financing options	Own revenue, state budget, donations, EU projects

Objective 3	Communication with stakeholders
ECST Key actions	5.3., 6.2., 6.3., 8.2.
Activity 3.6	Continue cooperation with stakeholders
Activity description	Organize a workshop on crisis management for stakeholders
Role of NPM	Implementation
Partners	Stakeholders' Forum
Period	2019-2023
Outcome indicators	Workshop on dealing with crisis situations for stakeholders was held
Cost	-35.553,73 EUR
Financing options	Own revenue, state budget, donations, EU projects



9. OVERVIEW OF THE SUSTAINABLE TOURISM ACTION PLAN

Table 7 Overall table of activities

Activity	Period	Responsibility	Partners
Objective 1: Protection of natural and cultural values			
1.1 Continue with the monitoring of the Veternica cave	2019-2023	PINPM	Research Associations, Scientists
1.2 Continue with the monitoring of the Zrinski mine	2019-2023	PINPM	Faculty of Mining, Geology and Petroleum Engineering, External experts
1.3 Continue with the monitoring of the ski slopes	2019-2023	PINPM	Scientists
1.4 Reconstruction of the Visitor Center Medvedgrad	2019	PINPM	External experts
Objective 2: Visits management			
2.1 Reconstruction of Sljeme cable car	2019-2020	City of Zagreb	External experts
2.2 Establish a bicycle offer in PPM	2019	PINPM	External experts
2.3 NPM visitor survey	2019	PINPM	External experts
2.4 Improve the CPM touristic value	2019	PINPM	External experts
2.5 Improve NPM touristic offer	2019	PINPM	External experts
2.6 Improve traffic signs outside the Park	2019-2020	City of Zagreb	External experts
2.7 Visitors' infrastructure regularly maintained and adapted to new demands	2019-2023	PINPM	City of Zagreb
2.8 Improve and upgrade traffic solutions for accessing the peak zone and traffic at standstill	2019-2023	City of Zagreb	ZET
Objective 2: Communication with stakeholders			
3.1 Redesign of the Nature Park Medvednica website	2019	PINPM	External experts



3.2 Regularly create and publish leaflets, posters and other promotional and educational materials	2019-2023	PINPM	ZET, Institution Sports Facilities Management - Sljeme Ski resort, City of Zagreb, catering and accommodation facilities, ski schools and ski clubs, tourist agencies
3.3 Encourage media participation in education and information on the protection of natural and cultural heritage in the Nature Park Medvednica and establish a permanent partnership	2019-2023	PINPM	ZET, City of Zagreb, MUP-Police department Zagreb, media
3.4 Support Forum members and other stakeholders in developing visitor content which protect and contribute to the values of the Park	2019-2023	PINPM	Stakeholders' Forum, catering facilities, tourist boards, Sljeme Ski resort
3.5 Educate the members of the Stakeholder's Forum and the wider public on sustainable tourism and other relevant topics	2019-2023	PINPM	Stakeholders' Forum, City of Zagreb, WWF, Ministry of environmental protection and energy
3.6 Continue cooperation with stakeholders	2019-2023	PINPM	Stakeholders' Forum



10. CONCLUSION

This document represents Sustainable Tourism Action Plan, Central Europe Eco-Tourism: tools for nature protection (CEETO)“ whose purpose is to contribute to the sustainable use of natural resources and to preserve biodiversity while establishing development of sustainable tourism on protected areas. The project is implemented by the Public institution "Nature Park Medvednica" with the support of the following institutions: City of Zagreb, Police Department Zagreb, Zagreb Electric Tram (ZET), Croatian Forests, local community and tourist agencies.

Pilot area „Peak area of the NPM“ is located at the very peak area of the Nature Park Medvednica and it covers the coverage area of the Urban development plan of state significance “Peak zone” (UPU Peak zone) and Urban development plan of state significance "Ski complex", Medvednica (UPU Ski complex). According to the Spatial plan of the Nature Park Medvednica (OG 89/14) the Pilot area is located within the zone *2d - Zone of moderate protection - Peak zone*⁴ and zone *3d - Zone of use - ski resort zone*. Issues of the Pilot area is related to the overload of the number of visitors, especially during the ski season.

Goals and activities defined in this document are relevant for the whole NPM area for development of innovative system of sustainable tourism management grounded in participatory approach.

Preparation of the Action plan included the following activities:

1. elaboration and conducting of research regarding the structure, habits and views of visitors of the Pilot area and their perception of PI NPM as an institution that is within its competence deals with the management of the NPM area
2. analysis of the data obtained through research and results of the conducted workshops with the members of the Stakeholder's Forum
3. On the basis of the conducted data analysis was given a proposal of goals and activities to be implemented within this Action plan in a period of 5 years, which was agreed with the members of the Stakeholder's Forum and final goals and activities were defined.

The defined goals and activities are in accordance with the principles of the European Charter for Sustainable Tourism in Protected Areas.

⁴ Part of the area from the second zone is separated as a place where intensive sports and recreational, excursion and tourism activities take place. These are primarily the areas of the peak zone with increased frequency of visits, with the exception of solid facilities. The aim of the management of these areas is active management for the purpose of preservation of the ecosystem and cultural landscape while maintaining sustainable use of space. At the same time, special emphasis is placed on the management of visitors, improvement of visitor infrastructure in terms of reducing pressure on ecosystems, and the development of a mode of use that permits sport-recreational and excursion activities to be carried out in a way that does not endanger the protection aims.