

**MANAGEMENT PLAN
FOR THE PROTECTED BLUE LAND AREA
VELIKA PLAŽA ULCINJ WITH BOJANA RIVER MOUTH AT THE ADRIATIC SEA**

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ACRONYMS

BL	Blue Land
CICES	Common International Classification of Ecosystem Services
ES	Ecosystem Services
EU	European Union
EUNIS	European Union Natural Information System classification of habitats
IUCN	International Union for Conservation of Nature

BACKGROUND INFORMATION	
Name of the Protected Area:	VELIKA PLAŽA ULCINJ WITH BOJANA RIVER MOUTH AT THE ADRIATIC SEA - the Blue Land Area
Proposal for the protection:	Nature Park
Total area proposed for the protection	~1,600ha
Biodiversity value of the natural resource	<p>18 NATURA 2000 habitats have been registered in the Blue Land area in Montenegro, and it is an area with the highest number of NATURA 2000 habitats in Montenegro.</p> <p>Velika Plaža is the last habitat of a large number of psammophytes (<i>Calystegia soldanella</i>, <i>Pancratium maritimum</i>...)</p> <p>1% of the total European population of the rare waterbird – Baillon's crane (<i>Porzana pusilla</i>)</p> <p>Mammals: <i>Mus spicilegus adriaticus</i>, <i>Talpa stankovici montenegrina</i> - endemic to this area, <i>Lutra lutra</i> and <i>Tursiops truncatus</i>, as well as representatives of Chiroptera (22 species) included in the Natura 2000 list</p>
Coordinates	<p>41° 53' 36.69" N</p> <p>19° 17' 47.47" E</p>
Biogeographic region	Mediterranean
International protection status	Emerald area, IPA area, IBA area
National protection status	national landscape reserve (Official Gazette of FRMNE, No.36/1968) = monument of nature (Official Gazette of MNE. No. 54/16)

Table of contents

MANAGEMENT PLAN AUTHOR:	2
ACRONYMS	2
I INTRODUCTION	6
1.1. Legal background	7
<i>Excerpt from the Proposal of the Decision on the proclamation of the Nature Park “VELIKA PLAŽA ULCINJ WITH THE BOJANA RIVER MOUTH AT THE ADRIATIC SEA”</i>	9
1.2. Spatial planning framework	10
The guidelines from the SUP Ulcinj, as regards protection, development, and planning of the Velika Plaža area provide for:	11
1.3. International importance for the nature protection	11
II OVERVIEW OF NATURAL RESOURCES AND PROTECTED AREAS USERS	13
2.1. Area, surface, and description of boundaries	14
2.2. Historical overview of the area’s origin	14
2.3. Characteristics of natural resources	15
2.3.1. Hydrological characteristics	15
2.3.2. Hydrographic characteristics	16
2.3.3. Geology, soil	16
<i>Seismic activity in the region</i>	17
<i>Geology</i>	17
<i>Geomorphological characteristics</i>	17
<i>Pedological characteristics</i>	17
2.4. Climatic characteristics	18
<i>Air temperature</i>	18
<i>Air humidity</i>	18
<i>Cloudiness</i>	18
<i>Insolation</i>	19
<i>Precipitation</i>	19
<i>Winds</i>	19
2.5. Characteristics of natural values	19
2.5.1. Ecosystems and Flora	19
<i>Grassland</i>	21
<i>Woodland and forest</i>	22

<i>Coastal ecosystems</i>	22
<i>Natura 2000 habitats</i>	25
2.5.2. Fauna	26
<i>Invertebrates</i>	26
<i>Ichthyofauna</i>	26
<i>Reptiles and amphibians</i>	26
<i>Ornithofauna</i>	27
<i>Mammals</i>	27
2.6. Overview of socio-economic resources and protected areas users	28
2.6.1. Cultural and historical heritage	28
2.6.2. Demographic data	29
2.6.3. Tourism	30
2.6.4. Agriculture and livestock farming	31
III ASSESSMENT OF THE SITUATION IN THE BLUE LAND AREA	32
3.1. Natural values	33
3.2. Ecosystem services	35
IV LONG-TERM OBJECTIVES OF PROTECTION AND SUSTAINABLE DEVELOPMENT	40
V ANALYSIS AND EVALUATION OF THE CONDITIONS FOR ACHIEVING THE PROTECTION OBJECTIVES	40
VI MEASURES FOR THE PROTECTION, CONSERVATION, MANAGEMENT, PROMOTION AND USE OF THE BL AREA	43
VII SPATIAL IDENTIFICATION OF PLANNED PURPOSES (ZONING) AND LAND USE REGIMES	44
7. Map 5: Protection regime on Velika Plaža Ulcinj	45
VIII PRIORITY ACTIVITIES FOR THE MANAGEMENT OF THE PROTECTED BL AREA	45
IX SOURCES OF FINANCES FOR THE PROTECTION MEASURES IMPLEMENTATION AND IMPROVEMENT OF SUSTAINABLE MANAGEMENT OF THE BL AREA	55
9.1. Providing funds for implementation of the plan	55
9.2. Improving the sustainable management in the BL area in Montenegro	55
REFERENCES	57

I INTRODUCTION

The Blue Land area in Montenegro is situated in the southern part of the coastal region and includes marine and terrestrial parts of Ulcinj Municipality. BL will be established to maintain core functions of ecosystems, habitats, and marine and coastal species, which serve the living of the local population.

The 1600 hectares coastal area between Port Milena and the river mouth of Bojana, is the area of Velika Plaža with its hinterland and recognized as the Blue Land area in Montenegro. This coastal zone is characterized by a 12 km long natural dune beach that connects the marine ecosystem with an area mostly covered by forest, grassland, and cropland.

Velika Plaža – “the Great Beach” – is a large-scale coastal habitat with a highly dynamic coast formed by accumulation processes. The beach is growing in part of the delta front, adding new sand barriers to the existing shoreline. The whole Velika Plaža is a “barrier island” formed by the sediments of the Bojana and the wave energy of the Adriatic Sea. The floods and dry cycles depend on the sea level, the Bojana River, and local rainfall. The gradient of habitats from the littoral zone, beach, dunes, and depressions with alkaline and freshwater habitats, up to the remains of the indigenous Mediterranean Pedunculate Oak (“Skadar Oak”) forest is of a great landscape value and should be protected (Schneider-Jacoby et al., 2006).

The Bojana river, although only 44 km long, is distinguished by many specificities. It springs from Skadar Lake, and flows into the Adriatic Sea, forming in one its part border between Albania and Montenegro, and a large part of its stream flows with sweet and salty water. This creates a very complex ecosystem consisting of subtropical and Mediterranean plant and animal species. The mouth of the Bojana in the Adriatic is a protected nature reserve with about 143 species of fish and close to 300 bird species.

Besides the natural habitats, the pastures and meadows spreading along the road to Ada near Bregvija and Štoj are very important habitats and have contributed semi-natural landscapes to the complex of marine coastal habitats. The terrestrial part of Velika Plaža covers 1,235 ha, without the already heavily used area in the west, and is included in the Biosphere concept as a transition zone, together with 993 ha of the shallow Adriatic Sea – the prodelta. According to the Nature Protection Act (SRN 36/77, 2/82), the beach covering some 500 ha is already protected as a “natural monument”. This proposal includes not only the beach but also the older parts of the barrier islands between the right branch of the Bojana and the new part of Ulcinj (Gornji and Donji Štoj). Clear zoning is needed for the most valuable areas to be strictly protected (Eastern Velika Plaža and the prodelta), with a surrounding buffer zone that will include the pasture and meadow system (Schneider-Jacoby et al., 2006).

The Blue Land area in Montenegro is one of the last zones in the Mediterranean region with preserved vegetation of psammophytes and with other Mediterranean habitat types occurring in the hinterland. In this area, 18 NATURA 2000 habitat types have been registered, making it the area with the highest number of NATURA 2000 habitats in the Montenegrin coastal region. Five of the above 18 habitat types so far have been registered in Montenegro only in Velika Plaža and its hinterland: 2130* Fixed coastal dunes with herbaceous vegetation (grey dunes), 2240 Brachypodietalia dune grasslands with annuals, 2270 Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*, 3170* Mediterranean temporary ponds, 6420 Mediterranean tall humid herb grasslands

of the Molinio-Holoschoenion. Two types of habitats are present only on Velika Plaža and on the Bojana Island: 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') and 2190 Humide dune slack. Velika Plaža is the last habitat of a large number of psammophytes (*Calystegia soldanella*, *Pancratium maritimum*...) in Montenegro, which disappeared from other locations on our coast as a result of intensive urbanization. However, it must be noted that ensuring a favourable status of conservation of species and habitats and of the ecological character of this area of international importance depends primarily on the management of this area and the development of economic activities in a sustainable manner.

The Blue Land biodiversity protection concept is based on the synergy of preservation of a valuable ecosystem of this area, as well as enabling the development of economic activities in the area: tourism, agriculture and fisheries in a sustainable way. The Management Plan is a key document on the basis of which the managing authority of the protected area implements various measures and activities to protect nature and to improve the protection objectives.

This document was developed on the basis of the guidelines set out in Article 59 of the Law on Nature Protection (Official Gazette of MNE No. 54/16), which lays down, at the national level, the content of the management plan, as well as on the basis of the recommendations and methodologies established under the Blue Land Project. In accordance with the said law, the Management Plan is adopted for a period of five years. It is a planning document for measures and activities aimed at the protection and preservation of the protected natural resource and provides a planning basis for the management and utilisation of the natural resource for environmental, economic, and social purposes.

Since this Management Plan defines and describes the manner of management of the protected area based on the best practice known at the time of its development and that monitoring of the situation in the area and obtaining new information and the emergence of some new impacts may require changing the management practice, it should be adaptable so as to allow changes to the activities planned in accordance with the changes that have occurred in the meantime.

1.1. Legal background

The documents used for the purpose of drafting this document result from the Blue Land Project activities and provide the basis for further development: Regulatory Framework Analysis and Legislative Proposal.

The legal basis for the protection of a particular area, its preservation, and management is contained in the Law on Nature Protection (Official Gazette of MNE No. 54/16).

The Law on Nature Protection defines the types of protected natural resources (Article 20) and categorization of protected areas (Article 30). In accordance with Article 20 of the Law, parts of nature of extraordinary value characterized by biological, geological, ecosystem, and landscape diversity may be proclaimed protected natural resources. Definition of a protected area category is of particular importance in terms of defining the objectives of management and permitted activities and the impact of humans on this protected area category.

It is important to note that a part of the Blue Land area, Velika Plaža, currently enjoys protection in accordance with national legislation. Namely, Velika Plaža was placed under protection already in

1968, under the natural landscape reserve category, in accordance with the then applicable legal framework, and on the other hand, Article 115 of the Law on Nature Protection (Official Gazette of Montenegro 54/16) the legal institute of a monument of nature has been recognized, which corresponds in all aspects to the natural landscape reserve and thus obviously, technically, it can be said that the protection of this area has a legal continuity. Therefore, in terms of applicable legislation in Montenegro, legally binding status under the Law on Nature Protection is given to any protected area declared in accordance with the legislation that ceased to have effect, including those declared in 1968, which was the case with the Velika Plaža status, although the boundaries of that area had not been defined precisely at the time. What is perceived as a shortcoming in the existing management system in this protected area in the existing format is the lack of clearly defined boundaries of the protected area and how its protection is implemented, which also shows why it is necessary to provide proper protection to this area against adverse anthropogenic impacts, which is precisely the objective of the Blue Land project through the establishment of a cross-border management model for the protected coastal zone management.

Article 35 of the said law, provides for revision of the status of protected areas, that is, if at some point in time the need to revise the protected area arises due to changes in natural values, the procedure for initiating and conducting the revision process is also laid down. Furthermore, for protected areas declared before the entry into force of the new law, for which no boundaries were set and/or data on the reasons for protection are lacking, as it is the case with the Velika Plaža area, the obligation to initiate the revision procedure for the purpose of creating preconditions for adequate management is defined. Thus, under the activity of the legal framework analysis and the proposal for the regulation developed under the Blue Land Project, the proposal was given to upgrade the protection of the area concerned with a higher degree of protection, from the Monument of Nature to the Nature Park. Also, additional protection would imply an extension of the protection area to the hinterland Velika Plaža and the Bojana River Mouth at the Adriatic Sea, namely, the right branch of the Bojana Delta located within the state borders of Montenegro.

Article 24 of the above law, defines the Nature Park as: "a vast natural or partly cultivated mainland and/or sea, characterised by a high level of biological diversity and/or geological values with the significant landscape, cultural and historical values and environmental characteristics of national and international importance". Furthermore, this article of the Law lays down that actions, activities, and business activities endangering the characteristics, values, and role of the park shall be prohibited in the Nature Park.

The procedure for the declaration of protected areas under Article 34 of the Law on Nature Protection reads, inter alia: "Marine protected areas whose territory is partly or entirely entering the public maritime domain, other than national parks, are declared by the Government."

Article 55 of the Law on Nature Protection defines the management authorities of the protected natural resources in Montenegro. Protected areas and environmental network areas are managed by a management authority complying with the requirements as regards personnel, organizational capacities for carrying out the tasks of protection, improvement, promotion, and sustainable development of the protected area and the environmental network areas. The managing authority of a protected area is determined by the act on the proclamation of the protected area. Protected areas, located in the public maritime domain, are managed by the legal entity in charge of coastal zone management.

In this concrete case, the Blue Land area in Montenegro is, for the most part, located in the public maritime domain zone; thus, to protect this area, the act needs to be adopted by the Government, which will designate the managing authority of the area which, in this case, will be the public enterprise for the coastal zone management, since the Law on Public Maritime Domain lays this entity down as the legal person managing the public maritime domain.

In accordance with Article 56 of the Law on Nature Protection, the managing authority of the protected area and/or the environmental network areas shall:

- adopt the annual management program and the act on internal order;
- provide protection service;
- adopt a financial plan for the protection and development of the area;
- adopt the annual development plan and personnel training plan;
- ensure implementation of nature conservation measures in accordance with the objectives of protection, zones, and protection regimes;
- preserve, enhance and promote the protected area and/or environmental network areas;
- demarcate the protected area and/or the environmental network area;
- ensure the smooth operation of natural processes and sustainable use of the protected area and/or environmental network area;
- monitor the situation in the protected area and/or the environmental network areas and provide information to the administrative authority;
- submit an annual report to the Ministry or the competent local administration authority on the implementation of the management plan for protected areas and environmental network areas (hereinafter referred to as: the management plan) or the annual management program, measures implemented, financial resources used to implement the measures;
- perform also other tasks as provided for by the law and the act on the establishment.

Excerpt from the Proposal of the Decision on the proclamation of the Nature Park “VELIKA PLAŽA ULCINJ WITH THE BOJANA RIVER MOUTH AT THE ADRIATIC SEA”

The decision proposes proclamation of the area of Velika Plaža Ulcinj with hinterland and the Ulcinj River Mouth at the Adriatic Sea - Blue Land area for the protected natural resource of national and international importance under the name: Nature Park Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea.

The Nature Park Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea shall be classified as a protected natural area of Category II.

The development of the Nature Park Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea - the Blue Land Area will be based on the harmonization of anthropogenic activities, economic and social development plans, programs, and projects with defined protection levels, and sustainable and rational use of natural values and resources for the purpose of their lasting conservation.

Under the Nature Park Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea - the Blue

Land Area, three protection zones have been identified, where protection regimes I, II, and III will be applied.

The decision designates the Public Enterprise for Coastal Zone Management as the management authority of the Nature Park Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea - Blue Land Area. The work of the management authority is supervised by the state administration authority in charge of nature protection, namely, the Ministry of Environment, Spatial Planning and Urbanism. The decision provides for establishment of the Council of Nature Park Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea - Blue Land Area in order to include relevant entities and to provide proposals and opinions in the decision-making process.

Article 7 paragraph 3 of the said Proposal for the Decision lays down the rights and obligations of the management authority to: develop and implement the management plan; develop and implement the annual management programme; to draft and implement the act on internal order and protection service; organize the protection service; ensure implementation of protection measures; protect, develop and promote the Nature Park Velika Plaža Ulcinj with Bojana River Mouth at the Adriatic Sea; demarcate the protected natural resource, boundaries and protection regime in a prescribed manner; ensure the smooth running of natural processes; ensure sustainable use of natural resources; monitor the situation and provide information to the administrative authority in charge of environmental protection and charge fees for the use of a protected natural resource.

1.2. Spatial planning framework

The Spatial Plan of Montenegro by 2020 (Official Gazette of Montenegro No. 24/08) is a strategic document and general basis for the organization and spatial planning in Montenegro, setting the objectives of the state and spatial development measures, in accordance with the overall economic, social, environmental and cultural and historical development of Montenegro. With this document, the plan is to extend the boundaries of the National Park "Skadar Lake" to the Rumija Regional Park or to the area of the Šasko Lake and the Bojana delta. The Study for the Protection of the Bojana Delta (2008), which covered the territory of the BL Area, proposed the establishment of a Regional Park in this area, within which several zones with different protection regimes were identified. The study was not widely accepted and, on the basis of it, no acts were adopted to protect these areas– sites.

The Special Purpose Spatial Plan for the Coastal Zone of Montenegro, adopted by the Parliament in late July 2018, recognized Velika Plaža as an area with significant natural and economic potential for tourism development in the coastal area. Velika Plaža was also recognized as an area previously placed under protection (1968) for which the revision process has not been implemented yet.

The Spatial Urban Plan of the Municipality of Ulcinj (SUP), adopted by the Government of Montenegro in 2017, places the area of Velika Plaža by the settlements of Štoj and Ada Bojana under the Planning Zone 2, with a total area of 2690 ha. The main potential of the zone is a unique, undeveloped natural environment of sandy beaches and dunes, areas under Mediterranean plants and pine forests in the area of Velika Plaža and areas under marshes, thicket and numerous habitats of autochthonous plant species, amphibians, reptiles and birds in the part of the Bojana River delta.

According to the Spatial Urban Plan (SUP) for the Municipality of Ulcinj, the developmental priority

for this area is the construction of the Velika Plaža tourist complex, which includes the construction of a high-category hotel and a tourist resort, sport and recreation facilities, camps, the reconstruction of a tourist resort in Ada Bojana, as well as the rehabilitation of the zone with temporary illegally built structures and rafts on the shores and at the mouth of the Bojana River at the Adriatic Sea. Such development can take place respecting the environmental requirements, with regard to the complex protection of the natural environment and protection of the entire space against interventions that would endanger the landscape and the picturesque environment.

The SUP for the Ulcinj Municipality clearly sets the objective of protecting the authentic appearance of the area and its identity, and the necessity for all interventions in the area, through efficient planning measures and positive land use measures, to preserve the natural ecosystems, geomorphological forms and typical elements of the cultural landscape.

The guidelines from the SUP Ulcinj, as regards protection, development, and planning of the Velika Plaža area provide for:

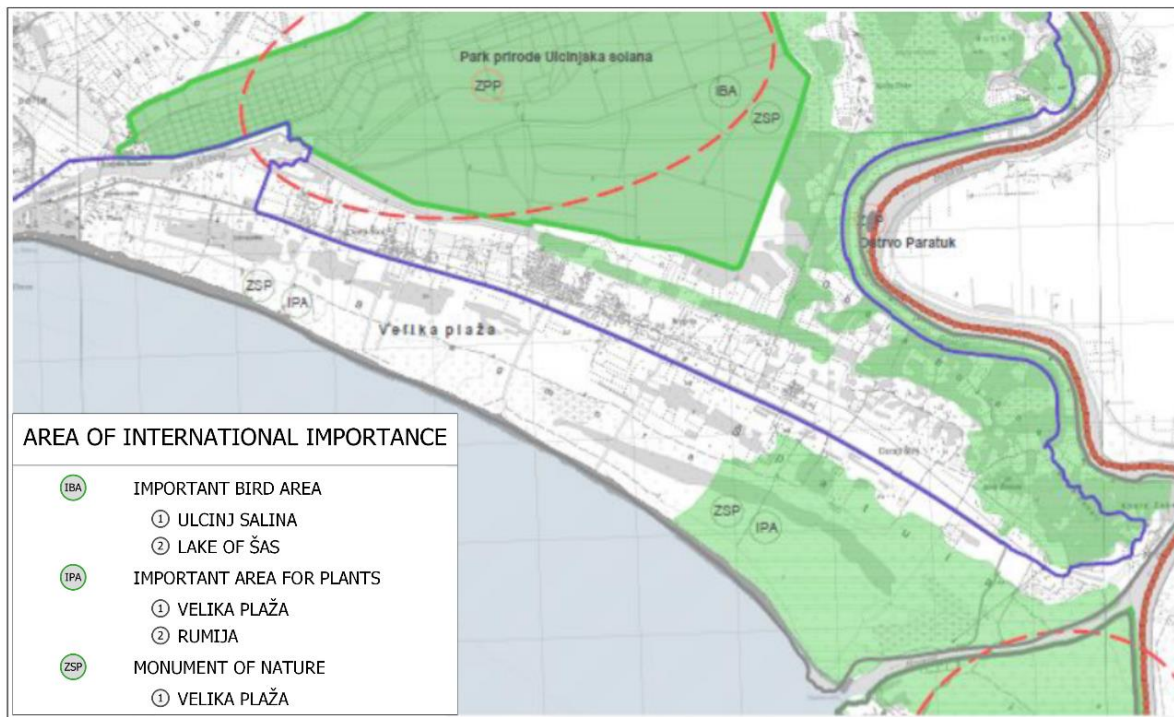
1. Preservation of the gravel-sandy coastline, its protection status, appearance, and autochthonous vegetation;
2. Preservation of Ulcinj dunes;
3. Preservation of the coastal and floodplain forests in alluvial terrain;
4. Preservation of alluvial fields;
5. Protection of the biodiversity of the area.

SUP for the Ulcinj for each of the categories listed above provides detailed measures for the protection and preservation.

1.3. International importance for the nature protection

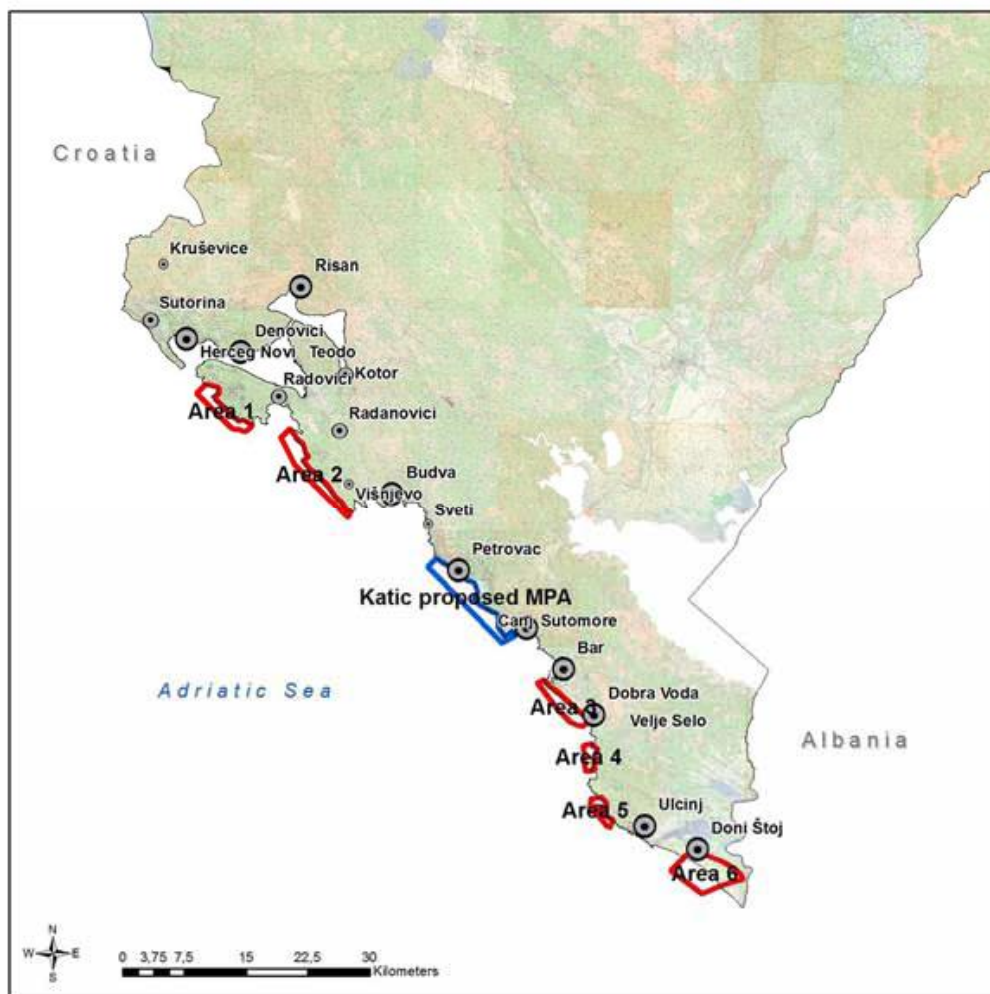
The Emerald Network is a regional ecological network of international importance, comprising the network of Areas of Special Conservation Interest for Nature Protection (ASCI) on the territory of Europe, Asia, and North Africa. The basis for establishing the network is the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The Parties to this Convention, including Montenegro, are obliged to protect and maintain the Areas of Special Conservation Interest (ASCI areas) that they have nominated in their territories. Velika Plaža Ulcinj beach with the Salina was recognized as an EMERALD area in Montenegro based on the habitat included in the Habitat Directive (Council Directive 92/43/EEC) and on the basis of the species listed in Annex I, II, IV, and V of the Habitat Directive (Council Directive 92/43/EEC), and on the basis of the species listed in the Birds Directive (Directive 2009/147/EC of the European Parliament and the Council).

This site was selected as an IPA area (Important Plant Area) based on two criteria: B - the biodiversity richness and C-habitats. The B Criterion concerns the B1 habitat Coastal dunes and sandy shores (EUNIS habitat classification, level 2). The sandy dunes of Velika Plaža and Ada Bojana have all the plant species typical of this habitat type in Montenegro. Most of the plants in this habitat in Montenegro are protected by the law (Čaković & Milošević, 2015).



Map 1: Area of international importance

Velika Plaža of Ulcinj belongs to areas of importance for ornithology (Map 1). The ornithological significance of the Velika Plaža had previously been as an important nesting site, notably pratincoles, the Eurasian stone-curlew, and oystercatchers. Today the habitat is fragmented, and only a few nests of Charadriiformes can be found (Common ringed plover) and in the remains of the floodplain forests, the nests of European roller *Coracias garrulus* and the Levant sparrowhawk *Accipiter brevipes* can be found. The beach is particularly important during migration: it is “a springboard” for the trip across Italy, Sicily, and Malta to Africa and a bird shelter after wintering. In addition to the Salina, Ada, and Paratuk, it is one of the key coastal sites on the migration route across the Adriatic. The beach meets the standards for admission to the Ramsar List of Wetlands of International Importance because in its hinterland, in the wetland that an illegal road was built upon, nearly 1% of the European population of Baillon's crake *Porzana pusilla* nests. Brijeg od Mora is an important nesting site for larks, the Eurasian stone-curlews, bee-eaters, and an important feeding ground for most of the species present in the delta. Woodlark *Lullula arborea* is present here in astonishing numbers Caković & Milošević (2013).



Map 2: Proposal for zones suitable for future MAP areas in Montenegro's coastal region.

Due to the presence of priority habitats types in accordance with the Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC), the protected area of “Velika Plaža Ulcinj” is expected to become a part of the NATURA 2000 network. This is the area with the highest number of NATURA 2000 habitats in the Montenegrin coastal region. As regards the value of the area, particular emphasis is placed on the eastern part of Velika Plaža, which is most valuable in terms of biodiversity and habitats preservation.

Velika Plaža was also proposed to be part of the cross-border biosphere reserve "Lake Skadar and the Bojana Delta". Furthermore, as a conclusion of the research carried out under the project “Start up of Katič Marine Protected Area in Montenegro and Assessment of Marine and Coastal Ecosystems along the coast “the proposal was given for the zones suitable for the future MAP (Marine Protected Area) in Montenegro’s coastal region, including the proposed Zone 6 from Seke Đeran, southward to the Bojana mouth, which partly covers an area of the marine part of the BL Area in Montenegro. (Map 2)

II OVERVIEW OF NATURAL RESOURCES AND PROTECTED AREAS USERS

2.1. Area, surface, and description of boundaries

The Blue Land Area has been identified as an area of importance for maintaining the basic functions of ecosystems, habitats, and marine and coastal species that are important for the livelihood of the local communities. In Montenegro, the area is located in the southern part of the coastal region and includes marine and land areas of the Municipality of Ulcinj. More specifically, for the purposes of this document, the Blue Land includes a 1600-hectare coastal area located between the Port Milena and the mouth of the Bojana river and includes Velika Plaža (Long Beach) with its hinterland (Map 3). This coastal zone is characterized by a 12 km long natural beach with sand dunes connecting the marine ecosystem to an area that is mostly covered in forest, arable land, and pastures. The Bojana River ecosystem is also situated there.



Map 3: Blue Land Area in Montenegro

Velika Plaža Ulcinj, together with Ada Bojana, which is not a part of this area, is the southernmost point of Montenegro's coast. The boundary of the beach to the north is Port Milena, and the right branch of the Bojana River to the south. It is 12 kilometres long, with the width varying from 200 to 1000 meters. It is the longest sandy beach on the eastern coast of the Adriatic Sea and, together with its hinterland, it forms a sandy dune complex as a unique habitat in Montenegro. The beach is a very diverse and dynamic coastal habitat created by accumulation processes. Its habitat types vary from the littoral zone, the beach itself, the dunes in the hinterland, the depression with the acidic and freshwater habitats, to remains of the endangered Skadar oak forests. While the eastern part of the beach is still maintaining its original appearance and represents the centre of the biodiversity of this site, the western part is under significant influence of anthropogenic activities. The Bojana is a river of international importance because it is the pathway for the migration of fish from the Adriatic Sea to the Lake Skadar.

2.2. Historical overview of the area's origin

The natural development of the Bojana delta complex can be described as a set of dynamic, short-term, and long-term processes, based on the following factors:

1. High sedimentary deposits, coming from the mountainous terrain of the Drim

- watershed;
2. Hydrographic variability of the Lake Skadar and the Drim;
 3. Variability of the sea and the littoral zone created by short-term events (storm and tidal waves) and long-term processes (marine transgressions);
 4. Tectonic changes, such as uplifts and subsidence (several earthquakes have been recorded in this area).

The formation was caused by high sediment deposits brought by the Drim, combined with low tidal currents in the Adriatic Sea (about 20 cm). Compared to other river mouths in the Mediterranean, such as the Rhone and the Po (about 4 km over 100 years), the creation of the Bojana Delta took a relatively long period, 1-1.5 km over the last 100 years. Typical of the Mediterranean conditions, the river levels change seasonally, with floods occurring in winter (November to April), while the river levels drop significantly between June and August.

The high water level of the Drim blocks the flowing of the water out of Lake Skadar and the Lake's water level rises. When the inflow of the water from the Drim decreases, the Lake Skadar flows out through the Bojana and the Lake's water level drops again. Due to such hydrological conditions, the flooding and accumulation processes in the Bojana delta are very dynamic. Prior to intensive drainage and melioration of the area, almost 50% of the entire plain complex was flooded on a regular basis (more than 28,000 ha). The research shows that nearly 9,000 ha is still regularly flooded. Flooding in the coastal and bay areas depends also on precipitation in the region. Since the Bojana flows through the lowlands, large amounts of sediment are deposited along the route towards the sea, and only sand and fine particles reach the sea. These sediments, consisting of fine particles, were transported by currents from the river mouth westward, where the barrier island (Velika Plaža) was formed in front of the bay. The sea and wind transported and deposited the remaining sediments, thus closing the barrier island and forming a shallow bay (Zoganjsko Mud), which was then filled up while the sandy barrier beach with its dunes was growing into the sea. This created a unique environment of muddy wetlands in the former bay. In the 19th century, the Zoganjsko Mud was an impassable marsh (about 25 km²) with brackish water, while melioration works began in 1913. That is when the marsh was connected to the sea by the Port Milena Channel and was fenced from the Bojana by an embankment, with the original intention of draining the area to contain malaria. The founding of the big Ulcinjska Solana (Ulcinj Salina) (1926-1934) in this area, and its significant increase by 60% since the early 1980s, with new large pools (formerly knetas) significantly altered the character of the landscape.

Since 1980, the deposition of the Bojana sediments has been reduced, and the front of the mouth has been further damaged when the Drim level and the sedimentary composition changed due to the construction of a hydropower plant and the use of large quantities of water to irrigate the Albanian side (Dömpke, 2008).

2.3. Characteristics of natural resources

2.3.1. Hydrological characteristics

Bojana is a partly navigable international river. It is 43 km long and has two main tributaries: The Morača, in Montenegro, and a Drim branch in Albania. It flows from the Skadar Lake for 18 km through Albanian territory, and the remaining 25 km is the border between Montenegro and Albania. According to estimates, 35% of its water comes from Montenegro. The water regime of

the Bojana is determined by its tributaries, the Skadar Lake and the mouth. Its flow is slow, due to a small slope of 1.2m/km. The average depth of the Bojana is about 3 to 5 meters, and in some parts, it is above 8 meters. At the mouth of the river, the sea waves created a reef, which is visible when the water level is low. The river branch west of Ada is smaller; its depth in winter is 0.9 meters and 1.2 meters in summer, while the second branch east of Ada forms the border with Albania, and is 1.2 m deep during winter, and 1.6 m during the summer period. The protection against floods consists mainly of passive measures, protective embankments, and some river regulation works. These embankments provide protection against seasonal flooding for an area of 600 ha between the Bojana and the old dam of Salina, as well as for the Ulcinj field (Dömpke, 2008).

Ulcinj belongs to the category of "the water-richest" areas in the Montenegrin coastal region. The following watercourses flow into the Port Milena Channel: Bratička River and Mala Bdrela, with springs below the Možura, as well as Velika Brdela, with its spring at the foot of the Briska Gora. The length of this channel from Salina to the sea is 1500 m, while its width is 150 m (Radojičić, 2005). Brackish and freshwater springs, present even today in the vicinity of Salina and the Zoganjsko Lake, form underground watercourses reaching the water basins in the Velika Plaža hinterland (Radojičić, 2005).

2.3.2. Hydrographic characteristics

Sea

According to research by the Institute for Marine Biology, there is a well-formed foreshore and shelf in Ulcinj aquatorium. The foreshore is a narrow strip of seabed that lies between high and low water and has an amphibian character because during the high tide it is covered by the sea and during the low tide it stays above sea level. The shelf is a part of the seabed that continues to the foreshore, usually at a small slope, and stretches in the aquatorium in front of Ulcinj up to about 200 m in depth. As regards physical structure, there are three main seabed types and are all well developed in this area – rocky, sandy, and muddy. Sea currents in the South Adriatic are up to 6 times stronger than in other parts of the Adriatic Sea. The highest current speeds in this part of the sea reach 42 to 88cm/s (outgoing current along the Italian coast). The Adriatic Sea is one of the saltiest seas on Earth. The South Adriatic region has the highest salinity values, with an average salinity of 38.48 - 38.60‰.

The coastal sea of the South Adriatic belongs to the warmest parts of the Adriatic Sea (southern position, the vicinity of the warm Ionian Sea, lower freshwater inflow, greater depth). The temperature of deep water layers is about 11°C and the surface temperature is up to 25°C during the summer period. During the winter period, the water temperature ranges from 12–14°C. For more than 6 months, the water temperature is above 18°C and for more than 4 months above 20°C (from May 6 to November 4 - 182 days in total). The chemical composition of seawater is diverse. It contains sodium, magnesium, calcium, potassium, strontium, and other elements in small quantities (fluorine, rubidium, aluminium, barium, lithium, copper, zinc, uranium, etc.). For the living world, the nutrient salts content is of particular importance, especially phosphorus and nitrogen.

2.3.3. Geology, soil

Seismic activity in the region

Montenegro's coastline is an area of intense seismic activity, due to the movement of tectonic plates in the border zone toward the Dinarides. The most important seismic zones of the coastal area are located in the southern part of Montenegro: the Skadar Zone, the Ulcinj Zone, and the Budva Zone. In these zones, strong earthquakes with the intensity of maximum 9 Mercalli (MCS) scale are possible in these zones. The seismic risk is aggravated by the fact that most of the Velika Plaža area is composed of Quaternary sediments. This region belongs to Zone 9c with a seismic coefficient of 0.12 Cs. Most of the research area shows an average soil condition. However, some zones, such as clay slope with flint sediments in the vicinity of Ada Bojana, are seismically unstable, and permanent deformations caused by the 1979 earthquake are visible there. Some parts of the terrain, such as sandy terrain near the sea with high levels of underground water, or marshes, are in a stable condition.

Geology

Quaternary formations are particularly developed in the Velika Plaža area. They cover a vast space and are represented by alluvial formations and shoreline sands. The alluvial sediments were developed in the lower course of the Bojana and on most of the beach, where the deposit was made from gravel, sand, silt, and sandy clay - materials that the watershed area is built of. Beach deposits are sandy (coastal recent ore-bearing sand), formed in places where the sea penetrated softer rocks and created space suitable for the accumulation of its erosive action products. They appear along the entire Velika Plaža.

Geomorphological characteristics

The geomorphological structure of the area under observation consists of elements of fluvial accumulation and marine relief. The Ulcinj Field is a typical example of a fluvial accumulation relief with alluvial and proluvial cones and sandy-gravel "curtains". The marine relief was created by the abrasive and accumulation processes in the contact zone of the sea and land, with accumulation forms, represented by sandy beaches, prevailing in the Velika Plaža. Velika Plaža, with a fluvial plain in its hinterland, is made of fine-grained sand originating from the ophiolitic zone in the Skadar Lake tributaries basin. This material, transported by the Bojana River to the littoral part of the sea, was retransported by the seawater energy and accumulated at the low coast in the form of a beach. Winds also influence sand transport. Some of these processes can be observed on a daily basis.

Pedological characteristics

The soil consists of several types with different physical and chemical properties and different agricultural value levels (bonity class I to VIII, with I class being the best). Sea sand and gravel, formed by sea waves, are deposited along the lower part of the coast on the Velika Plaža and Ada Bojana beach. This area contains the largest amount of fine sand in Montenegro. The alluvial soils are found in Donji and Gornji Štoj, Ada Bojana, and along the Bojana River. These soils are mostly made of sandy and muddy components and are found in the lower terrain, so they are often in contact with saline water. The ground near the Bojana is also saline because of the effect of seawater on the river. The coastal zone near the river is often flooded. The process of saline water

penetration and flooding occurs in microdepressions (known as "knetes"). The soils in these microdepressions are abundant in marshes and marsh vegetation, which is an important habitat for the plant and animal world, especially birds. Their bonity class ranges from I to VI. The elevated terrain of Donji and Gornji Štoj, so-called "Brijeg od Mora" and Špatula, are at 2.2 to 2.9 m above sea level. The quality of these soils is better than that in lower terrain (classes I to IV). This area is to some extent cultivated with vegetables and fruit growing, mostly lemon, and small quantities of other fruits and cereals. Most of the area is covered by forests and by macchia, and only partly by meadows and pastureland. The current quality of soil in Štoj and Ada belongs to classes III to IV, in some places, also class V.

2.4. Climatic characteristics

Climatic conditions in Ulcinj are specific and have diverse climate characteristics, which are due to geographical position, altitude, relief, and influence of the Adriatic Sea. The warm, Mediterranean climate interweaves here with the cold, continental climate resulting in very hot and dry summer periods, moderate autumn and spring periods with relatively low levels of precipitation, mainly in the form of rain, and mild winters. Ulcinj has the highest annual average insolation of 2571 hours, which is the highest in Montenegro. Based on the data, it can be concluded that average insolation in July is the highest - 332 h - and in the lowest in December -115 h (Ulcinj Salina Protection Study, 2015).

Meteorological data are collected from the weather station of the Hydro-Meteorological Institute of Montenegro, situated within the Ulcinj salina between the factory buildings and Port Milena channels.

Air temperature

The mean annual air temperature is 19.9°C. In July and August, the average monthly maximum temperature is around 30°C. In January and February, the average monthly maximum is around 10°C. The highest temperatures during winter are around 17°C, and the lowest around 0°C. The highest temperature during the summer is around 34°C and the lowest around 16°C. In Ulcinj, there are, on average, 108 days with daily maximum air temperatures above 25°C, around 28 days with daily maximum temperatures above 30°C, and 9 days with daily minimum temperatures below 0°C (Ulcinj Salina Protection Study, 2015).

The minimum mean air temperatures were recorded during January and February (none below 7 °C) and the maximum mean temperatures during July and August (≈25 °C).

Air humidity

The relative air humidity shows a very stable course throughout the year. The maximum of the mean monthly values is recorded during transitional months (April-May-June and September-October), and the minimum is recorded mostly during the summer period, and in some cases also during January-February. The mean annual relative air humidity value for Ulcinj is 65.9% (min 61.5 % in July, max 69.3 in May). The increased cloudiness is typical of the winter, which is not the case in summer.

Cloudiness

The increased cloudiness values are typical of the winter, contrary to the summer period when

these values are low. On average, 40% of the sky is covered by clouds during the year in the coastal region. The average annual cloudiness in Ulcinj is 41% (minimum 18% during July/August, and maximum 55% during December) (Ulcinj Salina Protection Study, 2015).

The mean annual cloudiness for Ulcinj is 4.13 (min 1.8 in July and August, max 5.5 in December). The average annual cloudiness in Ulcinj is 41% (minimum 18% during July/August, and maximum 55% during December). The highest cloudiness is measured in November and December - 5.7 and the lowest in July and August, 1.9 and 2.2, respectively.

Insolation

The mean monthly insolation for Ulcinj is 212.90 (max 332.0 in July). The average monthly insolation in Ulcinj is 212.9 hours (maximum 332 h in July). The minimum number of sunshine hours is in December and amounts to 114.7 h, while in July it amounts to 349.4 h. Ulcinj has an annual average insolation of 2571 hours, which is the highest in Montenegro.

Precipitation

The mean annual precipitation for Ulcinj is 1,109.0 l/m² (lowest in the coastal region). Extreme 24h precipitation for 100 years return period for the coastal region can reach the quantity of 234 l/m², and for Ulcinj 190.96 l/m². With most of the precipitation in winter and early spring, the long-term annual mean precipitation in Ulcinj is 1,231 mm. The precipitation is the highest in November (above 150 mm) and the lowest in August (less than 50 mm)

Winds

The following winds are typical of Ulcinj: Northeast (16.8%), East (16.3%), East-Northeast (11.6%), West (8%), West-Southwest (7.7%), and the North-Northeast (7.4%), while silences account for 3.9% only. On the entire coast, the winds from the northern and southern achieve the highest speed, with average speeds showing very steady values (not exceeding 5 m/s). For Ulcinj, the south wind has the highest mean speed (3.6 m/s, with a frequency of 3.7%), while the southwest wind achieves the highest speed (17 m/s, with a frequency of 3.6%). Extreme wind gusts are a very important characteristic of the wind field. The effect of extreme wind gusts can, in some cases, take on the character of a natural disaster. Extreme annual wind gusts have an average speed of 20 m/s (72 km/h) in Ulcinj. Given the specificity of these parameters, wind gust speeds of 20.2 +/- 5.38 m/s are quite regular - an expected phenomenon in the Ulcinj area.

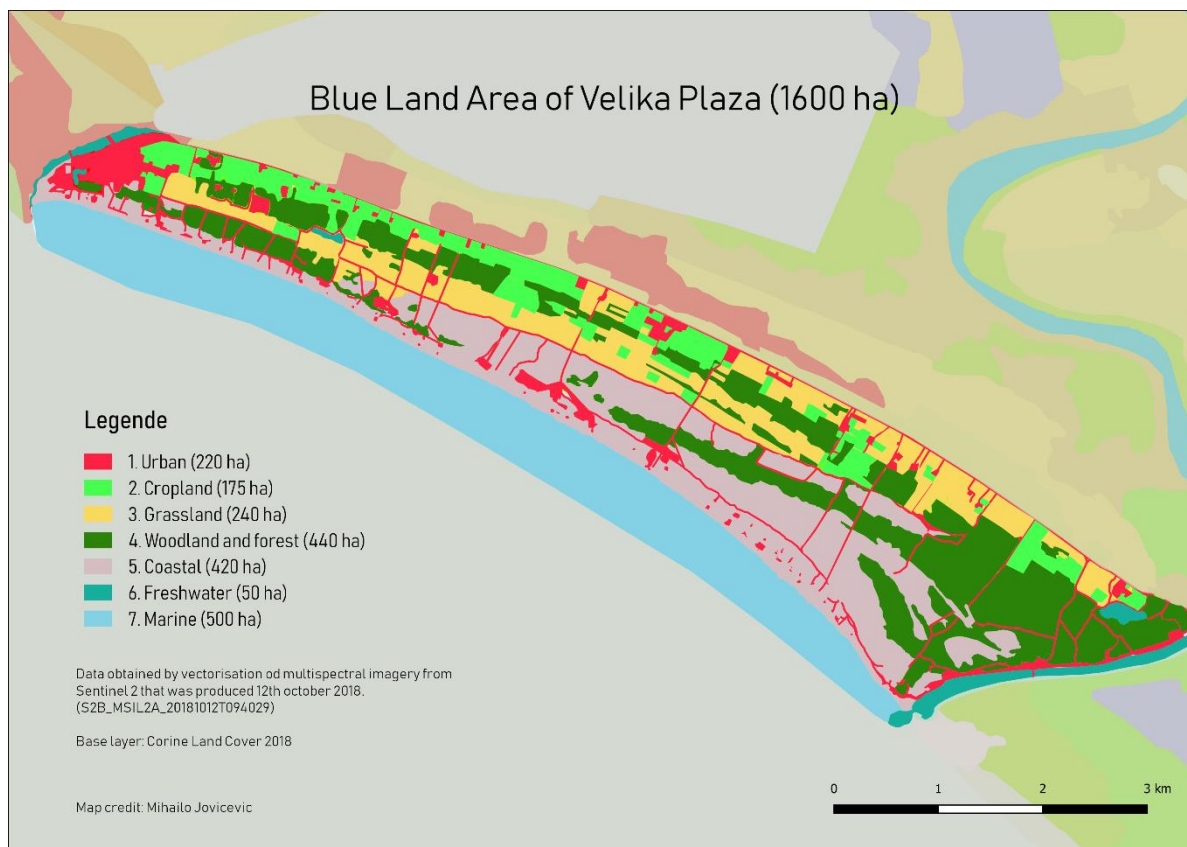
2.5. Characteristics of natural values

2.5.1. Ecosystems and Flora

Through the activity „Identification and classification of ecosystem services in Velika Plaža and Bojana River -Blue Land area of Montenegro“ done through the "Blue Land" project, seven ecosystems types by Corine classification are mapped and calculated its surface, but only five ecosystems are recognized as important due to services they provide (Map 4) :

1. Urban ecosystem with road infrastructure – 220 ha
2. Cropland – 175 ha

3. Grassland – 240 ha
4. Woodland and forest (with shrubs) – 440 ha
5. Coastal ecosystem – 420 ha
6. Freshwater ecosystem – 50 ha
7. Marine ecosystem (Soft bottom) – 500 ha



Map 4. Ecosystems in the BL area of Montenegro

Urban ecosystem

An urban ecosystem is an ecological system located within a city. Like any other ecosystem urban ecosystems are composed of physical and biological components that interact with each other. The territory of the BL area of Velika Plaža is characterized by a total of land covered by an urban ecosystem of 220 hectares. Besides the fact that the urban ecosystem occupies 14% of the total surface of the BL area, this ecosystem has no significant importance in terms of services due to the fact that it has seasonal character. Generally, it includes scattered private houses, hotels, bars, and other infrastructure that enable beach tourism, sports fields, minor agriculture constructions, uncategorized roads and roads without asphalt, footpaths etc. This area is also characterized by discontinuous urbanisation, dispersed habitation, agricultural structures for private use and purposes, constructed boundaries, and disused buildings. Due to its seasonal character and scattered distribution, this ecosystem will not be described and processed.

Cropland

Cropland is meant as land with regularly or recently cultivated agricultural, horticultural and domestic habitats. In the BL area of Montenegro, this ecosystem is spreading over 175 hectares or 11% of the total surface of the Blue Land area. It is mainly represented with **Arable land** (clc 21) and **Permanent crops** (clc 22) mixed with mesophilic meadows, pastures, and anthropogenic areas such as residence, farms, and warehouses, and crops are composed mostly of olives, orange, lemon, and pomegranate. This cropland is mainly planted for annually or regularly harvested crops, mostly for private and personal usage, without heavy machinery and industrial production.

Grassland

Grassland ecosystems are areas covered by grass-dominated vegetation with little or no tree cover and include meadows, steppes and grasslands grazed with variable intensity. These habitats are dominated by grassy vegetation, including tall forbs, mosses, and lichens.

This ecosystem covers 240 ha or 16% of the terrestrial part of the Blue Land area. It is represented by the following habitat types according to EUNIS classification:

E1.3a Mediterranean closely grazed dry grassland consist of heavily grazed pastures, mostly by sheep. They are usually found on fine clay/silt soils and flat areas, often at low elevations, which are intensively grazed and trampled by livestock. Due to grazing, their soils are often eutrophic, although they contain a low abundance of nitrophilous plant species, probably due to the xerothermic conditions of these areas and to the effect of soil compaction by trampling. These anthropogenic grasslands are dry in early summer, but with the first autumn rains, they sprout and grow rapidly, remaining green and fertile during the winter.

E1.3c Mediterranean annual-rich dry grassland is composed mainly of short annual plants with a short winter-spring vegetative cycle. There is a large inter-annual variation in the development of plant communities that is attributed to climatic fluctuations and especially to the amount of precipitation during spring; usually, in summer they become dry. These nano-therophytic, often ephemeral, communities exhibit extremely rich plant diversity that is mainly composed of species of the families Leguminosae, Rubiaceae, Compositae, Umbelliferae, and Gramineae. Consequently, the high plant species diversity results in a high communities' diversity. The grasslands of this habitat type are considered as an ultimate stage in the degradative succession of xeric Mediterranean forests and shrub communities. Traditional practices such as logging, fires, and grazing led to the degradation of forests and evergreen scrublands of the Mediterranean area, which gradually turned to grasslands. Abandonment of the traditional practices, mainly of grazing, facilitates the encroachment of woody species, a fact that may alter the character of this grassland habitat type. The most common species of these grasslands are *Poa bulbosa*, *Aira elegantissima*, *Erodium cicutarium*, *Medicago minima*, *Sideritis romana*, *Sherardia arvensis*, *Anthemis chia*, *Anagallis arvensis*, *Arenaria leptoclados*, *Bromus hordeaceus*, *Capsella rubella*, *Dasypyrum villosum*, *Gastridium ventricosum*, *Hedypnois cretica*, *Leontodon autumnalis*, *Linum perenne*, *Petrorhagia prolifera*, *Plantago bellardii*, *Phleum arenarium*, *Silene gallica*, *Trifolium campestre*, *Trifolium nigrescens*.

Moderate traditional grazing regime with signs of abandonment, presence of nitrophilous species, and signs of secondary succession are impacts that imply decreasing of habitat quality. These closely grazed dry grasslands are typical of the Mediterranean region, where they find optimal climatic conditions for their development. They shape a cultural landscape linked to the traditional land use of these areas, now increasingly at risk of disappearance due to different economic priorities and changing customs of the local populations.

Woodland and forest

Woodland and forest ecosystems are areas dominated by woody vegetation of various ages or they have succession climax vegetation types on most of the area supporting many ecosystems. This ecosystem covers 439 ha or 28% of the Blue Land area. It is represented by two habitat types according to EUNIS classification:

G1.3 Mediterranean and Macaronesian riparian woodland are broadleaved deciduous woodlands of periodically- or seasonally-flooded alluvial or gravelly deposits in river valleys and along streamsides. Typical of humid localities within the thermo- and meso- Mediterranean belts, this habitat has been long exploited for being an easy source of firewood and widely lost from the middle and lower reaches of rivers. Dominance can be of a single tree species, among which *Populus alba*, *Fraxinus angustifolia*, *Alnus glutinosa*, and *Salix alba*. Other woody species, sub-shrubs, and lianas associated with this habitat are *Celtis australis*, *Quercus robur*, *Euonymus europaeus*, *Smilax aspera*, *Vitex agnus-castus*, *Ligustrum vulgare*, *Periploca graeca*, *Ulmus minor*, *Alnus glutinosa*, *Ficus carica*, and *Humulus lupulus*. The field layer shares some species as: *Ruscus aculeatus*, *Carex remota*, *Cardamine pratensis*, *Circaea lutetiana*, *Eupatorium cannabinum*, *Lysimachia nummularia*, and *Rumex sanguineus*.

B1.7d Mediterranean coniferous coastal dune woodland develops naturally where coastal sands become sufficiently stabilized and remote from the influence of saline ground water or spray to sustain a permanent cover of trees and they bear a strong resemblance to the zonal woodland type of the particular regional climate. At the beginning of Velika Plaža and its hinterland various pine dominate the vegetation landscape. The commonest trees are *Pinus halepensis*. Associated woody species include *Pistacia lentiscus*, *Olea europaea* var. *sylvestris*, *Tamarix africana*, with *Juniperus oxycedrus*.

Coastal ecosystems

Coastal habitats are those above spring high tide limit (or above mean water level in non-tidal waters) occupying coastal features and characterised by their proximity to the sea, including coastal dunes and wooded coastal dunes, beaches, and cliffs (Hill, M.O., Moss, D. & Davies, C.E. (2004b)).

The coastal ecosystem is one of the most prominent since it covers 422 ha (27%) of Velika Plaža Blue Land area, and it is represented by five habitat types according to EUNIS classification:

B1.1b Mediterranean and Black Sea sand beach is represented by the lowest level of the supralittoral, just above the mean normal tide limit, where the drift material accumulates, and the sand may be enriched with nitrogenous organic matter. These beaches are sandy with very sparse vegetation cover composed mainly of few annuals. The vegetation belongs to the Class *Cakiletea maritima*, whose plant communities have a very low cover, sometimes not more than 1%. The species occur on drift lines along the surf line, where the salinity usually is very high. Examples of typical halo- nitrophilous species are *Cakile maritima* (*Cakile maritima* subsp. *aegyptica*), *Salsola kali*, *Xanthium strumarium*. On sandy beaches rarely visited by people, some perennial psammophytes also occur, such as *Polygonum maritimum* and *Euphorbia peplis*.

B1.3b Mediterranean and the Black Sea shifting coastal dune represent the first stages of dune construction. The habitat consists of mobile coastal sand ridges which are occupied by open grasslands; they sometimes form tall dune ridges but, in many cases, rather low (less than 10 m high). A zonation is distinguished from primary, embryonic dunes towards higher, and more stable white dunes, but these different sectors are not always well separated. Embryonic dunes are characterised by *Elymus farctus* that produces horizontal rhizomes that crawl along the sand or

penetrate it. Its stalks constitute obstacles where sand accumulates to a few decimetres forming embryonic dunes. These dunes are at the start of the psammosere; they grow by sand accretion and are sporadically inundated by the sea during storms. More inland, white shifting dunes are found, characterised by the dominance of *Ammophila arenaria subsp. arundinacea* that has a growth form in which the older parts (strong erect culms up to 1.5 m high) protect the plant and enable it to regenerate from its center. *Ammophila arenaria* is a very important rhizomatous dune species as it constitutes a barrier for windblown sand, contributing to the increase of the dune height. These dunes occur on yellow, very permeable, and humus poor soils. Among the characteristic species accompanying the dominant grasses on embryonic and white dunes *Chamaesyce peplis*, *Medicago marina*, *Eryngium maritimum*, *Pancreatium maritimum*, *Euphorbia paralias*, *Calystegia soldanella*, *Echinophora spinosa*, *Polygonum maritimum*, *Bromus madritensis*, *Medicago littoralis*, *Cyperus capitatus* and *Pseudorhiza pumila* could be mentioned. Large parts of the Mediterranean dunes are disturbed or completely destroyed by human pressure such as tourism activities, coastal urbanisation, and industry.

B1.4b Mediterranean and Macaronesian coastal dune grassland (grey dune) is dominated by herbs, graminoids, and chamaephytes, with a broad variety of plant communities. The term "grey dunes" originates from the color of the substratum which comes from the increased proportion of humus and silt in the sand. Here, the amount of windblown sand is much reduced, compared to the white dunes, and also salt spray and erosive processes are highly reduced, with higher plant cover. The number of species, in general, is higher than in shifting dunes. Characteristic species are: *Vulpia fasciculata*, *Alkanna tinctoria*, *Artemisia campestris*, *Crepis sancta*, *Euphorbia terracina*, *Euphorbia paralias*, and *Leontodon hispidus*.

B1.8b Mediterranean and the Black Sea moist and wet dune slack is a habitat type that develops in small permanent or temporary freshwater bodies in the depressions between dune ridges. These wetlands occur at the lower parts of white and grey dune systems, having a patchy distribution. Plant communities in wet dune slacks depend on the groundwater level. This varies spatially and temporally and dune slacks may occur in a range from permanent water bodies to waterlogged or moist sandy depressions. The communities consist of typical hydro- or hygrophytic species. The permanent or semi-permanent (persisting until summer) water bodies, like small ponds, lakes, and pools, are inhabited by aquatic vegetation, with species of the classes *Potametea* or *Charetea*. Often a zone of high grasses (reed, sedges, rushes, reed mace) develops at their periphery. Nutrient content also varies, but mostly the water is eutrophic to mesotrophic, sometimes even dystrophic. Temporary water bodies are very diverse in water depth and duration of water retention. Stands of high helophytes, like *Phragmites australis*, *Typha spp.*, *Juncus spp.*, *Carex spp.*, *Cladium mariscus*, *Holoschoenus spp.* and *Scirpus spp.* develop mostly on the over-wet sands, which desiccate during the summer. In such conditions, slight salinization is possible, and halophytic species or small therophytes of the class *Isoeto-Nanojuncetea* may inhabit the bare bottoms.

A2.5d Mediterranean and the Black Sea coastal salt marsh include various plant communities of the classes *Juncetea maritimi* and *Salicornietea fruticosae* which are under influence of saline seawater. Soil texture, salinity, and water content govern the main gradients. The vegetation is dominated by perennial and shrubby halophytes growing on the extreme upper shores of low sedimentary coasts, sheltered from the waves mechanical action. The most dominant species at Velika Plaža are: *Scirpus holoschoenus*, *Juncus maritimus*, *Juncus acutus*, *Cladium mariscus*, *Eleocharis palustris*, *Galium palustre*, *Iris pseudacorus*, *Juncus articulatus*, *Lycopus europaeus*, *Lysimachia vulgaris*, *Mentha aquatica*, *Poa palustris*.

Freshwater ecosystems

Freshwater ecosystems include rivers, lakes, and groundwater. Their condition and functioning are tightly connected to natural ecosystems at the water-land interface, such as riparian areas, floodplains, and wetlands (Maes et al., 2018). This ecosystem covers only 51 ha or 3% of the territory of Velika Plaža Blue Land area. Bojana river and channel Port Milena represents permanent non-tidal, smooth flowing watercourses. In the hinterland of Velika Plaža, a lot of small temporary ponds are stretching.

C1.6b Mediterranean temporary waterbody is shallow to very shallow temporary pools, existing only in winter and early spring, and seasonally wet depressions, mostly oligotrophic. They are colonised by pioneer ephemeral freshwater vegetation with above-ground growth visible for only a short part of the year, just 1-3 months. The predominant life forms are annual amphiphytes (Mediterranean spring annuals/therophytes), germinating in the aquatic phase and reproducing in the terrestrial ecophase, such as species of *Juncus* and *Cyperus*, or semi-terrestrial geophytes such as species of *Isoetes* and *Serapias*. Ephemeral vegetation types constituted by these plant species occur on water-saturated or submerged acidic sands or calcium-rich soils, which completely dry out in summer. This habitat is very important for invertebrates (especially branchiopods and dragonflies) and amphibians (*Triturus*, *Bufo*, *Rana*, and *Hyla*), and reptiles such as *Mauremys rivulata* and *Emys orbicularis*. The most common plant species of this habitat are: *Centaurium spicatum*, *Cicendia filiformis*, *Crypsis alopecuroides*, *Crypsis schoenoides*, *Cyperus flavescens*, *Cyperus fuscus*, *Cyperus michelianus*, *Fimbristylis bisumbellata*, *Juncus bufonius*, *Serapias lingua*, *Serapias vomeracea*.

C2.3 Permanent non-tidal, smooth-flowing watercourses include permanent watercourses with non-turbulent water and their associated pelagic and benthic animal, algal, and plant communities. The habitat is presented along river Bojana. The bed is typically composed of sand or mud. The water is mesotrophic and buffered. The vegetation is mainly constituted by rooted and floating Euro-Asiatic macrophytes, mainly with potamid, batrachid and utricularid growth forms, which belong to the Potamogetonion and Batrachion fluitantis communities. The vegetation cover of the habitat does not exceed 30% of the total area of a river stretch. Characteristic species of vascular plants are *Ranunculus aquatilis*, *R. circinatus*, *R. trichophyllus*, *Berula erecta*, *Butomus umbellatus*, *Callitriche* spp., *Mentha aquatica*, *Potamogeton perfoliatus*, *P. crispus*, *P. lucens*, *P. pectinatus*, *P. natans*, *Sagittaria sagittifolia*, *Scirpus lacustris*, *Sparganium erectum*, *Veronica beccabunga*, *V. anagallis-aquatica*...

C5.1a Tall-helophyte occupies a zone from shallow water to upper parts of the geolittoral belt along the river Bojana. These communities have poor water exchange with the open water area and show a clear accumulation of organic material. Tall helophytes include grasses (*Phragmites australis*, *Glyceria maxima*), bulrushes (*Schoenoplectus* spp., *Bolboschoenus* spp.), cattails (*Typha* spp.), often accompanied by some broad-leaved emergent herbs. Reed bed vegetation belongs to the most productive European plant communities in terms of the annual production of biomass. Reed bed vegetation has been influenced strongly by human activities. Reed beds are also impacted by regulation of water levels, construction activities, clearing of agricultural land, boating, and other recreational activities.

Marine ecosystem – Soft bottom

Soft bottom habitats include environments where the seabed consists of fine-grain sediments, mud, and sand. Their biodiversity and productivity vary depending upon depth, light exposure, temperature, sediment grain size, and abundance of microalgae and bacteria. Regarding the marine ecosystem, the BL of Velika Plaža is concentrated within the bathymetry of the 11 m and coves area of 500 ha. Here, we have been distinguished: mediolittoral and infralittoral sands and

estuarine sediments. According to EUNIS, habitat types that have been identified are:

A2.25 Communities of Mediterranean mediolittoral sands occupy the boundary between the poorly swashed, almost dry supralittoral sands and the permanently submerged infralittoral sands. The sediment consists of very fine sands. The fauna is dominated by polychaetes, oligochaetes, bivalves, amphipods, and bivalves. Anciently, this habitat was probably used for nesting by loggerhead turtle, *Caretta caretta*. In 2002, egg-laying Loggerheads were observed nearby, on Ada Island.

5.23 Faunal communities in Mediterranean infralittoral fine sand are formed on clean sands of shallow waters (between 4 and 25 m depth) on open coasts, subjected to moderate wave action, which allows for the accumulation of organic matter and fine sediments (<63 µm). These bottoms are dominated by deposit feeders, but filter feeders and carnivores are also present. Invertebrate assemblages found in this habitat correspond to those described as 'Littoral Fine Sand assemblages'.

A5.32 Communities of Mediterranean sublittoral estuarine sediments is present at the mouth of the Bojana River. Estuaries tidal amplitude is very weak and tidal currents, which generate vertical mixing of the water, are negligible. This favors vertical stratification of salinity with a counter current of saline water beneath the less dense river water (salt wedge estuaries). There are also distinct seasonal differences in salinity. In spring the estuary runoff from storms and greater flushing reduces the salinity. In summer, runoff becomes small and the estuary gradually returns to marine salinities. One consequence is that the benthos of the sublittoral sediments shows rapid transitions from marine to freshwater species.

Typically, there is an impoverished benthic macroinvertebrate community in the upper reaches of this estuarine habitat dominated by *Tubificidae* and *Chiromidae*. This contrasts with the lower reaches where there is a "salt wedge" community dominated by an abundance of polychaetes, molluscs and crustaceans. Sudden influxes of saltwater and drying up in the summer create recurrent disturbances that sometimes cause populations to disappear. In contrast, under oligotrophic conditions and long periods of salt wedge permanence, the complexity of the benthic communities can increase.

Natura 2000 habitats

Velika plaža in Ulcinj is one of the last zones in the Mediterranean region with preserved vegetation of psammophytes and other types of Mediterranean habitats that occur in its hinterland. Within the given boundaries of the Blue Land area in Montenegro, 18 types of NATURA 2000 habitats have been recorded, which is the area with the largest number of NATURA 2000 habitats on the Montenegrin coast:

- 6220 *Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea
- 6420 Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion
- 92A0 *Salix alba* and *Populus alba* galleries
- 92D0 as Southern riparian galleries and thickets
- 2270 Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*
- 1210 Annual vegetation of drift lines
- 2110 Embryonic shifting dune
- 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
- 2130 *Fixed coastal dunes with herbaceous vegetation (grey dunes)
- 2220 Dunes with *Euphorbia terracina*
- 2240 Brachypodietalia dune grasslands with annuals

- 2190 Humid dune slack
- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)
- 3170* Mediterranean temporary ponds
- 3250 Constantly flowing Mediterranean rivers with *Glaucium flavum*
- 1140 Mudflats & sandflats not covered at low tide
- 1110 Sandbanks slightly covered with seawater all the time
- 1130 Estuaries

Five of the above 18 habitat types so far have been registered in Montenegro only in Velika Plaža and its hinterland: *Fixed coastal dunes with herbaceous vegetation (grey dunes), 2240 *Brachypodietalia* dune grasslands with annuals, 2270 Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*, 3170* Mediterranean temporary ponds, 6420 Mediterranean tall humid herb grasslands of the *Molinio-Holoschoenion*. Two types of habitats are present only in Velika Plaža and in Bojana Island: 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') and 2190 Humid dune slack.

All these habitat types are listed in Annex I of the Directive on the conservation of natural habitats and of wild fauna and flora (92/43 / EEC).

2.5.2. Fauna

Invertebrates

In the area of Velika Plaža Ulcinj, in the floodplain forests of ash, common oak, and alder, small populations of protected species (under national legislation) of *Osmoderma eremites* (Natura 2000) and *Saga natoliae* can be found. The beach's hinterland is habitat to endemic and rare species *Crematogaster gordani* Karaman, 2008 (Hymenoptera, Formicidae), which, according to the research activities carried out this far, was found in only two sites along the Montenegrin coast. This area is also a habitat to the endemic species of Montenegrin and Albanian coast *Anomala matzenaueri* (Coleoptera, Rutelidae), as well as *Cicindela monticola albanica* (Coleoptera, Cicindelidae) which is endemic to the Balkan (Čaković, Milošević, 2013).

Ichthyofauna

The most important ichthyofauna habitat in the Montenegrin coastal area is the Bojana River. As part of the Skadar Lake-Bojana River-Adriatic Sea system, it is a link between this important water system and the sea and the main migration route to a number of fish species spawning in freshwater. For that reason, the list of ichthyofauna species includes typical freshwater species, marine representatives, as well as species typical of brackish waters. A total of 107 species and subspecies of fish have been registered in the area of the Bojana River, the sea, and the Šasko Lake. (Dömpke, 2008).

Reptiles and amphibians

Research activities carried out in 2011 in Velika Plaža in Ulcinj registered 12 amphibian and reptile species, 11 of which enjoy protection under the national legislation and are included in the Natura

2000 list (*Hyla arborea*, *Bombina scabra*, *Podariscis muralis*, *Podarcis melisellensis*, *Algyroides nigropunctatus*, *Lacerta trilineata*, *Testudo hermanni*, *Zamenis longissimus*, *Zamenis situla*, *Elaphe quatuorlineata*, *Natrix tessellata*) (Čaković, Milošević, 2013).

However, earlier research activities carried out in 2002, which were, among others, based on ecosystems of marshes and permanent ponds, recorded numerous populations of marsh frog (*Rana ridibunda*), European pond turtle (*Emys orbicularis*), and the grass snake (*Natrix natrix*). Furthermore, in ponds on the territory of Štoj (Velika Plaža) hinterland, smooth newt (*Triturus vulgaris*) and Italian crested newt (*Triturus carnifex*); horned viper (*Vipera ammodytes*) can be found in forests nearby, while European glass lizard *Ophisaurus apodus* is often run over on the road Ulcinj - Velika plaža (Dömpke, 2008).

Ornithofauna

There are 237 bird species recorded at the Bojana mouth. This includes 114 species of nesting birds (status: confirmed and possible nesting), and 16 species that are probably nesting in this area (Dömpke, 2008). The ornithological significance of the Velika Plaža had previously been as an important nesting site, notably pratincoles, the Eurasian stone-curlew, and oystercatchers. Today the habitat is fragmented, and only a few nests of Charadriiformes can be found (Common ringed plover) and in the remains of the floodplain forests, the nests of European roller *Coracias garrulus* and the Levant sparrowhawk *Accipiter brevipes* can be found. The beach is particularly important during migration: it is "a springboard" for the trip across Italy, Sicily, and Malta to Africa and a bird shelter after wintering. In addition to the Salina, Ada, and Paratuk, it is one of the key coastal sites on the migration route across the Adriatic. The beach meets the standards for admission to the Ramsar List of Wetlands of International Importance because in its hinterland, in the wetland that an illegal road was built upon, nearly 1% of the European population of Baillon's crane *Porzana pusilla* nests. Brijeg od Mora is an important nesting site for larks, the Eurasian stone-curlews, bee-eaters, and an important feeding ground for most of the species present in the delta. Wood lark *Lullula arborea* is present here in astonishing numbers.

Mammals

There are 63 species present on the territory of Ada Bojana, Velika Plaža, and Možura hill: (19 rodent species (Rodentia); 1 representative of hares (Lagomorpha); 1 representative of hedgehogs (Erinaceomorpha); 7 representatives of shrews (Soricomorpha); 22 bat species (Chiroptera); 10 species of carnivores (Carnivora); 2 representatives of ruminants (Artiodactyla); 1 representative of whales (Cetacea)). (Čaković, Milošević, 2013). This wide area has been taken into account due to the fact that mammals, in ecological terms, represent a very plastic group of organisms that are not strictly attached to a particular habitat, and if mammals are studied only in small, restricted areas, the actual results of presence, diversity, and numbers may be unreliable. Of the said number, 3 species (*Nannospalax leucodon*, *Lutra lutra*, and *Tursiops truncatus*) as well as representatives of Chiroptera (22 species) are protected under the national legislation and are included in the Natura 2000, with the exception of *Nannospalax leucodon* (lesser mole rat). The figure concerning the present (20) and potentially present (2) bat species account for 88% of all known bat species in Montenegro, which is not surprising, since each of these species occupies a different ecological niche, and this area provides a wide range of ecological niches.

The area of Velika Plaža at the Bojana mouth is particularly important for the species *Mus spicileus*. Its closest known populations are located in Serbia, so this isolated population is defined

as a subspecies *Mus spigeus adriacus*. The habitat provided by Velika Plaža (a part of Velika Plaža with best preserved vegetation) and Ada Bojana is typical of the smallest European rodent *Micromys minutus*. In Velika Plaža area, Krystufek (1994) described a new blind mole subspecies a blind mole of *Talpa stankovici montenegrina* which is endemic to this area. This area is an important feeding ground for the otter (*Lutra Lutra*) and the presence of the red fox *Vulpes vulpes* and jackal *Canis aureus* (Ulcinj Salina Protection Study, 2015) has been confirmed.

2.6. Overview of socio-economic resources and protected areas users

2.6.1. Cultural and historical heritage

The area of Ulcinj, in addition to numerous natural values, is characterised also by cultural and historical heritage. The Old Town Ulcinj is one of the oldest architectural and urban entities in the Adriatic. For 25 centuries, various civilizations have followed one another, with each leaving its own mark, visible even today. There is general agreement that the Old Town is in entirety a cultural-historical monument of invaluable importance, enriching the offer of this coastal town. It is an ancient city with picturesque medieval, narrow, and winding streets, densely packed with two-story and three-story stone houses and decorative Renaissance and Baroque style elements, and a number of highly valuable buildings from the Ottoman period. Legend has it that the famous Spanish author Miguel de Servantes was enslaved in the Old Town at the end of the 16 century and that his famous Don Quixote was written after Servantes' enslavement in the Old Town ended. Ulcinj is also known as the town of pirates, where slaves captured by the Ulcinj pirates in their expeditions were traded.

In addition to the Old Town, as the main tourist attraction of Ulcinj, the ruins of the Old Town of Svač above the Šasko Lake, which lies in the hinterland of Ulcinj Salina, should not be forgotten. The earliest discovered remains suggest that the first settlement in Svač was established in the 4th century BC founded by the Labeati Illyrians, who lived around the Skadar Lake. Svač reached the pinnacle of its development in the medieval period, it was occupied several times by various conquerors, and in 1242, the city was destroyed by Mongolians. Legend has it that it had as many churches as the year has days, 365. Today, Svač belongs to the category of the most famous "dead cities" on the eastern coast of the Adriatic and is an inexhaustible source for archaeologists and historians.

In addition to Svač, the Bay of Valdanos, the largest living monument of olive growing in Montenegro with about 18,000 olive trees, about 800 years old on average, with some trees more than a thousand years old, has extraordinary importance for tourism development in the Municipality of Ulcinj. The Law on Olive Growing and Olive Oil (Official Gazette MNE No. 45/2014 and 39/2016), placed Valdanos under a special protection regime.

Furthermore, kalimera in Port Milena also represents a significant cultural and historical heritage in this area. Port Milena channel was dug in 1885. From its completion until 1980s, it was the habitat of the highest quality species of fish and tourist attraction for many tourists from the country and abroad, due to a large number of kalimera, traditional fish-catching devices that were located along the channel. Today, just a few are still standing. Wooden huts with kalimera represent a specific blend of interaction between humans and nature.

Kalimera consists of two bent wooden poles crossed in the centre, up to 5m long, with corners of a square net hanging attached to all four ends. A long wooden stake is put at the river bank, V-shaped in its upper part, where the second stake is placed, serving as a lever to lower the net with crossed poles into the water. A rock is attached to the rope on the other end of the lever so that the lever is balanced, in order to lift the net out of the water more easily. If there is fish in the net, the fisherman moves the device towards the shore and uses a small sack to take fish out of it, and then lowers the net back into the water. Kalimera is used to catch fish both in day and night, and the catch is better if the water is turbid. There are permanent and movable kalimera. Large permanent kalimera were placed in suitable locations along the Port Milena's banks, on the banks of the Zogansko and Šasko Lakes, as well as at the Bojana River mouth.

For the cultural values presented above, the protection procedure was initiated by the Directorate for the Protection of Cultural Heritage. The initiative for the protection of kalimera has been accepted, so kalimera, as a cult symbol of the Bojana and fisheries, have been proclaimed intangible resource of local importance by the Administration for the Protection of Cultural Heritage in 2017.

2.6.2. Demographic data

According to the 2011 population census, Ulcinj has a population of 19,921 (3.21% of the total population of Montenegro) and 5,440 households. Of the total population, 9,938 (49.9%) are men and 9,983 (50.1%) are women. The population living in the urban area is 10,707 (53.74%), while 9,214 (46.26%) live in the rural area. The share of urban populations is below Montenegro's average (64.4% urban and 35.6% rural population).

According to the latest population census, the population density in Ulcinj is 78.1 people/km², slightly lower than in the previous census (80 people/km²), but still above the average in Montenegro (44.9 people/km²). Population migration is the main problem this municipality is facing. Namely, from 2003 to 2011, the total population decreased by 369. The population estimate for the municipality of Ulcinj had predicted a higher number of inhabitants than registered during the last census. According to demographic projections, the number of permanent (present) residents in 2021 in the Municipality of Ulcinj is projected to 22000 and in the town of Ulcinj 17670. Based on the estimate of demographic trends in Montenegro until 2050, the Municipality of Ulcinj is presented as part of the coastal region where population growth is projected (0.5% between 2005 and 2010, followed by 0.7% between 2010 and 2020). However, it is very likely that this forecast will not reflect the actual situation in the Municipality of Ulcinj.

The age structure of the population in Ulcinj is at the level of the national average in Montenegro. Namely, the working-age population (15-64) accounts for 67% of the population. As regards national or ethnic affiliation, according to the 2011 census results in Ulcinj, the majority of the population - 14076 are Albanians (compared to 14638 in 2003), followed by Montenegrins 2478 (compared to 2421 in 2003), Serbs 1145 (compared to 1509 in 2003), Muslims 770 (not recorded in 2003 census), Bosniaks 449 (262 in 2003), Roma 152 and Egyptians 73. As for religious affiliation, 72% of the population are Muslims, 15% Orthodox, while 11% declared themselves as Catholics.

The pronounced ageing of the population is one of the main effects of change in the age-gender structure. Population ageing is characteristic not only of the population in the Municipality of Ulcinj, but also at the national level and in most of the municipalities in Montenegro. It is a result

of several decades of negative demographic trends and a lack of adequate population policy, posing a serious social and state issue. Its resolution requires thorough national engagement, and the effects of good population policy, i.e. the first effects of positive demographic trends become evident in 10-15 years, and the full impact of a good population policy can be seen only 20-25 years later. The population is the most important resource for the development of a particular community. A favourable age structure enables the smooth and sustainable development of a community. The population age structure has a significant impact on the country's labour force, economic production, and the country's capacity to financially support the elderly during their retirement years.

2.6.3. Tourism

The Adriatic coast of the Municipality of Ulcinj is already an important tourism area, and it is becoming increasingly popular. Tourism as the major (economic) potential of the Municipality of Ulcinj has largely determined the economic profile of this municipality. Namely, the economic activity in the municipality is dependent on the duration of the season, since 17.5% of the population is employed in the tourism sector, and about 90% of the households offer private accommodation.

Velika Plaža is the main attraction of Ulcinj, especially due to its long sandy beach, as well as other natural conditions: vegetation, fauna, winds, surrounding relief, etc. Furthermore, the spatial planning document recognizes Velika Plaža as the biggest site for the construction of tourist facilities in Montenegro. All the natural resources of Velika Plaža attract all types of tourists, so various activities are being developed:

Rest, bathing, sunbathing - is the basic tourist activity and is linked with Velika Plaža's main feature - sandy beach. The northwestern part of Velika Plaža, along with existing hotel complexes, represents the area largely oriented to family tourists, who enjoy their leisure time there.

Sport - due to its favourable natural characteristics, the area of Velika Plaža is recognized as the sports area, in the broadest sense. Professional athletes prepare there for major competitions.

Extreme sports - in the southeastern part of Velika Plaža, due to the configuration of the terrain and strong wind, extreme sports, such as kitesurf have developed.

Health tourism - various organizations dedicated to recreational activities organize several-week courses and events in Velika Plaža and Ada Bojana. Activities that are practised are mostly different kinds of yoga.

Music festivals - in addition to the fact that every beach club has its own repertoire, along with the development of kitesurf and the interest of foreign tourists for this activity, organization of music events and festivals is also being developed. For six consecutive years, a festival gathering world-renowned soul and jazz musicians.

Hospitality - hospitality facilities along the Bojana river, offering dishes made from freshly caught fish, are popular among the local population and tourists. Restaurants in this area receive many visitors throughout the year.

Other types of tourism, such as cultural, environmental, and agro-tourism, although they have a great perspective, are still less developed and present. This results in limiting the season to just three months (from June to August).

Mass tourism is generally incompatible with the objectives of protecting natural resources. However, if it were to be developed respecting the principles of nature conservation, tourism

could be a complementary activity contributing to the economic sustainability of the protected area. Since resources are needed to manage the protected area, eco-tourism is an ideal solution, particularly since tourists receive a form of education during their visits.

In order to improve the Blue Land area tourism promotion from the eco-tourism viewpoint, the following visitor infrastructure needs to be developed: bird observation posts, area maps, hiking and cycling trails with information boards, Visitors Centre, and a souvenir shop. The said infrastructure could significantly complement the tourist offer of the city of Ulcinj and can provide additional income for the local population.

2.6.4. Agriculture and livestock farming

Agriculture is one of the key business activities in the Municipality of Ulcinj: the agricultural area covers 7,523 ha in total and most of it is arable land, with 5,424 ha (according to cadastral data).

About 1,900 households are engaged in agricultural activity, as the main or secondary activity. The primary activities of the rural population are:

- the cultivation of early vegetables (greenhouse production) on around 50 ha, cultivation vegetables in the open fields (mainly tomatoes, peppers, potatoes, watermelon, etc.) on about 1000 ha;
- Livestock farming, with about 3,000 dairy cows; about 7,000 sheep; 30,000 poultry; around 1,200 goats, pigs, etc., and about 3,000 bee hives;
- fruit production, mainly citrus growing 250,000 trees (500 ha);
- olives: old plantations with 80,000-86,000 trees or 300 hectares and new plantations, 40,000-50,000 trees or 150 ha;
- other fruit (figs, pomegranates, kiwifruit, etc.) on around 250 ha;
- viticultural production around 95 ha in total;
- cereals and fodder plants are grown on about 1500 ha

The population of the Blue land area is known for livestock farming, and the use of old cattle breeds ("buša" cows, "ljaba" and "baljuša" sheep, the Balkan goat, and the Balkan donkey) is still noticeable. In addition to the positive characteristics of livestock farming, it is important to note that grazing can change the composition of meadows to a large extent, creating favourable conditions for the introduced species, weed and ruderal species which are not typical of this area.

2.6.5. Fishing

For hundreds of years, fishing has been a part of the lives of the local population benefiting from the abundance of fish both in the delta and the open sea. Fishing remains an important economic activity for tourism. The fishing sector can be divided into two types - river and sea.

The Bojana River and Port Milena

The Bojana Delta and Port Milena are very rich in eel and mullet. However, since the closing of the border with Albania, access to the river and its banks have been strictly forbidden. Furthermore, building a dam on the Drim caused reduced inflow for the Bojana, while upstream of the city of Shkodra, pollution has risen significantly. As a result, river fishing has decreased.

During research in the Bojana delta, the Euronatur registered numerous unsustainable or illegal fishing activities, which have endangered the population or reproduction of several species. Some species, like the sturgeon, are probably extinct due to overfishing.

In particular, traditional fishing activities with "kalimera" nets in Port Milena have to be mentioned. This water basin is particularly rich in fish. However, the quantity and quality of fish are endangered by severe pollution. Due to the favourable conditions for the natural reproduction of fish and fish juveniles feeding, Port Milena was proclaimed a protected fishing area on the basis of the Rulebook on setting the line where the water ceases to be stably saline in rivers flowing into the sea and setting the boundaries of protected fishing areas (Official Gazette MNE No. 39/2013).

Adriatic Sea

Sea fishing, in addition to agriculture and tourism, is one of the most important activities carried out in this area. Fishing in this part of the Adriatic is performed by small vessels between 4-10 m and is developed at the level of small businesses of local fishermen and restaurant owners. Since the vessels used for fishing are small, the amount of catch is also small. According to the data of the Ministry of Agriculture, by 2021, 58 entrepreneurs are registered and have license to conduct small commercial fishing.

Although the capacities of commercial species at the Adriatic level are quite depleted, there are still enough for local needs. The fishing gear most used in this area are: triple bottom gillnets, single layer gillnets, fishing rods, traps, floating longlines and bottom longlines. The species that are most represented in the catch are: Flathead grey mullet (*Mugil cephalus*), red mullet (*Mullus barbatus*), Adriatic sole (*Solea impar*), common cuttlefish (*Sepia officinalis*), European hake (*Merluccius merluccius*), blackbellied anglerfish (*Lophius budegassa*), common smooth-hound (*Mustelus mustelus*), twait shad (*Alosa fallax*), caramote prawn (*Penaeus kerathurus*) and European seabass (*Dicentrarchus labrax*).

The tradition of fishing is especially developed here and is passed down from generation to generation, and its significance is much more than ordinary economic activity. The development of eco-tourism can be especially encouraged by linking fisheries with other economic sectors, which would enable the local population additional development and the potential to generate higher incomes.

2.6.6. Hunting

Hunting takes place for the most part in Ulcinj Salina and on Velika Plaža the main habitats of rare birds. Hunting is organized and carried out by the local hunting association in Ulcinj, which has 17 employees and about 150 local members (who hold permits). They hunt almost exclusively birds. This is a very widespread activity and is also performed by local (estimated to about 2000 people) and foreign (mostly Italian) hunters in marshes and coastal sand dunes. The Law regulates hunting, but poaching also takes place outside the hunting season. The hunting season in Montenegro is very long (it starts as early as 15 August – in the middle of the tourist season - and ends on 15 March). The official date of closing and/or restricted hunting is not respected, and hunting takes place at any time or place, mainly during bird migration and in winter.

III ASSESSMENT OF THE SITUATION IN THE BLUE LAND AREA

It can be said that the Blue Land area in Montenegro is one of the few examples in Europe where natural processes remained undisrupted to a large extent. Although humans made significant interventions – notably, infrastructure in the service of tourism and embankments along the Bojana River – flooding takes place on a regular basis in the flooding zone, the Bojana River keeps bringing sufficient quantities of sediments, coastal erosion processes and sedimentation processes are taking place. As a result, the whole area and all its biotopes have preserved their ecological functionality up to a very high degree, particularly in the eastern part of Velika Plaža. The best evidence of this is the presence of a large number of wild animal species. The area is a unique landscape created by the interaction between nature and humans.

The Blue Land area biodiversity is not yet well known and explored. Habitats and flora have been explored extensively in this area. On the other hand, as regards fauna, the Euronatur Foundation made a rapid assessment of birds, fish, and mammals, and the area was subject to biodiversity monitoring in 2011, but it can still be said that long-term, systematic research of these groups has not been done, while data on invertebrates are rather limited. Since Velika Plaža belongs to the areas protected under previous national legislation (1968) it is necessary, to initiate a revision procedure to create preconditions for appropriate management. The development of a revision study can be expected to provide comprehensive and indisputable evidence for a decisive action to protect nature in this area.

However, even fragmented information presented in the previous chapters provides sufficient evidence to assess and confirm the biological values of the explored area.

In order to assess the biodiversity value of the region, habitats and species of national and international importance were selected according to endangerment criteria. When assessing the condition of a particular area, the presence and impact of different pressures on the area, both direct and indirect, are taken into account.

3.1. Natural values

Habitats and flora

Among plant communities in the explored area, psammo-halophytic vegetation has a particular value. Along the Blue Land area, there is a 13-km long halophytic vegetation strip, which is the last preserved, compact zone of this vegetation type on the Montenegrin coast. All halophytes on Montenegrin beaches are endangered. Other beaches in Montenegro are significantly smaller compared to Velika Plaža. They are often devastated, especially in the hinterland. Thus, the almost intact strip of psammo-halophytic vegetation on Velika Plaža is the last, significant refugium of this vegetation type in Montenegro.

The most endangered plant species of the coastal area in Montenegro is the sea daffodil (*Pancratium maritimum*) which can be found on Velika Plaža only, in the narrow strip of the psammo-halophytic vegetation. This species has disappeared from other beaches in Montenegro and is included in the National Red List (by the Decision on the protection of rare and endangered species of animals, plants and fungi, Official Gazette of the Republic of Montenegro, No. 26/06, Podgorica 2006)

Strong pressure on these habitats resulting from tourism development poses a serious threat to

further fragmentation, so partial protection is not a solution. As a result, the psammo-halophytic vegetation on Ada Bojana and Velika Plaža requires strict protection of the entire area where they appear. Velika Plaža landscape, with typical habitats and species, is truly a unique value of the Adriatic coast.

The alkaline marshes, located between the first line of sand dunes and natural forests, are a unique habitat in Europe. This area is home to 1% of the total European population of the rare water bird – Baillon's crane (*Porzana pusilla*).

Natural forests with Skadar oak, oriental hornbeam, the narrow-leaved ash, and white poplar form the largest floodplain forest complex on the eastern part of the Adriatic coast. They are the trademark of the Bojana Delta, which can clearly be seen even in satellite images. These forests are important for future protection of the following species: *Fraxinus angustifolia*, *Carpinus orientalis*, *Alnus glutinosa*, *Populus alba*, *Salix sp.*, *Quercus robur scutariensis*, as well as accompanying species that create this association. The floristic composition of forests, the presence of the species *Q. robur* and the downy oak *Q. pubescens*, basically depends on the underground water levels. While *Q. pubescens* prefers a dry habitat, *Q. robur* grows in areas with high levels of underground water. The environmental significance of the floodplain forests is the rich genetic potentials of flora and fauna; they build a specific landscape, they are important for water balance, protect the terrain from floods, and are important for the area's microclimate. The floodplain forests of the Bojana Delta annually transpire about 2.5 million tons of water, purifying it at the same time. Furthermore, these forests have a significant impact on agriculture. The typical Mediterranean summer drought is mitigated by intensive water evaporation (Dömpke, 2008)

Cultivated areas

In cultivated areas, there is a mosaic of habitats made of small areas of: pastures, fields, gardens, hedges, forests linking the areas with the natural vegetation. It can be expected that these cultivated habitats provide shelters to small rodents, amphibians, reptiles, insects, and small birds. Experience shows that cultivated areas with diverse crops provide favourable conditions and shelter for rich biodiversity. Fields are important for birds because they are nesting sites for thermophilic insectivores, such as: The little owl (*Atene noctua*), Eurasian scops owl (*Otus scops*), black-headed bunting (*Emberiza melanocephala*), European roller (*Coracias garrulus*), while herons, marsh birds, the Levant sparrowhawk feed in very similar places.

Fauna

Due to a large number of endemic fish species, according to IUCN (2000) criteria for the animal taxa classification, the basin of the Skadar Lake, the Bojana River, and the Šasko Lake has great importance for the protection and is an important place in the Mediterranean and entire Europe. Based on the existing data, it was concluded that four species included in the Natura 2000 list live here: *Acipenser naccarii*, *Acipenser sturio*, *Anguilla anguilla*, and *Alosa fallax*, while there are 21 species in the IUCN Red List, as follows: 3 species with CR status, 1 species DD status, 18 species with LC status and 3 species with VU status. (Čaković, Milošević, 2013).

Velika Plaža is recognized as an important area in terms of potential unique groups and locally endemic species of amphibians and reptiles. The beach dunes, with halophytic vegetation, are important lizard habitats. The pools in the hinterland of Velika Plaža are important for triton's

reproduction. 11 types of amphibians and reptiles registered in this area are protected under the national legislation and are included in the Natura 2000 list. The most important is the presence of the loggerhead sea turtle (*Caretta caretta*) on Ada Bojana.

The Bojana delta is one of the most prominent areas for birdlife on the Adriatic coast of the Balkan Peninsula. More than 200 bird species have been registered in this area. Several habitats in the Bojana delta have great significance for spring bird migration, as well as for wintering and nesting. The ornithologically most significant parts of Velika Plaža are the westernmost part along the Port Milena mouth and the easternmost side along the Bojana River mouth. The shifting dunes on Velika Plaža are important areas for nesting and feeding birds (Schneider-Jakoby 2002b). The Bojana River mouth is an area with the highest density of migratory birds' populations in the coastal zone. Numerous passerines (Passeriformes) are nesting in the area along the Bojana banks. In each habitat type of Velika Plaža, the presence of endangered and rare nesting birds was recorded. Furthermore, the feeding of several bird species enjoying a high level of protection in Europe has been registered in this area. They are indicators that there is still a network of well-preserved habitats in the Bojana delta.

3.2. Ecosystem services

The ecosystem services are the so-called "gifts" nature provides to people. The concept of ecosystem services aims to explain the complex relationship between nature and society in a simplified way. These "gifts" are not only useful, but are crucial to us as individuals, but also to society as a whole because they ensure the sound functioning of local communities.

The creation of conditions for sustainable development, that is, for the development and improvement of the quality of life with maximum protection of, primarily, natural and socio-economic heritage (tourism, agriculture, and fisheries), is the primary objective of this Management Plan. The Blue Land area is the basis of the long-term local socio-economic development, through the use of natural values and resources provided by ecosystems in the form of ecosystem services, only in the case of adequate protection.

Through the activity "Identification and classification of ecosystem services in Velika Plaža and Bojana River-Blue Land area of Montenegro" done through the "Blue Land" project, a number of ecosystem services are recognized according to Common International Classification of Ecosystem Services (CICES), categorized into three classes of:

Provisioning services

1.1.6.1 Wild animals (terrestrial and aquatic) used for nutritional purposes. Fisheries have a long tradition in the BL area, on the Bojana river, and in the marine ecosystem, and is an important commercial activity for local citizens. Catches are sold and served mostly in local restaurants. Fisheries is based on small scale fishery, with small vessels and gillnets are most used fishing tools. While woodland and forest are home to small animals/venison that are subject of hunting (birds, rabbits)

Regulation & maintenance

2.1.1.1 Bio-remediation by micro-organisms, algae, plants, and animals. During the summer

season, the Bojana river is under the pressure of some amount of wastewater from local houses that reach the river. Microorganisms and algae use organic matter from wastewater, transform it, and produce food for other organisms.

2.2.1.3 Flood control (Hydrological cycle and water flow regulation - Including flood control, and coastal protection). Forest, woodland, and shrubs that grow on the banks of the Bojana river regulate river flow and decrease the possibility of floods during spring months when higher quantities of water are coming from the Skadar Lake. Additionally, roots of trees and shrubs protect and stabilize river banks, decrease the process of erosion, and protect the coast.

2.2.1.4 Wind protection. The BL area of Montenegro is under the strong influence of wind, especially strong south wind "jugo" during the winter months. Sand dunes present on the south part of the beach and forest and woodland present in the hinterland of the beach reduces and mitigates strong wind blows and protects the area behind it. Dunes and trees represent a natural barrier to the destructive forces of **wind** and defence against coastal storms. They absorb the impact of storm surge, preventing or delaying damage to inland structures.

2.2.5.1 Freshwater ecosystem. The high amount of nutrients originating from wastewater, agricultural activities in the upper stream of the Bojana river, and other anthropogenic activities, creates pressure on the river ecosystem, especially from elevated nutrients (nitrogen and phosphorus) and sediment inputs. Through various living processes, decomposition of pollutants and nutrients by aquatic plants, phytoplankton, their transformation and accumulation, chemical condition of freshwater is regulated and pressures are decreased.

2.2.6.2 Regulation of temperature and humidity, including ventilation and transpiration. Through the process of evaporation and transpiration trees and other plants are decreasing the temperature of the local area. Plants are cooling the area in the local environment through water evaporation through their leaves. Additionally, by creating shade trees area protecting ground surface from direct sunlight, and creates microclimate with much lower temperatures than in surrounding area, especially during summer months when temperatures are very high. The temperature of the coastal area is regulated and during summer months decreased by sea, while during winter months is warmed, creating a pleasant environment.

5.1.1.1 Mediation of waste, toxics and other nuisances by non-living processes (Dilution by freshwater and marine ecosystems). Water with a higher amount of nutrients that comes from the upper stream of the Bojana river becomes diluted with fresh and marine water, thus decreasing the concentrations of nutrients in the water.

Cultural (biotic)

3.1.1.1 Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through active or immersive interactions. The BL area of Montenegro provides great opportunities for recreational and sport activities including running, swimming, diving, snorkelling, sailing, wind kiting, etc. The rich diversity of habitats and species greatly supports these activities.

3.1.1.2 Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions. Various habitats and species inhabiting them, especially bird species on their migrations, endemic species in the area provides a good basis for wildlife observers to visit and enjoy the area. The unique landscape provides tourists and

visitors with the opportunity to relax in nature.

3.1.2.1 Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge. The area offers great opportunities for studying particular habitats listed in Annex I of Habitat Directive as well as a number of animal species listed in the annexes of both Habitat and Bird Directives. The area is included in the list of potential sites for the Natura 2000 network in Montenegro.

3.1.2.2 Characteristics of living systems that enable education and training. Various habitats and species inhabiting them, especially bird species on their migrations, endemic species in the area provide a good basis for education programs through practical examples, especially for students.

3.1.2.4 Characteristics of living systems that enable aesthetic experiences. Natural beauty, landscapes, and a mixture of different habitats provide a unique panoramic view. This area has been used for numerous artistic works (movies, promotional videos, musical videos, etc), and present a typical example of "the wild beauty of Montenegro" (slogan of tourist campaign of Montenegro).

3.2.2.2 Characteristics or features of living systems that have an option or bequest value. The BL area represents a mixture of various ecosystems and habitats with high natural value, which enables the development of specific tourism for nature lovers, mediation, meditation, and other spiritual relaxations and health therapies.

6.2.2.1 Natural, abiotic characteristics or features of nature that have either an existence, option or bequest value. Natural beauty, landscapes, the Bojana river mouth, and a mixture of different habitats has great value for the local community and visitors of the area and needs to be used in a sustainable manner.

3.3. Assessment of pressures and threats

When assessing the condition of a particular area, the presence and impact of different pressures on the area, both direct and indirect, is taken into account.

The National Biodiversity Strategy singled out 6 main groups of factors that pose hazard to biodiversity:

1. *Uncontrolled urban and tourism development*, especially on the coast and in Podgorica, concerning the construction of transport and hydro-technical infrastructure results in loss, degradation, and fragmentation of remaining natural habitats, particularly coastal and wetland habitats;
2. *Change of land use* related to urban and tourism development and the introduction of new practices in agricultural production results in not only the loss of natural and semi-natural habitats but also in the loss of agro-biodiversity i.e. domestic varieties and breeds
3. *Unsustainable and uncontrolled use of natural resources* due to: (i) logging of natural forests, (ii) harvesting of edible and medicinal plants, mushrooms, and invertebrates (iii) hunting of wild animals, and (iv) fishing
4. *Pollution* primarily of freshwater and marine ecosystems, by wastewater and solid waste, which in addition to the poisoning of organisms, results in eutrophication in these ecosystems
5. *Introduction of new invasive species*, mainly for commercial reasons, poses a threat to

biodiversity that has not yet been explored sufficiently but is expected to become topical in the near future.

6. *Climate change* poses an emerging threat to biodiversity with a narrow amplitude of variation especially in temperature and water regimes, so the analysis of climate change consequences requires increasing attention.

3.3.1. Factors endangering the BL area biodiversity

Construction and general development

Natural forests in the hinterland of the beach are under various anthropogenic impacts: construction of tourist resorts, private homes, camps, agriculture development, illegal logging... There is a risk that these impacts will eventually destroy these forests.

The populations of amphibians and reptiles are in decline and some species are disappearing because of the negative human impact. The serious problem is that construction reduces the area of wetland habitats such as marshes, sedge communities, small lakes. The number of reptiles has been decreasing due to the fragmentation of habitats by road, because they often die crossing the roads, following natural migration routes during mating and hibernation, during spring and autumn.

Illegal construction is evident on Velika Plaža. There are no construction permits for most of the structures, but in some cases, construction permits have been provided due to an inefficient legal and administrative system. Illegal construction is the main factor of the destruction of habitats, degradation, and urbanization of natural landscape and pollution occurring as a side effect. Important areas for resting and feeding some birds are getting smaller due to new construction.

Tourism development

The negative impact on the beaches includes the movement of vehicles off the roads along the beach, the construction of new access roads and parking spaces. Several studies (Saveljic 2002, Schneider-Jacoby 2002) have shown that since 1980, tourism has an increasing factor of disturbance of bird populations on Velika Plaža and Ada Bojana. In these locations, many bird species are disturbed during mating season, such as: *Glareola pratincola*, little tern (*Sterna albifrons*), little gull (*Larus minutes*), common sandpiper (*Actitis hypoleucos*), little egret (*Egretta garzetta*). The population of Kentish plover (*Charadrius alexandrinus*) is on decline; sandy beaches are nesting habitats for this bird species.

The increased number of tourists also leads to an increase in the amount of wastewater being discharged in the coastal area, which increases pollution and has a negative impact on biodiversity.

Hunting and fishing

Illegal hunting, especially off-season, poses a serious threat to the biodiversity of the Bojana mouth. The relatively long hunting season in Montenegro is unsustainable, as it starts already at the beginning of the nesting season. This is not in line with the principles of biodiversity protection and EU directives.

Hunters drive small buses and SUVs on trails along the beach, damaging this very sensitive vegetation, which contributes to the degradation and erosion of sand ridges and wetland habitats. As a result, wetlands quickly lose their role as an area of importance for the nesting of birds and as a resting site for migratory species.

Legal fishing with permitted fishing gear and tools has not been identified as a threat. However, dynamite is sometimes used for fishing, a practice that is being eradicated. However, the increase in the number of restaurants and tourists creates preconditions for the development of the illegal fishing market.

Illegal sand exploitation on Velika Plaža, which degrades natural habitats and landscapes, disturbing the animals.

Solid waste poses a serious problem in the hinterland of Velika Plaža and Ada Bojana, even during the season, especially between seasons. Solid waste is left by tourists, and illegal dumping sites formed by the local population can often be found in the zones mentioned above. This waste has multiple negative effects: it disrupts the landscape, occupies natural habitats, and causes their nitrification, which eventually leads to a change in the structure of living communities, disrupts the nesting of turtles, attracts some aggressive birds (e.g. crows) that can drive away some rare species of these habitats or kill their young...

Wastewaters – lack of adequate treatment facilities for proper wastewater management results in increased water pollution. In Port Milena and in the Bojana mouth area, eutrophication was observed, especially during the summer season. Toxic pollution (inorganic pollutants) has also been registered. Migration of the marine species meagre (*Argyrosomus regius*) along the Bojana River used to be recorded. At the beginning of the summer, huge shoals of this species used to be seen, and following mullets, this had been the most important fish species in the region of Ulcinj. In the late fall, it would return to the sea down the Bojana. In recent years, due to the anthropogenic impact and pollution of that part of the coastline, this species has become very rare (Joksimovic, 2007).

Invasive species

As an inevitable consequence of the intense anthropogenization of the area, adventive species also occur, many of which are recognized as invasive. During the monitoring of adventive flora on Velika Plaža, we noticed an increase in the number of invasive species, as well as an increase in the population of species recorded previously. These species pose a serious threat to the floristically poor sand dunes habitats. During field research in 2012, the following species were most commonly recorded: *Oenothera* sp. (quite an abundant population), *Xanthium italicum*, *Conyza albida*, *Amorpha fruticosa*, *Robinia pseudoacacia*, *Paspalum paspalodes*, *Eleusine indica*, *Danthonia stramonium*.

In recent years, an increase in the population of the invasive species, the blue crab (*Callinectes sapidus*) has been recorded. This species originates in the western part of the Atlantic and humans introduced it to Europe. This species has already become common in the southern part of the Adriatic. It can survive in high-salinity waters and is resistant to high water temperatures. It is most frequently found in estuaries.

Agriculture

The negative effect of agriculture is primarily related to herbaceous ecosystems, whereas it is not pronounced in the coastal dunes and forest habitats. It is reflected in nitrification occurring as a consequence of grazing and affects the change in the floristic composition of natural herbaceous ecosystems, as well as in the loss of natural habitats due to land cultivation.

IV LONG-TERM OBJECTIVES OF PROTECTION AND SUSTAINABLE DEVELOPMENT

Management Plan vision

The Blue Land area in Montenegro and the future Nature Park "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" remains a special and significant area with preserved vegetation of psammophytes and other Mediterranean habitat types appearing in the hinterland, an area with a recognizable and significant environmental, biological, aesthetic values and traditional economic activities and where the preservation of the natural integrity requires the active participation of people: the local population, visitors, researchers, to work together to preserve biodiversity and reduce negative practices that pose danger to biodiversity.

The vision for the protection of the Blue Land area in Montenegro "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" will be accomplished by achieving long-term (strategic) objectives, assessed on the basis of available biological, geological, aesthetic, cultural and socio-economic values of the region, divided into the following strategic areas:

1. Management authority capacity building
2. Preservation of natural values and landscapes
3. Protection and preservation of cultural heritage and tradition
4. Management of visits, interpretation, and education
5. Cooperation with the local community
6. Sustainable use of resources

Given its biological diversity, the area of Velika Plaža Ulcinj with its hinterland has extraordinary values that are significant at national and international levels. Based on natural characteristics, it is clear that the value of Velika Plaža exceeds its significance as a renowned tourist destination.

In the future, it is imperative to develop and put more emphasis on eco-tourism, which would be very useful for protecting the biological and landscape diversity of the Velika Plaža Ulcinj with its hinterland and it would also be fully compatible with the conservation efforts, underpinning them.

V ANALYSIS AND EVALUATION OF THE CONDITIONS FOR ACHIEVING THE PROTECTION OBJECTIVES

During the evaluation of the condition of a particular area and determining the possibility of placing it under protection, the presence and impact of different pressures on that area are taken into account. Without regular monitoring of the different impacts and consequences, the management of the future Nature Park "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea"- Blue Land area will be difficult since it would be difficult to predict trends. That is why it is necessary to recognise the needs, limitations, and priority actions, which means that pressure and threats in all three protection zones need to be analysed and evaluated.

The key threats identified in the Blue Land area, based on the field research undertaken so far as well as on the basis of the analysis of planning and other documents, can be divided into direct (direct impact on Velika Plaža area) and indirect. Direct threats identified include: unplanned/illegal construction, intensive tourism, pollution of terrestrial and sea waters due to the lack of a sound sewage network with a treatment plant, intensified agricultural activity, illegal hunting, and fishing, illegal solid waste dumping sites.

Natural events that can or could have a negative impact on ecosystems, infrastructure, include natural disasters such as: severe winters, possible floods, droughts, wildfires, and earthquakes.

Excessive use of resources such as hunting can be both a direct (killing) and indirect (animal harassment, habitat destruction...) threat.

Analysis of strengths, weaknesses, opportunities, and threats (SWOT) for the Nature Park area

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Protected nature; • An important habitat for the biodiversity protection, in particular of endangered habitats and fauna, both at the national and the international level; • Recognized as a natural attraction for visitors; • Ecosystem services providing favourable living and development conditions for the local community identified; • Potential for development of educational activities; • Issues concerning the use of natural resources and control of activities defined by the existing legal framework. • Development of sustainable tourism and the use of natural resources in line with the principles of nature conservation 	<ul style="list-style-type: none"> • Pressure of illegal activities (unplanned/illegal construction, illegal hunting, and fishing); • Pollution of terrestrial and sea waters and illegal solid waste dumping sites; • Lack of a coordination mechanism for articulating strategic objectives in line with existing biodiversity values and the needs for sustainable management of the area; • Lack of a clearly binding mechanism for engaging local communities in the process of decision-making and management of the area; • Poor coordination among competent institutions regarding control of activities in the area in accordance with responsibilities as defined by specific laws applicable to the use of natural resources; • Lack of steady sources of financing; • Lack of experts in the field of nature protection; • The existing protection of Velika Plaža in accordance with the law has not been revised.

OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Active protection measures can significantly improve the conditions for the conservation of endangered habitats and species; • Development of eco-tourism infrastructure (museum, observation posts, bicycling trails, etc.); • Generating additional income by selling tickets, souvenirs, etc.; • Educational visits and recreation; • Development of sustainable tourism and the use of natural resources in line with the principles of nature conservation; • Sustainable agriculture in co-operation with the local population; • Establishing of a coordination mechanism for the institutions responsible for managing natural resources in the Blue Land area, which allows for the participation of the local community; • The possibility of submitting project applications to international funds to protect nature; • Protection of Velika Plaža with the hinterland as the Nature Park with the managing authority Public Enterprise Coastal Zone Management. 	<ul style="list-style-type: none"> • Illegal activities in the area; • Population by invasive alien species; • Cataclysmic natural events (such as severe winters, drought, wildfires, floods, earthquakes, etc.); • Solutions for the intended use for the Blue Land Area not harmonised in spatial plans; • Great interest in the potential of natural resources in the area and different visions of their use and exploitation • Lack of awareness of the sustainable development principles of the area; • Unsatisfactory implementation of legal solutions and competencies in the Blue Land Area; • Not appointing the management structure and council of experts provided for in the proposal for the decision on the proclamation of the Nature Park "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" - Blue Land Area

VI MEASURES FOR THE PROTECTION, CONSERVATION, MANAGEMENT, PROMOTION AND USE OF THE BL AREA

Plan implementation objective: Ensuring the self-sustainability of the Blue Land area and the future Nature Park through the sustainable development of the area through maintaining traditional economic activities in the area, improving and preserving habitats, maintaining the good environmental status of the area, developing environmental, educational and agricultural tourism, and promoting the natural values of the area.

Measures for the protection, conservation, management, promotion, and use of Velika Plaža Ulcinj with the hinterland, with the proposal for the implementation of the activities and prioritization of their implementation are given below. Apart from prioritization, the measure implementation indicator is presented for each measure (activity). The key recommendation should be human resources capacity building in the managing authority of Velika Plaža at all management and operation levels.

The plan provides guidelines for:

1. Habitat management;
2. Species management;
3. Visits management;
4. Management of socio-economic activities;
5. Promotion and valorisation;
6. Physical protection of the area.

VII SPATIAL IDENTIFICATION OF PLANNED PURPOSES (ZONING) AND LAND USE REGIMES

The zoning of the Blue Land area, the future Nature Park "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" plays an extremely important role in planning and defining the existing and future use of Velika Plaža area, in particular as regards regulation and management of human activities. The zoning process plays an important role in preserving the overall biological, geological and landscape diversity of the protected area. The zoning of the Nature Park "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" - Blue Land Area was done based on the knowledge on natural values of the area, the current concept of utilization of the space, pressure on natural resources and in accordance with the guidelines for the zoning of the protected areas laid down by the Law on Nature Protection (Official Gazette of Montenegro No. 54/16).

The zoning process divided the Blue Land area in Montenegro "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" into three protection zones, depending on the protection objectives and the space use needs:

The first (I) protection zone covers: The eastern part of Velika Plaža, that is, the area that covers about 3.5 km of the beach, from the current "Copabana" beach to the Bojana mouth.

The first strict protection zone includes areas of great natural value whose preservation is of paramount importance and which require none or only necessary intervention in the space. The management objective for this zone is to preserve the natural processes and habitats. In this zone, all types of extraction of natural resources are prohibited, no intervention in the area (except under special circumstances) or any modification of the space is permitted. As an exemption, interventions in the area that are permitted include fire control, the removal of invasive allochthonous species, restoration of the damage caused by accidents in accordance with the provisions of the Law on Nature Protection. No activity is allowed in this zone except monitoring and scientific research.

The second (II) protection zone covers Montenegrin forests of ash, oak, and alder in the western part of Velika Plaža; Dry pastures and meadows and extensive grasslands on Velika Plaža (for protected orchids and daffodils), part of the sea from Seka Đeran southward to the mouth of Bojana (in order to allow for the generation of fish stocks it is recommended to establish two to three 'no take' zones).

The second protection zone is an area where the management of and decisions concerning the

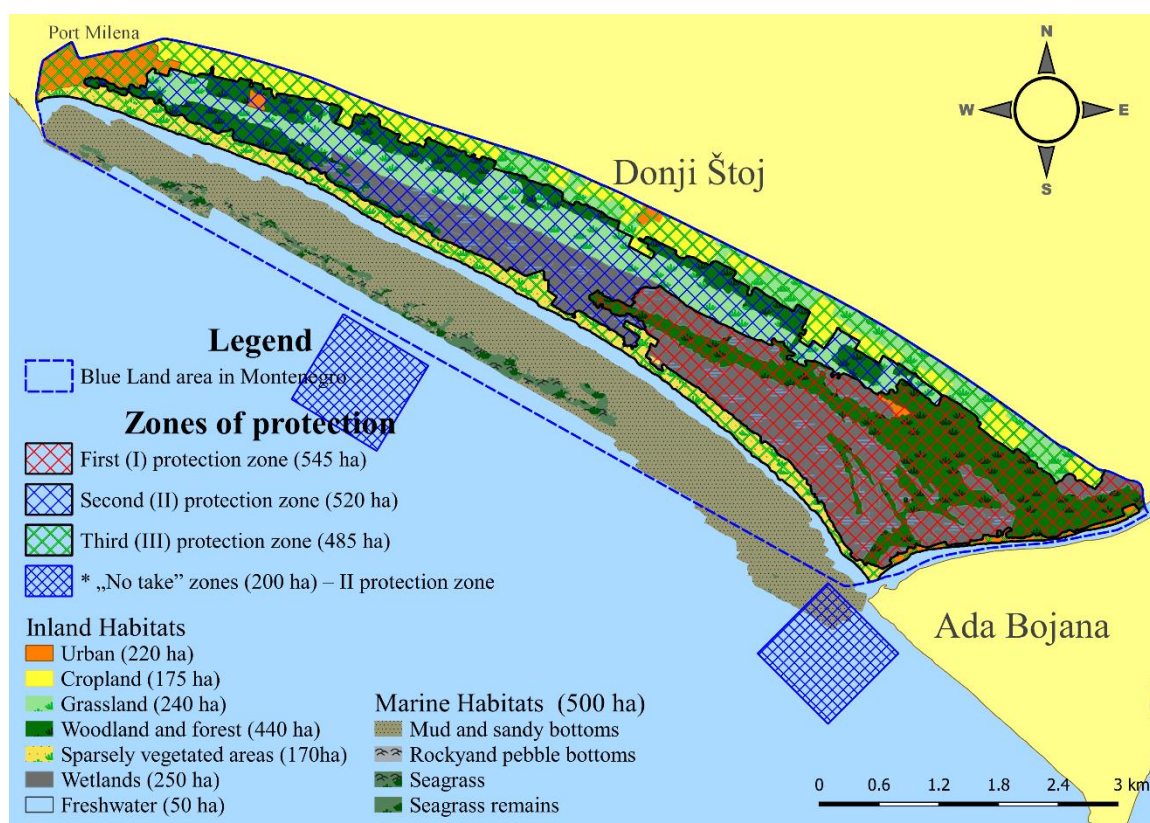
Nature Park is expected to have an effect on the preservation or restoration of the natural and cultural values of the area. Activities that have always been present in these areas are permitted, concerning the use of natural resources in accordance with the conservation objectives, the Law on the Nature Protection, and other laws and bylaws.

The third (III) protection zone covers the western end of Velika Plaža, Donji and Gornji Štoj,

The management objective for this zone is the sustainable use of space in line with the biodiversity preservation objectives. The zone covers: hiking and biking trails, the area around infrastructure facilities. This zone is a kind of compromise between the use and protection of nature, and its use is in line with the sustainable development principles and is not affecting the purpose of the protected area or endangering the objectives defined in the Management Plan.

Protection regimes I, II, and III will apply in the protected area (map 5).

The total area of the Nature Park "Velika Plaža Ulcinj with the Bojana River Mouth at the Adriatic Sea" is around 1,600 ha.



7.Map 5: Protection regime on Velika Plaža Ulcinj

VIII PRIORITY ACTIVITIES FOR THE MANAGEMENT OF THE PROTECTED BL AREA

The Management Plan is a strategic document that identifies the purpose and state of the protected area and sets out the management objectives, activities needed to achieve the objectives, and the management efficiency indicators.

Strategic objectives are the planning part of the Management Plan addressing a related set of issues, namely, the main issues the Plan will address. Their separation into specific activities will give a clearer picture of what is to be achieved by the Plan, while objective indicators allow monitoring of the accomplishment of the final objectives of the area protection and improvement, i.e. monitoring of the implementation of the Management Plan and the performance of the Management Authority will be enabled.

The tables below show the activities, the planned timetable for their implementation by years, listing activity holders that the implementation of individual elements or the entire activity would be impossible without. The holders of the activities, i.e. the entities in charge of implementation, may be all those who have an interest or play a role in the decisions made, partners in the planning process, individuals or communities involved, interested parties, or under the influence of the decisions planned – representatives of the local community, ministries, hunters, fishermen, municipalities, tourist communities, renowned individuals, farmers, associations, scientists, etc.

A separate document will lay down the protocols and obligations of all interested parties in the co-management or shared management process.

Also, one of the important guidelines of this document will be the principle of the so-called "citizen science" or "civil science" promoted by this project and for which a mobile phone application has been created so that all interested parties can join the management process.

The objectives and activities of the Management Plan, as regards the biodiversity of the area, are targeted at those species and habitats whose presence, importance, and vulnerability are already known. Most of them will also be important in the context of the proclamation of the Natura 2000 ecological network. With this in mind, their effective protection will contribute also to the preservation of other species and habitats status of which is still unknown. Determining the overall biodiversity of this area (invertebrates in particular) and its vulnerability is one of the important tasks. Monitoring programs should establish a system for monitoring the status of all relevant species and habitats at the national level, as well as carry out mapping of habitats and species.

Further research and regular monitoring of the status of species and habitats will certainly complement the picture of the still underexplored area of Velika Plaža Ulcinj and enable more targeted and efficient management. A better overview of the existing BL area status will allow a better overview of negative pressures on the area as well as of ways to reduce them. Non-material cultural heritage, including local customs and activities (e.g. fishing using kalimera) takes an important place among cultural values. Developed awareness of the local population about the value and significance of Velika Plaža certainly poses advantage in preservation efforts. Proper presentation of non-material and material cultural heritage will certainly contribute to the promotion of the protected area among the general public and its preservation, but also to expanding the tourist offer and prolongation of the season in the Municipality of Ulcinj.

The activities of the local community and the BL protected area are closely linked, and the management of the protected area through the defined objectives will contribute to improving the economic, social, and cultural status of the population. Agriculture, fisheries, and tourism are the most important industries in the field. However, the manner of carrying out business and all other activities, as well as the use of natural resources in the Nature Park, is laid down by the provisions of the Law on Nature Protection (Official Gazette of Montenegro No. 54/16).

Due to its specific geomorphological, hydrogeological, pedological, vegetation, floristic, faunistic, traditional, and other characteristics that reflect the autochthonous nature of Velika Plaža and the Bojana River, it is necessary to organize and develop sustainable tourism in the protected area. This is particularly important in order to maintain the status of the area as a place of importance at the national and international level concerning valuable habitats and species and to attract nature enthusiasts and to enrich the tourism offer of Ulcinj. Since all protected areas face the issue of harmonising the need to preserve biodiversity with an increasing number of visitors, the tourism

valorisation and promotion has to be well planned and based on the assessment of the capacity of the BL area to preserve biodiversity, while supporting the economic development of the local community. Therefore, the Management Plan is focused on the need to invest in the provision of information to visitors before arrival and on-site, interpreting natural and cultural heritage, as well as establishing a system to monitor visitors' movements. The visibility of the area itself will be achieved by establishing adequate infrastructure for visitors, in particular by establishing pedestrian, bicycle, and educational trails, and a visitors' center.

Understanding the BL area value through education and interpretation, threats that endanger them, and raising the awareness of the need to preserve a rich cultural and natural heritage are essential steps in achieving protection and preservation of the protected area. Understanding the nature conservation terms, rules of behaviour in a protected area, the importance of plant and animal species and their habitats, is of particular importance when it is well known that coexistence between humans and nature is necessary to maintain the ecosystem in this area. The development of educational programs will also be accompanied by the improvement of educational and information materials.

Education and provision of information through information materials, media, organization of events, workshops, and lectures have to be a continuous process that should be adapted to age and interest groups. The involvement of the local population in the process itself (through their activities, e.g. traditional agriculture and fisheries) is of great importance because such a form of cooperation is the cornerstone of effective protection and promotion of the BL area values.

Management of the protected BL area of Ulcinj Velika Plaža and the Bojana River is a complex process that requires consideration of all issues and setting clear management goals. The aim of this Management Plan is to contribute to the achievement of the vision for the development of the entire space through selected activities. Various skills and know-how are needed to carry out monitoring, as well as to follow the management activities foreseen in the Plan, and continuous efforts are needed to strengthen the capacity of the management structure through continuous education, participation in national and international events, as well as through the procurement of the equipment necessary.

It is also very important to establish cooperation with institutions, NGOs, individual researchers with whom scientific research activities are planned every year. It is also necessary to establish, and later on, upgrade, a database on natural and cultural values of the area, so that the management activities can be aligned with the new scientific and professional knowledge in the future. When addressing problems and challenges that are not directly under the competence of the management authority, cooperation with other competent authorities should be established, including cooperation with the relevant inspection services, the Police Administration, the state authorities in charge of environmental protection and tourism, etc.

The Management Plan can single out the following strategic management objectives for the protected Blue Land area in Montenegro Ulcinj Velika Plaža with the hinterland and the Bojana River mouth at the Adriatic Sea (hereinafter referred to as: the protected BL area in Montenegro):

Objective 1: The protected BL area in Montenegro is managed on the basis of the Management Plan, in accordance with the requirements of international good management practices. The BL area enables efficient professional and physical protection and preservation of all of its ecosystems and their natural processes, both living and non-living, water, wetland, brackish components of ecosystems, and the values created by work. Unacceptable and illegal activities, degradation, and significant negative impacts on natural processes, habitats, and species of flora and fauna have been eliminated. In accordance with the zoning, controlled use of some of the resources is allowed

only in specific areas.

Objective 2: The protected BL area in Montenegro is a known, accepted, and appreciated area because of its excellence as regards the conservation of habitats, diversity of species, and traditional socio-economic activities, and as an example of best practices in the preservation of biodiversity through the coexistence of humans and nature, both at the local level (among relevant stakeholders) and the international level.

Objective 3: The protected BL area in Montenegro supports sustainable forms of tourism and socio-economic development of a broader area, and also provides for the possibility of recreational services.

Objective 4: The protected BL area in Montenegro is managed by the Public Enterprise Coastal Zone Management, providing sufficient professional capacity to enable the development and management of the area, in accordance with the specific requirements and international standards. Good co-operation has been established with other competent state institutions and international institutions and partners.

Objective 5: To achieve the best possible management and inclusion of all stakeholders in line with the bottom-up principle, an advisory body will be established, i.e. a special body which, in addition to the managing authority brings together all relevant stakeholders in order to ensure co-management and to create an environment where everyone will contribute at the decision-making level, which was lacking in the past.

Objective 6: The protected BL area in Montenegro is stable in terms of the financial resources necessary for regular operations and implementation of all management activities in the period 2021-2025, in accordance with the appropriate mechanisms of business planning and management. The BL area is financed through: the Budget of Montenegro in accordance with annual programs, plans, and projects in the field of nature protection; fees for the use of protected natural resources; donations and other sources of income in accordance with the law, and funds for the protection of the BL area may be provided under the local self-governance financial framework.

The Operational Management Plan presented through six operational objectives, related to the general management objectives for the protected BL area in Montenegro, activities, activity indicators, and implementation periods:

Operational Objective 1: Habitats management to ensure their favourable conservation status

Activity	Indicator	Holders:	Implementation deadline
Develop a map and a habitat database	Map of habitats in the BL area Database with data on areas covered by habitat types developed	Management Authority	By 2022
Initiate a revision process for the protected area and develop a revision study (with the possibility of proclaiming Velika Plaža a Nature Park)	Protected area revision study developed	Management Authority	By 2022
Maximum possible conservation of habitats in their natural state	Hectares of preserved existing areas of a habitat type to be maintained	Management Authority	Continuously
Where appropriate, carry out the revitalization of habitats with a focus on habitats included in the Habitats Directive List (with particular emphasis on the dunes revitalization)	Hectares of habitats (dunes) revitalized	Management Authority	Continuously
Define conservation objectives and basic measures to preserve potential Natura 2000 habitats	Set of additional measures defined in accordance with the objectives set	Management Authority in cooperation with project partners, scientific institutions	2022
Defining and maintaining a favourable water regime to preserve habitats	Optimal regime ensured in accordance with environmental parameters	Management Authority	Continuously
Improving and conservation of endangered habitats	Measures defined and implemented	Management Authority	Continuously

Operational Objective 2: Species management to ensure their favourable conservation status

Activity	Indicator	Holders:	Implementation deadline
Inventory of plant and animal species	Inventory of plant and animal species made	Management Authority in cooperation with project partners	By 2022
Preserve the existing diversity of targeted flora and fauna species (with emphasis placed on the species listed in the Birds Directive and the Habitat Directive)	Maps of habitats and distribution of the species monitored, protection measures defined	Management Authority	Continuously
Implement habitat conservation measures	Conservation measures implemented	Management Authority	By 2022
Invasive species management	Reduced presence of invasive species	Management Authority or another legal person with permission from the Management Authority	Continuously
Monitoring of indicator, protected and endangered species to preserve them in their existing scale	Monitoring of indicator, protected and endangered species implemented and a report on their status produced	Management Authority	Continuously

Operational Objective 3: Visitor management

Activity	Indicator	Holders:	Implementation deadline
Develop the Carrying Capacity Study on the visitors' impact on the Park's natural and cultural values	Document produced	Management Authority	2022
Establish Visitors' Centre	Visitors' Centre opened	Management Authority	2023

Develop thematic visit programs for Visitors	Visitors programs developed	Management Authority, Tourism Organisation Ulcinj	Continuously
Development of eco-tourism infrastructure and other tourist furniture	Tourist infrastructure in place	Management Authority	Continuously
Maintaining eco-tourism infrastructure and furniture	Tourist infrastructure and furniture in operation	Management Authority	Continuously
Setting up information, educational and tourist signage and the markings within the park	Boards put in place, audio guide produced	Management Authority	Continuously
Establish protocols for tickets and permits to shoot photo and video material	Protocols established	Management Authority	2022
Established information desk as part of the Visitors' Centre with all the equipment and elements of the set up, room for interpretation and education activities (centre for visitors)	The Centre and the accompanying facilities operational	Management Authority	By 2023
Development of the cycling trail and infrastructure	Bike rental location and infrastructure	Management Authority	2022

Operational Objective 4: Management of socio-economic activities (tourism, fisheries, agriculture and hunting) and their consequences

Activity	Indicator	Holders:	Implementation deadline
Promoting habitat protection among current tour operators, building pedestrian bridges to protect halophytic vegetation	Kilometres of pedestrian bridges built	Management Authority, tour operators	continuously

Campaign to prevent further construction of informal roads for tourism purposes	Minimum 2 workshops per year	Management Authority, Tour operators, Administration for Inspection Affairs	continuously
Promote sustainable use of fishery resources and permitted fishing tools and gear	Minimum 2 workshops per year	Management Authority, Ministry of Agriculture, Forestry and Water Management	continuously
Establishing "no take" fishing zones to recover fish resources	At least two "no take" fishing zones established between Seka Djeran to the Bojana mouth	Management Authority, Ministry of Agriculture, Forestry and Water Management, Fishermen	2023
Put in place monitoring of blue crab (<i>Callinectes sapidatus</i>) in order to assess its population	Monitoring adopted and put in place	Management Authority, Institute of Marine Biology	2021
Promotion of blue crab as a gastronomic specialty	Preparation of a cookbook with blue crab specialties and promotional lunch organized	Management Authority, fishermen, owners of the restaurants along the Bojana, Ministry of Agriculture, Forestry and Water Management	2022
Preserve the elements of traditional livestock as an important component of preservation of biological and landscape diversity	Program for the promotion of local breeds designed and implemented	Management Authority, Local population	Continuously
Promotion of local agricultural products	Tasting organised at least 5 times a year	Management Authority, Local population, restaurant owners	Continuously
Promotion of the traditional life of the local population	Permanent exhibition organized as part of	Management Authority	Continuously

(clothing, furniture, household items, agricultural and fishing tools)	the Visitors Centre		
Development and implementation of a plan for strict control of hunting in accordance with the hunting ethics principles, Sustainability, in accordance with the national law and international standards, including a ban on hunting in strictly protected areas.	Plan adopted	Management Authority, Hunting associations, Ministry of Agriculture, Forestry and Water Management, Administration of Inspection Affairs	Continuously
Introduction of a system for solid waste management, recycling, and beach cleaning in accordance with the nature conservation practices	Plan adopted	Management Authority, Ministry of Environment, Spatial Planning and Urbanism, Tour operators, fishermen, hunters, local population	Continuously
Establish continuous control of wastewater discharges	River free from sewer outlets	Management Authority, Municipality of Ulcinj	Continuously

Operational Objective 5: Promotion and education of target groups

Activity	Indicator	Holders:	Implementation deadline
Create and maintain the BLUE LAND area website and regularly update the Nature Park website on social networks	Web page created; regular updates	Management Authority	Continuously
Media promotion and participation in national and international fairs, events and promote natural and cultural values of the area	Through media outlets provide information to the public on activities in the area	Management Authority	Continuously
Preparation of promotional, information and educational material	Produce promotional material	Management Authority	Continuously
Organization of educational, environmental and	Number of events and visitors	Management Authority,	Continuously

promotional activities and events		Tourism Organisation, Primary schools, preschool institutions, NGOs	
Organization and development of educational programs that are compatible with the pre-school and school curricula	Minimum 5 workshops per year	Management Authority	Continuously

Operational Objective 6: Managing authority capacity building

Activity	Indicator	Holders:	Implementation deadline
Establishment of an advisory body to achieve the best possible co-management	Working body established	Management Authority and all relevant stakeholders	2021-2025
Delivery of training for the future staff of the managing authority	Number and list of training events organized	Management Authority	2021 - 2022
Preparing a plan for development, strengthening and training of personnel, in particular for monitoring, interpretation, preparation of educational programs, maintaining environmental importance of the area	Improved level and quality of management skills, performance knowledge and skills of all employees in the Park	Management Authority	Continuously
Establishing cooperation with institutions engaged in similar activities, experts, NGOs and commercial organizations	Continued cooperation with institutions, experts, NGOs, and commercial organizations established	Management Authority	Continuously
Establishment of cooperation with the inspection services, the Police Administration and the Ulcinj Municipality Fire Department	Cooperation with the inspection services, the Police Administration and the Fire Department established	Management Authority	Continuously

International cooperation and inclusion in international networks and projects financed by the EU and other funds available	Projects and activities carried out	Management Authority	Continuously
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IX SOURCES OF FINANCES FOR THE PROTECTION MEASURES IMPLEMENTATION AND IMPROVEMENT OF SUSTAINABLE MANAGEMENT OF THE BL AREA

9.1. Providing funds for implementation of the plan

In accordance with Article 11 of the proposal for the Decision on the proclamation of the Nature Park "Velika Plaža Ulcinj with the Bojana River mouth at the Adriatic Sea" - the Blue Land area, the funds for the operations of the Managing Authority are provided from:

1. the annual budget of Montenegro in accordance with annual programs, plans and projects in the field of nature protection;
2. fees for the use of protected natural resources;
3. contributions from national and international sources; and
4. other sources, in accordance with the law.

The following elements are included in the estimate of the funds necessary for the implementation of the Management Plan for 2021-2025:

1. the cost of human resources (gross salaries and other earnings),
2. financing for programs (concrete programs concerning the Nature Park Ulcinj Salina)
3. other costs and other material and non-material costs concerning the operations
4. investment funds

9.2. Improving the sustainable management in the BL area in Montenegro

Taking into consideration the imperative provisions of the national legislation contained in the Law on the Nature Protection, and taking into account the fact that the protected Blue Land area in Montenegro is, for the most part, located in the public maritime domain zone, it is only natural to designate the public enterprise for the coastal zone management as the management authority of the area since the Law on Public Maritime Domain lays this entity down as the legal person managing the public maritime domain. On the other hand, sustainable management of an area can be ensured by strengthening the administrative capacity of institutions and by involving the local population in management, in order to ensure that the population also shares responsibility for the conservation of natural resources.

Perhaps the most important activity would be to build awareness of each individual about the importance of nature conservation in general, and in particular to protect certain parts of nature that are of outstanding importance for biodiversity, and thus achieve the consent of the majority

of the local population with the decisions crucial for the establishment and management of protected areas.

In this sense, the proposal for the regulation on the proclamation of the protected area (Blue Land area) also provides for the establishment of an advisory body that would, as such, take a proactive role in creating an environment for the sustainable management of the Blue Land protected area, and where the local population would be adequately represented with the aim of participating in decision-making process concerning the protected area management.

The Council will act as a forum for discussion on issues concerning the integrated management of the Blue Land area, review and evaluate documents of significance for Blue Land management and make suggestions and recommendations to the competent institutions for decision-making and to the Government of Montenegro in the context of improving them. It will delegate initiatives, recommendations, and activities of relevance for the sustainable management of the Blue Land area. It will serve to resolve outstanding issues of relevance with regard to the sustainable management of the Blue Land area.

The Council of the protected area is the body comprising representatives of national and local administration, scientific institutions, non-governmental organizations, local community offices, local population and fishermen associations as a particularly important population category from the viewpoint of marine biodiversity protection, institutions in the field of tourism and, where necessary, of other entities. In this way, the participation of stakeholders from the level of information and consultation as regards management is achieving a much higher level, as a form of joint decision-making.

Therefore, it can be concluded from the above that the “bottom-up” approach where the local community can participate directly in the management of protected areas is usually applied to protect the areas at the local level where the local population as users of the natural resources of the area lives in its immediate vicinity or in that area, so all forms of restrictions have an effect on their livelihood. The protection of an area can only be achieved through continuous education of the population and thus raise their awareness on the importance of environmental protection, i.e. that compliance with environmental regulations becomes a common practice.

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The Ramsar Sites Criteria:

http://www.ramsar.org/sites/default/files/documents/library/ramsarsites_criteria_eng.pdf



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