

# Evaluating the carrying capacity for visitor management in protected areas

Case study  
Danube Delta Biosphere Reserve

**Beneficiary**

**Danube Delta Biosphere Reserve Authority**



**Produced by**

**Association of Ecotourism in Romania**



**In collaboration with**

**Danube Delta National Research and Development Institute**



**Ivan Patzaichin Mila 23 Association**



**WWF**



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## The team

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The study has been coordinated and written by Andrei Blumer (AER).

## Abbreviations

DDBR	Danube Delta Biosphere Reserve
DDBRA	Danube Delta Biosphere Reserve Authority
AER	Association of Ecotourism in Romania

# 1. Context

The object of the current study is the *carrying capacity* of a protected area, using the Danube Delta Biosphere Reserve as a case study, with the Danube Delta Biosphere Reserve Authority (DDBRA) as the beneficiary. This study is correlated with a study concerning the carrying capacity of the Neuburg-Ingolstadt protected area in Germany. Both studies are part of the „DANUBEPARKS STEP 2.0 – Anchoring the Danube River Network of Protected Areas as Platform for Preservation of Danube Natural Heritage” project, Work package 6. Building mutual quality for tourism services – Activity 6.4. Implementing quality: Carrying capacity for visitor management. The project was financed through the SEE Programme 2007-2013 and the Danube Delta Biosphere Reserve Authority implemented it as a partner between 01.10.2012 – 30.09.2014.

The study also includes a previous document concerning the recreation and tourism zoning of the Danube Delta Biosphere Reserve – an excerpt from the Recreation and Tourism Zoning Strategy for the Danube Delta Biosphere Reserve study (2009, AER, Détente, WWF). The recreation and tourism zoning presented in this document is also integrated in the tourism strategy of the Danube Delta Biosphere Reserve Authority (DDBRA). Therefore, the carrying capacity study carries on the process of understanding, improving and monitoring the recreational and tourism phenomenon in the Danube Delta that the Association of Ecotourism in Romania and their partners have developed over the past six years, with the Reserve Authority as main beneficiary.

The carrying capacity study aims to integrate the vision and instruments proposed by Ivan Patzaichin Mila 23 Association’s Opportunity study regarding the development of a sustainable transportation network inside the Danube Delta Biosphere Reserve completed in August 2014. This study is part of the Austrian Environment Agency’s Transdanube project for sustainable tourism and transportation along the Danube. Transdanube is implemented by ADR SE along with 14 partners from six countries and 35 other associated partners and observers and is funded through the SEE Programme 2007-2013, Priority Axis 3: Improvement of the accessibility, Area of Intervention 3.1: Improve co-ordination in promoting, planning and operation for primary and secondary transportation networks. The project’s general objective is to improve the accessibility and quality of transportation services in the Danube region.

## 2. Methodology

The methodology used for developing this study consists of four stages, as follows:

### **A. Defining the scope of the concept of „carrying capacity” for visitor management in protected areas and applying it to the Danube Delta Biosphere Reserve in correlation with the existing tourism zoning.**

The following steps and methods were used to implement this stage:

- a. Writing a quick literature review regarding the „carrying capacity” concept in February-March 2014 and presenting it to DDBRA during the workshop session on 19-20 March 2014.

The authors have written a literature review and analyzed the existing strategies for developing sustainable tourism in the Danube Delta. This is how the concept of „carrying capacity” for visitor management in protected areas and applying it to the DDBR was defined in correlation to the existing tourism zoning of the area.

- b. Initiating the creation of a Work Group in order to develop the *Danube Delta carrying capacity* concept. The following institutions and organizations were invited to participate to the meetings organized during the development of this study: Tulcea County Council (CJ Tulcea), Danube Delta National Research and Development Institute (DDNRDI), „Ivan Patzaichin- Mila23” Association, the World Wide Fund for Nature Romania (WWF) and the Romanian Ornithological Society (SOR). A group of experts was formed, consisting of the project team, DDBRA specialists and 2-3 guest experts.

The group of experts consisted of the following people:

- on behalf of the Association of Ecotourism in Romania: Călin Hodor (biodiversity expert), Victor Mușat (ecotourism expert), Alois Lang (ecotourism and protected areas expert, Neusiedler See NP – Austria) and Andrei Blumer (coordinator, visitor management and ecotourism expert).
- on behalf of Danube Delta Biosphere Reserve Authority: Grigore Baboianu, Gabriela Crețu, Alina Codreanu, Gabriela Morozov și Mirela Nițu.
- on behalf of Danube Delta National Research and Development Institute: Alexandru Doroșencu.
- On behalf of WWF Romania: Cristi Mititelu.

- c. Planning a two-days meeting in Tulcea for agreeing upon the carrying capacity concept and adapting it to the DDBR case study. The meeting took place on 19-20 March 2014.
- d. Contacting the experts contracted by the German partner Danube Riparian Forest Neuburg-Ingolstadt (LKR N-S) – 3-5 March 2014. After establishing contact, the Work Group received the carrying capacity study their experts had written and

analyzed the possibilities of correlating approaches regarding this concept in the two areas.

- e. Planning a two days meeting of the group of experts in order to analyze the tourism zoning of DDBR and defining the first set of basic principles regarding the carrying capacity in each area based on the available information. The meeting took place on 5-6 May 2014.

**B. Identifying a set of indicators used to evaluate the current state of DDBR, by touristic areas, in correlation to the carrying capacity concept, and identifying the specific indicators that can be used to monitor tourism impact (both positive and negative). Developing a methodology for (permanent, long-term) monitoring of the impact of tourism activities in correlation to the carrying capacity assessment.**

The following steps and methods were used to implement this stage:

**B.1.** Using the existing recreation and tourism zoning, the group of experts has defined the types of tourism activities to be conducted inside DDBR and the methods for evaluating the positive and negative potential impact of said activities on the ecosystems/habitats inside the DDBR areas of interest for tourism.

**B.2.** The group of experts identified specific types of indicators (indicator species included) for different areas of interest inside the protected area, correlating them to possible areas of conflict, which can be used to monitor the positive and negative impact of tourism on the ecosystems/habitats inside the DDBR areas of interest for tourism, as well as the impact on local communities and visitors.

**B.3.** Consulting interested local actors within DDBR territory initially took place during the meeting on May 6<sup>th</sup> 2014 (CJ Tulcea, NGO-s, DDNRDI) and continued between 14 and 18 July 2014.

**B.4.** The Work Group completed the first step in establishing the methodology for monitoring the impact of tourism activities and analyzing the state of DDBR in correlation to the carrying capacity concept. An application was developed in collaboration with the experts the German partner had contracted – a matrix for the indicator species and the representative habitats, as defined by its applicability in the DDBR. After studying the types of indicators specific to the Danube Delta, the method proposed by the German partner gains the following new aspects, specific to the Delta:

- a. regarding the ecology component – evaluating the strictly protected areas and defining new types of indicators worth monitoring regarding colonies and habitats;
- b. regarding the social and visitor component – defining new types of indicators to evaluate the positive and negative impact of tourism activities.

**B.5.** Collaboration with the experts contracted by the German partner Danube Riparian Forest Neuburg-Ingolstadt (LKR N-S) started with an online meeting (3-5 March 2014) during which we agreed on a collaboration method and discussed the approach concerning the German study and the state of the online application. On 28-29 May 2014 a field trip took place for on-site research purposes in the Danube Riparian Forest Neuburg-Ingolstadt in Germany, where

the experts analyzed the local approach to visitor and tourism management and how the infrastructure and management of the Danube adjacent area can generate differences in the use of the area's recreational resources. Transportation and accommodation were provided for the AER expert who participated in this field trip.

Another meeting of the work group was organized between 14 and 18 July 2014 to analyze the types of previously proposed indicators and the resource availability for the implementation of an annual monitoring system. On August 31<sup>st</sup> 2014 there was a final consultation meeting in Tulcea, during the workshop „Ivan Patzaichin Mila 23” Association organized to present the *Soft mobility* concept in the Danube Delta.

### **C. Field research and knowledge transfer among the project partners**

The following steps and methods were used to implement this stage:

**C.1.** Research and field trips took place on 28-29 May 2014 in the partner protected area Danube Riparian Forest Neuburg-Ingolstadt (LKR N-S) in Germany and in the months of July and August in the Danube Delta Biosphere Reserve.

**C.2.** Andrei Blumer presented the results of the first work stage of the contract during the Tourism Workshop organized on 28-29 May 2014 in Neuburg an der Donau by the German partner Neuburg-Schrobenhausen. A knowledge transfer among the project partners was achieved and the results were provided to the management authorities of the protected areas in order to evaluate and monitor the impact of tourism activities and visitor management efficiency based on the carrying capacity concept.

### **D. Developing the Study for Assessing the visitor management carrying capacity in protected areas (case study: Danube Delta Biosphere Reserve)**

This stage was implemented through collaboration inside the group of experts in order to integrate all information gathered during the meetings and field trips and from reading the literature review with the purpose of synthesizing the current document.



## 3. Theoretical concepts regarding carrying capacity

### 3.1. Defining carrying capacity

Tourism activities have both positive and negative effects on the destinations where they are carried out. Positive effects on the local economy are often accompanied by negative effects on natural, economic and social resources of the destination and on the quality of visitor experience. Good planning of a tourism activity can provide acceptable balance between of resource conservation and the economic development of the destination.

Visitor management tools for any destination follow two main objectives: minimizing negative effects on destination resources and offering the best recreational opportunities for different types of visitors.

An important indicator of tourism impact on a destination is the *Carrying Capacity*; this is also an important component of tourism development planning and a mechanism for setting standards of sustainable tourism.

**Carrying Capacity** can be defined as the maximum number of tourists visiting a destination at the same time and using its resources without causing unacceptable and irreversible changes of the physical, economic or socio-cultural environment or a decrease in the quality of visitors' experience. Middleton and Chamberlain (1997) define **Tourism Carrying Capacity** as „... *the level of human activity an area can accommodate without the area deteriorating, the resident community being adversely affected or the quality of visitors' experience declining*”.

### 3.2. Short literature review concerning Carrying Capacity concepts

It's inevitable for changes to occur during the evolution of a tourist destination, but applying the concept of carrying capacity enables an effective and efficient estimation of the acceptable directions and levels of change that tourism activity can bring onto a certain destination.

Any form of human activity produces changes in environmental conditions – the aim of the carrying capacity based assessment of a destination is to measure and define the threshold beyond which damages brought on by tourism activity become unacceptable and irreversible. In order to make a proper assessment of the impact of tourism activities, one needs to know the characteristics of the environment in which they take place and especially its *resilience* – *the magnitude of disturbance that natural environment can absorb before altering its balance* (Holling, 1973).

Carrying capacity is therefore related to resilience and was born out of the necessity to measure the level of maximum acceptable impact on the environment (or any of its components) and its capacity to return to its initial state.

The World Tourism Organisation defines Tourism Carrying Capacity as „*the maximum number of people that may visit a tourist destination at the same time, without causing unacceptable and irreversible destruction of the physical, economic, socio-cultural environment or a decrease in the quality of visitors' satisfaction*”. Therefore, Tourism Carrying Capacity can be defined according to physical, environmental and socio-economic components:

- **Physical (ecological) Carrying Capacity** – the threshold over which natural resources of a destination are damaged by tourism; it can be determined by analyzing environment components (such as the amount and availability of water resources, limit values for pollutants, changes in number and behaviour inside the plant and animal communities present in the destination etc).
- **Economic Carrying Capacity** – the threshold over which tourism development becomes economically unacceptable through: a) interference between tourism and other local economic activities – tourism activities obstructing the latter, or: b) reducing tourist demand in the area and decreasing tourism activity due to the perception of discomfort caused by the presence of too many tourists inside one destination.
- **Social Carrying Capacity** – the threshold over which local social and cultural characteristics are influenced and damaged to an unacceptable degree, life quality of the destination inhabitants is no longer guaranteed or conflicts appear between tourists and the local community and/or between different types of visitors.

Starting from the three classical components (environmental, economic and social) presented in the literature, the current study proposes a new differentiation of the carrying capacity into the following three components:

- ecological component;
- visitor component;
- socio-economic component.

The visitor component refers exclusively to the carrying capacity generated by the interaction of different types of visitors; the socio-economic component exclusively covers the relationship between tourism and the local community from a social, cultural and economic point of view.

At the same time, the current study also uses certain essential elements present in the literature, which need to be taken into account during the evaluation of the carrying capacity:

- The impact level of tourism activity does not depend solely on the number of tourists visiting the destination, but also on their behaviour (Ioannides & Billing, 2005; Wagar, 1974) and the characteristics of the local tourism offer.

- Tourism destinations are not defined by a single Carrying Capacity, they are defined by a complex ensemble of Carrying Capacities, determined not only by the availability of natural and physical resources, but also by the characteristics of the management system, by the type of tourism that characterises the area and by other local conditions (Ioannides & Billing, 2005). International practice suggests moving on from asking „How much is too much?“ to asking „How much change from natural conditions is acceptable given the goals and objectives of a destination?“ starting from the Limit of Acceptable Change (LAC) model (Stankey & Cole, 1985). This approach allows using the Carrying Capacity concept not just as a scheme aimed at obtaining a unique value, but rather as a framework composed by a set of standards and criteria able to quantitatively define acceptable changes (Ahn et al., 2002). We can therefore say that defining a carrying capacity value can vary with seasons and visitor behaviour, but it can also depend on the system, which can include: available and usable resources, administration system, seasonal sensitivity etc.

Literature offers several models such as Visitor Impact Management (VIM) (Graefe & Kuss, 1990), Visitor Experience and Resource Protection (VERP) (US Department of the Interior, 1997) and Tourism Optimization Management Model (TOMM) (Manidis Roberts Consultants, 1997), that give a quantitative evaluation of tourism development limits in the destinations and therefore also represent a strategic framework in the process of decision-making for development purposes.

The challenge this study concerning carrying capacity must overcome is defining a conceptual model that can be applied to the particularities of a certain destination by selecting the adequate indicators and defining the relevant standards for each destination. United Nations Environment Programme (UNEP) (PAP/RAC, 1997) emphasizes the fact that a good carrying capacity assessment method must:

- keep in mind the priorities of the targeted area (e.g.: by including local stakeholders and experts in defining local indicators and standards);
- identify local limitations for tourism development by balancing the demand for new infrastructure with the need for environmental protection;
- highlight a set of indicators to be used by all operators and administrators in the tourism sector;
- define destination development scenarios.

In compliance with these recommendations, the current study proposes a carrying capacity assessment methodology defined according to the three key components (ecological, socio-economic and visitor related) and combined with the recreation and tourism zoning applied to the Danube Delta Biosphere Reserve.

### **3.3. Conclusions regarding Carrying Capacity theoretical concepts**

Based on the literature research, the current study proposes the following approach to the Carrying capacity concept:

- a. carrying capacity is a threefold concept with the following components:
  - ecological component
  - visitor component
  - socio-economic component
  
- b. in terms of the impact integrated in the carrying capacity concept, there are four dimensions of this concept:
  - impact generated by the number of visitors correlated to visit length and season;
  - impact correlated to visitor behaviour and visit pattern;
  - impact correlated to the type of tourist and recreation activities and local tourism offer;
  - impact correlated to administration system performance and characteristics.
  
- c. the current approach to carrying capacity cannot generate a quantifiable and comparable numeric value, but the carrying capacity concept will create a framework, generate a long-term instrument and define a set of standards and criteria to approach the destination Limit of Acceptable Change (LAC) model.

## 4. Integrating the carrying capacity concept in the Danube Delta tourism and recreation zoning concept

### 4.1. Short description of the zoning concept

The current study is based on the innovative tourism and recreational approach to the Danube Delta Biosphere Reserve selected from the „Recreation and Tourism Zoning Strategy for the Danube Delta Biosphere Reserve” study (2009, AER, Détente, WWF). This recreation and tourism zoning is also integrated in the DDBRA’s tourism strategy.

Based on this zoning approach, specific characteristics were identified for each zone according to its unique selling propositions (USP) and its specific development opportunities. Tourism and recreational zoning should not be mistaken for nature conservation zoning. The latter is the starting point for discussions about tourism zoning and has the highest priority, and a pre-defined rule is that any planning decision should consider and respect the nature conservation zoning. Therefore, tourism and recreational zoning is both a nature conservation instrument, because it complies with the conservation regulations and it is also a sustainable development mechanism integrating nature conservation into real development options. Furthermore, the current study integrates the carrying capacity concept into the tourism and recreational zoning concept.

Therefore, the foundation of our approach to the carrying capacity concept from the zoning perspective consists of the following core principles:

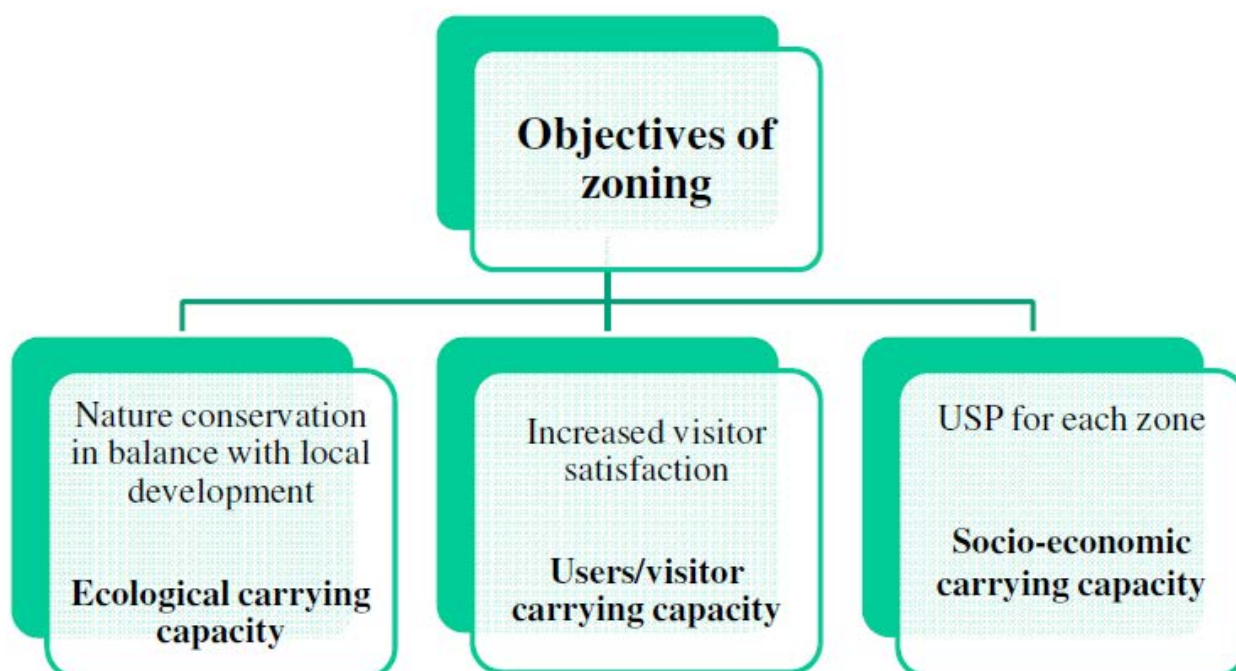
1. **Respecting all the conservation zones (cca. 50 900 ha);**
2. **Promoting the *slow down experience*:**
  - using time (for access) as a filtering factor to different locations/destinations within the Danube Delta;
  - bringing higher valorisation of natural and cultural assets by promoting and developing real ecotourism that:
    - produces significant income on the local level;
    - causes a low impact on nature.
3. **Zoning for managing the fast experience**

The Danube Delta zoning approach in correlation to the carrying capacity concept is defined by the following three common objectives:

1. **Balance nature conservation and local development**, therefore creating the best chances to implement a real long-term conservation policy through tourism and

recreation; this objective is associated with **the ecological component of the carrying capacity**.

2. **Increase visitor satisfaction** by offering the best opportunities for tourists and visitors to choose an area (and its implied services) where they can fulfil their expectations regarding the desired experience; this objective is associated with **the visitor component of the carrying capacity**.
3. **Increase the competitiveness of each area through sustainable development**, which offers opportunities for investments and development, which in turn have the best chances to become sustainable, to lead to fewer conflicts with nature conservation and to consolidate their market position inside the Danube Delta destination; this objective is associated with **the socio-economic component of the carrying capacity**.



The three objectives of tourism and recreation zoning are therefore correlated with the three key components of the carrying capacity concept (Fig. 4.1.)

**Fig. 4.1.** Tourism and recreation zoning objectives correlated with the carrying capacity components.

## 5. Types of tourism activities and their impact

This chapter uses concepts agreed upon in the previously mentioned Recreation and Tourism Zoning Strategy for the Danube Delta Biosphere Reserve study (2009).

### 5.1. Types of experience for users (tourists, visitors)

For a better understanding of the types of user experience, we introduced the *slow versus fast* concept, namely **SLOW versus FAST experience**.

**Slow experience** is based on an activity performed over a longer time frame, with a low resource consumption rate, a small impact on nature and with likely more positive (economic) impact on local communities.

**Fast experience** is the opposite of slow experience and requires a relatively short time frame for experiencing the Delta, often leaving the intrinsic value of the place (nature and culture) as the a mere background for performing certain recreation activities.

**Table 5.1.** Types of experience

Type of experience	Average stay in the Danube Delta	Resource use	Positive impact on local communities
Slow	More than 2 days	Low consumption rate	High
Fast	Less than 2 days	High consumption rate	Low

Low consumption rate means that the overall „quantity” of physical resources used to perform specific activities during the stay in a certain destination is low (e.g. using rowing boats ends up with zero fuel consumption). In comparison with low consumption rate, high consumption rate expresses the large amount of energy and other resources spent in order to enjoy a type of fast experience. For example, a four hour Danube Delta experience in a rowing boat uses zero fuel (slow experience) while a (fast experience) motorised boat can consume up to 160 litres of petrol. Both experiences take up the same amount of time: four hours.

As a result of the zoning study, five different visitor experience types were identified for the Danube Delta, and the slow/fast concept was correlated with each of them.

#### 1. Nature & culture experience (SLOW)

It is defined as a nature and culture orientated experience, based on activities that cause a low negative impact on the natural and social environment. The main feature of this type of experience is defined as SLOW and it leads to a deeper understanding of the assets of the

Delta. It is the *slow* experience that is fundamental for the future of the whole Danube Delta tourism.

## 2. Leisure experience (mainly FAST)

This type of experience is characterised through different ways of spending free time in a relaxing manner, such as: angling, sun-bathing, motorised water activities, etc. It is mainly a FAST form of consuming a tourism destination (predominantly during a short stay, focused on sunny weekends). In some cases it can be a slow experience as well (e.g. week-long angling holidays).

## 3. Active outdoor experience (mainly SLOW)

This type of experience concentrates on outdoor activities, with a certain degree of physical movement that is mainly performed in natural settings. In this case, nature is merely what inspires the activity. Rowing, canoeing, sailing or team building activities are examples that can describe this type of experience.

## 4. Event experience (FAST)

Event based experiences use the natural settings simply as a location where an event can take place. However, nature is sometimes more than just a background, it can motivate the event participants to extend their stay for half a day or take a one-day trip.

## 5. Sightseeing (cruises) (mainly FAST)

This type of experience is based on a relatively fast way of visiting each location, using motorised means of transportation and moving to the next location. Most visitors who prefer this form of „nature experience” are brought to the Delta by national and international tour-operators. Their knowledge of the Danube Delta is very much influenced by the advertisements and marketing messages of the tour-operators, whose main interest is to earn maximum of money within a minimum of time.

**Table 5.2.** Types of experience and resources used

No.	Type of experience	Resources use	Comments
1	Nature & culture experience	SLOW	Should be predominant
2	Leisure experience	Mainly FAST	Angling, sun-bathing, motorised water activities, sunny weekends, Exception – sometimes angling is <i>slow</i> experience



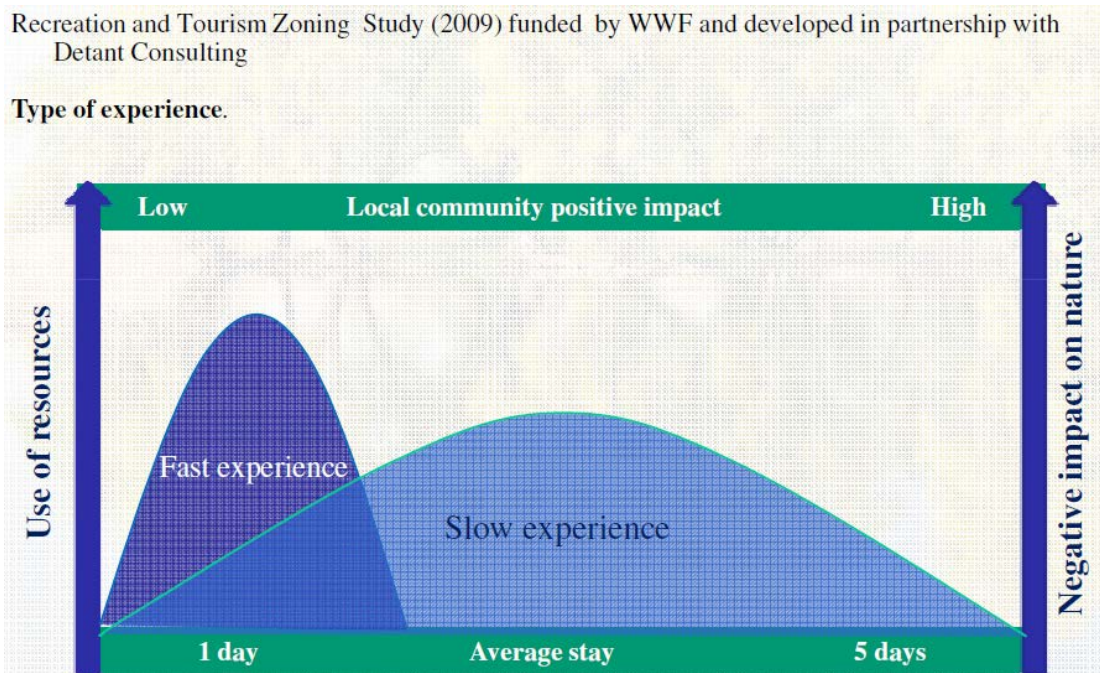
3	Active outdoor experience	Mainly SLOW	Rowing, kayaking, canoeing, sailing or team building activities
4	Event experience	FAST	Events where nature is just background Exception – can motivate for a longer stay
5	Sightseeing (cruises)	Mainly FAST	relatively fast way of visiting each location, using motorised transportation means, and moving to the next location

## 5.2. Evaluating potential positive and negative impact according to the types of experience

Using the previously agreed upon concept of *slow versus fast* tourist experience, the current study operates based on the following principles:

- The *faster* a tourist activity is, the more likely it is that the resource use and the respective negative impact on nature be more significant, correlated with a low positive local impact.
- The *slower* a tourist activity is, the more resource use decreases (concerning both the tourist and the visit time frame); implicitly, negative impact on nature decreases, while positive impact on the local community increases, generated by the increased length of tourist stay and the enhanced use of local services.

Based on these principles, it's extremely important to understand the significance of creating and supporting *slow* tourism programs, while simultaneously increasing the management performance of *fast* programs so that they no longer generate conflict and pressure on neither the ecological and socio-economic component of DDBR, nor on other types of visitors, especially the *slow* type.



**Fig. 5.2:** Positive and negative impact generated by the type of tourist experience (*slow versus fast*)

## 6. Objectives of the current study

The fundamental management and monitoring notions for protected areas presented in the previous chapters create the starting point of the current study, which develops a methodology for monitoring the three carrying capacity components on one hand, and, on the other hand, uses a brief analysis of the current state (generated by the group of experts and the tourism and recreation zoning study) to propose a set of recommendations which can lead DDBR to an adequate management strategy concerning carrying capacity. Based on the DDBR case study, the current study recommends a set of generally applicable measures for the entire DANUBEPARKS network.

The current study has three major objectives:

- defining a set of indicators which will help create a monitoring methodology of the carrying capacity;
- developing a set of recommendations specific to the DDBR which will lead DDBRA to an adequate carrying capacity management strategy;
- developing a set of measures that can be applied to the entire DANUBEPARKS network.

Please note that the current study does not offer to generate a quantifiable and comparable numeric value for the carrying capacity, within the DDBR interim geographic space. The approach presented in the current study creates a framework for the carrying capacity concept and generates a long-term instrument. Therefore, the current situation can be defined by a set of indicators as moment „0” and an annual monitoring process will create the opportunity to understand the tendencies and evolution of various indicators which reflect a certain state of facts in the field. This threefold assessment (based on the three key components) will be the foundation of future analyses, which in turn may generate management decisions.

The following tables contain the set of indicators proposed for defining the carrying capacity of DDBR.

## 7. Set of indicators and monitoring processes

The Work Group has identified four different types of indicators that cover all three components of the concept of carrying capacity:

1. ecological;
2. local socio-economical;
3. users/visitor.

The following table lists the four types of indicators along with the assessment of the significance and justifications for each indicator. *The importance* was defined by the experts according to the relevant information brought by the indicator in the context of evaluating the carrying capacity. Also, a correlation between the relevance of the information provided and the complexity and difficulty of collecting information generated by indicator was made.

The table presents the full set of indicators, both with high and medium importance, but the recommendation in this study is to address and elaborate on the monitoring indicators identified as having *high importance*.

**Table 3.** Types of indicators

No.	Type of indicator	Importance	Justification
<b>Ecological carrying capacity – Species and habitats indicator</b>			
A.1.	Water bird colonies – breeding season March - July	<b>High</b>	Important barometer of the impact of recreational and tourism activities on populations of colonial waterbirds.
A.2.	White tail eagle nests ( <i>Haliaeetus albicilla</i> ) – breeding season February - June	<b>High</b>	Idem A.1. Influence of leisure activities and tourism on a flagship species.
A.3.	Water lily covered surfaces (National classification: R2207 habitat Danube Communities with <i>Nymphaea alba</i> , <i>Trapa natans</i> , <i>Nuphar luteum</i> și <i>Potamogeton natans</i> , Natura 2000 correspondence: 3160 Natural dystrophic	<b>High</b>	With this type of indicator the channels traffic flow and the impact on aquatic floating vegetation can be monitored.

	lakes and ponds)		
A.4.	Endemic plants / rare plants, eg.: sand bindweed ( <i>Convolvulus persicus</i> ) in the Sf. Gheorghe-Sulina area	<b>High</b>	Measuring the impact of development and recreational activities on the coastal zone.
A.5.	Meadow viper ( <i>Vipera ursini moldavica</i> ) - Letea, Sf.Gheorghe, Periteasca, Perișor - April-October	<b>High</b>	Measuring the impact on habitat, generated by a series of activities and expanding the habitable zones (urban).
A.6.	Fish	<b>High</b>	Requires monitoring anglers.
A.7.	Letea & Caraorman Forest	<b>High</b>	Requires an integrated approach and develop a specific set of indicators to assess the impact of recreation activities.
A.8.	Fixed marine coastal dunes with herbaceous perennial vegetation (gray dunes) priority habitat 2130, during June-July	<b>High</b>	Requires monitoring the priority habitats in the beach area.
A.9.	Turtoise ( <i>Testudo graeca</i> ) – Vadu, Istria, Dolosman	<i>Medium</i>	Although it is an important species, it generates a highly relevant indicator for the tourism impact. Possible causes that generate negative impact: upgrading roads without taking into account the presence of this species in the area. Possible measures that could be implemented to avoid or minimize the negative impact: - verifying the hypothesis that tourism has a negative effect on the habitat; - management measures - reducing traffic, creating passages in order for the tortoise to cross.
A.10.	Terapin ( <i>Emys orbicularis</i> )	<i>Medium</i>	Idem A.9.

A.11	Sturgeon	<i>Medium</i>	<p>The possible type of indicator is difficult to measure under the present conditions.</p> <p>Possible tools to avoid or minimize the negative impact:</p> <ul style="list-style-type: none"> <li>- monitoring program related to tourism;</li> <li>- monitoring the menus in restaurants;</li> <li>- interviews.</li> </ul>
A.12.	Moulting bird period - June-July	<i>Medium</i>	<p>Possible type of indicator is difficult to quantify although the subject is of particular importance.</p> <p>Some bird species are vulnerable because they cannot fly in this period.</p> <p>Possible tools to avoid or minimize the negative impact:</p> <ul style="list-style-type: none"> <li>- Educational measures for service providers and tourists;</li> <li>- Diversification and providing alternative offers.</li> </ul>
A.13.	Large bird flocks on lakes - all year round (feeding, resting)	<i>Medium</i>	Idem A.12.

Ecological carrying capacity – Strictly protected zones			
B.1.- B.20.	<p><b>Strictly protected zones:</b></p> <ul style="list-style-type: none"> <li>- Roșca-Buhaiova</li> <li>- Letea</li> <li>- Răducu</li> <li>- Nebunu</li> <li>- Vătafu-Lunguleț</li> <li>- Caraorman</li> <li>- Sărături-Murighiol</li> <li>- Erenciuc</li> <li>- Popina</li> <li>- Sacalin-Zatoane</li> <li>- Periteasca-Leahova</li> <li>- Capul Dolosman</li> <li>- Grindul Lupilor</li> <li>- Istria – Sinoe</li> <li>- Grindul Chituc</li> <li>- Rotund</li> <li>- Potcoava</li> <li>- Belciug</li> <li>- Insula Ceaplace</li> <li>- Prundul cu Păsări</li> </ul>	<i>Medium</i>	In general the impact of tourism on strictly protected areas is reduced. Monitoring these areas will be continued by the field agents.
Socio-economical carrying capacity			
C.1	Land ownership - outsiders	<b>High</b>	Important type of indicator showing the development profile of the area, generated by non-local interference.
C.2	Abandoning the local architecture (Mila 23, Crișan, Uzlina)	<b>High</b>	This indicator can measure, on one hand the positive impact generated by tourism by reintroducing local architecture, but also the negative impact of local architecture degradation, having impact on the tourism potential of the area.
C.3	No. bed nights per type of accommodation	<b>High</b>	Some of the few indicators that measure the efficiency of tourism infrastructure.

C.4	Unregistered accommodation	<i>Medium</i>	Difficult to quantify in the current context.
C.5	The impact generated by the sturgeon prohibition - Sf.Gheorghe.	<i>Medium</i>	It is difficult to identify a specific indicator, although prohibition remains an important issue in the context of local socio-economic environment.
<b>User/visitor carrying capacity - Impact indicators of forms of leisure or tourism to other types of tourism</b>			
D.1	Motorised – water vehicles	<b>High</b>	Indicator showing a major importance of the impact of leisure activities.
D.2	Small planes traffic - Sf.Gheorghe	<b>High</b>	The emergence of a relatively new trend of visiting Danube Delta with possible major impact; it is necessary be monitored.
D.3	ATV / enduro - Chituc, Portița, Sf.Gheorghe, Sulina	<i>Medium</i>	It is a matter of great importance, but difficult to monitor and quantify. It is recommended to assess the situation through field agents with interviews with locals and direct observations.
D.4	Camping - regulations	<i>Medium</i>	Idem D.3.



In the following is a very brief overview of each type of indicator which was regarded as being important in this study to be monitored.

**A1. Water bird colonies – breeding season March - July**

Monitoring this indicator will be achieved by selecting colonies relatively close to trails that are most exposed to the negative impacts of tourism. Monitoring selected colonies will be done according to specific methods described in detail in the literature (Bibby et. all. Ferns, et. all., Gilbert et. all, Koskimies et. all, Musil et. all.). It is particularly important that the assessments are multiannual in order for the data can be compared and to be able to determine the size of the impact in the most objective approach.

**A2. White tail eagle nests (*Haliaeetus albicilla*) – breeding season February - June**

To monitor this indicator the information from previous studies as a reference specialist will be used. As in the colonies, pairs (or their nests) will be selected close to the trails that are most exposed to the negative impact of tourism. Monitoring selected colonies will be done according to specific methods described in detail in the literature (Bibby et. all, Gilbert et. all, Mikuska, T.). It is particularly important that the assessments are multiannual in order for the data can be compared and to be able to determine the size of the impact in the most objective approach.

**A3. Water lily covered surfaces (National classification: R2207 habitat Danube Communities with *Nymphaea alba*, *Trapa natans*, *Nuphar luteum* și *Potamogeton natans*, Natura 2000 correspondence: 3160 Natural dystrophic lakes and ponds)**

To monitor this indicator the main routes for motor boats will be chosen and the lily-covered areas will be charter Afterwards a sample of areas covered with water lilies will be selected and their evolution over time in terms of the area covered by this type of habitat will be monitored.

**A.4. Endemic plants / rare plants, eg. Sand bindweed (*Convolvulus persicus*) in Sf. Gheorghe-Sulina area**

These endemic plants will be monitored along beach sections from the point of view of the recreational use. Hence, a quantitative monitoring of certain areas of evidence in areas with recreational use will be used and a comparison with other sample surfaces of sections of beach in natural areas will be carried out.

**A5. Meadow viper (*Vipera ursini moldavica*) - Letea, Sf.Gheorghe, Periteasca, Perișor - April-October**

A monitoring program for these species will be conducted in particular along the access roads that cross the favourable habitat of the species. This will monitor the number of copies of viper that were killed on the section of the studied road.

**A6. Fish**

This indicator will be monitored by assessing the quantity and distribution of anglers.

**A7. Letea & Caraorman Forest**

These two reserves have a special appeal to the delta. It is necessary to develop a monitoring plan dedicated to these areas which should include biodiversity issues as well as those of visitor management.

### **A8. Fixed marine coastal dunes with herbaceous perennial vegetation (gray dunes) priority habitat 2130, during June-July**

A monitoring program of this habitat is necessary. A ground survey method will be applied in order to make a quantitative evaluation of this type of habitat on the field. Being an interest conservation priority habitat the site surface (quantitative indicator) will need to be monitored in order to observe the possible variations in time.

### **C1. Land ownership - outsiders**

This indicator can be monitored by assessing the number of non-residents who have or acquire properties in the Danube Delta. One such indicator can be monitored once a year by taking from every municipality the mentioned information.

### **C2. Abandoning the local architecture (Mila 23, Crişan, Uzlina)**

To monitor this indicator requires prior identification with traditional houses in each village and then annually monitor their condition. Also monitoring the accommodations is necessary in order to identify how many of them are using traditional architectural elements.

### **C3. Number of bed nights per type of accommodation**

This extremely important indicator for assessing tourism in the delta can be estimated by taking a sample of the existing accommodation units and obtain accurate data every year: the number of nights that will be divided to the number of beds for each rated accommodation. This study proposes to cover at least two types of accommodation: small (up to 30 beds) and large structures (larger than 30 beds).

### **D1. Motorised – water vehicles**

This indicator should be subject to prior regulations implementing a monitoring access in the Delta of recreational motorised boats through the licensing and completion of a short course offered by DDBRA. It is also recommended monitoring traffic on certain days of the year in some sections, on the routes for motorised boats.

### **D2. Small planes traffic - Sf. Gheorghe**

This information can be obtained from the traffic control flight from the Delta area and it is desirable to monitor the various days of the high season and low season.

These indicators will provide information that will form the basis of an analysis of the Delta state. Monitoring indicators must be based on a protocol that is extremely important to be maintained from year to year so that the information can be analyzed and compared in order to observe the annual change of the Delta. This analysis should be completed and correlated with the results of monitoring inputs and the major flow of visitors in the Delta.

### **Monitoring incoming visitors and tourist flow**

Monitoring will be performed through a quantitative and qualitative analysis. Data will be collected, interpreted and subsequently correlated with the results of the analysis of the information gathered from the previously mentioned indicators.

The current study proposes a method based on the direct observations of the monitoring agents (DDBRA agents, volunteers etc), who will benefit from training beforehand, with relatively low costs for initiating and operating this system. This method could be

supplemented by a monitoring system for boats equipped with GPS and an IT interface for collecting and analyzing data. Here is a brief presentation of the monitoring methodology:

1. Create a system to monitor incoming visits in the Danube Delta through a quantitative analysis collecting integrated data from:
  - a. water transport;
  - b. entry passes to the DDBR;
  - c. counting the number of boats and estimating the number of visitors leaving the Danube Delta through the main exit points;
  - d. counting the number of boats crossing certain sections of monitored routes.

This method involves monitoring conducted over the period of one year, during which certain days will be designated for data collection through field research and direct observations (e.g. high season/low season, weekdays and weekends, sunny days and cloudy/rainy days).

2. Run a qualitative analysis based on visitor interviews taken by the monitoring agents. Data collection will be based on 10-15 minutes long interviews with DDBR visitors, taken on the same dates designated for monitoring incoming visitors to the Delta.

Depending on the human and financial resources on hand, the monitoring system can be more or less complex, but the base monitoring system should be applied yearly, measuring the same type of indicators each year and collecting data that can be compared to its predecessors. If this basic condition is not satisfied, the resources used to run this kind of monitoring will be wasted and no useful information will be obtained.

## 8. Recommendations based on zoning for tourism and recreation

The following chapter presents the eight zones identified in the study “Recreation and Tourism Zoning Strategy for the Danube Delta Biosphere Reserve – A tool for nature conservation and local development” –along with their characteristics.

Each of these areas is assigned a set of actions proposed in the previous study and added the actions proposed in the current approach. Sound implementation of such actions lead to a better visitor management and to an tourism offer that is both for DDBRA conservation objectives and for the increase in the social and economic effect benefits to local communities, especially in the tourism sector.

### 8.1. Crişan Zone

#### Current state & visitor experience

At present, the Crişan area has visitors and tourists coming both from the international market, as well as from the domestic market. They are looking for a pure experience of the Danube Delta, being attracted by:

- bird watching and Delta culture for international tourists;
- angling / fishing (domestic tourists).

#### Vision and objectives

Crişan should become **the main destination for the *slow nature experience* type of tourism.**

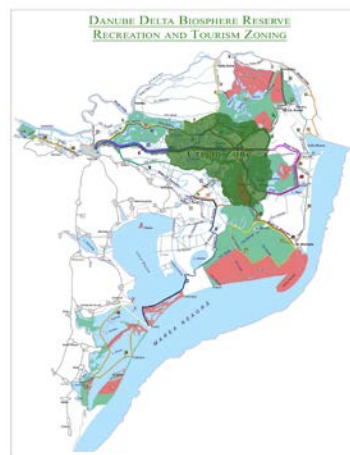
The main objectives for this zone are:

1. Establishing / enhancing the right type of infrastructure that would trigger only slow nature experience;
2. Developing and promoting tourism activities and services that will integrate into slow nature experience.

#### Recommendations

A couple of instruments have been identified which need to be used in parallel in order to reach the objectives of this zone, such as:

1. **steering the visitor flow and thus the stress distribution on habitats**, using:
  - a) filters, such as time and accessibility – decreasing the accessibility in term of physical access to some areas (e.g. “semi-natural” blocking of the access) or the time needed to access those areas (e.g. allowed only without motorised vehicles for tourists, eg. Lake Iacob zone, the channel behind the village, alongside the Danube);
  - b) implementing a regulation policy, at the local level, developed in partnership between DDBRA, the local municipality and local tourism



entrepreneurs, based on an agreed carrying capacity in each area of the Crişan zones. This needs to be enforced by

- the land use plan;
  - regulations for boats access routes according to the type of boat by DDBRA in partnership with the local municipality and local tourism enterprises (local association).
- c) developing and diversifying the local tourism offer starting from the following development framework:
- Crişan locality - the main hub of ecotourism in the Delta and one of the main starting points in non-motorised tour boats (kayaks or *canotca* – a combination between a *lotca* and a canoe, designed by Ivan Patzaichin – Olympic canoe champion), starting from the programs offered in the area by the owners of guesthouses and the Rowmania Ecotourism Centre for non-motorised visitors;
  - Mila 23 – offer of local cuisines offer combined with fishing tourism (participation in traditional harvesting fish with specially designed boats for tourism), combined with the possibility of an introduction to the Lipovan culture and also the rediscovery of the Romanian rowing champions who stam from here;
  - Caraorman locality – an opportunity to discover the Delta, providing a combination of bird sanctuary, arranged as a place of observation and understanding of the Delta’s birds.

**2. building a local partnership between DDBRA, the local municipality and local tourism entrepreneurs, through:**

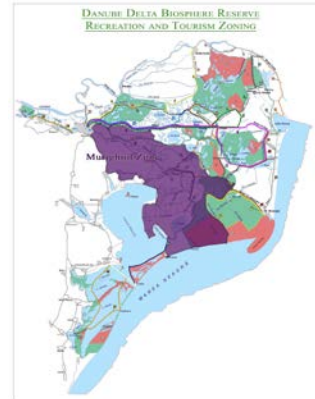
- a) assistance in funding access, product development and marketing;
- b) identifying and integrating local products into the tourism offer of Crişan zone;
- c) branding and labelling the whole zone as a *slow nature experience* destination in order to attract the right type of tourists and investors;
- d) facilitating the development of a local tourism association, developing its capacity and creating a partnership between the association and the local municipality;
- e) professional training for guides, guesthouse owners and boat drivers;
- f) legalizing and organizing camping and recreational-sport fishing in specially designated areas;
- g) identifying the optimal locations for nature observatories (hides), and legalizing the construction of these observatories (some accessible by bike / walking, and others by boat);
- h) developing a recreational/interpretational open air centre in the village and creating the link with the existing visitor centre. The open air centre should be on the village bank of the river (opposite from the visitor centre) and be designed to attract local people and tourists, too.
- i) re-building and updating the interpretation of the visitor centre;
- j) continuing modernizing the interpretation of the following visitor centers and their development into a communication and motivation place for visitors: DDBRA Center in Crişan, Rowmania Ecotourism Centre from Crişan, Caraorman bird sanctuary and the Gastronomic and rowing history centre from Mila 23.

## 8.2. Murighiol Zone

### Current state & visitor experience

Murighiol zone offers two different major experiences at present:

- a. **the traditional entrance gate** for a large number of domestic tourists that travel in small groups (e.g. families, friends) and have two main motivations to enter the Delta through Murighiol:
  - i. camping in the Murighiol surroundings (using or not using the private camping sites);
  - ii. accessing more remote destinations (especially Sfântu Gheorghe), where they spend a longer vacation time. They use Murighiol for parking their car, and they head towards their final destination: camping in nature, using their secondary residences (weekend houses) or local accommodation.



For these types of tourists, the main activity is fishing (angling). They are using either their boats or they rent boats from locals (with or without driver).

- b. **the weekend destination** that has recently developed and covers the localities Dunăvățul de Jos, Mahmudia and Uzlina. Weekend tourists use the already existent accommodation structures. They are in couples or small groups, and mainly travel from large cities, such as Bucharest.

### Vision and objectives

The vision for this zone is to become *a well-managed intensive recreation zone*, with two major objectives:

1. Strict management of the entire recreation spectrum and the activities related to that;
2. Slowing down the rhythm of the (weekend) visitor experience and diversifying the offer in favour of local people's income.

### Recommendations

Three different sets of instruments have been identified for the above mentioned vision, such as:

1. **regulations for a better planning and control of the spatial distribution of weekend visitors and tourists**, which will favour the tourists' concentration in less sensitive areas, using a sub-zoning system for Murighiol zone. The sub-zoning must consider:
  - a. traffic regulations by engine capacity and boat speed; the type of boat and the boat driving behaviour during navigation; regulated and controlled access;
  - b. authorised, legal camping and fishing locations.
2. **diversifying, specializing and improving the quality of the tourist services, in order to develop a coherent offer and diverse tourist packages for this zone.**

To **diversify** the offer, additional tourism products need to be developed:

- a. bird-watching tours on the banks of Danube, Sărăturile and Plopului;
- b. winter fishing / angling (October to December);
- c. integration of traditional local gastronomy into the tourist offer, and developing a traditional fish market during summer, along with other traditional products.
- d. integrating the cultural-religious offer in the Murighiol area tourism offer.

For **specializing and increasing the quality** of the services, special training programs need to be implemented, targeting the most important service providers:

- a. local professional guides specialized in bird watching;
- b. the owners of local guesthouses;
- c. the owners of boat companies;

To **improve the quality** of the tourism offer, special attention has to be paid to boat related issues, such as:

- a. the development of an incentive policy for promoting rowing boats, electrically propelled boats and low power engine boats, aiming at decreasing the pressure from heavy motorised boats and slowing down the forms of nature experience;
- b. the establishment of rental stations for rowing or low power engines or electrically propelled boats (with or without driver);
- c. identification of optimal locations for nature observatories, and legalizing the construction of these observatories in the Sărături area and small observation points together with mooring and walking platforms on suspended lake trails in southeast of Lake Uzlina and northwest of Lake Isaac;
- d. the development of a public transparent offer – including a specific website – for boat riding (taxi boats, shuttles) with determined itinerary, time duration and prices.

3. **supporting local communities** can contribute to reach the zone's objectives. Following that, two major instruments have been proposed by the members of the Work Group, such as:

- a. assistance for setting up local associations for fishermen in the traditional fishing areas;
- b. Establishing a local Fish Market in Murighiol;
- c. support for a local tourism initiative (e.g. accommodation units), enabling its members to develop and to place their offer on the market;
- d. Positioning Murighiol as a family destination;
- e. Assisting Mahmudia to become a young people`s destination;
- f. Assisting a steered camping development;
- g. Assisting local cultural life to become integrated into the tourism offer (local festivals etc);
- h. Developing a *falaise* promenade along the Sf. Gheorghe channel correspondent to Mahmudia locality.

The instruments described have to be implemented in a partnership between the local municipality, DDBRA and the local business initiative.

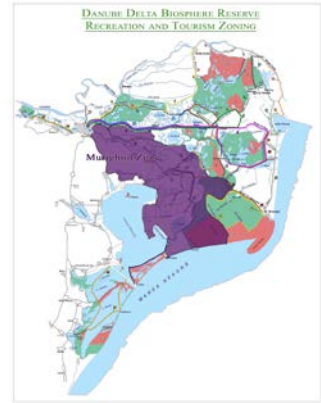
## 8.3. Jurilovca Zone

### Current state & visitor experience

Within Jurilovca zone, Portița is the most famous attraction as a summer destination, with its traditional “3S” offer: *sun, sand and sea*, attracting Romanian tourists who enjoy the beach.

The other major attraction is related to a cultural site: Enisala, with the ruins of the nearby old citadel, build by the Byzantine imperial power and by the Genovese commercial power in the end of the XIII century and in the beginning of the XIII century, that is mainly visited by tourists passing by car on the main road (Jurilovca – Tulcea).

Razim Lake is the third attraction, used frequently by weekenders on their motor boats during summer, which has been reported as an increasing pressure on the bird populations along the lake’s shoreline.



### Vision and objectives

The USP of Jurilovca zone stands in experiencing the Delta from the terrestrial side. Therefore, Jurilovca can become a *manifold and multiple season destination*, with a diversified offer for two main seasons.

The objective of this zone is to develop it in a two main season offer, namely:

#### A. *Summer:*

- a. for leisure experience at Portița – relaxing “3S”: sea, sand, sun (helio-marine treatment);
- b. culture tourism centred on the archaeological attractions;
- c. the walking and cycling destination of the Danube Delta.

#### B. *Winter:*

- a. a bird watching destination on Razim area, as an alternative to hunting (with its low exploitation);
- b. nature photography (digi-scoping).

### Recommendations

For developing the *summer destination*, a few instruments based on concrete projects should be implemented, such as:

- a. developing the public harbour in Portița;
- b. developing an information point of DDBRA in the village Jurilovca (at present, it is designed to be at Portița);
- c. designing cycling and walking routes from Capul Neagru up to Jurilovca (for non-motorised use only) and routes for motorised traffic up to Ceamurlia;



- d. defining and signposting a walking & motorised tour Enisala – Capul Dolosman – Istria, with a strong component of cultural interpretation;
- e. including the pilgrimage in the tourist offer of Jurilovca area;
- f. exploitation of the area ethnical diversity : Lipovans.

In order to create the *winter component* of Jurilovca destination, specialized training has to be provided to the specific target groups, and products have to be identified and put into practice:

- a. Birding tour offer: guides, accommodation owners;
- b. Traditional and new culture events integrated into the tourism offer.

In terms of tourism infrastructure development and tourism offer development, the following actions must be performed:

- Identifying the optimal locations for appropriate observatories (hides);
- Legalizing the construction of these observatories - some accessible by bike / walking, and other by boat;
- Legalizing the access in the Wolves Grind and in Chituc-Periboina Grind by bike and by walking.

## 8.4. Sfântu Gheorghe – Sulina Zone

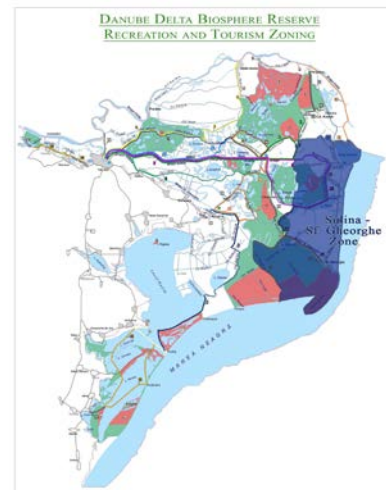
### Current state & visitor experience

**Sfântu Gheorghe** is related to three main experiences, such as:

- a. 3S (sun, sea and sand) in a somewhat *traditional* and yet *exotic* summer destination, attracting a different type of tourist as compared to the traditional Black Sea resorts;
- b. the “traditional, authentic fisherman village experience”;
- c. the “Anonymous Film Festival”, taking place there for 10 days each summer.

**Sulina** is linked with two major tourism experiences:

- a. 3S (sun, sea and sand);
- b. cultural heritage – the history of Sulina related with its “porto-franco” (free-harbour) status and the Danube European Commission history with its socio-cultural influence on the place.



### Vision and objectives

The proposed vision for the development of this zone is to become a ***different sun-sand-sea destination with a specific blend of attractions formed by the beach, the culture of the Delta (heritage and rural life) and its nature (sea delta)***. The motto of this zone should invite the guests to experience ***the “Old River and the Sea”, based on an authentic fishermen village***

***(Sfântu Gheorghe) or on sand and history in Sulina, altogether in a unique natural setting that also facilitates bird watching.***

The unique selling proposition (USP) for this zone is a mosaic of cultures (urban as well as traditional fishermen's culture) and nature with the local fresh water habitats.

The main objectives for this zone are presented below:

- a. to integrate the bird watching offer into the attraction of the area, redistributing the visitor flow into less sensitive areas;
- b. to increase the attractiveness of the cultural component of the zone;
- c. to highlight the unique locality of the interconnection of the Black Sea with the Delta as the major feature for natural and socio-cultural tourism.

### **Recommendations**

In order to integrate **bird watching and other nature related activities** into the local tourism offer and to direct the visitor flow towards less sensitive areas, a few instruments are proposed below:

- a. developing bird watching programs in Sulina – centred on the Golful Musura area – and building a bird watching tower within this area;
- b. building a wildlife observation tower in Câșla Vădanei that can serve both tourists who travel on the water to get there and those who walk in that area;
- c. developing the connection Sulina – Sf.Gheorghe as a basis for a diversified offer for walking/cycling/bird watching/canoeing;
- d. decreasing the tourist pressure (based on bird watching activities) onto the Sacalin area by
  - i. redirecting the tourist flows to other areas of great potential: Roșu, Roșuleț, Casla Vădanei-Sărățuri, beyond the Sfântu Gheorghe village;
  - ii. establishing a bird watching tower on the way to Sacalin - Zătoare, creating a “honey-spot” to steer the tourists only up to that point;
- e. restoration of fish farming in the area (Protected Area Ceamurlia), opening of the area to angling tourists;
- f. implementing the restoration project thus developing new bird watching areas;

To highlight the **cultural** component of the zone, the following instruments have been proposed:

- a. implementing an integrated culture restoration project for both locations: Sulina and Sfântu Gheorghe;
- b. implementing building regulations in both settlements;
- c. opening a museum out of the water treatment plant in Sulina;
- d. identifying and implementing measures to increase the exploitation out of tourism for the inhabitants of Sulina;
- e. including authentic traditional food in the local restaurants' offer;
- f. opening the zone for sailing boats by building a tourism harbour in Sulina, replacing the shipyard;
- g. developing a series of cultural events related to history, for example Europolis Festival, featuring the European dimension of Sulina, or an ethnic festival dedicated to various minorities who have been living in the area.

Highlighting **the importance of the Black Sea** in contact with the Danube, this zone can clearly add a substantial tourism value both for nature experience as well as for visitors spending their leisure time. This can be mainly performed through the following major instrument:

- Building a modern visitor centre in Sulina dedicated to the natural, cultural and socio-economical components of the Pontic and fluvial-marine area (the marine Delta) from DDBR; moreover, the European dimension of Sulina can be picked out as a central theme for being communicated to visitors.

## 8.5. Chilia Zone

### Current state & visitor experience

At present, fishing (and hunting) is the main attraction for domestic tourists and visitors in this zone. Besides the impressive church and the reed (**Bulrush, *Typha***) waving workshop, no other attraction could be spotted in the area now.

### Vision and objectives

This zone can play the role of understanding **the “highland” (continental part) of the Danube Delta (the Fluvial Delta), getting the sense of the geomorphology of the Delta and at the same time can prove how active nature management and restoration can support the development of ecotourism by a local community.**



The main objectives for the zone are:

- a) diversifying the tourism offer including the specific landscape of the Fluvial Delta and the local food products (agricultural and zoo technical);
- b) integrating wetland restoration as an asset for tourism;
- c) positioning Chilia as the link with the Ukrainian part of the Danube Delta.

### Recommendations

For **diversifying the offer**, the report proposes the following instruments:

- a. developing a local-product-based destination:
  - i. it is almost the only place in Danube Delta where vegetables, cheese and other food products can be supplied directly from the locals;
  - ii. developing a product centred on the *Russian spa* tradition is still present in the village: warm bath.
- b. replacement of local label dairy products like "Sibiu cheese" with a local brand "Delta cheese type";
- c. opening the bicycle route from Tulcea to Chilia and linking it with the route to Sulina;

- d. exploiting the monumental church (similar to the one in Germany, at Donaueschingen, close to the source of the Danube);
- e. pilgrimages to religious sites in the area (especially in Stipoc or St. Athanasius monastery);
- f. opening the border crossing with Ukraine for developing a trans boundary Delta tourism offer, with strict regulations in terms of goods traffic;
- g. developing a bird watching and angling tourism product in the former restored agricultural establishments in Babina and Cernovca through opening a channel-access into the reed, under a controlled visitor management (project to be designed in cooperation between DDNI & DDBRA as an integrated reed and visitor management project);
- h. completing the route no. 3 (Tulcea – Stipoc Channel - Chilia Veche –Tulcea) having the possibility to visit the Mila 23 locality also, on an adjacent route on Eracle Channel – Dunărea Veche – Mila 23 – Olguța Channel.

Integrating the **wetland restoration with the existing tourism offer** can be achieved through the following:

- a) creating bird watching sites with managed water level – implementing the project promoted by the Romanian Ornithological Society (SOR), the World Wide Fund for Nature (WWF) and Tulcea County Council;
- b) development of existing infrastructure by identifying optimal sites for nature observatories, legalization and construction of these observatories.

## 8.6. Vadu - Corbu Zone

### Current state & visitor experience

At present there is an uncontrolled camping ground on the Vadu beach, lacking any infrastructure and valorisation for the local people; an extensive seaside resort is planned, threatening both the ecotourism development (based on a well-managed camping site) and the coastline habitats.

### Vision and objectives

*Vadu can become a managed nature camping destination, with benefits for local community development. In addition to that, the place offers good opportunities for specialized bird watching.*

### Recommendations

A series of instruments have been identified below in order to reach the recreation and tourism objectives of this zone:

- a. legalizing and controlling the camping tourism on the beach (Corbu beach in the south of the military base - officially known as low impact beach with basic camping facilities and the Vadu-Chituc area - last wild marine coastline from Romania - beach with legal camping in certain areas/exploitation of existing constructions/in use);
- b. building up dry toilets and introducing a waste management system for the beach area;
- c. offering the opportunity for tourists to stay overnight in the villages;

- d. increasing the capacity for the community to develop local guesthouses (providing access to available funding schemes);
- e. developing and implementing a regulation in partnership with local municipality and DDBRA focusing on the access of visitors with motorised vehicles (weekend-sports and leisure activities) restricting the motorised access on the beach;
- f. elaborating and disseminating information about the good bird watching opportunity in the area.
- g. legalizing and building observatories for bird watching tourism (Nuntasi and Istria lakeside etc.).

## 8.7. Letea Zone

### Current state & visitor experience

The current state of tourism is based on usually less than a day visit to Letea's famous oak forest evolved between the sand dunes (hasmace), mostly including a stopover in the village. Such a visit is mainly conducted by driving the visitors on an open tractor-drawn trailer, organized in advance and run by the owner of the only accommodation offer in C.A. Rosetti village. Only a handful of tourists stay overnight in one of the five settlements in the area.



### Vision and objectives

The vision for this zone is to develop it as *a core experience of the Danube Delta, with two major unique selling propositions: ethnical diversity and the oak dune forest (hasmac forest).*

There are two key objectives for this zone in terms of ecotourism development, namely:

- a. designing ecotourism products / programs that ask for a multiple day stay as well as increasing the daily exploitation by offering a diverse natural and cultural experience (including local food);
- b. a careful approach to the utilization of this sensitive nature and culture.

### Recommendations

There is a series of instruments capable of stimulating a **higher valorisation of the place through ecotourism**, such as:

- a. legalizing camping and fishing in special places;
- b. legal regulations to visit the forest;
- c. identifying optimal sites for nature observatories and legalize their construction;
- d. implementing a restoration project for the traditional houses;
- e. developing accommodation facilities at the local people's houses;
- f. building up a fresh water supply system and individual waste water treatment solutions;
- g. implementing a horse-cart taxi (excepting May – August because of the horse fly);

- h. developing new visiting forms of the area using local horses in order to visit the area in horse riding groups;
- i. developing a range of local food offers for tourists and one day visitors – in cooperation with the tour operators and boat companies of Tulcea;
- j. integrating the culture experience related with Periprava;
- k. developing offers for observing the wild horses and including them into the USP of the region.

Corresponding with the **sensitive nature and culture** features of this zone, two major instruments can be used:

- a. generating a community development project for local people including training and education through a community development centre, which will help to establish a structure of local partnership;
- b. designing a visitor management policy for Letea's strict nature reserve and re-assessing of today's trail network;
- c. diversifying the tourism offer by including religious tourism, namely by organizing pilgrimages in religious sites in the area (especially the Cardon monastery).

## 8.8. Tulcea Zone

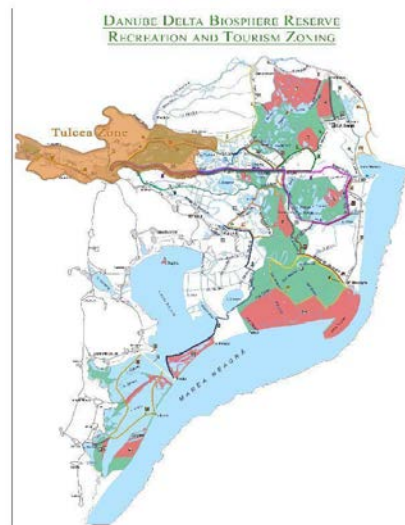
### Current state & visitor experience

Currently, tourists that arrive to Tulcea actually use the location as a pure gate: very little time is dedicated (one day or even less than a day) to the city or to its surroundings. Tulcea has little to offer to the tourists at this moment, and limited information is available for the existing attractions.

### Vision and objectives

Tulcea zone is intended to *complete the experience of the Danube River, of the Danube Delta and of Dobrogea (3D concept)*.

The main objective for Tulcea zone is to offer a complementary and completing experience to tourists that visited or intend to visit the DDBR, with a higher exploitation of the city's assets as well as of the natural and cultural surroundings.



### Recommendations

A series of proposed instruments have evolved out of the workshops that would contribute to increasing the value of Tulcea zone as a tourism attraction:

- a. developing, positioning and marketing the new 3D Centre as a hub for information and tourism offers for the whole region (focusing on training programmes for partners and multipliers in tourism and the programme design for guided tours in the Delta);

- b. Tulcea Municipality tourism offer to be developed and marketed.

There has been identified a number of actions to develop tourism in a sustainable direction:

1. educating the service suppliers; influence/reconstruct the offers to include eco-tourism products;
2. regulate supply information and provide incentives for favourable deals (administration etc.);
3. awareness program for local institutions regarding acceptable behaviour according to the destinations' local characteristic;
4. improve the tourist offer of Tulcea area through:
  - a. integrating the cultural experience;
  - b. nature routes/ observation infrastructure;
  - c. positioning the Somova-Parcheş Lake Complex, upstream Tulcea (the last undisturbed area in the Danube Meadow as an offer on the market;
  - d. small/rowing boat infrastructure in Somova, observation facilities in relevant areas Mila 36 Channel, but without access to mixed colony-Purcelu Sireasa area (providing viable alternatives for biodiversity observation area;
  - e. "slowing down tourism" - filtering by type and location of infrastructure.
  - f. integrating the cultural offer (eg. Museums) in offers/programs for visitors;
  - g. diversifying the tourism offer by including religious tourism, namely by organizing pilgrimages in religious sites in the area (the Cilic Dere-Cocoş-Saon Monasteries);
  - h. connecting the cultural offer of the Museums from Tulcea (archeology, ethnography);
  - i. development or revival of the summer cultural events in Tulcea
  - j. including Măcin Mountains National Park in the regional tourism offer;
  - k. development of specific regional tourism offers such as one day cultural trips (eg. Visits to towns bordering DDBR) or boat trips in nature (for example Somova);
  - l. discovering the old town's atmosphere: the drinks, braga or the coffee shops with Turkish coffee;
  - m. development of a bird watching programme in the Somova-Parcheş complex;
  - n. cross marketing of quality offers;
  - o. develop "tourist multipliers" (accommodation, restaurants, petrol station staff) for the existing offer.

## 8.9. Recommendations for the DDBR

The previous sub-chapters a series of observations have been made regarding the way that each area has specific characteristics determined by a specific on-site situation and that each area can play an important role in the overall picture of the Danube Delta, supporting the entire conservation and sustainable development framework of the region. The following sub-chapter presents the recommendations for the entire Delta, recommendations which do not specifically apply to any one zone, but still influence all of them.

Proposed activities applicable in the DDBR:

1. Creating a Coordination Committee for Tourism in the DDBR

This recommendation is also present in the „Recreation and Tourism Zoning Strategy for the Danube Delta Biosphere Reserve” study (2009); it concerns the necessity to **create a tourism committee** for the entire Danube Delta Biosphere Reserve Region. Very few instruments proposed in this study can actually be put to use in the absence of a concrete entity which can speak on behalf of all the actors involved in (eco)tourism in this region. In the absence of a specific structure responsible for the implementation of the zoning policy, chances are slim that progress will be made in this field.

**The management committee represents a platform for dialogue and an essential instrument for the coordination of tourism marketing and infrastructure development conducted in the Biosphere Reserve.** This committee will be responsible for the final implementation of the recreation and tourism zoning plan of the area. Simultaneously, the committee will elaborate and implement a concrete marketing strategy for the area, thus positioning the Danube Delta as one of the key destinations for nature experience in Europe.

A first step in the creation of this type of committee can be a management formula to cover a certain zone in the Delta and this zone can extend to the entire Delta as far as the management is concerned. At the time when this study was work in progress, an initiative had already appeared to create the ecotourism destination in the central zone of the Delta and to create a destination management unit (DMU).

2. Creating a boat driving licence system in the Delta that should also be correlated with a code of conduct and a recurring training programme (free of cost for the locals and fee-based for non-residents). This training programme will teach navigation techniques suitable for protected areas, which are in line with the values of the Delta and its general state, as well as which Delta zones and routes are allowed for navigation.
3. Creating a network of volunteer rangers who can report abuse and abnormal situations in the DDBR using the green telephone line. Access to the identity of these rangers can be restricted in order to maintain monitoring efficiency over various aspects in the DDBR.
4. Developing a programme that will increase response capacity of the local groups and volunteer rangers to possible deviations from the code of conduct on behalf of service, transportation and accommodation providers.
5. Reassessing DDBR tourist routes based on the new concept proposed by the opportunity study regarding the development of a sustainable transportation network inside DDBR conducted by Ivan Patzaichin Mila 23 Association (2014).

The following sub-chapters present the information relevant to the current document concerning the new „soft mobility” approach mentioned at proposed activity number 5.



## **8.10. Recommendations regarding the development of sustainable transport network**

This information is highly relevant in the context of the current study, so they were taken entirely from the study by Ivan Patzaichin Association Mila 23 (Transdanube Project – Transport and tourism sustainability along the Danube).

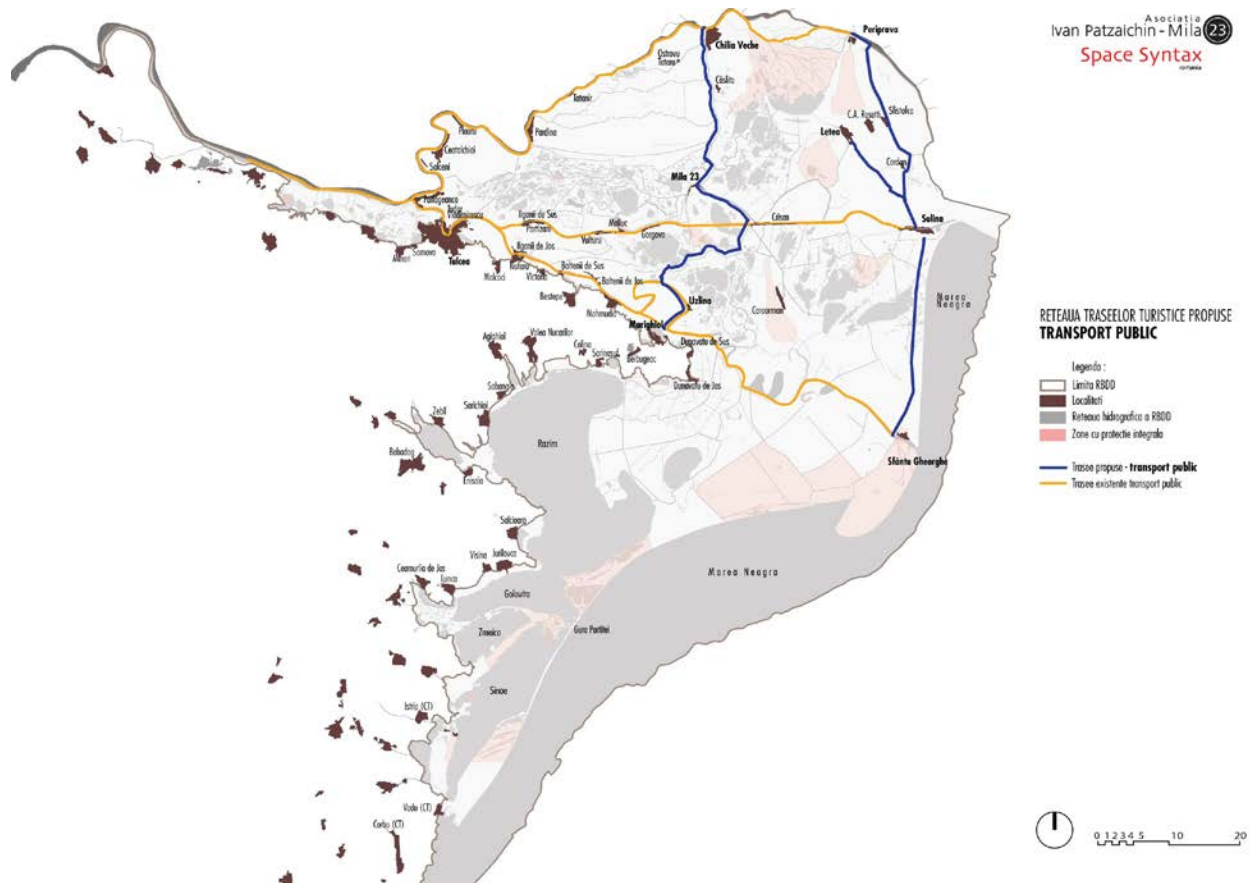
Routes efficiency in order to be connected with other access points in the Delta, or Murighiol and Mahmudia or Sf. Gheorghe with other villages, without going through Tulcea, offering the possibility to connect localities situated along the three arms.

Two new trails were identified on which, with a small investment in infrastructure, there will be able to introduce public transport connections, using boats up to 15-20 people. A feasibility study is proposed, which will analyse in detail the optimal time and seasonal flow, while it can be adapted (the frequency of the rides can be increased or decreased) depending on travel packages proposed for each subzone. A detailed analysis of the route, of the work needed and of the types of vessels best adapted to the conditions is also necessary, opting for those that will ensure the lowest possible environmental impact. It may consider electrically powered boats or hybrid engines.

The map represents the proposed diversification of the routes, through connections between the villages on the three channels, the feasibility of these proposals will be studied in a study on this investment.

The new routes are:

- Sf Gheorghe – Sulina – Periprava/Letea
- Chilia – Mila 23 – Crişan – Uzlina – Murighiol



**Figure 8.8.** The map of the proposed routes (Source: The mobility study, AIP 2014)

Regarding the transport exclusively dedicated to tourism activities, a sustainable transportation network for tourists based on a concept known in the literature as the "soft mobility" is designed.

This suggests a hierarchical network of channels - to be used by paddle boats or electric motors - taking into account their capacity and current regulation for traffic in DDBR. On this basis three types of "packages" of transport for tourists are proposed, that will bring benefits to both the visitors and the local community.

*Proximity routes*, created near *tourist centres*, established and concentrated close to the localities where large tourist numbers. In some cases the starting point is very close to the *tourist centre* and, in their proximity, there is no smaller channels network, dense enough for this activity. Guests will be led by other motor boats to reach a starting point, offering an attractive sightseeing experience on a limited distance on rowing boat access (maximum two hours).

On these trails, traditional boats will be offered to visitors - "lotca" will be led by a local attendant, routes will not exceed 2h one way, 4h of rowing in total. A partnership between local operators, local government and DDBRA is purposed, to delegate the maintenance of these trails to the local operators. This will encourage their involvement in the maintenance and control of the activities along these routes, taking a part of the assignments of the institution which will be compelled to take on other transportation management activities in DDBR.

The starting points of these paths, their configuration and use is proposed to be analysed in a feasibility study object of this investment. It will be taken into account the channel configuration and the possibility of using existing infrastructure (platforms, tourist centres, pontoons etc.). This feasibility study will be correlated with the existing and proposed travel packages, and other projects related to tourism (in or outside this strategy) to size and phase the investment in the fleet and support infrastructure.

Considering the present analysis, the following nine starting points are proposed:

1. Chilia Veche – zone of Dracului Lake (Devil's Lake zone)
2. Sulina
3. Crişan
4. Mila 23
5. Maliuc
6. Uzlina
7. Sfântu Gheorghe
8. Somova
9. Tulcea – Mila 35 Channel

Also, routes for the tours of two hours' rowing boat (lotca – canotca) were bound, as well as the starting and finishing points for each tour. This network will be studied in detail by field observations in a subsequent step to establish the feasibility of the proposed routes.

Evaluating the carrying capacity for visitor management in protected areas  
 Case study: *Danube Delta Biosphere Reserve*

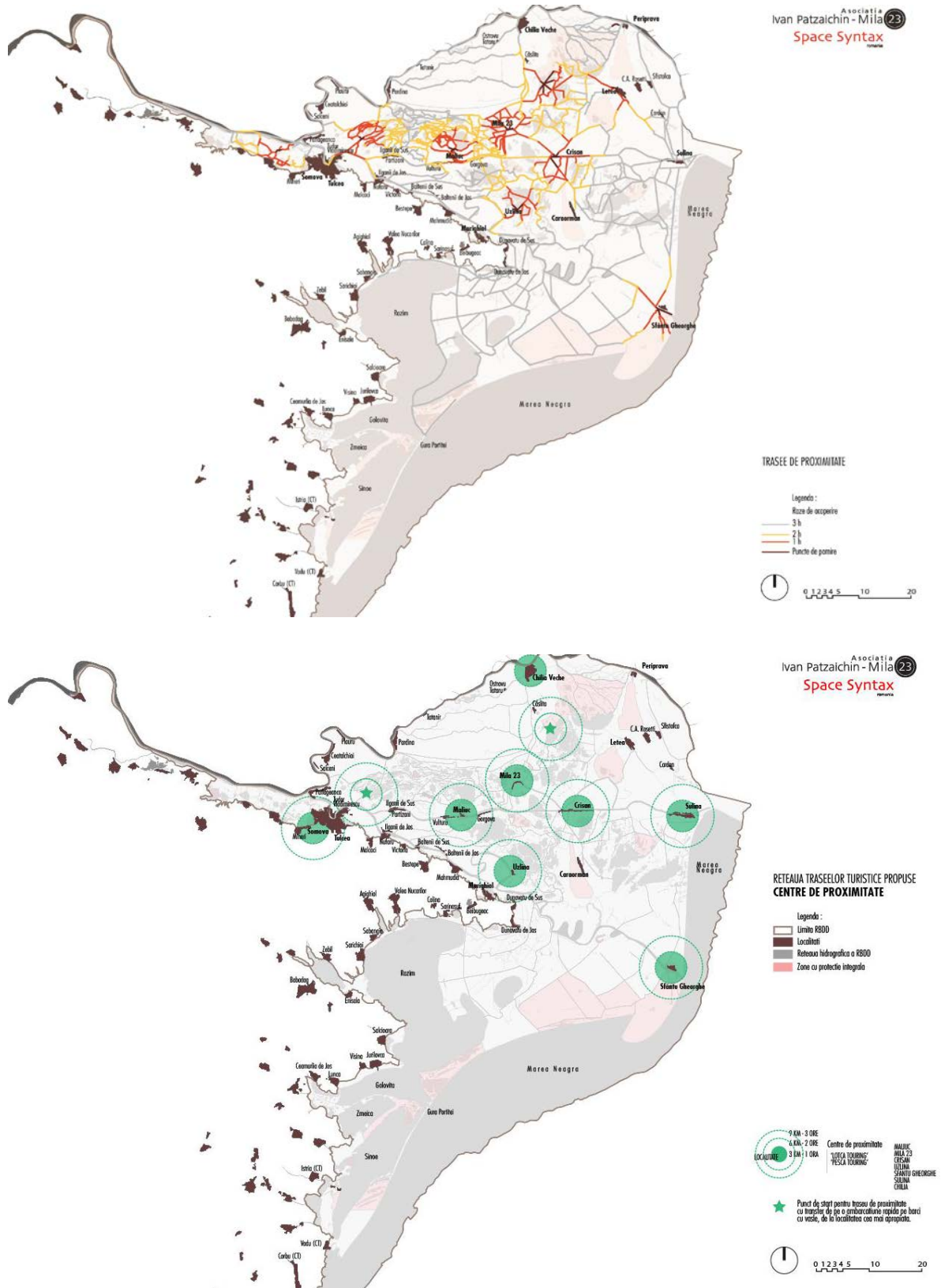


Figure 8.9. and 8.10. Map of the proposal for the proximity routes and centres (Source: The mobility study, AIP 2014)

## 9. Conclusions and recommendations for the protected areas inside the DANUBEPARKS network

The current set of recommendations is actually a general set of conclusions that can also be applied to other protected areas along the Danube. These recommendations are meant to be presented and adopted by these protected areas in order to be applied both in the monitoring and carrying capacity assessment process and in applying recreation and tourism management measures inside and around the protected area.

1. Assessing the carrying capacity must take into account all three components – ecological capacity, socio-economic capacity and visitor capacity. Even though the ecological component is used the most, the other two are just as important: the socio-economic component is connected to the local communities and the visitor component is connected to types of visitors and the interaction between them.
2. In order to assess and monitor the capacity in correlation to the impact generated by tourism activity, it is extremely important to study the impact by connecting several factors and not just by measuring the number of tourists.

These are the essential factors to be correlated when studying tourism impact:

- i. number of visitors;
  - ii. visitor behaviour;
  - iii. visitor presence (length and season of visit) correlated to plant and animal species;
  - iv. types of recreational and tourism activities and types of local recreational and tourism offer;
  - v. administration system characteristics and performance.
3. Developing a clear and properly implemented visitor management concept helps wild species to adapt to high tourist traffic areas. Even though, wild species require quiet areas (sanctuaries).
  4. Nature conservation policy can be successfully and efficiently implemented with the help of a carefully selected tourism offer and the development of proper infrastructure. Both the tourism offer and the infrastructure can attract the right kind of visitors to the desired areas, therefore avoiding additional pressure and conflicts generated by tourism and recreational activities. In this context, we recommend that the conservation policy of the protected area administrator also include an open dialogue with the tourism sector, as well as assessing and directing tourism offers and infrastructure according to the characteristics of each zone inside and around the protected area.

5. One instrument that is bound to be successful in preventing pressure and conflict generated by tourism and recreational activities is ‘*slowing down*’ the tourist experience. By promoting the *slow experience*, chances increase to minimize negative tourism impact on the environment.
6. It is very important for the protected area administration to have a dialogue and management partner from the recreation and tourism sector. We recommend the creation (where there is none) of a destination management organization (DMO) who can become the main partner both in tourism administration and in the monitoring process.
7. It is recommended to develop a recreation and tourism zoning model of the protected area and possibly of the neighbouring area by:
  - a. defining each specific zone according to visitor management opportunities;
  - b. offering a set of instruments to strengthen the conservation status of the protected area and to bring genuine advantages to the local communities through (eco)tourism development.

Zoning the protected and surrounding area has three major advantages:

- offers the best chances to implement an efficient long-term nature conservation policy through tourism and recreational activities;
- offers the best chances for tourists and visitors to choose a zone (and its respective services) where they can satisfy their expectations regarding their desired experience (and time budget);
- offers good opportunities for economic development and investments, activities which have the best chances to be sustainable in nature, to generate fewer conflicts with nature conservation policies and to strengthen their position on the market.

In addition to the advantages mentioned above, tourism and recreational zoning produce two more results:

- It becomes a communication instrument for all involved sectors – nature conservation, tourism and development sectors respectively. This means it offers common ground to negotiate solutions on behalf of both the tour-operators and investors and the nature conservation sector, therefore avoiding the permanent tensions between conservation and development.
- It becomes a suitable marketing instrument for the private sector and the protected area as a whole because it’s based on identifying unique selling propositions (USP) for each zone and each zone integrates and strengthens the general position on the tourism market.

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