

**Public Institution
Brijuni National Park**

**Brijuni National Park
MANAGEMENT PLAN**

(Period of plan implementation: 2016 to 2025)

Brijuni, October 2016

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Document format may differ slightly from the original due to variations in language structure. Local physical place names remain in Croatian format to correspond with maps. Cultural heritage monument names are translated where appropriate. Acronyms as per original document for ease of reading.

The MedPAN South Project "Strengthening the Network of Marine Protected Areas in Croatia"

The MedPAN South Project has been developed to speed up the process of establishing effective marine protected areas management in the Mediterranean. It aims to increase the effectiveness of preserving the important coastal and marine biodiversity of the Mediterranean, through improving the management of existing marine protected areas and promoting the establishment of new ones. The project was implemented from 2008 to 2012 through pilot projects in Algeria, Tunisia, Libya, Turkey and Croatia and through regional activities of strengthening capacities and communication on the theme of marine protected areas.

The main goals of the pilot project in Croatia were to:

- Support public institutions of the Croatian *Marine Protected Areas* (MPA) involved in the project, towards the gradual development of their own protected area management plan.
- Strengthen the capacity of public institutions involved in the project in matters relating to the management of marine protected areas.
- Improve the networking capacity of Croatian MPAs and other relevant institutions and their integration into MedPAN and AdriaPAN networks, with the aim of encouraging data exchange, good practices and solutions in MPA management issues.

During the project, specialized workshops for the gradual development of management plans were organised. Technical support was shared on how to develop the individual parts of a management plan (experts, studies, etc.) with training and exchange of studies related to the specifics of marine protected areas.

Presently involved in the project as partners are: the previously named Ministry of Culture (now the Ministry of Environmental Protection and Energy), the previously named State Institute for Nature Protection (now part of the Croatian Environment and Nature Agency) and public institutions of nature parks and national parks that have a relatively significant sea boundary - Brijuni, Telašćica, Kornati, Lastovo islands and Mljet. As beneficiaries of workshops and training at the national level, coastal county public institutions for the management of protected areas are also included.

The pilot project coordinator in Croatia is the Association for Nature, Environment and Sustainable Development *Sunce*, and the Regional Project Coordinator is the Mediterranean Program Office of the World Wildlife Fund for Nature Protection (WWF MedPO). The project was funded by the European Commission (EuropeAid), the French fund Fonds Francais pour l'Environnement Mondial (FFEM) and the MAVA Foundation. It was implemented in cooperation with the MedPAN network and the UNEP MAP Regional Activity Centre for Specially Protected Areas (RAC/SPA).

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VISION OF THE BRIJUNI NATIONAL PARK

The Brijuni National Park is a unique archipelago of exceptional natural, cultural, historical and topographical value, in which visitors play a significant role, organised in accordance with the sustainable use of the protected area.

1. INTRODUCTION AND CONTEXT

1.1 A brief description of the plan, its goals and tasks

The Brijuni National Park is an area of great natural, cultural and landscape value. The Brijuni Islands were formed from geological processes occurring over millions of years, and the natural resources existing are the result of centuries of conservation in this area. The landscape on the Islands has been formed by human activity from the distant to recent past (the remains of quarries, modification of

meadows and forests through land cultivation, building of villas etc.). Today, when these unique areas are rarely found on land and sea, it is crucial that they are managed in a thoughtful and sustainable way so that their value is not lost, diminished or neglected with future generations in mind, but are instead protected, preserved and enhanced appropriately.

The Public Institution Brijuni National Park is responsible for managing this area through paying special attention to maintaining a balance between the goals of preserving its natural and cultural value on the one hand, with the desire for and needs of tourism and stakeholders on the other. Managing such a system is therefore a complex task that requires careful consideration on a multidisciplinary level. At the same time all open issues must be taken into account along with the development and implementation of a clear and efficient management strategy. The purpose of this Management Plan is to display assets, acknowledge the problems and challenges faced taking care of a protected area, defining the goals of the protected area and elaborates on how goals will be achieved. However, the Management Plan is more than just a strategic guideline - it is also a tool to guide and determine the annual work of the Public Institution directed to achieve these goals.

The development of the Management Plan for the Brijuni National Park was started in cooperation with the Institute for Spatial Planning and Environmental Protection - IGH d.d. in July 2008. With IGH the first phase of the Management Plan was made. Since 2009, the Plan has been developed further, together with the Association for Nature, Environment and Sustainable Development – *Sunce* from Split as part of the project "Strengthening the Network of Marine Protected Areas in Croatia (MedPAN South)". One of the main goals of the project was to support, among other things the public institutions protecting Croatian marine areas in the gradual development of their own management plans. Involved within the project as active partners were; the Directorate of Nature Protection under the Ministry of Culture (now the Ministry of Environmental Protection and Energy - MZOIE), the State Institute for Nature Protection (now the Croatian Environment and Nature Agency) and the public institutions of nature and national parks which have relatively significant sea boundary - Telašćica, Kornati, Lastovo Islands, Mljet and Brijuni. The management plan process was completed in 2016 and represents a written summary of guidelines and actions to be managed in the future. The plan was created by the employees of the Public Institution Brijuni National Park through a series of workshops, consultations and educational events led by consultants and project partners. In the process of adopting the Plan, a large number of stakeholders have been involved such as; representatives of local, regional and state administrations, non-governmental organizations, various institutions and organizations associated with the protected area, and those who have knowledge which could be of assistance in the preparation of the Plan.

The plan is conceived as a public document, available to all stakeholders of the Park, the local population, those protecting the natural environment, tourism workers, business people and any other interest groups or individuals. For this reason, the Plan was designed to be written in simple and comprehensible language. It is divided into logical units, from the description of the protected area, to goals and management activities, to as clearly as possible outline what the Public Institution wants to achieve in the next ten years and how it will achieve it.

1.2 Legislative framework for protected area management

The area of the Brijuni Islands, thanks to the geomorphological-hydrological, climatic and overall landscape features, along with the existing flora, fauna and cultural heritage, was declared a National Park and Memorial Site on November the 1st 1983, by the National Park Act and the Brijuni Memorial Site (NN 46/83 and later amendments 57/89, 05/90 and 47/91). Brijuni was opened to the

public in April 1984. On April 23rd 1999, Members of the Croatian Parliament passed amendments to the Act on the National Park and Memorial Site of Brioni (NN 45/99), which changed the name of this law to the Act on the Declaration of the Brijuni National Park, correcting through this process the coordinates defining the boundary of the Brijuni National Park.

Nature protection and management of protected areas in Croatia is regulated by the Nature Protection Act (NN 80/13).

Article 113 of the aforementioned Act states: "The National Park is a large, predominantly unchanged land and/or sea area of exceptional and multiple natural values, which includes one or more preserved or slightly modified ecosystems and its primarily intended role is the preservation of the original natural and landscape values. The National Park also has a scientific, cultural, educational and recreational purpose. Interventions and activities that do not threaten the natural environment are permitted in the national park. The commercial exploitation of natural resources is prohibited in the national park. It is permitted to carry out catering-tourist and recreational activities as a part of visiting and carrying out other activities which are in accordance with the terms referred to in Article 142 of this Act".

By decree on the Public business "Brijuni" (NN. 47/91 and 2/92), the Government of the Republic of Croatia established the Public business "Brijuni" p.o., Brijuni, to protect, promote, maintain and present specifically the protected area of the Brijuni National Park under the Nature Protection Act (NN 30/94) including all its movable and immovable property owned by the Republic of Croatia under the jurisdiction of the Public Institution Brijuni National Park.

The key documents that regulate the organization, usage, planning, protection and the way of managing the area of the Brijuni National Park are; the Spatial Plan of Areas of Special Character, the Management Plan and internal organisational rules. For efficient management of the protected area, it is important that these documents are aligned with each other and based on expert knowledge of the area and of its users. In this way it is possible to preserve the natural environment, balanced with benefits derived from the area's protection.

The Spatial Plan of the Brijuni National Park - as a plan of areas of special features, defines the organization, use, arrangement and protection of spaces within the national park (hereinafter referred to as NP). It is authorised by the Croatian Parliament so it outranks other plans. The plan is drafted in compliance with the guidelines of the Spatial Planning Strategy, in respecting the natural, landscape and cultural-historical value and nature conservation conditions. The Spatial Plan of areas of special features defines the framework for the development of public and other infrastructure, conditions for construction within the space and interventions to areas without a more detailed spatial plan. It also defines obligations and the scope of development permitted within these guidelines and further defines when separate more detailed spatial plans are required for specific features or areas.

Pursuant to Article 22, Paragraph 1 of the current Act on Spatial Planning (NN 30/94, 68/98, 61/00) and Article 28 of the Nature Protection Act (NN 30/94, 72/94), the Spatial Plan of the Brijuni National Park (NN 45/01) was adopted by the Croatian Parliament during a sitting on May 4th, 2001. The Spatial Plan was drawn up by the Ministry of Environmental Protection and Spatial Planning - Department for Spatial Planning, in cooperation with the Nature Protection Directorate, the Ministry of Culture - the Cultural Heritage Management Board, the Ministry of Tourism, the State Geodetic Administration, Geofoto-Zagreb and expert infrastructure companies.

Since new information and understanding have emerged since the time of writing of the Spatial Plan, it is now necessary to make a new Plan. Currently, an expert study is being prepared which will be the basis for the creation of a new Spatial plan.

The Management Plan, as defined by the Nature Protection Act, is a strategic document setting out the purpose and state of the protected area and defines the goals of management, the activities needed to achieve these goals and indicators of management effectiveness. The Management Plan is developed by the Public Institution for the management of the protected area, in consultation with stakeholders and expert consultants. The participation of the public in the process of drafting management plans for protected areas is of the utmost importance, as without the support of the public, no further implementation of plans would be possible.

The plan is made for a period of ten years, with the possibility of modification and/or amendment after five years. After the drafting of the management plan, the management board of the public institution shall start the process of public scrutiny for a minimum of 30 days. Upon processing all further proposals and objections, the management plan is to be sent to the Croatian Environment and Nature Agency for assessment and to receive consent of the Ministry of Environmental Protection and Energy. After obtaining consent of the Ministry, the management board of the public institution shall adopt the management plan, which is deemed valid from that point forward. Legal and natural persons performing activities within the protected area must comply with the Management Plan. After a period of five years, the implementation of the Management Plan and the achieved results will be analysed and revised if necessary.

The Code on Internal Procedures (NN 75/00) of Brijuni National Park remains in force until the entry into force of the Code on Protection and Conservation, confirmed by the Minister under the Nature Protection Act (NN 80/13).

The area of the Brijuni National Park is also protected as a Cultural Monument - Cultural Landscape of the Brijuni Islands, by the Ministry of Culture declaration of April 29th, 2013, following the examination of the report of the Regional Institute for the Protection of Cultural Monuments of Rijeka in 1983. It was entered into the Registry of Immovable Cultural Monuments of the Regional Institute for the Protection of Cultural Monuments in Rijeka under the Register Number RRI-433, defined as cultural heritage.

1.3 National and international context of protection

The Brijuni National Park is one of eight national parks in the Republic of Croatia. This category of protection was determined because the area is defined as one of the most biologically valuable sea areas of our country. Apart from biological features, Brijuni also has a unique cultural-historical and geological-paleontological value.

With regard to conservation and protection, the Brijuni National Park falls into Category II protected areas according to IUCN. Category II covers large natural or almost natural areas with the purpose of protecting entire ecosystems, the processes that take place and the species they support. The areas are protected in such a way as to provide the basis for environmentally and culturally acceptable spiritual, scientific, educational, recreational and visitor activities (Dudley, N., 2008).

The whole area of the Park is also included in the ecological network of the Republic of Croatia.

1.3.1 NATURA 2000

NATURA 2000 is an ecological network of the European Union that covers internationally significant areas within each of the member states, important for the conservation of endangered species and habitats. The basis for the designation of the NATURA 2000 network is the Directive on the protection of natural habitats and wild plant and animal species (Directive 92/43/EEC, supplemented by Council Directive 2013/17/EU) and the Wild Birds Directive (Directive 2009/147/EZ). Member States regulate the conservation of the NATURA 2000 area through their own legislation, according to the principles of sustainable development and in accordance with relevant directives. A NATURA 2000 network in a particular country is created on the basis of scientific data on the natural environment and estimates on threatened habitats and species listed in the appendices to these Directives.

In the Republic of Croatia, the ecological network NATURA 2000 was proclaimed by the Ecological Network Directive (NN 124/13, NN 105/15). The Directive also prescribes a list of species and habitat types whose conservation requires a definition of the ecological network area, the criteria for determining the ecological network area, the target species and the habitat types for establishing the ecological network area and establishing a cartographic presentation of the ecological network. As an internationally important area for birds and for wild species and habitat types, the entire Brijuni National Park has been evaluated along with the waters of the western coast of Istria. Data referring to the Brijuni area is listed below in Tables 1 & 2

Table 1. Excerpt from Annex III, Part 1. Conservation Area Significant for Birds (POP) of the Ecological Network Directive (NN 124/13, NN 105/15).

Code and area name	Conservation goals	
HR1000032 Waters of Western Istria	Wild taxa	
	Black-throated loon	<i>Gavia arctica</i>
	Red-throated loon	<i>Gavia stellata</i>
	European shag	<i>Phalacrocorax aristotelis desmarestii</i>
	Common tern	<i>Sterna hirundo</i>
	Sandwich tern	<i>Sterna sendvicensis</i>
	Common kingfisher	<i>Alcedo atthis</i>

Table 2. Extract from Annex III, Part 2. Conservation Areas Significant for Species and Habitats types (POVS) of the Ecological Network Directive (NN 124/13, NN 105/15).

Code and area name	Conservation goals	
HR2000604 Brijuni National Park	Habitat types	
	NATURA Code	Habitat type
	8330	Flooded or partly flooded sea caves
	1170	Reefs
	1120*	Neptune grass beds (<i>Posidonium oceanicae</i>)

Public Institution Brijuni National Park – Management Plan (2016 - 2025)

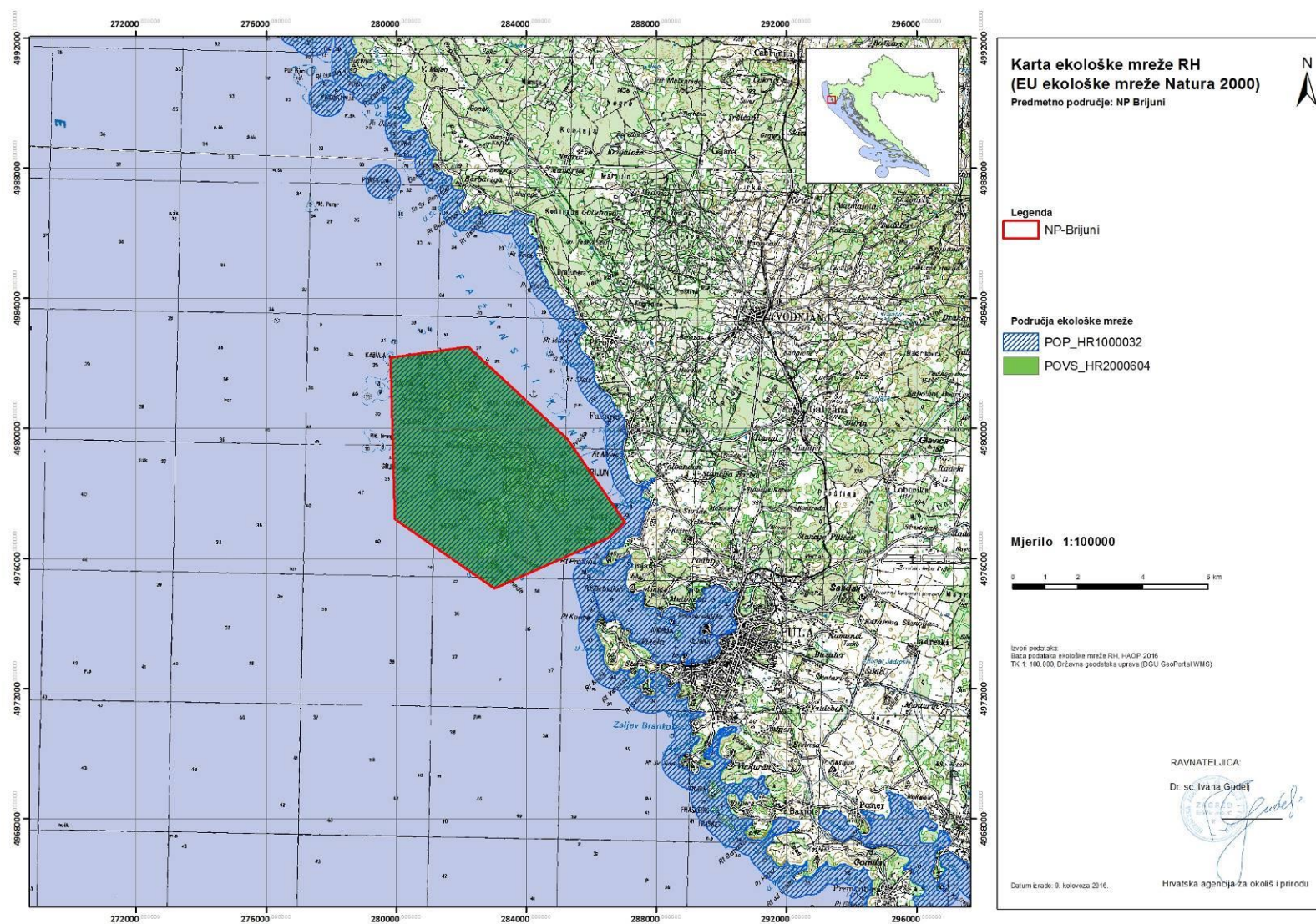
	1240	Rocks and cliffs of the Mediterranean coasts covered by endemic species <i>Limonium</i> spp.
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Note:

NATURE code - a habitat type protected by Council Directive 92/43 / EEC on the conservation of natural habitats and wild plant and animal species (Habitats Directive);

* priority habitat type

Public Institution Brijuni National Park – Management Plan (2016 - 2025)



Map 1. Extract from the ecological network for the Brijuni NP area.

1.4 Competent Bodies in Nature Protection

The Ministry of Environmental Protection and Energy, which carries out administrative and professional affairs, is the competent body for the implementation of the Nature Protection Act, the Environmental Protection Act, and other international and national legal documents in the field of nature and environment protection in the Republic of Croatia. Supervision over expert work and its legality, and the general directives of public institutions managing national parks and nature parks, is carried out by the Ministry.

The Ministry of Construction and Spatial Planning is responsible among other things for the implementation of the Spatial Planning Act and the Construction Act, which specifically applies to spatial plans of areas of special features.

The Ministry of Culture through the Conservation Department is responsible for consenting to the activities undertaken in the protection and preservation of the cultural heritage within the national park.

The Croatian Environment and Nature Agency carries out expert natural environment protection activities in the Republic of Croatia, which includes giving input on the management plan.

1.5 Organization and Activities of the Public Institution Brijuni National Park

1.5.1 Organizational Structure of the Public Institution Brijuni National Park

The Brijuni National Park is managed by a Public institution based on Brijuni - Pula. The founder of the Public Institution Brijuni National Park is the Croatian Government. The activity of the Public Institution includes the protection, preservation, maintenance, promotion and use of the national park, in order to protect and preserve the natural environment, and to oversee the smooth running of natural processes, the sustainable use of natural resources, and monitoring of the implementation and the conditions of nature protection measures in the area in which it operates.

The public institution also carries out other activities that serve the basic needs of nature protection, namely: catering, museum activities, care of the cultural heritage in the area of the Brijuni National Park, the breeding of native domestic animals, the cultivation of vegetables, flowers, ornamental plants and planting material, retail and publishing.

The internal organization and activities of the Institution are defined by the Statute of the Public Institution Brijuni National Park and the Code of Practice for Internal Organization and Methodology of the Public Institution Brijuni National Park.

The Public Institution is managed by a Governing Board of five members appointed by the Minister of Environmental Protection and Energy. The Governing Board adopts the Statute of the Public

Public Institution Brijuni National Park – Management Plan (2016 - 2025)

Institution with the consent of the Ministry of Environmental Protection and Energy. The board also adopts the Management Plan and the annual program of protection, maintenance, preservation, promotion and use of the protected area, with the prior opinion of the Croatian Agency for Environment and Nature and the consent of the Ministry of Environmental Protection and Energy) and follows its implementation.

In addition it issues work orders, produces an annual financial plan for the Public Institution and keeps annual accounts. The Board announces public tenders for the selection of the general manager of the Public Institution, for expert managers, head of rangers, rangers, heads of departments, and performs other activities defined under Article 134 of the Nature Protection Act (NN 80/13).

The internal organization is made up of internal organizational units, ensuring harmonious, professional and systematic functioning of the Institution and management of Brijuni National Park. The institution has a total of 9 organizational units: the Office of the General Manager, the Department of Expert Protection, Maintenance, Preservation and usage of the National Park, the Department for Supervision and Protection, the Department of Hotel Management, the Department for Excursion Tourism, the Department for Promotion and Sales, the Department for Finance, Accounting and Procurement, the Department for Maintenance and Transport, and the Department for Human Resources, Legal and General Affairs. All departments combined have a total of 265 employees (Table 3). The head of the institution is the General Manager.

Table 3. Organization of Brijuni NP employees as of 05.05.2016.

No.	Organisational units	Total no. of employees	Seasonal Employees	Financed by Brijuni NP
1.	The Office of the General Manager of the Public Institution	4	-	4
2.	Department of Expert Protection, Maintenance, Preservation and usage of the National Park	41	6	41
-	Department Office	6	1	6
2.1.	Subdepartment for plant protection	21	1	21
2.2.	Subdepartment for animal protection	7	2	7
2.3.	Subdepartment for cultural heritage protection	7	2	7
3.	Department for Supervision and Protection	30	4	30
4.	Department of Hotel Management	108	50	108
-	Department Office	3	-	3
4.1.	Subdepartment for hotel accommodation	42	22	42
4.2.	Subdepartment for catering	59	26	59
4.3.	Subdepartment for sports and recreation	4	2	4
5.	Department for Excursion Tourism	19	12	19
6.	Department for Promotion and Sales	5	1	5
7.	Department for Finance, Accounting and Procurement	14	-	14

Public Institution Brijuni National Park – Management Plan (2016 - 2025)

No.	Organisational units	Total no. of employees	Seasonal Employees	Financed by Brijuni NP
-	Department Office	1	-	-
7.1.	Subdepartment for finance and accounting	9	-	9
7.2.	Subdepartment for purchasing and inventory	4	-	4
8.	Department for Maintenance and Transport	38	9	38
-	Department Office	2		2
8.1.	Subdepartment for facilities and equipment maintenance	16	5	16
8.2.	Subdepartment for internal transport	18	3	18
8.3.	Subdepartment for IT and Telecommunications	2	1	2
9.	Department for Human Resources, Legal and General Affairs	6	-	6
	U K U P N O	265	82	265

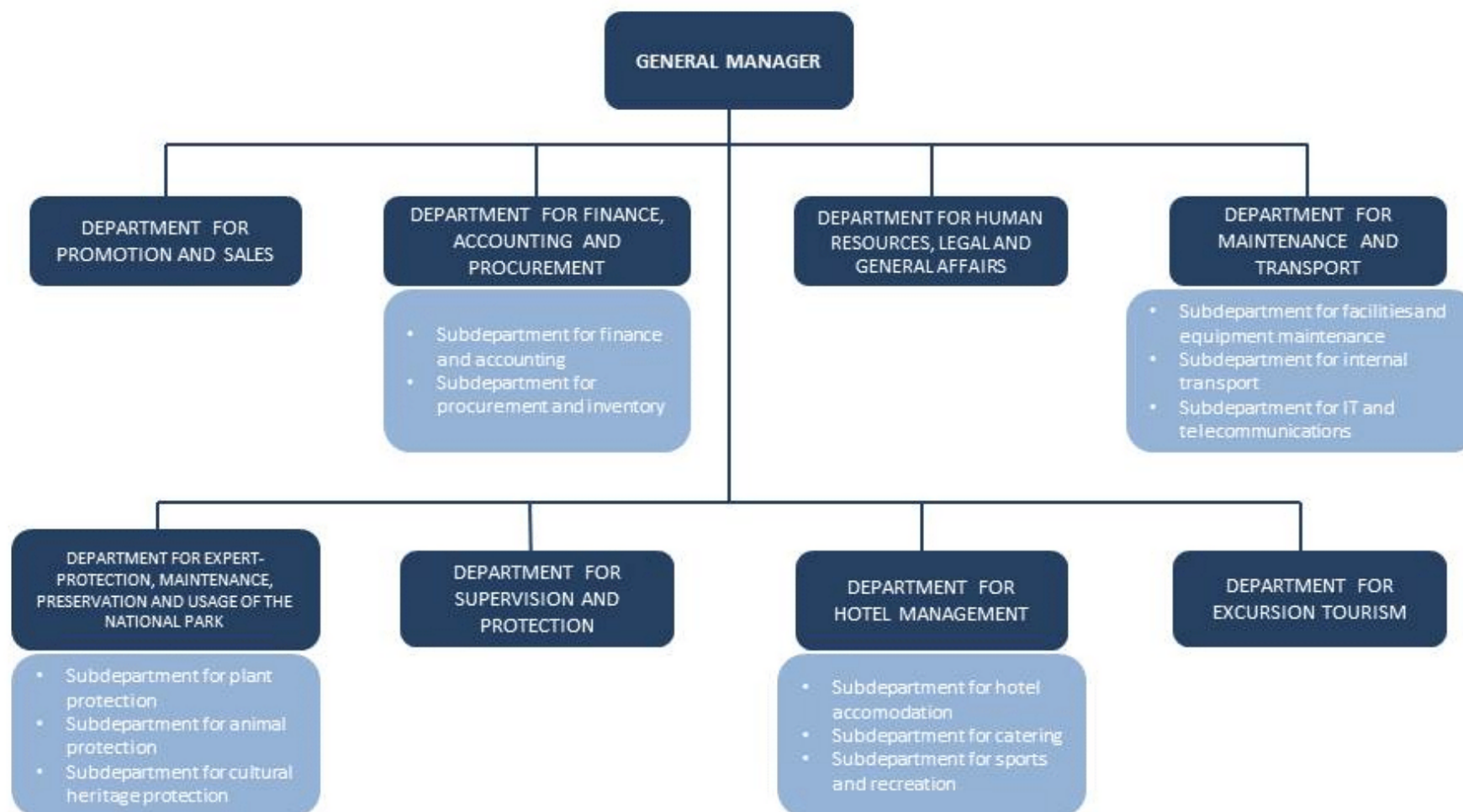


Image 1. Scheme of the internal organization of the Public Institution Brijuni NP.

1.5.2 Funding work of the Public Institution

Funds for the operation of the Public Institution and the performance of activities are secured through revenues from its own activities, state budget, property income, donations, etc.

The financial accounts of the Institution's total revenue for the period from 2006 to 2015 are presented in Table 4. A breakdown of the 2014 and 2015 budgets are presented in Table 5.

Table 4. Annual accounts of Brijuni National Park for the period from 2006 to 2015

Accounts of Brijuni National Park (HRK)				
Year	Self-Generated Revenue	State Budget	Other Revenue	Total Revenue
2006	43.791.772	6.472.029	1.871.201	52.135.002
2007	48.555.680	7.327.771	1.134.446	57.017.897
2008	51.943.624	7.045.999	2.636.324	61.625.947
2009	49.371.687	6.797.999	1.473.878	57.643.564
2010	44.661.483	6.590.302	2.799.388	54.051.173
2011	46.336.912	6.410.415	1.707.377	54.454.704
2012	45.127.639	3.693.752	2.070.608	50.891.999
2013	42.969.019	1.543.639	2.411.878	46.924.536
2014	40.593.336	4.753.330	1.509.132	46.855.798
2015	27.129.365	0	18.314.030	45.443.395

Table 5. Overview of Revenues and Expenditures of the Public Institution for 2014 and 2015.

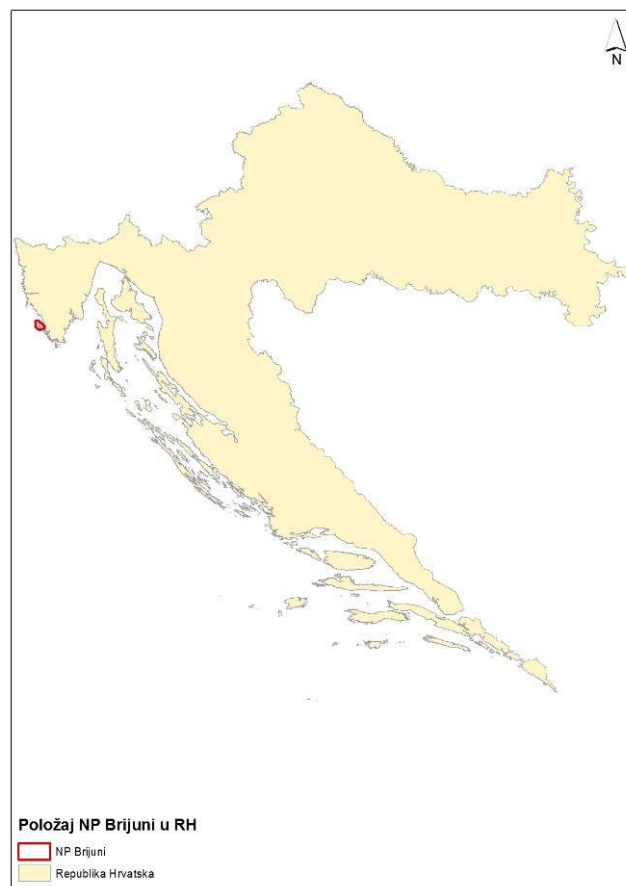
DESCRIPTION	2014.		2015.	
	Amount (HRK)	Percentage (%)	Amount (HRK)	Percentage (%)
Revenues	46.855.798	100	45.443.395	100,00
Revenues from state budget	4.753.330	10,14	0	0
Self-generated revenues	39.874.884	85,10	26.711.956	58,78
Property revenues	778.470	1,66	449.809	0,99
Donations	408.103	0,87	254.499	0,56
Other revenues	1.041.011	2,22	18.027.131	39,67
Expenses	53.588.619	100	58.219.515	100
Employee expenditures	20.970.776	39,13	20.956.210	36,00
Material expenditures	22.058.437	41,16	19.485.983	33,47
Financial expenditures	591.466	1,1	405.796	0,70
Compensation for damages to legal and natural persons	0	0	7.433	0,01
Expenditures for the acquisition of nonfinancial assets	1.252.245	2,34	9.213.014	15,82
Amortization	8.694.095	16,22	8.131.879	13,97
Other expenditures	21.600	0,04	19.200	0,03
Excess income	-6.473.821		-12.776.120	

2. DESCRIPTION OF THE PROTECTED AREA

2.1 General information and features of the Brijuni National Park

2.1.1 Location

The Brijuni National Park consists of 14 islands, islets and cliffs situated along the western coast of Istria, not far from the city of Pula. Today's boundaries of the National Park have been aligned with Amendments to the National Park Act and the Memorial Site of Brioni (NN 45/99), made in 1999. The park area now includes the islands, along with the surrounding shelf and sea area, such that the total area is 33.95 km². The park was named after the two largest islands within the archipelago, Veliki and Mali Brijun.



Map 2. Brijuni's location within Croatia.

The transportation of passengers, visitors, guests and employees to the National Park, or to the island of Veliki Brijun, is carried out by the Public Institution with its own vessels sailing the route: Fažana harbour – Brijuni harbour - Fažana harbour.

Fažana is connected by local roads to Vodnjan and Pula, which are in turn connected to the Istrian highway (A9) "Ipsilon", a fast road linking Istria to other motorways of Croatia and Slovenia.

Sailing within the waters of Brijuni National Park is permitted for vessels owned by legal and natural persons. However this permission is solely for the purpose of sailing, mooring at the port of Veliki Brijun, mooring in the bay of Sv. Nikola off the island of Mali Brijun and mooring at the island of Sv. Jerolim.

As far as air traffic is concerned, there is Pula international airport and two small sports airports in Medulin and Vrsar.

Table 6. General data of Brijuni National Park.

County	Istria
Municipality	Pula
Total area of the National Park	3.395,0 ha
Sea area	2.651,7 ha
Land area	743,30 ha
Total coastline length	46,82 km
Length of the NP sea boundary	22,93 km
Greatest sea depth	50 m

Source: Spatial Plan of Brijuni National Park

Table 7. Details of the size of individual islands and islets.

Island Name	Area (ha)	Highest Point (m nm.)	Length of Coast (km)
Veliki Brijun	561,00	55	25,90
Mali Brijun	108,85	30	8,28
Krasnica (Vanga)	19,84	9	2,65
Sv. Jerolim	12,62	18	1,51
Kozada (Kotež)	7,84	9	1,16
Gaz	6,28	15	1,13
Vrsar (Orzera)	6,79	12	1,39
Galija	4,94	5	0,83
Pusti (Madonna)	5,06	5	1,19
Obljak (Okrugljak)	4,17	7	0,76
Grunj (Grongera)	3,37	8	1,00
Supin	1,28	8	0,43
Supinić	0,37	2	0,25
Sv. Marko	0,89	6	0,34
Total	743,30		46,82

Source: GIS survey 1999. - Department of Spatial Planning of the Ministry of Environmental Protection and Physical Planning. From scales 1: 5,000 in AutoCAD.

The boundary of the Brijuni National Park runs along the line of these connecting the points:

- A - light on the Kabula ridge $44^{\circ} 56' 40''$ and $13^{\circ} 42' 56''$
- B - position $44^{\circ} 54' 00''$ and $13^{\circ} 43' 06''$
- C - position 0.3 naut. miles at 180° from the Peneda lighthouse $44^{\circ} 52' 54''$ and $13^{\circ} 45' 30''$
- D - position 0.1 naut. mile at 180° from the southern cape of the island Kotež (Kozada) $44^{\circ} 53' 45''$ and $13^{\circ} 48' 10''$
- E - position 0.1 naut. mile at 90° from the eastern cape of the island Kotež (Kozada) $44^{\circ} 54' 00''$ and $13^{\circ} 48' 33''$
- F - position 0.35 naut. miles at 15° from Cape Slavuja $44^{\circ} 55' 24''$ and $13^{\circ} 47' 07''$



Map 3. Brijuni National Park with marked boundaries.

2.1.2 Property Rights and Restrictions

The area of the Brijuni National Park belongs administratively to the County of Istria as a unit of regional self-governance. It borders the City of Pula, the Municipality of Fažana and the Town of Vodnjan.

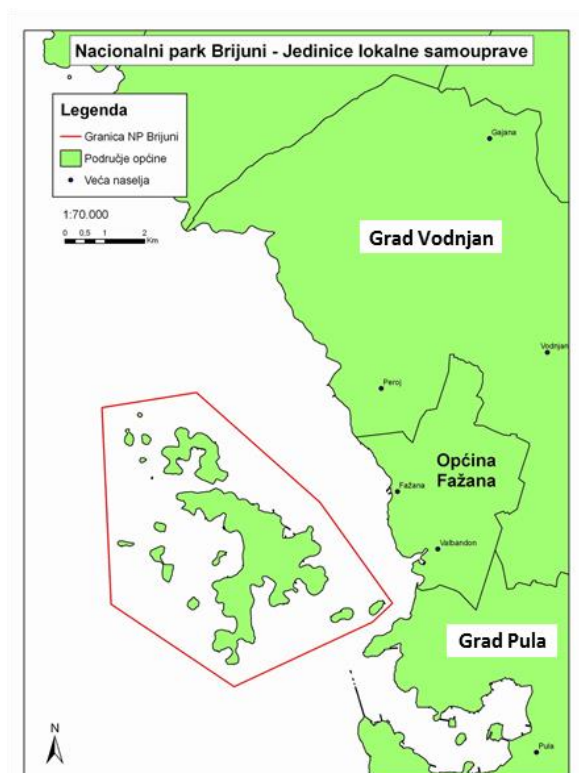


Image 2. Local self-governing units.

All real estate within the area of Brijuni National Park - K.O. Brijuni, is owned by the Republic of Croatia and logged in the Land Registry of the Municipal Court in Pula. This relates to 583 properties, with a total area of 7,373,071 m² under the ownership of the Republic of Croatia, and 21 properties are registered as maritime property, with a total area 94,828 m².

The Republic of Croatia's Ownership is defined by Article 4 of the Directive on the Public Institution "Brijuni" (NN 47/91 and 02/92). The above mentioned directive states that the Brijuni National Park, consisting of the islands of Veliki Brijun, Mali Brijun, Sv. Marko, Gaz, Okrugljak, Supin, Supinić, Galija, Grunj, Krasnica (Vanga), Pusti (Madonna), Vrsar, Sv. Jerolim and Kozada, is owned by the Republic of Croatia.

The Municipal Court in Pula, acting in accordance with the provisions of the Act on Islands (NN 34/99, 149/99, 32/02, 33/06) has registered and recorded all real estate of K.O. Brijuni, as exclusive property of the Republic of Croatia.

The park, its real estate and movable property is managed by the Public Institution Brijuni National Park with the exception of certain facilities such as; "The White Villa", "Villa Brijunka", "Villa Jadranka", the Castle building, buildings and movable property on the islands of Vanga and Galija as well as their surrounding space, additional facilities and movable property directly serving these

facilities, which in 1992 the Croatian Government placed under State protocol. All of these are now managed by the State Office for State Property Management and used by the Office of the President of the Republic of Croatia and the Government of the Republic of Croatia.

In addition to the Office of the President of the Republic of Croatia and the Government of the Republic of Croatia, another user of the area in the Brijuni National Park is the Honorary Defence Battalion, which is an ancestral unit of the Armed Forces of the Republic of Croatia (OS RH), responsible for carrying out protocol activities. MORH manages buildings and areas in the southern part of the island called Peneda, and part of the army is located at the Tegetthoff Fortress.

Table 8. List of facilities of Brijuni National Park.

Veliki Brijun - central zone	Area (m²)
Hotel Istra and dependent Hotel Neptune	14.065
Conference Hall	980
Winter Pool	1.440
Boathouse	500
Karmen facility	5.600
Beach facility	50
Museum - Photo Exhibition and Natural History Exhibition	1.880
Villa Pava - Ethnographic Museum	504
Economic facilities	6.200
Villa Perojka	400
Villa Fažanka	395
Jurina and Franina facility	3.035
Villa Magnolija	570
Castle and tower	570
Villa Zagorka (Kupelwieser Villa)	1.165
Vila Robilant - offices of expert department	256
Villa Borika	308
Veliki Brijun - outside the central zone	
Fire Station - Đakoni	500
Villa Lovorka	350
Villa Dubravka	200
Villa Primorka	550
Fažana	Area (m2)
The former Fažana Hotel facility	1.706
Headquarters building	209
Garage and accounting	1.000

2.1.3 Maps and Surveys of Area

Previously the Ministry of Culture, in cooperation with the State Geodetic Administration and the then State Institute for Nature Protection, and with the help of the Government of the Kingdom of Norway, secured the procurement of all available cartographic databases and created the PAMS (Protected Area Management System) database in ArcGIS format. In addition to the PAMS database, several Brijuni developed databases were created, such as a database of marine habitats, cultural heritage sites from prehistoric times to the 20th century and of geological-paleontological locations of interest. PAMS provides maps from the Spatial Plan of Brijuni National Park created by the Ministry of Environmental Protection and Spatial Planning in 2001, a land registry map and other data being updated in the database.

Table 9. List of maps and surveys of Brijuni National Park.

Map name	Scale	Format	Note
Brijuni Islands, (Situation in the harbour and cultivated areas, circa 1904)	1:10 000	Print format	
Brijuni Islands, (Paths and cultivated areas, circa 1910)	Reduced map 1:7500	Print format	
Isole Brioni (circa 1939)		Print format	
Topographical map	1:25 000	Digital and print format	Geo-referenced
Digital rectified photo mapping	1:5 000	Digital format	Geo-referenced
Basic map of Croatia	1:5 000	Digital format	Geo-referenced
Brijuni, military map	1:10 000	Digital and print format	Geo-referenced
Brijuni NP also has other maps and plans of various uses and scales.			

2.1.4 Climate

Brijuni according to Köppen's classification of climate have the so-called. "Camellia climate", a moderately warm rainy climate without a dry period and with a hot summer (Cfa). As there are no meteorological and climatological stations on the island, the climate of the Brijuni area is based on the data of the nearest meteorological stations in Pula, Fažana and Rovinj. Given that there are a number of small islands heavily affected by the sea and lush vegetation, even with the interpolation of reliable data from these three meteorological stations, it is difficult to obtain reliable data related to the specific microclimate of the islands.

Summers are pleasant with an average air temperature of about 22.7°C, and mild winters have an average of about 5.5°C. This kind of mild, Mediterranean climate with plenty of sun, heat and humidity in the air, provides for lush vegetation growth and a comfortable environment on the islands. The average relative humidity is lowest in July, at 70% and the highest in December at 82%. Summer

sea temperatures range from 22 to 25°C. The average annual rainfall is 817 mm, with lowest values in June of 47 mm, and a maximum in November of 114 mm.

Summer is characterized by onshore sea breezes (the most common is the maestral), while offshore winds dominate in the winter (bura). The bura in the Fažana channel can be very strong but does not create large waves. The rough sea in front of the harbour is mostly caused by the tramuntana wind while the jugo, oštro and lebić/garbin winds create strong waves in the southern part of the channel. South-southwesterly storm force winds (ponenat and lebić/garbin), measuring 7 – 8 on the Beaufort scale develop in some areas.

Snow and hail are rare on Brijuni.

2.1.5 Physical and chemical properties of the surrounding sea area

The physical and chemical properties of the sea area of the Brijuni NP haven't been specifically explored (except those for seawater cleanliness), but measurements have been made in the North-Adriatic region. The sea surrounding the Brijuni Islands is shallow, with an average depth of about 35 meters, but with distinct horizontal and vertical variations of water masses dynamics.

Although sometimes the most frequent winds of this area, the bura and jugo, contribute to the mixing of sea water masses, for the most part of the year sea currents are caused by tidal changes (tidal wave amplitude ranges from 45 to 50cm - 90cm or more) and generally move parallel to the shore. In this sea area there are also significant residual currents due to differences in the density of water masses in the Adriatic as a whole. Residual currents have a predominantly north-northwest direction, but occasionally, especially in the summer, they can move in a south-southeast direction. During the winter part of the year from November to March, fresh water from the River Po typically flows southwards along the Italian coast. During April and May there is a transitional period when the freshwater flows start moving towards the middle and eastern areas of the northern Adriatic basin. This results in the development of summer freshwater currents extending to the west coast of Istria.

The coming of fresh water bringing substantial amounts of nutrient salts and other soluble substances of terrigenous and biogenic origin through the rivers of the Northern Adriatic-Alps Basin, significantly influences seasonal changes in the physical, chemical and biological properties of the Brijuni waters. The introduction of organic substances and pollutants from Pula, near to the islands, as well as from other tourist villages in the Fažana Channel and the surrounding area, should not be ignored. In general, measurements have shown so far that the sea here is oligotrophic (low in nutrients and with low primary production), however occasionally especially in summer, there is evidence of eutrophication (an increased nutrient state and primary production).

The average minimum sea temperature in the entire water column is about 9°C (February-March) and the maximum is about 25°C on the surface (August). These values are representative for the shallower parts of the coastal area of western Istria, and for areas affected by reduced salinity, coming from the Po delta region.

During the greater part of the year the salinity of sea water along the western coast of Istria is about 38 ‰. However at the end of spring and summer in the years of high flow off from the river Po and other rivers feeding the northern Adriatic basin, salinity is 34-37 ‰.

2.1.5.1 Sanitary water quality

Sampling and analysis of seawater and waste water on Veliki Brijun is frequent and carried out by the Public Health Institute of the Istrian County of Pula (Image 3). The analysis must be carried out 10 times during the bathing season in the area of the central Saluga beach, according to the Bathing Water Quality Regulation (NN 73/08). Results can be found at: <http://www.izor.hr/kakvoca/kakvoca.html>

Wastewater analysis is carried out four times a year at three locations:

- Wastewater from Hotel Neptun, measuring point: Hotel Neptun control point prior to discharge into the sea, MM 401153-2
- Wastewater from Hotel Karmen, measuring point: Hotel Karmen control point prior to discharge into the sea, MM 401153-1
- Wastewater from the laundry, measuring point: Control point prior to discharge into the sea, MM 401153-3.



Image 3. Seawater and waste water sampling stations on Veliki Brijun.

2.1.6 Ecological processes and relations and / or specifcness of Brijuni National Park

The Brijuni National Park is quite specific in many ways; from the layered and rich history and development of the islands to the ecological interactions that are still taking place in this area. The deer introduced at the beginning of the 20th century had, until recently been allowed to reproduce almost without control and this has caused great damage to the land. Excessive grazing and browsing has prevented the growth and development of many plants, consequently causing the loss of many animal species and soil erosion. The peacock (*Pavo* sp.) also introduced in the 20th century, completely adapted to the environment and also had a significant influence of the natural system. On Brijuni there

was also a range of introduced exotic species, some of which lived in cages, within fenced areas, and some moved freely, mostly on Veliki Brijun. From 1912 Carl Hagenbeck (1844-1913), owner of the then famous Zoological Gardens near Hamburg, set up a station for the acclimatization of animals (at the same time a quarantine centre) on Veliki Brijun near the Zoo, before they were to be transported onwards to European zoos.

In later years, during the presidency of Josip Broz Tito, exotic animals came to the Islands mostly as gifts from friendly overseas countries. Unfortunately, for the entire activity of the Zoo there is no documentation, and also the taxidermied animals are, due to historical circumstances, mostly without the necessary documentation. Still living today are the descendants of Zebras and Indian cattle that came to Brijuni to live in the Safari Park, as well as a lama, the elephant Lanka, Cameroon goats and ostriches.

Foreign species are no longer being introduced in the Brijuni area.

2.2 Natural heritage of Brijuni National Park

2.2.1 Geodiversity

In geological and geomorphological terms, Brijuni are the continuation of the western "Red Istria". Ten to twenty thousand years ago Brijuni were an integral part of the Istrian mainland. The rise of the sea level after the last ice age (Würm) has given the final shape to the Adriatic coast, including the Brijuni Archipelago.

Based on their geological structure, the Islands were formed during the lower Cretaceous period (alb) with sediments of crystalline-structured hard limestone also known as marble limestone. The Cretaceous limestone that forms the Brijuni Islands also forms the largest part of Istria. The rock mineral raw material that is part of this formation is horizontally layered, easily breakable, white or light-yellow coloured, abundant in clay and metasilicic acid, strong and great as building material.



Image 4. Quarry under the Gradina Hill on Veliki Brijun

Due to its quality as building material, stone from Brijuni was highly valued already during Venetian times and was exported and used throughout Europe (Venice, Ancona, Vienna). Traces of stone exploitation are visible on almost all the islands of the archipelago, with particularly significant quarries found on the islands of Veliki and Mali Brijun and Sv. Jerolim.

The Cretaceous sediments forming the Islands are somewhere covered with Tertiary layers of eocenic marl and clay deposits which due to large amounts of iron have a characteristic red colour. The soil is a couple of meters deep at places and shallower on the hills due to erosion caused by excessive wildlife pasture. Sediments of the red soil (Terra Rossa) on Velki Brijun are from 1 to 7 meters deep and are very fertile for the growth of lush vegetation.

The high clay content (up to 60%) in the Terra Rossa has caused for all the land depressions on the Island to become damp or marshy. These wet habitats were eventually land filled and dried up at the end of the 19th and early 20th century, and most of them used for agricultural purposes or cattle pasture. Today, only smaller enclosed parts of the Island are being cultivated, more so for keeping the tradition and for educational purposes; in order to preserve old native fruit varieties.

There are no freshwater surface sources or any watersheds on the Island. There are several boreholes on Veliki Brijun, which over the summer often give briny water, but that was not always the case. On Gradina Hill above Verige Bay on Veliki Brijun remains of a former water source have been found, along with reservoirs which supplied inhabitants with fresh water during the Roman times. There are no other known sources. Two speleological phenomena have been found on the same hill: the 15 meters deep Nimphaeum Pit, and a small cave under the Gradina, 4 meters long, penetrating 4 meters deep into the ground.

There are two anchialine ponds on Veliki and Mali Brijun, and one sea cave on Veliki Brijun. Anchialine ponds are mostly located within the karstic plain that covers the area of about one kilometer from the seashore. They are ponds with underground aquatic habitats in which salinity ranges from almost fresh water on the surface to completely seawater at the bottom of the pond. The level of water in these underground spaces oscillates with tidal changes, which confirms their connection with the surrounding sea. As regards to sea caves, their main feature, depending on the cave morphology, is the reduction of the amount of light from the entrance towards the interior. Thus algae, as the primary producers of organic matter (food) cannot survive in sea caves, except within the entrance part of the cave.

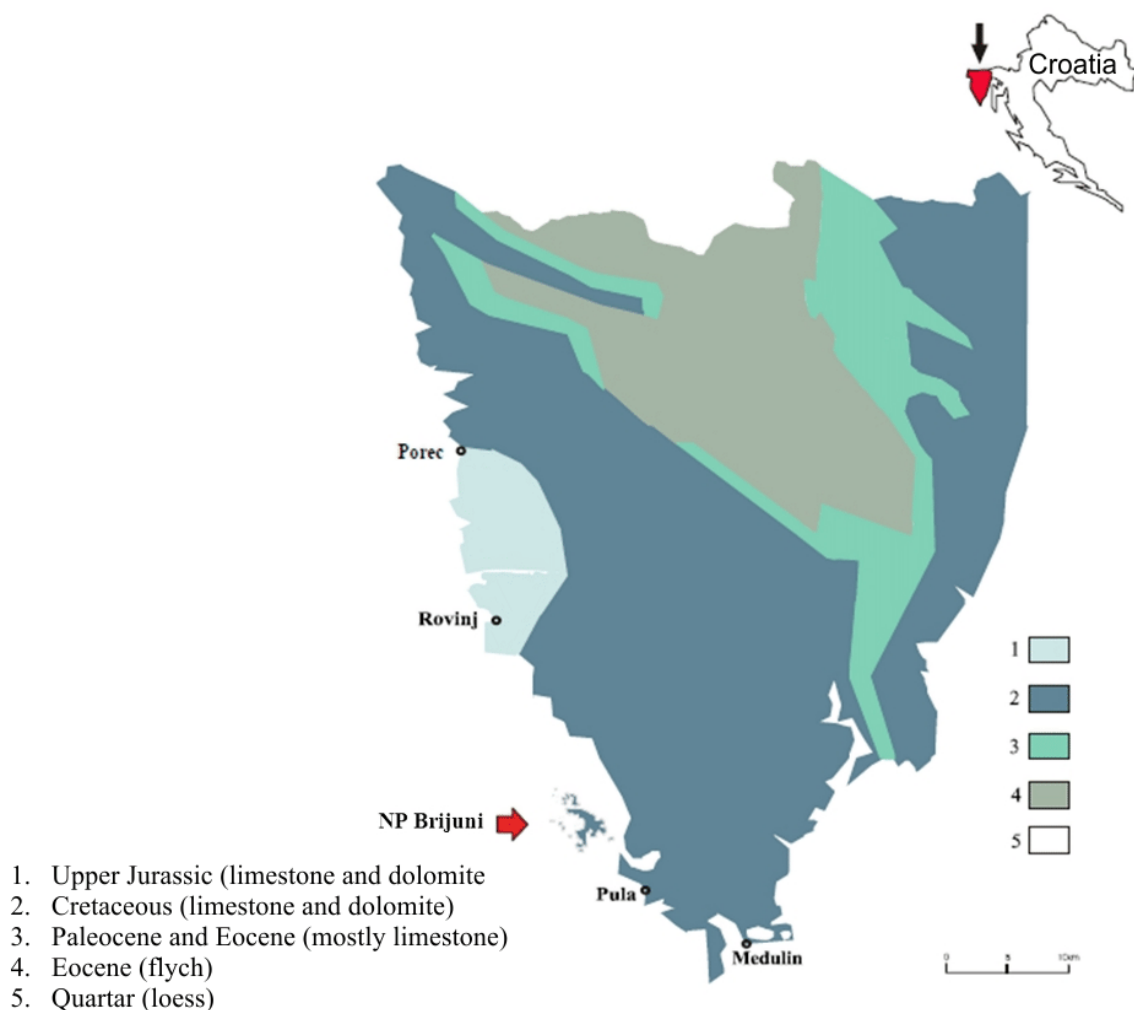


Image 5. Geological map of Istria (acc. to Durn, Ottner & Slovenec, 1999)

PALEONTOLOGY

According to the Nature Protection Act (NN 80/13), geodiversity is defined as the diversity of soils, rocks, minerals, fossils, relief formations, underground structures and phenomena as well as all the natural processes that have created them through geological periods, including the Brijuni ichnofossils, i.e. geological records of animal activity.

Around two hundred Theropod and Sauropod dinosaur footprints (individual and in the form of trails) were recorded at four locations on Veliki Brijun (Pogledalo/Vrbanj/Barban Capes, Ploče Cape, Kamik/Plješivac Cape and Trstike/Debela Glava Cape), as well as on the islands of Vanga, Galija and Vrsar. The footprints date back to the Early Cretaceous period (130 to 100 million years ago). Along with the dinosaur footprints, ripple marks from 100 million years ago were recorded on Pogledalo Cape and on several sites along the peninsula of Zelenikovac. Fossilized snails called *nerinea* were recorded on the same peninsula. Among the youngest paleontological finds is the bone breccia at Cape Ploče and Cape Peneda.

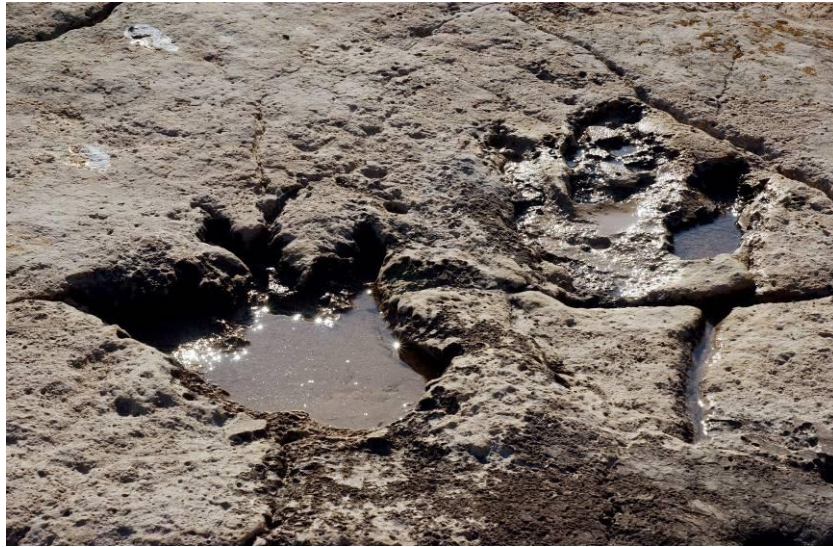


Image 6. Footprint of a theropod dinosaur at Cape Pogledalo

The first traces of dinosaur movements on Veliki Brijun were recorded in 1924 by the Austrian industrialist Bachofen-Echt. Further research and processing of the finds were made in the 1990's.

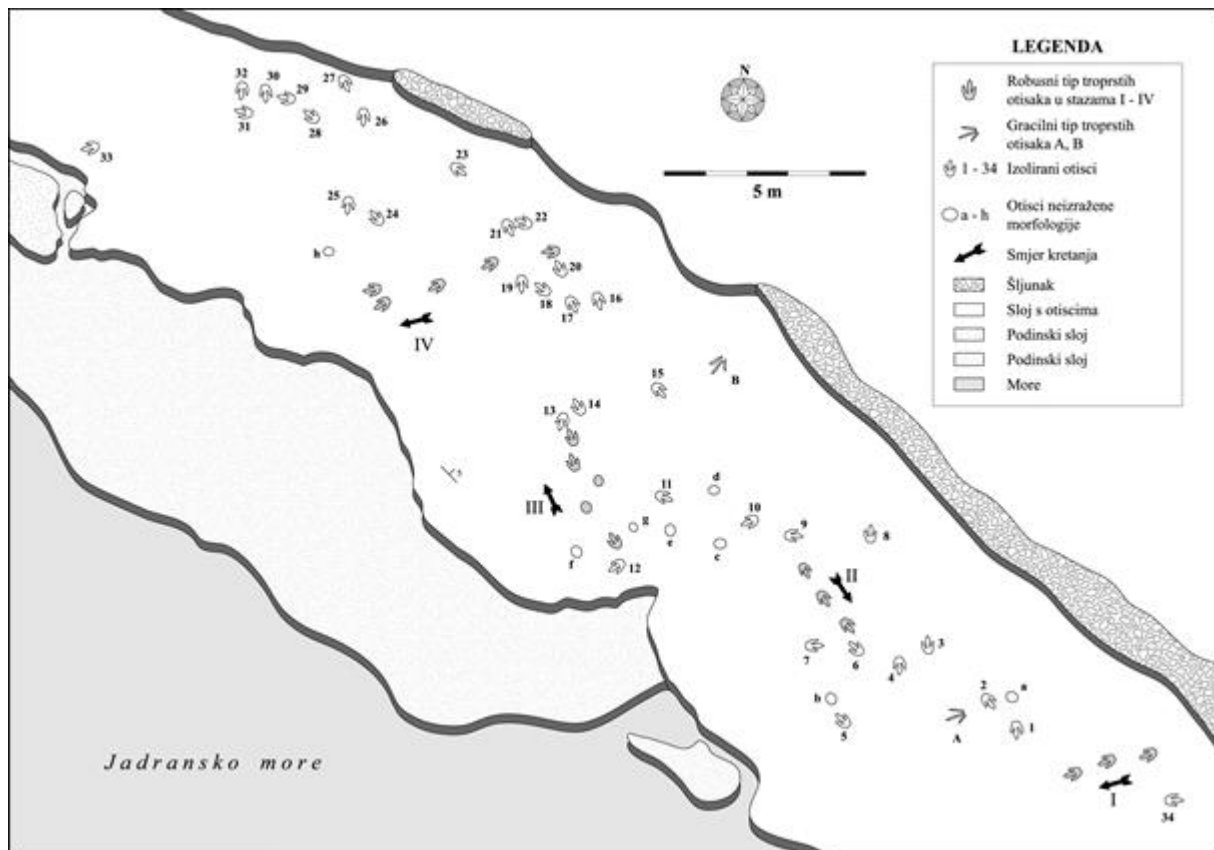


Image 7. Dinosaur footprints at Barban site (according to Mezga – Bajraktarević, 2004)

2.2.2 Landscape diversity

Based on the study "*Landscape regionalization of Croatia based on its natural features*", created within the Strategy of Spatial Planning of the Republic of Croatia, the area of Brijuni National Park falls under the Istrian landscape unit.

In cooperation with the Institute for Applied Ecology, Oikon d.o.o., the *Study of the Landscape and Spatial Identity of the Island of Veliki Brijun* was created in 2015. Since the aesthetic value of the landscape of this area is set as one of its basic values, its preservation and improvement is possible exclusively through the preservation of the balance between natural and human intervention.

Today, the Brijuni Islands attract many visitors with their characteristic park-landscape design. The landscape of Brijuni has changed considerably through time, gaining its present appearance in the late 19th and early 20th centuries, during the lifetime of Paul Kupewieser and the forester Alojz Čufar. What they found upon their arrival was an unwelcoming area ridden with malaria. In just a few years the Islands were transformed into a landscape with gentle elevations and spacious meadows along the seashore that often end up in pebble beaches and relatively shallow bays. The indented coastline is enhanced by the dynamics of the surrounding relief. The whole archipelago is characterized by gentle elevations, which are a continuation of the heavily indented coastline of the Pula sea area.

Paul Kupelwieser (1843-1919), an Austrian industrialist who became owner of the Islands in 1893 created the landscape parks by choosing and planting native plant species together with plants he brought from different parts of the world. The concept was based on the tradition of the English landscape garden and today it results in a landscape of exceptional harmony.

One of the key elements of the Brijuni landscape design is the lavish use of grassy surfaces. Meadows and water surfaces are the foundation of the park's composition and main features generating the overall atmosphere, enabling easier orientation and far reaching views.

The second design element is the volume of forest masses, which visually connect with the meadows in a sharp and accentuated vertical contrast, without the typical forest undergrowth. The line where two dimensions of the horizontal and the vertical meet is maintained by wildlife grazing and browsing on lower branches. The shaped forest masses are in some parts enriched by planting cedars, cypress or pine trees and a compact forest mass of holm oak, laurel trees or pine trees in the background.

The immediate environment of facilities in the stationary tourism area of Veliki Brijun, as well as the landscape park that spreads up to the edges of natural forests are regularly maintained and nurtured. However, the present state of the landscape differs greatly from how it looked in the Kupelwieser's time and up to the 1950s. Around the middle of the 20th century, the uncontrolled number of game started to seriously endanger the rich flora of the Islands.

One of the oldest golf courses in Europe, advertised in the 1930s as the golf course where you can play during winter months, highly contributes to the unique Brijuni landscape. The course was renovated in the last few years - only half of it initially – in order to obtain 18 holes. Since no pesticides are used for lawn cultivation, this is the only "ecological" golf course in this area. Herds of deer graze and walk on the meadows undisturbed, creating unique views and golfing experience for visitors.



Image 8. Brijuni game grazing in meadows areas.

On smaller islands, the Mediterranean macchia descends to the sea. Visually, this specific combination of green meadows, forests, macchia and the blue-green sea creates unique landscape views, whether we look at the Islands from the sea, land or from above.



Image 9. Brijuni photographed from the air.

2.2.3 Biodiversity

2.2.3.1 Biodiversity of the land

2.2.3.1.1 Habitats

The area of Brijuni National Park phytogeographically belongs to the Eumediterranean zone of the littoral (coastal) belt of the Mediterranean region. The climate vegetation, i.e. the vegetation that develops under the influence of the general climate of this zone, is made up of holm oak forests. These are relatively well developed in some parts of the Park, while in other Adriatic and Mediterranean areas they have been significantly altered by human influence and long-term activity.

The holm oak forest, which according to the National Classification of Habitats (2009) is defined as a mixed forests and macchia of holm oak and black ash (*As. Fraxino orni-Quercetum ilicis* H-ic (1956) 1958) has developed as this typical composition in several parts of Veliki Brijun (in the northern and southern part and east of the "White Villa"), and in some places of Mali Brijun. The fenced forest east of the "White Villa" on Veliki Brijun is considered the most beautiful forests of that type in Croatia and the most valuable vegetation complex of the entire Brijuni Islands. Beside the typical species (holm oak and black ash), this forest is made up of numerous shrubs (mock privet, strawberry tree, turpentine tree, mastic, laurestine, myrtle and tree heath) and many climbing plants (common smilax, old man's beard, wild asparagus, southernwood and dog rose). This association is, however, largely developed as macchia, which represents the first degradation stage of this forest. Macchia is characterized by almost the same floral composition as the forest, but the structure and the appearance are completely different. The macchia is typically a few meters tall and consists of mostly bushes and climbers, which make it virtually inaccessible. The laurel tree subassociation has developed in addition to the typical subassociation in various parts of Veliki Brijun (Zelenikovac, Javornik, Kosir, Kosirić, Gradina, Mrtvi vrh and Crnikovac).

The forest and the macchia of the turpentine tree and Mediterranean buckthorn (*As. Pistacio-Rhamnetum alaterni* Šugar (1985) 1994) appear only on the Brijuni and Rovinj islands. It is mainly developed as a macchia, with dominant species of the Mediterranean buckthorn, turpentine tree and myrtle, but without the holm oak.

The grasslands on Brijuni Islands were created by the clearing of forests, primarily for agriculture. When the land was not being worked anymore, it transformed into grassland areas, which were then subsequently altered by the overgrazing of the introduced game. Today the most developed grassland associations are the large areas of ryegrass and buck's-horn plantain (*As. Lolio-Plantaginetum commutatae* H-ic. (1934) 1963). This poorly halophilous and ruderal association covers the largest area on Veliki Brijun.

Other grassland communities on Brijuni Islands are less widespread. As the ultimate degradation stage of the Eumediterranean forests, here we can find a somewhat nitrophilic shaded lawn of ricegrass (*As. Oryzopsetum miliaceae* H-ic. (1956) 1958). It grows on a relatively deep and slightly humid soil in shaded locations, so we often find it in parks and plantations. From the ruderal communities, here are the little-explored grasses of timothy-grass (*As. Haynaldio-Phleetum* H-ic, 1975, nom. subnud.) along with the community of wall barley (*As. Hordeetum leporini* Br.-Bl. 1936).

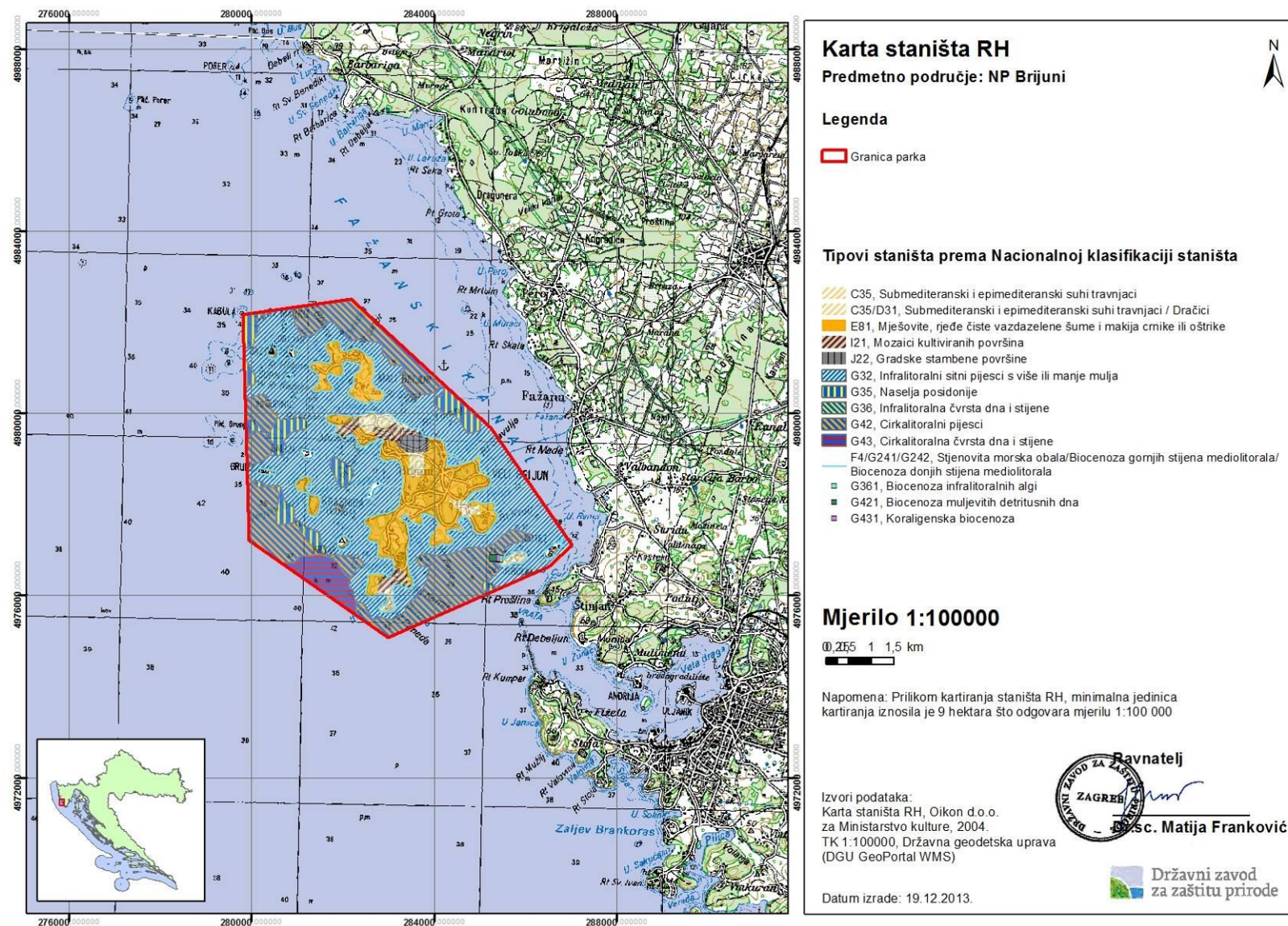
In the past, wetland vegetation was significantly developed in the wetland habitats on Veliki Brijun. Its development had been enabled by deep sediments of red soil that retains water on the surface. However, almost all of the wetlands on the Island were dried out to eradicate malaria at the end of the 19th century, so data on this type of vegetation is almost completely missing. However, what has been found are habitats of common reed (As. *Phragmitetum australis* ("vulgaris") Soó 1927 (= *Scirpo-Phragmitetum* W. Koch, 1926)), which are poor in plant species diversity.

Different plant communities alternate along the Island's coastline, depending on the coast type and the distance from the sea. Thus on the shallow, muddy seashore that is beyond the reach of the sea during low tide, but within reach during very high tide, we can find the European-Mediterranean rush communities (As. *Juncetum maritimo-acuti* H-ic, 1934). On salty surfaces, mostly beyond the reach of the tide, the sea-lavender and artemisia communities (As. *Limonio-Artemisietum coerulescentis* H-ic, 1934) can be found. The community of spurge and sea-poppy (As. *Euphorbio-Glaucietum flavi* H-ic, 1934) develops on the pebble and pebble-sandy beaches periodically washed over by the waves. This halophilous and nitrophilic community consists of a small number of characteristic species of small area coverage. The endemic halophytic community of statice and the narrowleaf plantain (As. *Plantagini-Limonietum cancellati* H-ic. (1934) 1939) develop on the shore reefs, and also consist of a small number of species, of which endemic and those widely distributed.

According to the Map of the Habitats of the Republic of Croatia (OIKON for MZOPU 2004), there are five types of land habitats in the area of Brijuni National Park (Map 4), of which three types are endangered and rare habitats according to the Code on habitat types, habitat map, endangered and rare habitat types and conservation measures for the preservation of habitat types (NN 7/06, 119/09) and the EU Habitats Directive (Table 10). However, this map of habitats was made at the level of Croatia, where the minimum mapping unit was 9 ha, corresponding to the scale of 1:100.000. This is why a number of habitat types are not visible on the map, since they were merged with the larger ones. Thus, it is necessary to pay attention when interpreting the map.

The vegetation of Brijuni National Park, especially non-forest vegetation, was never thoroughly and systematically explored, so vegetation research needs to be carried out in the following years.

Public Institution Brijuni National Park – Management Plan (2016 - 2025)



Map 4. Excerpt from the habitats map for the area of Brijuni NP.

Table 10. Types of land habitats in the area of the Brijuni NP (according to NKS). Habitats marked with # are endangered and rare habitat types of national and European importance, according to the Directive on habitats types, habitat map and endangered and rare habitat Types (NN 88/14), based on the Nature Protection Act (NN 80/13).

NKS mark	HABITAT TYPE	Surface (ha)	Surface (%)
C.3.5.	Submediterranean and epimediterranean dry grassland [#]	70,24	9,45 %
C.3.5./ D.3.1.	Submediterranean and epimediterranean dry grassland [#] / Dračici	18,06	2,43 %
E.8.1	Mixed, sparse homogeneous evergreen forests and macchia of the holm oak and kermes oak [#]	566,70	76,24 %
I.2.1.	Mosaics of cultivated areas	64,59	8,69 %
J.2.2.	Town residential areas	23,71	3,19 %
Total:		743,30	100,00 %

2.2.3.1.2 Flora

The landscape of Veliki Brijun is unique on the Croatian coast of the Adriatic, as it represents a mix of natural and anthropogenic elements. Human activity transformed parts of former agricultural lands and forest areas into landscaped parks with spacious open grasslands, which today make up 2/5 of the total area of Veliki Brijun. The Islands are predominantly marked by the Mediterranean evergreen macchia, holm oak forest and grass vegetation.

Apart from a small number of fenced areas, the vegetation on Mali and Veliki Brijun is impoverished and degraded. Due to the yearly overgrazing by the big game (fallow deer, axis deer and mouflon) trees now exist without the layer of bushes, the ground layer of herbaceous plants, saplings and the lower parts of tree crowns. The game thus caused a particular visual appearance of trees with umbrella-like crowns (trimmed crowns).



Image 10. Undercut tree canopy.

Due to the climatic characteristics of the Islands, the majority of the floristic elements on Brijuni have real Mediterranean characteristics, while Submediterranean species are far less represented, both by the number of species and habitat size.

The native vascular flora counts about 680 taxa. Many were recorded in the 19th and early 20th centuries, and recent studies have confirmed only 365 finds. It should be noted that this specific list of flora does not contain imported dendroflora, although we have data on dendrological inventory of Veliki Brijun, Mali Brijun and Vanga (Krasnica) conducted in 1992. The inventory has documented all the native and imported wood taxa, with a total of 360 of which 133 taxa were recorded only in the former nursery. The imported dendroflora counted 184 taxa with some of the introduced taxa, such as the stone pine (*Pinus pinea* L.), the Aleppo pine (*Pinus halepensis* Mill.) and the Turkish pine (*Pinus brutia* Ten.), the cypresses (*Cupressus* sp.) and the cedars (*Cedrus* sp.) dominated the native vegetation. Now, along with the holm oak, these invasive species dominate the landscape of Veliki Brijun. Exotic species were first planted in the beginning of the 20th century, mainly around hotels, villas and other facilities, while the cultivated ones had already been introduced before. The dendroflora of Brijuni is rich in exotic plants, and interesting from the botanical and forestry perspective, since numerous species act as a potential seed base and mother plant for cutting and grafting propagation.

There are 42 endangered taxa recorded in Brijuni NP (Table A. attached), of which 4 taxa (9.5%) are at critical endangered (CR), 7 taxa (16.7%) are endangered (EN), 11 (26.2%) are vulnerable (VU), 9 (21.4%) near threatened (NT) and 11 taxa (26.2%) are data deficient (DD). It should be noted that of the total number of endangered taxa, a number of 22 have not been confirmed as present in the recent flora list. This refers primarily to ruderal "weeds" such as: the lanceleaf throw-wax (*Bupleurum lancifolium* Hornem.), rough poppy (*Papaver hybridum* L.), false carrot (*Turgenia latifolia* (L.) Hoffm.) and cowherb (*Vaccaria hispanica* (Miller) Rauschert). Due to the loss of habitat, it is unlikely that these species are permanently present on the Islands. Generally speaking, as the result of the abandonment of traditional agriculture and the increasing use of herbicides, species of this category are in decline all over Europe. For the same reason (loss of habitat), the existence of some species such as Lesser Sea Daisy (*Asteriscus aquaticus* (L.) Less.) and shore bindweed (*Calystegia soldanella* (L.) R. Br.) have not been confirmed as present. There are 33 strictly protected species among the endangered species.

As a special feature of the Brijuni flora, it is worth mentioning the *Juniperus deltoides* R.P. Adams - a new species of the *Juniperus* in Croatia recorded on Mali Brijun, as well as the *Ampelodesmos mauritanica* (Poir.) - T. Durand & Schinz (rope grass) - a rare species of Croatian flora that until recently was considered extinct for the North Adriatic area.

Monitoring showed that due to excessive numbers of wild game, the endangered species of yellow-horned poppy (*Glaucium flavum* Crantz) is slowly declining throughout the Island.



Image 11. Rope grass - *Ampelodesmos mauritanica*



Image 12. Yellow-horned poppy - *Glaucium flavum*.

Some invasive taxa were also recorded on the Islands. Spreading of those plants should be monitored and kept under control. A highly invasive Asian species called the tree of heaven (*Ailanthus altissima* (Mill.) Swingle) is spreading on Mali Brijun along with a smaller population of jimsonweed (*Datura stramonium* L.). Prickly burweed (*Xanthium spinosum* L.) grows on certain sites on Veliki Brijun.



Image 13. Tree of heaven - *Ailanthus altissima*

2.2.3.1.3 Fauna

The land fauna on Brijuni is poorly studied. However, new research was recently carried out to collect the necessary data. Due to the Islands' isolation and the disappearance of habitats as a result of excessive grazing of game, the fauna is losing some of its species.

The most known group of invertebrates are butterflies with 44 recorded species of diurnal (*Rhopalocera*) and 331 species of nocturnal butterflies. Interestingly, the Brijuni Islands are a *locus typicus* of the butterfly species *Agriphila* (= *Crambus*) *brioniellus*, described by the Austrian entomologist Zerny in 1914. As this data is exceptionally old and since new research is currently being carried out, the number of species will certainly change. In general, land invertebrates have never been subjected to systematic mapping and were extremely poorly studied.

This is also the case with the level of the study of vertebrate fauna, which is also only partially known.

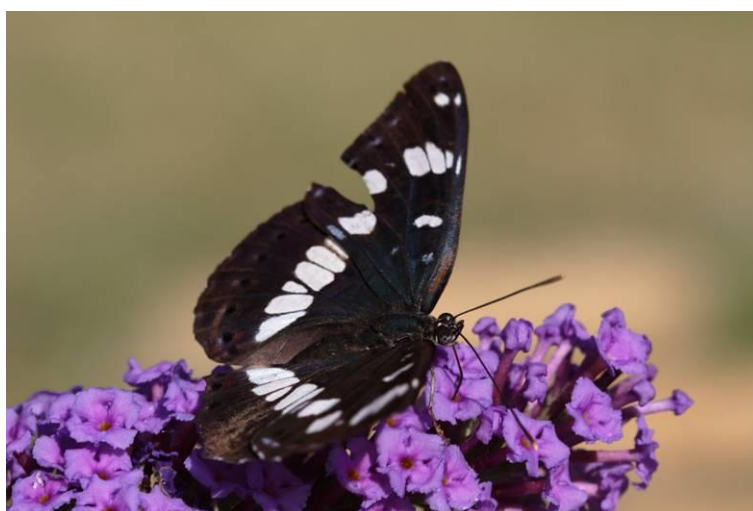


Image 14. Southern white admiral – *Limenitis reducta*

The European eel (*Anguilla anguilla*) is the only native freshwater fish species (conditionally speaking) that once inhabited the area of Saline. Due to high eutrophication and landfilling of the lake, combined with the lack of physical connection with the surrounding sea, the eel disappeared from Saline. The eastern mosquitofish (*Gambusia holbrooke*) along with the so-called goldfish (*Carassius* sp.) have been introduced to fresh waters on the Island.

The fauna of amphibians and reptiles is slightly better researched. Inventory and mapping of the herpetofauna has been done, resulting in two new amphibian species being recorded: the marsh frog (*Pelophylax ridibundus*) and the *Pelophylax kurtmulerii*. As regards reptiles, four species have been recorded: the European pond turtle (*Emys orbicularis*), which also a permanent resident of the Brijuni pond, the red-eared slider (*Trachemys scripta*), the nonpoisonous western whip snake (*Hierophis viridiflavus carbonarius*) and the Italian wall lizard (*Podarcis siculus*). Reptiles that walked the Islands 120 million years ago (dinosaurs) are probably better known than those present today.



Image 15. Marsh frog - *Pelophylax ridibundus*



Image 16. Italian wall lizard - *Podarcis siculus*

The bird world has been well-researched, represented by 151 recorded species listed in Table B (attached). Thanks to the following species: the black-throated loon (*Gavia arctica*), the red-throated loon (*Gavia stellata*), the European shag (*Phalacrocorax aristotelis desmarestii*), the sandwich tern (*Sterna sendvicensis*), the common tern (*Sterna hirundo*) and the common kingfisher (*Alcedo atthis*), the area of the waters of western Istria, including Brijuni, have been declared as Area of the Ecological Network and as a NATURA 2000 Area under the Directive on Birds. The outer islands of the Brijuni Archipelago are nestling places for seagulls, terns, pigeons and the European shag. The monitoring of the European shag has been carried out since 2009 on the islands of Pusti, Grunj, Galija and Supin. Brijuni Islands are one of the five most important nestling places of this species in the Adriatic (by comparing the number of active nests in the last three years, an increase in their number can be observed (Table 11). Brijuni are also an extremely important seasonal settlement for northern bird populations, with Soline (Saline) on Veliki Brijun as the most interesting site for wetland birds.



Image 17. European shag - *Phalacrocorax aristotelis desmarestii*

Table 11. Number of European shag nests in the area of Brijuni NP from 2009 to 2015.

	NUMBER OF NESTS						
Islands	YEAR						
	2009	2010	2011	2012	2013	2014	2015
Galija	64	79	74	92	54	64	55
Pusti	31	45	57	30	29	/	32
Grunj	57	59	55	49	92	89	61
Supin	19	/	46	14	34	23	/
Vrsar	/	/	/	/	/	/	13
Total number of nests	171	183	232	185	209	176	161

There are 28 mammal species recorded in the Park area, of which are 15 bat species recorded from 2010 to 2016 through field research (Table C attached). The field research included catching bats in nets and recording bat sounds as well as a detailed inspection of facilities where bats could be identified, such as attics, abandoned buildings, basements and underground facilities. Further research

should focus on monitoring most important habitats and species in periods relevant to the annual bat life cycle.

Of other mammals present on the Islands, the most interesting ones are the hedgehog (*Erinaceus* sp.), red squirrel (*Sciurus vulgaris*), brown hare (*Lepus europaeus*), axis deer (*Axis axis*), fallow deer and mouflon (*Ovis aries musimon*). Small mammals have not been recently recorded, so they are not being mentioned.



Image 18. Red squirrel - *Sciurus vulgaris*



Image 19. Brown hare - *Lepus europaeus*

The introduction of axis deer, fallow deer and mouflon to Veliki and Mali Brijun at the beginning of the 20th century, between 1902 and 1908, had devastating consequences on the flora and the fauna. Between 1930 and 1943, European roe deer (*o capreolus*) and the European rabbit (*Oryctolagus cuniculus*), were introduced to the Island, but they soon disappeared due to mass hunting. The European rabbit survived only on the island of Kozada. Game has been doing great damage to the flora and fauna; therefore in the next 5 to 10 years, efforts will be made to reduce the numbers in order to make the habitat sustainable.

2.2.3.2 Marine biodiversity

2.2.3.2.1 Habitats

The sea covers almost 80% of the territorial area of the Brijuni National Park, therefore great efforts are being made to ensure its protection and preservation. Since the archipelago is very close to the mainland and the largest Istrian town of Pula, human influence is evident on the shores of the island, especially on the southern shores. Nearly every day, waste is being removed from the shores in order to reduce pollution that disrupts the natural balance and affects the biocenosis of the supralittoral zone.

Thanks to the MedPAN South project and the *Sunce* Association from Split, underwater biocenosis was systematically explored for the first time in 2010 and 2011. Coastal biocenosis was explored within the same period, with the help of the international exchange program (Eurodysey) and the staff of Brijuni National Park. The list of habitat types identified during the study is shown in Table D (attached).

According to their composition and distribution, the seabed life communities in the area of Brijuni National Park are very similar to the communities (biocenosis) found in other parts of western Istria. In the supralittoral zone, i.e. the part of the seashore that is constantly beyond sea reach and is wetted only by spraying and spreading of waves, the most important communities are those developing on sandy and pebble seashores. In all parts of the Mediterranean, these communities are increasingly under the pressure of tourism, but since that is not the case on Brijuni, they are well preserved. The infralittoral zone is the area extending from the lower boundary of the low tide down to the depth of the penetration of light. Within that zone, rocky seabeds dominate up until 10 metres of depth and sandy, muddy and detrital seabeds are found in areas of greater depth. Often these sediments are found on a rocky substrate as a thinner or a thicker layer. The best developed biocenosis on the solid foundation is the one of infralittoral algae, often dominated by brown algae and yellow tube sponges (*Aplysina aerophoba*) and the *Chondrilla nucula* species. In areas of greater depth and more pronounced sea currents such as the southern parts of Brijuni, around Cape Peneda, coraligenic community and the semi-dark caves community develop occasionally. Of communities that develop on moving substrates (sand and mud), the most common are the fine uniform sands and muddied sands communities on protected seashores, particularly associations with the *Cymodocea nodosa* species. In deeper areas with more pronounced sea currents there are the communities of coastal detrital seabeds. Meadows of *Posidonia oceanica*, a seagrass species, cover a relatively small area, yet this is one of the largest, if not *the* largest, settlement of *Posidonia* on the west coast of Istria. The settlement is likely to be regressing, as it is the case in other parts of the northern Adriatic. Therefore, a monitoring program was set up in 2011 that in the upcoming years should demonstrate what will be the future of this biocenosis on the Brijuni Islands.

2.2.3.2.2 Flora

Sea algae and flowering plants have been studied since the middle of the 19th century and especially before the First World War. After the Second World War, due to military and political circumstances research in this area was banned. It was only after 1983 when Brijuni were declared a National Park that the Ruđer Bošković Institute for Sea Research in Rovinj was permitted to carry out research about the composition and the communities of the sea floor.

The total number of algae recorded in the Adriatic is 638, of which 350 are red, 170 brown and 118 green algae. Currently, the Public Institution has a list of marine flora that consists of 53 algae species, of which 23 are red algae species, followed by brown and green algae with 14 species each.



Image 20. Green algae Mermaid's wine glass – *Acetabularia acetabulum*

Due to small number of research projects and poor insights into the existing data, a much larger number of species is to be expected in the results of future research. Probably the most significant algae recorded in the Brijuni area is the endemic brown algae bladder wreck, or *Fucus virsoides*.

Four species of seagrass have been recorded: the Neptune grass (*Posidonia oceanica*), the slender seagrass (*Cymodocea nodosa*), sea wrack (*Zostera marina*) and dwarf eelgrass (*Zostera noltii*). Seagrasses cover a significant surface of the Brijuni seabed and are often home to the noble pen shell (*Pinna nobilis*) as well as a spawning place for a large number of fish. This data was taken into consideration when the zoning plan was created, so that a significant part of the 1a zone covers the areas of seagrasses.



Image 21. Noble pen shell among Neptune grass.

Unfortunately, after a regular underwater survey during the summer of 2011, the invasive green algae sea grape (*Caulerpa racemosa*) was recorded.

2.2.3.2.3 Fauna

The study of sea invertebrates - molluscs, coral and crabs - began parallel to the study of the sea algae, in the middle of the 19th century. Some of the most important research on marine fauna is the research on the hydroid polyps from 1898, the study of the marine demosponges from 1904 and the study of gorgonians from 1906, in which a new species, the *Alcyonium brioniense* was first described. Today it is known as the Mediterranean sea finger (*Alcyonium acaule*). The problem with the list of marine fauna is the same as with the list of marine flora. Recent data and species lists are missing, so the list used by the Brijuni NP is certainly not representative of the actual state (Table 12). In order to get more complete data, research is being undertaken on individual groups of organisms.

As already mentioned, the protection of the Brijuni underwater habitat has been given special importance. Therefore, strict supervision is carried out by the Brijuni Coast Guard, Maritime Police and Fisheries Inspectorate. Many strictly protected species are found in Brijuni underwater habitat, such as the noble pen shell (*Pinna nobilis*), the marine sponge (*Axinella cannabina*) the orange puffball sponge (*Tethya aurantium*), the date shell (*Lithophaga lithophaga*), an endemic species of tunicate, the ascidian (*Polycitor adriaticus*), the European lobster (*Homarus gammarus*) and many others. Research has recorded 64 species of coastal fish, with the total number of fish species recorded in the Adriatic being 440. It is often possible to see the cartilaginous fish in the Park area, which is a rare sight nowadays in the Adriatic.

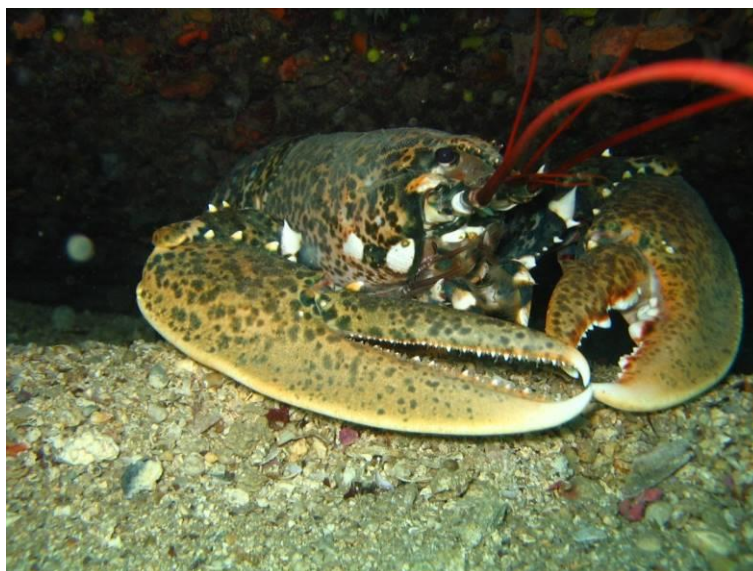


Image 22. European lobster - *Homarus gammarus*

The waters of Brijuni are significant as spawning place for fish and represent a unique oasis for typical sea species of the Northern Adriatic. The study of marine fish and the effectiveness of protected marine areas carried out by the Institute of Oceanography and Fisheries in Split in 2008 and 2013, showed a clear effectiveness of the protection of the fish stock in Brijuni National Park. The preserved fish stocks are certainly one of the greatest assets of this area and the whole of the Adriatic.

According to observations of the Park rangers and the expert protection department, the bottlenose dolphin (*Tursiops truncatus*) is a permanent resident of Brijuni waters. The loggerhead sea turtle (*Caretta caretta*) is also a frequent visitor. However, there are no published papers or scientific data about these species in the Brijuni area. Both species are strictly protected under the Directive on Strictly Protected Species (NN 144/13, NN 73/16).



Image 23. Loggerhead sea turtle - *Caretta caretta*

Table 12. Underwater Fauna of Brijuni NP.

GROUP	NUMBER OF RECORDED SPECIES
Sponges (Porifera)	37
Flatworms (Platyhelminthes)	2
Cnidarians (Cnidaria)	28
Molluscs (Mollusca)	104
Spoon worms (Echiuroidea)	1
Bristle worms (Polychaeta)	66
Sipunculid worms (Sipuncula)	1
Crabs (Crustacea)	79
Moss animals (Bryozoa)	15
Echinoderms (Echinodermata)	19
Tunicate (Tunicata)	19
Vertebrates (Vertebrata)	64
	435

2.3 Cultural-historical heritage and use of space

2.3.1 Cultural heritage

2.3.1.1 History

Brijuni Islands are characterized by numerous and rich archaeological sites from different time periods, dating back to the Neolithic up to the Middle Ages (Table E encloses a list of sites, architectural heritage and monuments of cultural-historical heritage in the area of Brijuni NP). Already in 1911, inspired by a large number of finds and sites in the area, the conservator for the Austrian coastal area, Anton Gnirs, declared Brijuni Islands an open air museum. Along with the rich archaeological heritage, this specific area boasted a remarkable architectural heritage, created in periods from the early Middle Ages until the beginning of the 20th century. Since the Gnirs' era, until the end of the century, a whole series of buildings of remarkable value have emerged. Therefore, today we can say that the richness and diversity is representative of the cultural heritage on this relatively small area, reflecting over four millennia of rich history of the northern Adriatic area.

A good geographical and strategic position, along with a pleasant climate, natural resources and fertile soil, favoured the Islands' population since prehistoric times. The first traces of human life on the Islands were found at the Neolithic / Eneolithic site of Gromače in Saline Bay on the island of Veliki Brijun. The best preserved Bronze Age settlement is located on Gradina Hill, with numerous other sites from the same period documented at Straža, Antunovac, Javornik, Rankun and Petrovac on the island of Veliki Brijun and on the islands of Sv. Nikola of Mali Brijun.

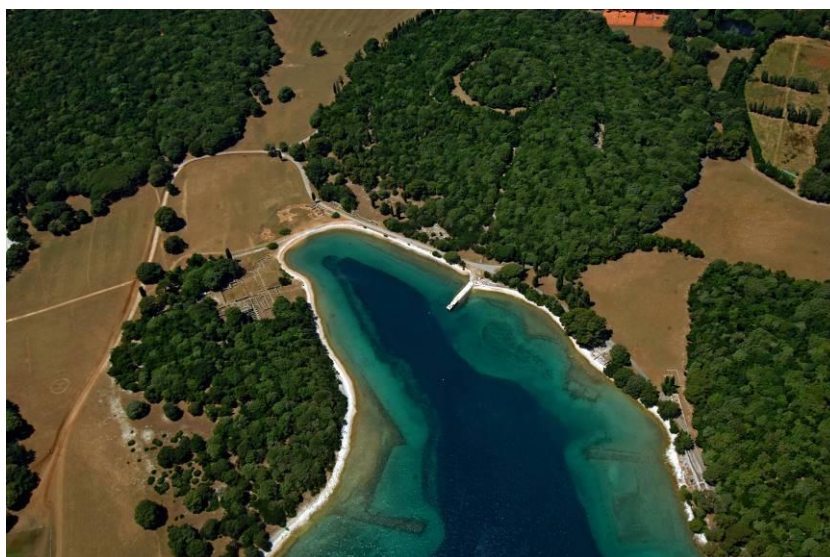


Image 24. View of Verige Bay from the air.

Intense human activity continued in times of the Antiquity, as evidenced by the numerous remains of residential and economic estates (*villae rusticae*) and other buildings on the islands of Veliki and Mali Brijun, which at the time were connected. Country villas were found at the locations of Kolci Hill, in Dobrika Bay, in today's harbour, in the area of the vegetable garden on Veliki Brijun, in Sv. Mikula Bay on Mali Brijun, and various building fragments were documented on the seabed just off the Island of Vanga (Krasnica). Most impressive are remains of the luxurious and grandiose complex in Verige Bay, which stretched a length of 1 km along the bay. The complex consisted of economic facilities and

a luxuriously equipped villa, temples, a *palestra*, baths and a pond. Everything was connected together with a system of covered and open walkways.



Image 25. The fortified settlement Castrum.

After the fall of the Western Roman Empire, the Islands were briefly under the rule of the Eastern Goths followed by the Byzantine rule until the year 778. The most important site from the Byzantine period is the Castrum in Dobrika Bay. The fortified settlement on the area slightly larger than a hectare in size was developed around the original Roman *villa rustica* concept from the 1st century. During the 5th and the 6th century the villa was fortified. During the same period the three-naved church of St. Mary and the single-nave church of St. Peter were built in close proximity. As evidenced by material findings in the Castrum, from the year 788 Brijuni were under the Frankish rule when a Benedictine monastery was added to the church of St. Mary. The Islands were later in the possession of the Patriarchate of Aquileia, falling under the Venetian rule in 1331, along with the town of Pula.

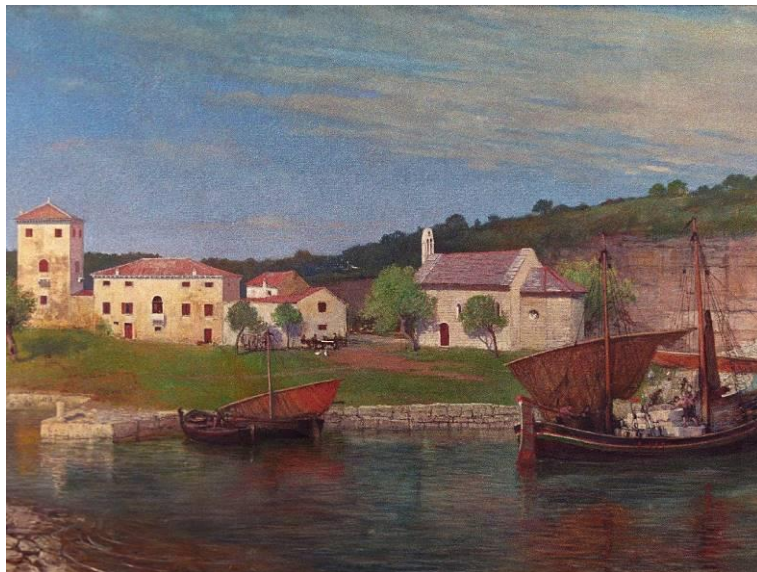


Image 26. Hugo Charlemont, Old Brijuni, 1906

During Venetian rule the main settlement moved from the western to the eastern coast of the island of Veliki Brijun, at the location of today's main harbour. The Venetian period was marked by numerous

plagues epidemics and malaria which caused the depopulation of the Island, soon followed by a resettlement stimulated by local authorities. In 1431, the name *Brioni*, referring to the Islands, was recorded for the first time in the town Statute of Pula. Numerous buildings were built during the period: the donjon tower and the attached castle, the churches of St. Germaine, St. Rocco and St. Anthony, and the Villa Pava residential building. After the fall of the Venetian Republic in 1797, Brijuni were briefly under the Austrians, and after that, under Napoleon's rule. In 1815 the Islands became part of the Austrian Empire where they would remain until the fall of the Austro-Hungarian Monarchy in 1918. Although on paper they were Austrian territory, the Islands remained property of the Franzini family from Venice until 1893. In 1850 Pula became the main port of the Austrian Navy, which gave the Brijuni Islands strategic military significance. Parts of the Pula port defence system were built on several prominent points of the islands; namely Fort Brioni (later called Tegetthoff) on Straža Hill and Fort Peneda on Veliki Brijun. Fort Brioni Minor on the island of Mali Brijun was built in the period from the 1895 to 1900 and was the largest fortress of the Pula port defence system. The spaces between the forts were defended with a number of cannons and batteries.

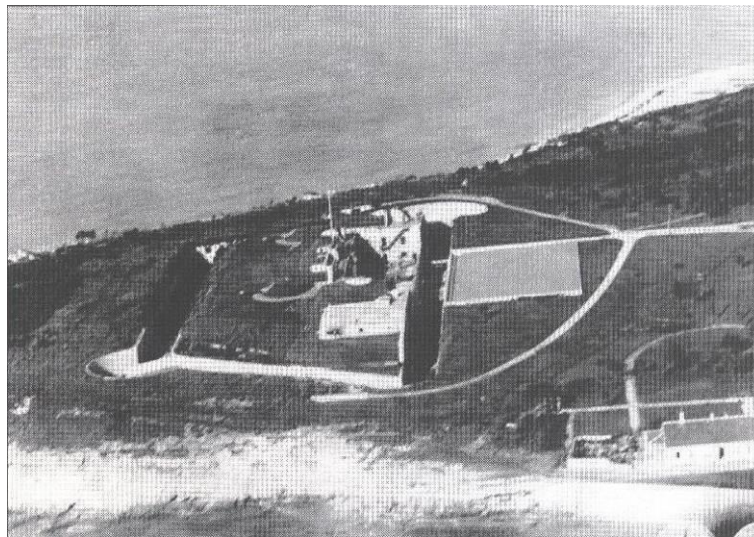


Image 27. Fort Peneda.



Image 28. Carl I visiting Brijuni Minor 1917

In 1893, an Austrian industrialist called Paul Kupelwieser bought the malarious Islands. He soon invited the bacteriologist Robert Koch to spend some time on Brijuni, who between 1900 and 1901

managed to rid the Islands of malaria. With huge investments and by using existing resources, Kupelwieser transformed the malaria-ridden and neglected islands into a health resort and tourist destination in a very short period of time. He built numerous hotels and villas, a winter swimming pool with heated sea water, a boathouse housing the Island doctor's office and residence, an economic complex with a whole range of contents (stalls, storage rooms, and workers' rooms), a wine cellar and a sacristy within the Gothic church of St. Germaine. The neglected quarries were transformed into promenades, and the waste material used to build 50 km of roads, paths and trails. Rock debris was used to make the embankments in the harbour which until then was so shallow that boats could sail into it only during high tide. The harbour was improved so much that it served as anchorage place for Austrian submarines during the First World War. Three viewpoints as unique works of engineering architecture were built on different locations on the Island (two of them still preserved, on Javornik and Saluga Hill).



Image 29. Hotel complex in the harbour, around 1930



Image 30. Viewpoint on Javornik Hill

After the fall of the Austro-Hungarian Monarchy, the Islands fell under Italian rule. Brijuni soon developed into a world-famous holiday resort, oriented towards sports and entertainment. In 1922 one of the largest golf courses in Europe was built, along with new tennis courts, and a polo club was founded. The economic crisis of the late twenties affected the Island as well, so after the suicide of Karl Kupelwieser in 1930, Brijuni became property of the Kingdom of Italy (1936).



Image 31. Aldo Raimondi, Polo field

During the Second World War Brijuni were occupied by the Italian army. After the fall of Italy in 1943, the Germans took over power and stayed on the Island for a short time. Towards the end of the war, in April 1945, the Allies bombarded the Islands. The liberated Islands were annexed to the so-called Yugoslavian B zone and in 1949 they became the residence of Josip Broz Tito. During Tito's time, many presidential residences were built, including the White Villa (1953), the Villa Brionka (1956/1957), and the vacation house on the island of Vanga (1955).

In 1983 Brijuni Islands were declared National Park, welcoming the first visitors in April 1984. Some parts of Brijuni are still used for the residential purposes of the President and the Government of the Republic of Croatia (Villa Jadranka, Villa Brijunka, White Villa, and the islands of Krasnica, Galija and Pusti), and a part is under the jurisdiction of MORH (the Honorary Battalion and the Croatian Navy).

2.3.1.2 Research

ARCHAEOLOGICAL HERITAGE

Excavations: Archaeological excavations on Brijuni started at the beginning of the 20th century with Anton Gnirs, who recorded almost all archaeological sites from prehistory to the Middle Ages. During Italian jurisdiction on Brijuni excavations were carried out by Mario Mirabella-Roberti. After the Second World War the research was continued by Štefan Mlakar, Boris Bačić and Anton Vitasović.



Image 32. Gnirs' excavation works, beginning of the 20th century.

Architectural surveys: A geodetic survey of the Roman villa Verige Bay was made at the end of the eighties and early nineties. During the same period, detailed surveys of the complex began along with the analysis of the existing state including emergency consolidation works. The Roman *villa rustica* on Kolci Hill was archaeologically surveyed.

Hydro-archaeological research: In the period from 1987 to 1997, underwater research was carried out in Verige Bay in parallel with research on land, resulting in finds dating from the 1st to the 6th century.

Geophysical (georesistant and magnetometric) surveys were carried out from 1988 to 1990 on a series of archaeological sites. The most interesting results were seen in Verige Bay where previously undocumented building structures were discovered.

Aerial Photography Analysis: In 1992, aerial photographs of the archaeological site in Verige Bay were analysed. The results partly match with the results of the geophysical survey.

Processing of materials: Architecture, ceramics and other small findings have been the subject of analysis by a number of experts over the past 20 years (Tamas Bezeczky, Vlasta Begović, Adrijana Gri, Mario Jurišić, P.M. Pröttel, Renata Šošćarić, Željko Ujčić, Anton Vitasović and others).

ARCHITECTURAL HERITAGE

In the period from the 1950's to the 1980's, various research projects were undertaken during restoration works on facilities housing different exhibitions (church of St. Germaine, Venetian castle, donjon tower, Villa Pava, Boathouse). The research and systematization of the architectural heritage of the second half of the 19th and the beginning of the 20th century was also undertaken in the 1980s within the Conservation Study. This document used for the creation of the spatial plan of the National Park and a further Conservation Study for the Planning of the Central Zone (Mavar Zofia, Goldstein Gordana). During studies and the systematization of the old maps and drawings collection, more in-depth research was undertaken where the chronology of the unique architectural complex of Kupelwieser's Brijuni was completed.



Image 33. Boathouse

Fortifications: The first directions for research on the Brijuni fortification system began in 1998 as part of the development and revitalization program of the Government of the Republic of Croatia for Brijuni. According to this program, in 2001 the Department for Cultural Heritage of the Ministry of Culture launched the *International Student Workshop of Fortification Architecture* with the aim of surveying, enhancing, scientific research and the development of concepts for adequate use, purpose and revitalization of fortifications. The Workshop program has been continuously implemented as such.

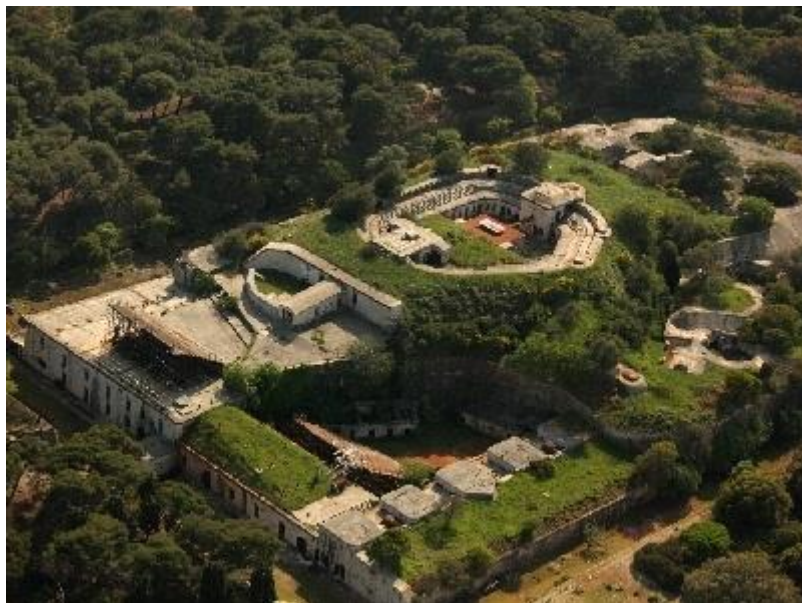


Image 34. Fort Brioni Minor

MOVABLE HERITAGE

The Department for the Protection of Cultural Heritage of the Brijuni National Park looks after 19 museum collections and 2 documentation collections, which together total over 50.000 inventory units. Most of the collections have been formed, listed and systematized over the last twenty years. According to the classification of the Museum Documentation Centre, the collections are classified

into museum and documentation collections, and they are in the process of being registered. Parts of the museum collections are exhibited within the few permanent exhibitions. The church of St. Germaine hosts the *Exhibition of copies of frescoes and glagolitic inscriptions of Istria and Kvarner*. There are three permanent exhibitions in the former steam bath building: the *Natural History Exhibition*, the photo exhibition *Josip Broz Tito on Brioni* and an exhibition called *From the memoirs of an old Austrian*. Brijuni sculptures, both the ones in the park and within the residence villas, were subject of Davorin Vujčić's scientific elaboration.



Image 35. Photo exhibition *Josip Broz Tito on Brioni*

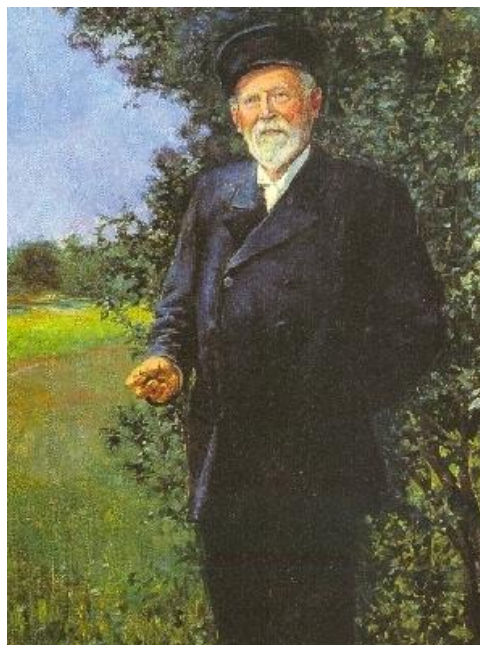


Image 36. J. Engelhart, Portrait of Paul Kupelwieser, 1925 from the art collection.

The material value of the Art Collection of Brijuni National Park was estimated in 1997, and revised in 2011. Upon request from Brijuni National Park, in 2008 Željko Laszlo from the Museum Documentation Centre in Zagreb created a study entitled; *The state of protection and preventive protection of Museum inventory and objects with the proposed measures for their improvement*.

The revision of all the inventory (7647 inventory numbers with about 40000 items) located in four residential buildings (White Villa, Villa Jadranka, Villa Brijunka and the residency in Vanga) was carried out in 1992. On this occasion, objects of artistic and cultural-historical value were marked. All inventories from the presidential villas are under the jurisdiction of the State Office for State Property Management.

2.3.2 Population

In the area of the National Park Brijuni there are no permanent nor temporary inhabitants.

2.3.2.1 Population – a historical overview

The last inhabitants left the island in 1984. Due to frequent plague epidemics (from 1312 to 1631) and malaria during the Venetian rule, the number of inhabitants on the Islands was in constant decline. To revitalize the Islands, Venetian authorities made a set of rules for resettling Brijuni. At the beginning of 1804, during the time of Napoleon's rule, the Island was inhabited by stonecutters only. At the time of the Austro-Hungarian Monarchy, during the construction of Fort Tegetthoff, the Island was only occasionally inhabited (Table F attached).



Image 37. Inhabitants of Brijuni around 1910

In 1893 Paul Kupelwieser bought the malaria ridden Islands. At that time only a few residents still lived on the Island (with the exception of the military personnel in the fortresses). As early as 1900, when intense efforts to eradicate the Islands of malaria had begun, the number of inhabitants totalled just 300. Shortly before the start of the First World War, the number of inhabitants had increased to 700, resulting in opening of a single-grade school. By the Royal Decree in 1933 Brijuni were separated from the Municipality of Pula and became the independent Municipality of Brioni Maggiore. After the Second World War, the Islands counted 196 inhabitants. In 1949, Brijuni became the presidential residence. Due to intensified presidential and political activity during the period from 1958 to 1960, the population gradually resettled to nearby Fažana and Pula. Towards the end of the 1980s, there were no more permanent residents remaining: the last inhabitants - a family of three working in the lighthouse - left the Island at the end of summer 1984.



Image 38. Inhabitants of Brijuni at the beginning of the 20th century.

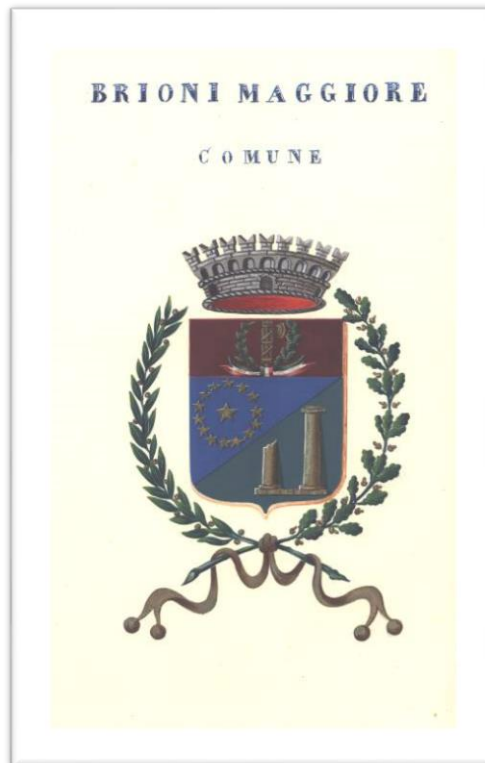


Image 39. Coat of arms of the Municipality of Brioni Maggiore

2.3.3 Infrastructure

2.3.3.1 Traffic system

LAND BASED TRAFFIC AND ROADS

In the area of the Brijuni National Park, a total of 274 km of roads were built during the 20th century, comprising of 100 km of internal roads (asphalt and macadam) and 174 km of landscaped visitor trails. Since 1947, a system of more important routes has been built, which functionally link certain

locations and facilities intended for light car traffic (vehicles of supervising, maintenance and supply services of the NP) and originally for early carriage traffic, adapted to landscape features. Excursion trains drive on existing asphalted roads. The roads are located only on Veliki Brijun and have a combined length of about 47 km. In the forested areas, macadam paths totalling about 29 km in length have been laid out, primarily intended for fire protection purposes.

Roads - roads in the areas of the Brijuni National Park are owned by the Republic of Croatia and are maintained by the Institution.

MARITIME TRAFFIC, MOORINGS AND LIGHTHOUSES

Maritime transport between the Brijuni islands and the mainland is undertaken by vessels of the Institution, mainly on the Fažana - Veliki Brijun - Fažana route. Transport is provided for guests to the island, tour programs, staff and the transport of goods.

The distance between the island of Veliki Brijun and Fažana is about 3 km, which is the shortest distance between the harbour of Veliki Brijun and the harbour of Fažana. For the fastest and most economical transport of people and cargo, these harbours should continue to be retained, as the two harbours between which the said maritime traffic will take place. This is also set out in the Spatial Plan of the Brijuni National Park, as well as the Spatial Plan of the Municipality of Fažana.

In accordance with the Code on Internal Procedures of the Brijuni National Park (NN 75/00), the movement of vessels within the waters of the Park is permitted only with the express permission of the Institution, with the exception for safe passage without stopping on the navigable route between the island of Sv. Jerolim and lighted buoys at Cape Rankun, as well as safe passage without stopping on the navigable route between the islands of Sv. Jerolim and Kozada.

In the harbour of Veliki Brijun and at the moorings of Mali Brijun and Nova obala, it is permissible to moor for the purpose of visiting the protected area. The harbour on the island of Veliki Brijun is the nearest sea-port facility in relation to the Istrian coast and the harbour of Fažana, and almost all visitors to the National Park pass through it. The harbour has an 86m long sea wall, a 30m breakwater, an unfinished sea wall of 80m and a developed coastline with a 370m main pier for excursion boat lines. The harbour is capable of accepting vessels of length up to 50m and beam of 5m. The harbour can accommodate 30-40 for smaller vessels (7 - 15m yachts and boats) at seasonal berths. The main cargo port "Kaštel", along the Tore Cove, serves ferries.

Brijuni harbour is classified as a county level port of public traffic, and is both part of, and under the jurisdiction of the Port Authority of Pula. Since it is a harbour in a protected area, it is necessary to align the status of the harbour with the Nature Protection Act and amendments to the Maritime and Seaports Act. This has been done to provide legal clarity that the harbour is managed by the Public Institution established to manage the protected area, including the harbour, with the purpose of accepting visitors to the National Park.

The facilities for organizing harbour services that provide guest access to the Brijuni Islands and the transportation of goods necessary for the maintenance and operation of the National Park, are located in Fažana. The provisions of the Spatial Plan of the Brijuni National Park comply with the guidelines for the regulation of the Istrian coastal area (the Spatial Plan of the County of Istria and the Spatial Plan of the Municipality of Fažana).

In the area of the Brijuni National Park there are five lighthouses and one lighted buoy, these are:

- the Peneda lighthouse at the southern part of Veliki Brijun: White light
- the Kabula lighthouse at the north-western boundary of the Park: White Light
- the lighthouse at the entrance to the harbour of Veliki Brijun: Green light
- the lighthouse at Cape Slavulja: Red light
- the lighthouse on the shallows of Kotež: Green light
- the lighted buoy at Cape Rankun: Red light

2.3.3.2 Water supply

In 1954, construction of a new water supply network for Brijuni began, as well as a system linking the island of Veliki Brijun via an underwater pipeline to the mainland water supply network. Most of the mainline magistral water supply system for the islands was completed the same year. Later years saw the upgrading and expansion of the system. Thus in 1979, a new underwater pipeline from Fažana to Veliki Brijun and Veliki Brijun to Mali Brijun was laid, due to the need for increased capacity and water to be brought to new locations.

The present water supply system works by directly supplying the facilities on Brijuni and any excess is stored in the water tank at Teget (46m above sea level).

The water supply network consists of the following basic parts:

- the main magistral pipelines of various lengths. Total length: 12.000 m
- the underwater pipelines connecting the mainland system with the island of Veliki Brijun and with the islands of Pusti, Krasnica, Galija, Mali Brijun and Sv. Jerolim. Total length: 5.500 m
- the connections from the main pipelines to buildings (hotels, villas, etc.), outlying buildings, zoo, etc.: Total length: 15.500 m
- the network of fire hydrants. Total: 20 units
- openings with latches, hydrants and water meters. Total: 200 units
- water tanks at: Teget 3.600 m³, Val di Torre: 200 m³, Krasnica: 100 m³
- two irrigation pools with ancillary system.

Since water pipes are made of different materials (cast iron, asbestos cement, alkathene, etc.) and are often laid on rocky terrain without the support of a sand course, in certain sections pipes often crack and break.

The water supply system in the area of the National Park is maintained by the Public Institution, although most of the network consists of communal infrastructure for public water supply and drainage, which are regulated by the Water Act (NN 153/09, 63/11, 130/11, 56/13 and 14/14). Public infrastructure in public use is exclusively owned by the public water service provider.

In order to comply with the Water Act of January 2015, an agreement was signed between Hrvatske vode, the Public Institution Brijuni National Park, Vodovod d.o.o. Pula and the utility company Pragrande d.o.o. Pula, for fixing and reconstruction of water infrastructure within the Brijuni National Park. This agreement was made to facilitate the ownership transfer of the communal water system and structures to the ownership of public service providers - utility companies.

2.3.3.3 Wastewater drainage and purification

The area of the Brijuni National Park has no organised sewage system. Raw waste water from individual buildings or groups of buildings is discharged by the shortest route to the sea and released at shore outlets without prior purification. The hotels have sediment tanks, and several facilities have their own septic tanks that are regularly emptied through an authorized company.

The current total amount of wastewater is about 258 m³/day.

Hydraulic volumes correspond to 1.000 to 1.300 ES. The amount of wastewater is estimated at about 35% of the total daily amount of water piped from the mainland, i.e. from an average of 700 m³/day (20,000 - 22,000 m³/month). The reason for this is the great need for watering, losses from substandard parts of the water supply system, and the quantities used in residential buildings and the facilities managed by other stakeholders.

Accordingly in 2007, a new concept project called: "Drainage and treatment of wastewater and the disposition of purified waters in the area of the Brijuni National Park ", was created. It provides for:

- a central purification system for the central zone of the island of Veliki Brijun.
- a shorter underwater discharge in case of emergency.
- smaller separate systems located on the islands Veliki Brijun, Mali Brijun, Sv. Jerolim and Krasnica.
- the purification of wastewater up to grade III standard, such that the same water could be reused for watering agricultural areas.
- the piping of purified water to tanks where it can be stored for reuse.

As already mentioned in the previous chapter, an Agreement was signed in 2015, whereby the utility company Pragrande d.o.o. undertakes the management of the drainage system after its redevelopment in cooperation with Hrvatske vode.

2.3.3.4 Electricity network

ELECTRICAL INFRASTRUCTURE LOCATIONS

The Brijuni Islands are supplied with electricity from Hrvatska Elektroprivreda d.d. Zagreb, DP Elektroistra Pula, Pogon Pula, via 10 (20) kV underwater cables. The first underwater cable ends at TS 10 (20) / 0.4 kV Plaža and continues to TS 10 (20) / 0.4 kV Centre-Brijuni, while the other ends at TS 10 (20) / 0.4 kV Centre- Brijuni.

Readings are taken at an average 10 (20) kV voltage. From the *TS 10 (20) / 0.4 kV Centre-Brijuni* there are four radial 10 kV or 20 kV cables. The islands of Madonna, Krasnica, Galija and Mali Brijun are also electrified. There are 14 substations in the existing medium voltage network today.

In addition to the aforementioned, part of the facility is equipped, for the sake of safety, with generators for the production of electricity, namely:

- TS 10 (20) / 0.4 kV Centre-Brijuni
- Villa Jadranka
- The White Villa
- Villa Brijunka
- The Island of Krasnica
- The Island of Sv. Jerolim

From the TS 10 (20) / 0.4 kV Centre-Brijuni there are four radial cables, two 10 kV and two 20 kV. The first 10 kV cable goes to TS Laundry, and continues to TS Mali Brijun. On the other 10 kV cable there are 5 substations. The 20 kV cable from TS Centar-Brijuni goes to TS White Villa and continues to TS V. Jadranka. The other 20 kV cable goes to TS Brijunka, and continues towards TS Krasnica.

The Island of Sv. Jerolim is not connected to the power grid, but has generator power for its needs.

PUBLIC LIGHTING

The external lighting network on the Brijuni Islands includes the lighting of central zone buildings, residences and villas, and the roads linking them, as follows:

- the central port and the surroundings of the hotel Neptun, Istria and Karmen.
- around the villas Primorka, Dubravka and Lovorka.
- around the White Villa, Villa Brijunka and Villa Jadranka.
- the following roads: 1. from the center towards the beach, Villa Primorka, Villa Lovorka and Villa Dubravka; 2. from the center towards The White Villa; 3. from the center towards Villa Brijunka; 4. from the center towards the hotels Jurina and Franina and Villa Jadranka and 5. from The White Villa towards Villa Brijunka.

The total length of public lighting network is 9835 m.

The public institution maintains the electrical power network itself, which is in need of a complete overhaul. Given that the management and maintenance of a medium-sized electrical network is not part of the core competency of the Public Institution, we propose outsourcing the management and maintenance of the network to a company whose main activity is such.

2.3.3.5 Heating and cooling

The existing heating system consists of a boiler room located near the plant nursery, the hot water supply towards the Hotel Neptun and Istria, and installations within the building. There is also a boiler room in the Karmen facility for heating the building and the provision of hot sanitary water.

The hot water boiler room is located in a stand-alone ground floor building near the nursery. It has two boilers, each with a capacity of 1750 kW. The fuel used is oil (specifically heating oil), which is stored in two underground fuel tanks, with a total combined capacity of 100 t.

Also, the Karmen facility has its own oil boiler (specifically heating oil), which provides heating for the hotel and hot sanitary water.

On the ground floor of Hotel Neptun-Istra there is a compressor system for cooling the space inside the hotel.

2.3.3.6 Telecommunications

EXISTING TELECOMMUNICATIONS (TC) NETWORK

The public TC network of the Brijuni National Park complex is connected to the public TC network by fiber-optic cable Pula - Veli Vrh - Štinjan - Fažana - Brijuni. Via the optical fiber cable connecting

Brijuni - Muzil - Stoja - Veruda - Pula there is a ring of optical fiber cables that enables the transmission of SDH protocols.

INTERNET TC NETWORK

The local fixed line cable TC network on the island of Veliki Brijun was laid between buildings and was constructed from $TD\ 4 \times 0.8\ mm$ telephone cables of varying capacities. All TD cables are paper-sealed. Furthermore, the central zone of Veliki Brijun has an optical fiber network for computer data transmission.

STATE PUBLIC TELECOMMUNICATION SYSTEM

State wide network connectivity via sanctioned telecommunications service providers has been achieved through the installation of digital transmission systems using optical fiber technology, thus enabling a high data traffic capacity.

2.3.3.7 Waste Management

In dealing with waste within the protected areas and on the islands, as always the principles are based on:

- the avoidance of waste generation.
- the reuse of waste that cannot be avoided (recycling).
- the safe disposal of waste that can no longer be utilized.

The avoidance of waste generation is achieved through a series of different measures and procedures, eg: the use of reusable packaging, avoiding the use of disposable products and avoiding the use of unnecessary or oversized packaging etc. The prerequisite for reusing waste is its collection based on its material composition and then using this substance as a raw material for new production (recycling).

The public institution has a small vehicle which daily collects waste from existing waste collection points and also directly from the facilities where waste is generated. This is then transported to the waste disposal site Kaštijun.

Other recyclable waste is separated and collected in clearly marked containers (recycling yard) and is then transported to the mainland to be handled by specialist waste management companies.

2.3.3.8 Fire protection

The Brijuni National Park, by a categorization decision on 6th May 1996, is classified in Category IIb fire risk category and accordingly it has an organised service which, in accordance with the Fire Protection Act, performs preventive and operational fire protection tasks.

National parks in the coastal and island areas up to 800 ha must have a fire department with either two professional firefighters or one professional firefighter and three professionally trained voluntary firefighters on duty, including at least one team member assigned to carry out preventive fire protection work.

The Public Institution fire prevention service is fully compliant with the Fire Protection Act, and thus has an organised fire prevention service of eight professional firefighters, alternating 24 hour shifts with two present at any given time. There are also 10 rangers who are trained as volunteer firefighters. In this way rangers along with firefighters work shifts together, continuously undertaking preventive and operational fire protection roles. Furthermore the Brijuni NP fire prevention service cooperate with the fire department of the city of Pula, the voluntary firefighters of Vodnjan, Fažana and Peroj, and with the Croatian Army stationed on Veliki Brijun.

During periods of increased fire risk on Brijuni and based on fire threat assessments, the Brijuni National Park have extra fire prevention resources. This is done in accordance with the Program of implementation of special fire protection measures in the Republic of Croatia, at the request of the Public Institution. A unit of six professional firefighters and two forest fire engines are relocated from the mainland.

The National Park's fire service has two tenders (1986 and 2012), plus a combined fire truck (1989), two patrol fire trucks, a car platform and 3 fire pumps with a capacity of 250 liters per minute. The service has three fast vessels for the transportation of firefighters to the islands of the National Park, and in the summer season has an additional two firefighting vehicles from a separate unit.

As the area of the National Park falls under three separate jurisdictions; PI Brijuni NP, the State Property Management Office and the Ministry of Defence, there is a need for the coordinated organization of the fire service in the implementation of fire protection procedures across all areas and facilities within the park, with the cooperation and participation of all users.

2.3.4 Current use of space

2.3.4.1 Forestry

Forests are managed in accordance with the Management Program for the Brijuni economic unit, which was developed by the Faculty of Forestry in 2003. The program was created for the period 2003 to 2012 on the basis of the then Forestry Regulations (NN 11/97, 121/97, 52/01) and the Nature Protection Act (NN 30/94 and 72/94). Article 140 of the current Nature Protection Act (NN 80/13) stipulates that for protected areas within the category of strict reserve and national park, the Forest Protection Program shall contain the measures for their protection, so next year the Public Institution shall proceed with the preparation of the said Program for a period of 10 years.

In the case of the Brijuni NP, forest management means in fact, forest protection. In the Park area, the use of forests for commercial ends is not permitted, nor any other typical forestry activity, since the commercial exploitation of natural resources is prohibited under the Nature Protection Act of National Parks. The forests are left to develop naturally, and the management of them is limited to the care and upkeep of native species, fire prevention, road maintenance, repair of damage caused by the wind and the removal of trees and branches that cause a threat to humans, animals or building. The greatest challenge is dealing with centuries-old trees which cause damage to buildings, having been planted in the close proximity, and become damaged and uprooted due to their shallow roots and the effect of

strong winds. This is mostly the case with Aleppo pines and other cultivated species that were planted during the Kupelwieser time or following the Second World War.

In 2011, mature holm oaks were replanted in places where centennial holm oaks had been uprooted. The aim is to preserve the same views that are unique to the landscape architecture of the Islands for future generations. Planting will continue in the following years, but only as a substitute for damaged and uprooted trees and / or as forest revitalization.

The deer population is causing great damage to the forest ecosystem. However certain measures are being taken to reduce the number of game and by protecting certain trees or groups of trees with fences.

2.3.4.2 Agriculture

There are no longer large agricultural areas on Brijuni as was the case in the past, when vineyards were cultivated, large amounts of fruit and vegetables were produced and cattle were bred. Today agriculture is confined to small specific areas with the aim of preserving the tradition, educating and for scientific purposes.

Zuffar's Garden (Vegetable Garden) is a fenced area of 1.8 ha just outside Hotel Neptun. It consists of a planted orchard with native varieties of fruit such as figs, pomegranates, rowan fruit, olives and others plants. The orchard is designed as a collection of fruit trees planted with the species type clearly identified and the goal of protecting and promoting native fruit genomes of species native to the Istrian habitat. It is important to note that clones of the “Old olive tree” are planted in the same area.

The Brijuni Mediterranean Garden is a space of 1.9 ha close to the centre of Veliki Brijun. Once a forest nursery, today the Mediterranean Garden is a landscaped park (and gardening attraction). The garden is envisioned as a place to visit, to present the Brijuni flora, educate and organizing various events. The garden is laid out in a design of 23 distinct surfaces with walkways and grass areas harmoniously integrated into a unique landscape whole. Currently, the 23 differently themed growing areas are home to 169 varieties of Mediterranean species and exotic plants.



Image 40. Brijuni Mediterranean Garden

The flower nursery is laid out on 0,83 hectares and is a place for cultivation and the presentation of indoor and balcony plants used for decorating hotels, villas and other visitor facilities within the Brijuni NP.

Vineyards, a citrus grove and a wine cellar are located on the island of Krasnica (Vanga). Apart from Vanga being interesting as the former residence of Tito, the tall Mediterranean macchia draws attention from a biological point of view. During Tito's time on Vanga, part of the forest was cleared and a vineyard was planted. Today, the vineyard covers an area of 0,64 ha, is managed by the State Office for the Management of State Property, and showcases grape varieties such as the Istrian Malvasia, Yellow Muscat and Merlot. In the extension of the vineyard there is a fully equipped wine cellar for grape processing and production of rare wines, along with a wine archive.

Within the vineyard, there is a tangerine plantation of Kwano Wase and Ovari Unshiu varieties. Around 100 tangerine trees were planted in total and are at full yield. Apart from the tangerines, a number of orange trees, apple trees, pear trees, figs and other fruit trees were also planted on the island.

On the nearby island of Galija there is a tangerine plantation laid out on around 0,6 ha with around 50 trees of the Kwano Wase variety. The plantation is managed by the State Office for the Management of State Property.

2.3.4.3 Hunting

At the beginning of the 20th century, fallow deer, axis deer, mouflon, roe deer and pheasant were introduced for hunting on the island of Veliki Brijun. No accurate data exist with regards to the introduction of the brown hare. Almost all these species have survived up to present day with the most widespread species being fallow deer.



Image 41. Fallow deer

Given that there has been no hunting since Brijuni was declared a National Park, the number of deer has increased on Veliki and Mali Brijun and today they are creating considerable problems on grasslands and within the forest ecosystem. In order to protect and preserve the Islands' uniqueness, following responsible and sustainable management of wildlife in the Park, the "Wildlife Protection Program in Brijuni National Park" was created in 2011, for the period from 2011 to 2021. Through this program, the Public Institution is looking to reduce the number of imported game and establish a sustainable balance between the plant and animal world.

2.3.4.4 Brijuni Zoo

The Safari Park, the Pheasantry and the Ethno Park were collectively registered as the Brijuni Zoo in 2011.

The Safari Park was founded in 1978 as an enclosed area covering 13.75 ha in the north part of Veliki Brijun. The Park was inhabited by exotic animals which arrived on the Islands as gifts to Josip Broz Tito. Some offspring of these original animals (mostly exotic) still live within the Park today. The aim of the Ethno Park is to preserve and present native breeds of domestic Istrian and Croatian animals, which are slowly falling in numbers and threatened by extinction. Today, along with the zebras, the Indian sacred cow, an elephant, ostriches and a llama in the in Ethno Park the visitors can see Istrian sheep, Istrian and Dalmatian donkeys, goats, Zagorje turkeys, Istrian cattle and other animals.



Image 42. Brijuni Zoo

2.3.4.5 Bird park (Pheasantry)

Just a few hundred meters away from the centre of Veliki Brijun, there is a bird park inhabited by exotic bird species, some of which were given to Tito as gifts. Among the most important species are; the sulphur-crested cockatoo (*Cacatua galerita*), known as Koki, the ara and the peacocks. Within the bird park, native species of poultry (Croatian chicken and Zagorje turkey) are also bred.



Image 43. Koki, Sulphur-crested cockatoo - *Cacatua galerita*

2.3.4.6 Fishing

As with all national parks in the Republic of Croatia, commercial fishing around Brijuni is prohibited. As there are no local residents on Brijuni, so without a local population there is no tradition of fishing. All these factors together with continuous monitoring, understanding and participation of the local community, the Ministry of Defence, the Maritime Police and the Fisheries Inspectorate contributes to the quality of fish stock conservation.

As some islands are very close to the mainland and the local population has always enjoyed the right to fish, today the Public Institution continues to issues permits for recreational fishing around the island of Sv. Jerolim and Kozada. This fishery is specifically supervised and regulated under the authority of the Public Institution Brijuni National Park. These regulations can be viewed on the internet site of the Public Institution. The right to shore based recreational fishing was abolished in 2013.

From 2007 to 2015, 15,025 monthly and 72 yearly permits were sold (yearly permits were introduced in 2010). The sale of individual permits is shown in Table 13 for this period. It is important to note that fees for sea based recreational fishing permits are set at a nominal price, which primarily serves to control the number of people fishing and acquaint them with possible changes in the manner and type of fishing allowed. It should also be emphasized that there is significant pressure on fishing stocks at and beyond the maritime boundaries of the Park, and the establishment of a buffer zone around the current boundaries of the Park it is being considered to better regulate future fishing.

Table 13. Number of licenses sold for recreational fishing in the area of the Brijuni NP

Year	Number of sold licences		
	Shore based recreational fishing on the island of Veliki Brijun (daily permits)	Recreational fishing around the islands of Sv. Jerolim and Kozada (monthly permits)	Recreational fishing around the islands of Sv. Jerolim and Kozada (yearly permits)
2007	296	1,803	/
2008	287	2,694	/
2009	204	2,821	/
2010	131	2,196	19
2011	92	1,313	16
2012	45	1,106	8
2013	/	1,077	8
2014	/	1,034	9
2015	/	981	12
Total	1,055	15,025	72

2.3.4.7 Tourism

Brijuni has been inhabited since ancient times, and the beginnings of tourism on this island can be linked back to the construction of luxurious villas of wealthy Romans. However the modern day

concept of tourism development commenced on Brijuni at the beginning of the twentieth century, with the arrival and actions of a true tourism visionary, Paul Kupelwieser.

The rich cultural-historical heritage, the people who influenced Brijuni, the unique natural heritage and specific landscape with its pleasant climate, and the declaration of the islands and the surrounding waters as a national park, today are the foundations on which the tourism experience of Brijuni is being built.

The NP welcomes guests who spend only a few hours here, guests staying for a few days and the guests who come with their boats. The NP is in the process of creating a study on visitor management, which will be an additional annex to the management plan. The purpose of the study is to better balance the need for visitor access with the need to protect the heritage within the protected area.

The Department for Excursion Tourism sells, organises and manages the reception of visitors to the National Park. The entrance point is the boarding gate at Fažana harbour. The reception of the Brijuni National Park is in Fažana, where excursion tickets are sold and where all information about visiting the National Park is available. Visitor infrastructure is located within approximately twenty meters of the main harbour of Veliki Brijun and includes catering facilities, a souvenir shop and toilets. Near the main harbour there is also the “Boat House”, an educational-interpretation centre where the cultural and natural heritage of the Brijuni Islands is presented.

Various programs are offered to visitors to the island of Veliki Brijun. The typical tour of Veliki Brijun is accompanied by a guide and lasts for 4 hours. This tour includes a riding on the tourist train and acquainting visitors with the island’s rich history, cultural and natural heritage. There is also a tour of archaeological sites a part of the archaeological tour, an educational underwater trail in Verige Bay and a tour of the bicycle-pedestrian Path of Good Vibrations.

In addition to these visitor programs, during the summer months, there is also a summer movie program, a tour of the Zelenikovac educational trail and many other educational themed tours set up around the island of Veliki Brijun. These themed tours are designed so that visitors can be guided interactively, by scanning the QR codes (placed on the info boards) with their phone camera.

Another significant form of tourism offered are diving trips, however this form of tourism takes place only through licensed concessionaires and strictly at designated locations.

Local residents are permitted to make daytrips including swimming to the islands of Sv. Jerolim and Kozada for a nominal fee.

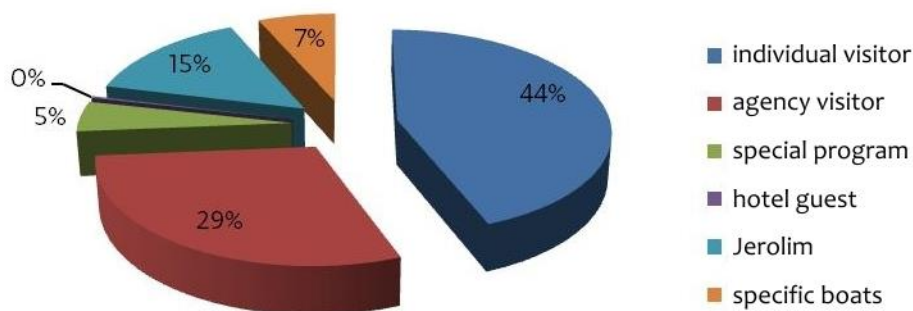


Figure 1. Visitor structure in Brijuni NP (data for 2015).

Table 14. Overview of the number of visitors to the NP Brijuni for the period from 2005 to 2015.

Year	Visitors
2005	157,420
2006	165,395
2007	176,925
2008	173,620
2009	162,664
2010	145,152
2011	155,776
2012	150,943
2013	151,007
2014	153,086
2015	160,010

The National Park also organises programs for visitors with specific themes (archaeological sites, plant and animal world, paleontological finds etc.), plus sightseeing by bike, electric cars and special vehicles.

2.3.4.8 Hotels and Catering

The accommodation facilities located within the Brijuni National Park are: Hotel Istra with the Neptun Wing, "Karmen", "Jurina" and "Franina" facilities, and holiday houses – the villas Primorka, Lovorka, Dubravka, Magnolia, Borik and Fažana. Within the hotel are the restaurants Neptun and the a la carte restaurant "Galija". Other catering facilities include the cafe bar "Školjka", the bistro "Saluga" and the "Sony & Lanka" bar. In Hotel Istra there is a conference hall (approx. 250 seats) and four smaller meeting rooms.

Numerous conferences, gatherings and meetings are mostly held either pre or post-season. During the main part of the tourist season the hotels are full of regular guests. The reservation and selling of hotel capacity is done through the Department for Promotion and Sales of the Brijuni National Park, either directly or through travel agencies.

Table 15. An overview of the total overnight stays in Brijuni accommodation facilities for the period 2005 to 2015.

Year	Overnights
2005	35,233
2006	29,878
2007	32,323
2008	33,502
2009	29,474
2010	28,762
2011	27,333
2012	28,632
2013	27,735
2014	28,436
2015	29,189

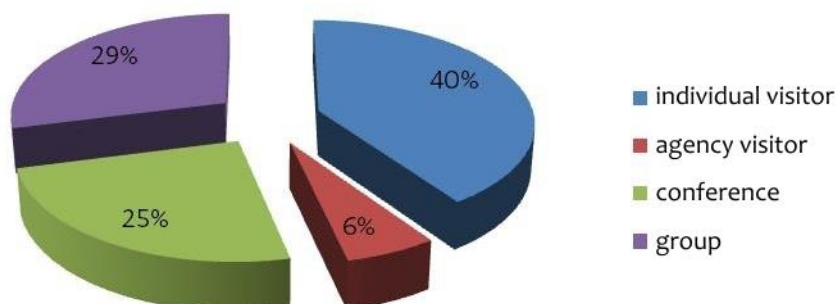


Figure 2. Structure of overnight stays per marketing segment (data for 2015).

The largest number of overnight stays is generated by Croatian guests. Of the foreign guests staying the most numerous are Italians, Slovenes, guests from the region and Russians.

A significant segment of the visitors to the Brijuni NP are boaters who moor at the harbours of Veliki Brijun and Mali Brijun from Easter until early October.

The Brijuni National Park manages accommodation capacity and the hotel business segment as a whole, which greatly impedes the restoration of old hotels and villas. During 2010 Villa Lovorka was renovated, and in 2011 a part renovation of the Hotel Istria was undertaken. Also planned is the renovation of two more villas in the near future. Most of the buildings on Brijuni are designated as cultural heritage which increases the cost and complexity of their renovation. Tourism, hotels and catering employ a relatively large number of people on Brijuni, especially during the high season. Most of these employees come from Istria, and also other parts of Croatia. Thus the Brijuni NP is a significant contributor to the economy of the region as a whole.

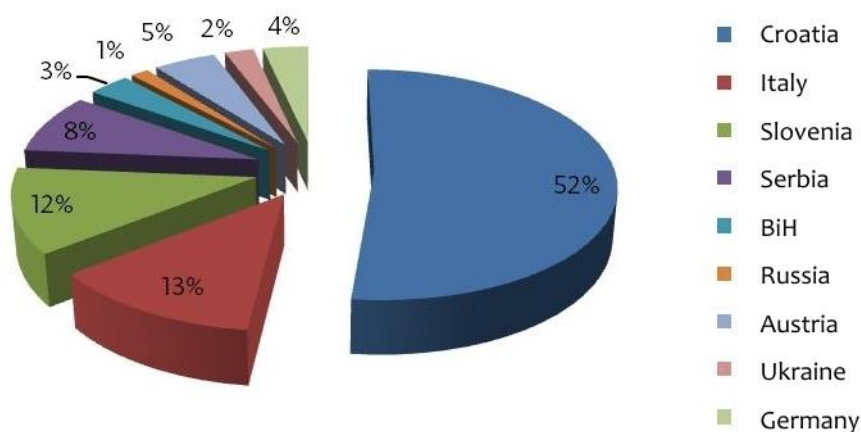


Figure 3. Breakdown of overnight stays by countries from which guests come (data for 2015).

Table 16. An overview of the number of vessels in Brijuni NP waters for the period 2005 to 2015.

Year	Number of Vessels
2005	2,236
2006	2,439
2007	2,753
2008	2,750
2009	2,747
2010	2,268
2011	2,450
2012	2,130
2013	1,828
2014	1,504
2015	1,703

2.3.4.9 Promotional Activity

Ongoing activities undertaken, with the aim of better presenting the National Park and its heritage are as follows: the development of a book of standards defining the visual identity, and other solutions related to primary means of communication, the redesign and regular web site maintenance as well as online positioning on Croatian sites as well on foreign browsers, using the typical techniques for that area. Advertising at home and abroad, and the sending of newsletters and sponsored media impressions are an important part of the Park's promotion. Great importance is given to the printing of promotional materials (leaflets, brochures, info booklets, books, CDs, photo monographs, banners, etc.), the organization of presentations, visits to fairs, and in particular erecting of info boards both in the park itself and beyond. Advertising billboards are placed in Istria, at border crossings with Slovenia and in the tourist towns of Istria such as Poreč, Rovinj, Novigrad, Umag, Pula, Rabac and Fažana. Every year the digital photo archive is renewed and the choice of Brijuni souvenirs is expanded. For more effective public relations communication, notice of events on Brijuni are sent in a timely manner. The National Park also publishes the internal publication "Brijuni Glasnik", and in cooperation with the Istrian and Croatian Tourist Boards, hosts foreign journalists to present the full range of natural and cultural-historical heritage of the National Park, along with the sustainable development of tourism within it.

3. AN INTERNAL PERSPECTIVE: WHAT DO THE STAKEHOLDERS SAY?

3.1 The process of including space users

The intention of the Brijuni National Park was to gather information and opinions of the local community and all important stakeholders of the protected area during the drafting of the Management Plan, which should be an important starting point for later phases of strategic planning and planning of activities in the implementation of the Plan. Since the time of interviews and discussions with stakeholders, no significant changes have taken place, thus the plan remains in line with information collected through those discussions.

As there is no population living within the boundaries of the Park, a number of meetings and two workshops were organised with interested local government representatives and competent institutions, stakeholders, non-governmental organizations and others who have a stake in the Park and in some way represent the local mainland population. Individual structured interviews with park visitors were also carried out.

Interviews were also held with representatives of the Office of the President of the Republic of Croatia, ministries and state administrations (who through their work and activities are connected to the National Park), mayors / heads of towns and municipalities (with whom the Brijuni co-operates on an administrative level), representatives of educational institutions of the municipality of Fažana, heads of local non-governmental organizations, diving centres (concessionaires), representatives of city tourist boards, representatives of Istria County, county administrative bodies, etc.

Along with all the workshops and the interviews conducted, several internal workshops were organised, which were primarily intended for the employees of the National Park, in the better planning and implementation of the Management Plan.

WORKSHOPS WITH STAKEHOLDERS

During the development of the Management Plan, two workshops were held with stakeholders. The first was held on the topic "Goals and activities of Brijuni National Park management". All previously interviewed representatives of institutions and organizations connected to the National Park were invited to the workshop, and 31 responded. The focus was on goals and management activities and priorities. Ideas were also gathered on how to involve stakeholders and inform them about the work of the National Park. It was concluded that there is a need to strengthen the expert capacities of the Park, to intensify communication with the wider public as to the value of the National Park and how it functions, and to continue cooperation with stakeholders in order to illicit a high degree of stakeholder interest in cooperation.

At the second workshop on "Brijuni National Park Zoning", targeted stakeholders were invited to contribute to deliver better zoning options for the park moving forward. Both land area and sea area zonings were considered. Based on the existing zoning with regards to the Brijuni Spatial Plan and zones defined within management plans, zones were mapped with defined authorised, regulated and

unauthorised activities. It was agreed that the zones would be included in the Code on Protection and Preservation.

INTERVIEW WITH PARK VISITORS

In order to get an insight into the thoughts and satisfaction levels of the experience to visitors offered by the National Park, the Public Institution undertook a series of structured interviews.

A total of 107 short interviews were conducted, with the most frequent individual visitors being German, Italian and Austrian.

It should be noted that the interviewed number of visitors is not a representative sample compared to the average number of visitors per year, but is an important source of information, since such surveys are a source of direct feedback once a visit to the Park is concluded. The current phase of planning did not include an obligation to consider the opinions of visitors, who in visiting, contribute to the promotion of the protected area and at the same time contribute significantly to the generated revenue of the Public Institution.

Questionnaires were processed, and the results of the visitor survey are as follows:

- Most park visitors expect to interact with nature (20.61%), visit natural and cultural heritage (18.79%), expect relaxation (16.67%) and engagement with local culture/art and tradition (13.03%).
- The National Park is most effectively promoted through the recommendation of friends and family as an informal source (39.25%). Of the formal and official ways of promotion, travel agencies are most effective (30.84%) and articles in print are also relatively effective (7.49%). Other remaining forms have a negligible impact on promotion.
- Visitors mostly used guided excursions (25.60%), public transport (15.36%), souvenir shop (11.75%) and bars (9.34%).
- According to gender, the visitor breakdown is 57.01% female and 42.99% male.
- The average age of visitors to the park is 41.6 years. 47.66% of visitors are younger than average, and 26.17% older than average.
- According to research results, most visitors to the park are foreign visitors (62.62%), including Germans (15.89%), Italians (10.28%) and Austrians (9.35%). There are a significant number of Croatian visitors (37.38%) and visitors from other European countries (12.15%).
- Most park visitors have completed either secondary or third level education (74.76%). Within this group 22.43% have only a high school education and a very small percentage have only a primary level education (2.80%).
- 75.70% of all surveyed were first time visitors to the park.
- The main goal of 21.50% of visitors was to experience the park specifically. The remaining visitors visited the Park while on vacation or while traveling through the area.
- Most of the visitors (84.11%) to the park believe they learned more about the park, 8.41% think they didn't learn enough, and 7.48% did not learn anything new.
- A large portion of the park's visitors, (27.78%) believe that the park needs to be thoroughly renovated (facades of hotels and buildings, abandoned buildings, toilets, electric trains), 31.48% would like to see some improvement in the overall experience (visitor education, swimming on the beach with barbecue and drinks, a better gastronomy offering, more space and information on the boat, hotels being open throughout the year including New Year's Eve, more free time during

the tour, a better experience for children - more animals). 22.22% of visitors to the Park believe that nothing needs to be changed.

All feedback received from visitors and stakeholders serves to clarify the activities of the National Park management. The Governing Board hopes that, in the future at least some negative feedback from stakeholders and visitors will be remedied, however this will only be possible through joint co-operation, the greater involvement of governing bodies (ministries, and local government) and the greater involvement of stakeholders, especially direct users of the National Park and greater financial investment.

INTERNAL WORKSHOPS

The management plan was developed through a participatory process, i.e. the process was structured, workshops had clear goals and structure and were facilitated. Thus, in the time between the stakeholder interviews and the two workshops with stakeholders, five internal workshops were undertaken in which individual parts of the plan were developed. These internal workshops were primarily intended for the employees of the Public Institution, but the workshops were also attended by representatives of Nature Histrica, the Conservation Department of Pula, and other specialists from specific fields (plant and animal groups, fisheries, agriculture, tourism etc.). As with other stakeholder workshops, this workshop was run by the association *Sunce* with the help of DZZP (now part of the HAOP) and UZP.

As part of the internal workshops, the following topics were discussed: protected area value and threats to it; themes, goals and conceptual model; goals, indicators and management strategies (joint workshop with experts); goals and management activities, and cooperation with stakeholders plus additions to the action plan.

Given the complex structure and number of employees of the Brijuni National Park, internal workshops have enabled all the Public Institution services to be included in the process of drafting the Management Plan. Thus, during the internal workshops, opinions were gathered from various Public Institution departments, and their ideas and suggestions were included in the implementation part of the plan. Within the framework of the internal workshops a jointly conceived vision of Brijuni National Park was developed.

3.2 Key issues and proposals for the future

Most of the above-mentioned interviewed participants had concerns regarding; the NP infrastructure problems of (drainage, parking, park access roads etc.), hotel management, visitor organisation, spatial planning documentation, problems with utilities, the protection and preservation of cultural-historical heritage, the protection and the preservation of natural heritage, the number of experts employed, etc.

Some stakeholders had no issues with cooperation levels so far and hope to continue cooperating in a mutually beneficial way (research, joint initiatives). Others want to increase the level of cooperation and actively participate more in the activities of the Park (research, education, volunteer work). Some stakeholders expect the Park to fix issues that unfortunately do not fall under the jurisdiction of the Public Institution (i.e. legislative changes).

It is equally evident that individuals, as representatives of their institutions, have differing views on the concept of how to protect the areas under the NP's jurisdiction. Opinions ranged from placing all hotels under concession and meeting any and all concessionaire's demands, to the idea that the protection activities in the NP should be controlled far more strictly and furthermore prohibit all recreational (fishing) or sports activities (golf, polo).

From the interviews it is clear that those familiar with NP's performance were able to point out some shortcomings in its current functioning, while at the same time wanting to focus on their willingness to offer collaboration in their specific fields of interest, in the belief that they can contribute to improving the overall protection of the National Park.

All interviewed stakeholders are interested in co-operating with the Public Institution Brijuni National Park, as they see this cooperation as an opportunity to develop their own organisational goals along with a certain increase in revenue.

4. MANAGEMENT

4.1 Themes, Goals and Activities of the Management Plan

Themes are the planning part of the Management Plan and deal with a related series of questions, which represent the main issues that the Plan deals with.

The general goals include the essence of each theme, their separation into specific goals giving a clearer picture of what is to be achieved by the Plan. Through specific goal (indicators) it is possible to monitor the achievement of the ultimate goal of protecting and improving the Park area. Specific goals are achieved by implementing the planned activities. Indicators of activity implementation enable the monitoring of the total implementation of the Management Plan and work of the Public Institution. For more efficient monitoring, the goals are divided into short-term (1-2 years), medium-term (up to 5 years) and long-term (up to 10 years) due to the long time frame of the Management Plan.

In order to gain a better insight into the schedule and priorities for certain activities, a schedule of implementation for all activities has been made on a year by year basis. Furthermore the collaborators involved in the implementation have been listed, with whom the realisation of certain activities or the entire goal would not be possible. Some activities which have a period of implementation within the first year continue from previous years. Their implementation starts in 2016, and new activities will begin with realization in 2017.

Due to limited human resources and financial capacity, different levels of priority for planned activities are defined.

Priority 1 - Activities to be undertaken within the time scope of the Management Plan. These are key activities and the failure to achieve them is damaging to the success of the entire Management Plan.

Priority 2 - Activities to be undertaken within the time scope of the Management Plan. There is some flexibility, but there must be a good reason for the non-implementation of these activities.

Priority 3 - Activities that can be undertaken when time and/or resources become available after completion of the 1st and 2nd priority level activities.

List of acronyms representing collaborators in tables:

AF	- Faculty of Architecture
AG	- Tourist agencies
ALU	- Academy of Fine Arts
AMI	- Archaeological Museum of Istria
AP	- Aquarium Pula
DUUDI	- State Office for State Property Management.
GI	- Glas Istre (Newspaper)
HAOP	- Croatian Environment and Nature Agency
HEP	- Croatian Electrical Supply Board
HPM	- Croatian Natural History Museum
HRZ	- Croatian Restoration Institute
HTZ	- Croatian Tourist Board
HV	- Hrvatske vode
JU	- Public Institution Brijuni National Park
KO	- Conservation Department of Pula
LK	- Port Authority
M	- Media (TV, newspapers, radio, web, etc.)
MGIPU	- Ministry of Construction and Spatial Planning
MK	- Ministry of Culture
MORH	- Ministry of Defence
MRSAF	- The International Student Workshop of Fortification Architecture
MT	- Ministry of Tourism
MZOIE	- Ministry of Environmental Protection and Energy
NVO	- Non-governmental organizations
PL	- Plovput LLC
PMF	- Faculty of Science, Geological Department
PVP	- Agricultural College of Poreč
RGNF	- Faculty of Mining, Geology and Petroleum Engineering
RM	- Various ministries and state bodies
RP	- Radio Pula
ŠI	- Forestry Institute
Šk	- Schools
UP	- Office of the President of Croatia
Vet	- Veterinarians
VF	- Faculty of Veterinary Medicine Zagreb
VJ	- Fire Units
Vr	- Pre-schools
VS	- External collaborators
ZI	- Scientific institutions
ZP	- Protected areas

Theme A. Protection and preservation of natural heritage

The Brijuni National Park archipelago is a small area, but of significant natural value. Introducing a large number of game animals in the past has led to the degradation of land habitats due to excessive grazing and browsing. Through direct intervention, the negative impact of game has been diminished and the coexistence of animal *and* plant life is slowly regaining a balance within the environment of the Brijuni National Park and its functioning. This process needs to be monitored on a continuous basis in order to clearly assess the correctness (or incorrectness) of procedures by scientific methods, and if incorrect again to determine the correct course of action. Vegetation has been in regression and disadvantaged for years on Veliki and Mali Brijun, however the situation is improving. With only a small reduction of the pressure on vegetation, growth has been noted of the meadows and the forest floor, which has enough seeds and light for adequate restoration.

Many birds find shelter on Brijuni; nesting, migratory, wintering, wetland, sea and forest species. Peace, serenity, silence, food and many other things can be found here, something that in the world that surrounds us today is slowly disappearing due to human activity. The highest levels of concern and care should be given to these last remaining oases and they must be afforded the highest levels of protection and the correct evaluation. Research on the European shag has shown that the presence of rats on the islands is a problem and their number needs to be controlled in order to preserve the population of this species. Saline, a swampy area of Brijuni and a type of bird realm, is an area which needs to be continually taken care of. Landfill and seepage are increasing and if certain measures are not taken Saline could soon disappear. In this eventuality many of the birds nesting there would lose their habitat along with it. Sea birds, on the other hand, prefer sheltered bays and the outer islands of the archipelago where there are no people. Here they can nest undisturbed and hunt in the plentiful sea, and this situation must be maintained in the future.

The Brijuni Islands were well studied in the past, which was followed by a period of little activity. The PI has access to this data however it is outdated and no longer relevant. For this reason research on habitats and groups of organisms has been resumed recently. It *is* necessary to check and review old understanding and to develop a new one. In this way we can see what is happening with the natural heritage, and how and where to direct management activities. It is difficult to act properly unless we know the area we protect. Research activities in the field of nature and the environment will be carried out over the coming years to provide the correct guidelines for the area's conservation. For now, special attention is being paid to the preservation of forest ecosystems, protection of the sea, as well as bird nesting areas and fish spawning areas. Research is planned of flora, birds, bats, dragonflies, butterflies, mushrooms, sea invertebrates, land habitats, monitoring of the European shag etc. The NP co-operates with NGOs, individual experts and various scientific institutions. Also, great efforts are being made to rebuild and preserve in a quality manner, and further explore Brijuni's cultural-historical heritage. An overview of inventory and research projects in the Brijuni NP is shown in Table G.

According to literary references, flora of the Brijuni Islands it is not particularly rich, and it is distinguished, especially on Veliki Brijun and Vanga, by the large number of introduced species. More recently, the vascular flora was researched from 2006 to 2009, as other research documents are outdated and more than a century old. Freshwater algae and lichens have not been studied at all, and data for mosses dates back to the 19th century (14 species were recorded). Forest vegetation and its stages of degradation are relatively well known. The natural grassland vegetation was not recorded before the introduction of large herbivores, but was further studied in 1991 and 1992. As there was no possibility of the natural renewal of vegetation, there was a decrease in the number of game introduced to achieve a sustainable ecosystem status. On the pebble and gravel-sand shore of the Brijuni Islands

species are developing which need to be protected and preserved due to the loss of their habitat in other areas outside the National Park. This habitat is rare and usually endangered due to the great pressure of tourism that causes the reduction and extinction of the species we find there. Also, these habitats are affected by waste through sea currents reaching the coastal areas of Brijuni, therefore it is necessary to regularly conduct waste removal activities and involve the local communities and the public in these actions.

The Brijuni Islands are an important habitat for bats with a total of 15 species recorded. One of the potential habitats is a tunnel along Koch's Path, where there are ideal conditions for bats (darkness, high humidity, rough and uneven surface of the vault, tubular cavities in the vault walls and quiet). Such locations on other islands are frequently used by bats. In accordance with expert guidelines the Park is planning enable the visiting of this tunnel but exclusively in guided groups with the purpose to educate visitors about the importance of bats for the entire ecosystem.

The sea, as the largest natural resource of Brijuni, must be continuously monitored, studied and protected. The pressure from the nearby mainland on the fish stock and other sea resources is great. Cooperation between the Park, the local population, the maritime police and other institutions is indispensable, and presently is highly professional and satisfactory, with expert consultants supporting the necessity of these protection efforts. Research on the effectiveness of the protection provided by the Brijuni National Park in the restoration of coastal fish settlements, has shown that within the maritime boundaries of the park there is 166% larger number of fish when compared with unprotected areas outside the boundaries. Furthermore the biomass of fish in the park is almost eight times larger than the biomass in the surrounding areas. Brijuni with its well-preserved and well-developed habitats for marine organisms can serve as a reference point for northern Adriatic research. Seagrass meadows and noble pen shell beds, populations of fish, sponges and other organisms develop undisturbed in the Brijuni submarine environment, like few other places.

In accordance with the NATURA 2000 ecological network, within the Brijuni National Park there are four different habitat types and all habitat types meet the conditions required to be protected by carrying out activities planned in this theme. Based on the data obtained from Standard Forms (SDF), which are the official European Union forms for the NATURA 2000 program, the habitat type is graded by the degree of preservation with a rating: "A" if the habitat is in excellent condition, "B" if the habitat is in good condition and "C" for fair/poor state. The Neptune grass beds and the rocks and cliffs of the Mediterranean coastline covered with endemic species of *Limonium* spp. are in good condition (grade B), while reefs and flooded or partly flooded sea caves are in excellent condition (grade A). The Brijuni NP is also included in the Conservation Area Significant for Birds with six present species that use the Park area for nesting and as a winter habitat. Conservation Area Significant for Birds (POP) and Conservation Areas Significant for Species and Habitats types (POVS) of the waters of western Istria will be processed with individual management plans such that only POVS Brijuni National Park will be mentioned here. Table 17 sets goals and conservation measures for habitat types and wild taxa within the NATURA 2000 ecological network, and also links to a number of activities pertaining to specific habitats or taxa.

With the aim of promoting geological and paleontological heritage, a life sized dinosaur model (similar to the Allosaurus) was reconstructed and erected at Cape Pogledalo on the Vrbanj/Barban peninsula to educate visitors as to the natural size and type of dinosaur that left its footprints in this area. The rich geological and paleontological heritage is presented through interpretation boards along the Zelenikovac educational trail. Due to the number and attractiveness of the dinosaur footprints, the aim is to further present the rich paleontological heritage and to broaden the visitor experience by opening a longer family program.

Public Institution Brijuni National Park – Management Plan (2016 - 2025)

THEME A: THE PROTECTION AND PRESERVATION OF NATURAL HERITAGE																
GENERAL GOAL																
Protect and preserve biological and geological diversity and provide conditions for the restoration of endangered habitats of the Park.																
ACTIVITY	Act. No.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AA - Preserve the favourable status of plant groups and fungi in relation to initial research. GOAL INDICATOR: Created lists of plant groups, mushrooms and prepared maps of habitats. Established parameters of plant and mushroom status monitoring.																
Investigate plant groups and fungi.	AA1	Research Reports. GIS database. Created list of species.	Research Reports. GIS database. Created list of species.	Research Reports. GIS database. Created list of species.	1											JU, VS, ZI, NVO
Establish a monitoring and protection system for endangered and rare plant species and fungi.	AA2	Plan for status monitoring.	Report on status monitoring.	Report on status monitoring.	1											JU, VS, HAOP
ACTIVITY	Act. No.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AB - Preserve the favourable status of animal groups, especially entomofauna (butterflies, dragonflies, beetles), compared to initial research. GOAL INDICATOR: The establishment of parameters for animal status monitoring. Created lists of animal groups and defined maps of habitats.																
Research animal groups, especially entomofauna.	AB1	Research Reports and create list of species. GIS database.	Research Reports and create list of species. GIS database.	Research Reports and create list of species. GIS database.	1											JU, VS, ZI, NVO

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Establish a monitoring and protection system for endangered and rare land species.	AB2	Plan for status monitoring. Report on status monitoring.	Plan for status monitoring. Report on status monitoring.	Report on status monitoring.	1													JU, VS, DZZP
ACTIVITY	Act. No.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10			
SPECIFIC GOAL: AC - Preserve the favourable state of land habitats compared to initial research and control the status of invasive species. GOAL INDICATOR: Created lists of species and habitat maps. Established parameters for monitoring land habitats and the production of habitat maps.																		
Carry out research on endangered habitats and establish a system for monitoring and protection of these habitats and habitats important for nesting and wintering birds.	AC1	Plan for status monitoring. Report on status monitoring.	Report on status monitoring.	Report on status monitoring.	2													JU, VS, HAOP
Identify and monitor invasive species and, if necessary, perform activities to suppress them.	AC2	Identified invasive species. GIS database.	The number of species and/or affected areas, and if necessary, the activities for removal. Report on status monitoring.	The number of species and / or affected areas, and if necessary, the activities for removal. Report on status monitoring.	1													JU, VS, HAOP

Public Institution Brijuni National Park – Management Plan (2016 - 2025)

ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AD - Enable the revitalization of the forest ecosystem within its 2003 boundaries. GOAL INDICATOR: The percentage of forest covered with saplings increasing. The forest is regenerated and the forest floor is covered with trees.																
Develop and implement the Forest Protection Program.	AD1	Created program.	Report on Program implementation	Report on Program implementation	1											JU, ŠI
Regularly repair uprooted trees that endanger visitors, roadways and buildings.	AD2	Log of extracted wood mass.	Log of extracted wood mass.	Log of extracted wood mass.	1											JU
Conduct monitoring of populations of bark beetle and other pests in forests.	AD3	Plan for status monitoring. GIS database	Report on status monitoring within affected areas.	Report on status monitoring within affected areas.	1											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AE - Establish typical vegetation of Mediterranean meadows on existing grasslands and increase biodiversity relative to initial conditions. GOAL INDICATOR: Increasing the number of typical grassland species compared with the total number of species.																
Carry out research on the existing status of grassland vegetation and establish a system of status monitoring.	AE1	Plan for status monitoring. Report on status monitoring. GIS database.	Report on status monitoring. GIS database.	Report on status monitoring.	2											JU, VS DZZP
Establish and implement a plan for revitalization and maintenance of grasslands.	AE2	Inventory of species. Plan for the revitalization and maintenance of grasslands.	Improved status with respect to the quality of grasslands and the number of native species.	Improved status with respect to the quality of grasslands and the number of native species.	3											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	

Public Institution Brijuni National Park – Management Plan (2016 - 2025)

SPECIFIC GOAL: AF - In accordance with the Game Protection Program, establish a balanced population of game without any negative impact on habitats. GOAL INDICATOR: Vegetation outside and within protected areas is developing evenly.																
Implement the existing Game Protection Program.	AF1	Reduced number of game as per Program.	Reduced number of game as per Program.	Maintain the number of game as per Program.	1											JU, VS
Develop and implement a new Game Protection Program	AF2	Developed new Game Protection Program	Maintain the number of game as per Program.	Maintain the number of game as per Program.	1											
Place barriers at the southern part of Veliki Brijun to reduce the number of game and monitor the forest ecosystem status.	AF3	The southern part of Veliki Brijun separated. A monitoring program created.	Report on status monitoring. A more favourable status of vegetation.	Report on status monitoring. Equally developed vegetation.	1											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AG - Maintain the favourable status of bat varieties, their shelters and hunting habitats compared to initial status monitoring. GOAL INDICATOR: Identification of how habitats are used and the number of bat shelters. The maintaining or increase of those numbers.																
Investigate species, identify shelters and hunting habitat and assess the degree of endangerment. Monitor status.	AG1	Database and forms for monitoring status. Bat inventory. GIS database.	Threat assessment study with proposals of protection measures. Status monitoring report. GIS database.	Status monitoring report.	1											JU, VS NVO, DZZP
Revitalise the tunnel in the centre of Veliki Brijun as a potential habitat for bats, and according to the recommendations of experts, devise a visit.	AG2	Guidelines of experts for arranging and organising tunnel visits.	The tunnel is revitalised according to the guidelines. Number of tunnel visitors.	Number of tunnel visitors.	3											JU, VS NVO
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	

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SPECIFIC GOAL: AH - Monitoring the environment by systematically collecting data on the state of the environment that will serve as an additional resource for future research and for presenting to visitors. GOAL INDICATOR: Established measuring stations and databases of environmental parameters.																
Establish a measuring station for collecting basic environmental parameters on land.	AH1	Project documentation	Set up measuring station.	Collected data in database.	3											JU, VS
Monitor sea status parameters.	AH2	Collected data in database.	Collected data in database.	Collected data in database.	3											JU, VS
Present data to visitors.	AH3	Data is available to all visitors.	Data is available to all visitors.	Data is available to all visitors.	3											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AI - Bring all wetland habitats to a favourable condition and/or preserve them in a favourable condition for the duration of the Management Plan. GOAL INDICATOR: The habitats have favourable physical - chemical parameters and an optimal amount of vegetation.																
Carry out a study of the condition of all wetland habitats in the Park, prescribe conservation and protection measures, and establish status monitoring.	AI1	GIS database. List of areas. List of archive data.	Research report with protection and conservation measures. Monitoring plan.	Monitoring reports.	2											HAOP, VS, JU, NVO
Revitalize and/or maintain wetland habitats, with emphasis on the Saline area, in accordance with protection measures (removal of mud and vegetation, etc.)	AI2	Certain sites where protection measures are being implemented.	Cleaning actions undertaken every two years.	Favourable physical - chemical parameters and optimum state of vegetation.	2											HAOP, VS, JU, NVO
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	
SPECIFIC GOAL: AJ - Preserve plant communities of sandy and pebble beaches in relation to the initial population. GOAL INDICATOR: The percentage of the area covered by plants of sandy and pebble beaches is stable.																

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Create a list of species and population estimates on sandy and pebble beaches and monitor the state of the selected areas.	AJ1	Research report.	Status monitoring reports.	Status monitoring reports.	2													JU, VS
Regularly carry out the removal and cleaning of waste from the beaches with the aim of preserving the vegetation of the beach.	AJ2	Clean beaches. Seasonal cleaning actions held every year.	Clean beaches. Seasonal cleaning actions held every year.	Clean beaches. Seasonal cleaning actions held every year. Population of threatened species of sandy and pebble beaches is stable.	1													JU
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10			
SPECIFIC GOAL: AK - Monitor and preserve the status of marine habitats and marine plant and animal groups in relation to initial research. GOAL INDICATOR: Changes of parameters in monitoring the condition of marine habitats and species established.																		
Continually update the list of marine plant and animal species. Keep track of changes in the sea and update the habitat map.	AK1	The number of field trips and researched areas. GIS database, reports with lists of species and habitat map updated.	The number of field trips and researched areas. GIS database, reports with lists of species and habitat map updated.	The number of field trips and researched areas. GIS database, reports with lists of species and habitat map updated.	1													JU, VS, ZI, NVO
Regularly monitor the existence and/or spread of marine invasive species and, if necessary, carry out activities for their suppression.	AK2	The number of field trips and researched areas. GIS database, reports with lists of invasive species.	The number of field trips and researched areas. GIS database, reports with lists of invasive species.	The number of field trips and researched areas. GIS database, reports with lists of invasive species.	1													JU, VS
Preserve the favourable conditions of habitat types included in the NATURA 2000 ecological network.	AK3	Plan for status monitoring. Status monitoring reports.	Status monitoring reports.	Status monitoring reports.	1													JU, VS, HAOP
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		

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		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AL - To monitor and preserve the state of distribution of strictly protected and threatened marine species. GOAL INDICATOR: Changes in established parameters for monitoring the population status of threatened and strictly protected marine species.																
Conduct regular status monitoring of Neptune grass beds.	AL1	Status monitoring reports. GIS database.	Status monitoring reports. GIS database.	Status monitoring reports. GIS database.	1											JU
Identify habitats and population density of the noble pen shell and establish a method of status monitoring.	AL2	Research report. GIS database. Protocols for status monitoring.	Status monitoring reports.	Status monitoring reports.	2											JU, VS
Conduct research on the spread or presence of other protected, threatened or rare species and monitor status.	AL3	Monitoring reports. GIS database.	Monitoring reports. GIS database.	Monitoring reports. GIS database.	2											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: AM - To preserve or increase the biomass of fish in the entire sea area of the Park in relation to the initial state of the monitoring. GOAL INDICATOR: Biomass of commercial types of fish has increased or remained the same with respect to the first year of monitoring.																
Continually carry out an assessment of the condition of the fish stock through visual survey.	AM1	Status monitoring reports.	Status monitoring reports.	Status monitoring reports.	1											JU, VS
Develop a system for monitoring sea-urchins as a fish stock (ecosystem) indicator.	AM2	Status monitoring reports.	Status monitoring reports.	Status monitoring reports.	3											JU, VS
Continually conduct regular sea controls by rangers.	AM3	Report on conducted controls.	Report on conducted controls.	Report on conducted controls.	1											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	

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SPECIFIC GOAL: AN - Enhance and present paleontological heritage and geological structures and incorporate into visitor offer. GOAL INDICATOR: Enhanced and protected paleontological heritage included in visitor offer.														
Inventory of the entire paleontological heritage on the Islands.	AN1		Created database.		3									JU, PMF, RGNF
Create a geomorphological study of the Brijuni Islands.	AN2		Creation of study arranged.	Created study.	3									JU, PMF

Table 17. Goals and conservation measures for habitat types and wild taxa within the NATURA 2000 ecological network.

Identification number of area	Name of area	Croatian name of species / Croatian name of habitat	Scientific name of species / Code of habitat type	Preservation goal	Basic measures	Administrative area	Number of activity
HR2000604	Brijuni National Park	Flooded or partly flooded sea caves	8330	Two preserved anchialine karst pit caves	Preserve favourable habitat conditions in two anchialine pit caves by maintaining favourable physical-chemical characteristics and water quality	Nature protection	AH2, AK3
HR2000604	Brijuni National Park	Flooded or partly flooded sea caves	8330	Two preserved anchialine karst pit caves	Preserve the surrounding vegetation in the vicinity and around the anchialine pit caves	Nature protection	AK3
HR2000604	Brijuni National Park	Flooded or partly flooded sea caves	8330	Preservation of sea cave	Preserve favourable habitat conditions in the sea cave by maintaining seawater quality and preventing waste disposal, construction and landfill in the sea	Nature protection	AH2, AK1, AK3
HR2000604	Brijuni National Park	Flooded or partly flooded sea caves	8330	Preservation of sea cave	Visitors not permitted to visit/dive in the cave	Nature protection	AK1, AK3
HR2000604	Brijuni National Park	Neptune grass beds (<i>Posidonium oceanicae</i>)	1120*	Preservation of 2,35 ha of existing habitat types	Monitor the spread of <i>Caulerpa racemosa</i> close to Neptune grass beds	Nature protection	AK2, AK3

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HR2000604	Brijuni National Park	Neptune grass beds (<i>Posidonium oceanicae</i>)	1120*	Preservation of 2,35 ha of existing habitat types	Preserve favourable habitat conditions of Neptune grass beds by maintaining favourable seawater quality	Nature protection	AH2, AK1, AK3, AL1
HR2000604	Brijuni National Park	Neptune grass beds (<i>Posidonium oceanicae</i>)	1120*	Preservation of 2,35 ha of existing habitat types	Do not permit construction and landfill in the sea at locations of Neptune grass beds and in the zone of influence	Nature protection	AK1, AK3, AL1
HR2000604	Brijuni National Park	Neptune grass beds (<i>Posidonium oceanicae</i>)	1120*	Preservation of 2,35 ha of existing habitat types	Do not permit anchoring in the area of Neptune grass beds	Nature protection	AK1, AK3, AL1
HR2000604	Brijuni National Park	Reefs	1170	Preservation of 391 ha of existing habitat types	Preserve favourable habitat conditions in marine habitat by maintaining favourable seawater quality	Nature protection	AH2, AK1, AK3
HR2000604	Brijuni National Park	Reefs	1170	Preservation of 391 ha of existing habitat types	Do not permit construction, coast concreting and landfill in the area of habitat type distribution	Nature protection	AK1, AK3
HR2000604	Brijuni National Park	Reefs	1170	Preservation of 391 ha of existing habitat types	Do not permit diving in the area of habitat type distribution except in the places designated by the Public Institution Brijuni National Park where 600 dives per year are allowed	Nature protection	AK1, AK3
HR2000604	Brijuni National Park	Rocks and cliffs of the Mediterranean coasts covered by endemic species <i>Limonium</i> spp.	1240	Preservation of 40 ha of existing habitat types	Do not permit construction in the area of habitat distribution and landfill and coast concreting	Nature protection	AC1
HR1000032	Aquatorium western Istria	Black-throated loon	<i>Gavia arctica</i>	Preserved suitable habitats (deep sea bays, coastal waters) for significant wintering populations	No measure	Nature protection	AC1
HR1000032	Aquatorium western Istria	Red-throated loon	<i>Gavia stellata</i>	Preserved suitable habitats (deep sea bays, coastal waters) for significant wintering populations	No measure	Nature protection	AC1
HR1000032	Aquatorium western Istria	European shag	<i>Phalacrocorax aristotelis desmarestii</i>	Preserved habitats (steep rocky island shores, rocky islets) to maintain a nesting population of 150-180 b.	Do not visit the nesting islands (Pusti, Grunj, Galija, Supin and Vrsar) during the nesting period (1 st January-31 st May)	Nature protection	AC1, AC2

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HR1000032	Aquatorium western Istria	Common tern	<i>Sterna hirundo</i>	Preserved nesting habitats (islets with bare, grassy or pebbled surfaces) to maintain a nesting population of 2-10 p.	Do not visit nesting islands during the nesting period (20 th April-31 st July); reduce the population of seagulls on the islands where terns nest or have decreased in numbers	Nature protection	AC1
HR1000032	Aquatorium western Istria	Sandwich tern	<i>Sterna sandvicensis</i>	Preserved suitable habitats for wintering (deep sea bays, coastal waters)	No measure	Nature protection	AC1
HR1000032	Aquatorium western Istria	Common kingfisher	<i>Alcedo atthis</i>	Preserved habitats (estuaries, sea shore) for wintering of a significant population	Remove trees and undergrowth only if the flow of watercourses are damaged in such a way as to pose a danger to the human health and property. Otherwise, leave vegetation in its natural state	Commercial fishing waters; Nature protection	AC1

Denotes: * Priority habitat type

Theme B: Protection and preservation of cultural heritage

The largest number of cultural-historical assets of the Brijuni National Park are located on the island of Veliki Brijun. Other, smaller islands of the archipelago, in proportion to their size and importance have significantly less historical remains, but almost every one of them holds a part of the history of Brijuni. Due to their long-time isolation, their areas remained less explored. Nevertheless, in the last few years, an expert processing of preserved historical remains is in progress.

The status of cultural-historical heritage in Brijuni National Park is not satisfactory. Given that for a long time only the most necessary repairs were made, and as a result of the inappropriate use of certain sites and the loss of function of individual facilities, the situation is getting worse every year. Urgent measures need to be taken for its improvement, following the rules of the profession.

Conservation works carried out a long time ago on archaeological sites are clearly visible on each of the sites today. Therefore, it is necessary to revise the state of the archaeological sites and, according to priorities, starting with the renovation of the walls and floors made of mosaic tiles or small ceramic bricks (the *opus spicatum* technique). Likewise, it is necessary to implement a drainage system for the temples and porticoes affected by the tides in Verige Bay. At the site of Castrum, it is necessary to protect the stone fragments of Roman architecture which have been exposed to weathering since 1984 and thus are in a very poor condition. The stone fragments need to be conserved and restored and then exposed *in situ*, protected from weather conditions and physical damage. All archaeological sites must be maintained throughout the year, and access roads need to be upgraded. Before conservation works are undertaken, it is necessary to conduct research and collect all the necessary documentation. A database for hydro-archaeological sites should also be created.

The sensitive museum inventory, systematized into 19 museum and 2 documentation collections, requires stable microclimate conditions and is therefore dependant on the building of its location. In order to ensure appropriate temperature and humidity for the exhibits in the exhibitions as well as those stored in depots, it is necessary to repair the buildings and to regularly carry out preventive measures for protection. It is also necessary to regularly undertake the inventory of museum material, register individual collections, complement collections with new items and present them in exhibitions.

One of almost completely neglected cultural units on the Islands is the Austro-Hungarian fortification system. Preserved in its original form, the fortification architecture is a valuable historical feature of the Islands. After Brijuni lost their strategic defence importance, the fortifications gradually declined to the point that their renovation is now essential. Thanks to a high construction quality, they have been resisting the weather conditions, and yet the building structure, seemingly in good condition, is very much damaged due to lack of protection. In the last fifteen years the fortifications of Brijuni have been the subject of study of the *International Students Workshop of Austro-Hungarian Fortification Architecture*. The aim of the Workshop is to revitalize, renovate and present fortifications and military facilities and make them accessible to visitors.

There are many quarries on the Brijuni Islands, mainly on the islands of Veliki and Mali Brijun and island of Sv. Jerolim. Some of these quarries were transformed into very pleasant promenades in the early 20th century. Part of the rich Brijuni heritage associated with stone was explored and presented as part of the KAMEN-MOST program SI-HR 2007-2013. The quarries and dry stone wall constructions

on all islands were registered and explored, along with the previously unexplored fortification on Mali Brijun where a new educational trail called *Brijuni Stone Stories* was arranged. The goal is to continue with protection measures and the presentation of the Brijuni quarries, their ancillary features and the characteristics of stone-cutting activity on the Islands. The latter was especially developed during Venetian times when Brijuni stone was regularly exported to Ancona, Ravenna and other places.

The maintenance, repair and presentation of such a large, rich and diverse cultural-historical heritage requires considerable financial resources which cannot be sustained from funds generated by the National Park through its day-to-day income generating activities. Therefore, these activities will be carried out when financially possible for the National Park, with the emphasis on outsourcing the necessary financial resources. Furthermore, due to the still unresolved situation regarding the concessions of certain facilities, some exhibitions as well as workplaces might be relocated in the future. Thus it will be necessary to provide new adequate locations, either by renovating existing buildings or by building new ones.

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THEME B: PROTECTION AND PRESERVATION OF CULTURAL HERITAGE																
GENERAL GOAL																
Protect, preserve and present the cultural-historical heritage.																
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: BA - Preventively protect, conserve, renovate, maintain and present archaeological sites.																
GOAL INDICATOR: Archaeological sites in good condition, with at least four sites included in the visitor experience.																
Make a revision of the status of archaeological sites and prepare documentation for reparation work.	BA1	Revision report. Documentation for emergency repair.	Documentation for further repair.	Documentation for further repair.	1											JU, KO, AMI
Conserve and maintain archaeological structures (walls and floors) and implement preventive protection measures.	BA2	Most endangered parts protected.	Sites on visitor routes repaired.	Other sites repaired according to priorities.	1											JU, VS, KO
Drain facilities endangered by the sea in the Roman villa in Verige Bay (temples, portico, etc.).	BA3		Project documentation.	Drainage works carried out according to priorities.	2											JU, MK, VS
Regularly maintain green areas and access paths in archaeological sites.	BA4	Archaeological sites and access paths on visitor routes maintained.	Other archaeological sites and access paths maintained.	Archaeological sites and access paths maintained.	1											JU
Create a database of hydro-archaeological sites.	BA5			Database and GIS database.	2											JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	

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SPECIFIC GOAL: BB – Protect, maintain, preserve and present museum facilities and exhibitions according to museum standards and expertise. GOAL INDICATOR: Museum facilities in good condition, with an increased number of exhibitions.													
¹ Repair the Venetian castle and open the exhibition.	BB1	Project documentation created, building repaired, exhibition set up.	Building repaired. Exhibition opened.	Regular maintenance.	1								JU, VS
¹ Repair the donjon tower, open the exhibition and maintain the building.	BB2	Project documentation for building repair and exhibition created.	Building repaired. Exhibition opened.	Regular maintenance.	1								JU, MK, VS
¹ Repair and regularly maintain the Villa Pava building with the courtyard and chapel, open and regularly maintain the exhibition space within the Villa.	BB3	Documentation for reparation works, exhibition documentation, conservation and restoration works.	Building repaired. Exhibition opened.	Regular maintenance.	1								JU, MK, VS
¹ Repair and maintain the church of St. Germaine and the sacristy, maintain the existing exhibition and space.	BB4	Documentation for conservation and restoration works, fixing of capillary action, maintenance.	Building repaired, report on conservation and restoration works	Regular maintenance.	2								JU, VS
¹ Repair and regularly maintain the steam bath building; renovate and complement the photo exhibition.	BB5	Documentation for reparation works, list objects from the residential villas that the SOMSP cedes to the PI.	Building reparation works, museum spaces equipped and maintained, exhibition complemented.	Regular maintenance.	2								JU, DN, VS
Regularly maintain the natural history exhibition and make adjustments in accordance with the need for exhibit protection.	BB6	Documentation of the implemented protection measures.	Museum spaces and exhibition renovated and maintained, protection measures implemented.	Regular maintenance.	1								JU, HPM, VS

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Regularly maintain the church of St. Rocco and organise temporary exhibitions	BB7	Church maintained and exhibitions organised.	Church maintained and exhibitions organised.	Church maintained and exhibitions organised.	2													JU, VS
Prepare the documentation for the implementation of protection measures of other museum facilities and collections.	BB8	Documentation prepared.	Documentation prepared.	Documentation prepared.	2													JU, MDC, KO
Renovate, equip and maintain the museum spaces for the protection and storage of museum and documentation material.	BB9	Documentation created, satisfactory microclimatic conditions.	Depots adapted and equipped, satisfactory microclimatic conditions.	Depots renovated, equipped and maintained.	1													JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10			
SPECIFIC GOAL: BC – Work on the protection of the museum holdings in accordance with museum standards and expertise, study, collect and present the holdings and register five museum collections. GOAL INDICATOR: Number of protected and collected objects, registered collections and publications / presentations.																		
Countinuously monitor the state of museum holdings and carry out preventive protection measures, as well as conservation-restoration works.	BC1	Number of protected objects.	Number of protected objects.	Number of protected objects.	1													JU, VS,
Continuously work on collecting and acquiring museum and archive materials.	BC2	Number of acquired objects.	Number of acquired objects.	Number of acquired objects.	1													JU
Continuously work on the inventory and registration of the museum holdings and documentation.	BC3	Number of registered collections.	Number of registered collections.	Number of registered collections.	1													JU, VS
Study, research and presentation of the museum holdings.	BC4	Study report. Museum holdings presented.	Documentation, material processing, exhibitions, publications.	Documentation, material processing, exhibitions, publications.	1													JU, VS,
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		

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		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: BD - Enhance, protect, renovate, renew, maintain and present the Austro-Hungarian fortifications and associated facilities. GOAL INDICATOR: The fortifications are in good condition, with three of them included in the visitor program.																
Align the needs of the Public Institution with the needs of MORH and DUUDI, arrange regular maintenance of facilities and include them in visitor routes.	BD1	List of locations and needs, tour plan; agreed terms of visiting in accordance with the DUUDI and MORH obligations (agreement signed).	Locations maintained and included in visitor routes.	Locations maintained and included in visitor routes.	3											JU, MORH, DN
Develop and implement a priority program for cleaning and maintaining the fortification facilities, associated features and roads. Enable and regularly maintain old communication routes; undertake protection measures for visitors according to health and safety standards, design and install info boards and signposts and the accompanying equipment (benches, rubbish bins ...) on the tour route.	BD2		Priority program for maintenance according to the plan and program of visiting. Hazardous places secured, info boards and road signs created, equipment installed according to priority.	Info boards and signposts created, benches, baskets and other equipment installed.	2											JU, MORH, HTZ, KO, VS
Reparation of fortification facilities and land embankments according to priority and project.	BD3	Project documentation created. Object repaired.	Project documentation created. Object repaired.	Object repaired and maintained.	3											JU, MORH, KO
Present fortification heritage.	BD4		Number of presentations (info boards, publications, exhibitions, events).	Number of presentations (info boards, publications, exhibitions, events)	2											JU, MK, MRSAF
¹ Renovate the Giaconne battery and its surroundings; set up an exhibition on fortifications, conserve the cannons and the tower in accordance with the legal possibilities, clean the vegetation with the aim of clearing the view from the tower through the greenery towards the sea (cannons). The battery to be included in the visitor route.	BD5	Project documentation created. Battery and its surroundings renovated, cannons conserved.	View towards the sea cleared, battery included in the visitor route, tower conserved. Exhibition on fortifications set up.	Reguar maintenance.	2											JU, MK, MORH, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.

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		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: BE – Protect, maintain, renovate and present other cultural-historical architecture and monuments. GOAL INDICATOR: Buildings and monuments in good condition in a maintained environment, easily accessible.																
¹ Repair Villa Marica and its surroundings, open an exhibition space.	BE1	Project documentation created.	Building repaired. Preliminary and detailed design of the exhibition created. Exhibition space opened.	Regularly organised exhibitions.	2											JU, VS, MK, KO
¹ Repair and maintain Kupelwieser's Rest and its surroundings.	BE2	Project documentation created.	Implemented renovation with regards to statics, surroundings cleaned.	Mausoleum repaired, environment cleaned.	2											JU, MK, VS, KO
¹ Repair and present the viewpoints and, in accordance with legal possibilities, clear the views through vegetation, create and implement a program of visiting.	BE3	Project documentation created.	Project documentation created, preparation and design of info boards, signposts and additional equipment produced.	Viewpoints repaired and presented, views cleared.	2											JU, HRZ, MK, KO, DZZP
¹ Repair and present the glass pyramid (memorial to fresh water).	BE4	Project documentation created. Pyramid repaired.	Pyramid maintained.	Pyramid maintained.	1											JU, MK, HRZ, KO
¹ Renovate and maintain the Summer cinema for holding cultural events.	BE5	Number of cultural events held (projections, plays etc.)	Number of cultural events held (projections, plays etc.)	Number of cultural events held (projections, plays etc.)	3											JU, VS
¹ Renovate the compressor station, conservation-restoration works and presentation.	BE6	Project documentation created. Building renovated.	Regular maintenance.	Regular maintenance.	1											JU, HRZ, KO, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	

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SPECIFIC GOAL: BF - Enhance and present stone quarries and additional facilities (lime kilns, stonecutters houses, rails, etc.) as well as features of stone-carving activities on the Islands. GOAL INDICATOR: Enhanced, protected and presented stone quarries and additional features.													
Inventory of sites, objects, evidence associated with the quarrying of stone on the Brijuni islands and archive research.	BF1	Identification, database creation and reports. GIS database.	Database.	Database.	3								JU, RGNF, PMF
¹ Recultivate and maintain quarries. Renovate and maintain accompanying features. (lime kilns, stonecutters' houses...)	BF2	Program of maintenance priorities. Created documentation.	Quarries recultivaed.	Facilities renovated. Regularly maintained.	2								JU, VS

¹ Explanation is given in the description of the topic and in section 4.4. Planned financial resources.

Theme C. Visitor Management

The Brijuni National Park is located close to its markets, i.e. the countries from which a large number of its visitors come. The Public Institution has dealt with tourism since its humble beginnings in 1984 until the present day, as competition increases from Istria and the wider region. However the Brijuni NP has always been, and will remain, a destination in itself, in many ways special and different from others. It is a destination that does not change much over time, but guests visit and return to it because of the experience, beautiful landscapes, green and blue views, sunsets, scents of grass, centuries-old trees, millennial history and invaluable cultural heritage, as a whirlwind of past times that can be perceived and felt with every step taken within the National Park.

The area of Brijuni offers a lot of stories, themes and possibilities. The wish of the PI is to constantly supplement and improve the already existing offer, but also to introduce new experiences. At a time of ever greater flows of information, haste and lack of time, it is necessary to update how to approach and do business with the customer. Furthermore, today's guest on a vacation or business trip expects and requires a certain standard of comfort and quality level of supporting infrastructure. Therefore, hotels, villas and supporting infrastructure in the Brijuni NP require reconstruction to meet the standards required. However the Public Institution must at the same time, keep account of and safeguard the protection and preservation of the natural environment, finding harmony and coexistence within the space of the NP.

As a result of the above, the Public Institution Brijuni National Park wants to position itself as a place of sustainable tourism in line with preservation, development and promotion, but also that the use of the natural and cultural heritage serves to guide this development and progress.

Nowadays, there is growing trend in all things natural; healthy nutrition, sport and recreation, caring for the body, a healthier lifestyle. All these things Brijuni can offer, while remaining true to itself.

Most visitors to The Brijuni National Park are one-day guests who undertake the classic 4-hour excursion which includes a tourist train tour and acquainting visitors with the cultural and natural heritage. In addition, there is also an archaeological tour, an educational underwater trail of Verige Bay, a tour of the bicycle-pedestrian paths of good vibrations, thematic educational tours and a visit to the newly opened educational and interpretive centre the "Boat House". It is planned to design and include additional visiting locations that will complement the present experiences offered on Veliki Brijun and other islands open to visitors. Furthermore it is necessary to improve the sales system for day trips and to allow the purchases of tickets online in order to simplify the visitor's arrival and visit.

During the drafting of the Management Plan, a visitor survey was conducted to gain information about the level of visitor satisfaction and to better design activities that would lead to improvements in visitor management. Surveys are still being conducted regularly, especially when new experiences are introduced, so that the visitor's opinion can be taken as to what should be changed. Continuous effort is made in educating and informing visitors about interesting things from natural and cultural heritage, to educational guidings, events, information panels and other programs.

An Action Plan of Visitor Management is being prepared which will be completed within two years. Its purpose is to balance visiting with the protection of values within the protected area, and furthermore to analyse the structure of visitors.

This management plan will not detail the development of hotel and catering activities, as in 2014 a contract was signed between the Ministry of Environment and Nature Protection and Horwath and Horwath Consulting Zagreb d.o.o. to work on the project called: "Consulting services for finding investors in the hotel industry and accompanying offers for the island of Veliki Brijun." Documents provided through this Contract should be elaborated in detail. Until then it is not possible to plan the development of the hotel and catering departments. In activities, only mentioned is mandatory maintenance of infrastructure carried out within the framework of financial capabilities. Other activities will be implemented when monies are received from various EU funds, national funds, donations and sponsorships. These activities are marked with a sign “!” in the table below.

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THEME C: VISITOR MANAGEMENT																
<div>GENERAL GOAL</div> <div>To improve the visitor system to increase the quality of the presentation of the National Park and the quality of vacation and recreation for visitors. To renew and develop existing infrastructure in accordance with environmentally-friendly technologies and sustainable development of the NP.</div>																
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: CA - Develop and implement at least five new excursion programs on Brijuni Islands. GOAL INDICATOR: There are at least five new programs on the excursion offer.																
Improve and include additional locations on Veliki Brijun (Mediterranean garden, Zuffar's garden, gallery in the Venetian castle and Villa Pava, etc.) in the existing visitor program.	CA1	Number of additional locations included. Visitors surveyed.	Visitors surveyed.	A minimum of five additional locations included. Visitors surveyed.	1											JU
Develop and implement visiting programs thematically related to one or more of Brijuni's attractions (Fortifications, J.B. Tito, Forest Ecosystems, Sea etc.) and conduct visitor education.	CA2	Number of designed programs and educational points. Trained guides. Number of visitors per program.	Completed programs. Number of visitors per program.	Completed programs. Number of visitors per program.	1											JU, VS, AG
Organise and implement visits to residential villas.	CA3	Agreed with DUUDI, MORH and the Office of the President.	Number of visitors and trips.	Number of visitors and trips.	1											JU, MORH, UP, DUUDI
Design and implement visits to Vanga.	CA4	Agreed with DUUDI, MORH and the Office of the President.	Number of visitors and trips.	Number of visitors and trips.	1											JU, MORH, UP, DUUDI

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Design and implement a new program for visiting Mali Brijun.	CA5	Number of designed programs. Trained guides. Number of visitors per program.	Completed programs. Number of visitors per program.	Completed programs. Number of visitors per program.	2														JU
Improve the visit to the island of Sv. Jerolim.	CA6	Number of designed programs. Trained guides. Number of visitors per program.	Completed programs. Number of visitors per program.	Completed programs. Number of visitors per program.	2														JU
Develop and maintain software to promote the sale of day-trip visits.	CA7	Prepared database, produced documentation and public tender.	Implemented application for sales via smartphones and tablets, and digitalized ticketing for Brijuni NP.	Updated database, monitored effectiveness of sales channel.	1														JU, VS
¹ Renovate the promenade of traditional crafts in the area of the former ZOO and renovate the golf training course nearby.	CA8	Created project documentation.	Existing facilities and infrastructure reconstructed.	Completed programs. Number of visitors per program.	1														JU, VS
¹ Renovate the former pheasantry in accordance with today's ZOO standards.	CA9	Created project documentation.	Existing facilities and infrastructure reconstructed.	Completed programs.. Number of visitors per program.	1														JU, VS
¹ Renovate the space of the flower nursery.	CA10	Created project documentation.	Existing facilities and infrastructure reconstructed.	Completed programs. Number of visitors per program.	1														JU, VS
¹ Design and renovate the educational path below Straža Hill.	CA11	Created conceptual design of the promenade and the planned educational panels and exhibits.	Educational panels and exhibits are set up.	Completed programs. Number of visitors per program.	1														JU, VS
¹ Open a dinosaur park on Barban peninsula, arrange a building for exhibitions and educational workshops, arrange and equip the nearby environment.	CA12	Created project documentation.	Existing facilities and infrastructure reconstructed.	Completed programs. Number of visitors per program.	1														JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.			
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10				

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SPECIFIC GOAL: CB - Renew infrastructure and visitors transport system. GOAL INDICATOR: Renewed infrastructure and means of transport.																	
¹ Renovate and maintain infrastructure and facilities under the management of the Public Institution.	CB1	Project documentation.	Renovated infrastructure and facilities.	Maintained infrastructure and facilities.	2												VS, JU
¹ Renovate Villa Primorka and Villa Dubravka.	CB2	Project documentation. Renovated Villas.	Maintenance of the Villas.	Maintenance of the Villas.	1												VS, JU
Regularly maintain and supplement land and sea fleet (ship, ferry, electric carts, etc.).	CB3	Regular service and procurement of vehicles and vessels.	Regular service and procurement of vehicles and vessels.	Regular service and procurement of vehicles and vessels.	1												VS, JU
¹ Procure passenger ship (up to 150 people).	CB4	Released public tender.	Procured ship.		1												VS, JU
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.	
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10		
SPECIFIC GOAL: CC - Improve ticket sales system. GOAL INDICATOR: Increased sales efficiency, increased visitor numbers in accordance with transport capacity.																	
Improve booking system by introducing new technologies.	CC1	Created and implemented internet sales system and updated database.	Maintained and improved database.	Maintained and improved database. Number of tickets sold.	2												VS, JU
Determine the strategy and plan to target sales using the benefits of new mobile technology.	CC2	Determined strategy, created and implemented mobile technology.	Analysed effects.	Maintained and enhanced application. Number of tickets sold.	2												VS, JU
Strengthen co-operation with tourist entities and stakeholders involved in visiting the Park and selling accommodation capacity.	CC3	Established contacts (database).	Maintained ongoing cooperation and consultation.	Maintained ongoing cooperation and consultation.	1												VS, JU

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¹ Create a visitor management Action plan.	CC4	Created visitor management Action plan			1															JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.				
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10					
SPECIFIC GOAL: CD - Renovate infrastructure on the islands and put it into use according to the revised Spatial Plan. GOAL INDICATOR: Number of renovated and functional facilities.																				
¹ Renovate facilities and the environment on Mali Brijun and put them into use.	CD1	Preparation of location. Collected project documentation.	Work started on facilities.	Renovated and functional facilities.	2															JU, VS
¹ Renovate infrastructure on other islands, especially Sv. Jerolim, and put it into use.	CD2	Preparation of location. Collected project documentation.	Work started on facilities.	Renovated and functional facilities.	2															JU, VS

¹ Explanation is given in the theme description and in section 4.4. Planned financial resources.

Theme D. Preservation and maintenance of inherited cultivated heritage and traditional cultivars.

There are no inhabitants on Brijuni today, but former inhabitants of Brijuni and other users of the islands left us a heritage of specific value that we must not neglect and abandon. Although they often cause controversy when talking about Brijuni, they are now part of the story and give it a certain charm and meaning.

It is difficult to imagine Brijuni without its avenues of trees, meadows, cypresses, pines and cedars, deer, peacocks, safari park, tangerines, olives, etc. All these are Brijuni heritage, part of the landscape, history, folklore and tradition. They should not be discarded and neglected, but instead put within a new context, find a new purpose or restore the old - the purpose of existing within the National Park.

In the cultivated areas today we have old olive and fig trees, and in the future we intend to plant other types of fruit and vegetables that were once grown in Istria, as today foreign hybrids are threatening to cause the disappearance of native species. We would like to develop recognizable products of these native fruits and vegetables and present them to visitors, and also invite them to join us in the harvesting experience.

The Brijuni Zoo consists of a safari park, an ethno park and a bird park. Still remaining are the offspring of animals that were once donated to Tito, so this area is of historical significance to the Brijuni Islands. Through the reintroduction of historically important exotic species (species that have already existed here), a story would be presented for the development of the zoo and increasing its attractiveness, given that in surveys, visitors point to the zoo as one of the important attractions to be celebrated. In the Ethno Park there are more and more native breeds of animals through which we want to develop another story of Brijuni, while also contributing to their preservation. The zoo needs to be revitalised and a master plan made that would be the basis for the re-design of the environment, living spaces for animals and related facilities.

Much effort is invested in maintaining the Brijuni landscapes, old walkways, groups and avenues of trees, gardens, etc. On one side these elements are destroyed by park game and the other with the passage of time. Some trees are over a hundred years old. At a certain point, with their dry branches and shallow roots, they become uprooted and pose a threat to visitors, roads, and island facilities. All these elements should be taken care of, nurtured and renewed in an organised way, so as not to lose the recognizable views of the Brijuni Islands.

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THEME D: PRESERVATION AND MAINTENANCE OF INHERITED CULTIVATED HERITAGE AND TRADITIONAL CULTIVARS.																
GENERAL GOAL																
Preserve and / or restore traditional cultivars and put inherited cultivated heritage into a sustainable framework in relation to the natural heritage and the need to visit.																
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: DA - Cultivate on "ecological principles" and present "old" varieties of fruits and vegetables in agricultural areas GOAL INDICATOR: An area of cultivated land supporting permanent crops and old varieties of fruits and vegetables. Every year, visitor picking is organised.																
Maintain orchard with labelled planting material of "old" fruit varieties of Istrian and / or Croatian area.	DA1	Report on works.	Report on works.	Report on works. Plantation fruit.	1											VS, JU
Plant and maintain the olive grove of old olive varieties and the historic vineyard from the Kupelwieser times.	DA2	Prepared planting area. Purchased planting material.	Planted olive grove and vineyard. Report on works.	Report on works.	1											VS, JU
Cultivate old varieties of vegetables on the principles of "ecological production" on existing agricultural areas.	DA3	Prepared planting area. Purchased planting material.	Report on works. Amount of vegetables grown.	Report on works. Amount of vegetables grown.	2											VS, JU
Present old varieties to visitors and hold visitor harvesting.	DA4	Program presented and materials prepared.	Plantations labelled.	Number of participants in visitor harvest.	1											JU
Organise field trips for agronomy students.	DA5	Established contact with the Institute for Agriculture and Tourism in Poreč.	Number of students on field trips.	Number of students on field trips.	2											PVP
Produce typical homemade fruit products and include in the Park's offer.	DA6	Prepared area. Purchased planting material.	Number and types of homegrown products.	Number and types of homegrown products.	2											JU, VS

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Renovate visitor infrastructure (tasting room, souvenir shop) in the central area of Veliki Brijun.	DA7		Created documentation.	Renovated presentation centre / tasting room.	3													JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10			
SPECIFIC GOAL: DB - Develop and regulate the ZOO according to the created master plan. GOAL INDICATOR: The number of species in the ZOO increased. The ZOO, animal housing and the accompanying facilities renovated.																		
Maintain, feed and nurture the animals and maintain animal housing and surroundings in the ZOO.	DB1	Veterinary control is carried out regularly. Veterinary register of health status. Animal housings are regularly maintained.	Veterinary control is carried out regularly. Veterinary register of health status. Animal housings are regularly maintained.	Veterinary control is carried out regularly. Veterinary register of health status. Animal housings are regularly maintained.	1													JU, AP, Vet
Gradually replenish and increase the amount of animals in the ZOO.	DB2	Number of domestic animals.	Number of domestic animals.	Number of domestic animals.	1													JU, VS
Restore and conserve the carriages. Renovate stables into an exhibition space for old carriages.	DB3	Restored carriages.	Restored carriages. Stables renovated.	Exhibition space opened.	3													JU, VS
Maintain and renovate supporting facilities in the ZOO.	DB4	Number of renovated facilities.	Number of renovated facilities.	Number of renovated facilities.	1													JU, VS
Develop and implement master plan of ZOO management.	DB5	Master Plan developed.	Report on Master plan Implementation.	Report on Master plan Implementation.	1													JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10			
SPECIFIC GOAL: DC - Maintain landscape, tree avenues, tree groups and other elements of landscape architecture. GOAL INDICATOR: Brijuni has retained a recognizable landscape from the beginning of the 20 th century.																		

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Regularly maintain and attend to tree avenues, promenades and other elements of the recognizable Brijuni park architecture in accordance to guidelines of the Landscape study.	DC1	Report on maintenance and work performed.	Report on maintenance and work performed.	Report on maintenance and work performed.	1													JU
Regularly maintain and attend to existing floral elements and floral arrangements at the hotel and its surroundings, villas and guest reception points.	DC2	Report on maintenance and work performed.	Report on maintenance and work performed.	Report on maintenance and work performed.	1													JU
Remove sick, dry and destroyed bushes, trees and other plants towards the preservation of the recognizable Brijuni park architecture.	DC3	Report on maintenance and work performed.	Report on maintenance and work performed.	Report on maintenance and work performed.	1													JU
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.		
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10			
SPECIFIC GOAL: DD - Present the plants of the Brijuni Islands through the Brijuni Mediterranean Garden. GOAL INDICATOR: Number of plants inhabiting Brijuni, which are present in the Garden.																		
Finish the project of the Brijuni Mediterranean Garden.	DD1	Created project documentation.	A pond area is created and freshwater species are present.	Completed programs. Number of visitors per program.	1													JU
Regularly maintain plants, supporting facilities and area of the Garden.	DD2	Report on maintenance and work performed.	Report on maintenance and work performed.	Report on maintenance and work performed.	1													JU

Theme E. Education, interpretation and promotion

Education, as a segment for many years, was perhaps the most neglected on Brijuni. Things have changed recently with an ever increasing investment in efforts and resources into education and interpretation. In 2015 two electric vehicles were purchased, each seating 14 people. The primary use for the vehicles is special programs and education in the field of natural and cultural-historical heritage.

On the peninsula of Zelenikovac in 2010 an educational trail 1km long was launched, where geological and paleontological sites (dinosaur foot prints, wave ripple marks, fossilized nerinea snail shells, bone breccia), cultural-historical sites (two limekilns, battlements in the Fažana Channel, the islands of Sv. Jerolim and Kotež, the old toponym of Cape Svetlin) and the natural heritage presented through educational panels in four languages. In Verige Bay, in 2013, an underwater trail was opened presenting the natural wealth of the Brijuni underwater area and an archaeological site - the remains of the Roman villa from the 1st century BC, which due to sea level rise is now below the sea surface. It is planned to set up at least one more educational trail, which will be based on the island of Sv. Jerolim.

The education and interpretation centre for visitors the "Boathouse" was opened in 2015. It presents the natural and cultural-historical heritage of the Brijuni National Park in an innovative and interactive way.

Erected on Veliki Brijun are educational and informative panels that mark and described the natural and cultural-historical heritage attractions. The panels give visitors basic information about a particular location or item interest, and additional information is available through QR Codes that are located on them. In this way, areas important for biodiversity (Brijuni pond, Saline, the Mediterranean garden) are marked, and individual plant and animal species in the Safari and Ethno Park and in other areas are described. Also marked are the archaeological sites of Verige, the Kastum and the Basilica of St. Mary, along with other cultural monuments. In collaboration with experts from the Department of Geology and Paleontology of the Faculty of Science, info panels have been erected on Cape Pogledalo, on the pier in the harbour and along the Zelenikovac peninsula to highlight finds of dinosaur footprints in that locality. In 2011 a scientific and artistic sculpture of a dinosaur from the Alosauridae family was created (2.80m in height and 4m in length), which is compatible with the dinosaur that left footprints at that site. Certainly in the future, we will try to mark as many interesting sites and attractions as possible.

Since 2012, the NP has organised educational programs of teaching in the field, for pre-school and elementary school children. The programs are designed to complement school curricula and cover the themes of nature and biology. The programs offered will continue to be developed to be of the highest quality possible. The design of new themes is planned along with the development of educational programs for secondary school age groups.

The International Student Workshop of Fortification Architecture has been held since 2001. Over the past ten years, surveys of the fortresses and batteries on Veliki and Mali Brijun have been undertaken, recording fortified landscapes, creating architectural plans and proposals for adaptation and revitalisation. A large number of students and mentors have attended the workshop largely financed by the Public Institution Brijuni National Park. The desire is to continue the cooperation and

furthermore to organise similar forms of cooperation in other fields (biology, paleontology, art, etc.). An ideal space for such activities would be Mali Brijun; therefore it is necessary to provide more significant resources for the reconstruction of its facilities and other infrastructure.

In addition to the aforementioned space, it is necessary to arrange a space for other external collaborators, researchers and volunteers. This would be preferably on Veliki Brijun as it is planned to develop already existing volunteer programs and, if possible increase the number of volunteers.

On Mali Brijun, developed as part of the KAMEN-MOST project, is the pedestrian educational trail *The Brijuni Stone Story*. Thanks to the diversity and the number of preserved stone elements along the trail, 15 interpretation panels have been erected to familiarise visitors with different aspects and features of stone; geological, technical, construction, historical, fortification, ethnographic, and even stone and quarries as inspiration for artists. A 2.5km trail leads from the main harbour to the north side of the island, Cape Glavina and the unfinished Austro-Hungarian battery Femina, probably built on the eve of the First World War.

Every year in the Park there are some important dates related to natural heritage protection (Forest Protection Day, Water Day, Biodiversity Day, Nature Protection Day, and Bat Night). On these occasions, interested pre-schools, schools and individuals from the Istria and Kvarner regions are invited to visit the Park for free or at preferential rates. Themed workshops and programs with expert guides, games, lectures, etc. are organised to raise public awareness and educate about the importance of protecting and preserving the natural environment. These annual events are attended in ever increasing numbers year on year and both local and national media often announce or support them. The NP also prints relevant materials in relation to the events such as brochures, books, flyers and posters. In addition to this on Mali Brijun, *The School in Nature* will be held, with various educational programs, multidisciplinary workshops and field trips for pre-schools, schools, university groups, NGOs, artists, scientists and other interested parties.

Our wish is to further enhance the heritage of this area through all these activities and presentations.

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THEME E: EDUCATION, INTERPRETATION AND PROMOTION																
GENERAL GOAL																
Increase knowledge and awareness of visitors and the local population about the need to preserve the values of the Park and direct promotion towards the natural and cultural-historical heritage.																
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: EA - Regularly conduct visitor and local population education to raise awareness about the protection of nature and care of the environment, as well as for the natural and cultural-historical heritage of Brijuni and regularly conduct volunteer programs.																
GOAL INDICATOR: A changed perception of Brijuni. Brijuni is increasingly mentioned in the context of natural and cultural heritage.																
Regularly design and implement educational programs for schools and pre-schools on the natural and cultural-historical heritage of Brijuni.	EA1	Designed programs.	Number of programs implemented and the number of students participating in the program.	Number of programs implemented and the number of students participating in the program.	1										JU, Šk, Vr	
Mark important dates in the nature protection calendar with special workshops, activities and programs.	EA2	Number of events held and number of visitors.	Number of events held and number of visitors.	Number of events held and number of visitors.	1										JU, VS, Šk, Vr	
Publish brochures, educational materials, flyers, multimedia content and other materials (including info panels) to educate, promote, and present NP heritage.	EA3	Number and type of material.	Number and type of material.	Number and type of material.	1										JU, VS	
Open and maintain at least two new educational trails or paths.	EA4	Designing the educational trails.	Number of educational trails or paths.	Number of educational trails or paths.	1										JU, VS	
Promote and organize exhibitions, lectures, workshops etc. on the subject of protection and preservation of the natural and cultural-historical heritage of Brijuni, Istria and Croatia.	EA5	Number of engagements and reports.	Number of engagements and reports.	Number of engagements and reports.	1										JU, VS	
Maintain and update the <i>Boathouse</i> information-education centre.	EA6	A maintained and updated centre.	A maintained and updated centre.	A maintained and updated centre.	1										JU, VS	
¹ Develop and open an educational centre in Mali Brijun to accommodate and maintain multidisciplinary workshops.	EA7	Preparation of the location. Collected and drafted project documentation.	Works started on the centre.	Opened centre.	1										JU, VS	

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Develop facility for external collaborators and volunteers.	EA8	Preparation of the location. Collected and drafted project documentation.	Works started on the facility.	Facility ready for collaborators and volunteers.	2															JU, VS
Continually inform the public about events in the Park through local media and the web.	EA9	Number of media impressions. Number of news impressions on the web.	Number of media impressions. Number of news impressions on the web.	Number of media impressions. Number of news impressions on the web.	2															JU, GL, RP
Continue to conduct training for guides.	EA10	Materials created and training organised. Number of guides who finished the training.	Materials updated with new information. Number of guides who finished the training.	Perfected presentation of program. Number of guides who finished the training.	1															JU
Cooperate with other protected areas and relevant institutions for the purpose of exchanging information, education and consulting staff.	EA11	Database on contacts made with relevant institutions.	Database on contacts made with relevant institutions.	Database on contacts made with relevant institutions.	1															ZP, HAOP
Create questionnaires and conduct surveys for feedback on the quality of educational programs and the presentation of the Park.	EA12	Number of surveys.	Number of surveys.	Number of surveys.	2															JU, VS
Regularly create and implement volunteer programs.	EA13	Created programs.	Number of implemented programs and number of volunteers participating in the programs.	Number of implemented programs and number of volunteers participating in the programs.	1															JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.				
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10					
SPECIFIC GOAL: EB - Offer and sell original Brijuni souvenirs. GOAL INDICATOR: The souvenir shops offer unique Brijuni souvenirs.																				
Design and make original Brijuni souvenirs.	EB1	Designed souvenirs.	Number of different souvenirs offered.	Number of different souvenirs offered and sold.	3															JU, VS
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.				

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		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: EC - Promote the Park with all its contents. GOAL INDICATOR: Increase the number of visitors per year.																
Promote the Institution through individual presentations and attendance at various specialized fairs, either alone or in cooperation with other protected areas, relevant ministries and other tourist entities.	EC1	Number of fairs attend and number of co-operating entities.	Number of fairs attend and number of co-operating entities.	Number of fairs attend and number of co-operating entities.	1											JU, AG, MT
Advertise and promote the institution through print and electronic media.	EC2	Number of media impressions.	Number of media impressions.	Number of media impressions.	1											JU, Media

¹ Explanation is given in section 4.4. Planned financial resources.

Theme F. Management and Administration

The Public Institution Brijuni National Park with its seat on Brijuni belongs to the Istrian County as a unit of regional self-governance.

In accordance with the Spatial Plan of the Brijuni National Park, as well as through stakeholder discussions, in Fažana it is necessary to organise a reception-arrival point for the needs of the Park, to meet traffic needs; parking lots for visiting groups and hotel guests, organization of port traffic, access to Brijuni for guests and goods needed to maintain the Park and supply the catering facilities. All infrastructure that goes to the National Park is also linked to Fažana. The Spatial Plan of the Fažana Municipality should be aligned with the Spatial Plan of the Brijuni National Park at the highest level. It is necessary to intensify and strengthen cooperation with the municipality of Fažana so that together they can work to solve these problems.

The Public Institution manages the protection, maintenance and promotion of the Brijuni National Park as well as the area within the boundaries of the Park, with the exception of the residential part of the island. The residential part which consists of the "White Villa", "Villa Brijunka", "Villa Jadranka", Castle, buildings on the islands Krasnica (Vanga) and Galija, as well as the space directly serving these facilities, is managed by the State Property Management Office, and used by the Office of the President and the Government of the Republic of Croatia. Protection and other protocol duties of these facilities and premises are performed by the Honorary-Defence Battalion, a special unit of the Armed Forces of the Republic of Croatia. These locations within the area of the park, for now are not part of the Public Institution's visitor program and these facilities are not open to organised visits. However, as these locations and facilities fall within the defined boundaries of the Park, it is necessary to cooperate with those responsible for them on a daily basis. It is also important that the infrastructure used by all parties is maintained and that the activities of common interest are jointly executed and financed.

Currently the Public Institution fully funds its budget through self-financing and projects. There is a growing financial need for maintaining and improving (replacing) the infrastructure system within the National Park jurisdiction. The water supply system, electric power system, heating and cooling system, wastewater drainage system, traffic system and telecommunications require repair and/or complete replacement. We are moving towards renewable energy sources and the reduction of CO₂ emissions (by installing solar panels, reducing the fleet of vehicles running on diesel and the like). Today it is with great difficulty that the public institution can meet all these obligations from its own generated funding. The solution is EU funds and/or the outsourcing of system maintenance, its functions and obligations to utility companies.

In order to implement the Plan, while dealing with everyday obligations placed on Park in all departments, continuous training should be carried out, experience exchanges with other protected areas, nationally and internationally, through meetings, workshops and seminars. There are also obligatory trainings with regards to legal obligations and safety at work, and discussions on plans and activities and their realisation within the Institution. During the realization of certain activities, the Conservation Department of Pula and other stakeholders important for implementation, are regularly consulted. It is also necessary to rearrange the premises for employees at Villa Robilant, Villa Kupelwieser and others.

The Park has a Spatial Plan from 2001. The plan is outdated and does not meet the needs of the Park today, i.e. many parts of it are unrealistic and over-oriented towards tourism, and paying not enough attention to the protection of natural and cultural heritage. The development of expert documentation which will be the foundation for the new Spatial Plan is in process. The same applies to the Regulations on Protection and Conservation, which need to be aligned with the applicable Nature Protection Act.

Considerable effort is constantly invested in supervision and fire protection - two very important segments within the protected area. The Department for supervision and protection has multiple vessels and one vehicle for their work. It is essential to maintain the fleet of all departments and replace ageing vehicles so that everyday jobs can be successfully carried out without affecting the quality of the environment and the visitor experience. The fire brigade has old vehicles and as soon as possible it is necessary to replace at least one firefighting tender. The price of such a vehicle is very high and this is a huge financial cost for the Public Institution.

There are many challenges in the Brijuni National Park and it is difficult to plan 10 years in advance. At the state level no clear concept has been given of a Brijuni development strategy, therefore it will probably be defined during the timeframe of this Plan. A large number of activities and employees, limited financial resources, a small number of experts, a ban on employment, different stakeholder interests, local self-governance units, local people, tourism, natural and cultural heritage, state, visitors, etc., all these things need to be brought together and harmony created, acting thoughtfully and always moving towards the basic goals and obligations which come with the status of being a National Park.

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THEME F: MANAGEMENT AND ADMINISTRATION																
GENERAL GOAL																
Ensure the human and material resources required for successful implementation and monitoring of the Management Plan. Continue and further enhance co-operation with stakeholders.																
ACTIVITY	No. Act.	Activity indicator			P	Implementation Period (2016-2025)										Coop.
		SHORT TERM	MEDIUM TERM	LONG TERM		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
SPECIFIC GOAL: FA - Ensure the human and material resources required for the successful implementation of the Management Plan. Continue and further enhance co-operation with stakeholders.																
GOAL INDICATOR: Activities planned by the Management Plan are successfully implemented through annual programs and executed.																
Create a new Spatial Plan for Brijuni NP.	FA1	Request development procedure for new Spatial Plan.	Created new Spatial Plan.		1										JU, VS, MGIPU, MZOIE	
¹ Rehabilitate and upgrade the electro-energy system. Place the system under the management of an authorized company.	FA2	Project documentation and obtained permits.	Rehabilitation of system.	System managed by an authorized company.	3										JU, MORH, DN, UP, HEP, VS	
¹ Maintain drainage system and wastewater treatment.	FA3	Maintained system.	Maintained system.	Maintained system.	1										JU, VS	
Transfer the drainage and wastewater treatment system to the management and / or ownership of an authorized utility company.	FA4	Project documentation and obtained permits.	System managed by an authorized company.	System managed by an authorized company.	1										JU, MZOIE, VS, HV	
¹ Upgrade the telecommunications network.	FA5	Project documentation and obtained permits.		Upgraded network.	3										JU, VS	

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¹Maintain water supply system.	FA6	Maintained system.	Maintained system.	Maintained system.	1														JU, VS
Transfer the water supply system to the management and / or the ownership of an authorized company.	FA7	Project documentation and obtained permits.	System managed by an authorized company.	System managed by an authorized company.	1														JU, MZOIE, HV, VS
Secure personnel, equipment and infrastructure for effective work, supervision and timely operation of the firefighting unit in the Brijuni NP.	FA8	Maintained and functional equipment, secured number of employees.	Maintained and functional equipment, secured number of employees. Report on the purchase of new equipment.	Maintained and functional equipment, secured number of employees. Report on the purchase of new equipment.	1														JU, VJ, RM, VS
Secure personnel, equipment and infrastructure for effective work, supervision and timely operation of the Department for supervision and protection.	FA9	Supervisor reports. Maintained equipment, secured number of employees.	Supervisor reports. Maintained or new equipment, secured number of employees.	Supervisor reports. Maintained or new equipment, secured number of employees.	1														JU, RM, VS
Maintain, modernize, upgrade and complete the equipment necessary for the implementation of the Plan's activities (including IT equipment, software and hardware).	FA10	The equipment is maintained.	List of new equipment.	All departments have the necessary equipment to work.	1														JU
Ensure ongoing training for making project applications, using EU funds and project implementation.	FA11	Education of employees.	Number of project proposals written.	Number of projects accepted.	1														JU, VS
Strengthen the capacities of the Expert's Department to carry out management planning activities.	FA12	Number of employees secured.	Number of employees secured.	Number of employees secured.	1														JU
Upgrade and maintain a fleet of vehicles necessary for the regular operation of all departments.	FA13	Fleet maintained and new vehicles procured.	Fleet maintained and number of new vehicles.	Fleet maintained and number of new vehicles.	2														JU
Adopt a new Code of Practice on the internal structure and functioning of the Public Institution "Brijuni National Park" according to current needs, in compliance with the regulatory framework.	FA14	Code of Practice adopted.			1														JU, MZOIE
Adopt a new Code of Practice on protection and conservation, i.e. decision on measures for protection, preservation, improvement and use of protected areas.	FA15	Code of Practice adopted.			1														JU, MZOIE

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[illegible]

¹ Explanation is given in the description of the topic and in section 4.4. Planned financial resources.

4.2 Zoning

4.2.1 Zoning Principles in Protected Areas

Protected area zoning is one of the basic tools for planning space usage and management. The procedure of zoning of protected areas is defined as existing and planned future use of the space in order to preserve natural and cultural heritage. The zones range from a “strict” protection zone where virtually no human impact is allowed to a “use” zone where the natural space inside the zone can be significantly altered. It is important to note that these designations do not imply the value of the area, but reflect the need for managing the protected area for the purpose of preserving the overall biological, geological and landscape diversity.

4.2.2 Zoning of Brijuni National Park

The Spatial Plan of the Brijuni National Park already defines zones in its chapter "Organization and Basic Purpose and Use of Space". The aforementioned zoning is the result of analyses and reflections on the use of space (visitor, buildings, protection, infrastructure, etc.) and does not meet the need for zoning in the Management Plan. The Management Plan zoning reflects the needs of the Public Institution for the management of the area defined by the goals of conservation.

For this reason, new zoning was created at workshops undertaken as a result of the adoption of the Management Plan for the Brijuni National Park. The representatives of the National Park, the State Institute for Nature Protection, the Ministry of Culture, the Ministry of Defence (MORH) - Honorary Defence Battalion and the *Sunce* Association led the workshop. The representatives of the other invited stakeholders, NP users, did not respond.

Based on the conclusions from the workshop, the Park area is divided into three basic zones and several subzones (Map 5). Each zone defines authorised and unauthorised activity. When adopting the new zoning, the boundaries were defined as to be easily identifiable on site, such that users of the space, visitors and rangers, can identify the zones easily. At the same time, the zones were not placed arbitrarily, rather their position reflected thinking and knowledge of the space defined by protection goals. The zones are aligned with the national categories of protected areas.

During the time period of the Management Plan, the Brijuni zoning will be included in legal and by-laws that will enable its legal implementation and will be used in the layout of zoning of a new Spatial Plan.

1 ZONE OF STRICT PROTECTION

The Zone of Strict Protection covers areas of great natural heritage whose conservation is of extreme importance and which do not permit any interventions. The goal in managing the area of this zone is to preserve natural processes and habitats and their constituents.

All types of natural resource extraction are prohibited in this zone. Spatial interventions (except in exceptional circumstances) or any modification of the space are not permitted.

Exceptionally permissible interventions in the area include the localization of fire, the removal of invasive foreign species, reparations of damage caused by incidents, in accordance with the provisions of the Nature Protection Act.

We have divided the Zone of Strict Protection into two sub-zones, 1a and 1b.

1a Zone of Very Strict Protection. No activities are allowed in this zone other than monitoring and scientific research.

The zone includes the area of Ribnjak on Veliki Brijun, the islands of Supin, Supinić, Grunj and Sv. Marko, part of the sea from Cape Kozlac to Cape Kamnik on Veliki Brijun, and a part of the sea that includes a polygon that goes from Cape Hlibine on Mali Brijun, around Supin, Supinić and concludes at Cape Pisak on Mali Brijun. These are important areas for nesting birds, fish spawning and reproduction and the lives of other marine and land organisms. It is important that biological and ecological processes in these areas evolve undisturbed in order to preserve habitats and species.

1b - Zone of Strict Protection. In this zone on land, no activities are allowed except research, monitoring and visiting under the supervision of an expert guide. In the sea part of the zone, it is permitted to dive with an autonomous diving apparatus exclusively with the assistance of an expert guide or a concessionaire at well-defined and marked locations. Free diving, swimming and visiting is controlled and allowed under special regulations, and sailing is regulated and limited. Unfettered navigation is only permitted for Park authorities, the Croatian Military and Police, fishing inspections and *Plovput* during the maintenance of sea and land based signalling.

In the waters extending from the western coast of Veliki Brijun and the southern area around Cape Peneda, outside of the islands of Vrsar, Krasnica and Grunj, and up to Cape Kadulja on Mali Brijun, there is a special regulation of navigation with respect to the residential parts of the Park under the jurisdiction of the Croatian Military (marked by a blue line on the map).

On the mainland, this zone includes the fenced area of Saline, and the islands of Vrsar and Pusti. Most of the protected waters fall within this zone.

2 ZONE OF DIRECTED PROTECTION

The Zone of Directed Protection covers areas of great importance for preserving the natural and cultural heritage of the Park. The aim of the area management of this zone is:

- the preservation of natural processes and habitats (land, water and sea) and their constituents.
- the preservation of landscapes, i.e. anthropogenic conditioned ecosystems, their biodiversity and the cultural heritage of the area.

The Zone of Directed Protection is defined as a special zone of recreational fishing around the island of Sv. Jerolim and Kozada. Fishing is regulated here by a special decision of the General Manager of the Institution and is permitted under a purchased license. As this was traditionally an area used by local residents particularly for bathing, thus bathing is permitted in this zone with a fee. Other activities in this area have been regulated. Anchoring is only allowed for small vessels and permitted

is the safe passage without stopping for boats on the navigable route between the island of Sv. Jerolim and lighted buoy at Cape Rankun, as well as a safe passage without stopping on the navigable route between the islands of Sv. Jerolim and Kozada. Diving with an autonomous diving apparatus is permitted only with an accompanying expert guide or concessionaire at well-defined and marked locations. Free diving is permitted, and other forms of sport and recreation are limited to those that do not cause damage to marine organisms and habitats.

The second area of the Zone of Directed Protection at sea is in front of Cape Garma. This area is established exclusively for the anchoring of ships that cannot pass into the harbour at Veliki Brijun. With the exception of anchoring, all other rules of Zone 1b apply.

The Zone of Directed Protection covers most of Veliki and Mali Brijun and all other islands that are not in Zone 1 (Krasnica, Jerolim, Kozada, Obljak, Gaz and Galija). These areas are permitted to visit, however sports and recreational activities are regulated in this zone, and are limited to activities that do not endanger natural and cultural heritage.

3 ZONE OF USAGE

The Zone of Usage generally includes those areas of lower conservation importance and/or areas where a certain degree of usage is traditionally present. The goal of managing the area under this zone is the sustainable usage of space in accordance with the goals of preserving biological and landscape diversity of the area.

On Brijuni the Zone of Usage includes land with buildings, harbours, moorings, intensive use areas, agricultural land, golf course and other sports grounds, bathing resorts etc.

This zone is a kind of compromise between use and protection of the area. Its use is in accordance with the principles of sustainable development, without disturbing the purpose of the protected area or endangering the conservation goals defined within the management plan.

Table 18. Breakdown of protection zones under the jurisdiction of Brijuni NP.

Public Institution Brijuni National Park			
BREAKDOWN OF INDIVIDUAL ZONES			
ZONE - LAND		ha	%
1a	Zone of Very Strict Protection	5	0,68
1b	Zone of Strict Protection	22	2,99
2	Zone of Directed Protection	552	75,10
3	Zone of Usage	156	21,23
Total - Land		735*	100,00
ZONE – SEA AREA		km ²	%
1a	Zone of Very Strict Protection	127	4,77
1b	Zone of Strict Protection	2.217	83,19
2	Zone of Directed Protection	311	11,67
3	Zone of Usage	10	0,38
Total – Sea Area		2.665*	100,00

*Note: * The total area differs from the area defined by the Spatial Plan, because some of the areas above are taken from the Park zone created in ArcGIS. In the spatial plan, the land area is 743.30 ha and the surface area of the sea is 2.651,70*

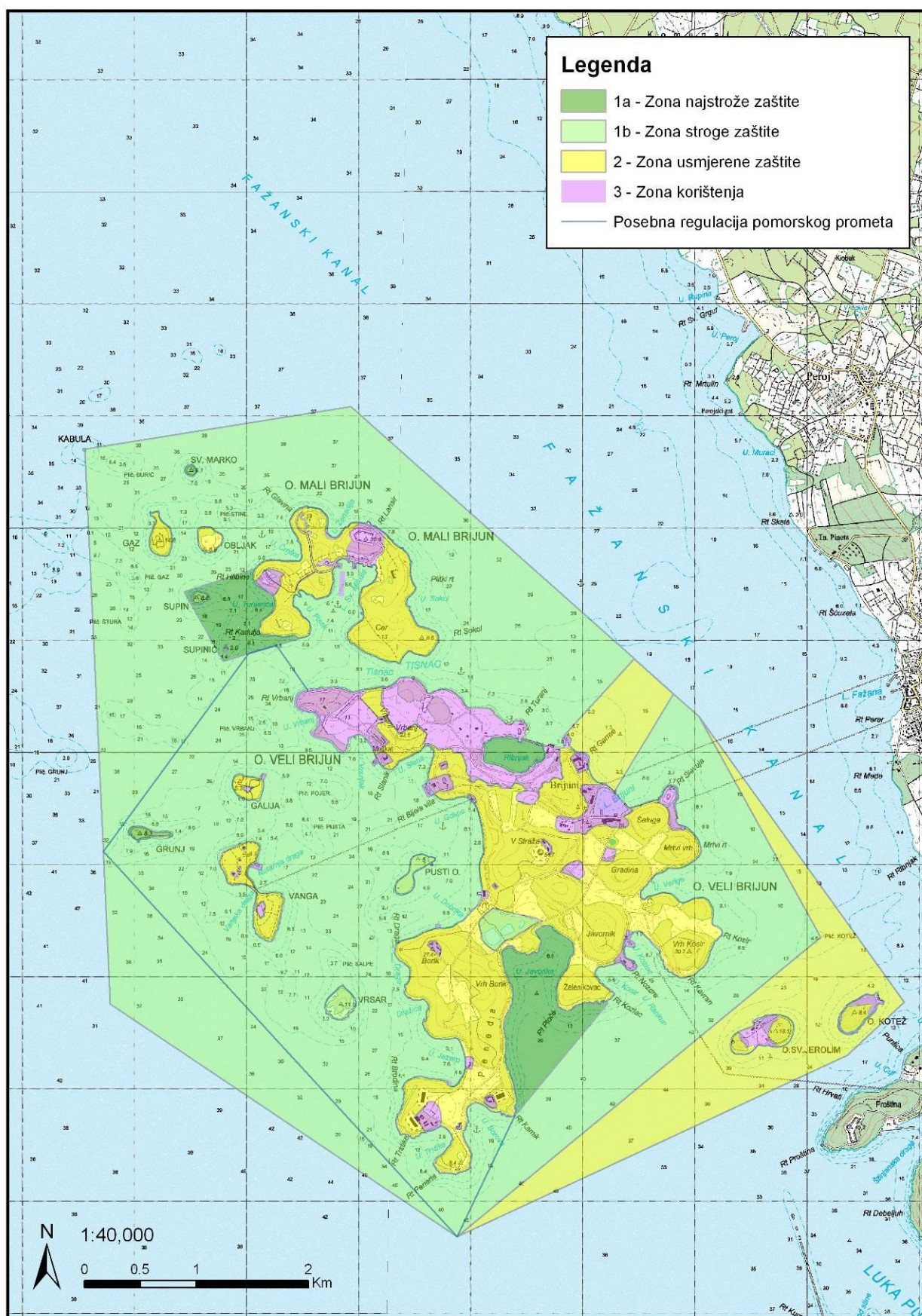
Table 19. Regulated activities by zones

Activity	1 Zone of Strict Protection		2 Zone of Directed Protection	3 Zone of Usage
	1a Zone of Very Strict Protection	1b Zone of Strict Protection		
Research	✓	✓	✓	✓
Scuba Diving	X	R	R	X
Free Diving	X	R	R	X
Anchoring	X	X	R	X
Sailing	X	R	✓	✓
Bathing	X	R	R	X
Fishing	X	X	R	X
Mooring	X	R	R	✓
Sea kayaking	X	R	R	✓
Visiting	X	R	✓	✓
Traditional farming activities	X	X	✓	✓
Sport and recreation	X	X	R	✓

Note:

✓ Permitted activity; X non-permitted activity; R Permitted activity under regulation.

All non-listed activities are regulated.



Map 5. View of the zones in the Brijuni NP area

4.3 Planned human resources

Over the last decade, many staff members have retired and no new staff has been hired to fill their places, especially in hotel and catering. Moreover, year after year, new facilities are being opened in the Park and new people need to be recruited so that everything can function safely. The additional need for staff stems from the fact that laws and/or regulations that require the employment of additional specialists in certain jobs (such as additional crew members, safety at work supervisors and security officials, etc.) change over time. Within the Institution, individuals are encouraged to further educate and develop themselves, and the Institution strives to fill jobs from within the existing staff pool. However this is not always possible, especially considering the fact that the demographic of the existing employees is ageing. When planning employment, Table 20 details recruitment only of NEW staff needed, or positions in which new staff have not been employed for years, and they are systematised and are needed for the regular work of the Institution. The table does not specify the staff that will need to be compensated for retirement or other reasons.

It is also important to note that it is urgently necessary to revise job systematization.

Table 20. Employment Plan

PLANNED HUMAN RESOURCES	Timeframe of staffing requirements									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Expert consultant - Educator										
Head of Subdepartment for animal protection										
Expert consultant-forester or biologist										
Expert consultant for human resources										
Head of Sales department										
Senior expert consultant – Internal auditor										
Expert consultant - Curator										
Expert consultant - Curator										
Assistant to expert consultant for operational affairs										
Head of Subdepartment for hotel accommodation										
Head of Subdepartment for sports and recreation										

Head of serving staff										
Head hostess for hotels and villas										
Hostess for villas										
Housekeepers – 2 employees										
Maitre d'hotel – 2 employees										
Waiter – 2 employees										
Head Chef										
Cooks – 2 employees										
Helmsman – 4 employees										
Sailor - a member of the navigational guard on deck – 3 employees										
Boiler man										
Electrician										
Plumber										
Auxiliary worker										
80 seasonal employees in the field of visitor tourism (guides), hotel and catering (chefs and waiters, housekeepers, hosts, sports and recreational equipment providers, ship crew) etc.										

In line with increasing scope and amount of work, expert staff will be employed. During each tourist season (June - September), a total of 310 staff will be employed.

4.4 Planned financial resources

Financial resources for the work of the Public Institution are provided through self-generated revenues (visitors' tickets, fees for carrying out permitted activities within the Park, professional guidance services, souvenir sales etc.). Furthermore a part of the funds is provided through donations and sponsorships, and by submitting projects to national and international co-financing programs.

For the implementation of the Public Administration Management Plan, the Brijuni National Park will provide funds from the following sources:

- self-generated
- European Union funds and national funds
- donations and sponsorships.

The total funds needed to implement the Brijuni National Park Management Plan for the period from 2016 to 2025 amounts to HRK 444.998.100. Of this amount, the expenditure for implementing new Plan activities amounts to HRK 48.515.652 and the operating expenses of the Institution are HRK 396.482.448.

Some activities are not included in the total resources needed to implement the Management Plan because it is necessary to create project documentation on the basis of which funds will be allocated for their realization. Most of these activities will be implemented when funds can be provided from various EU funds, national funds, donations and sponsorships. These activities are marked with a “!” sign in the tables that indicate such activities in Themes B, C, E and F.

***NOTE:**

Employment expenses are calculated taking into account *Table 3: Organization of Brijuni NP Employees* and *Table 20: Employment Plan*. Employee salaries are also included in the expenses.

****NOTE:**

Expenses not part of the Plan activities include:

office materials

energy

current maintenance material

telephone, mail, transport services

current and investment maintenance services

promotion and public relations services

communal services

leasing and rent

health services

promotional expenses

membership fees

other unpublished business expenses

interest on borrowing

banking and payment services

other unspecified financial expenses

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Table 21. Total funds needed to implement the Management Plan

Total funds needed to implement the Management Plan											
BUDGET	Implementation Period (2016-2025)										TOTAL
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
EMPLOYEE EXPENSES*	23.024.778	23.533.681	23.762.800	23.968.800	24.088.600	24.209.000	24.330.000	24.451.000	24.574.000	24.697.000	240.639.659
EXPENSES NOT PART OF PLAN ACTIVITIES **	15.550.559	14.381.656	15.110.237	15.579.937	15.765.400	15.984.000	15.888.000	15.817.000	15.884.000	15.882.000	155.842.789
EXPENSES OF IMPLEMENTATION OF PLAN ACTIVITIES	4.654.663	4.874.663	5.200.663	4.965.663	4.750.000	4.837.000	4.732.000	4.852.000	4.772.000	4.877.000	48.515.652
TOTAL	43.230.000	42.790.000	44.073.700	44.514.400	44.604.000	45.030.000	44.950.000	45.120.000	45.230.000	45.456.000	444.998.100

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Table 22. Expenditure for the implementation of activities according to the themes of the Management Plan.

Expenditure for the implementation of activities according to the themes of the Management Plan											
THEME	Implementation Period (2016-2025)										TOTAL
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
A	751.000	716.000	660.000	720.000	672.000	749.000	594.000	724.000	664.000	739.000	6.989.000
B	600.000	600.000	600.000	600.000	570.000	570.000	600.000	570.000	570.000	600.000	5.880.000
C	1.110.000	1.120.000	1.115.000	1.085.000	1.065.000	1.065.000	1.065.000	1.065.000	1.065.000	1.065.000	10.820.000
D	1.331.663	1.636.663	1.978.663	1.738.663	1.641.000	1.651.000	1.671.000	1.671.000	1.671.000	1.671.000	16.661.652
E	230.000	170.000	215.000	190.000	170.000	170.000	170.000	190.000	170.000	170.000	1.845.000
F	632.000	632.000	632.000	632.000	632.000	632.000	632.000	632.000	632.000	632.000	6.320.000
TOTAL	4.654.663	4.874.663	5.200.663	4.965.663	4.750.000	4.837.000	4.732.000	4.852.000	4.772.000	4.877.000	48.515.652

Table 23. Expenditure for the implementation of activities according to the priorities of the Management Plan.

Expenditure for the implementation of activities according to the priorities of the Management Plan.											
PRIORITY	Implementation Period (2016-2025)										TOTAL
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
1	4.066.663	4.301.663	4.612.663	4.217.663	4.067.000	4.042.000	3.997.000	3.987.000	3.937.000	3.992.000	41.220.652
2	558.000	543.000	513.000	543.000	446.000	546.000	526.000	596.000	566.000	676.000	5.513.000
3	30.000	30.000	75.000	205.000	237.000	249.000	209.000	269.000	269.000	209.000	1.782.000
TOTAL	4.654.663	4.874.663	5.200.663	4.965.663	4.750.000	4.837.000	4.732.000	4.852.000	4.772.000	4.877.000	48.515.652

4.5 Monitoring implementation of Plan

The monitoring of the implementation of the Management Plan aims to promote the effective functioning of the plan and to indicate whether goals have been achieved and whether there are any possible deficiencies in the implementation itself. It also enables possible problems to be resolved more easily should performance indicators for achieving goals not be satisfactory and to adjust management activities as needed.

The purpose of monitoring the performance is to collect data for measuring performance indicators for achieving goals and activities. The Public Institution Brijuni NP has 23 activities. By the implementation of these activities the necessary results for performance monitoring will be collected.

Table 24. Monitoring Activities for the Implementation of the Management Plan.

Management goals		
Monitor, collect and document the results of management activities as well as fulfilment of management goals.		
Monitoring Activities for the Implementation of the Management Plan		Activities of the Management Plan being monitored
M1	Provide timely submission of research reports (within the time limits and within the guidelines set by the Institution) for any research work carried out by Park staff or contracted consultants.	AA1, AA2, AB1, AB2, AC1, AC2, AD1, AD3, AE1, AF3, AG1, AI1, AJ1, AK1-AK3, AL1-AL3, AM1, AM2, BC4, BF1, BG1, BG2
M2	Maintain a current and organised archive of official documents, plans, research and other reports, projects, interpretative and educational materials and other Park related materials.	AA1, AA2, AB1, AB2, AC1, AC2, AD1, AD3, AE1, AF1, AF2, AG1, AH1, AH2, AI1, AI2, AJ1, AK1-AK3, AL1-AL3, AM1, AM2, BA1, BA3, BA5, BB1-BB9, BC3, BC4, BD1-BD5, BE1-BE4, BE6, BF1, BF2, BG1, BG2, CA1, CA7-CA12, CB1-CB4, CC4, CD1, CD2, DA1-DA4, DA7, DB1-DB5, DC1-DC3, DD1, DD2, EA1, EA3-EA8, EA10, EA12, EA13, FA1-FA7, FA9, FA11, FA13-FA15, FA17-FA21, FA23-FA25
M3	Ensure that all partnerships are formalized and confirmed through the exchange of letters, contracts and cooperation agreements.	AA1, AA2, AB1, AB2, AC1, AD1, AE1, AE2, AF1, AF2, AG1, AI1, AI2, AJ1, AK1-AK3, AL1-AL3, AM1, AM2, BA1-BA3, BB1-BB9, BC1, BC4, BD1-BD5, BE1-BE6, BF1, BF2, BG1, BG2, CA3-CA12, CB1-CB4, CC1-CC3, CD1, CD2, DA7, DB2-DB5, EA7, EA8, FA1, FA2, FA4, FA5, FA7, FA11, FA13-FA15, FA18, FA19, FA21, FA23, FA24
M4	Ensure that supervisors and other relevant staff submit regular reports on activities related to control and monitoring of endangered species and habitats and access to sensitive areas; set up a database of supervisor's reports.	AA2, AB2, AC1, AJ2, AK1, AK3, AL3, AM3
M5	Ensure that appropriate staff member submits regular reports on activities related to the control and monitoring of invasive	AC2, AK2

	species.	
M6	Ensure that data on key species, habitats and cultural heritage contained in GIS folders and other databases is maintained and up to date.	AA1, AB1, AC2, AD3, AE1, AG1, AI1, AK1, AK2, AL1-AL3, BA5, BF1
M7	Carry out annual monitoring of key and indicator species to ensure that the Park and other stakeholders are not causing harm.	AA2, AB2, AG1, AJ1, AK1, AL1-AL3, AM1, AM2
M8	Maintain a database of field reports and expert protection department reports, as well as all data relating to Park biology.	AA1, AA2, AB1, AB2, AC1, AC2, AD1-AD3, AE1, AE2, AF1-AF3, AG1, AI1, AI2, AJ1, AK1-AK3, AL1-AL3, AM1-AM3
M9	Maintain a database of basic environmental parameters on land and at sea	AH1, AH2
M10	Regularly update records on the status and numbers of animals in the zoo and on the status of the associated facilities	DB1, DB2, DB4
M11	Keep track of repairs of archaeological sites and the implementation of preventive measures for the protection of museum materials	BA1-BA4, BB1-BB9, BC1, BE1
M12	Ensure that the Park gains insight into all external plans, strategies and laws produced by the services and authorities that influence the Park and participates in their creation through written recommendations.	AD1, AF2, FA1, FA14, FA15, FA18, FA22
M13	Ensure that necessary permissions, permits and technical intervention certificates are obtained from relevant institutions.	BB2-BB5, BB8, BB9, BD3, BD5, BE1, BE4, BE6, CA8-CA12, FA2-FA7, FA19, FA23, FA24
M14	Keep track of information materials and educational programs.	AH3, BD4, CA1, CA2, CA12, DA5, EA1-EA7
M15	Keep track of education and presentation programs and events held, and the number of participants.	DA5, EA1, EA2, EA5
M16	Ensure website is updated regularly and keeps track of all the more important events in the Park.	AH3, EA3, EA5, EA9
M17	Maintain a database of the number of visitors to selected sites and/or individual visitor arrangements.	AG2, BB1-BB9, BE1, BE5, CA1-CA6, CA8-CA12, CC1, CC2, DA4, EA2, EA6
M18	Keep track of production and sales of local products and souvenirs	DA1-DA3, DA6, EB1
M19	Keep track of impressions of the park in the media.	EA3, EA9, EC2
M20	Maintain an up-to-date list of vehicles and equipment.	FA8-FA10, FA13
M21	Maintain up-to-date list and documentation of staff, their roles and responsibilities, education needs as well as reports on official travel, courses and workshops, internal meetings, questionnaires, and events.	EA1-EA3, EA5, EA11, EA12, EC1, FA8, FA9, FA11, FA12, FA16, FA22

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M22	Hold two annual meetings to ensure that the Park develops and implements key plans, projects, programs and strategies outlined in management activity plans or deriving from their results.	All activities of the Management Plan to be implemented in the current year.
M23	Prepare a full assessment of the management plan during the fifth year of implementation and produce a revised version	All Management activities commenced in the first 5 years of implementation of the Plan.

4.6 Procedure for Changing Management Plan

The Management Plan defines and describes the mode of management of a protected jurisdiction based on the best known practice at the time of its creation. However in studying the state of the area and gaining understanding of new information and the emergence of some new impacts, there may be a need to change management methods. The plan should therefore be tailor-made in such a way as to enable the planned activities to be modified in accordance with the changes that occur.

4.6.1 Revision after ten years

The Protected Areas Management Plan in Croatia, pursuant to Article 138 of the Nature Protection Act (NN 80/13), is for a period of ten years. Changes that have arisen during these ten years should be incorporated through revisions to the activities of the Plan. The ability to make changes to existing activities will allow the Park management to be flexible in its work while at the same time retain the general management direction as defined by vision and goals.

The vision of the management plan is actually the long-term goal of managing a protected area. It is therefore set for a period that is longer than the duration of the plan itself. As a result, should the status of the protected area not change, the vision should remain the same during the creation of the next management plan, thus ensuring the continuity of the managed area. Similarly, unless there is a significant change, the specific goals of the plan should remain unchanged at least for the next ten years.

4.6.2 Amendments and additions after five years

After the expiration of a period of five years, the implementation of the management plan and the results achieved shall be analysed and, where necessary, the plan revised in the manner prescribed for its adoption. If need arises, management activities should be re-structured, partly or completely. The chapter on monitoring the implementation of the plan should include an analysis of the success of the implementation of the previous activities i.e. what has been done and what has not been done and the reasons why the activity has not been carried out as well as other knowledge and experience that were used in the revision of the management plan.

4.6.3 Annual Programs

Pursuant to the Nature Protection Act (NN 80/13), an annual program for the protection, maintenance, preservation, promotion and use of the protected area, is an implementing document with which the Management Plan is implemented on a yearly basis. Annual Programs include activities envisaged in the Management Plan for that year, which if need be can be further elaborated upon. With relevant explanation and through the preparation of Annual Programs, smaller deviations can be made from the planned activities of the Management Plan. Furthermore activities can be added beyond the scope of the plan, as well as activity priorities reviewed and redefined, including time frames (for that year).

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6. APPENDICES

Table A. List of vascular flora in the area of the Brijuni NP categorised as threatened in the Red List of Vascular Flora of Croatia, 2005. (CR - Critically Endangered, EN - Endangered, VU - Vulnerable, NT – Near Threatened, DD – Data Deficient). According to the Act on Strictly Protected Species (NN 144/13, NN 73/16), SZ - Strictly Protected Species is also categorised.

Latin Name of Taxa	Common name of Taxa	Category of threat	Status	Law NN 144/13, NN 73/16
<i>Adiantum capillus-veneris</i> L.	Southern maidenhair fern	NT	stable popul.	/
<i>Adonis annua</i> L. emend. Huds.	Pheasant's-eye, Adonis' Flower	EN	stable popul.	SZ
<i>Ampelodesmos mauritanica</i> (Poir.) T. Durand & Schinz	Mauritania grass	NT	stable popul.	/
<i>Asteriscus aquaticus</i> (L.) Less.	Asteriscus aquaticus	DD	unverified	SZ
<i>Bupleurum lancifolium</i> Hornem.	Lanceleaf thorrow-wax	CR	unverified	SZ
<i>Calystegia soldanella</i> (L.) R. Br.	Seashore false bindweed	CR	unverified	SZ
<i>Carex depauperata</i> Curtis ex With.	Sedge	DD	unverified	SZ
<i>Carex divisa</i> Huds.	Divided sedge	EN	unverified	SZ
<i>Carex extensa</i> Gooden.	Long-bracted sedge	EN	unverified	SZ
<i>Carex liparocarpos</i> Gaudin	Glossy Fruited Sedge	DD	unverified	SZ
<i>Carex nigra</i> (L.) Reichard	Black sedge	EN	stable popul.	SZ
<i>Cyclamen repandum</i> Sibth. et Sm.	Spring sowbread	NT	stable popul.	/
<i>Desmazeria marina</i> (L.) Druce	Desmazeria marina	VU	stable popul.	SZ
<i>Elymus pycnanthus</i> (Godr.) Melderis	Tick quackgrass	NT	stable popul.	/
<i>Euphorbia paralias</i> L.	Sea Spurge	DD	stable popul.	SZ
<i>Glaucium flavum</i> Crantz	Yellow-horned Poppy	EN	in decline	SZ
<i>Glyceria fluitans</i> (L.) R.Br.	Floating Sweet-grass	VU	unverified	SZ
<i>Hainardia cylindrica</i> (Willd.) Greuter	Barbgrass	VU	unverified	SZ
<i>Lemna gibba</i> L.	Gibbous duckweed	EN	unverified	SZ
<i>Linaria chalepensis</i> (L.) Mill.	White Toadflax	DD	unverified	SZ
<i>Lolium remotum</i> Schrank	Ryegrass	DD	unverified	SZ
<i>Melica transsilvanica</i> Schur	Red Spire	DD	unverified	SZ
<i>Narcissus tazetta</i> L.	Bunchflower daffodil	NT	numerous	/
<i>Ophrys apifera</i> Huds.	Bee orchid	EN	rare	SZ

Latin Name of Taxa	Common name of Taxa	Category of threat	Status	Law NN 144/13, NN 73/16
<i>Ophrys bertolonii</i> Moretti	Bertoloni's Bee Orchid	VU	unverified	SZ
<i>Orchis papilionacea</i> L.	Butterfly orchid	VU	rare	SZ
<i>Orchis purpurea</i> Huds.	Lady orchid	VU	stable popul.	SZ
<i>Orchis tridentata</i> Scop.	Toothed orchid	VU	unverified	SZ
<i>Papaver hybridum</i> L.	Rough poppy	CR	unverified	SZ
<i>Parapholis incurva</i> (L.) C.E.Hubb.	Coast barbgrass	VU	stable popul.	SZ
<i>Phalaris brachystachys</i> Link	Bulbous canary-grass	DD	unverified	SZ
<i>Polypogon maritimus</i> Willd.	Mediterranean beard grass	NT	unverified	/
<i>Ruppia maritima</i> L.	Widgeon Grass	DD	numerous	SZ
<i>Salsola kali</i> L.	Common saltwort	VU	unverified	SZ
<i>Salsola soda</i> L.	Salsola soda	VU	stable popul.	SZ
<i>Scandix pecten-veneris</i> L.	Shepherd's-needle	NT	stable popul.	/
<i>Scirpus maritimus</i> L.	Sea clubrush	NT	stable popul.	/
<i>Silybum marianum</i> (L.) Gaertn.	Milk thistle	NT	rare	/
<i>Suaeda maritima</i> (L.) Dumort.	Herbaceous seepweed	VU	stable popul.	SZ
<i>Trifolium glomeratum</i> L.	Clustered clover	DD	unverified	SZ
<i>Turgenia latifolia</i> (L.) Hoffm.	False carrot	DD	unverified	SZ
<i>Vaccaria hispanica</i> (Miller) Rauschert	Cowherb	CR	unverified	SZ

Table B. List of birds in the Brijuni NP with the category of threatened on the Red List of Threatened Birds of Croatia, 2003 (RE - Regionally Extinct, EN - Endangered, VU - Vulnerable, NT- Near Threatened LC - Least Concern, DD - Data Deficient) and the following tags: gn - nesting, ngn - non-nesting, pre – of passage, zim - wintering population. According to the Act on Strictly Protected Species (NN 144/13, NN 73/16), the status SZ - strictly protected species is categorised and according to its local status is designated: S-resident, G-nesting migratory, P-of passage, Z-wintering, R- regular wandering, N-irregular wandering, O-released, escaped. Species are marked with the corresponding substatus: s, g, p, z of the same meaning.

(Based on the bird monitoring data of the Brijuni National Park from 2009 - Roberto Stelko)

Scientific name	Common name	Category of threat				Annex I of Birds Directive	Acts NN 144/13, NN 73/16	Local status
		gn	ngn	pre	zim			
<i>Accipiter gentilis</i>	Northern goshawk						SZ	S
<i>Accipiter nisus</i>	Eurasian	LC					SZ	S

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Scientific name	Common name	Category of threat				Annex I of Birds Directive	Acts NN 144/13, NN 73/16	Local status
		gn	ngn	pre	zim			
	sparrowhawk							
<i>Acrocephalus arundinaceus</i>	Great reed warbler						SZ	G
<i>Acrocephalus melanopogon</i>	Moustached warbler	CR				+	SZ	R
<i>Acrocephalus schoenobaenus</i>	Sedge warbler						SZ	R
<i>Acrocephalus scirpaceus</i>	Eurasian reed warbler						SZ	G
<i>Actitis hypoleucos</i>	Common sandpiper	VU					SZ	R
<i>Aegithalos caudatus</i>	Long-tailed tit						SZ	S
<i>Alauda arvensis</i>	Eurasian skylark	LC					/	R
<i>Alcedo atthis</i>	Common kingfisher	NT				+	SZ	S
<i>Anas acuta</i>	Northern pintail	RE			EN		SZ	R
<i>Anas clypeata</i>	Northern shoveler	RE			VU		SZ	R
<i>Anas crecca</i>	Eurasian teal				NT		/	R
<i>Anas penelope</i>	Eurasian wigeon				NT		/	R
<i>Anas platyrhynchos</i>	Mallard						/	S
<i>Anas querquedula</i>	Garganey	NT					/	R
<i>Anas strepera</i>	Gadwall	EN			EN		SZ	R
<i>Anser albifrons</i>	Greater white-fronted goose	LC					/	
<i>Anser anser</i>	Greylag goose	EN					SZ	N
<i>Anthus campestris</i>	Tawny pipit	LC				+	SZ	R
<i>Anthus pratensis</i>	Meadow pipit						SZ	R
<i>Anthus trivialis</i>	Tree pipit						SZ	R
<i>Apus apus</i>	Common swift						/	P
<i>Apus melba</i>	Alpine swift						/	P
<i>Ardea cinerea</i>	Grey heron						/	R
<i>Ardea purpurea</i>	Purple heron	VU				+	SZ	N
<i>Ardeola ralloides</i>	Squacco heron	EN				+	SZ	R
<i>Athene noctua</i>	Little owl	NT					SZ	S
<i>Aythya ferina</i>	Common pochard	LC					/	R
<i>Aythya fuligula</i>	Tufted duck	NT					/	R
<i>Aythya nyroca</i>	Ferruginous duck	VU		NT		+	SZ	R
<i>Bucephala clangula</i>	Common goldeneye				LC		SZ	N
<i>Buteo buteo</i>	Common buzzard						SZ	S
<i>Cairina moschata</i>	Muscovy duck						/	O
<i>Calidris alpina</i>	Dunlin			NT			SZ	R

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Scientific name	Common name	Category of threat				Annex I of Birds Directive	Acts NN 144/13, NN 73/16	Local status
		gn	ngn	pre	zim			
<i>Calidris ferruginea</i>	Curlew sandpiper			NT			SZ	R
<i>Calidris minuta</i>	Little stint			NT			SZ	R
<i>Carduelis chloris</i>	European greenfinch						SZ	S
<i>Charadrius hiaticula</i>	Common ringed plover						SZ	R
<i>Chlidonias leucopterus</i>	White-winged tern						SZ	R
<i>Chrysolophus pictus</i>	Golden pheasant						/	O
<i>Ciconia nigra</i>	Black stork	VU				+	SZ	
<i>Circus aeruginosus</i>	Western marsh harrier	EN				+	SZ	R
<i>Cisticola juncidis</i>	Zitting cisticola	NT					SZ	G
<i>Columba livia f. domestica</i>	Wild pigeon						/	S
<i>Columba palumbus</i>	Common wood pigeon						/	Zg
<i>Corvus corax</i>	Common raven						/	G
<i>Corvus corone cornix</i>	Hooded crow						/	S
<i>Corvus monedula</i>	Western jackdaw						/	S
<i>Delichon urbicum</i>	Common house martin						SZ	R
<i>Dendrocopos major</i>	Great spotted woodpecker						SZ	S
<i>Egretta alba</i>	Great egret	EN				+	/	R
<i>Egretta garzetta</i>	Little egret	VU				+	SZ	R
<i>Emberiza calandra</i>	Corn bunting	LC					/	R
<i>Emberiza schoeniclus</i>	Common reed bunting	LC					SZ	R
<i>Erithacus rubecula</i>	European robin						SZ	Z
<i>Falco peregrinus</i>	Peregrine falcon	VU				+	SZ	N
<i>Falco subbuteo</i>	Eurasian hobby	NT					SZ	N
<i>Falco vespertinus</i>	Red-footed falcon			NT		+	SZ	N
<i>Ficedula hypoleuca</i>	European pied flycatcher						SZ	R
<i>Fringilla coelebs</i>	Common chaffinch						/	S
<i>Fulica atra</i>	Eurasian coot				NT		/	S
<i>Galerida cristata</i>	Crested lark						/	R
<i>Gallinago gallinago</i>	Common snipe	CR	NT				SZ	N
<i>Gallinula chloropus</i>	Common moorhen						/	Gz

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Scientific name	Common name	Category of threat				Annex I of Birds Directive	Acts NN 144/13, NN 73/16	Local status
		gn	ngn	pre	zim			
<i>Garrulus glandarius</i>	Eurasian jay						/	S
<i>Gavia arctica</i>	Black-throated loon				LC	+	SZ	N
<i>Gavia stellata</i>	Red-throated loon					+	SZ	N
<i>Grus grus</i>	Common crane			NT		+	SZ	N
<i>Gyps fulvus</i>	Griffon vulture					+	SZ	
<i>Himantopus himantopus</i>	Black-winged stilt	CR		EN		+	SZ	R
<i>Hippolais pallida</i>	Eastern olivaceous warbler						SZ	R
<i>Hippolais polyglotta</i>	Melodious warbler						SZ	Rg
<i>Hirundo daurica</i>	Red-rumped swallow	NT					SZ	P
<i>Hirundo rustica</i>	Barn swallow	LC					SZ	G
<i>Jynx torquilla</i>	Eurasian wryneck						SZ	G
<i>Lanius collurio</i>	Red-backed shrike					+	/	Rg
<i>Lanius minor</i>	Lesser grey shrike	LC				+	/	R
<i>Lanius senator</i>	Woodchat shrike						/	R
<i>Larus cachinnans</i>	Caspian gull						/	S
<i>Larus ridibundus</i>	Black-headed gull	LC					/	R
<i>Limosa lapponica</i>	Bar-tailed godwit					+	/	N
<i>Lullula arborea</i>	Woodlark	LC				+	/	R
<i>Luscinia megarhynchos</i>	Common nightingale						SZ	G
<i>Mergus serrator</i>	Red-breasted merganser				LC		/	N
<i>Miliaria calandra</i>	Corn bunting	LC					/	Rg
<i>Motacilla alba</i>	White wagtail						SZ	G
<i>Motacilla cinerea</i>	Grey wagtail						SZ	N
<i>Motacilla flava</i>	Western Yellow Wagtail	NT					SZ	R
<i>Muscicapa striata</i>	Spotted flycatcher						SZ	R
<i>Numenius arquata</i>	Eurasian curlew				EN		SZ	
<i>Numenius phaeopus</i>	Whimbrel			NT			SZ	
<i>Nycticorax nycticorax</i>	Black-crowned night heron	NT				+	/	N
<i>Oenanthe hispanica</i>	Black-eared wheatear						SZ	Rg
<i>Oenanthe oenanthe</i>	Northern	LC					SZ	R

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Scientific name	Common name	Category of threat				Annex I of Birds Directive	Acts NN 144/13, NN 73/16	Local status
		gn	ngn	pre	zim			
	wheatear							
<i>Oriolus oriolus</i>	Eurasian golden oriole						SZ	G
<i>Otus scops</i>	Eurasian scops owl	NT					SZ	G
<i>Panurus biarmicus</i>	Bearded reedling	EN					SZ	N
<i>Parus ater</i>	Coal tit						SZ	N
<i>Parus caeruleus</i>	Eurasian blue tit						SZ	S
<i>Parus lugubris</i>	Sombre tit						SZ	N
<i>Parus major</i>	Great tit						SZ	S
<i>Pavo cristatus</i>	Indian peafowl						/	O
<i>Phalacrocorax aristotelis desmarestii</i>	European Shag	NT				+	SZ	S
<i>Phalacrocorax carbo</i>	Great cormorant	VU					/	Z
<i>Phasianus colchicus</i>	Ring-necked Pheasant						/	O
<i>Phoenicopterus ruber</i>	American flamingo					+	/	N
<i>Phoenicurus ochruros</i>	Black redstart						SZ	Z
<i>Phoenicurus phoenicurus</i>	Common redstart	NT					SZ	P
<i>Phylloscopus collybitus</i>	Common chiffchaff						SZ	R
<i>Phylloscopus sibilatrix</i>	Wood warbler	NT					SZ	R
<i>Phylloscopus trochilus</i>	Willow warbler	EN					SZ	R
<i>Pica pica</i>	Eurasian magpie						/	
<i>Picus viridis</i>	European green woodpecker	NT					SZ	S
<i>Podiceps cristatus</i>	Great crested grebe						SZ	N
<i>Podiceps nigricollis</i>	Black-necked grebe	EN					SZ	Z
<i>Prunella modularis</i>	Dunnock						SZ	Z
<i>Puffinus yelkouan</i>	Yelkouan shearwater	DD				+	SZ	R
<i>Rallus aquaticus</i>	Water rail	NT					/	S
<i>Regulus ignicapilla</i>	Common firecrest						SZ	R
<i>Regulus regulus</i>	Goldcrest						SZ	R
<i>Remiz pendulinus</i>	Eurasian penduline tit						SZ	R
<i>Riparia riparia</i>	Sand martin	NT					SZ	R
<i>Saxicola rubetra</i>	Whinchat	LC					SZ	P

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Scientific name	Common name	Category of threat				Annex I of Birds Directive	Acts NN 144/13, NN 73/16	Local status
		gn	ngn	pre	zim			
<i>Saxicola torquatus</i>	African stonechat	LC					SZ	S
<i>Scolopax rusticola</i>	Eurasian woodcock	DD	NT				SZ	N
<i>Serinus serinus</i>	European serin						SZ	N
<i>Sterna albifrons</i>	Little tern	EN				+	SZ	G?
<i>Sterna hirundo</i>	Common tern	NT				+	SZ	G
<i>Sterna sandvicensis</i>	Sandwich tern		NT			+	SZ	Z
<i>Streptopelia decaocto</i>	Eurasian collared dove						/	S
<i>Streptopelia turtur</i>	European turtle dove	LC					SZ	G
<i>Sturnus vulgaris</i>	Common starling						/	R
<i>Sylvia atricapilla</i>	Eurasian blackcap						SZ	S
<i>Sylvia borin</i>	Garden warbler	NT					SZ	R
<i>Sylvia cantillans</i>	Subalpine warbler						SZ	G
<i>Sylvia communis</i>	Common whitethroat						SZ	G
<i>Sylvia melanocephala</i>	Sardinian warbler						SZ	S
<i>Tachybaptus ruficollis</i>	Little grebe	LC					/	S
<i>Tadorna tadorna</i>	Common shelduck						SZ	N
<i>Tringa erythropus</i>	Spotted redshank			LC		+	/	R
<i>Tringa glareola</i>	Wood sandpiper			LC			SZ	R
<i>Tringa nebularia</i>	Common greenshank			LC			/	R
<i>Tringa ochropus</i>	Green sandpiper						SZ	R
<i>Tringa totanus</i>	Common redshank	CR			CR		SZ	R
<i>Troglodytes troglodytes</i>	Eurasian wren						SZ	Z
<i>Turdus merula</i>	Common blackbird						/	G
<i>Turdus philomelos</i>	Song thrush						/	R
<i>Turdus pilaris</i>	Fieldfare	VU					/	R
<i>Turdus viscivorus</i>	Mistle thrush						/	R
<i>Upupa epops</i>	Hoopoe	NT					SZ	Rg
<i>Vanellus vanellus</i>	Northern lapwing	LC					/	N

Table C. List of bats in the Brijuni NP with marked protection status at European level (*IUCN*), and in Croatia (*Red List of Mammals of Croatia 2006*), and in accordance with the Act on Strictly Protected Species (NN 144/13, NN 73/16) the status SZ - a strictly protected species is also categorised. (LC - least concern, EN - Endangered, VU - vulnerable, NT – Near Threatened, DD – Data Deficient).

Latin name of taxa	Common name of taxa	Category of threat		Habitats Directive	Bern Convention	Acts NN 144/13, NN 73/16
		Europe	Croatia			
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat	LC	NT	II, IV	II	SZ
<i>Rhinolophus hipposideros</i>	Lesser horseshoe bat	LC	NT	II, IV	II	SZ
<i>Miniopterus schreibersii</i>	Common bent-wing bat	NT	EN	II, IV	II	SZ
<i>Myotis auraszens</i>	Steppe whiskered bat	LC	/	IV	II	SZ
<i>Myotis capaccini</i>	Long-fingered bat	VU	EN	II, IV	II	SZ
<i>Myotis emarginatus</i>	Geoffroy's bat	LC	NT	II, IV	II	SZ
<i>Myotis mystacinus</i>	Whiskered bat	LC	/	IV	II	SZ
<i>Myotis nattereri</i>	Natterer's bat	LC				SZ
<i>Nyctalus lasiopterus</i>	Greater noctule bat	NT	DD	IV	II	SZ
<i>Nyctalus leisleri</i>	Lesser noctule	LC	NT	IV	II	SZ
<i>Pipistrellus kuhlii</i>	Kuhl's pipistrelle	LC	/	IV	II	SZ
<i>Pipistrellus nathusii</i>	Nathusius's pipistrelle	LC	/	IV	II	SZ
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	LC	/	IV	II	SZ
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	LC				SZ
<i>Hypsugo savii</i>	Savi's pipistrelle	LC	/	IV	II	SZ

Table D. Marine habitats of the Brijuni NP according to the National Classification of Habitats. Endangered and rare habitat types are marked with # and determined according to the Directive on habitat types, habitat map, endangered and rare habitat types and on conservation measures for habitat types (NN 7/06, 119/09).

NCH designation	Type of habitat
F.	SEASHORE
F.1.	Muddy seashore
F.1.2.	Supralittoral muds [#]
F.2.	Sandy seashore
F.2.2.	Suprealittoral sands [#]
F.2.2.1.	Biocenosis of supralittoral sands
F.3.	Gravel seashore
F.3.2.	Supralittoral gravels and stones [#]
F.4.	Rocky seashore
F.4.2.	Supralittoral rocks [#]
F.4.2.1.	Biocenosis of supralittoral rocks
F.4.2.1.3.	Puddles with variable salinity (mediolittoral enclave)
F.5.	Anthropogenic seashore habitats
F.5.1.	Anthropogenic seashore habitats
G.	SEA
G.2.	Mediolittoral
G.2.1.	Mediolittoral muddy sands and muds [#]
G.2.2.	Mediolittoral sands [#]
G.2.3.	Mediolittoral gravel and stones
G.2.4.	Mediolittoral hard seabeds and rocks [#]
G.2.4.1.	Biocenosis of upper rocks of the mediolittoral [#]
G.2.4.2.	Biocenosis of lower rocks of the mediolittoral [#]
G.2.5.	Anthropogenic habitats in the mediolittoral
G.3.	Infralittoral
G.3.2.	Infralittoral fine sands with more or less mud [#]
G.3.2.1.	Biocenosis of fine surface sands [#]
G.3.2.2.	Biocenosis of uniform fine sands [#]
G.3.2.2.1.	Association with <i>Cymodocea nodosa</i>
G.3.2.3.	Biocenosis of muddy sands in sheltered seashores [#]
G.3.2.3.4.	Association with <i>Cymodocea nodosa</i>
G.3.4.	Infralittoral stones and gravels [#]
G.3.4.1.	Biocenosis of infralittoral gravels
G.3.5.	Neptune grass meadows [#]
G.3.5.1.	Biocenosis <i>Posidonia oceanica</i> meadows
G.3.6.	Infralittoral hard seabeds and rocks [#]

NCH designation	Type of habitat
G.3.6.1.	Biocenosis of infralittoral algae
G.3.6.1.20.	Facia and associations of the coralligenous biocenosis (as enclaves)
G.3.6.1.21.	Facies with <i>Chondrilla nucula</i>
G.3.8.	Anthropogenic habitats in the infralittoral
G.3.8.3.	Underwater archaeological sites
G.3.8.6.	Infralittoral communities with invasive species
G.3.8.6.2.	Community with <i>Caulerpa racemosa</i>
G.4.	Circalittoral
G.4.1.	Circalittoral muds [#]
G.4.1.1.	Biocenosis of seashore terrigenous muds
G.4.2.	Circalittoral sands [#]
G.4.2.1.	Biocenosis of muddy detritic seabeds
G.4.2.2.	Biocenosis of seashore detritic seabeds [#]
G.4.3.	Circalittoral of hard seabeds and rocks [#]
G.4.3.1.	Coralligenous biocenosis [#]
G.4.3.2.	Biocenosis of semi-dark caves (as an enclave in the infralittoral) [#]

Table E. List of sites, architectural heritage and monuments of cultural-historical heritage in the area of Brijuni NP.

CULTURAL MONUMENTS		
ARCHAEOLOGICAL HERITAGE		
Land based archeological sites		Period
1	Gromače	neolithic/eneolithic
2	Gradina	bronze/iron age
3	Rankun	bronze age
4	Antunovac	bronze age
5	Straža	bronze age
6	Javornik	bronze age
7	Mali Brijun, north of Sv. Mikula Bay	bronze age
8	Kastrum	1 st C. BC – 15 th -16 th C.
9	Verige	1 st C. BC – 6 th C.
10	Kolci	1 st C. BC – 6 th C.
11	Basilica of St. Mary	6 th Century
12	Church of St. Peter	6 th Century
Underwater archeological sites		Period
13	Verige Bay	1 st - 6 th C.
14	Cape Mrtvi (Moribon)	antiquity
15	Čeprljan Bay	antiquity
16	Sv. Marko	1 st C.
17	Dobrika Bay	1 st – 14 th C.

ARCHITECTURAL HERITAGE		
Religious buildings		Period
19	Church of St. Germaine	1481
20	Church of St. Rocco	1504
21	Church of St. Anthony	14 th /15 th C.
22	Chapel of St. Barbara	1912
Civil buildings		Period
23	Donjon tower	12 th /13 th C. (16 th C.)
24	Turanj Bay, Venitian salt works	Venitian period
25	Venitian Castle	16 th C.
26	Villa Pava	16 th -18 th C.
27	Lighthouse	1870
28	View points (Javornik, Saluga, Opatija)	1900
29	Villa Kupelwieser	1895 – 1899
30	Boathouse	1902
31	Koch's path	end of 19 th , beg. of 20 th C.
32	Čufar's path	end of 19 th , beg. of 20 th C.
33	Madonna quarry	end of 19 th , beg. of 20 th C.
34	Path below Gradina	end of 19 th , beg. of 20 th C.
35	Path below Straža Hill	end of 19 th , beg. of 20 th C.
36	Castle	1910
37	Villa Magnolija	1909 and 1912
38	Villa Perojka	1909/1910
39	Villa Fažanka	1909/1910
40	Steam bath building	1910/1912
41	Hotel Istra, (formerly Neptun II)	1910
42	Hotel Neptun, (formerly Neptun III)	1912
43	Complex of economy buildings	1912
44	Villa Borika	1912
45	Ostrich house, (Villa Robilant)	1911/1912
46	Winter pool	1913
47	Kupelwieser's Rest	1917
48	Villa Lovorka	1931
49	Villa Jadranka	1932
50	Hotel Karmen	1939 - 1942
51	Villa Marica	Italian period
52	Holiday house, Island of Vanga	1955
53	White Villa	1953
54	Villa Primorka	1956
55	Villa Brijunka	1957
56	Villa Dubravka	1956 – 1960
Austro-Hungarian military buildings – Veliki Brijun		Period
57	Fort Tegetthoff	1864/1868
58	Fort Peneda	1898 - 1902
59	Cavarolla Battery	end of 19 th , beg. of 20 th C.

60	Punta Peneda Battery	end of 19 th , beg. of 20 th C.
61	Naviglio Battery	end of 19 th , beg. of 20 th C.
62	Giacone (Đakoni) Battery	end of 19 th , beg. of 20 th C.
Austro-Hungarian military buildings – Mali Brijun		Period
63	Fort Brioni Minor	1895-1902
64	Stretto Battery	end of 19 th , beg. of 20 th C.
65	Kadulja Battery	beg. of 20 th C.
66	Sabbion Battery	beg. of 20 th C.
67	Femina Battery	beg. of 20 th C.
68	Punta Grosso Battery	beg. of 20 th C.
69	Torpedo Battery	beg. of 20 th C.
70	San Nicolo (St. Nicolas) Battery	beg. of 20 th C.
71	Siemens Complex	1886
72	Store houses in the main harbour	beg. of 20 th C.
73	Admiral Tegetthoff Memorial	beg. of 20 th C.
GEOLOGICAL - PALEONTOLOGICAL HERITAGE		
74	Barban, Cape Pogledalo – dinosaur footprints	125-130 mil. years old
75	Zelenikovac, Cape Ploče - dinosaur footprints	100 mil. years old
76	Zelenikovac – bone breccia	100 mil. years old
77	Cape Kamik/Plješivac - dinosaur footprints	100 mil. years old
78	Cape Trstike/Debela glava - dinosaur footprints	100 mil. years old
79	Island of Vanga - dinosaur footprints	
80	Island of Galiža - dinosaur footprints	
81	Island of Vrsar - dinosaur footprints	
MOBILE CULTURAL HERITAGE		
MUSEUM COLLECTIONS		
Archeological department		
82	Prehistoric collection	
83	Antiquity collection	
84	Medieval collection	
85	Stone monuments collection	
86	Kastrum collection	
Cultural - Historical Department		
87	Ethnographic collection	
88	Josip Broz Tito Memorial collection	
89	Photography collection	
90	Collection of hotel cutlery and crockery, useful and decorative objects	
91	Maps and technical drawings collection	
92	Furniture collection	
93	Postcard collection	
94	Sport collection	
95	Print collection	
96	Flag collection	
Natural History Department		

97	Geological-paleontological collection	
98	Mineralogy and petrology collection	
99	Zoological collection	
Art Department		
100	Art collection	
DOCUMENTATION COLLECTIONS		
101	Photos	
102	Slides	
EDUCATIONAL - INTERPRETIVE CENTER "BOATHOUSE"		
103	Herbarium collection	2015
104	Entomological collection	2015
105	Marine invertebrate collection	2015

Table F. Number of inhabitants by year on the Brijuni Islands.

NUMBER OF INHABITANTS					
Year	Obljak	Veliki Brijun	Mali Brijun	Sveti Jerolim	Total on the Islands
1631					50
1741					11
1770					39
1797					14
1880		43	8	32	83
1890				49	49
1900		200-300			200-300
1910	7	333	11		351
circa 1914					700
1931					799
1946					196
1953					277
1961					51
1971					13
1984					4

Table G. An overview of inventory and research projects undertaken in the Brijuni NP.

Inventory and research projects and expert / sector studies	Period
Biological Diversity	
Brummer, F.: Bioraznolikost spužvi i ostalik beskralježnjaka obalnih voda Brijuna. Institut za biomaterijale i biomolekularnu sistematiku, Sveučilište u Stuttgartu.	2015
Grbac, I.: Inventarizacija i kartiranje herpetofaune i vlažnih staništa Brijunskog otočja. Hrvatski prirodoslovni muzej, Zagreb.	2015
Melzer, R.: Dekapodni rakovi Nacionalnog parka Brijuni.	2015
Petricioli, T.B., Kipson, S.: Praćenje temperature mora u Nacionalnom parku Brijuni na postaji na rtu Kamik. PMF, Zagreb.	2015
Tkalčec, Z., Mešić, A.: Raznolikost gljiva Nacionalnog parka Brijuni. Hrvatsko mikološko društvo, zagreb.	2015
Udruga "Animalia": Izvješće o istraživanjima morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima.	2015
Udruga za zaštitu šišmiša Tragus: Fauna šišmiša Nacionalnog parka Brijuni.	2015
Grbac, I.: Inventarizacija i kartiranje herpetofaune i vlažnih staništa Brijunskog otočja. Hrvatski prirodoslovni muzej, Zagreb.	2014
Mihoci, I.: Preliminarni izvještaj po projektu o istraživanju faune leptira brijunskog otočja i izrade ogledne zbirke leptira. Hrvatski prirodoslovni muzej, Zagreb.	2014
Udruga "Animalia": Izvješće o istraživanjima morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima.	2014
Udruga za zaštitu šišmiša Tragus: Fauna šišmiša Nacionalnog parka Brijuni.	2014

Radalj, A., Surina, B.: Morfometričke značajke jaja morskog vranca (<i>Phalacrocorax aristotelis desmarestii</i>) na otocima Galiji i Grunju (NP Brijuni) prema rezultatima istraživanja u 2013. godini. Prirodoslovni muzej, Rijeka.	2013
Grbac, I.: Inventarizacija i kartiranje herpetofaune i vlažnih staništa Brijunskog otočja. Hrvatski prirodoslovni muzej, Zagreb.	2013
Kruschel, K.: Izvještaj o stereo-video istraživanje riba i istraživanje ekologije ribljih zajednica u NP Brijuni (ožujak 2013). Sveučilište u Zadru, Pomorski odjel.	2013
Stagličić, N.: Praćenje učinkovitosti zaštite nacionalnog parka »Brijuni« za priobalne zajednica riba. Institut za oceanografiju i ribarstvo, Split.	2013
Udruga "Animalia": Izvješće o istraživanjima morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima.	2013
Kalan, K., Bužan, E.: Poročilo o terenskom delu v narodnem parku Brijoni v okviru projekta DIVA (komarci, štakori, papatači). Univerza na Primorskem, Inštitut za biodiverzitetne študije, Kopar, Slovenija.	2012
Kruschel, K., Schultz, S.T., Zubak, I.: Izvještaj o istraživanju riba na području Nacionalnog parka Brijuni (proljeće 2012). Sveučilište u Zadru, Pomorski odjel.	2012
Udruga za zaštitu šišmiša Tragus: Preliminarni izvještaj o provedbi projekta „Fauna šišmiša Nacionalnog parka Brijuni“.	2012
Pavoković, G.: Izvješće o istraživanjima morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima 2012. Udruga Animalia, Rijeka	2012
Udruga "Animalia": Izvješće o istraživanjima morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima.	2012
Udruga "Animalia": Izvješće o istraživanjima morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima.	2011
Udruga za prirodu, okoliš i održivi razvoj "Sunce": Monitoring livada posidonije (<i>Posidonia oceanica</i>) u Nacionalnom parku Brijuni.	2011
Franković, M.: Istraživanje i vrednovanje faune vretenaca.	2010
Udruga "Animalia": Izvješće s akcije istraživanja gniježđenja i prstenovanja morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Brijunima.	2010
Udruga za zaštitu šišmiša Tragus: Preliminarno istraživanje šišmiša na području Nacionalnog parka Brijuni.	2010
Stagličić, N., Pallaoro, A.: Preliminarno izvješće o procjeni učinkovitosti zaštićenih morskih područja istočnog Jadrana. Institut za oceanografiju i ribarstvo, Split.	2009
Udruga "Animalia": Istraživanja gniježđenja i prstenovanja morskog vranca <i>Phalacrocorax aristotelis desmarestii</i> na Kornatima, Silbanskim grebenima, Rovinjskom otočju i Brijunskom otočju tijekom 2009. s prijedlozima mjera zaštite.	2009
Udovičić, D.: Determinacija starih stabala maslina na otoku Veliki Brijun. Diplomski rad. Sveučilište u Rijeci, Poljoprivredni odjel, Poreč.	2009
Ševrlica, A.: Determinacija postojećih sorata maslina na otoku Veliki Brijun. Diplomski rad. Sveučilište u Rijeci, Poljoprivredni odjel, Poreč.	2009
Stelko, R.: Monitoring ornitofaune u Nacionalnom parku Brijuni. Brijuni.	2008-2009
Hervat, M.: Rasprostranjenost trpa <i>Holothuria tubulosa</i> GMELIN, 1788 (Echinodermata, Holothuroidea) na širem području Fažane i Brijunskih otoka. Diplomski rad. Sveučilište u Splitu, Sveučilišni studijski centar za studije mora.	2007
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