THE FIRST MPA IN ALBANIA, SAZANI ISLAND – KARABURUNI PENINSULA, AS A REGIONAL PRIORITY CONSERVATION AREA FOR MARINE BIODIVERSITY

OTOK SAZANI – POLOTOK KARABURUNI, PRVO MORSKO ZAVAROVANO OBMOČJE V ALBANIJI KOT PREDNOSTNO NARAVOVARSTVENO OBMOČJE ZA MORSKO BIOTSKO PESTROST

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Ključne besede: morska zavarovana območja, Albanija, Jadransko morje, Jonsko morje

ABSTRACT

The coastal and marine area of Sazani Island – Karaburuni Peninsula has been recently proclaimed the first MPA in Albania. After a complex analysis, based on the existing data on marine biodiversity, field survey at the sea, historical, cultural and socio-economic values, this area has been recognised as meeting to the greatest extent the criteria of a MPA among the eight proposed areas as potential MPAs in Albania. The main features that make this area important at the national and regional levels are the presence of at least 36 marine species that are of international concern and appear on the lists of protected species of several conventions (Barcelona, Bern, Bonn, CITES), such as *Posidonia oceanica*, *Corallium rubrum, Lithophaga lithophaga*, as well as extended facies of Cystoseira, "trottoirs" of *Lithophyllum byssoides* and biocenosis of mediolittoral caves. Coralligenous biocenosis is also present with calcareous red seaweeds, gorgonians and bryozoans. The presence of the loggerhead turtle *Caretta caretta*, the common dolphin *Delphinus delphi*s, the bottlenose dolphin *Tursiops truncatus* and the Mediterranean monk seal *Monachus monachus* has also been recorded in marine waters of the relevant area. This area owns precious archaeological, historical and cultural values, too, with Grama Bay, a famous harbour built in antiquity, and the ancient town of Orikum, founded in 4th century BC, conserving traces of several antique and mediaeval civilizations. This area has also been identified as a priority area by many recent national and international environmental reports and can be considered a priority area for marine biodiversity conservation on a regional scale.

IZVLEČEK

Obalno in morsko območje otoka Sazani in polotoka Karaburuni je bilo nedavno razglašeno za prvo morsko zavarovano območje (MPA) v Albaniji. Po temeljiti analizi, temelječi na obstoječih podatkih o morski biotski raznovrstnosti, popisu morskih vrst, zgodovinskih, kulturnih in socio-ekonomskih vrednost je bilo ugotovljeno, da med osmimi predlaganimi potencialnimi MPA-ji v Albaniji prav to območje v največji meri izpolnjuje obstoječe kriterije. Poglavitni razlog, zaradi katerih je to območje pomembno tako na regionalni kot nacionalni ravni, je dejstvo, da ga naseljuje 36 morskih vrst mednarodnega naravovarstvenega pomena, ki jih najdemo na seznamih vrst, zaščitenih z različnimi konvencijami (barcelonsko, bernsko, bonsko, CITES), kot so na primer *Posidonia oceanica*, *Corallium rubrum* in *Lithophaga lithophaga*, kot tudi

močno razširjena asociacija s cistoziro, "trotoarji" z *Lithophyllum byssoides*, in biocenoze mediolitoralnih jam. V območju uspeva tudi prekoraligen z apnenčastimi rdečimi morskimi travami, koralami in briozoji, v teh vodah pa so bile zabeležene tudi vrste, kot so na primer glavata kareta *Caretta caretta*, navadni delfin *Delphinus delphi*s, velika pliskavka *Tursiops truncatus* in sredozemska medvedjica *Monachus monachus.* Hkrati je območje znano po svojih dragocenih arheoloških, zgodovinskih in kulturnih vrednotah, saj na primer zaliv Grama, slovito nekdanje prazgodovinsko pristanišče, in antično mestu Orikum, zgrajeno v 4. stoletju pr.n.št., še vedno hranita sledove več antičnih in srednjeveških civilizacij. Območje so v mnogih nedavnih nacionalnih in mednarodnih okoljskih poročilih nenazadnje razglasili za prednostno območje za zaščito morske biodiverzitete na regionalni ravni.

1. INTRODUCTION

The Albanian coastal area, situated in the south-eastern part of the Adriatic Sea and in the north-eastern part of the Ionian Sea, is about 427 km long; 273 km of it belong to the Adriatic and 154 km to the Ionian. Territorial waters extend 12 nautical miles offshore and include a wide range of water depths and substrate conditions.

River mouths and deltas, lagoon systems, dry old riverbeds, marshes, sandy beaches, dunes covered with vegetation, and dense forests are present in the Albanian littoral. According to various geological studies, the geomorphologic classification of the Albanian coastal area consists of two principal major zones: a) Adriatic Coastline of Peri-Adriatic Depression in the central and northwestern parts of Albania; b) Erosion coastline of Ionian tectonic zone in the southwestern part of Albania (Kabo 1990 - 1991).

Marine ecosystems and coastal wetlands of Albania are rich in habitat typologies, animal and plant communities and species. They constitute an important part of nature heritage not only for the country itself but also for the Mediterranean region as a whole (Anonimous 2002).

Despite the considerable coastline and the important role of marine ecosystem in the country's nature and biodiversity, history, culture, tourism and socio-economy in general, there were no marine protected areas in Albania until 2010. The existing coastal protected areas, including mainly coastal lagoons, river mouths and deltas, are supposed to imply also marine habitats close to them, although these habitats have never been stated and managed as MPAs. Legally, they were subjects to the IUCN categorization and had to be managed under the same categorization as stated for the coastal area.

Recently, together with the increasing interest in marine research in Albania, increasing awareness of Marine Protected Areas and marine conservation in general has been noted in the country. The National Biodiversity Strategy and Action Plan (NEA/AKM 1999) has proposed eight areas along the Albanian coast as potential areas for being proclaimed Marine Protected Areas. Several surveys and assessments have been focused on these areas in the recent years.

The present paper focuses on the first Albanian MPA, Sazani Island – Karaburuni Peninsula, proclaimed in April 2010. This proclamation was prepared by a recent project (Protected Areas Gap Assessment and Marine Protected Areas Development in Albania) that, besides

other objectives, was also aiming to identify and propose one single area as the most suitable for being stipulated the first MPA in Albania. This project has analyzed in a comparative way the eight potential areas as MPAs, based on the previously existing data, as well as on a rapid field survey in each of them during the project implementation, in order to update the current situation. Marine and coastal area Sazani Island – Karaburuni Peninsula has been distinguished and targeted to be proclaimed the first MPA. This paper describes the relevant area in a large context, including the natural and landscape values, considering the importance of habitats, communities and species, especially those of special importance as rare and/or endangered at the national and international levels, feeding and/or breeding grounds, as well as cultural, historical and socio-economic values and importance.

2. METHODS

The analysis and assessment of natural, biodiversity, historical, archaeological and socio-economic values of the area Sazani Island - Karaburuni Peninsula have been based on the previous collected and reported data in the recent years, as well as on a rapid survey carried out in 2009. Data sources are described in the following documents:

1. *Inventory of Posidonia oceanica meadows and coastal habitats along the Albanian coast* (Kashta et al. 2005, Kashta et al. 2007). This inventory was carried out by NGO Association for the Protection of Aquatic Wildlife of Albania (APAWA) and supported by the Ministry of Environment, Forests and Water Administration of Albania (MEFWA) in 2005. Inventory of Posidonia meadows, together with the assessment of their ecological state and associated macrofauna, was done for the whole Albanian coast, including two sites on Karaburuni Peninsula.
2. *Rapid assessment survey of the important habitats of marine turtles and monk seal in the coastal area of Albania*. This survey was supported by the RAC/SPA, GEF/SGP Albania, MEFWA, and implemented by the MEDASSET (Greece) and APAWA in 2005. Karaburuni Peninsula and Sazani Island were two main sites for this survey, especially for the monk seal habitats, due to their considerable number of suitable coastal caves and beaches for shelter and stranding, as well as the very limited human access.
3. The project *Technical Assistance for Establishment and Management of an International Centre for Marine Studies (CISM) in Albania* (CoNISMa 2008), implemented by ARPA Puglia (Italy), CoNISMa (Italy), IRPI-CNR (Italy), Faculty of Natural Sciences of the University of Tirana (Albania), Academy of Sciences of Albania and the MEFWA (Albania), and supported by the EU Program Interreg III Italy – Albania, 2006 - 2008. Vlora Bay, including Sazani Island and Karaburuni Peninsula, has been the case study of this project, implementing a complex and detailed study of the relevant area, implying benthos, plankton, nekton, ecotoxicology, hydrology, geology, sedimentology, coastal erosion, chemical oceanography and physical oceanography. Data collected from this study represent the largest data ever collected for any marine and coastal area in Albania.

4. The project *Protected Areas Gap Assessment and Marine Protected Areas Development in Albania*, implemented by the UNDP Albania and supported by GEF (USA) and MEFWA (Albania), 2008 – 2010. One of the main objectives of this project was to identify and propose one single area as the most suitable for being proclaimed the first MPA in Albania. This project has analyzed the eight potential areas as MPAs, proposed by the National Biodiversity Strategy and Action Plan, based on the previously existing data, as well as on a rapid field survey in each of them during the project implementation, in order to update the current situation (Kashta et Beqiraj 2009). Marine and coastal area Sazani Island – Karaburuni Peninsula has been distinguished and targeted to be proclaimed the first MPA. A more detailed survey has been carried out for this target area in July 2009 by national and international experts involved in the project. Snorkelling has also been used for this survey, aiming at a quick assessment of the state of benthic habitats in mediolittoral and upper infralittoral. Based on the analysis of the existing and new collected data, as well as on the analysis of legal and administrative framework related to marine conservation and protected areas, this project has also prepared the necessary documentation and organized the consultation process for proclaiming the area Sazani Island – Karaburuni Peninsula the first MPA in Albania.

a) b)

Figure 1: a) Map of Albania, showing the position of Sazani Island – Karaburuni Peninsula; b) Map of the area Sazani Island – Karaburuni Peninsula

Slika 1: a) Zemljevid Albanije z vrisano lego otoka Sazani - polotoka Karaburuni; b) Zemljevid območja otoka Sazani - polotoka Karaburuni

2.1 GENERAL DESCRIPTION OF THE AREA SAZANI ISLAND – KARABURUNI PENINSULA

Karaburuni Peninsula runs along the western part of Vlora Bay. It covers 62 km^2 and separates the Albanian coast of the Adriatic Sea from the Ionian Sea. A narrow

sea channel, named Mezokanali *(in English: middle channel)*, separates Karaburuni from Sazani Island.

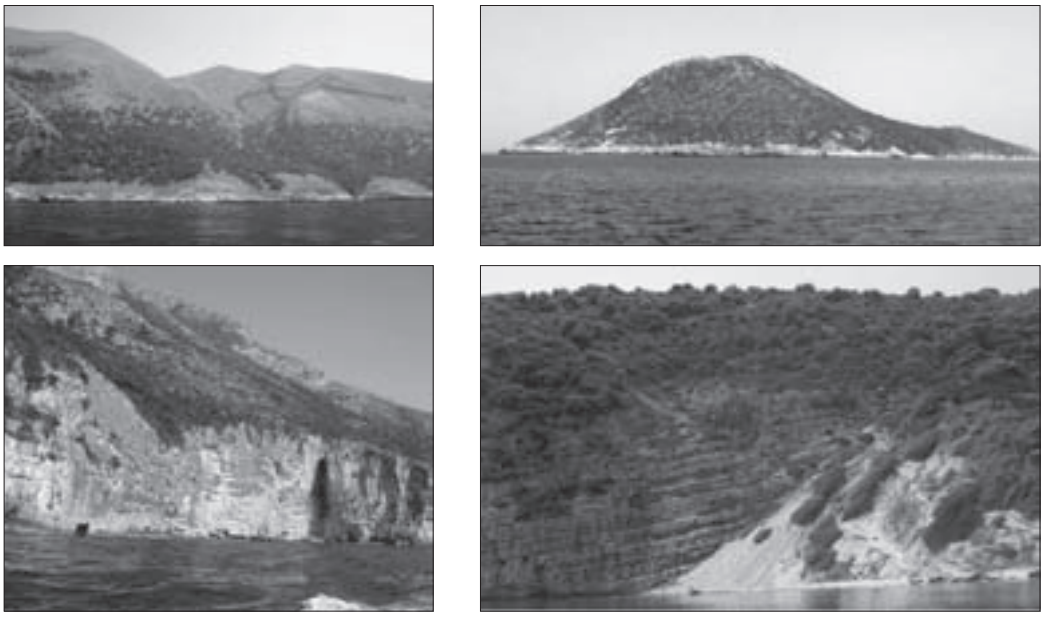
From the geological point of view, Karaburuni is made up of Cretaceous carbonic limestone, while in the north-western part, Bay of Shën Jani, it is composed of terrigenic deposits.

The relief comprises a number of hills, up to 800 m high. The highest peaks are Maja e Ilqes (733 m), Maja e Flamurit (826 m) and Çadëri (839 m).

The entire peninsula meets the sea with steep, inaccessible cliffs. The western shore is high, fragmented with many fissures, caves, gaps, and small beaches. The access to several coastal parts and beaches, especially on the western side of the peninsula, is very difficult and sometimes impossible unless using a boat, due to the cliffs at the seashore. The eastern shore is less fragmented. Cape Gjuhezes (Kepi i Gjuhezes) at the northwestern tip of the peninsula is the westernmost point of Albania. The area is practically devoid of woody vegetation, except for sparse maquis and wild grasses, and it has no freshwater sources.

Karaburun Peninsula embraces some small bays: the Bay of Raguza, the Bay of Shën Jan, The Bay of Bristan, the Bay of Dafina, etc.

Sazani Island is 4.8 km long, 2 km wide, and has a surface of 5.7 km^2. It is composed mainly of limestone rocks of Cretaceous era and in the eastern part partially of terrigenic and cleistogenic deposits. On its eastern coast, the largest bay is that of military harbour, while the western coast is more fragmented, steep, with high cliffs, fissures and small bays, where the best known are the Bay of Paradise (Gjiri i Parajses) and the Devil Gorge (Gryka e Djallit). Woody vegetation is scarce and the island is mainly covered by maquis and wild grasses.



a) b)

Figure 2: View of: a) Karaburuni Peninsula; b) Sazani Island (photos: Beqiraj et Kashta 2009)
Slika 2: Pogled na: a) polotok Karaburuni; b) otok Sazani (fotografije: Beqiraj et Kashta 2009)

3. RESULTS AND DISCUSSION

Description of habitats of Sazani Island – Karaburuni Peninsula and their values is based on the data collected from the projects already mentioned in the "Methods". Descriptions in the following are focused on marine habitats only, aiming at highlighting the most important habitats, species and associations.

3.1 MEDIOLITTORAL STAGE

3.1.1 Biocenosis of the lower mediolittoral rocks

Lithophyllum byssoides (= *L. lichenoides*), a characteristic species of the western Mediterranean and Adriatic Sea, is present on the mediolittoral of Sazani Island and Karaburuni Peninsula. This incrusting coralline alga grows slightly above mean sea level, in small caves, corridors and along cliffs. In this area it forms small cushions (hemispheric concretions) and rarely builds rims, usually known as "trottoirs".

3.1.2 Biocenosis of mediolittoral caves

Mediolittoral caves correspond to crevices or cave entrances that are partially out of the water. These formations are mainly situated along the western side of peninsula, where species like *Catenella caespitosa, Hildenbrandia prototypus*, *Phymatolithon lenormandii* can be found.

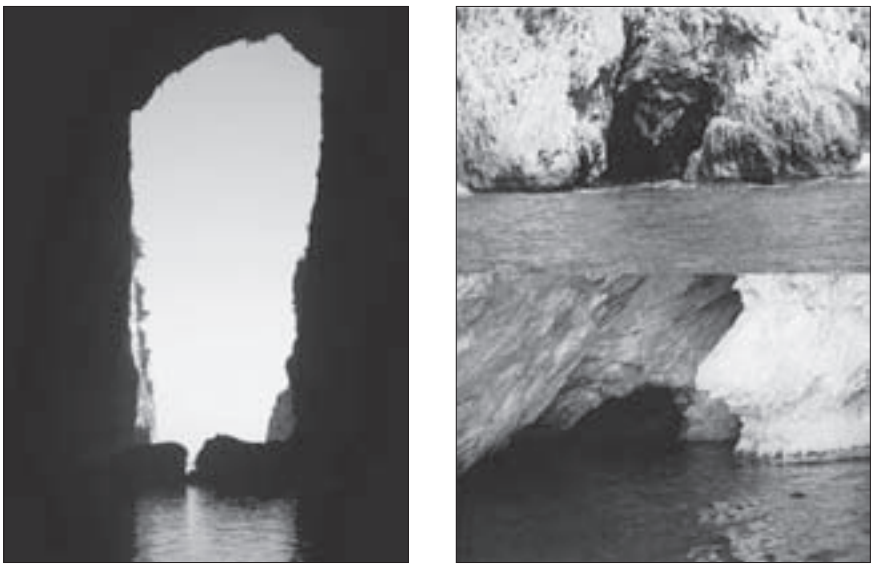


Figure 3: View of some caves on Karaburuni Peninsula (photos: Beqiraj et Tilot 2009)
Slika 3: Pogled na jame na polotoku Karaburuni (fotografije: Beqiraj et Tilot 2009)

3.2 INFRALITTORAL STAGE

3.2.1 *Posidonia oceanica* meadows

Seagrass communities often characterize sandy and muddy bottoms in Karaburuni coasts and Vlora Bay. On the western side, *Posidonia oceanica* grows generally on rocky substrates and rarely on sandy seabed, in front of small beaches.

Posidonia meadows, as a habitat, concern the Habitat Directive 92/43/EEC as priority habitat, whereas *P. oceanica* as a species concerns Annex II (List of the endangered or threatened species) of the Barcelona Convention (Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean).

Fragmented *Posidonia oceanica* meadows have been observed along the eastern coast of Karaburuni, in Vlora Bay. The beds with a coverage of 50% extend from 6 m to 15-18 m depth.

An inventory of Posidonia meadows has been implemented in Shen Vasil and Raguza Bay, along the eastern coast of Karaburuni. In Shen Vasil, the Posidonia meadows were very poor in benthic macrofauna. The commonest species in this site were sponges *Crambe crambe* and *Axinella canabina*; bryozoans *Myriapora truncata, Smittina cervicornis* and *Membranipora sp*., eunicid polychaetes (Fam. Eunicidae) and ascidian *Halocynthia papillosa*. It's worthy to emphasize the high abundance of *Halocynthia papillosa* and *Holothuria tubulosa* in the bare parts, without macrovegetation cover, between the patches of Posidonia.

In Raguza Bay, benthic macrofauna was slightly richer, compared to the first site. A very high abundance of *Holothuria tubulosa* was recorded, especially in the bare parts, without macrovegetation cover. A high species richness of sponges was also recorded, the commonest among them being *Aplysina aerophoba, Crambe crambe, Ircinia variabilis, Petrosia ficiformis* and *Axinella damicornis*. Other species with high abundance were the anthozoan *Cladocora caespitosa*, gastropod *Hexaplex trunculus*, bivalves *Venus verrucosa* and *Pseudochama gryphina*, and the ascidian *Botryllus schlosseri* with the anthozoan *Caryophyllia inornata* as epibiont.

Along with the regression of *Posidonia oceanica* beds, a mass growth of the invasive alga *Caulerpa racemosa*, developed mainly on "mattes morte" from 2 m to 15 m depth, has also been noted. After its first record in Albania in 2002, this invasive alga seems to be common in wide ranges of depths and substrata along the coast of Vlora Bay.

3.2.2 Biocenosis of infralittoral algae in hard bottoms

Perennial brown algae are dominant over extensive parts of shallow hard substrata in the western side of Karaburuni Peninsula and Sazani Island. The most important group is that of the brown algae Cystoseira, represented by 5 species (*Cystoseira amentacea var. spicata, C. barbata, C. compressa, C. crinita and C. spinosa*). The *Cystoseira* communities are, together with the *Posidonia* meadows, the main supporters of biodiversity in shallow water.

3.2.3 Association with *Cystoseira amentacea var. spicata*

This association is located in the first meter of the infralittoral (from 20 cm to 30 cm depth) and creates belts in the photophilic biotopes, where a strong wave action predominates and where the rocky substratum is subvertical. *Cystoseira amentacea* is an indicator of the upper limit of the infralittoral stage and represents a threatened species (after Barcelona Convention, Annex II). This association includes many strata and is characterized by a high species richness. It shelters epibiont organisms and other benthic organisms, mainly algae, polychaetes, molluscs and crustaceans.

Other associations to be mentioned among infralittoral algae in hard bottoms are: association with *Cystoseira crinita*, association with *Dictyopteris polypodioides,* association with *Corallina elongate*, and facies with *Cladocora caespitosa*.

Among the infralittoral algae recorded for the area (after Kashta 1987), some of species are very interesting from a biogeographical point of view, such as *Catenella caespitosa* with boreal affinity, *Polyphysa parvula* (Solms-Laubach) Schnetter et Bula-Meyer with tropical affinity, and the lessepsian seagrass *Halophila stipulacea* (Forskal) Ascherson. Until now, Vlora Bay has represented the northern limit of distribution of *Halophila stipulacea* in the Mediterranean (Kashta et Pizzuto 1995).

3.3 CORALLIGENOUS BIOCENOSIS

In the circalittoral zone, on hard substrata, the most important biocenosis is the coralligenous, with calcareous red seaweeds, gorgonians and bryozoans. This biocenosis is well developed on the western side of Sazani Island and Karaburuni Peninsula.

Other important biocoenosis is that of semi-obscure caves, where the red coral *Corallium rubrum* and some sponges live.

a)

b)

Figure 4: a) *Ophidiaster ophidianus* and b) *Corallium rubrum* from Karaburuni Peninsula (photo: Kashta 2005, 2007)
Slika 4: a) Ophidiaster ophidianus in b) Corallium rubrum s polotoka Karaburuni (fotografiji: Kashta 2005, 2007)

The red coral is a species of the Annex-III of the Barcelona Convention, as a species whose exploitation is regulated and also a species of the Annex III of the Bern Convention, as a protected fauna species.

3.4 OTHER IMPORTANT MARINE BENTHIC MACROFAUNA

There are relatively richer data on marine fauna of this area, compared to many coastal areas of Albania. Most of the data belong to studies of specific groups, such as mollusks, crustaceans and echinoderms.

More than 150 mollusk species have been reported from this area, and new species for Albania and the relevant area itself are being published from almost every study on malacofauna and the macrozoobenthos in general (after Dhora et Salvini-Plawen 1997, Beqiraj et Kashta 2007, Beqiraj et al. 2008, Kasemi et al. 2008, Panneta et al. 2009).

About 50 species of decapod crustaceans have been reported from this area (after Vaso et Gjiknuri 1993, Kasemi et al. 2008), of which many species appear on the national red list (see Annex II).

From 46 echinoderm species reported for the Albanian coast, 32 have also been found in Vlora Bay, including Karaburuni Peninsula and Sazani Island (after Gjiknuri 1980). These species include 1 crinoid, 13 asterids, 4 ophiurids, 9 echinids and 5 holothuroids.

A recent study on macrozoobenthos of the shallow rocky coast of Vlora Bay (after Kasemi et al. 2008), in supralittoral, mediolittoral and upper limit of infralittoral, has also included the south-eastern coast of Karaburuni (Orikum). This study reports on about 140 species of benthic macroinvertebrates, including isopods, cirripeds, amphipods, annelids, cnidarians, nematodes, bryozoans and sipunculids (besides mollusks, crustaceans and echinoderms, which are mentioned above).

In the Red Book of Albanian Fauna (Misja 2006), 49 species from 64 species of marine benthic macroinvertebrates originate from Vlora Bay, of which 5 are sponges, 8 cnidarians, 1 annelid, 20 mollusks, 12 decapods and 3 are echinoderms (see Annex II).

Taking into account the Red List of Albanian Fauna 2007 (MMPAU 2007), too, about 160 species (75%) among 220 species of marine fauna involved in this list, have been reported also for Vlora area, including Karaburun – Sazan.

Some important crustaceans like lobster (*Homarus gammarus*), crawfish (*Palinurus elephas*), greater locust lobster (*Scyllarides latus*) and spiny spider crab (*Maja squinado*) live in this area. These species concern Annex III of the Barcelona Convention, as species whose exploitation is regulated.

Ophidiaster ophidianus, a sea star of international concern, is a characteristic echinoderm of precoralligenous biocenosis in this area.

At least 36 marine species, which are of international concern and appear on the lists of endangered and/or protected species of several conventions, are present in Sazani – Karaburuni area (see Annex I). They involve seagrasses, seaweeds, sponges, cnidarians, mollusks, crustaceans, echinoderms, fishes, reptiles, pinnipeds and cetaceans. These data show the importance of the relevant area in a regional and international context.

3.5 MARINE VERTEBRATES OF SPECIAL IMPORTANCE

The presence of the dolphins *Delphinus delphi*s and *Tursiops truncatus* and many other threatened species, protected by international conventions, has also been recorded in the

marine waters of Sazani – Karaburuni. The coastal waters of Karaburuni are also visited by the Mediterranean monk seal (*Monachus monachus*), one of the most threatened species in the world.

In the *Rapid assessment survey of the important habitats of marine turtles and monk seal in the coastal area of Albania (2005)* it was suggested that suitable (potential) monk seal habitats exist along the southern coast of Albania, stretching from Karaburuni and Rreza e Kanalit to the area around Butrint (White et al. 2006). From the fishermen's reports *in verbalis*, 1 – 2 monk seal individuals are seen every 4 – 5 years along the coast of Karaburuni Peninsula.

In another publication (Antolović et al. 2005), 17 caves that seemed to be of some importance as monk seal shelters were located between the small gulf of Grama and the northern tip of Karaburuni.

This area seems to be an important migrating corridor for the loggerhead turtle *Caretta caretta*, from its nesting site in Zakynthos Island in Greece in the Ionian Sea, to the Patoku coast in Albania along the Adriatic Sea, which has been recently identified as an important foraging site for this species (White et al. 2006).

Noteworthy fish species of Karaburuni waters, included in Annex III of the Barcelona Convention, are: dusky grouper (*Epinephellus marginatus*), Atlantic bluefin tuna (*Thunnus thynnus*) and swordfish (*Xiphias gladius*).

3.6 HISTORICAL AND CULTURAL VALUES

Karaburuni area and Vlora Bay are well-known for their historical and cultural values. In the south-eastern part of Karaburuni Peninsula, the ancient town of Orikum is situated, one of the most important Illyrian ports, founded in 4th century BC and mentioned as an important economic and cultural centre in the Mediterranean during the ancient Greek and Roman periods until the Mediaeval period.

Along the western coast of Karaburuni, Grama Bay is the only suitable and safety place for ship anchoring and it was a famous harbour in antiquity. On the rocks of Grama Bay, there are numerous ancient inscriptions in the old Greek and Latin languages. The series of caves have legends associated with them. Grama is considered the richest "rocky diary" in the Mediterranean.

In the underwater habitats of Karaburuni, a considerable number of wrecked ships and many archaeological objects bear witness to this area's relations with other civilizations of the Greek and Roman periods. Divers can also see traces of the two World Wars.

These values make this area of the Albanian coast one of the most potential tourist destinations in historic, cultural and archaeological aspects, besides the high variety of landscape from geomorphologic and environmental aspects. Underwater topography with interesting caves and very diverse microhabitats, as well as the presence of wrecked ships are additional tourist values, especially for divers.

3.7 OTHER IMPORTANT FEATURES

The Sazani Island – Karaburuni Peninsula area has additional values if considering terrestrial habitats in its coastal parts, with a great diversity of vegetation types. Among the most interesting habitats are: broad-leaved evergreen forests (Assoc. Orno –Quercetum ilicis), plant communities dominated by *Quercus coccifera* (Assoc. Orno- Quercetum cocciferae), plant communities dominated by *Euphorbia dendroides* and *Pistacia lentiscus* (Assoc. Pistacxio – Euphorbietum dendroides), the forests dominated by *Quercus ithaburensis* subsp. *macrolepsis* (known as Valona oak). Relict species like *Quercus ithaburensis subsp. macrolepis* and *Laurus nobilis* are found among them, as well as rare and threatened plant species like *Athamanta macedonica, Brassica oleracea subsp. oleracea, Brasica incana, Laurus nobilis, Origanum vulgare, Prunus webbii, Quercus ilex, Limonium anfractum, Lotus cytisoides, Desmazeria marina, Capparis spinosa, Prasium majus*, *Ephedra distachia, Orchis sp. diverse* and *Daphne gnidium.*

Some special and traditional old breeds of sheep graze in Karaburuni, feeding on the rich herb and shrub vegetation. They are famous for the quality of their meat and milk and may be considered the area's another potential for the development of rural and ecological tourism. High diversity of the topographic formations, with steep and inaccessible cliffs, canyons, tracks and plateaus (such as plateau of Ravena) are other potentials for the development of alpinism, horse riding and other sports, besides the various sea sports.

Limited access to Karaburuni and Sazani, mostly due to the lack of roads and steep rocky coast, has in fact protected and conserved their natural habitats. However, there are possibilities for controlled tourist and visitor access in the area, along h trails in the hills and forests and by boat in the small bays and beaches with mooring possibilities, such as the Bay of Raguza and the Bay of Shën Jan on the eastern coast, and the Bay of Bristan, the Bay of Dafina and the Bay of Grama on the western coast of Karaburuni.

Western side of the Sazani – Karaburuni area has been identified as a priority area by many recent environmental policy documents of the Government of Albania. The WWF Mediterranean Program has identified 10 Mediterranean marine and coastal areas that are vital for biodiversity. One of them includes the coasts and islands of the eastern part of the Ionian Sea (Albania and Greece). This is another reason to highlight the importance of the Sazani – Karaburuni area in a regional context.

The Sazani Island – Karaburuni Peninsula area has an important position on the eastern side of the Otranto Channel (Otranto Straight). As it is known, the water mass that flows in and out from this channel has a strong influence on the water regime of the entire Adriatic basin, also affecting the Ionian Sea. These effects are consequently reflected in the situations and state of marine populations, especially related to the species distribution and larvae recruitment in the whole Adriatic basin in general, and in the south Adriatic and north Ionian in particular. This is another feature that makes this area of a special importance at the regional level.

Based on the values commented above and after a long process of consultations with relevant institutions and stakeholders, the Council of Ministers of Albania has proclaimed

the marine and coastal area Sazani Island – Karaburuni Peninsula, an area of 12,570 ha, with the status of National Marine Park, on 28th April 2010 (see Fig. 5). This proclamation has also complemented the status of the whole terrestrial area of Llogora-Orikum-Karaburun-Sazan-Radhimë-Tragjas-Dukat (35,000 ha), situated in the east of the MPA, which has already a protected status as a Managed Nature Reserve and includes the National Park of Llogora.

Proclamation of the first MPA should be considered as a step forward in strengthening and enlargement of the protected areas system in Albania, which is one of the most important objectives of the Work Program and Action Plans of the Ministry of Environment, Forest and Water Administration. Within this framework it is aimed that the protected areas will cover 15% of the territory (currently about 12.5%) as a short term objective, and about 20% of the overall country's surface as a long term objective (year 2015). The bases for the enlargement of the protected area system are the proposals made within the National Biodiversity Strategy and Action Plan (NEA/AKM 1999), refined and improved by considering recent developments and natural processes.

Aiming to join the EU structures, Albania would need to improve its environmental quality, too. Regarding coastal and marine protected areas, the implementation of the Marine Strategy Framework Directive (2008/56/EC) and Water Framework Directive (2000/60/EC) would be important for meeting the international standards and requirements.

Figure 5: Map of the proclaimed MPA Sazani Island – Karaburuni Peninsula (MMPAU 2009)
Slika 5: Zemljevid razglašenega morskega zavarovanega območja (MPA) Otok Sazani – Polotok Karaburuni (MMPAU 2009)

Figure 6: Grama Bay along the Rreza e Kanalit Ridge (photo: Mato 2008)
Slika 6: Zaliv Grama vzdolž grebena Rreza e Kanalit (fotografiji: Mato 2008)

Figure 7: Remains of the ancient town Orikum (photo: Mato 2008)
Slika 7: Ostanki antičnega mesta Orikum (fotografija: Mato 2008)

4. SUMMARY

The first MPA in Albania was proclaimed on 28th April 2010. Embracing the coastal and marine area of Sazani Island – Karaburuni Peninsula with the National Marine Park status, it covers 12,570 ha,. This paper presents a synthetic description of natural and biodiversity values of this area, with additional information on archaeological, historical and socio-economic values.

The relevant area is characterized by high diversity of landscapes, with steep and inaccessible cliffs, fissures, caves, capes, small beaches and bays (Bays of Bristan, Dafina, Grama, etc.).

At the mediolittoral stage, biocenosis dominated by *Lithophyllum byssoides* is present on both Sazani Island and Karaburuni Peninsula. It has created small cushions and rims, known as "trottoirs". Another biocenosis in the mediolittoral is that of mediolittoral caves, which corresponds to crevices or cave entrances that are partially out of the water.

The most important biocenosis in the infralittoral stage is that of *Posidonia oceanica* meadows. On the western coast, *Posidonia oceanica* grows generally on rocky substrates and rarely on sandy seabeds, in front of small beaches.

On the hard beds and rocks of the infralittoral, perennial brown algae are dominant over extensive parts of shallow hard substrata on the western side of Karaburuni and Sazani. The most important group is that of the brown algae Cystoseira, represented by 5 species (*Cystoseira amentacea var. spicata, C. barbata, C. compressa, C. crinita and C. spinosa*). Other important associations are those of *Dictyopteris polypodioides, Corallina elongata* and *Cladocora caespitosa*.

Another important biocenosis is that of semi-obscure caves, where the red coral *Corallium rubrum* and several species of sponges live.

Coralligenous biocenosis is present in the circalittoral zone, on hard substrata, with calcareous red seaweeds, gorgonians and bryozoans. This biocenosis is well developed on the western side of Sazani Island and Karaburuni Peninsula.

In the presence of the loggerhead turtle *Caretta caretta*, the common dolphin *Delphinus delphi*s, the bottlenose dolphin *Tursiops truncatus* and the Mediterranean monk seal (*Monachus monachus*) have also been recorded in marine waters of this area. These are among the most threatened species on a global scale, protected by several international conventions (Barcelona, Bonn, CITES, Bern). This area seems to be an important migrating corridor for the loggerhead turtle *Caretta caretta*, from its nesting site on the Greek island of Zakynthos in the Ionian Sea to the Patoku coast in Albania in the Adritaic Sea, which has been recently identified as an important foraging site for this species.

At least 36 marine species, which are of international concern and belong to the lists of endangered and/or protected species of several conventions are present in the Sazani – Karaburuni area. They include seagrasses, seaweeds, sponges, cnidarians, mollusks, crustaceans, echinoderms, fishes, reptiles, pinnipeds and cetaceans. These data show the importance of the relevant area at the regional and international levels.

On a national scale, about 75% of endangered species of marine animals, mostly benthic macroinvertebrates, which are listed in the Red Book of Albanian Fauna (2006) and in the Red List of Albanian Fauna (2007), have been recorded in the Sazani – Karaburuni area.

This area has an important position on the eastern side of the Otranto Channel. The water mass that flows in and out from this channel has a strong influence on the water regime of the whole Adriatic basin, also affecting the Ionian Sea. These effects are consequently reflected in the situations and state of marine populations, especially related to the species distribution and larvae recruitment in the entire Adriatic basin in general and in the south Adriatic and north Ionian in particular. This is another feature that makes this area of a special importance at the regional level.

This area owns precious archaeological, historical and cultural values, too. Along the south-western coast of Karaburuni the bay of Grama is situated, a famous harbour built in antiquity. On the rocks of Grama Bay, numerous ancient inscriptions in the old Greek and Latin languages can be found, that have made this bay the richest “rocky diary” in the Mediterranean. In the south-eastern part of Karaburuni Peninsula, the ancient town of Orikum is situated, one of the most important Illyrian ports, founded in the 4th century BC and mentioned as an important economic and cultural centre in the Mediterranean during the ancient Greek and Roman periods until the Middle Ages. In the underwater habitats of Karaburuni, a considerable

number of wrecked ships and many archaeological objects bear witness to the relations of this area with other civilizations during the Greek and Roman periods. Divers can also see traces of the two World Wars.

The eastern part of the Ionian Sea, also including Albania, has been identified by the WWF Mediterranean Program as one of the ten Mediterranean marine and coastal areas that are vital for biodiversity. This is another reason to highlight the importance of the Sazani – Karaburuni area at the regional level.

Proclamation of the first MPA in Albania is a step forward in implementing the national environmental policies regarding strengthening and enlargement of the network of protected areas and in fulfilling the environmental policy criteria and standards for the country's accession in EU structures.

5. LITERATURE

1. Anonimous (2002): National Report on Marine and Coastal Biodiversity. Tirana. 126 pp.
2. Antolović, J., A. Vaso, L. Kashta, V. Shutina, S. Anagnosti, S. Bogdanović, L. Adamić, N. Antolović (2005): Protection of the Mediterranean Monk Seal (Monachus monachus) and its Habitats. EURASLIC 11. 11th Biennial Conference of the European Association of Aquatic Sciences Libraries and Information Centres, 4-6th May 2005, Split, Croatia.
3. Beqiraj, S., L. Kashta (2007): Preliminary data on benthic macrobenthos of *Posidonia oceanica* meadows in Albanian coast. Universiteti i Shkodrës "Luigj Gurakuqi", Bul. Shk., Ser. Shk. Nat. 57: 179-194
4. Beqiraj, S., L. Kashta, M. Kuci, D. Kasemi, Xh. Mato, A. Gace. (2008): Benthic macrofauna of *Posidonia oceanica* meadows in the Albanian coast. Natura Montenegrina 2008/7 (2): 55-69
5. CoNISMa (2008): Technical Assistance for Establishment and Management of an International Centre for Marine Studies (CISM) in Albania. Technical report. www.cismalbania.it
6. Dhora, Dh., L.v. Salvini-Plawen (1997): Preliminary list of Gastropoda and Bivalvia from off the Albanian coast. La Conchiglia, Roma 284: 10-20
7. Gjiknuri, L. (1980): Rezultate të studimit të ekinodermatëve të bregdetit tonë. Doctorate theses. University of Tirana, Faculty of Natural Sciences: 120 pp.
8. Kabo, M. (1990–1991): Gjeografia Fizike e Shqipërisë. Albanian Academy of Sciences. Geographic Centre. Tirana: 137-144
9. Kasemi, D., S. Beqiraj, S. Ruci (2008): Macrozoobenthos of the rocky coast of Vlora, Albania. Natura Montenegrina 2008/7 (2): 133-145
10. Kashta, L. (1987): Alga makrofite të brigjeve të Shqipërisë. (The macrophyte algae of Albanian coast). Doctorate Thesis. Tiranë: 187 pp.
11. Kashta, L., F. Pizzuto (1995): Sulla presenza di *Halophila stipulacea* (Forskaal) Ascherson nelle coste dell'Albania. Boll. Acc. Gioenia Sci. Nat. Catania: 161-166
12. Kashta, L., S. Beqiraj, Xh. Mato, M. Xhulaj, A. Gaçe, A. Mullaj (2005): The inventory of habitats with *Posidonia oceanica* and littoral habitats in Albania. Technical Report. APAWA. Tirana: 96 pp.
13. Kashta, L., M. Xhulaj, Xh. Mato, S. Beqiraj, A. Gaçe (2007): The state of *Posidonia* meadows along the Albanian coast: general evaluation. Proceedings of the Third Mediterranean Symposium on Marine Vegetation, Marseilles, 27-29 March 2007: 272-273
14. Kashta, L., S. Beqiraj (2009): Analysis of the proposed potential marine protected areas. Protected Areas Gap Assessment and Marine Protected Areas Development in Albania, (UNDP, GEF, MEFWA). Technical report: 81 pp.

15. Misja K. (2006): Libri i Kuq i Faunës Shqiptare. Ministria e Mjedisit, Pyjeve dhe Administrimit të Ujërave. Tiranë: 1-256
16. MMPAU (2007): Lista e Kuqe e Faunes. Tirane: 14-26
17. NEA/AKM (1999): Biodiversity Strategy and Action Plan. National Report. Tirana: 1-100
18. Panneta, P., F. Mastrototaro, S. Beqiraj, A. Matarrese (2009): Molluscs of soft bottoms in Valona Bay. Biologia Marina Mediterranea 16(1): 328-329
19. Vaso A., L. Gjiknuri (1993): Decapod Crustaceans of the Albanian Coast. Brill pub., Crustaceana 65(3): 390-407
20. White, M., V. Kouroutus, A. Plytas, A. Gace, A. Vaso, S. Beqiraj, I. Haxhiu (2006): Sea turtles in Albania: Results of a rapid assessment of possible foraging and over-wintering habitats (October – November 2005). 26-th Annual Symposium on sea turtle biology and conservation. Crete, Greece.

ANNEX 1: Marine species of international concern in the Karaburun – Sazani area, listed in the most important Conventions

PRILOGA 1: Mednarodno pomembne morske vrste območja Karaburun – Sazani, ki so navedene v najpomembnejših konvencijah

Species name	Barcelona protocol (1996)		Bon (2006)		CITES (2006)	Bern (1993)
	Ann. II	Ann. III	App. 1	App. 2		
Magnoliophyta						
Posidonia oceanica	+					+
Cymodocea nodosa						+
Phaeophyta						
Cystoseira amentacea var. spicata	+					+
Rhodophyta						
Lithophyllum byssoides	+					
Lithophyllum trochanter	+					
Spongia						
Geodia cydonium	+					
Hippospongia communis		+				+
Spongia officinalis		+				+
Petrobiona massiliana						+
Cnidaria						
Corallium rubrum		+				+
Mollusca						
Ranella olearia	+					+
Tonna galea	+					+
Charonia tritonis	+					+
Zonaria pyrum	+					+
Pholas dactylus	+					+
Pinna nobilis	+					
Lithophaga lithophaga	+				+	+
Crustacea						
Homarus gammarus		+				+
Maja squinado		+				+
Scyllarides latus		+				+
Scyllarus arctus		+				+
Palinurus elephas		+				+

Echinodermata						
Paracentrotus lividus		+				+
Ophidiaster ophidianus	+					+
Centrostephanus longispinus	+					+
Pisces						
Anguilla anguilla		+				
Umbrina cirrhosa		+				+
Thunnus thynnus		+				
Sciaena umbra		+				+
Hippocampus guttulatus					+	
Epinephellus marginatus		+				+
Xiphias gladius		+				
Reptilia						
Caretta caretta	+		+	+		+
Pinnipedia						
Monachus monachus	+		+	+	+	+
Cetacea						
Tursiops truncatus	+			+	+	+
Delphinus delphis	+		+	+		+

ANNEX 2: Marine species of national concern in Karaburun – Sazani area (after Albanian Red Book 2006)

PRILOGA 2: Nacionalno pomembne morske vrste na območju Karaburun – Sazani (iz Rdeče knjige Albanije 2006)

Seagrasses
Posidonia oceanica
Cymodocea nodosa

Seaweeds (algae)
Cystoseira amentacea var. spicata
Lithophyllum byssoides
Lithophyllum trochanter
Tenarea tortuosa
Bornetia secundiflora
Catenella caespitosa
Digenea simplex
Polyphysa parvula

Sponges
Geodia cydonium
Spongia officinalis
Hippospongia communis
Raspailia viminalis
Petrobiona massiliana

Cnidarians
Aurelia aurita
Chrysaora hysoscella
Actinia cari
Bunodactis verrucosa
Cladocora cespitosa
Corallium rubrum
Eunicella singularis
Eunicella cavolinii

Annelids
Sabella spallanzani

Gastropods
Patella caerulea
Monodonta turbinata
Diodora graeca
Haliotis lamellosa
Aporrhais pespelecani
Ranella olearia
Charonia tritonis variegata
Zonaria pyrum
Tonna galea

Bivalvia
Mytilus galloprovincialis
Lithophaga lithophaga
Pinna nobilis
Pteria hirundo
Glossus humanus
Ostrea edulis
Pecten jacobaeus
Solen marginatus
Chamelea gallina
Tapes decussatus
Venus verrucosa

Crustaceans
Alpheus dentipes
Callianassa tyrrhena
Crangon crangon
Dardanus arrosor
Eriphia verrucosa
Galathea intermedia
Maja squinado
Paguristes oculatus
Palaemon serratus
Palinurus elephas
Penaeus kerathurus
Scyllarus arctus

Echinoderms
Paracentrotus lividus
Ophidiaster ophidianus
Centrostephanus longispinus

Fishes
Hippocampus guttulatus
Mola mola

Reptiles
Caretta caretta

Pinnipedia
Monachus monachus

Cetaceans
Delphinus delphis
Tursiops truncatus

***Note:** The Red List of Albanian Fauna 2007 includes about 220 species of marine fauna. About 75% of them have been reported also for the Vlora area, including Karaburun – Sazan.*

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