

Velebit Mountain Biosphere Reserve Management Plan



Velebit Mountain Biosphere Reserve Management Plan

(2018-2027)



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Nature park



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Nacionalni park
National Park



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National park

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Velebit Mountain Biosphere Reserve

Management Plan

September, 2017

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Contents

1. Introduction	1
2. Velebit Biosphere Reserve Management Plan.....	8
3. Sources	14
4. Acronyms	14

1. Introduction

1.1 World Network of Biosphere Reserves

Biosphere reserves are designed as sites for successful implementation of Man and Biosphere Programme. Each BR promotes solutions reconciling the conservation of biodiversity with its sustainable use. BRs are models to test and apply interdisciplinary approaches to understanding and managing changes in social and ecological systems, and their interaction, including conflict prevention and the conservation of biodiversity. UNESCO'S MAB Programme is an intergovernmental scientific programme that aims to establish a scientific basis for the improvement of relationships between people and their environments. MAB combines the practical application of natural and social sciences, economics and education to improve human livelihoods and the equitable sharing of benefits. BRs form a worldwide network, known as the World Network of Biosphere Reserves (WNBR). It comprises 669 biosphere reserves in 120 countries, including 20 transboundary biosphere reserves. The WNBR represents a unique tool for international co-operation through sharing knowledge, exchanging experiences, building capacity and promoting best practices. The common goal for WNBR is to strive to be sites of excellence as well as to explore and demonstrate approaches to conservation and sustainable development on a regional scale. To achieve these goals, each BR should combine three interconnected functions: conservation (contribute to the conservation of landscapes, ecosystems, species and genetic variation), development (foster economic and human development which is socio-culturally and ecologically sustainable) and logistic support (support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development) through appropriate zoning, comprising one or more legally constituted core areas, devoted to long-term protection; adjacent buffer zones and an outer transition area where sustainable development is promoted and developed by public authorities, local communities and enterprises. MAB Programme is governed by its International Coordinating Council, under the overall authority of the UNESCO General Conference and its Executive Board. Governance at the national level is managed through MAB National Committees. The most important strategic documents of the MAB Programme include the Seville strategy and the Statutory Framework of the WNBRs, MAB Strategy 2015-2025 and the associated Action Plan (Lima Action Plan). MAB Strategy 2015-2025 and the Lima Action Plan 2016-2025 are designed on the continuity of the Seville Strategy and the Statutory Framework of the WNBR and are based on the findings of the evaluation of the implementation of the Madrid Action Plan for BRs (2008-2013). The Statutory Framework for the WNBRs makes provision under Article 9 that the status of each biosphere reserve should be subject to periodic review every ten years, based on a report prepared by the concerned authority, on the basis of the criteria of Article 4, in order to carry out a qualitative survey of the actions implemented. The report is then forwarded to the secretariat by the State concerned and considered by the Advisory Committee for Biosphere Reserves for recommendation to ICC. Its objective is to improve the quality of the biosphere reserves and their functioning as sites for testing and demonstrating approaches to sustainable development. Designated areas are governed on the basis of a management plan, which is in line with national and international legislation. The plan outlines the general vision and priorities, objectives and actions necessary for its protection, effective management and sustainable development of the area.

1.2. Velebit Mountain Biosphere Reserve

Velebit Mountain BR is located in the south-western part of Croatia, in the large mountain area of Mount Velebit close to the Adriatic Sea. Velebit is the first Biosphere Reserve in Croatia, designated in 1978, only a few years after the WNBR was established. The area is distinguished by high level of biodiversity in forests, highland subalpine meadows and dry and mountain grasslands. With the altitude ranging from 0 to 1757 m a.s.l., the area represents a 145 km long and 10-30 km wide stretch of Dinaric karst landscape. Zonation of the Velebit BR was made for the first time in 2012 and follows the MAB Programme zoning system containing core, buffer and transition zone. The surface of the BR in the time of designation (1978) was 203.554 ha. In 2017, the revision of the zonation started according to the Decision of the 29th session of the MAB Council on periodic review reports, follow-up recommendations of the UNESCO Advisory Committee and the Process of Excellence and Enhancement of the WNBR

Table 1. Original surface of the Velebit Mountain BR

Velebit Mountain Biosphere Reserve	
Original surface	
Area	Surface (ha)
Velebit Mountain Biosphere Reserve	203 554
Zone	Surface (ha)
Core area	24 796
Buffer zone	170 265
Transition zone	8 491
Total:	203 554

Zonation

The Core zone of the Velebit BR corresponds to existing protected areas designated as National Parks (Northern Velebit NP and Paklenica NP), Strict Nature Reserve (Rožanski i Hajdučki kukovi SNR) and isolated areas within the Nature Park (Velebit NP) in which there is no exploitation of natural resources or any economic activities with the exception of limited research and recreation. The core zone of Velebit BR is the ecological backbone of the reserve and comprises areas with high biodiversity, minimally disturbed ecosystems with ongoing monitoring and research activities. The goals and activities in the core zone are predominately focused on the preservation of natural habitats, species and ecological processes, as well as the restoration of already degraded areas. Total surface of the core zone is 24.796,07 hectares and it constitutes 12,18% of the total BR area.

The Buffer zone corresponds to existing Nature Park borders and adjoins the core areas of the BR. It is characterized by a mosaic of cultivated land and small settlements separated by large forested areas. Economic activities and ecosystem services exploitation take place in this zone, under the provision that environmental protection conditions are fulfilled. This area is autochthonous economic resource for development of sustainable forestry, agriculture, water-use, and maritime resources as well as nature based tourism. Emphasis is given on sustainable management of natural resources, cultural values and to the active participation of local community in developing sustainable recreational and touristic activities. Some of the key activities of this area are forestry, followed by hunting organized in hunting grounds, cattle-breeding, bee-keeping, ecotourism and recreation, electricity generation and water supply.

Ecosystem services of the buffer zone provide most of the inputs for cattle and dairy production, such as clean water and good forage. Cattle which are adapted to the harsh mountain conditions and easy to breed are crucial for grasslands and meadows preservation, which are important habitats for biodiversity conservation as well as for local bee-keeping and honey production. Velebit's honey is highly appreciated and has a higher market price compared to honey of other areas.

Total surface of the buffer zone is 170.265,11 hectares and it constitutes 83,64% of total BR area.

The Transition zone from 2012 was found to be too narrow and could not enable in its entirety the provision of development function. The UNESCO Advisory Committee recommended to revise the zonation which is a complex process that first must be communicated to the local community and it will take some time. Meetings were held between the Public Institutions that manage the BR, Croatian Agency for Environment and Nature and Ministry of Environment and Energy, in order to jointly consider the revision of the transition zone. After careful deliberation on which towns and municipalities should be included in the transition zone, the result was enlargement of the zone in the buffer of 5 km around the buffer zone of the BR, which is also the natural border of the Velebit Mountain. Towns and municipalities which would be included in the new proposal of the transition zone have already deep connections with the BR and management of the BR has administrative and infrastructural connections with the towns proposed. The new proposed zonation first has to be elaborated and accepted from the included municipalities and towns. In this Management Plan, we have foreseen meetings and workshops with local community in order to inform them about the proposed new borders of the BR and gain their consent on proposed enlargement of the transition zone. The planned timeframe for these activities is the first year of the implementation of the Management Plan.

At the moment the transition zone constitutes only 4,1 % of the total BR surface and, with new accepted proposal for the enlargement of the transition zone it would include much wider area. The proposed transition zone, which has to be accepted, would provide regional economical and scientific support to the buffer zone. Towns which surround the Velebit mountain and are administrative centers for management authorities and local communities would be included in this zone. The total population inside the transition zone, after the current proposed enlargement, would be 107.548 inhabitants. The transition zone stretches between two counties: Lika-Senj County and Zadar County. The largest towns in this zone are Senj, Gospić and Otočac in the Lika-Senj County and Zadar in the Zadar County, where 87.096 inhabitants live, which makes 80% of total population inside the transition zone of the BR. Town of Zadar is locally, regionally and nationally important development factor with its geostrategic location and good traffic connections. Town of Gospić represents urban, cultural, economic and development center of Lika-Senj County. It is positioned between the Continental and Mediterranean regions of Croatia and consequently has great development potential.

This flexible transitional area contains a variety of agricultural activities, settlements, educational, research and cultural institutions, renewable energy production and logging and timber production facilities. Forestry and wood processing represents the most important economic activity and source of income for the population in the inland areas, whilst nature based tourism is the main source of income for the population in the coastal part of the Velebit Mountain BR. People commute inside the transition zone from smaller places into larger towns on daily basis in order to work or do different administrative errands.

The population of the Velebit Mountain BR works in the public and private sector. The former consists of public administration, education, health and social services, while the latter is represented by small scale industry such as small but numerous family dairies and a brewery positively contributing to local development, not only through employment (in an employment-depressed area) and tax revenue to the government, but is also an important development enterprise as it is recognized for its quality products even outside the BR. Of other small-scale industries there is fishing, fish farming and shell-fish farming. Family farms are prime promoters of development in rural areas. Their activities are numerous, ranging

from arable and livestock farming to beekeeping or growing traditional cultivars of fruits and vegetables. Some family farms also process milk and cheese, fruit and vegetables and produce homemade brandies, liquors and other sorts of beverages. They make a living out of that and enrich gastronomical and cultural tourist offer in their surroundings. There are several water bottling plants in the BR formed on the sources of karst rivers with excellent water quality, which distribute bottled water all over the country and employ local people in the bottling facilities. Use of renewable energy sources includes hydropower plants (HPP) and wind power plants. HPPs in Velebit Mountain BR are one of the most significant energy providers in Croatia, using ecosystem services from several karst rivers in the BR.

Educational institutions in the transition zone are important not only for the population inside the BR but also for the wider population of the country. The University of Zadar is the largest integrated University in the Republic of Croatia, which includes 25 university departments. Velebit Mountain BR serves as natural laboratory for the educational and research requirements of the University, especially the Archaeology, Ecology, Agronomy and Aquaculture Departments, Ethnology and Cultural Anthropology, Geography Departments. Departments perform studies on three levels: undergraduate, graduate and postgraduate. In order to organize and promote scientific and research activities, the University has founded scientific research centers as its constituent units. There is also Institution for Higher Education in Gospić. Within the Institution, the professional Research Center for Karst works as a separate independent institution. The scope of work of the Center for Karst is professional research related to modelling and teaching scenarios, the economic program with the acceptance of sustainable growth as the basis for deciding on the development of the karst areas, execution of research and economic studies, expertise and studies, the study of ecological systems and urban communities. Public open schools exist in every town inside the BR conducting education, diverse courses and cultural manifestations for the local community. Two Local Action Groups (LAGs), which have representatives in the Velebit Mountain BR Coordinating Council, are active in the BR and they are important initiators of the local development as they include members from private and civil sector and are in the direct communication with local community. They make an important link between individuals and BR management in decision making processes.

National importance

Velebit mountain is the largest Croatian mountain, 145 km long and protected nationally on several levels. In its whole length, it is protected as a Nature Park (total surface of 203.608 hectares) which corresponds to the IUCN management category V. Higher level of national protection is designated to the areas of Northern Velebit National Park (total surface of 11.100 hectares) and Paklenica National Park (total surface 9.500 hectares) corresponding to the IUCN management category II. Under the management of the Northern Velebit National Park, there is a Strict Nature Reserve - Rožanski i Hajdučki kukovi, IUCN Management category Ia. The whole area of Velebit BR comprises seven more designated sites protected as Special Reserves, Natural Monuments and Significant Landscapes.

International importance

Importance of the Velebit mountain is recognized internationally. Besides the National Protection which is regulated by Nature Protection Act, this area is also protected as a NATURA 2000 site as an ecologically important area on the European level. Croatian Ecological Network Natura 2000 was designated by the Ordinance on the Ecological Network in 2013. Wide range of areas have been defined as the areas on Velebit mountain important for the conservation of endangered plant and animal species and habitat types. In total, 64 sites have been designated as Special Areas of Conservation, including the whole areas of Northern Velebit National Park (Site code HR2000605), Paklenica National Park (Site code HR2000871) and the whole Velebit mountain is a Special Protected Area (Site code HR5000022).

Velebit has been designated as a Biosphere Reserve shortly after the establishment of the WNBR.

Velebit mountain is also listed on the Top Ten Hot Spots within the Mediterranean Forests Protection Programme, by WWF.

Primeval beech forests of Velebit Mountain BR are recognized to have outstanding universal value and, along with other 63 European sites, in 2017 were listed as the Joint World Heritage Property “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe”.

In 2017, Velebit Mountain BR gained the Certificate of Belonging, from the International UNESCO Center for the Mediterranean Biosphere Reserves, as a Member of the Mediterranean Biosphere Reserves Network.

In September 2017, as a participant in the International Encounter on Sustainable Tourism in Mediterranean Biospheres (MEDITERRANEA2017), in Castellet, Barcelona, Velebit Mountain BR signed the Castellet Declaration on Sustainable Tourism in the RRBBMed.

Management of the Velebit Mountain Biosphere Reserve

Velebit Mountain BR is managed jointly by Velebit NP, Paklenica NP and Northern Velebit NP. All nature parks and national parks in the Republic of Croatia are managed by Public Institutions and are under the jurisdiction of the Ministry of Environment and Energy. The PI activities include protection, maintenance and promotion of the protected areas for the purpose of protecting and preserving the authenticity of nature, ensuring undisturbed natural processes, sustainable utilization of natural wealth, and the supervision of implementation of nature protection stipulations and activities within the protected areas. The Public Institutions are managed by Management Councils, the Directors and the Conservation Managers. The Management Councils operate the Institutions whose business is managed by the Directors of each PA, appointed by the Minister in charge of the nature protection affairs. In order to ensure coordinated, expert and systematic performance of activities related to the management of the Protected Areas, the Public institutions are divided into several departments. Management Councils consist of representatives from Ministry in charge, local authorities, local government and employees of the Public institution.

In compliance with the goals of the Seville Strategy for Biosphere Reserves, and following the recommendations of the Advisory Committee and the decision of the 29th session of the MAB Council on the periodic review report, Coordinating Council of the Velebit Mountain BR was established in May 2017. An agreement was signed between PI Velebit NP, PI Northern Velebit NP, PI Paklenica NP, Local Action Group (LAG) Lika and LAG Bura as representatives of the public, civil and economic sector. LAGs are members of the Coordinating Council of the BR, in order to ensure that all decisions and activities are implemented in agreement and together with the local community. The agreement was signed with the goal of promoting and encouraging the fulfilment of the all three functions of the Biosphere Reserve, in order to assure management efficiency and biodiversity protection, foster sustainable socio-economic development and strengthen the cooperation between the managing authorities and the local community. The main activities and responsibilities of the Coordinating Council include coordination activities related to biodiversity conservation, promotion of Education for Sustainable Development, capacity building and use of contemporary communication tools, strengthening cross-sectoral collaboration, involvement of stakeholders in the decision-making processes and the implementation of activities in the BR Management Plan. Coordinating Council is also in charge of coordinated management of the BR, ensuring promotion and respect for the tangible and intangible cultural heritage of the BR, raising awareness at the local, national and international levels of the importance of the heritage in building a prosperous community; coordinating joint activities regarding the sustainable tourism, and ensuring the financial sustainability of the BR.

The Coordinating Council meets periodically at least twice a year or more when necessary. The work of the Coordinating Council is managed by PI Velebit NP.

The overall internal organization and management of each PI is defined by its Statute of the Public Institution and the Regulations on Internal Structure and Operating Rules. Each PI has its own Management Plan which was adopted by its Management Council after securing consent from the then competent Ministry of Culture of the Republic of Croatia and technical approval by the State Institute for Nature Protection (SINP), for a period of 10 years.

Since the current Management Plans were adopted in 2007, the ten-year planning cycle will begin again. New Management Plans for the three Public Institutions are in the initial preparation, at the moment of writing of the Velebit Mountain BR Management Plan, within the joint project of Ministry of Environment and Energy and Croatian Agency for Environment and Nature named "Establishment of the management framework for Natura 2000 ecological network". The aim of the project is to establish the framework for management of Natura 2000 ecological network (EN), and it will be funded through European funds from EU Operating Programme Coherency and Cohesion 2014-2020. Management plans for all three Public Institutions will be jointly coordinated and in line with the goals and activities from the BR Management Plan. The Velebit Mountain Biosphere Reserve Management Plan was developed jointly by the three PIs with the timeframe of 10 years, following the guidelines from the Lima Action Plan.

The Velebit Mountain BR is managed based on the ecosystem approach following the five steps suggested by the Ecosystem Approach Strategy. This approach is compatible with the BR concept promoted through the MAB Programme. In developing the future complementary Management Plans for each Public Institution, regarding the forests management and preservation, resources and information from the Sustainable Forest Management Toolbox will be used.

Currently (September 2017), the human resources of the Public Institutions managing the Velebit BR are as follows (Table 2):

Velebit Mountain BR currently has staff of 56 permanently employed, who are financed from several sources, from Central State Budget (43 employees) and by Public Institutions' own revenues (13 employees) and ongoing projects (2). Counting seasonal employees (28) who are also financed by the Public Institutions' own revenues, currently there are 87 employees in the BR management. The current number of employees is insufficient given the size of the territory, so the management is rendered difficult. The optimal situation would entail the possibility of filling all systemized posts as foreseen under The Internal Structure and Operating Rules of each Institution, but first the mentioned documents should be revised and the updated assessment of Institutions' needs should be done. BR management is currently in grave need of additional employments due to the uprising pressures on natural values of the managed area, regarding the administration, visiting, conservation and maintenance. In order to perform all the tasks properly, due to the lack of employees in some departments, the BR management is forced seek the support of the central institution for nature protection (CAEN) and other external experts in topics that go beyond the scope of their regular work.

Table 2. Human resources in the management of Velebit Mountain BR

Public Institution	Number of permanently employed		Number of seasonally employed	Number of trainees
	Central state budget	Own revenues		
Northern Velebit National Park	13	4	2	0
Paklenica National Park	20	6	21	0
Velebit Nature Park	10	3	5	3
Total	43	13	28	3

Table 3. Financial resources for the 2016

Public Institution	State budget (%)	Own (%)	International funds (%)	Other (%)	Budget In 2016 (HRK)
Northern Velebit National Park	9,77	2,91	81,91	5,39	20.980.225,00
Paklenica National Park	15,71	43,16	2,08	39,05	13.914.028
Velebit Nature Park	51,9	19,5	0,00	28,6	3.459.338,00
Total					38.353.591,00

2. Velebit Biosphere Reserve Management Plan

2.1. Conservation

The state of valuable natural features in the BR is assessed as good. Natural processes in the majority of the BR area are undisturbed.

In general, there is high biodiversity and geodiversity in the area, which has served different institutions as a research and educational polygon (e.g. Universities, Research Institutes). So far, we have established long-term collaboration with universities from our country as well as other European countries which conduct student practice and fieldwork in the BR.

The Velebit Mountain BR is a textbook example of Dinaric karst, mostly overgrown with beech forests and grasslands. Primeval beech forests have been recognized as ecosystems with exceptional value and put on the UNESCO World Heritage List as „Ancient and Primeval Beech Forests of Carpathians and Other Regions of Europe “. Beech forests of this area comprise the oldest and the largest beech forest complex in the East Adriatic coast and are an important habitat for numerous animal species including the Natura 2000 species such as large carnivores, woodpeckers, owls, beetles and bats. Forests in the BR are managed by guidance of Forest Principles and Sustainable Forest Management approach. Potential threats identified include poaching, fire risk, and excessive and poorly controlled adventure events.

Since this area was inhabited throughout the past, a significant grassland surface has been created by human activities that are now islands within the forest belt, and have largely contributed to overall biodiversity. Some plant and animal groups have been inventoried and mapped so far (such as birds, bats, large herbivores, amphibians), but there is a significant number of taxa whose number of species and abundance is still unknown, and Special focus should be put on indicative taxa as orchids, grasshoppers and butterflies. Vegetation succession is a major problem. Overgrowing of the lower and middle altitude grasslands is recognized as one of the biggest threats for biodiversity loss in this area. Only a small percent of grasslands under succession is being maintained by mowing. In the inland part of the BR, some grasslands and meadows are being maintained by grazing, but the majority of the grasslands are unmaintained. Future planned activities include cooperation with local community in habitat restoration and traditional usage of grasslands (sustainable livestock breeding and agriculture).

On the highest peaks of the mountain, above the tree line, natural grasslands were also maintained in the past by seasonal pasture. Alpine climatic conditions are prevailing in recent years and the biodiversity of these grasslands is in potential threat by climate change, which may especially be felt in the change of occurrence and abundance of relict alpine plant species and the changes in areal of animal species sensitive to climate changes (butterflies, wintering and nesting bird species, small mammals etc.).

Climate trends towards long dry periods combined with vegetation succession and difficult to reach terrain, impose a high fire hazard risk. Measures of fire risk mitigation have been established by remote surveillance of the area and regular patrols as well as the usage of the fire potential indicator. Volunteer fire brigades inside the BR are interlinked and the collaboration with the BR management is established. In public institutions managing the BR, some employees are trained as firefighters and future activities include efforts in rising awareness on fire risks among the local community.

Some monitoring protocols concerning the Natura 2000 species (e.g. beetles, birds of prey, common bird species) have been established in the cooperation with the experts on those taxa, but in order to be able

to estimate the effects of climate change on geo- and biodiversity, more species and habitat types should be included in monitoring. Other important Natura 2000 species should be monitored, when the PI capacity improves, such as cave beetles, owls, woodpeckers and viper, since monitoring protocols for those taxa are fully developed on national level.

There has been some species extinction, such as vultures, during the last few decades, some of which are extinct nationally and some locally, mainly due to lifestyle change of the residents of the area and negative global trends in the populations concerned. Disappearance of vultures from the area may be correlated with abandoning the traditional livestock breeding, rapid depopulation and uprising of the touristic activities in the nesting area. Some species are identified as highly endangered or on the verge of extinction (such as Golden Eagle, whose population in the BR is being regularly monitored and the monitoring activity is also foreseen in this Management Plan). Negative trends in abundance of some species have been recognized on the national level and the cooperation has been established with authorities and centers that promote protection and actively deal with the remained populations. The cooperation includes, among the other, activities of the reintroduction of critically endangered species to their former habitats.

Homogenous and preserved nature with mainly strong populations and good habitat fitness provide resistant ecosystems. As invasive species are concerned, there is no problem in the core zone, and only locally small surfaces around settlements is affected in the buffer and transition zone. We don't have the complete list of invasive species and it should be made in the future actions. Tree of Heaven and the Common Ragweed are identified as the most problematic invasive species in the BR, the latter causing health problems. It is necessary to raise awareness and draw attention of local community on the potential threats of invasive species and the importance of healthy ecosystems in sustainable development and long-term usage of ecosystem services.

Some Ecosystem services stand out as greatly valuable such as flowering plants abundance and their role in pollination and beekeeping. Bees are abundant in this area since this is the pristine habitat for their survival. Forest ecosystems provide valuable services such as control of soil erosion, carbon storage, production of clean air, natural disasters mitigation. Forests are also important in terms of mitigation and adaptation to climate change. Forests cover more than 50% of the core and buffer zone of the BR. Since forests comprise the majority of the core and buffer zone of the BR, provide diverse range of valuable ecosystem services and since forestry is one of major economic activities, Velebit Mountain BR activities foreseen by this Management Plan follow the Sustainable Forest Management approach and Forest Principles in overall promotion of the Ecosystem approach.

Grassland ecosystems are important to sustain livestock and dairy production, and consequently support the livelihoods of rural families. Without the natural attractions Nature Based Tourism (NBT) would not be possible. Tourists find NBT experiences – trekking, hiking, climbing, wild life viewing (including bird-watching) more valuable when they take place in healthy ecosystems, such as those found in Protected Areas. Drinkable water sources provide fresh water for the local population, and tourists.

The preserved nature in the BR provides the whole range of ecosystem services which still needs to be fully evaluated in order to use them in a sustainable way. In this Management Plan we have foreseen further identification and quality evaluation of ecosystem services as well as promotion of benefits of ecosystem services to local community.

2.2. Development

According to the national legislation, protected areas have educational, recreational and promotional purpose, therefore recreation, visiting and education is important developmental factor in the BR. There has been a significant growth in the number of visitors in the last ten years, more as a consequence of global trends in travel and safety than planned visitor management. It has been noticed that uneven distribution of visitors in the BR creates pressure in some locations and the seasonal distribution of visitors is uneven with the most visits in summer period, which demands more active visitor management, therefore, development and implementation of Visitors Management Plan is foreseen for each PI, and it will be developed parallel with new PI Management Plans.

Recreational activities such as rock climbing and hiking are the most popular among the visitors. Guided hiking tours in the BR are included in the touristic offer. This area has been known for its long rock climbing history and almost twenty years of climbing competitions. Cooperation with local adventure sports agencies on broadening the recreational opportunities for visitors has been developed. They are specialized in the outdoor and adventure travel, offering well-balanced mixture of nature, activity and culture. Local adventure sports agencies are becoming leading companies in rural tourism activities and adventure holidays. They offer activities in cooperation with local rural estates. Cyclotourism is fast growing type of active tourism in the BR. We have established collaboration on further cyclotourism development with local authorities, tourist boards and local stakeholders in creating of network of all stakeholders involved, and promotion of cyclotourism as a form of tourism that sustainably uses environment and reduces seasonality of touristic offer. Trekking competitions are becoming more popular each year as the BR area is challenging and attractive for sport enthusiasts.

Raising awareness on natural values of the BR and their benefits for the overall wellbeing of the local community is carried out through joint activities with local community, interpretation and informing through periodicals and social media. Future actions include developing educational programs for people living in the BR in collaboration with local authorities, educational institutions and NGOs, based on guidelines from Education for Sustainable Development program. Close collaboration with local associations for environment protection which include local residents in active resolving local ecological and environmental problems and supervises the activities in the transitional zone of the BR. In further development of the infrastructure for renewable energy sources, e.g. for new HPPs, great attention should be paid to sustainability of ecosystem services usage, since HPPs have some negative ecological implications which should be considered. By identifying the important economic issues which could affect the ecosystem and its inhabitants, as suggested in Step C of the Ecosystem Approach Strategy, BR is further fulfilling its conservational function with this Management Plan. Local associations contribute to environment and nature protection through encouraging public participation in organized actions, informing the general public, advocating responsible, effective and sustainable management and organizing round table discussions. As a very important aspect of fostering local community development in the transitional zone, partnerships with local tourist boards and municipal authorities in different projects are identified as priority. Tourist accommodation capacity in the buffer zone is poorly developed with only few private renters. In the coastal area of the transition zone, local community is completely tourism-oriented but mostly lacking coherency and sustainable development plan which should include further development of the tourist offer in the inland of the BR. There is plenty of room for improvement on this subject and efforts will be made on improving touristic offer on the other parts of the BR. The activities foreseen by this Management Plan, which include joint projects with Tourist boards of the BR,

on development of the Active Tourism, all-year tourist offer and European Destinations of excellence projects, should contribute to develop more complete and equitable tourist offer.

Rich cultural heritage is recognized as important segment of the touristic offer and the basis for sustainable development of the area, but its full potential is still unused. Valorization and promotion of the cultural heritage is also recognized as a key for strengthening the sense of belonging in the local community people in order to mitigate negative consequences of depopulation which is major threat to the cultural heritage deterioration. Traditional Mediterranean lifestyle which is also widely present in the area of the BR, has been recognized by the UNESCO and it was inscribed on the Representative List of the Intangible Cultural Heritage of Humanity as Mediterranean diet of Cyprus, Croatia, Spain, Greece, Italy, Morocco and Portugal. The Mediterranean diet involves a set of skills, knowledge, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking, and particularly the sharing and consumption of food.

Individual restoration of the abandoned houses, by local community, is encouraged by the support in filling the application forms for funding and granting the permissions required, as well as the promotion of traditional agriculture, livestock breeding and beekeeping, with the aim of preservation of tangible and intangible cultural heritage. Being aware of the importance of the intangible cultural heritage, collaboration with universities and cultural institutions has been established, in order to research, record and preserve the valuable data on practices, representations, expressions, knowledge, skills as well as the instruments, objects and artefacts. Guided by the purposes of the Convention for Safeguarding of the Intangible Cultural Heritage, there has been continuous promotion of intangible cultural heritage in form of exhibitions, manifestations and publications all with the aim of raising awareness of the importance of preserved intangible heritage for the future development and ensuring respect for the heritage among young generations. Regarding the tangible cultural heritage, we have several successful examples of restoration and conservation of traditional architecture.

2.3. Logistic support

In order to preserve the authenticity of the nature and facilitate the interpretation of natural values, it is highly important to develop visitor infrastructure on the locations of the most intense and concentrated visiting in the BR.

Modern and interactive visitor centers as a central point for interpretation of natural and cultural values of the area have been under development for the last several years. There are two visitor centers in the area of the BR situated on locations with the highest visiting frequency, one is fully operating and managed by the PI Northern Velebit NP and the other is partially equipped but with secured financial resources from EU funds for the final completion and managed by the PI Paklenica NP. Multimedia halls in the visitor centers are serving local communities as a place for holding meetings, conferences and other events. Visitor centers should contribute to the quality of visits and fulfill the needs of visitors of all categories including children, elderly and disabled. Current visitor infrastructure is, or will soon become inadequate as the number of visitors is rising. This is very visible in receptions capacity and traffic infrastructure which should be adjusted to current trends.

Basic volunteering programs have been developed and for the last two years volunteers from Croatia as well from other European countries have been helping with informing and directing visitors, interpretation, active management of target habitats and species. In future development of the volunteer program, we plan greater involvement of volunteers, longer volunteering period and adequate accommodation for volunteers.

Cooperation with universities and individual faculties has been established for a long time in form of student practice and field work. International cooperation between several European universities and the BR has also been established as well as individual international student practices which are granted on request.

In the beginning of 1980s, guided by MAB Programme principles, total of 100 permanent experimental surfaces for forest ecosystem research had been established in Croatia. Six of them were located in Velebit BR, two in each PA. Over time, these surfaces have become neglected, and until recently there has been neither research nor monitoring activity. There is an ongoing international project on revitalizing the existing and establishing new experimental surfaces in old and primeval forests, including those in Velebit BR. Activities foreseen in that project are included in this management plan. One of those permanent surfaces has become a part of UNESCO World Heritage Property “Ancient and Primeval beech forests of the Carpathians and Other Regions of Europe” designated in 2017.

Educational workshops are being hosted for local people in order to strengthen the cooperation with the local community. There is infrastructural capacity inside the BR and local community is welcome to use it for conducting different type of educational activities. Raising awareness and interpreting the natural values among the children of local schools and preschools, by lectures, presentations, workshops, publications and social media are recognized as priority. Field work and interpretation of natural values with students from local elementary schools have been successfully implemented. Through those activities we are trying to raise awareness about the significance of protection and sustainable use of natural resources. In future, we plan to be more involved in promoting and encouraging education of local community on different topics such as sustainable agriculture, cultural heritage conservation, sustainable tourism etc.

in the sense of exchange of good practice, collaboration with vicinal BRs was established. In the process of revising the zonation of the Velebit Mountain BR, we have consulted the experts who were working on the zonation of the Mura-Drava-Danube Biosphere Reserve, second Croatian BR. They provided us with the “know how” and their experiences from the designation process. A valuable cooperation was also established with the Karst BR from Slovenia. Mutual visits of BRs are arranged and plans for future joint projects are made.

In the spirit of adaptive management, our employees regularly attend different workshops, educational programs and seminars in order to gain new knowledge and broaden their perspectives. Our employee was enrolled and successfully finished training on Education for Sustainable Development.

Internal Memorandum of cooperation with the aim of joint actions towards research and monitoring, capacity building, strengthening management framework and involvement of stakeholders, has been signed between Public Institutions managing the BR and the partner NGOs.

2.4. Management

Velebit Mountain BR is managed by three Public Institutions which makes the coordination of the joint activities rather challenging, hence the Coordinating Council has been established. The Council encompasses local communities and authorities, aimed at strengthening cross-sectoral cooperation, involving stakeholders in decision-making processes and implementing activities in BR. In future, it is necessary to promote and encourage better involvement of people living inside the BR and to strengthen their awareness of the benefits BR provides. The Coordinating Council will meet periodically at least two times per year or more if needed. Work of the Coordinating Council is managed and coordinated by PI Velebit NP.

In 2007 Public Institutions prepared Management Plans for the three PAs that are included in Biosphere reserve (Paklenica National Park, Northern Velebit National Park and Velebit Nature Park). Those plans were among the first management plans developed for protected areas in Croatia. Since the management plans were prepared for the period of ten years, new plans are needed. According to adaptive management principles, evaluation of management plan implementation is in progress and in the 2018 new planning cycle will start. New management plans will be developed with consideration of the management of ecological network Natura 2000. It will be participatory and structured with the active involvement of stakeholders. All three PAs will work together and by the end of the planning process prepare the new management plan for the BR.

The efficiency of the PA management is being assessed through the Management effectiveness tracking tool (METT). By now it has been assessed three times – in 2013, 2015 and 2017, and the result of the assessment has been used in order to better plan our activities. ISO 9001 certificate was gained and Quality Management System requirements were implemented. A Communications strategy is lacking therefore plans are made to develop joint communications strategy along with the Management Plan for BR. Other management documents include, for each Public Institution inside the BR, Statute of Public Institution, Regulation on Internal Order in Public Institution, Spatial Plan of PA and the Annual Work Plan and financial plans. Regulation on Internal Order is inconsistent with the current Law on Nature Protection and should be adjusted accordingly. Periodic reviews for UNESCO were done by each PA separately and then combined together before sending to the UNESCO Advisory Committee. Recommendations of the Committee on previous reports were acknowledged and additional information was provided in the last report. So far, reports have been too detailed and missing the perspective. Agreement is reached that future reports should be more descriptive and more understandable.

3. Sources

The Statutory Framework of the World Network of Biosphere Reserves
The Seville strategy for Biosphere Reserves
MAB Strategy 2015-2025
Lima Action Plan for UNESCO'S Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016-2025)
Castellet Declaration on sustainable tourism in the RRBBMed (MEDITERRANEA2017)
Aichi Biodiversity Targets
Convention for the Safeguarding of the Intangible Cultural Heritage
Education for Sustainable Development in Biosphere Reserves and other Designed Areas. A resource book for educators in South-Eastern Europe and the Mediterranean
Development Strategy for town of Zadar 2013-2020
Development Strategy for town of Gospić 2016-2020
FAO 2003: Sustainable forest management and the ecosystem approach: two concepts, one goal. By Wilkie M. L., Holmgren, P., Castaneda, F. Forest management Working Papers, Working Paper FM 25, Forest Resources development service, Forest Resources Division, FAO, Rome (unpublished).
Paklenica National Park Management Plan 2007-2017
Northern Velebit National Park Management Plan 2007-2017
Velebit Nature Park Management Plan 2007-2017

4. Acronyms

BR- Biosphere Reserve
MAB-Man and Biosphere
WNBR-World Network of Biosphere Reserves
ICC- International Coordinating Council
PA-Protected area
NP- National Park/Nature Park
PI-Public Institution
LAG-Local Action Group
CAEN-Croatian Agency for Environment and Nature
EN- Ecological Network
HPP-Hydro Power Plant
ESD - Education for Sustainable Development
SINP – State Institute for Nature Protection

Objectives and activities for the Velebit Mountain Biosphere Reserve Management Plan

Objective	Activity	Indicator	Implementation partners	MP code	Year of implementation										Implementation BR zone			Contributing to			
															core	buffer	transition	MAB Strategy 2015-2020	Lima AP		
																		Strategic Action Areas	Outcome	Action	
A. Conservation																					
Establishment of structured cooperation with local institutions and stakeholders on promoting the significance of preservation of natural resources and sustainable development	Establish formal cooperation on field work programme designed for students, between Public institutions (PI) that manage the BR and educational institutions in transitional zone of the BR	Number of signed agreements with educational institutions; Number of field work programme established; Number of students that have been attending the programme	PI Northern Velebit National Park, PI Velebit Nature Park; PI Paklenica National Park, University in Zadar; Higher Education Institution in Gospić, Individual faculties	PI VNP:3.1.7; PINVNP:3.2.2. PIPNP:3.1.2.												X	X	X	A	A1	A 1.1. A 1.3.
	Continue partnerships and establish new ones with universities and/or research institutions to undertake research both scientific and professional	Number of research conducted and reports provided, number of contracts signed, number of meetings held	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, University in Zadar; Higher Education Institution in Gospić, local public schools, Individual faculties educational institutions	PI VNP: 3.1.1; PI NVNP: 3.2.2; PI PNP:3.1.2													X	X		A C	A 4 C 8
To comply with Aichi Biodiversity Targets, preserve high biodiversity and emphasize geodiversity of the BR, improve knowledge on the BR overall value	Protect forests and ensure natural development in forest ecosystems based on Sustainable Forest Management approach and Forest Principles by technically supporting research	Number of research and reports from professionals involved	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, CAEN, Faculty of forestry, Croatian Forest Research institute	PI VNP: 3.1.3.1; PI NVNP:3.2.3.2; PI PNP:3.1.2.2												X	X		A	A1	A1.3. A1.4.
	Actively manage grasslands affected by the vegetation succession	Total surface of maintained grasslands; number of herds on pastures; number abundance of indicator species;	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, local community	PI VNP: 3.1.1.2; PI NVNP:3.2.3.1; PI PNP: 3.1.2.1												X	X		A	A1	A1.3. A1.4.
	Undertake research, inventarisation and mapping of species with data deficient status, endangered species, critically endangered and species on the verge of extinction	Number of habitat types, plant, fungi and animal taxa mapped and research; Number of geological features researched	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates	PI VNP:3.1.1; PI NVNP: 3.2.3; PI PNP: 3.1.2													X	X	X	A	A1

	Implement monitoring protocols for Natura 2000 species and habitats and identify potential needs for monitoring of other species	Abundance and fitness of target species and habitat types; Number of reports on status of target species and habitat types regarding the European Commission reports	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates, CAEN	PI VNP: 3.1.7; PI NVNP: 3.2.2; PI PNP:3.1.5										X	X	X	A	A1	A1.2.
	Provide guidelines for fire protection and actively mitigate the fire risk in BR	Annual programme for fire protection; Number of days in fire protection patrol; Number of educations completed; Annual number of fires put out; Number of maintained firefighting roads	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates	PI VNP: 3.1.1; PI NVNP:3.2.3.2; PI PNP:3.1.2.1										X	X	X	A	A1 A 4	A1.4. A1.6. A 4.4
	Monitoring the effects of climate change on indicative species and habitats	Reports on species areal and habitats surface changes; Results of data logger analysis	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates	PI VNP:3.1.1.5; PI NVNP: 3.2.2; PI PNP: 3.1.5										X	X	X	A	A1	A1.4.
	Inventarisation and monitoring of invasive species in BR	List of invasive species, their abundance estimated and surface of distribution calculated	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, CAEN	PI VNP: 3.1.5; PI NVNP: 3.2.3; PI PNP: 3.1.2										X	X	X	A	A 1	A 1.2
	Reintroduce critically endangered species to their former habitats and ensure their long- term survival in the area	Number and effectiveness of reintroductions	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates, Ministry of Environment and Energy, CAEN	PI VNP: 3.1.1; PI NVNP: 3.2.3; PI PNP: 3.1.2										X			A	A1 A 4	A 1.2. A 1.4 A 4.4.
	Identify and promote important ecosystem services of BR to public and stakeholders	List of ecosystem services, evaluated quality of ecosystem services; Ecosystem services of BR promoted on local, national and international level	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates	PI VNP:3.1.5; PI NVNP:3.2.5; PI PNP:3.1.6										X	X	X	A	A 7	A7.1 A 7.3
B. Development																			
	Develop a well-organized, sustainable, non-invasive, educational and cultural tourism based on the natural values of the BR	Number of repetitive visits, list of different tourist attractions, Number of conducted questionnaires on visitors' satisfaction, visitor management plan developed	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Tourist Boards of towns and municipalities inside the BR, Local tourist agencies	PI VNP: 3.1.4; PI NVNP: 3.2.7; PI PNP: 3.1.4										X	X	X	A	A 1	A 1.1 A 1.5

	Use important dates in nature protection as means to educate on biodiversity protection and benefits to local community	Number of manifestations held and people reached, results of knowledge level surveys	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, external associates	PI VNP: 3.1.4.2; PI NVNP: 3.2.7.2; PI PNP: 3.1.4.2											X	X	A	A 1	A 1.1 A 1.2 A 1.5
	Inform the local community on the BR management, ensure the transparency and involvement of the local people	Number of newsletters and annuals produced, number of people reached through social media, number of expert guidance, number of lectures held; number of different promo materials;	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Local tourist boards	PI VNP: 3.1.5; PI NVNP: 3.2.5; PI PNP: 3.1.6											X	X	A D	A 1 D 1 D 3	A 1.1 D 1.1 D 3.1
	Develop Visitors Management Plan	Number of workshops and meetings held, Visitors Management Plan developed	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, CAEN, Ministry of Environment and Energy,	PI VNP: 3.1.4.1; PI NVNP: 3.2.7.1; PI PNP: 3.1.4.4.															
	Develop new ways of interpretation and educational programmes for interpretation of BR natural values based on ESD principles	Number of educational trails developed, number of interpretative guided tours provided	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Educational institutions, local elementary schools	PI VNP: 3.1.4.2; PI NVNP: 3.2.7.2; PI PNP: 3.1.4.2											X		A	A 1	A 1.1
Promote BR as a model of good practice, based on sustainability science, which benefits local community	Active participation and partnership in projects that are conducted by local community	Number of projects in development and implementation	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Local action groups, local entrepreneurs	PI VNP: 3.1.5; PI NVNP: 3.2.5; PI PNP: 3.1.6											X	X	A	A 4	A 4.5
	Promote the BR as site that actively contribute to achieving the Sustainable development goals	Media coverage; participation in fairs, number of visitors	Local Tourist Boards, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, local authorities	PI VNP: 3.1.4.4; PI NVNP: 3.2.6; PI PNP: 3.1.4.3											X	X	A	A 1	A 1.1
	Cooperation with Local Action Groups, local manufacturers and entrepreneurs to benefit local community	Number of signed agreements and meetings held	LAGs, local entrepreneurs, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI VNP: 3.1.5; PI NVNP: 3.2.5; PI PNP: 3.1.6										X	X	X	A C	A 1 A 4 C 3	A 1.1 A 4.5 C 3.2
	Encourage and promote sustainable and traditional livestock breeding and agriculture in BR	Number of projects developed; number of signed contracts; list of species and number of herds;	Individuals from local community, LAGs, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, local authorities	PI VNP: 3.1.1.2; PI NVNP: 3.2.3.1; PI										X	X	X	A	A 1	A 1.3 A 1.5

				PNP: 3.1.2.1																
	Conservation and restoration of tangible and intangible cultural heritage in the BR considering the Convention for Safeguarding of the intangible cultural heritage	Number of restored objects; number of manifestations held, research conducted and publications published	Educational and cultural institutions from Zadar and Gospić, LAGs, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI VNP:3.1.2; PI NVNP 3.2.4; PI PNP: 3.1.3										X	X	X	A C	A 1 C 8	A 1.6 C 8.1	
C. Logistic support																				
Enable research and practical learning based on ESD principles that support the management of BR and sustainable development in BR	Building and maintenance of visitor infrastructure in BR	Number and type of objects;	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI VNP: 3.1.6; PI NVNP:3.2.8, 3.2.9; PI PNP: 3.1.4.4											X	X	B	B 6	B 6.1	
	Developing and conducting volunteering programmes	Number of volunteers involved and number of programmes developed	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Ministry of Environment and Energy, CAEN	PI VNP: 3.1.4.2; PI NVNP: 3.2.7.2; PI PNP: 3.1.4.2											X	X	C	C 3	C 3.2	
	Encourage and facilitate education for local community	Number of workshops and participants	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, LAGs, Educational institutions from Zadar and Gospić	PI VNP: 3.1.5; PI NVNP:3.2.5; PI PNP: 3.1.4.2, 3.1.6											X	X	X	A	A 1	A 1.1
	Revitalisation of the permanent monitoring sites in BR under MAB Programme	Number of annual reports, MAB monitoring sites revitalised and permanent monitoring established	Faculty of forestry and international experts, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI VNP: 3.1.3.1, 3.1.8.4; PI NVNP: 3.2.3.2; PI PNP: 3.1.2.2											X	X		A	A 1	A 1.4
	Collaboration and knowledge exchange with other BRs	Number of meetings, number of visits to the BRs, number of joint activities	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Mura-Drava-Danube BR, Karst BR	PI VNP:3.1.8.4; PI NVNP:3.2.10											X	X		B	B 7	B 7.2

D. Management																					
Establish up-to date, coordinated and adaptive management of the BR with ensurance of transparency and participatory approach in decision making processes	Promote and communicate MAB Programme with the local community and stakeholders regarding the enlargement of the BR	Number of workshops and meetings held	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI VNP: 3.1.5; PI NVNP:3.2.5; PI PNP:3.1.6														X	A D	A 1 D 1	A 1.1 D 1.1
	Collect the letters of support regarding the revision of the transition zone from representatives of municipalities in the BR	All letters of support collected	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Ministry of Environment and Energy, CAEN, representatives of municipalities inside BR	PI VNP: 3.1.5; PI NVNP:3.2.5; PI PNP:3.1.6														X	A D	A 1 D 1	A 1.1 D 1.1
	Establish regular communication with the UNESCO Secretariat regarding the revision of the transition zone and the required procedures	Communication in written form archived	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Ministry of Environment and Energy	N/A														X	A	A 4	A 4.1
	Create and implement Management Plans for three Protected areas in the BR, according to the adaptive management process	Management plans for three PAs developed	CAEN, Ministry of Environment and Energetics, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, representatives of local community	PI VNP: 3.1.7; PI NVNP: 3.2.10; PI PNP: 3.1.5														X	A	A 6	A 6.2
	Conduct periodic meetings of Coordinating committee	Number of meetings held	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	N/A														X	A	A 6	A 6.1 A 6.2
	Periodic assessment of management of the PI	Number of assessments made	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP, Ministry of Environment and Energetics	PI VNP: 3.1.7; PI NVNP: 3.2.2.; PI PNP: 3.1.5														X	A	A 6	A 6.1
	Develop and implement Communication strategy	Number of meetings and workshops held, Communication strategy developed	Ministry of Environment and Energetics, CAEN, PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI VNP: 3.1.5; PI NVNP: 3.2.5; PI PNP: 3.1.6												X	X	D	D 1 D 2 D 3	D 1.1 D 2.1 D 3.1	
	Capacity building	Number of workshops and educational programmes that employees attended	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP	PI NVNP: 3.2.10; PI PNP:														X	A	A.4	A 4.1
Provide periodic reviews to the UNESCO MaB Secretariat	Periodic reviews provided in time	PI Northern Velebit NP, PI Velebit NP, PI Paklenica NP. Ministry of Environment and Energy	PI VNP: 3.1.7; PI NVNP: 3.2.5; PI PNP: 3.1.5														X	A	A 6	A 6.1	