

**Sustainable Transport and Tourism
along the Danube**
www.transdanube.eu

**PRE-FEASIBILITY STUDY
ON THE DEVELOPMENT OF A SUSTAINABLE TRANSPORT
NETWORK IN DANUBE DELTA BIOSPHERE RESERVE**

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More information about TRANSDANUBE and the project activities & results are available at www.transdanube.eu

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. PREAMBLE

Sustainable tourism is an important part of the strategy of the European Union for the following years. Adaptation to the climate change, energy efficiency and economical trends all bring the decision-makers of the continent to support the ways of growing this part of the tourism sector, in accordance with the energy and economical strategies of the European Union. In the following sections, we will count the most important programs and projects shaping this feasibility study and the area taken into consideration.

1.1. THE SEE PROGRAM

The SEE Transnational Programme supports projects which have a clear transnational focus, high quality partnerships and with appropriate transferable outputs/outcomes.

The SEE Programme is fully integrated within the Objective 3 of the Cohesion Policy, strongly concentrated on the achievement of the Lisbon and Gothenburg objectives. Therefore, projects are approved which clearly consider the following aims:

- contribution to sustainable territorial development;
- leverage effect on investment, development perspectives and policy development;
- facilitation of innovation, entrepreneurship, knowledge economy and information society by concrete cooperation action and visible results (creation of new products, services, development of new markets and the improvement of human resources based on the principles of sustainability);
- contribution to integration by supporting balanced capacities for transnational territorial cooperation at all levels (systems building and governance).

The orientation on research, technology and innovation involves a significant entrepreneurial development aspect. Hence pure academic research activities cannot be supported under this programme.

Activities could include networking and exchange of information, but not as stand alone purely networking activities, as these are not supported.

Detailed information can be found on <http://www.southeast-europe.net>.

1.2. THE TRANSDANUBE PROJECT

Transdanube is focusing on useful, applicable and transferable outputs, preparing investment and demonstrating the efficiency of the developed sustainable transport offers, methodologies and strategies decided at transnational level and of their reproducible character. Special emphasis will be given to visible outputs highlighting the benefits of soft mobility offers to the tourists and the regions.

According to the needs of the partners and the stage of the planning process, activities can be assigned to a matrix consisting of the means of transport (multimodal transport offers, bus, train, cycling and shipping/river lines) and the stage in the planning process (feasibility, realization concept and demonstration).

The regional action plans include a catalogue of feasible development measures to be implemented along with the activities of the Transdanube project. Feasibility studies will verify whether the proposed project is well-founded and is likely to meet the needs of its intended target groups / beneficiaries. The feasibility study for short-listed projects will be a compromise between simplicity, clarity and thoroughness. For the most suitable (in terms of their importance and realisability) projects, realization concepts (=business cases) including further information necessary for project financing (including tender documentation) will be carried out.

For the development of the necessary sustainable transport offers the requirements of our target group, the tourists, always have to be taken into account. These are:

- Safe and reliable: Punctuality, no detours, port security
- Comfortable / convenience mobility/transport services Take into account specific customer needs of different target groups, e.g. Accessible for the mobility impaired, easy interchanges, simple bookability mobility (Ticketing and Reservation), attractive and targeted information system
- Attractive: Direct arrival and departure transport service, no long waiting times, but attractive waiting time reduction, attractive design of the infrastructure (stations, airports, transport)
- Socially equitable / affordable mobility: getting there and back again by sustainable means of transport has to be affordable in order to compete with private car usage.
- Sustainable: Environmental (CO₂, ecological footprint, “carbon neutral vacation” ...), economic (tourism as a major source of income, at the same time decreasing subsidies for transport, ...), as well as social (accessible for all, ...)
- Information Availability: Mobility information already at planning a trip, on-site and at the right time and take into account modern communication media such as Internet, smartphone applications, e.g. with augmented reality information, Ipad, Google navigation, etc.

It is an idealistic list for the development of new sustainable transport offers. Depending on the current situation and the existing possibilities minor deviations from those ideal conditions have to be accepted.

It is the objective of the project to develop sustainable mobility along the Danube including train, bus, bike and shipping traffic to improve accessibility and facilitate the concept of sustainable tourism in the whole Danube region.

Activities being implemented by the partners differ in scope and the level of detailedness. In order to guarantee the joint action implementation, the partners developed a common soft mobility vision, summarizing their approach for the development of sustainable mobility offers and packages in a common vision.

Based on this common vision, the partners developed or updated regional action plans for sustainable mobility development and implementation. These action plans will be the guideline for action implementation in the project and beyond. The action plans will be based on the SoA analysis (including recommendations) developed in Act. 4.2 and will follow the principles laid down in the common methodology (Act. 3.1).

The regional action plans will be the framework for the development of specific sustainable transport offers. Depending on the status quo of the sustainable transport system, the solutions to improve accessibility in the participating regions differ in scope and detailedness. The activities cover the whole range from basic feasibility studies to detailed business cases and demonstrations of selected pilot actions, always taking into account the commonly defined principles of sustainable mobility in the SEE region.

The experiences gained during the implementation of the activities on the transnational as well as on the regional level will be summarized in manuals. These manuals will guarantee the transferability of project outputs to other regions interested in further development and implementation of sustainable mobility offers.

0. EXECUTIVE SUMMARY

The EU Strategy for the Danube Region - EUSDR appeals for an integrated answer of all stakeholders involved, to create better and smarter connections for mobility, commerce and energy, to create benefits from joint efforts in the field of innovation, tourism, information society, institution and marginalized communities capacities.

Priorities are set by the 4 main objectives de of EUSDR Action Plan:

- (1) **improving connectivity of the Danube region by improving mobility and multi-modal transport**, as well as by **promoting culture and tourism** and inter-personal interaction;
- (2) **improving the environment protection** by conserving bio-diversity, landscapes and air and soil quality; a better environment risk management;
- (3) **increasing prosperity in the Danube** region by developing information society through research, education and IT; supporting competitiveness and developing groups and fords; by investing in human resources and specializations;
- (4) **strengthening the Danube region** by institutions and institutional cooperation.

In the spirit of the above strategic documents at the request ADR, the Opportunity Study studies on the development of a sustainable transport network in DDBR, was conducted, this document sets **the bases of the mobility strategy in the Danube Delta**, anticipating economic, social and infrastructure changes that will be required in the development of the area and which will be supported by financial interventions at national (already mentioned in governmental documents - POR Chapter ITI - new specific intervention, specific, currently in preparation) and at European level.

Opportunity study conducted an analysis of the existing situation in DDBR in terms of the **existing transportation system and development directions** proposed by the study of the tourism carrying capacity achieved DDBRA. It started from an understanding of the concepts underlying the DDBR development strategy, such as transport and tourism sustainability, accessibility, mobility and value for the future development of the area.

This strategy proposes several sets of measures, that together will be able to ensure a transport system adjusted to local needs and especially to the tourism profile of the area, without which no sustainable development of the Danube Delta is possible.

The analysis included assessment of water public transportation system and recreational in the Danube Delta; analysis of tourism activities, prioritizing POIs in the area and assess the tourism potential of the sub-areas and how it can be supported by sustainable transport, where appropriate; **tourists and locals flow analysis** by establishing the profiles of mobility system user in the Danube Delta.

Pursuant to analyses, a range of issues and at the same time of **opportunities** related to **connectivity** and accessibility, **infrastructure, environment and regulations** and last but not least, culture and **tradition** were determined.

This strategy proposes several sets of measures, that together will be able to ensure **a transport system adjusted to local needs and especially to the tourism profile of the area, without which no sustainable development of the Danube Delta is possible.**

A. First, it is necessary to create a **transportation management system** in RBDD by which to control and constantly regulate all types of transport (goods, services and people), but also to collect and manage information currently hard to find. To this end several measures are proposed:

- (1) Identification of an institution / work group which have legal and operational capacity to manage in the transportation system in a flexible manner
- (2) Inventory and monitoring of vessels;
- (3) Creating a database and
- (4) Setting a regulation periodically adaptable according to the observed conditions.

It is necessary to develop **a plan for water movement that** aims hierarchy of trails and velocities to differentiate routes, taking into account the environmental impact. There were identified mainly three types of routes: **Waterways** (those in supervisory and control on RNA), **Express Routes** (liners are dedicated to public and private transport aimed mainly at ensuring connectivity between localities – under DDBRA surveillance) and **tourist circuits** (for transport of tourist under visitation programs - under supervision DDBRA).

B. In terms of **public transport and freight** the study demonstrated the need for: **diversification of routes, encouraging tourists to use, as much as possible, the existing public transportation; costs efficiency; reduce resource consumption and impact on environment;** support all modes of transport (bicycles, personal kayaks) and modal exchanges.

To achieve these objectives the following measures were proposed that should be detailed in a *Feasibility study* dedicated to this component of transport:

- (1) Creation of **new** public transport **connections** between the three arms of the Danube;
- (2) **Providing** routes with services needed by operators and users;
- (3) Diversification of existing fleet in order to use boats with **different capacities** to meet the demand **according to season and area.**
- (4) **Provision of boats and motors with low impact.** Also on the routes in less used in low flow periods would be appropriate to use smaller crafts and suitable engines;
- (5) **Preserving the mix between public transport and freight transport..** People mooring infrastructure

- (6) Equipping the crafts craft of public transport with **storage systems for bicycles or personal rowing boats**.
 - (7) Developing a strategy to improve water public transport services and identify funding sources for its realization.
- C. In terms of **private transport** the following objectives were identified: a) reducing operating costs by increasing accessibility by water btween localities or various tourist zones; b) **reducing environmental impact** through tax incentives or financial support programs / grants aimed at renewal of flotilla (oriented towards traditional transport or the least pollutant, wheter electric motor or hybrid) and special training programs and certification of boats drivers.

A package of measures subject to a specific Feasibility Study was also designed for private transport, emphasizing on the tourist dedicated transport, as it has the most significant impact on the future development of the area.

- (1) **Special endorsements for boats drivers in DDBR**. To reduce the environmental impact generated by water transport an introductory and accreditation course and accreditation is required for understanding the rules that must be onserved in DDBR. This program is intended for all drivers of boats in the RBDD area but will be differentiated for locals and visitors. For locals and tour operators, this program must be financed from European funds support programs.
- (2) **Accreditation of boats designed for tourists transport** on DDBRA territory. Motor crafts designed to carry tourist must provide a safety standard and comfort and to meet the objectives set to reduce environmental impact.
- (3) **Defining a sustainable transport network for tourists**

Thus it is proposed that a priority network of channels to be used by oars craft or electric engine boats. Based on this three types of **'packages' for tourist transport** are proposes that will benefit both visitors and the local community.

- **Tourist proximity routes** developed near established tourist centers and near the localities where a considerable number of tourists is concentrated. Traditional boats trips – 'lotca' will be offered on these routes, led by a local attendant.
- The innovative **"rent a boat" system**. Rowboats or electric engine boats will be available in local rental centers which can be used between various destinations or with return to the starting point in a network which allows developing of a on of ak kind ecotourism offer in Europe.
- **„Soft mobility" tourist circuits** – Priority routes dedicated to small boats propelled by oars or electric motor. The purpose of these routes is to stimulate a package of "exploration", developed over several days that enhance different regions of the Danube Delta in a very friendly environment. These routes will be apprachable also by individual boats and can be

combined with cycle or hiking trails, offering tourists in the delta and an increase tourism revenues on a wider area.

(4) Support infrastructure.

- **Boats rental and maintenance centers**, featuring a package suitable for tourists. Centers may be shared by lotcas, other rowing or electric boats intended for rental, even by rowing personal (kayaks, canoes) that could be hosted for a certain period of time;
- In the localities where land accessibility or public waterways transport is available, **intermodal nodes** are proposed – to allow visiting Delta by segments using several means of transport (boat, car, bike, etc.);
- **Electricity supply stations**. Using the alternative electricity production resources- for example use of solar panels, is proposed, where appropriate;
- **Light, environment friendly mooring infrastructure**, for small crafts;
- **Campsites** as an integral part tourist tours, designed on the basis of ecotourism global standards;
- **Support refuges** also for emergency cases on tourist tours, designed at international standards
- **Interpretation and tourist guidance system** conducted in situ and on-line/mobile as a tool to increase efficiency and quality of transport tourists to the Delta.

To continue this approach feasibility studies intended for both public and private transport, are proposed to be conducted, by which current proposals be detailed and to determine how they could be implemented and the potential funding resources, including a staging of projects and evaluation program of results.

Working methodology

The consultant sought and observed the guidelines and interconnections between the previous results of the project, in consultation with all documents made under it and under the direct coordination of SERDA. Moreover, the consultant followed all documentation made available by the authorities concerned and related studies conducted in the area.

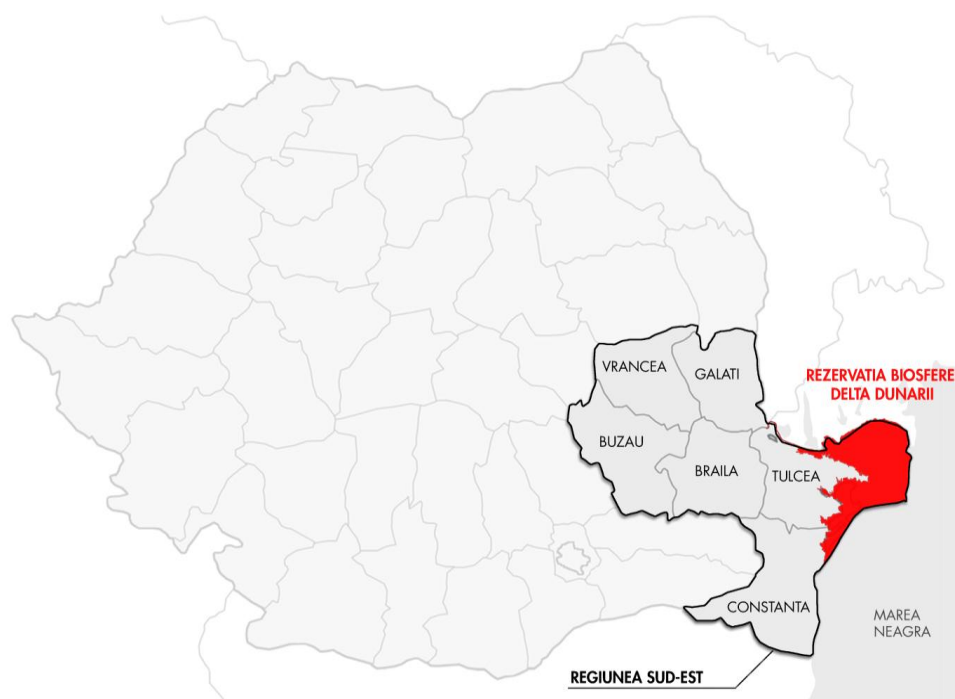
The consultant conducted a field research through questionnaires and interviews to collect data needed for the analysis of existing transport infrastructure and tourism.

I. INTRODUCTION

I.1 General context

Transdanube – sustainable transport and tourism along the Danube is a project developed by Austrian Environment Agency, together with 14 other partners from six countries and 35 associated partners and observers. Transdanube project is implemented by SE RDA as a partner and funded within Southeast Europe Transnational Cooperation Program, 'Improving accessibility' Priority Axis, Key Area of Intervention 'Improve coordination in promoting, planning and operation in the sector primary and secondary transport networks'. The project's overall objective is improving the accessibility and quality of transport services in the Danube region.

Starting from the need to ensure a transportation system that meets the needs of local people and tourists, while responding to both the criteria for the sustainable exploitation of natural resources and ecosystem conservation and taking into account specific constraints determined by the complex problem of Biosphere Reserves, this study identifies current problems in the system and outlines several directions for a transportation system with minimal impact to the environment and responsible behavior towards nature. A sustainable transport policy must address issues of increasing traffic volume, noise, pollution and transport arrangements that have no impact on the environment.



The South-East Development Region is represented in the Transdanube project by the South-East Regional Development Region Association, as a partner and by Danube Delta Biosphere Reserve Administration with the role of strategic associated partner.

I.2 Definition of terms

Sustainability

[DEX] Quality of an anthropic activity to take place, without exhausting available resources and without destroying the environment, thus without compromising the ability to meet the needs of future generations. World Conference on the Environment in Rio de Janeiro in 1992 paid special attention to this concept, which involves establishing a balance between economic growth and environmental protection and finding alternative resources. When referring to the overall economic development of a country or region, the synonym 'sustainable development' is usually preferred.

Sustainable (durable) transport

Sustainable transport is a complex system designed to ensure the mobility needs of current generations without damaging environmental and health factors. Through efficient energy and material consumption, it must make possible meeting in optimum conditions, from the economical-ecological-social perspective, the mobility need for future generations.

Sustainable transport system is achieved primarily through clean transport modes or which have a low impact on the environment and health through increasing fuel efficiency and decrease of fuel consumption from non-renewable resources and continuous decrease of solid and liquid waste resulting from construction, maintenance and abandon of transport means.

The main economic instruments that can be used for this purpose are taxes, fees and licenses/permits. Thus, reduction of using polluting transport means, reducing energy consumption, promoting efficient transport activities, equitable redistribution of revenues between society and carriers and the reorientation of the way the society meet the needs of transport activities.

Sustainable tourism

Developing all forms of tourism, tourism management and marketing that respect natural, social and economic environmental integrity, providing exploitation of natural and cultural resources for future generations.

Impact of tourism on environment

It entails analyzing the relationship tourist - tourist reserve – tourism product.

Since its inception in 1987, the concept of sustainable development has penetrated all areas of economic and social life: from sustainable agriculture to sustainable transport and sustainable tourism. A growing number of those involved in one way or another in tourism activities are aware of the effects caused by tourism development, the impact of these activities on population and ambience; in the latest decades the expansion of tourism has been achieved in a balanced manner in accordance with standards that guarantee the preservation of ecological balance and avoid overexploiting of resources, pollution and other negative environmental impacts.

The concept of impact entails analyzing the relationship tourist - tourist resource - tourism product, which runs from simply visiting a tourist attraction, to ensuring the services package and tourist activities designed to highlight the objective.

The impact of a tourism area is defined by:

- Natural environment and the variety of touristic potential;
- The existence of a general infrastructure that ensures circulation, access and information;
- Presence of tourism accommodation facilities, catering, leisure.

These defining elements of tourism trigger several types of impact, which may take positive or negative forms of manifestation.

Soft mobility

It is a prospect pilot-project which supports ecologic tourism transport. The concept of soft-mobility should serve as a guide for all stakeholders involved in the development of such tourism product. It should support partners in the regional development of the strategy soft type and incorporate it in the existing policies. It includes all types of non-motorized transport (NMT-non motorized transport) which use more than human power (human power mobility-HPM).

1.3 The Danube. Danube Delta

Geographic position

The Danube Delta is located in the extreme eastern part of Romania, in the area where the Danube flows into the Black Sea, with a total area of approximately 580,000 hectares, including the Danube Delta itself, Razim-Sinoie lake complex, the maritime Danube to Cotul Pisicii Bend, including Somova-Parcheş floodplain, lake Sărățuri-Murighiol and the marine area between the coast and isobaths of 20 m. The Danube Delta covers 2.5% of the country and the from administrative point of view, the reserve is situated on the territory of counties Tulcea (87.73%), Constanta (12.23%) and Galati (0.14%). Within the perimeter of the reserve, several functional areas were delineated, as follows:

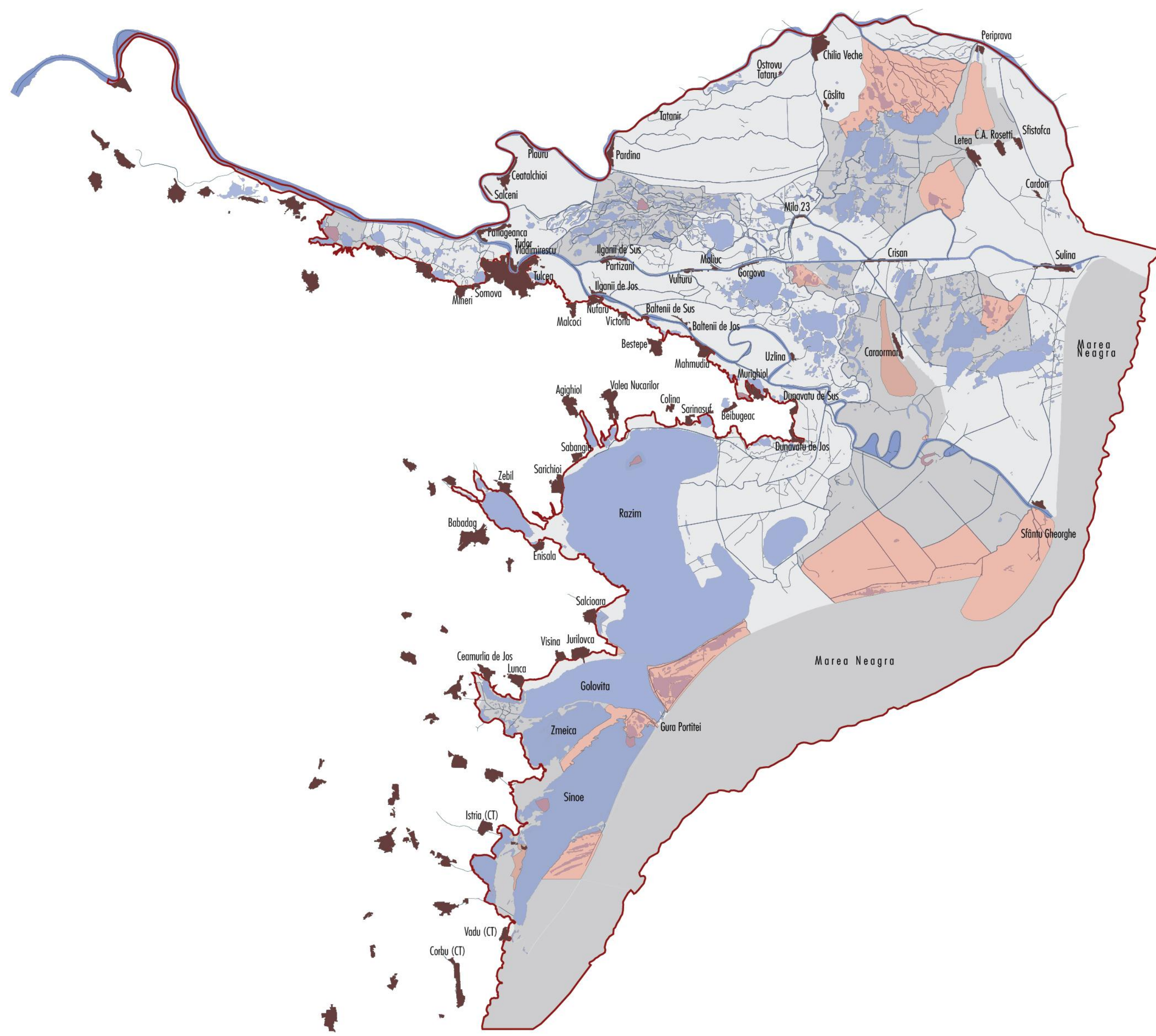
- 20 strictly protected areas, occupying a total area of 50,904 ha (8.7% of Reserve area); they are strictly protected and little disturbed patches, representative for natural, terrestrial and aquatic ecosystems in the reserve;
- buffer zones established around areas under full protection regime; they occupy a total area of 222,996 ha (38.5% of the reserve) and were designed to mitigate human impact on protected area;
- sustainable development zones covering a total area of 306 100 ha (52.8% of reserve area). They include lands defined as easily flooding lands, dammed lands for agricultural, aquaculture and forestry use, and lands on which human settlements are located;
- ecological restauration zones are the lands in which the Reserve Administration carries out activities to restore ecological balance and revegetation of the affected area using technical means and technologies.

According to specialized literature (Gâștescu, 1989), the Danube Delta is the territory between the first bifurcation of the Danube (Ceatalul Chiliei), bordered to the east by the Black Sea, to the north by Chilia Arm and to the south by Razim-Sinoe lakes complex. The Danube Delta itself is the largest component of the reserve and has a total area of about 4178 km², of which the largest part lies on the Romanian territory, i.e. 3510 km², representing about 82%.¹

Map 1 DELIMITATION OF THE DANUBE DELTA BIOSPHERE RESERVE (DDBRA) contains elements of geographical delimitation of the Reserve territory, being carried on topographic support offered by ARBDD; areas with full protection, buffer zones (deltaic and marine) and the settlement pattern within and adjacent territory DDBR are figured on it.

Map 2 POPULATION provides information on the studied population. Besides the greater number of inhabitants in the two largest cities - Tulcea and Sulina, greater concentration of the population are over the right arm of Sf. Gheorghe, Nufăru, Mahmudia, Murighiol, Dunavăț communes.

¹ Source: www.ddbra.ro

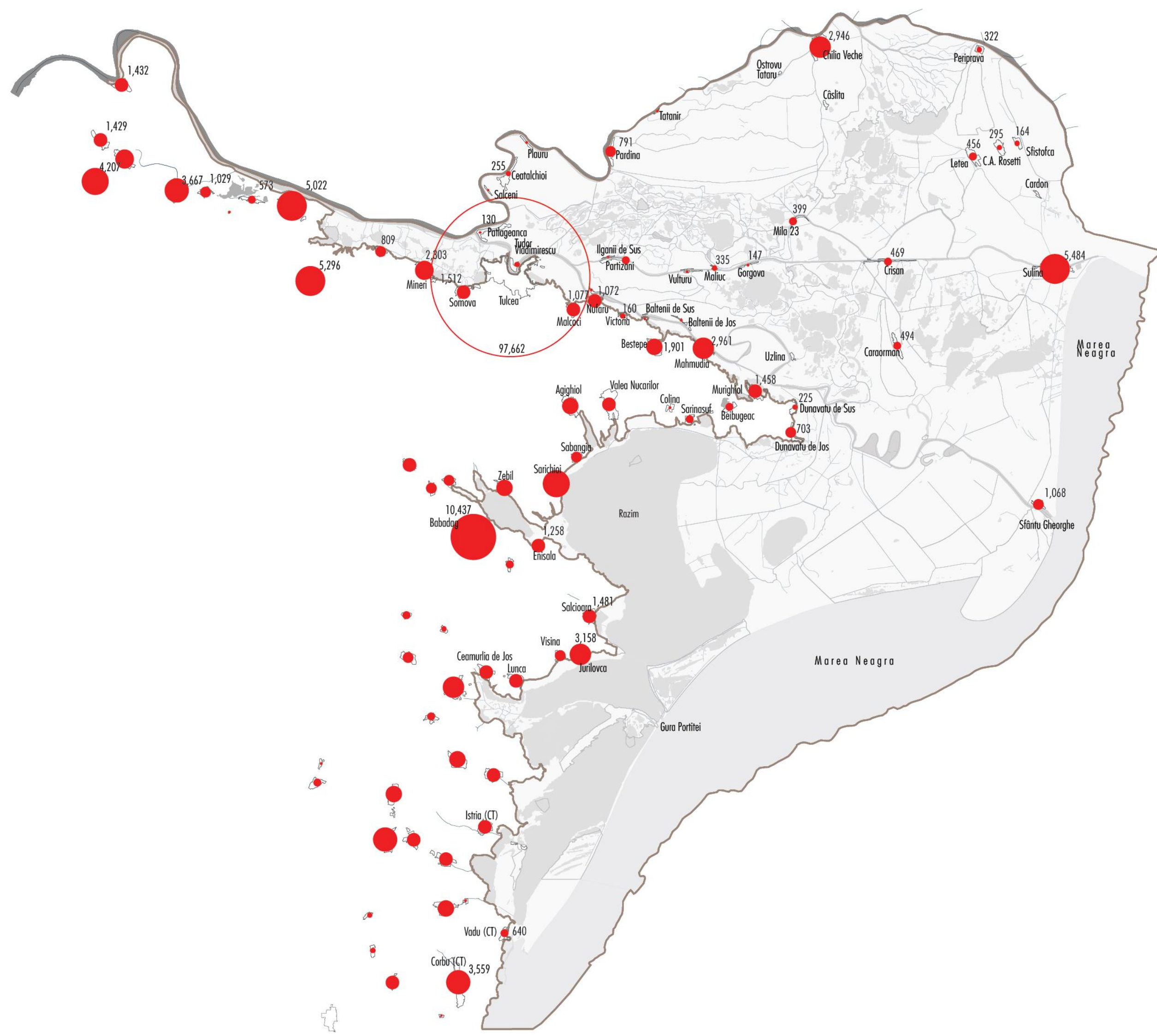


DELIMITARE REZERVATIA BIOSFEREI DELTA DUNARII

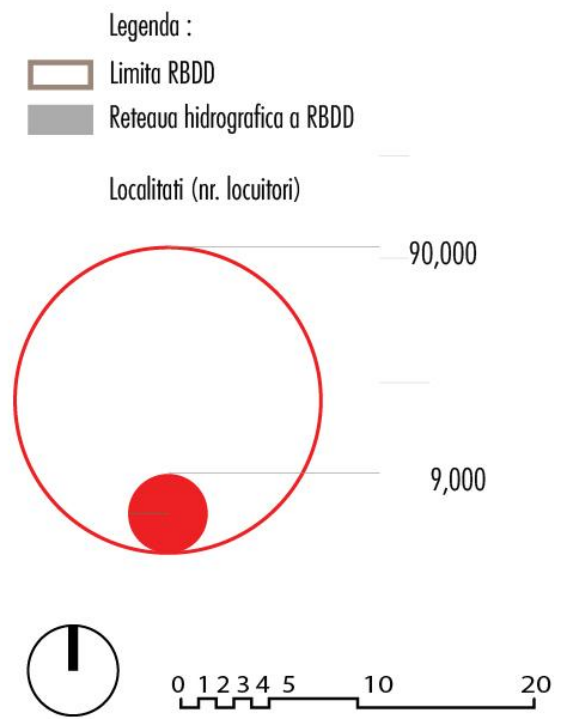
- Legenda :
-  Limita RBDD
 -  Localitati
 -  Zone cu protectie integrala
 -  Zone tampon
 -  Reteaua hidrografica a RBDD



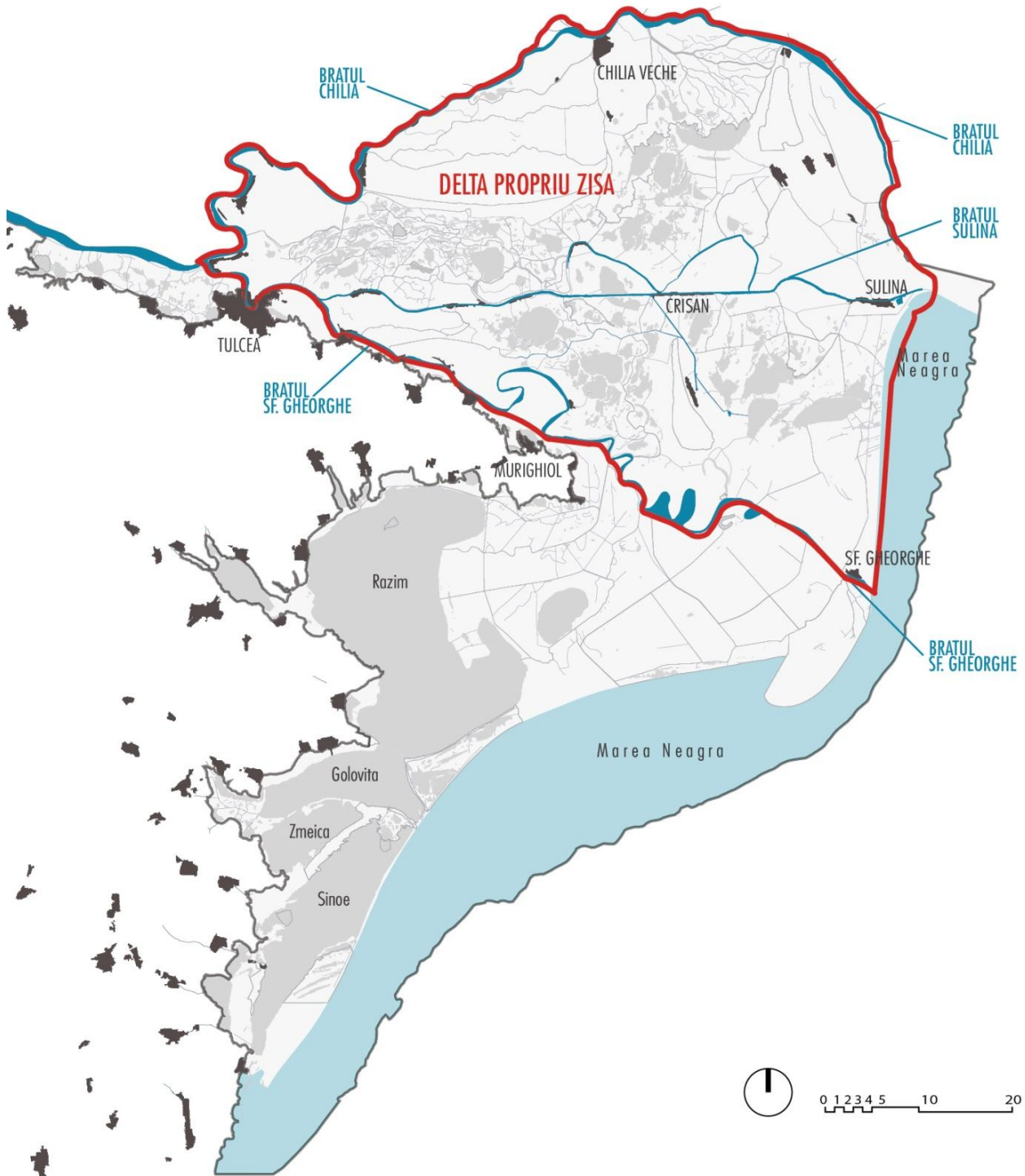
0 1 2 3 4 5 10 20



POPULATIE



This study makes a radiograph of the entire territory of the Danube Delta Biosphere Reserve, while it proposes a transport network in the Danube Delta itself.



I.4 Administrative Institutions

By its appurtenance to RBDD, the territory is a totally protected area and Natura 2000 sit, at the same time benefitting from the status of triply protected biosphere reserve statute - and UNESCO heritage site, part of the Ramsar Convention and Berne Convention for the Conservation of Natural Habitats.

DDBRA²

Danube Delta Biosphere Reserve (DDBRA) was established in 1990 as the administrative organization responsible for the conservation and management of biodiversity, ecosystems and natural resources in the Danube Delta. This role was legalized by the legislation enacted in 1993 (Law no. 83/1993). Danube Delta Biosphere Reserve (ARBDD) is a public institution with legal personality, subordinated to the Ministry of Environment and Forests whose activities are conducted under the provisions of Law no. 82/1993 on the establishment of the Danube Delta Biosphere Reserve (DDBR), as amended and supplemented, the environmental protection legislation, the legislation on protected natural areas, habitats, flora and fauna, fisheries and aquaculture legislation, legislation on hunting and the hunting areas, etc.

Field of activity - Creating and applying a special administration framework for:

- Conservation and protection of biological diversity in natural ecosystems of the DDBR;
- Development of human settlements and organizing economic activities in conjunction with the carrying capacity of natural ecosystems in the Danube Delta ;
- Ensuring compliance with the legislation in force to protect the environment and protected areas.

RNA³

Romanian Naval Authority (NRA), Tulcea Harbor Master's Office

Area of jurisdiction: MM 64 Maritime Danube - MM 0 Sulina Arm; Chilia Arm; Sfântu Gheorghe Arm; Black Sea Coast from the mouth of Chili Arm to Periteasca; Danube Delta.

The main tasks

Inspection, control and supervision of safety of navigation;

Coordination of assistance, search and rescue activities in national navigable waters and actions in the event of natural disasters and ship sinister;

Control in preventing pollution from ships and coordination of necessary measures in case of intervention;

Sanctioning of the contraventions and investigation of the navigation accidents and casualties;

Registration of ships under Romanian flag

Organizing exam sessions for certification of pleasure crafts drivers;

Authorization traders operating sea transport.

² <http://www.ddbra.ro/>

³ <http://www.rna.ro/index.html>

I.5 Coordination with EU policies and programmatic activities of the Romanian authorities

EU Strategy for the Danube Region - EUSDR (COM(2010) 715) is a strategic and institutional manifesto for an integrated approach for the sustainable development of the entire Danube region, which aims to identify areas of potential and synergies to be exploited until 2020, until all inhabitants of this region should have a better living standard and the region become one of the most attractive in Europe.

EUSDR also calls for an integrated response of all stakeholders to create **better and smarter connectivity for mobility, trade and energy**, to create benefits from joint efforts in the field innovation, tourism, information society, institutional capacity and community marginalized

Priorities are set by the four main objectives of the Action funnel EUSDR:

- (1) **improving** connectivity in the Danube region by improving mobility and multi-modal transport, and by promoting culture and tourism and inter-personal interaction;
- (2) **improving** the environment, by conserving biodiversity, landscapes and the air and soil quality; better management of environmental risks;
- (3) **increasing** prosperity in the Danube region by developing information society through research, education and IT; supporting competitiveness and development groups and fords; by investing in human resources and specializations;
- (4) Strengthening the Danube region by institutions and **institutional cooperation**.

In the spirit of strategic documents mentioned above, at DRA's request to conduct the Opportunity Study for the development of a sustainable transport network in DDBR, this document proposes setting of the bases of mobility strategy in the Danube Delta, anticipating economic, social and infrastructure changes, that will be required in the development process of the area, which will be supported by financial interventions at national (already mentioned in governmental documents - POR Chapter ITI, new specific intervention, currently in preparation) and at European level. This strategy also proposes a series of objectives:

- (1) Locating and defining existing mobility flows, redefining them through new routes and by proposing new types of infrastructure, aligned with the desired process of ecological development of DD;
- (2) Identifying local challenges and opportunities (SWOT analysis);
- (3) Reforming mobility in the region in several steps (terms of reference);
- (4) support for DRA and other local and central institutions created to develop DD (as shown in the ROP / ITI-Coordination Committee in the MFE, ITI Management Committee and Technical Advisory Council thereof), to coordinate all efforts to achieve comprehensive and coherent programmatic actions, by proposing several key projects, built on activities and projects already initiated and some completed in the wider area of Danube region.

Regarding the point (4) above, we have analyzed the EUSDR actions already completed, in order to improve infrastructure and economic performance of navigation on the Danube and therefore we recommend some directions for local initiatives, including networking and acquainting with partners that have such initiatives, and their projects and the outcomes obtained so far.

To this end we propose the following:

- adapting the platform for implementing NAIADES (PLATINA initiative about good practice in planning sustainable navigation);
- preparing investments in waterways infrastructure and development of interconnections as we present them in our considerations on the missing links/connections in the Danube Delta (the access port in DD should be developed into multi-modal logistics centers);
- promoting the modernization of the Danube Delta fleet to improve economic and environmental efficiency;
- Implementing of River Information Services (RIS) by stimulating and attracting key technologies, services and other applications to prepare a platform to support the preparation of future projects that could be funded under several operational programs (ROP, COSME, POC, R & D etc.);
- creating linkages to public transport and other types of links between centers [commercial] that will be further developed in the Danube Delta (which we expect to find in development strategy of the World Bank). We believe that all projects listed have value for the relevant Romanian authorities in developing Danube Delta and we believe that there must be a continuous flow of information and coordinated actions to achieve the proposed integrated nature of EUSDR. Whatever local isolated local efforts, they will not be considered to be complete and supportive of the region development objective, by 2020.

This document is built based on the priorities established by (i) Romanian Government Partnership for 2014-2020; (ii) Regional Operational Program 2014-2020; (iii) DRA strategy for sustainable development, along with our own approach on the mobility in the Danube Delta. We intend to offer a way to understanding the needs and specificity of target regions, and an innovative approach to the current transform into projects that can be funded from existing European funding platforms.

II. INFRASTRUCTURE DEVELOPMENT CONTEXT ANALYSIS OF WATER AND LEISURE TRANSPORT IN THE DANUBE DELTA

II.1 Hydrographic network structure – as support of the main transport network in the Delta

Under the action of natural factors during formation and development of the Danube Delta, a number of hydrographic units, distinct by morphology and hydrologic regime were established across the delta, between the main arms and aside, as follows:

- Between Chilia, Tulcea and Sulina: Sireasa-Şontea-Fortuna hydrographical unit and Lopatna-Matita-Merhei hydrographic unit.
- Between Sulina and Sf. Gheorghe arms: Rusca-Gorgova-Uzlina hydrographic unit and Puiu-Rosu-Rosulet hydrographic unit.
- South of Sf Gheorghe arm: Dunavăț-Dranov hydrographic unit and Razelm – Sinoe lagoon complex.

The current component aquatic elements of the Danube Delta hydrologic network are:

- Main arms: *Chilia, Tulcea, Sulina and Sf. Gheorghe*, with their bifurcation nodes, through which the Danube enters and crosses the Danube Delta, flowing into the Black Sea.
- *Main channels within the Danube Delta*, through which the permanent access of Danube water in the delta and Delta navigation with small self-propelled boats.
- *Secondary canals and streams/brooks* that provide water penetration and distribution of the Danube waters into the Delta and the remaining spaces between main channels.
- *Natural banks of the main arms and streams*, which by their genesis appear as some levees along river beds.
- *Main arms' mouths and the seashore* consisting of 4 sand cordons.⁴

II.2 Access to and in the territory

For the purpose of this study, the area between the three arms of the Danube: Chilia (north), Sulina and St. Gheorghe (south) have been considered.

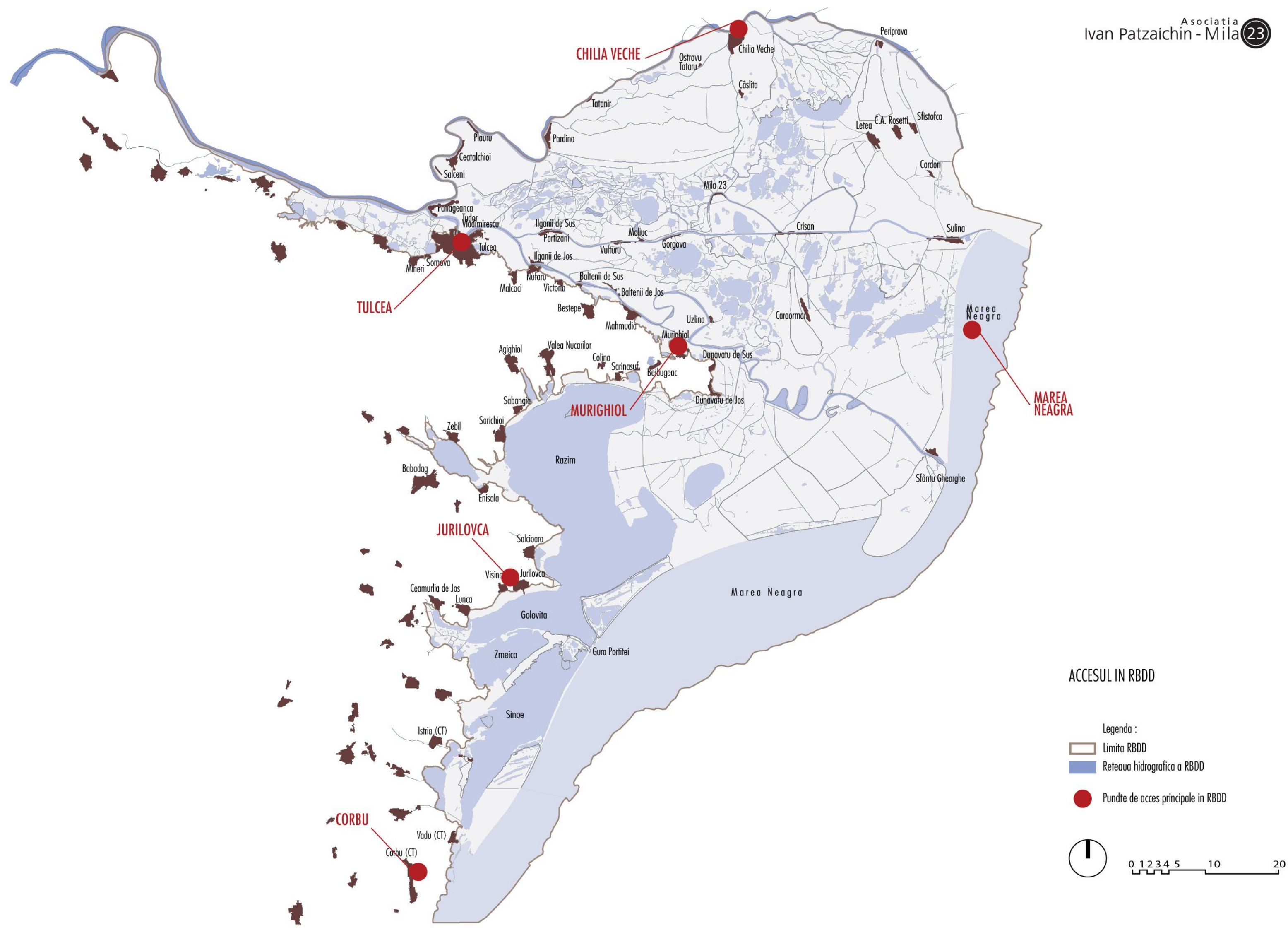
To define an alternative transport system based on principles of sustainability the current state of the area must be considered, in terms of accessibility, means of transport and related infrastructure and the issues found need to be assessed.

⁴ Source: Memoriu Plan de Amenajare a Teritoriului

The analysis of the current situation of the area was done by processing numerical data obtained by the main operators in the area and from ARBDD and at which analyses and findings land have been added.

1. Tulcea Municipality
2. Chilia
3. Murighiol
4. Jurilovca
5. Corbu - Vadu
6. Black Sea

[Map 3 ACCESS IN DDBR](#) marks the major entry ports in the delta of tourists flow.



1. Tulcea Municipality

Before addressing the issues of mobility in the delta, we make a brief analysis of current opportunities of reaching Tulcea, through the specific communication ways of each transport mode.

In addition to the administrative, economic office (county seat) and cultural facilities, another element that emphasizes the polarizing role of Tulcea is the seat of Danube Delta Biosphere Reserve Administration, through which the control of the activities of any kind in the delta is achieved.

- Road access:

- Slobozia - Tulcea A2 Motorway (approx. 300 km ~ 3 ½ - 4 hours)
- Bucharest - Urziceni - Slobozia - Giurgeni - Vadu Oii - Tulcea National Road DN 22
- Constanta - Tulcea European Motorway (approx. 130 km ~ 2:00; currently under modernization works)
- Galati – ferry crossing
- Brăila – ferry crossing

Traveling time from Braila to Galati or Tulcea is approx. 1 ½ hours, including crossing the Danube; in case of congestion at the ferry, specific to summer season, duration increases significantly.

Crossing the Danube by ferry takes about half an hour. Problems occur in winter, when the Danube is frozen, during fog or strong winds or floods or droughts periods with very low levels of water - situations that could trigger stopping crossing the Danube. In these cases, a detour of more than 100 miles to the bridge on Giurgeni bridge and access through Harsova is necessary.

All road transport ways allow access to all categories of cars, minibuses, buses and coaches. For road transport there are private operators for all routes described above, departing from Tulcea bus station..

- Rail access

The rail transport operator is CFR. The town benefits from direct link to the capital; there are also daily flights from Tulcea to Constanta. Due to the technical condition of railways, speed restrictions are imposed so that travel time significantly increases.

- Bucharest - Medgidia – Constanta the main railway;
- Medgidia - Babadag – Tulcea the secondary railway;

- Air access

Air transportation is provided by Cataloi airport, located 15 km from Tulcea. Link to Bucharest is achieved by two air flights per week Tulcea - Bucharest. Also, occasional charter flights are organized.

- Waterway access

Tulcea port is accessible from upstream (Galati and other Danube ports abroad) for river vessels (inland waterway vessels) and from the Black Sea for maritime ships. Port allows access of goods and passengers; freight traffic declined in recent years due to the closure of two plants in the city.

For passenger waterway transport, no regular ferry lines to the ports of upstream are available. Tulcea port is an endpoint to international cruises on the Danube; in Tulcea local vessels by transshipping tourists ensure

transporting of passengers on the three arms of the Danube: Chilia, Sulina, Sfantu Gheorghe by daily transport. For international cruises, there are important tour operators, such as SC Europolis SA Tulcea, Karpaten Tourism Bucharest, Danube Cruises Romania; Alternative international cruises are represented by international passenger ships that come from the Black Sea to Tulcea (approx. 20 ships / year)

The status of nature reserve and dominance of aquatic environment confers specificity to transport facilities in the Danube Delta, the link between localities in the delta being possible only on inland waterways.

2. Chilia

Chilia Veche village is located the north of the county of Tulcea and the northern extremity of the Danube Delta. Chilia Veche village is largest commune in the Danube Delta, comprising almost half of the territory between the Sulina and Chilia arms. Access to commune can be achieved through:

- Water access, 60 km from Tulcea;
- Land access, DC 1, 60 km from Tulcea;

Communal road 1 has a length of 66 km and it is land access path approachable from Tudor Vladimirescu, suburb of Tulcea and Chilia Veche. Causeway, earth road or partially covered with cement on the pier, start from the crossing point with the ferry at Tudor Valdimirescu, gets to the exist of Ceatalchioi to Plauru, enters.

3. Zona Nufăru, Bălteni, Mahmudia, Murighiol, Dunavăț Area

Among Nufăru, Bălteni, Mahmudia, Murighiol, Dunavăț communes, Murighiol is the most important access gate to the delta. These communities are located in the west of Tulcea county, on the right arm of Sf. Gheorghe. Because of easier, faster, cheaper, land access, in this area there is a higher density of hotels and guesthouses in comparison to the other areas of the delta.

- Land access by roads E87, DN 22A, DJ 222C;
- Water access.

4. Jurilovca

The village is located within the Danube Delta nature reserve, in the area of Razim-Sinoe lagoon complex, at the point where you can go by boat to the Black Sea. The town is located on the shores of the lagoon complex, at the minimum distance from the sea (19 km).

On the north-south Jurilovca commune is crossed by the county Road DJ 222.

- Land access, 90 km from Constanta, 69 km from Tulcea, 32 km from Babadag;

Transport means: minibuses Constanta - Jurilovca-Constanta, Tulcea-Jurilovca- Tulcea.

- Water access from the Black Sea.

5. Corbu

Corbu is a village in Constanța County, Dobrogea, located in the eastern part of the county and included in the Danube Delta Biosphere Reserve. It consists of two villages: Vadu, located 4 km and Light, 8 km from Corbu village resident.

- Land access, 31 km from Constanta, 4 km from Năvodari - the nearest town.

6. The Black Sea

The Black Sea coastal area along the Danube Delta is a component part of DDBRA.

International Black Sea cruises are another entering way of tourists in the Delta. They are taken by the operator operators and Delta's channels and arms, for rapid tours.

No.	Communes and towns	Localities and components	ACCESS WAYS			
			DN	DJ	DC	F (fluvial)
1	SULINA TOWN	Sulina				
2	SF. GHEORGHE	Sf. Gheorghe				
3	CRIȘAN	Crișan				
4		Caraorman				
5		Mila 23				
6	MALIUC	Maliuc				
7		Partizani				
8		Vulturu				
9		Ilgani de Sus				
10		Gorgova				
11	CEATALCHIOI	Ceatalchioi				
12		Pătlăgeanca				
13		Plauru				
14		Sălceni				
15	PARDINA	Pardina				
16	CHILIA VECHÉ	Chilia Veche				
17		Câșlița				
18		Tatanir				
19	C.A.ROSETTI	C.A. Rosetti				
20		Periprava				
21		Letea-Cardon				
22		Sfiștofca				

The table illustrates access ways to the localities in the Delta itself.

Inside the Delta the accessibility rate is much greater on water than on land. For the communes and villages inside DDRB area, the access is mainly by water; outside these routes, there are a few communal roads, which connect only some settlements and trails for touristic hiking. Letea, CA Rosetti, Sfiștofca, Cardon, Periprava communes, apparently more isolated due to their positioning outside the dense channels system, benefit from paved roads, approachable by car, which establish the link between these communes and the city of Sulina.

II.3 Existing transport options utility type (public transport, services) and recreational, water transport wheter public and private.

River transport availability

As the connecting of most of the delta's localities is achieved by water, the inland waterway transport of passengers is organized in public and private, utility and leisure type transport.

Tipuri de nave care se deplasează pe căile navigabile ale Deltei Dunării⁵. L - lungimea; B - latimea

n.	Type of vessel or craft – installed capacity -	Main features LxB [m]	Number of crew memebers	Products transport capacity [to.]	Persons transport capacity	Economic speed [km/h]
I	Pleasure crafts >250CP		2 – 3	-	10	cca. 25
II	Professional ships					
1	Towboat/tugboats >200HP					
	SR 65 HP	9,06 x 2,7	2	5	6	13 – 14
	SR 150 HP	9,95 x 3,90	2 – 3	17	25	18
	SR 180 HP					
	Auxiliary boats 180 HP	16,9 x 3,80	2	8	12	18 – 22
	Insepction boats 150 P	12,64 x 3,24	2	6	10	18 – 22
	Auxiliary boats jet type 170 P	10,9 x 2,79	2	2	6	35
	Tugboat 150 HP	15,6 x 3,80	3	6	12	18
	Tugboat 180 HP					
2	Tugboats >200HP					
	Tugboat 200 HP	21,5 x 4,20	3	-	-	18
	Tugboat 400 HP	32,2 x 5,80	5	-	-	20
	Tugboat 555 HP	33,4 x 6,3	5	-	-	20
3	Motor ferry (BM): 150 HP, 180 HP, 215 HP	17,71 x 3,65	3	-	-	17
4	Towboats >2400HP					
	Towboats 560 HP	20,8 x 7,7	3	-	-	16

⁵ Source: Danube Delta Master Plan, developed by INCDDD Tulcea, at the request of the Ministry of Environment.

	Towboats 200 HP	34,57 x 10,09	5	-	-	22
	Towboats e 2400 HP	34,5 x 11,01	5	-	-	25
5	Watertaxies and tourist passenger ships	27,5 x 5,00	4	6 – 16	30, 60, 80	18 – 24
6	Passenger ships					
	Classic passenger ships 840 HP	45,21 x 7,09	6	80	300	24
	Classic passenger ships 1 640 HP	61,4 x 11,3	6	140	600	25
	Passenger hydrofoil 1 000 HP	21,32 x 4,80	5	8	51	50
7	Coastal fishing vessels 385 HP	25,75 x 7,22	5	18	-	16
8	Technical ships					
	Grab pontoon	24,28x 9,6	1	-	-	-
	Floating dock	41,5 x 16,16	4	-	-	-
	Floating crane	40,5 x 20	3	-	-	-
9	Tanker ships					
	Unpropelled	20 x 4	1	30 – 200	-	-
	Propelled	54,26 x 9,9	5	30 – 200	-	15
10	Non-propelled vessels for solid bulk cargoes					
	Scow 100 to	28 x 7	1	100	-	-
	Open barge 100 to	26,7 x 7,2	1	100	-	-
	Open barge 500 to	49,9 x 7,51	1	500	-	-
	Barge 1000 to	38,25 x 11	-	1000	-	-
	Barge 1500 to	70,2 x 11	-	1500	-	-
	Barge 3000 to	88,96 x 11	-	3000	-	-
11	Non-propelled vessels for passenger accommodation					
	Houseboat pontoons	28,2 x 5	1	18 – 40	20 – 42	-
12	Sea vessels cca. 6000 HP	130 x 18 x 9	21	4000	0	26

The control of navigation is achieved mainly by:

- Tulcea Territorial Naval Authority (NRA), a specialized body under the Ministry of Transports, Constructions and Tourism through which it exerts its function of state authority in the safety of navigation;
- Danube Delta Biosphere Reserve (DDBRA), which is empowered to control the application of specific environmental legislation.

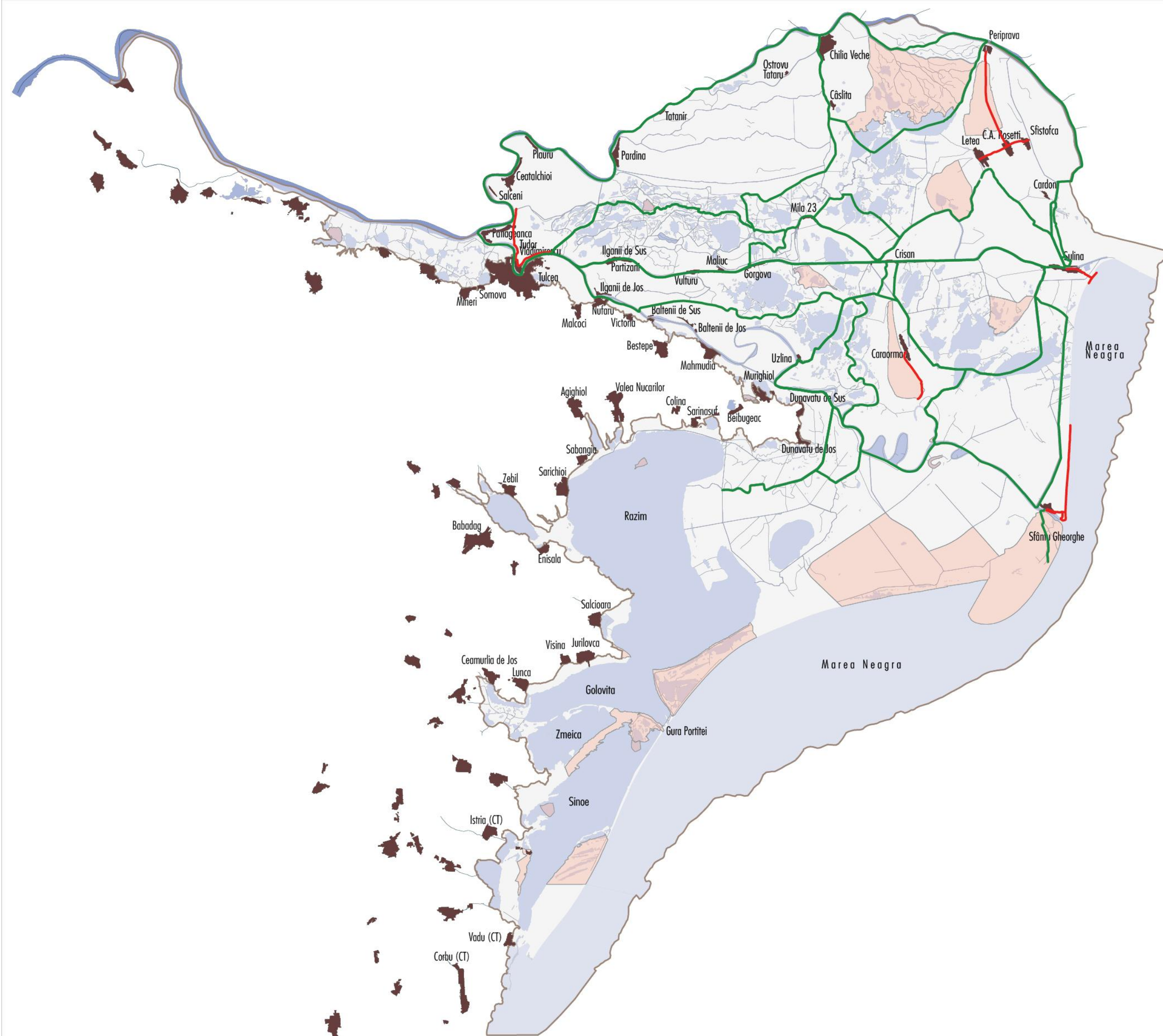
Within the perimeter of DDBR, navigation takes place/ is carried out both with tonnage ships, as well as with other types of vessels that can travel both on the three arms, and inner channels and lake complexes.

Given the status of Biosphere Reserve, with strictly protected areas, buffer zones, DDRA established the following navigation routes. ⁶

⁶ Source DDBRA

- Open shipping routes, throughout the year, subject domestic and international shipping rules and regulations;
- Open shipping routes within morphohydrographic units between arms, motor boats, shallow draft and boats with self-driven propellers, with permits to practice on water transport activities, issued by the Tulcea County Council;
- Open shipping routes located in the natural lakes and streams, breeding areas of the aquatic fauna, in the economic and buffer area open only to navigation of the non-mechanical propelled vessels, for the purpose on capitalizing the renewable natural resources or leisure trips in conditions of strict necessity, for limited periods, the shipping of self-propelled crafts.
- Within the strictly protected areas, only for the purpose of conducting activities of scientific research and monitoring
- Open shipping routes for tourism, which include navigable canals and streams, for tourism with self-propelled crafts established and approved annually by DDBRA, located in economic and buffer zones (along the waterway routes regulating signage of navigation and protection of the areas crossed by waterways are planted).

Map 4 TRASEE DE VIZITARE PE TERITORIUL RBDD water and land tourist's trails are shown, as approved by DDBRA.



TRASEE DE VIZITARE PE TERITORIUL RBDD

- Legenda :
- Limita RBDD
 - Localitati
 - Reteaua hidrografica a RBDD
 - Zone cu protectie integrala
 - Trasee de vizitare pe cai navigabile
 - Trasee terestre (drumetii)



0 1 2 3 4 5 10 20

II.3.1 Utility type transport

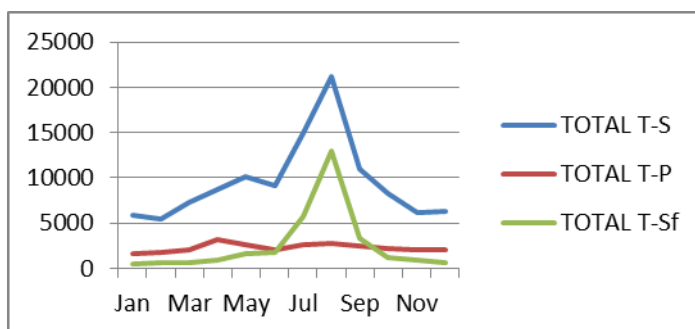
a. Public transport

Public transport services on inland waterways for the transport of passengers and goods between the localities in the Danube Delta and Tulcea. The types of boats used are traditional ships (passengers + cargo) ships and semi-fast catamaran type (passengers). The service is operated by SC Navrom Delta, which ensures the transport of passengers between Tulcea and the Danube Delta localities on the three arms, on the routes: Tulcea - Sulina and return; Tulcea – Chilia Veche – Periprava and return; Tulcea – Sfântu Gheorghe and return.

The residents of Tulcea Municipality and the Danube Delta residents benefit from subsidies.

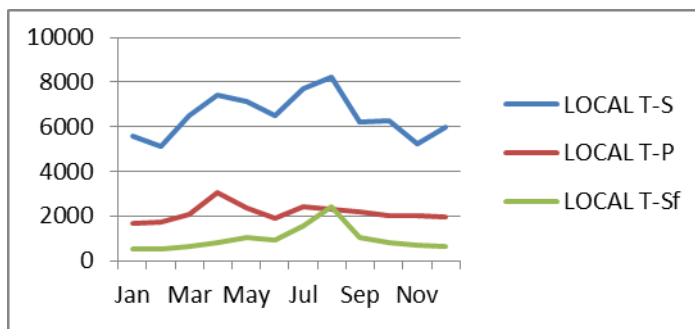
In summer season, on weekly basis, the company supplements -Sfântu George and Tulcea Tulcea – Sulina routs with pleasure boats. For the last two tracks, the classic passenger ships travel and return the next day.

Navrom Delta is equipped with two fast ships, with a capacity of 200 passenger, six classic ships with capacities between 300 and 150 seats and 20 mooring pontoons located in Tulcea and in the major cities of the Danube Delta.



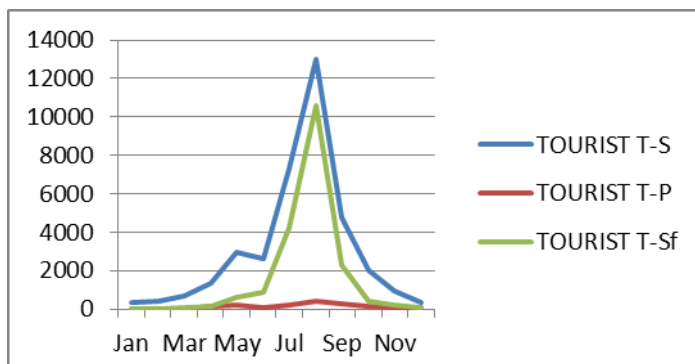
Total number of passengers (**locals + tourist**) transported on the three arm of the Danube, in 2013, by Navrom Delta.

T-S: Tulcea – Sulina
T-P: Tulcea – Periprava
T-Sf: Tulcea – Sf. Gheorghe



Total number of **locals** transported on the three arm of the Danube, in 2013, by Navrom Delta.

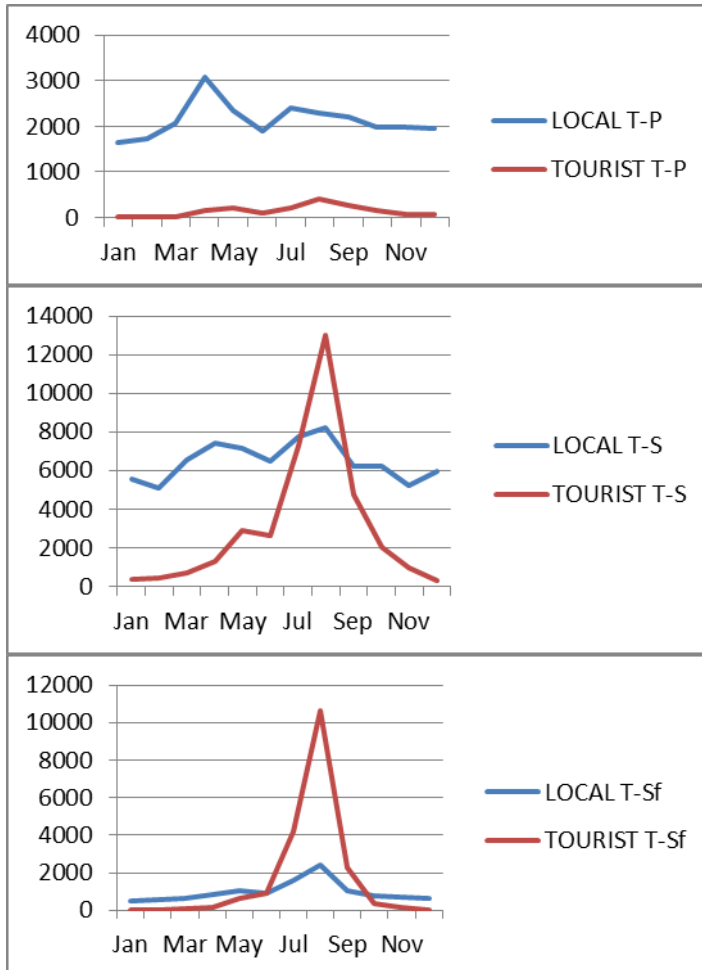
T-S: Tulcea – Sulina
T-P: Tulcea – Periprava
T-Sf: Tulcea – Sf. Gheorghe



Total number of **tourists** transported on the three arm of the Danube, in 2013, by Navrom Delta.

T-S: Tulcea – Sulina
T-P: Tulcea – Periprava
T-Sf: Tulcea – Sf. Gheorghe

According to the graphs, the route most used, both by locals and tourists is Tulcea-Sulina. For Sulina and Sf. Gheorghe, there are peak tourist periods from June to September, while for the Chilia arm the values are approximately constant throughout the year.



The graphs on the left side compare, according to the user type, the values recorded on each arm separately. It is to be noticed that most "tourist" routes are Tulcea-Sulina and Tulcea, Sf. Gheorghe, while on Chilia arm, public transport is mostly used by locals.

The comparative graphs show the highest flows for both tourists and locals on the Sulina arm. The highest flows of tourists are recorded in the period May – September, with a small peak in May on Chilia and Sulina arms, probably due fishing-tourism. On Chilia arm we can see very few tourists throughout the year. Regarding the movement of locals we can notice it is reduces in winter.

There are passenger ships transport, small capacity ships(50 x passenger / trip) that with classic passenger ships connect Sulina channel between: Crisan- Crisan- Caraorman and Mila 23.

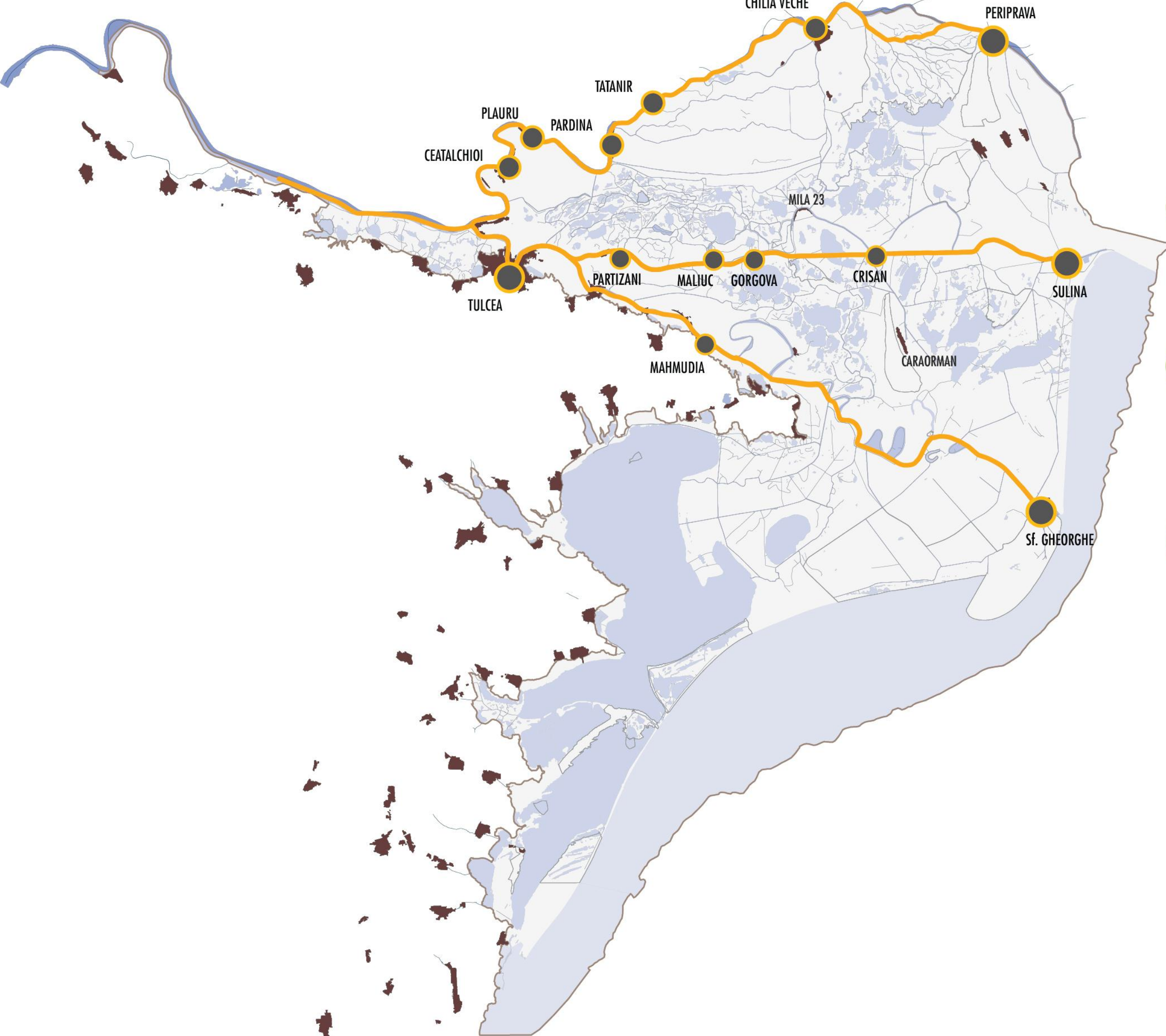
Another operator, SC Diana Shipping Bucharest SRL, uses the rapid ship 'Diana' on Tulcea – Sulina route, lasting 1 ½ hours, but with a limited capacity to 70 seats.

Current issues of naval transport:

Due to high costs, no operator has acquired new vessels, despite existing ones, due to their old age, were damaged and require costly repairs. Off-season, on Periprava - Sf. Gheorghe routes, these vessels are used far below capacity and except for Tulcea – Sulina route, the timetable doesn't n provide a daily connection with the localities in the delta.

Also, the lack of berthing infrastructure (large pontoons are insufficient) and of a wrong systematization in Tulcea, the mooring areas of passenger ships, international traffic overlap with the internal traffic, resulting in port congestion, crowding of passengers and tourists. Tulcea port does not provide facilities for recreational crafts with tourists in international traffic; is not a berthing place for these shifts.

[Map 5 TRANSPORT PUBLIC](#) presents public transport routes and stop stations in localities situated on the three arms. High values of the number of tourists are recorded on routes to Sulina and Sf. Gheorghe, in the months from June to September.



TULCEA - PERIPRAVA



TULCEA - SULINA



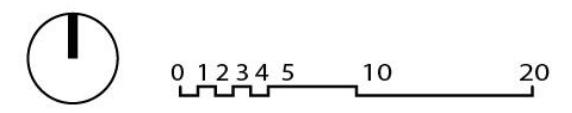
TULCEA - SF.GHEORGHE



** Calatori pe an,
(statistica anul 2013)

TRANSPORT PUBLIC

- Legenda :
- Limita RBDD
 - Localitati
 - Reteaua hidrografica a RBDD
 - Traseu transport public
 - Statii nave transport public



b. Services

Freight

Passenger vessels may be used to transport goods or construction materials on the three arms of the Danube.

Waste collection⁷

The basic source basis to assess the current situation of waste on the territory of DDBR is the database at the level DDBRA.

The main sources of data on waste generation are supplied by waste generators operators who carry out their activity within the reserve, by local administration, by sanitation services, as well as by quantitative estimation of waste produced by tourists visiting the area.

An issue related to street sanitation in the city is the lack or the shortage of containers and street bins and special machinery for the maintenance and transportation of generated and collected waste.

Currently, the storage by final disposal of irrecoverable waste and non-recyclable storage makes the process uncontrollable throughout DDBR through direct dumping in the landfill.

In the open garbage areas, the air is vitiated by a bad smell, and in uncovered garbage flies multiply rapidly and there is ignition and burning hazard of garbage.

II.3.3 Recreational type transport (tourism dedicated transport)

The variety of resources enable practicing tourism in the DDBR perimeter its various forms: the way of practicing tourism determines and influences commuting and type of crafts used in transport within DDBR.

- On water

a. Cruises and floating hotels

Floating hotels and cruise boats to offer accommodation services on vessel board. These are meant for rest and relaxation tourism, practiced through tourism companies and generally have little contact with local communities and do not encourage the local economy.

Tourists arriving by international cruises at Tulcea, are transferred to local ships for trips in the Danube Delta. The cruises season begins in late March to early November and brings an estimated 80,000 visitors / year by approximately 200 cruise ships.

⁷ Source: *Waste Management Plan of the Danube Delta Biosphere Reserve*, Tulcea 2006,

b. Fast boats of travel agencies or hotels and guesthouses in the area

For transporting tourists inside DDBR the approved routes DDBRA are used. These types of boats serve both as destination carriers and as visitation routes transporters.

c. Tour operators rowingboats

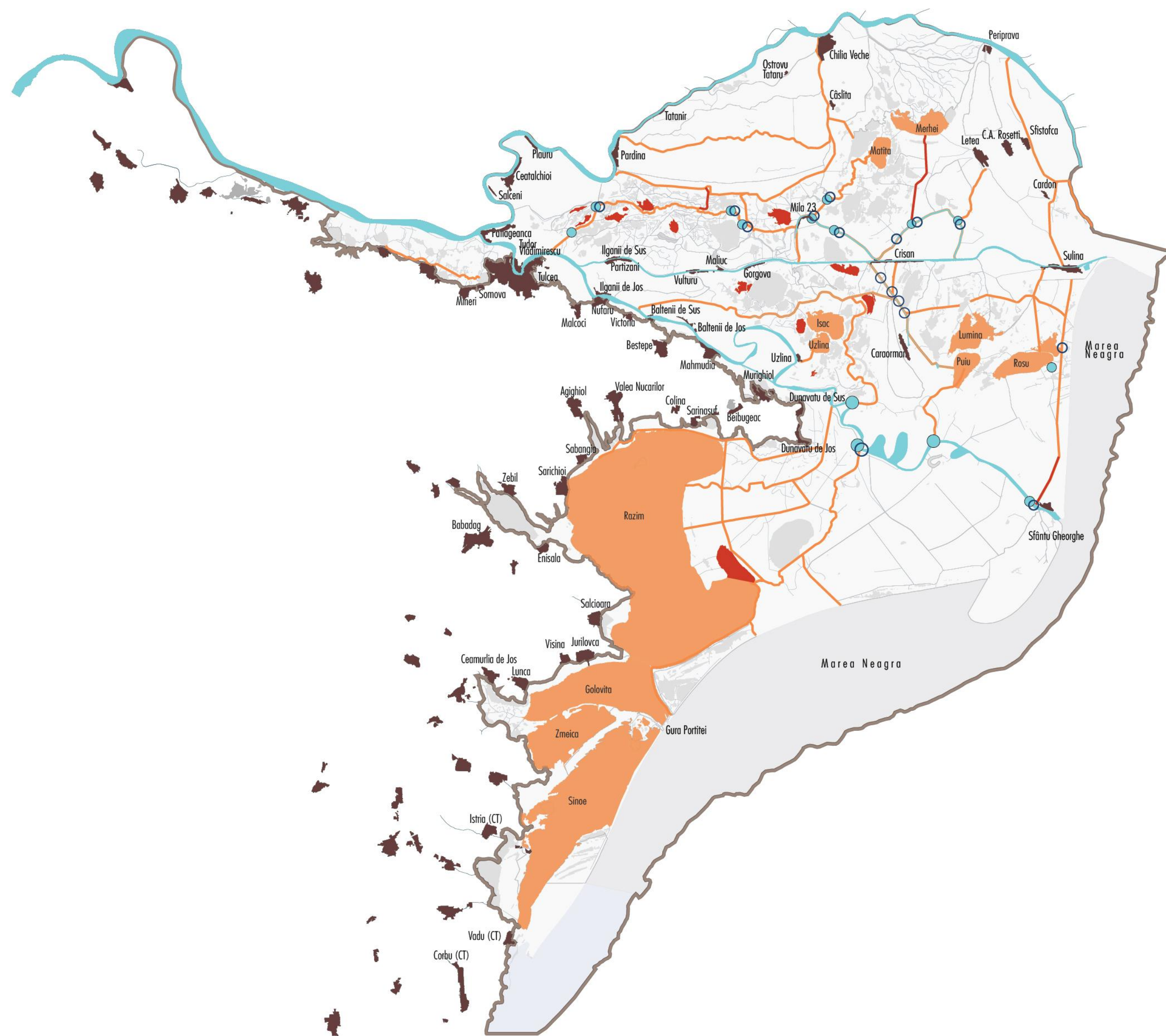
Non-motorized craft - canoes, canotca, lotca are the most practical leisure crafts and can use all channels and lakes where access is strictly forbidden; moreover, they are not restricted by flow and channel depth.

Rowing boats are the most environmentally friendly means of transport, in contrast to the motorized, high power ones.

For navigation and control of ships and boats on navigable routes in the Danube Delta Biosphere Reserve, on inland canals and lakes Rules on access and movement of ships and boats on the canals and inland lakes within the perimeter of "Danube Delta" Biosphere Reserve (which was drawn with observing the Regulation of Navigation on the Danube) is currently under elaboration. It contains rules relating to speed motorized boats traveling on the canals and inland lakes.

To define touristic routs intended for rowboats meetings and informal interviews with a number of tour operators were conducted. Because of the busy summer season, sufficient information couldn't be gathered through questionnaires previously drawn up in advance; therefore, for the next phase of the study such questionnaires will be re-distributed, during autumn-winter periods, based on which conclusive evidence of existing tourism infrastructure in the Delta will be drawn up.

Map 6 REGULI PRIVIND ACCESUL ȘI CIRCULAȚIA NAVELOR PE CANALELE ȘI LACURILE INTERIOARE DIN PERIMETRUL RBDD illustrates the rules on access and movement of ships and boats on the canals and inland lakes within the perimeter of "Danube Delta" Biosphere Reserve (2014-05-06_Government Decision)



**REGULI PRIVIND ACCESUL SI CIRCULATIA
NAVELOR PE CANALELE SI LACURILE INTERIOARE
DIN PERIMETRUL RBDD**

Legenda :

- Limita RBDD
- Localitati
- Reteaua hidrografica a RBDD
- Canalele si lacurile interioare pe care este admisa
circulatia ambarcatiunilor cu 30 km/h
- Canalele si lacurile interioare situate in apropierea
coloniiilor de pasari, cu limitare de viteza 5 km/h
- Locurile pentru acostarea / stationarea navelor
- Locurile permise pentru acostarea / stationarea
pontoanelor dormitor



0 1 2 3 4 5 10 20

- On land

To have an integrated sustainable transport in the Danube Delta, the Opportunity Study on trails / biking trails to and within Delta (Tulcea County administrative territory) should be considered. The study is conducted by Danube Delta National Institute of Research - Development and complements the present study, both having a common basis starting in their drafting.

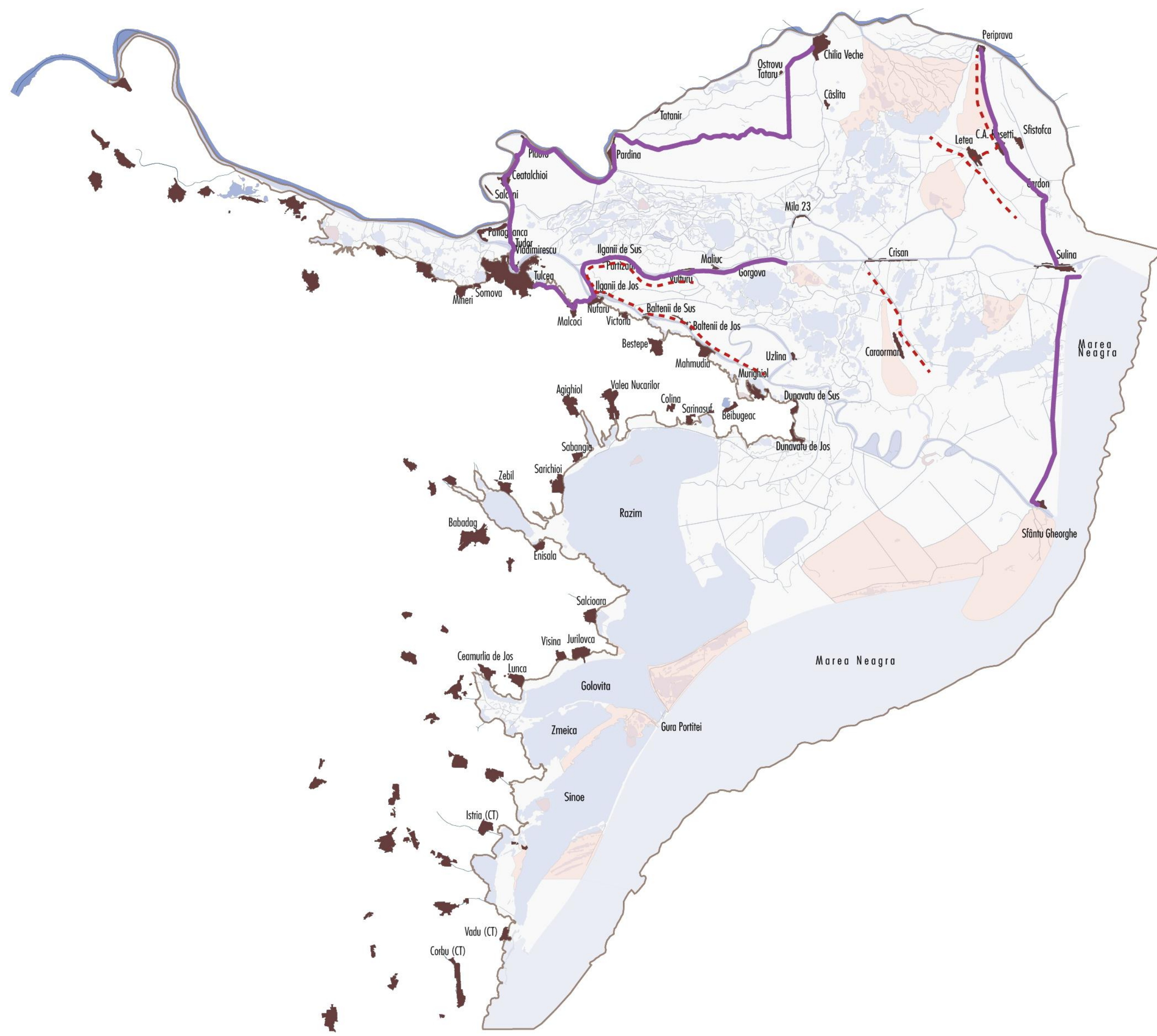
In the context of a rich hydrographic system - the Danube branches, channels, ponds, lakes and swamps - practicing cycle tourism in the Danube Delta is not a typical tourist activity for a wetland the of the Delta size, but the presence of communal roads and some quite large portions of land to ensure satisfaction cyclotourists (Chiliei area and Grindul Letea and Cararoman) makes this type of tourism become increasingly popular in the latest years⁸.

In these two studies, it is desirable to connect existing or under construction cyclotouristic trails as an alternative to the transport network on water and thus achieving an integrated system along the Danube Delta, a unique marking system, reasonable equipping of such trails and in accordance with European requirements promoted nationally and internationally.






In addition to bicycle transportation on land, there is the possibility to transport by horses, practicing recreational riding or horse-drawn carriage on certain routes.

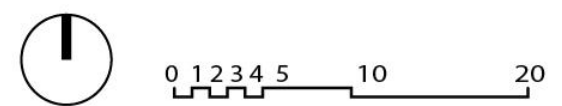
Map 7 ALTE TRASEE SOFT MOBILITY Existing routes for cyclists are marked on the map.

These are not tracks equipped for tourism, but only cycling routes recommended by cycling associations or other organizations of its kind.



ALTE TRASEE 'SOFT-MOBILITY'

- Legenda :
-  Limita RBDD
 -  Localitati
 -  Reteaua hidrografica a RBDD
 -  Trasee ciclabile existente
 -  Zone pentru calarie



II.4 Analysis of the existing transport means having a direct and indirect impact on the environment

Waterway transport in the reservation is carried out by ships and small shallow draft boats and heavy vessels (up to 25,000 dwt) on the maritime Danube. The fleet used for naval transport inside the reserve is characterized mainly by the following elements:

- Specialized fleet activities (transport of goods in bulk, transport of liquids in bulk, transport of technological equipment, transport of reed, live animal transport, technical, towing, pushing vessels, working staff accommodation, passenger transport tourists, floating hotels etc.);
- Boats and motor boats or powered by oars, specialized in fishing activities, fish transport and people, traditional parts of the delta;
- Pleasure crafts, in the full process of evolution, equipped with various propulsion systems and a large diversity design, with features ranging from archaic to ultramodern.

According to approval no. 2 / 11.02.2004 for the sailors issued by AFDJ Galati (which manages the Sulina channel), maximum permissible gauge for marine ships is 200 m long, 28 m wide and 7.32m draft (in 2004 , 35 vessels 000 dwt navigation was allowed, of course under proper navigation restrictions). Since 2004 there is access to ships through Bistroe channel (Ukraine) to ports Ismail and Reni.

Maritime routes used by commercial vessels are:

- Those which leave the port of Sulina towards the sea, are to the Bosphorus - Istanbul; Burgas; Constanta; Odessa and other ports in the Black Sea on the coast of Anatolia and the Caucasus;
- Those entering through the port of Sulina, sailing to ports of Tulcea, Galati, Reni, Ismail (last two Ukrainian ports).

Within DDRB's perimeter, sailing is performed with marine tonnage ships is carried on Sulina arm and with other types of vessels that can sail on the three arms (Chiali, Sulina and Sf. Gheorghe) and inner channels and lake complexes.

From the analysis of the effects of pollutants resulted from sailing or stationary vessels on Danube's arms (Chilia, Sulina and Sf. Gheorghe) and on the inner channels of the delta (especially Mila 35 channels, Crişan-Caraorman and Old Danube to of Mila 23) it resulted that the main pollutant product is the fuel used on board of ships (diesel, light and heavy liquid fuels, fuel oils and oils), both as a result of the combustion process and through their trickle of tanks, reservoirs, plants. Movement of vessels causes significant changes in banks, channels through suction and wave phenomena, for the assessment of which measurements were performed, and the production of noise and vibration affecting the fauna, especially during nesting and feeding.

In terms of environmental protection, control of vessel traffic and water craft on the DDBR routes is performed under the provisions of the following acts:

- Rules of navigation on the Danube, the Romanian sector; provisions of Marpol Convention by Law No. 6/1993; rules POLDANUB-86; legislation that provides for regulations on environmental, flora and fauna, biodiversity and specific ecosystem protection: Law no. 82/1993 on the establishment of the Danube Delta Biosphere Reserve, as amended, the Environmental Protection Law no. 137/1995, as amended, Water Law no. 107/1996 as amended, Law no. 192 / 19.04.2001 regarding the fishery, fisheries and aquaculture, Law on hunting and game protection no.103 / 1996 and Law nr.654 / 2001.

The control of navigation is performed within the limit of attributions granted by the Government to authorized bodies. DDBRA is authorized to control the enforcement of specific environmental legislation.

Other authorities involved are the National Environmental Guard, Border Police, Naval Authority etc.

Ports of the mouth of the Danube, in terms of economic activity, especially the food trade, have been mentioned since ancient times.

More certain data date back from the Byzantine period to the fall of Chilia fortress under Turkish occupation (1484), when there was a flourishing trade through commercial transit ports.

Modern construction of ports, in the Romanian sector of the Danube, started by the late nineteenth century, when they were first capacities at ports of Sulina, Galati, Braila were designed. Performing artery waterways Black Sea - Danube - Rhine - North Sea caused the current territory of the Danube Delta Biosphere Reserve to be included in the European multimodal transport flow, European, goods and raw materials. Within the reserve and in the adjacent areas there are fluvial-maritime ports of Sulina and Tulcea, located on Romanian territory, Ismail and Reni ports belonging to Ukraine and a Danube shore area of nearly 1 km, under the jurisdiction of the Republic of Moldova and river ports Chilia Veche, Sf. Gheorghe, Mahmudia, Isaccea etc.

Based on the above mentioned it results that transport activity in the DDBR, is a long term activity, over a large area as scientific importance and has a major impact on the area. Spot Monitoring (transport unit) does not provide a true picture of the overall study is therefore necessary to define a system for monitoring the impact and transport management in the Danube Delta.

This study should address the following main directions:

1. Identify all institutions responsible for monitoring, control, regulation and transport management in the Danube Delta Biosphere Reserve;
2. Identify and analyze legislation underpinning their operation;
3. Assign an existing authorities to take over the leading role in monitoring by centralizing all the data collected by various means each entity, real-time processing them, making necessary decisions and measures;

4. Establishing monitoring sections (as modeled by Romanian Waters) that with the specific equipment transmit all the data needed to assess (craft type, speed, waves, noise, pollution, etc.);
5. Estimation of transport needs in various periods by type of cargo and quantities;
6. Estimation passenger need in various periods;
7. Identification of new means of transport in terms of technology (low consumption, renewable energy, propulsion and modern forms, etc.);
8. Identifying advantageous financing opportunities for the purchase of such means of transport (European funds, etc.);
9. Proposals to amend the legislation to support sustainable transport in the Danube Delta.

Analysis of existing transport means having a direct and indirect impact on the environment.

If we assume that any means of transport has an impact on the environment, this analysis should begin with an inventory of existing means of transport.

This activity has a difficulty in the sense that there is a sufficient number of owners (manning agents) individuals, businesses, NGOs, institutions. In parallel with the transport inventory assets (functional) inventorying of non-operating means of transport must be carried (most are found in those parks cold in some areas of the delta) which under certain conditions can have a major impact on the environment.

After collecting all the data from the field, from the owners and by monitoring at least one year the boats registered in other parts of the country or the world, all the necessary data for an accurate assessment of the impact will be established (fuel, oils, exhaust emissions, wastewater, noise, vibration, waste, etc.).

In conclusion, even for data collection specialists working in the area of research and operating in research institutions in Tulcea, Constanta, Galati, Bucharest, must be involved.

II.5 Analysis of sustainable transport and current accessibility supply

II.5.1 Existing sustainable transport offers

Currently, sustainable water transport means are represented by the rowing boats, lotcas, canoes, canotca type. Only a few operators offer tourist routes based exclusively on non-motorized boats. There are also a small number of tour operators who have included in their offer, experiencing different sports and soft-mobility along the channel during a single day of the package tourist offer.

The sustainable transport water and the land transport are represented by bikes (described in the previous chapter) and horses

II.5.2 Accessibility. Spatial Analysis.

The space configuration space is the one that shapes its use, i.e. it shapes the two basic types of activities: movement (crossing) and occupancy; a better distribution of flows affects functions, density, safety and impact on adjacent areas.

This type of analysis reveals the spaces and routes that will be the most "strategically positioned" to make all the connections between all points in the system and as such areas with the highest potential for use.

At the urban level, increased use leads to viability of functions (services and trade) that rely on the presence of users, namely the flow of movement. In this case, however, an increased potential of use indicates that those routes could be the key routes in planning a sustainable transport system, along which infrastructure and services might be focused on and at the same time a special care is needed because these channels support a high level of traffic of potentially negative environmental impacts.

In this case, using only the basic spatial structure (spatial network analysis), of "guess" analysis the major axes of the delta which focuses on routes and tourism services and their related infrastructure.

The areas in question are located in distinct configurations of channels networks, have different characteristics in terms of spatial accessibility - which may be one of the basic conditions that determine the shape of their functioning.

From a global scale to a local scale

Once a facility has been achieved by its integration into existing structure, development can focus on smaller scale problems. Local strategies for design can use the advantages of crossing movement and create distinct areas in the territory, by designing routes, premises, facilities, signage.

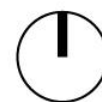
Map 8 SITUAȚIE EXISTENTĂ – ACCESIBILITATE ÎN TERITORIU: ACCESIBILITATE LOCALĂ The diagram below shows the network of water routes. Analysis lies in the integration of these pathways in the context of the whole navigation system in Danube Delta. Routes most integrated and those that have the highest degree of accessibility are figured in warm colors of red, in contrast, being the routes marked with cool colors of blue. This means that the routes with the highest accessibility have a greater potential to be used as communication channels / travel system, unlike those blue, more isolated. This analysis takes into account the number of segments of the entire route, the angle and number of channels that intersect it.



SITUATIE EXISTENTA
ACCESIBILITATE IN TERITORIU
ACCESIBILITATE LOCALA

Space Syntax
romania

Legenda :
Accesibilitate ridicata



0 1 2 3 4 5 10 20

Global accessibility. Land routes networks

Map 9 SITUAȚIE EXISTENTĂ – ACCESIBILITATE ÎN TERITORIU: ACCESIBILITATE GLOBALĂ In this example, land routes networks are presented, based on the same factors as in the previous example. From the analysis it appears that Tulcea is the most important access node for terrestrial links, potentially greater accessibility to Chilia and Murighiol. However, it is to be noted that the current analysis reflects "potential movement"; there is a possibility that this does not coincide with the situation on the ground. In these situations should be taken into account road quality and climatic factors.



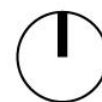
SITUATIE EXISTENTA
ACCESIBILITATE IN TERITORIU
ACCESIBILITATE GLOBALA

Space Syntax
romania

Legenda :
Accesibilitate ridicata



Accesibilitate scazuta



0 1 2 3 4 5 10 20

II.6 Related infrastructure: stations, wharves, fuel, cargo storage platforms, waste etc.

On DDBR territory can identify the following facilities and services: three visitor centers /existing information and other phase design / build, 12 Quantity 40 pavilion.

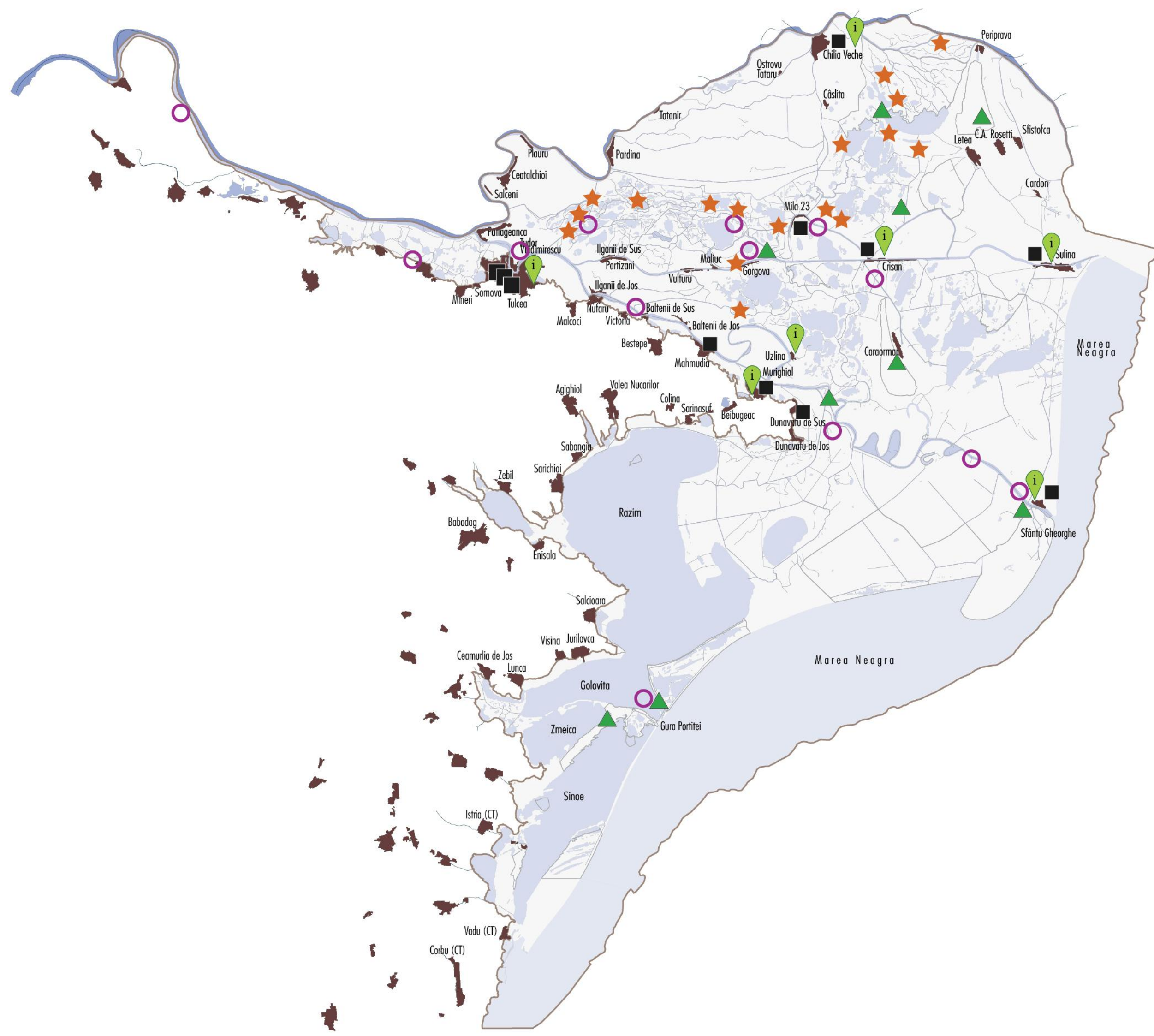
In addition, transport related infrastructure includes:

- Mooring pontoons
- 7 stops fuel supply than those of Tulcea municipality.

Navrom Delta has 20 mooring pontoons located in major cities of Tulcea and the Danube Delta.

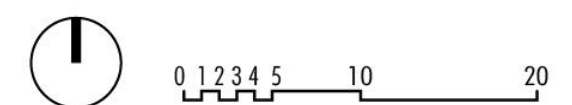
Most fuel stations are located on the Sulina and St. George, one station being located in Chile Veche.

[Map 10 INFRASTRUCTURA CONEXĂ](#) presents the DDBR existing infrastructure, according to data collected from the Danube Delta Biosphere Administration. Their location is less dense actual Delta, where several lakes and channels can be found.



INFRASTRUCTURA CONEXA

- Legenda :
-  Limita RBDD
 -  Reteaua hidrografica a RBDD
 -  Statii pecc plutoare
 -  Cantoane
 -  Adaposturi pescaresti
 -  Centre de informare ecologica
 -  Foisoare de observare



III. ANALYSIS OF TOURISM ACTIVITIES GENERATING TRAFFIC (FLOWS OF TOURISTS) THROUGHOUT THE YEAR

Range of tourism activities that a tourist may undertake during a specific form of tourism is very varied, depending on the form of tourism practiced, the diversity of tourism products, the distances, the seasonality of tourism activities, polarizing tourist attractions.

III.1 Tourism and recreation zoning Danube Delta

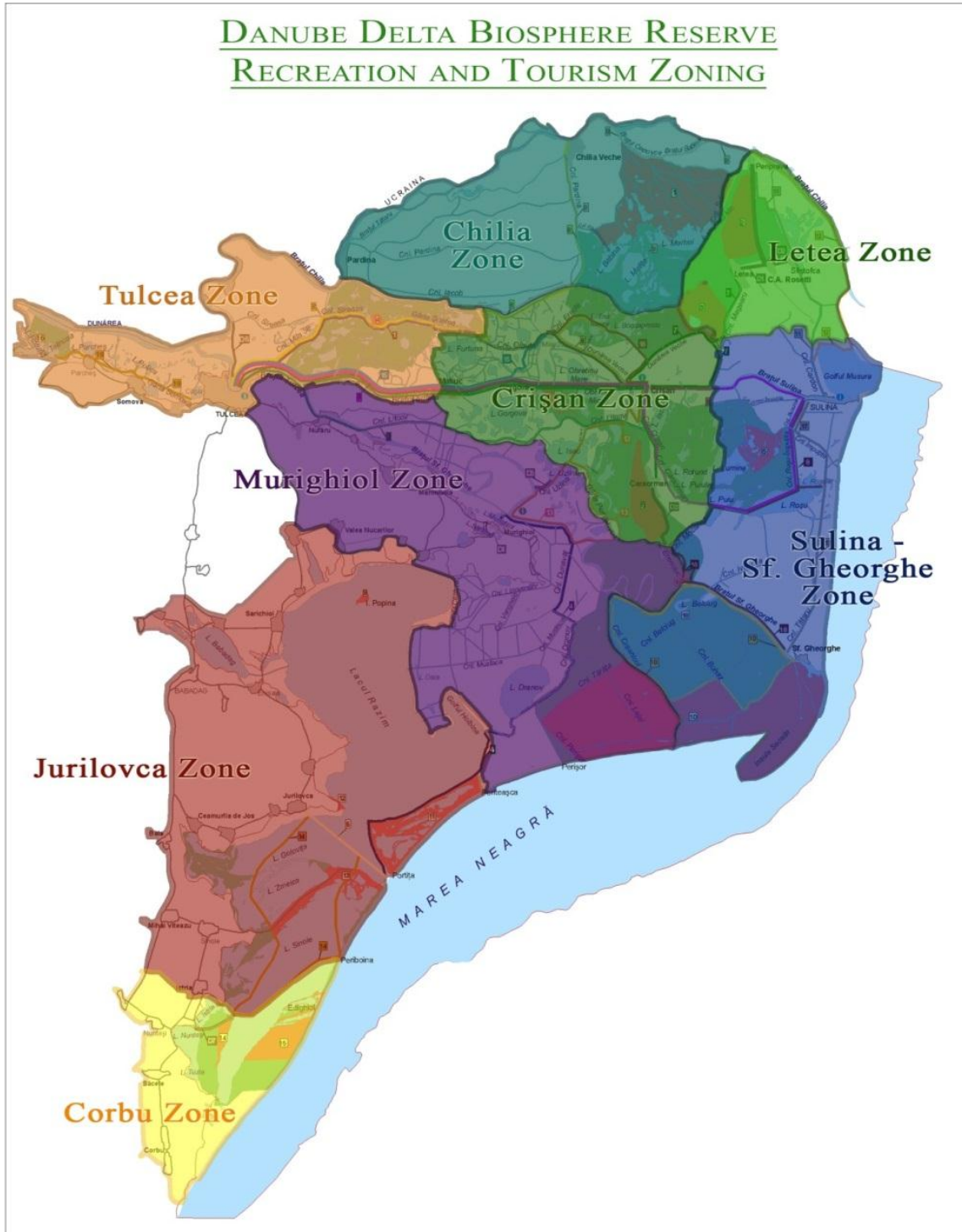
The status of the Danube Delta, that of protected area triggered a process of reorganization of tourism that is carried out in this area, in the context of sustainable exploitation of natural resources.

Concepts such as sustainable tourism development and ecotourism, sustainable transport, were taken and adapted to DDBR conditions and formed the basis for defining the management objectives regarding the organization and control of tourism activities DDBR. In the context of the accelerated tourism development in the DDBR, DDBRA requested in 2008 performing a new tourist zoning of DDBR territory to assist visitor management and development of visiting strategy. This study was conducted by the Association for Ecotourism in Romania, in collaboration with the Detente consulting firm in France, DDBRA, INCDD Tulcea, Tulcea County Council and SOR. According to this study, the new zoning for tourism and recreation takes primarily into account primarily the behavior and prevailing experiences of current visitors and promotes a certain vision on development, including those objectives that maintain local specificity and provide better opportunities both for environmental conservation and sustainable development.

Thus, for sustainable use of DDBR's aesthetic resources and efficient management of visitors, on DDBR's territory 8 zones were delineated for tourism and recreation, based on concepts used for the first time in DDBR:

- i) access points and central existing and potential points;
- ii) the structure and types of visitors / tourists (type experience slow or fast).

New zoning takes especially into account unorganized tourism, that need less control and the experience of visitors / tourists during their in the Danube Delta Biosphere Reserve.



Tourism and recreation zoning map. (Source: AIR & detention 2009)

III.2 Prioritization POIs in the area

Crisan Area

Crisan area has visitors and tourists that come both international market and domestic market. They seek a pure experience of the Danube Delta, being attracted to:

- Observation of birds and culture of the Delta, if foreign tourists;
- Fishing (tourists from Romania)

Murighiol Area

Murighiol area offers two different major experiments currently:

- a. *Traditional entrance gate* for a large number of tourists from Romania, traveling in small groups (eg family, friends) and have two main motivations to enter the Delta by Murighiol:
 - i. camping in the surroundings of Murighiol (using or not private camping areas);
 - ii. access to more distant destinations (especially Sf. Gheorghe), where they spend longer holidays. They use Murighiol to park their car and then heading to the final destination: camping in nature, stand in their second home (weekend house) or using the local accommodation.
The main activity of these tourists is fishing. They use either their own boats or rent boats from the locals (with or without driver).
- b. *weekend destination* that was conducted recently and covers Dunavățul de Jos, Mahmudia and Uzlina. Tourists weekend use of the existing accommodation facilities. They come in couples or small groups and travel mainly in major cities like Bucharest.

Zona Jurilovca

In the Jurilovca, Portita is the most famous attraction as a summer destination, with its traditional offer: sun, sea and sand, attracting Romanian tourists who love the beach.

The other major attraction is linked to a cultural place: Enisala, with the ruins of ancient Greek city which is visited mainly by tourists passing car on the main road (Jurilovca - Tulcea).

Lake Razim is the third attraction, frequently used by weekend tourists in their engine boats in the summer time, which has been proven that set pressure on bird populations along the lake shore.

Sfântu-Gheorghe – Sulina Areas

Sfântu Gheorghe is associated with three main experiences:

- a. sun, sea and sand in a summer destination somewhat traditional yet exotic, which attracts a completely different type of tourists than typical resorts on the Black Sea;
- b. the experience of "traditional and authentic fishing village";
- c. "Anonimul" Film Festival that takes place there for 10 days each summer.

Sulina is associated with two major tourism experiences:

- a. sun, sea and sand;
- b. Cultural Heritage - Sulina history is linked to its status as a "free port" (porto franco) and the history of the Delta Commission with its socio-cultural influence in the area.

Chilia Area

Currently fishing (and hunting) is the main attraction for Romanian tourists coming to this area. Besides the impressive church and rush knitting shop (Typha), there is no other attraction in the area.

Vadu – Corbu Area

Currently there is an uncontrollably camping area on Vadu beach, beach without any kind of infrastructure or benefits for local people; planned an extensive seaside resort that threatens both ecotourism development (based on a well maintained camping) and coastal habitats.

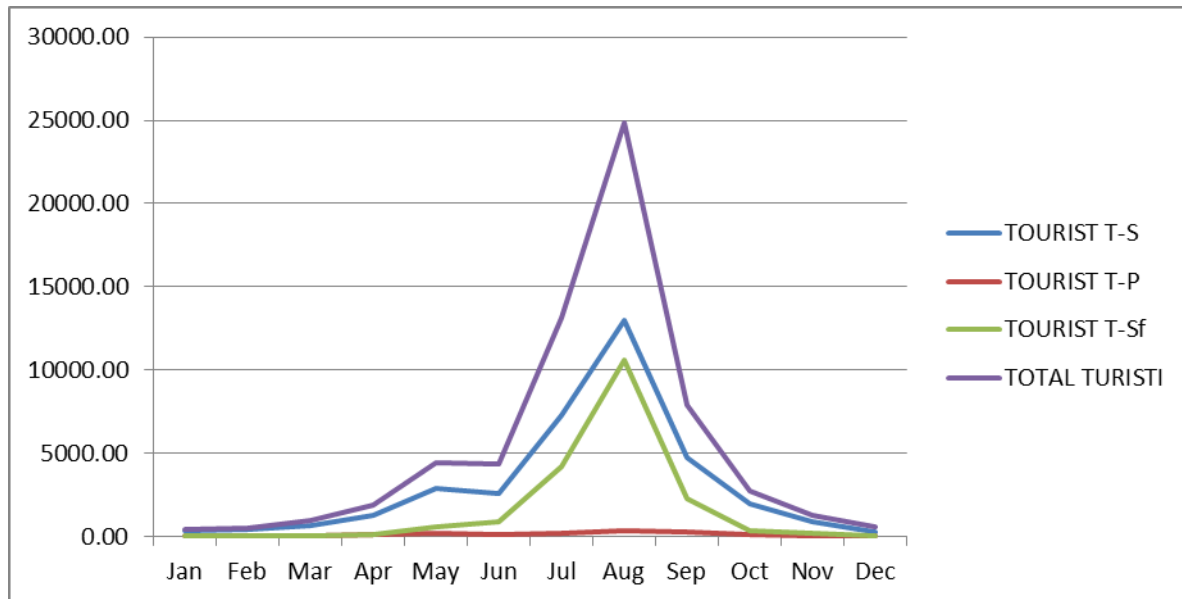
III.3 Analysis of tourists flows

The way of practicing tourism determines and influences the flow of tourists throughout the year, as follows:

- Tourism for rest and recreation, practiced by tourism companies in the hotels within the reserve or floating hotels, combining trips on canals and lakes with beaches located along the Black Sea coast;
- Knowledge tourism (itinerant), practiced either individually or through organized trips, suitable for smaller groups of visitors to explore the wild landscape, combining boat trips on channels manually propelled with hiking along channels or fluvial and marine shores, etc.
- Specialty Travel (Scientific) for ornithologists, specialists, researchers, students;
- Special programs for youth, for knowledge of nature;
- Ecotourism, with a role in promoting sustainable use of biodiversity, with a fair distribution of the benefits to the public and local community;
- Rural tourism (in which guests are hosted and guided by locals), traditionally in Danube Delta Biosphere Reserve, home to many local families and accompanying visitors in the Danube Delta. This type of tourism is an important potential to improve incomes of local people;
- Walking for water sports, photo safari;
- Tourism for fishing, very appreciated by visitors of all ages, in any season, for any species of fish, and hunting sports.

Certain tourist activities requiring special regulations, such as angling.

To practice these activities, only certain areas of DDBR were authorized, selected based on accessibility, low impact on wildlife and they non-belonging to strictly protected areas. These tourism activities / recreation can take place only in areas specifically designated and approved by DDBRA.



The graph above compares the tourist flows on each arm of the Danube, recorded by public transport facility. It is to be noted that most "tourist" routes are Tulcea-Sulina and Tulcea-Sf. Gheorghe, while the Chilia arm, the public transport is used more by locals.

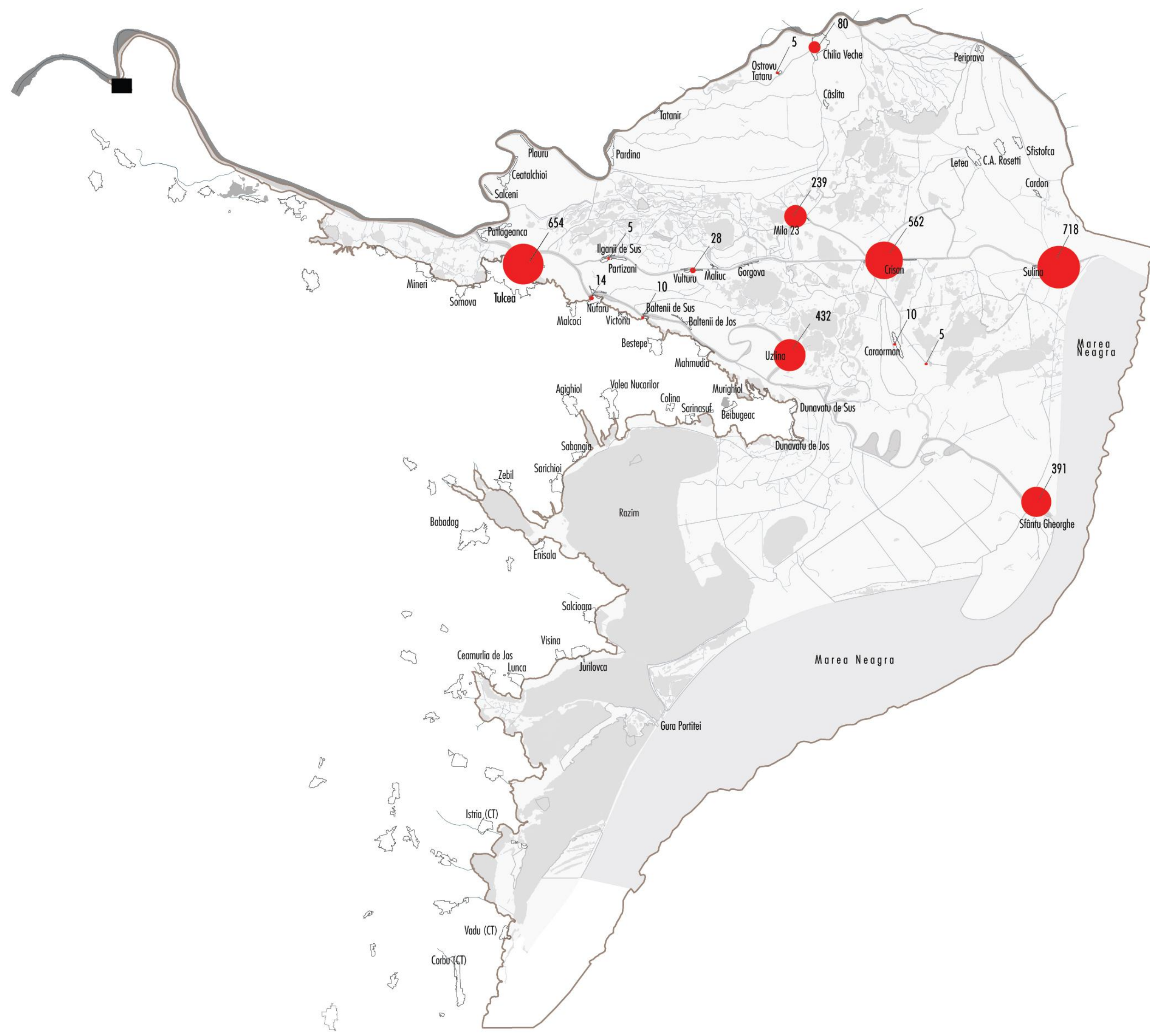
III.4 Accommodation capacity (Carrying capacity)

Tourism facilities generally comprise various accommodation equipment (camping areas, cottages, lodges, villas, hotels, youth camps, holiday villages, etc.), catering facilities, sports facilities, walking trails, horseback riding trails, information centers, museums and exhibition halls, etc. All must be designed so that would not exceed environmental endurance, to meet the needs of tourists.

Although there are no accurate data on the actual accommodation capacity in DDBR, from information obtained from ARBDD and based on local observations a grouping tendency of tourists can be observed in certain areas for accommodation, a determining factor for this being the natural environment and accessibility of the area.

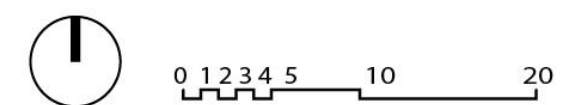
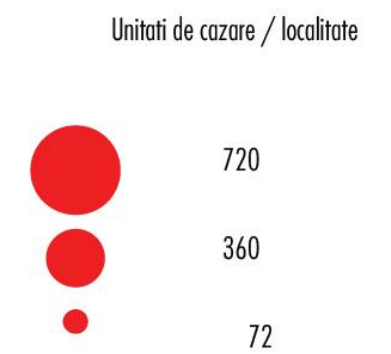
Recent trends in international tourism show a growing market of ecotourism. Starting from the size of the potential market, the key issue is providing ecotourism products that meet market needs and at the same time have a positive economic and environmental impacts.

[Map 11 CAPACITATE DE CAZARE](#) illustrates the accommodation infrastructure in RDBB territory, according to data taken by the DDBRA from registered tour operators. There is a concentration of accommodation establishments along the Sulina arm, a predictable information if we into account tourist flow chart on the same arm. Although the data provided do not show a significant number of hotels / hostels along Tulcea-Murighiol road, field observations indicate that there is a very high concentration of units in this area.



CAPACITATE DE CAZARE

- Legenda :
- Limita RBDD
 - Reteaua hidrografica a RBDD



III.5 Analysis of tourism activities based on zoning conducted by DDBRA. Assessment of tourism potential of sub-areas and how it can be supported by sustainable transport, as the case may be.

Crişan area

Crişan should become a prime destination for a type of tourism focused on nature experience slow. The main objectives for this area are:

- 1. Establish / develop the right type of infrastructure that would attract only slow nature experience;*
- 2. Develop and promote tourism activities to be integrated into a slow nature experience.*

Murighiol area

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

- 1. strict management of full area of recreational opportunities and related activities;*
- 2. slowdown of rate that consumes the visitor experience (weekend) and diversification of offer in favor of the locals*

Jurilovca area

The unique promoting items (USP) of Jurilovca area consist in exploring the delta by land approach. Thus Jurilovca can become a multiple seasonal destination with a varied offer during two main seasons.

The objective of this area is its development according to two main seasonal offerings, and namely:

A. Summer:

*For a relaxing experience at Portita - sun, sea and sand;
cultural tourism based on archeological attraction;
for walking and cycling destination.*

B. Winter:

- a. a destination for bird watching in Razim area as an alternative to hunting (with a value so low);*
- b. photography nature ("digi-scoping").*

Sfântu-Gheorghe – Sulina area

The vision proposed for the development of this area is becoming a different kind of destination for "sun, sea and sand" with a certain mix of attractions consisting of beach, Delta culture (heritage and country life) and nature (sea delta). The motto of this area should invite visitors to experience a taste of "Old Man River and Sea" based on an authentic fishing village (St. George) or sand and history in Sulina, combined in a natural setting that offers facilities and observation of birds.

Chilia area

This area may contribute to the understanding of the mainland of the Delta, focusing on Delta geomorphology and at the same time showing how an active nature management and restoring natural areas can support the development of ecotourism by local community.

The main objectives for this area are:

- diversification of tourism including specific landscape of the continental Delta;*
- integrating wetland restoration plans for tourism development;*
- Chilia positioning as a bridge to the Ukrainian Danube Delta.*

Vadu – Corbu area

Vadu can become a destination for camping in nature with proper management, with benefits for the local community. In addition, the site offers good opportunities for bird observation specialists.

III.6 Profiling Mobility System Users in the Danube Delta. Sustainable transport network and related facilities varies according to each user profile.

Sustainable transport network and related facilities varies according to each user profile. To define the planning principles of these networks will be analyzed the needs of the users area.

Chilia area

Users	Activities	Pressures	Benefits
'FUN SEEKERS'	Relaxation Tourism	Boat trips among birds colonies Cars, motorbikes, ATV traffic on roads	Transport Boats rental Boarding
NATURE LOVERS	Tourism (canoe, small motorboats, bicycles)	Travelling by car or boats near the birds colonies area	Transport Boats rental Boarding Local guides
ANGLING	Relaxation Sport	Travelling by cars or boats Rumor, waste and camping	Transport Boats rental Boarding Local guides
BIRD WATCHERS	Tourism	Travelling by car or boats Getting close and access to birds colonies areas	Transport Boats and cars rental Boarding Local guides
PILGRIMS	Pilgrimages in religious places in the area	Travelling by car or boats	Transport Boats rental

Murighiol area

Users	Activities	Pressures	Benefits
ANGLING	Relaxation Sport	Travelling by cars or boats Rumor, waste and camping	Transport Boats rental Boarding Local guides
'FUN SEEKERS'	Relaxation Tourism	Boat trips among birds colonies Cars, motorbikes, ATV traffic on roads	Transport Boats rental Boarding
BIRD WATCHERS (IN SMALL GROUPS)	Tourism	Travelling by car or boats Getting close and access to birds colonies areas	Transport Boats and cars rental Boarding Local guides
NATURE LOVERS	Tourism(canoe, small motorboats, bicycles)	Travelling by car or boats near the birds colonies area	Transport Boats rental Boarding Local guides
PILGRIMS	Pilgrimages in religious places in the area	Travelling by car or boats	Transport Boats rental

Jurilovca area

Users	Activities	Pressures	Benefits
"FUN SEEKERS"	Relaxation Tourism	Boat trips among birds colonies Cars, motorbikes, ATV traffic on roads	Transport Boats rental Boarding
ANGLING	Relaxation Sport	Travelling by cars or boats Rumor, waste and camping	Transport Boats rental Boarding Local guides
BIRD-WATCHERS	Tourism	Travelling by car or boats Getting close and access to birds colonies areas	Transport Boats and cars rental Boarding Local guides
NATURE LOVERS	Tourism(canoe, small motorboats, bicycles)	Travelling by car or boats near the birds colonies area	Transport Boats rental Boarding Local guides
PILGRIMS	Pilgrimages in religious places in the area	Travelling by car or boats	Transport Boats rental

Sfântu-Gheorghe – Sulina area

Users	Activities	Pressures	Benefits
'FUN SEEKERS'	Relaxation Tourism	Boat trips among birds colonies Cars, motorbikes, ATV traffic on roads	Transport Boats rental Boarding
ANGLING	Relaxation Sport	Travelling by cars or boats Rumor, waste and camping	Transport Boats rental Boarding Local guides
BIRD WATCHERS	Tourism	Travelling by car or boats Getting close and access to birds colonies areas	Transport Boats and cars rental Boarding Local guides
NATURE LOVERS	Tourism(canoe, small motorboats, bicycles)	Travelling by car or boats near the birds colonies area	Transport Boats rental Boarding Local guides

Chilia area

Users	Activities	Pressures	Benefits
'FUN SEEKERS'	Relaxation Tourism	Boat trips among birds colonies Cars, motorbikes, ATV traffic on roads	Transport Boats rental Boarding
ANGLING	Relaxation Sport	Travelling by cars or boats Rumor, waste and camping	Transport Boats rental Boarding Local guides
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PILGRIMS	Pilgrimages in religious places in the area	Travelling by car or boats	Transport Boats rental

Vadu – Corbu area

Users	Activities	Pressures	Benefits
'FUN SEEKERS'	Relaxation Tourism	Boat trips among birds colonies Cars, motorbikes, ATV traffic on roads	Transport Boats rental Boarding
ANGLING	Relaxation Sport	Travelling by cars or boats Rumor, waste and camping	Transport Boats rental Boarding Local guides
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IV. SWOT ANALYSIS OF THE TRANSPORT SYSTEM IN DELTA

Strengths	Weaknesses	Opportunities	Threats
<p><i>Accessibility:</i></p> <p>Ability to access DDBR by several means of transport:</p> <ul style="list-style-type: none"> - Personal car, public transport bus type - Rail access - Tulcea station - Air access by airport of Cataloi - Access to water from upstream Danube or sea ports. <p>A vast network of waterways available for both public transport and leisure.</p> <p><i>Infrastructure:</i></p> <p>Lower costs of major infrastructure, enough high level of safety versus other existing means of traveling.</p> <p><i>Environmental Regulations:</i></p> <p>Limited access to water to protect areas under UNESCO.</p> <p><i>Culture and tradition:</i></p> <p>Local tradition in the production</p>	<p><i>Accessibility:</i></p> <p>Relatively isolated area, because it is situated at the eastern extremity of Romania. Very limited public transport routes, zone restricted, less functional for tourists.</p> <p>The low number of boats that provide public transport cannot cope with the population and the contribution of tourists in peak season.</p> <p>Since transportation of it done in 80% by water, it does not offer a 100% safe alternative, depending on climate, weather conditions and seasons.</p> <p><i>Infrastructure:</i></p> <p>Poor infrastructure is not well done or missing in some places.</p> <p>They used motorboats with engines that do not meet required standards of environmental protection are outdated.</p>	<p><i>Accessibility:</i></p> <p>The existence of a public transport system that can be improved.</p> <p>Implementation of new sustainable public or public-private partnership transport systems dedicated to tourists. (water transport, bicycles, etc.)</p> <p>By improving the transport system capability to exploit the natural habitat will increase and along with it, will increase tourism activity in a controlled manner and with minimal environmental impact.</p> <p><i>Infrastructure:</i></p> <p>A better signage of access routes by signaling water transport routes will improve the experience for tourists and will facilitate their access control type.</p> <p>Creating an information system that can be accessed online by tourists for a better understanding of the place and opportunity of planning</p>	<p><i>Accessibility:</i></p> <p>Inadequate maintenance of the waterway may have negative impact on accessibility.</p> <p><i>Infrastructure:</i></p> <p>The aging of existing fleet and weak investment in refurbishment will increase a negative impact on the habitat.</p> <p>Unplanned growth of tourism activity and thus water transport will also have a negative impact on the environment, and in the short term will cause difficulties in tourism activity and lack of a DDBR coherent presentation discourse.</p> <p><i>Environmental Regulations:</i></p> <p>Lack of control over shipping traffic and a unique organism having this office</p>

<p>boat-lotca-</p> <p><i>Strategic Development:</i></p> <p>strong links with various European development goals</p>	<p>This mode of transport is dependent on the conditions of the waterway, coping with the frost winter, or in dry seasons with clogging the channels.</p> <p>Public transport infrastructure is not equipped properly.</p> <p>Signage on waterways is poorly signaled or nonexistent.</p> <p>Poor quality of roads makes them inaccessible for land transport.</p> <p>Infrastructure represents a high cost due to seasonality of tourists flow.</p> <p>High degree of pollution due to oil spills resulting from crafts transiting the area</p> <p><i>Regulations</i></p> <p>Due to poor regulating the movement of boats on the Danube, many times accidents happen and walking problems</p>	<p>trips.</p> <p>Creating multimodal port-access, bike-rail access centers, to support a sustainable multimodal system, which will increase the mobility of the area.</p> <p>The introduction of more efficient propulsion systems, including infrastructure for fuel (engine that works with electricity), to support a new flotilla low impact on nature.</p> <p><i>Environmental Regulations:</i></p> <p>Creating a vessel traffic control system to reduce environmental impact. Making a rowboat zoning exclusively dedicated to provide experience tranquility in nature.</p> <p><i>Culture and tradition:</i></p> <p>Reviving traditional craft and some tourist packages that highlight this goal, along with activities such as fishing, photography and bird watching.</p>	<p><i>Strategic Development:</i></p> <p>Lack of interest and especially the coordination of institutions with responsibilities in the area and the potential target groups.</p> <p>Difficulty in accessing finance, limited knowledge of financing options</p>
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	<p><i>Culture and tradition:</i></p> <p>Giving up local operators that organize trips on the water, means of traditional locomotion in favor of motor boats that provide a higher volume of tourists and high speed.</p> <p><i>Strategic Development:</i></p> <p>Few European funds were accessed by local operators. Low level of available resources.</p> <p>There is not enough cooperation between stakeholders.</p>	<p><i>Strategic Development:</i></p> <p>Organizing programs of presentation of new sources of funding for locals, local tour operators and other stakeholders.</p> <p>The existence of an international interest for the deployment of sustainable mobility.</p>	
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V. PROPOSALS FOR THE USE OF ECOLOGICAL MEANS OF TRANSPORT / ORGANIC ROUTES IN THE DANUBE DELTA

This chapter will detail a strategy for sustainable transport in the Danube Delta, by defining some measures and projects that will be developed following the objectives set for each of them.

Establishing a network of trails will be proposed, taking into account the identified needs and condition of the existing hydrographic network, which will support through the infrastructure provided along it, several models of transport for tourists and locals alike.

This network will be defined based on existing trails, but also on the ones closed, for various reasons over the years and will be correlated with other modes of transport in the area, especially with biking routes, traking, water public transport and existing local roads.

Locations will be identified for tourist centers according to their accessibility, neighborhood, existing transportation system. The main objective of the strategy is to allow exploration of the area by tourists, but also locals providing the necessary mobility of service providers, with minimal impact on the environment, including intermodal stations and information centers.

Not least a mobility management system in the Delta, will be proposed based on a mobility monitoring system in the Danube Delta, in order to improve sustainable transport these.

- A. *The main objective addressed* by this study is a sustainable transport system in the medium and long term. In this respect it is essential to create a **transportation management structure** flexible enough so that it can be continuously adapted to developments in tourism, environment activities and all the other factors present in the region.

In a first phase, as seen in the analysis of existing data, a program **of inventory and monitoring** all vessels operating in DDBR is required. It is also important that this includes all categories of boats that may belong to either locals or tour operators or visitors who enter the DDBR perimeter by own boat, registered to another captain's office. At the same time transport vessels transiting the area and offering services in area must be taken into view.

Based on observed traffic patterns and analysis of environmental impacts, transportation management system in DDBR will manage and regulate the movement of all existing means of transport.

Once this monitoring and management system is defined, an institution or department that has the operational and legal capacity to implement it, will be identified.

It is necessary **to develop a plan for water movement** that aims to categorizing trails and velocities to differentiate routes, taking into account the environmental impact. mainly three types of routes were identified: **Waterways** (those under supervision and control of RNA) **Express Routes** (inland waterways dedicated to public and private transport aimed mainly at ensuring connectivity between localities – under DDBRA surveillance) and **Tourist tours** (for tourist transport under visitation programs - under DDBRA supervision);

Sustainable transport strategy must address to many types of users and includes measures performed on several levels.

B. Public transport and freight

B.1. Public transport

Objectives

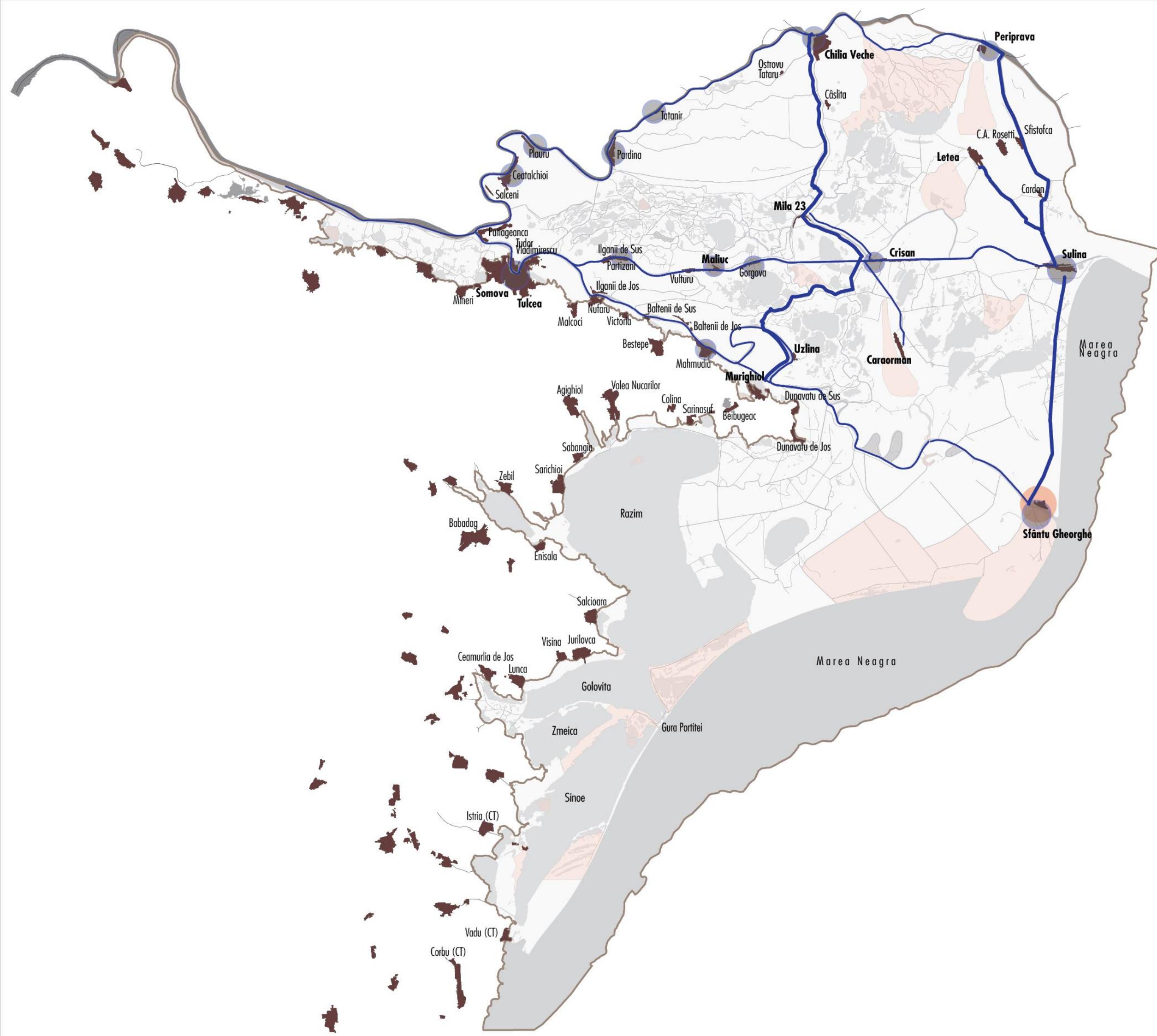
- Diversification of routes
- Encouraging tourists, both those coming on their own, and those come with packages in groups to use as much existing public transport especially to reach the access points to Delta, to accommodation or transfers between these tourist locations, both costs and environmental impact can be reduced so.
- Cost efficiency, this objection refers both to reducing operators 'consumption in the long term and reduce costs for users.
- Reduce resource consumption and environmental impact will be achieved through a gradual adjustment of supply to the real needs and by management and dedicated fleet modernization.

Measures

B.1.1. Creating **new public transport connections** between the three arms of the Danube on the north-south, so other access points in the Danube Delta can be interlinked, respectively Murighiol and Mahmudia or Sf. Gheorghe with other localities, without going through Tulcea, thus providing a faster connection possibility between localities along the three arms.


Two new trails were identified, that with a little investment in infrastructure, will be able to introduce public transport connections using boats for a maximum 15-20 persons. A feasibility study was proposed to be conducted, to analyze in detail the optimal time zone and season flow, while it can be adjusted (the rate of transport can be increased or decreased) depending on travel packages proposed for each subarea. It also required a detailed analysis of the route, the work required and the types of vessels that best adapt to conditions, opting for the ones what will ensure the lowest possible environmental impact. Electrically propelled boats or hybrid engines boat can be considered.

Map 12 REȚEAUA TRASEELOR proposed diversification of routes, connections between areas on the arms, while the feasibility of these proposals will be analyzed in a study on this investment. The two new routes are: 1/ Sf Gheorghe – Sulina – Periprava/Letea; 2/ Chilia – Mila 23 – Crișan – Uzlina – Murighiol



RETEAUA TRASEELOR

Legenda :

-  Limita RBDD
-  Localitati
-  Reteaua hidrografica a RBDD
-  Zone cu protectie integrala

CATEGORII DE TRASEE

1/ **CAI NAVIGABILE**

 Trasee existente *transport public*

2/ **TRASEE EXPRES**

 Trasee propuse - *transport public*



0 1 2 3 4 5 10 20



<http://earthtechling.com> Solar Water Ferry, Hong Kong, hybrid engine catamaran Solar Sailor Holdings

Catamaran partially manufactured by Solar Sailor Holdings, an Australian company that won the "Environmental Technology of the Year Award" in Sustainable Shipping Awards, London, benefiting both electric propulsion, based on solar panels and a diesel engine, the engines can operate in parallel if needed. It brings both economic and environmental benefits to the company that acquired them, The Hong Kong Jockey Club, the new catamarans saving up to 50% fuel consumption and consequently operating costs.

B.1.2. **Route equipping** with services necessary to both operators and users - especially tourists.

B.1.3. Diversification existing fleet to use **various capacities** boats, to meet demand **according to season and area**. Following a brief analysis it was noticed that smaller capacity boats need to be introduced, to operate on routes during the winter and on less used routes, but a detailed study is required in a later stage.

B.1.4. Providing **low-impact boats and engines**. Also on less used routes and low flow periods would be appropriate to use smaller boats and small engines.

B.1.5. **Introducing mix between public transport and freight transport**. Achieving adequate infrastructure mooring.

B.1.6. Craft equipping of the public transport system with storage systems **for bikes or personal rowing boats**.

B.1.7. **Policy and funding sources**. Developing a strategy to improve public transport services on the water and identifying sources of funding for its implementation. A study on funding opportunities and facilities for infrastructure works was proposed to be conducted. Because the aim to reduce the environmental impact, for these investments may exist from special funding sources.

B.2. Services

Objectives

- Reduce costs;
- Support all modes of transport (bicycles, kayaks personal);
- Reduce resource consumption and impact.

Measures

B.2.1. Diversification of routes. It proposes maintaining the current mix between transport and public goods, designating a section intended for them depending on their type. By allowing the use of boats and shipping on public transport routes, along with the diversification of routes will benefit transport cost goods. For a sustainable local development, this measure should be supported also by encouraging local producers that can replace the need to import the products in the area, from distance.

For example at the moment supply of pensions is done almost exclusively from Tulcea. Offering easier transport options from other areas of the Delta where small producers of dairy products, vegetables, meat, etc. can support the local economy through these small producers and it can bring added authenticity to the complete tourist offer. To reduce the impact of transport of building materials same time, it is recommended to encourage the use of local building materials and techniques. Although these measures are indirect, they will have direct effects on targets set to reduce the impact of transport.

B.2.2. At the same time in setting public transportation it is important that these crafts can provide **services of carrying personal sports equipment**- bikes and kayaks - to allow transfer from one mode to another, also keeping in view of minimizing environmental impact and encouraging exploratory type tourism, slowly - set as main objective of the study dedicated to tourist capacity, conducted by DDBRA.

C. Private transport

Private transport includes at least two categories: individual transport and tour operators conducted by or registered tour operators, whether registered or not, or licensed to carry out tourism activities.

Objectives

- Reduce costs;
- Reducing Environmental impact
- Encouraging traditional modes

Measures

C.1. **Special Endorsement** for access by boat into DDBR. This should be accompanied by a guide and an introductory course for understanding the rules that must be observed in DDBR.

C.2. **Accreditation of crafts** designed to carry tourists. Motor boats for the transport of tourists must provide a safety standard and comfort, but also to fit the objectives set to reduce environmental impact, using hybrid or fuel-efficient engines.

C.3. In terms of transport designed exclusively dedicated to tourism activities is was designed as network of **sustainable transport** for tourists focused on a concept known in the literature as the "**soft mobility**".

This suggests a hierarchical network of channels - to be used by boats with oars or electric motors (though not exclusively) - taking into account their capacity and current regulation for DDBR movement. On this basis three types of "packages" of transport for tourists that will benefit both visitors and the local community, are proposed.

C.3.1. **Proximity trails** developed near *tourist centers* established and concentrated near the localities where a considerable number of tourists is concentrated. In some cases the starting point is in the vicinity of *tourist center*, in the case where in their proximity is no network of smaller channels, dense enough for this activity, guests will be led by other motor boats to get to a starting point that can offer an attractive sightseeing experience on a limited distance rowing boat access (two hours).

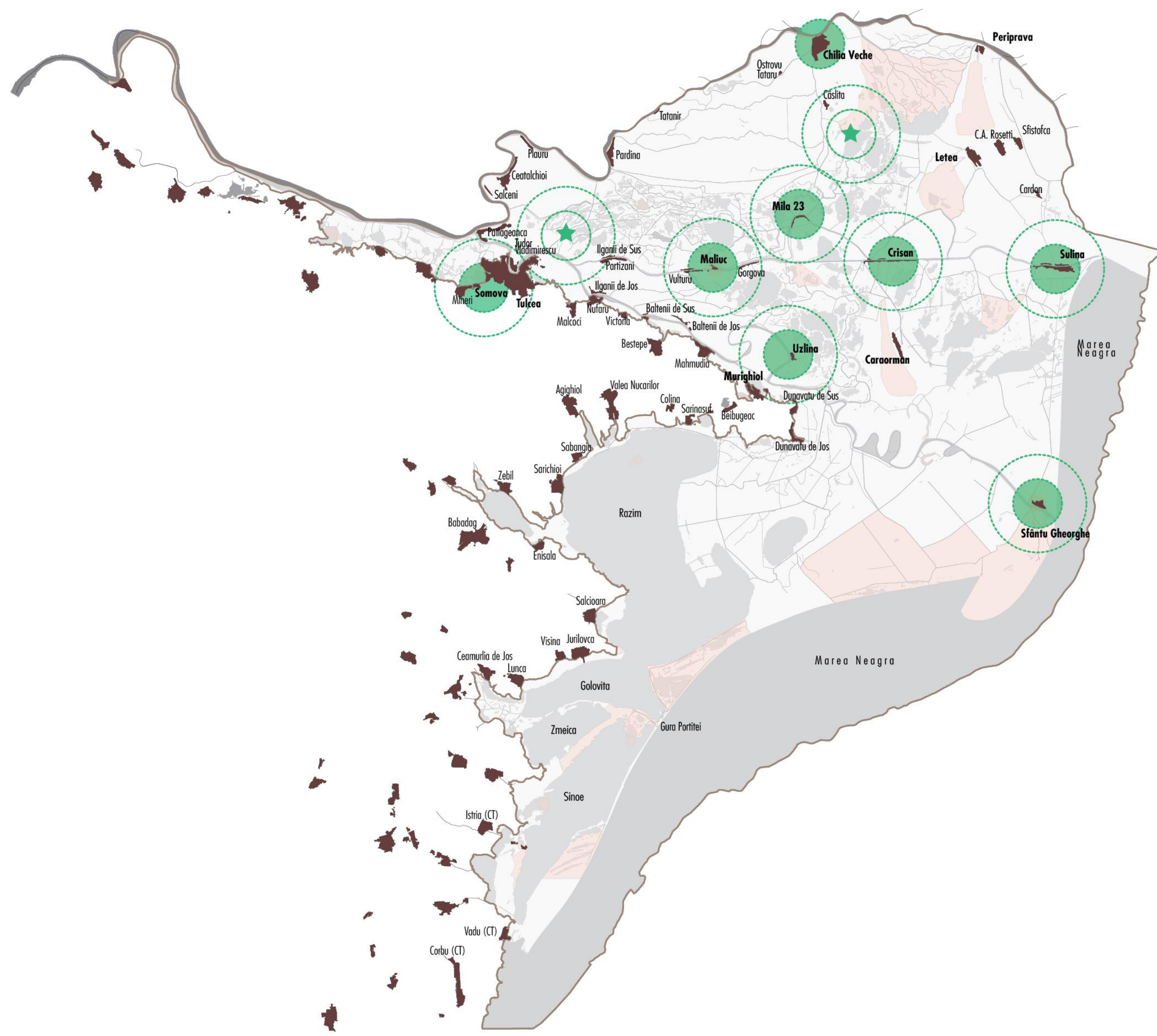
On these trails traditional crafts - "lotca" will be offered to visitors, crafts that will be led by a local attendant, while routes will not be longer than 2h or 4h rowing, in total. Partnership between local operators, local administration and DDBRA was proposed to be established to delegate the maintenance of these trails to local operators. This will encourage their involvement in the maintenance and control of the activity along these routes, taking part of the institution's tasks that will be forced to undertake other types of transport management activities in DDBR.

The starting points of these routes, configuring and their equipment are proposed to be evaluated in a feasibility study dedicated to this investment. It will take into account channel configuration, the possibility of using existing infrastructure (platforms, centers, tourism, pontoons, etc.). This feasibility study will be correlated with travel existing and proposed packages and other projects related to tourism (in this strategy or outside it) to size and phase the investment in fleet and supportive infrastructure.

Pursuant to current analysis start new stations are proposed to be established (Map on page 69)

1. Chilia Veche - Devil's Lake area
2. Sulina
3. Crisan
4. Mile 23
5. Maliuc
6. Uzlina
7. Sf. Gheorghe
8. Somova
9. Tulcea - Canal Mila

For each local network a starting point was set, that can be included in time schedule, a two hours trip by boat rowing. This network needs to be studied in detail by field observations, in a subsequent step to establish the feasibility of the proposed routes. [Map 13 TRASEE DE PROXIMITATE](#)



RETEAUA TRASEELOR

- Legenda :
- Limita RBDD
 - Localitati
 - Reteaua hidrografica a RBDD
 - Zone cu protectie integrala

CATEGORII DE TRASEE

3/ **CIRCUITE TURISTICE**

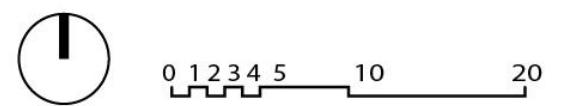
Circuite turistice de proximitate

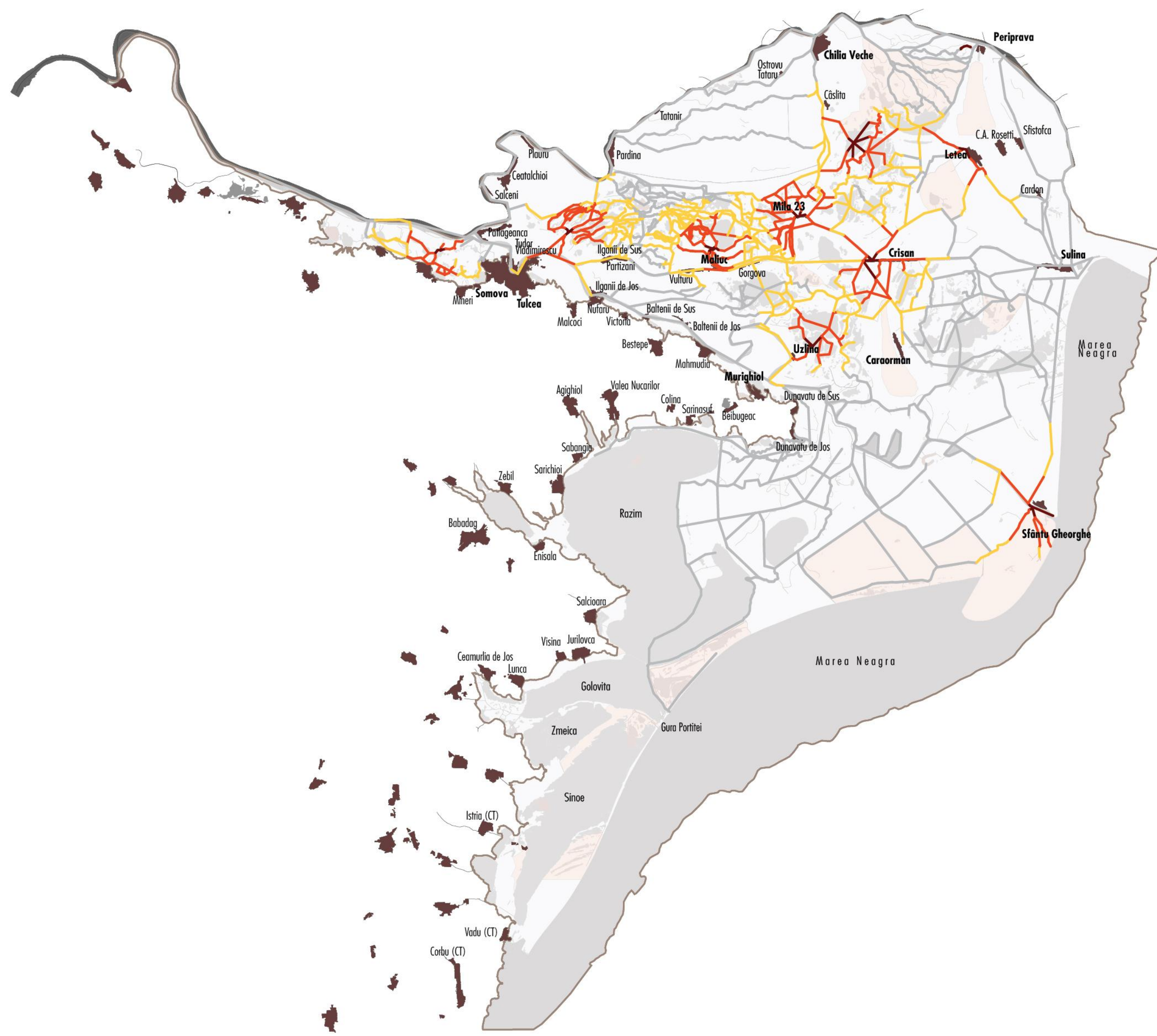
3 KM - 1 ORA
 6 KM - 2 ORE
 9 KM - 3 ORE

LOCALITATE
 Centre de proximitate
 'LOTCA TOURING'
 'PESCA TOURING'

MALIUC
 MILA 23
 CRISAN
 UZLINA
 SFANTU GHEORGHE
 SULINA
 CHILIA

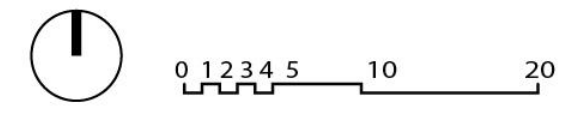
Punct de start pentru trasee de proximitate cu transfer de pe o ambarcatiune rapida pe barci cu vase, de la localitatea cea mai apropiata.





TRASEE DE PROXIMITATE

- Legenda :
- Roze de acoperire
 - 3 h
 - 2 h
 - 1 h
 - Puncte de pornire

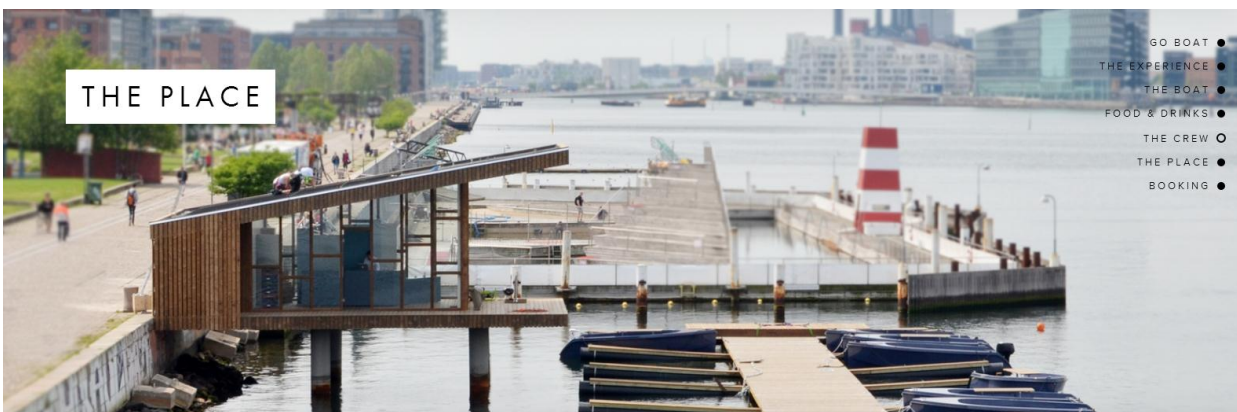


C.3.2. **The innovative “rent a boat” system.** Rowboat or electric motor boats will be made available at local rental centers, and can be used between different destinations or to return to starting point.

Like the urban system "rent a boat" it is mainly used by visitors who want to enjoy the freedom of choice of access routes individually and gradually to establish routes. Thus they will have the freedom to choose any of indicated and equipped routes, will be able to choose between types of boats and enjoy services.

The two examples show a similar concept in urban environment, also benefitting from a high density of channels or extended and rehabilitated harbor area -Amsterdam and Copenhagen. Although the idea itself is not quite new, the innovation is the concern for ecology and economy of resources and of course the possibility to visit a wide area in a single boat and visit places that otherwise are not included in routes intended for larger groups, providing all the necessary information before starting the trip.

GoboBoat, Copenhagen suggests electric motors boats up to 8 seats, partially built with recycled plastics. Solar panels mounted on the roof of the administrative pavilion generate all the energy needed for them and for boats engines. The boats are equipped with a picnic kit, the company also offers menus options. They are created by Danish designers and are available for purchase to those interested.



<http://www.goboat.dk/>

Similarly, Mokumboot, Amsterdam proposes visiting the city in electric boats and two rental centers around the center area.



<http://www.mokumbootverhuur.nl>

In a future feasibility study is proposed to study the location of the boat rental centers, as well as the number, type and equipment, as well as potential funding sources and forms of management of the proposed system.

C.3.3. **„Soft mobility”tourist tours** – Priority routes dedicated to small boats propelled by oars or electric motors. The purpose of these routes is to stimulate a package of "exploration", developed over several days that showcase different regions of the Danube Delta in a very friendly environment.

These routes will be approachable also by individual boats and can be combined with hiking cycle routes providing greater mobility of tourists in the delta and increase tourism revenues on a wider area.

Along the trails it is proposed to use, to the possible possible extent, accommodation and board local services to support the local economy. There was also proposed to study the feasibility of creating campsites dedicated exclusively to performing these circuits, possibly limiting the staying time to two nights stay.

C.4. Throughout entire network of trails **a support infrastructure will be constructed**, to support the proposed transport related packages. If possible services offered to tourists and maintenance of infrastructure will be based on locals.

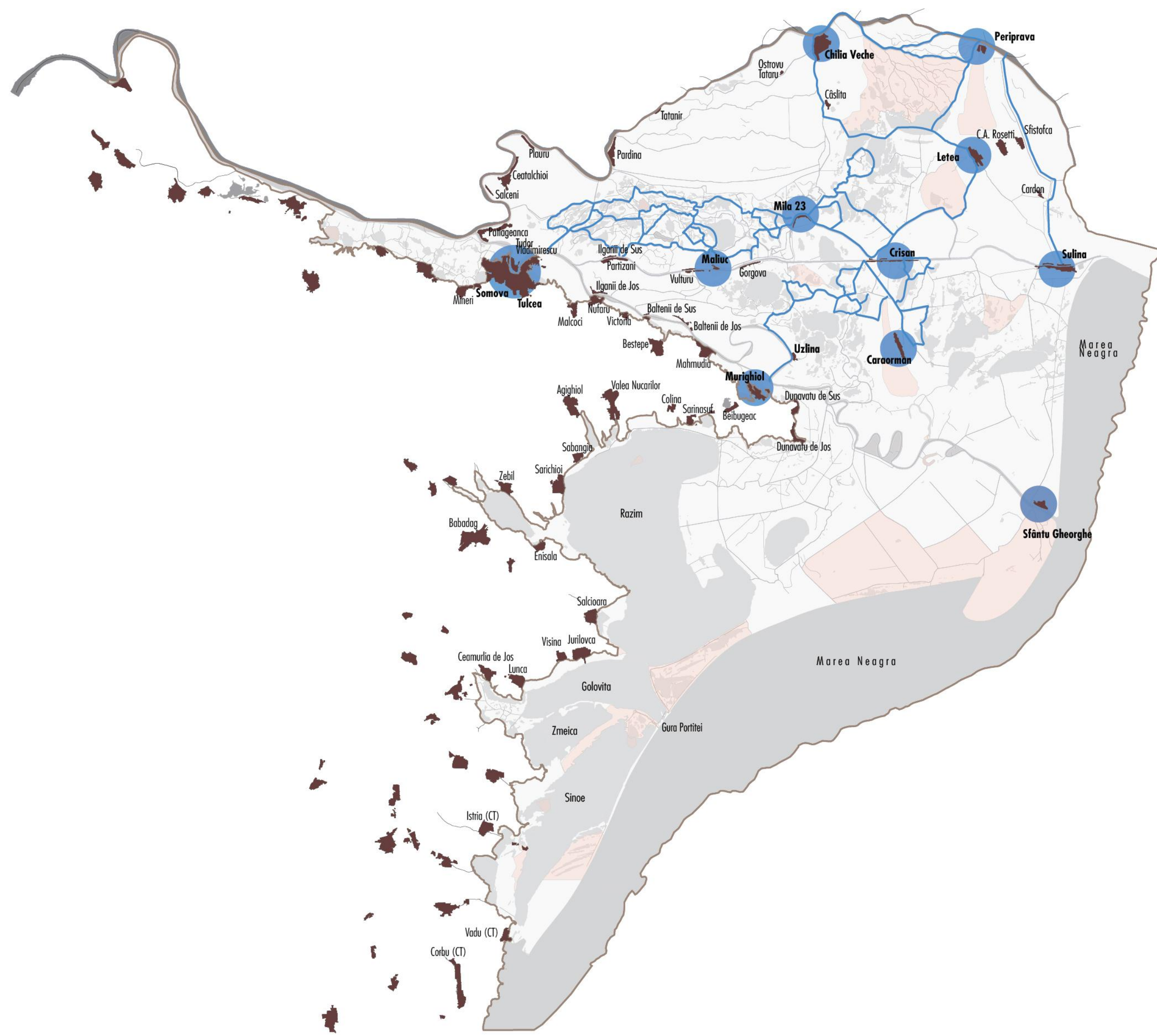
This minimum infrastructure should include

- **Rental and maintenance centres for boats** with minimum equipment for tourist boats. Centers may be shared by lotcas(dinghies) rowing boats intended for rental or electrical boats and even personal rowing boats (kayaks, canoes) which could be kept for a certain period of time. These centers will also provide information on eco-tourism packages in DDBR and transport possibilities.

In areas where there is land availability, **intermodal nodes** are proposed:

- To allow the visiting Delta by segments using several means of transport (boat, car, bike, etc.).
- **Electricity supply stations.** Given the desire to minimize environmental impact and that the areas where it is proposed to use electrically powered boats are not located in the immediate vicinity of settlements, the use of alternative sources of electricity generation - for example solar panels, was proposed.
- **Mooring Infrastructure.**
- **Places for camping** in the vicinity of settlements and centers travel, equipped with a minimum of services. For this purpose use of existing infrastructure, is advised, such as jetties managed by DDBRA.

[Map 14 REȚEAUA TRASEELOR](#) illustrates the network of channels that will be used tourist tours(rent a boat and soft mobility). This network will be analyzed in detail to establish the feasibility of the proposal and also to locate precisely the proposed support infrastructure.






RETEAUA TRASEELOR

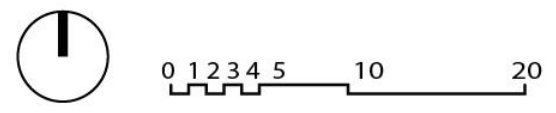
- Legenda :
-  Limita RBDD
 -  Localitati
 -  Reteaua hidrografica a RBDD
 -  Zone cu protectie integrala

CATEGORII DE TRASEE

3/ CIRCUITE TURISTICE

- Circuite turistice de proximitate
-  Sistem 'Rent a Boat'
-  Circuite turistice 'Soft mobility'

- LOCALITATE 
- Centre intermodale si HUB-uri
- 'RENT A BOAT'
 - 'LOTCA TOURING'
 - 'ELECTRIC BOAT TOURING'
 - 'PESCA TOURING'
 - 'ELECTRIC CAR'
- TULCEA
MALIUC
MILA 23
CRISAN
UZLINA
CARAORMAN
CHILIA
LETEA
SULINA
SFANTU GHEORGHE
MURIGHIOL
SOMOVA


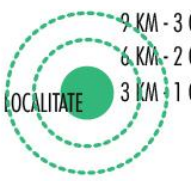


C.5. In certain areas, local alternative routes will be designed, in particular Tulcea and Murighiol, for those interested in a quick sightseeing short stay experience. These routes will be dedicated especially to motorboats, however proposing engines with low environmental impact. Such a route could be Somova area near Tulcea city.

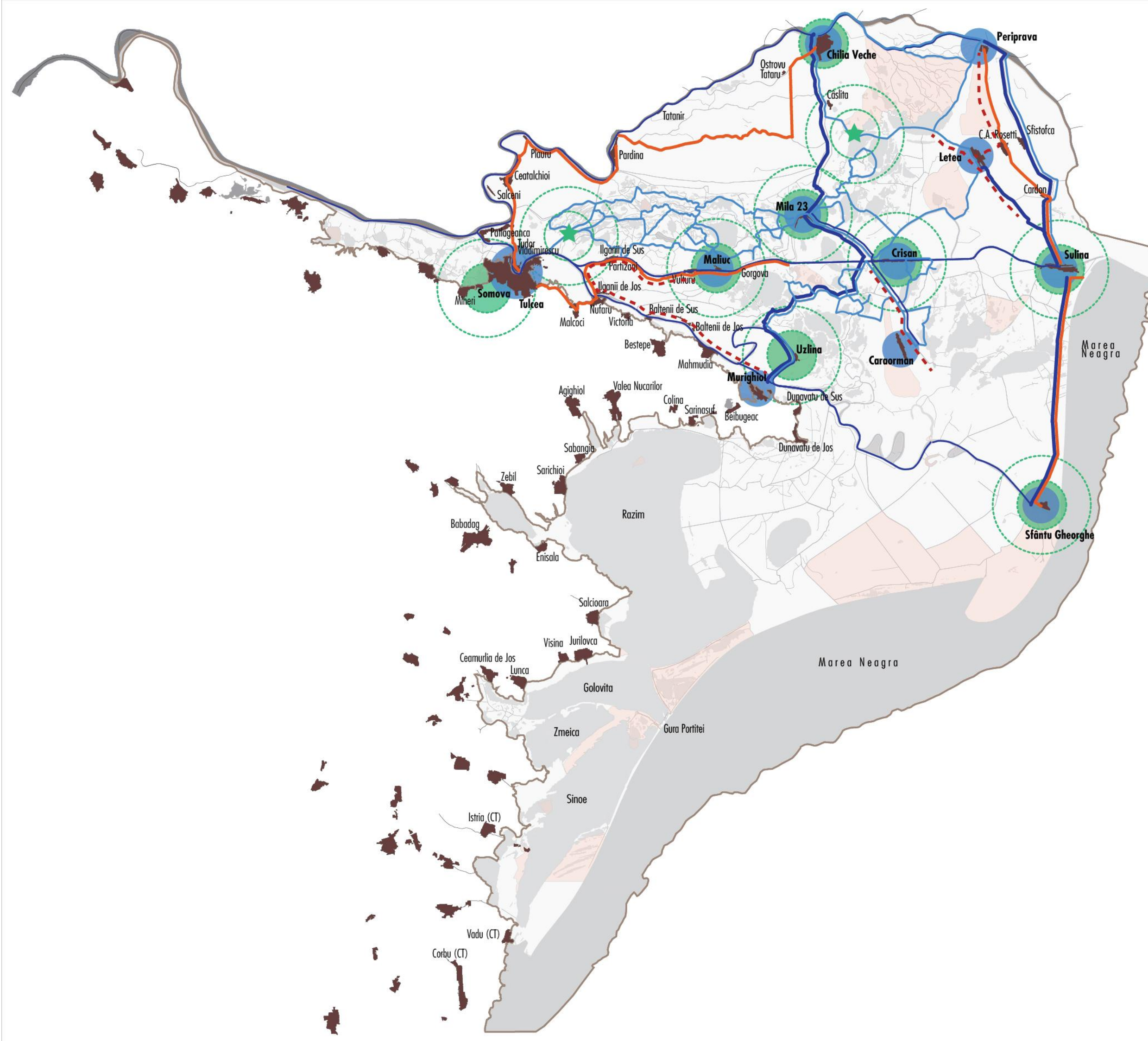
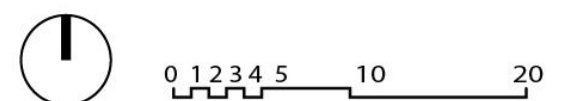
[Map 15 REȚEAUA TRASEELOR TURISTICE PROPUSE](#) shows the solution that integrates all components of a sustainable transport system proposed - new trails for public transport, network of recommended channels routes for rowing or electric propulsion boats, tourist centers (HUBS) and intermodal centers, as well as starting points for proximity trails.

RETEAUA TRASEELOR TURISTICE PROPUSE

- Legenda :
-  Limita RBDD
 -  Localitati
 -  Reteaua hidrografica a RBDD
 -  Zone cu protectie integrala
- CATEGORII DE TRASEE
- 1/ **CAI NAVIGABILE**
-  Trasee existente *transport public*
 -  Trasee propuse - *transport public*
- 2/ **TRASEE EXPRES**
-  Trasee propuse - *transport public*
- 3/ **CIRCUITE TURISTICE**
-  Circuite turistice de proximitate
 -  Sistem 'Rent a Boat'
 -  Circuite turistice 'Soft mobility' pe apa
- TRASEE 'soft mobility' pe uscat
-  Trasee ciclabile existente - propuse pentru reabilitare
 -  Zone pentru practicarea calariei

LOCALITATE		Centre intermodale si HUB-uri	TULCEA MALIUC MILA 23 CRISAN UZLINA CARAORMAN CHILIA LETEA SULINA SFANTU GHEORGHE MURIGHIOL SOMOVA
LOCALITATE		Centre de proximitate	MALIUC MILA 23 CRISAN UZLINA SFANTU GHEORGHE SULINA CHILIA

 Punct de start pentru traseu de proximitate cu transfer de pe o ambarcatiune rapida pe barci cu vase, de la localitatea cea mai apropiata.



VI. ELABORATION OF TERMS OF REFERENCE OF THE FEASIBILITY STUDY – ‘ECOLOGIC TRANSPORT IN THE ACCREDITED AREA -ECOTOURISTIC DESTINATION- BETWEEN CHILIA AND SULINA ARMS’

- a) A synthesis chapter will be drawn up to be included in the terms of reference for the next phase consisting of conducting a Feasibility Study for the development of a sustainable in Danube Delta Biosphere Reserve.

The opportunity study conducted an analysis of the existing situation in terms of the existing transportation system and the proposed development directions proposed through the study dedicated to tourism capacity achieved by DDBRA. It was initiated from an understanding of the concepts underlying the development strategy of DDBR, as transport and tourism sustainability, accessibility, mobility and value for the future development of the area.

The analysis included the assessment of public transportation and recreational system, on water in the Danube Delta; analysis of tourism activities, prioritizing POIs in the area and assessment of the tourism potential of subareas and how it can be supported by sustainable transport, where appropriate; analysis of tourist flows and mobility profiling system users in the Danube Delta.

Pursuant to analyses several issues related to transport were identified.

- **Accessibility**

At regional level DDBR is relatively isolated, being located in the eastern part of the country, accessible mainly through Tulcea on European roads from Constanta, Hârşova or Galati, or by train on a single connection Medgidia-Tulcea, or along the Danube (upstream Tulcea) and from the Black Sea (Sf. Gheorghe and Sulina). It is also relatively accessible by air transport through airport of Cataloi. Inside DDBR public transport is limited along the three arms, while the rest of the movement by private boats is relatively regulated by DDBR, but poorly managed in the absence of a system of data collection and managed centrally. At the same time, the existence of this vast network of canals and lakes are a good opportunity to develop a sustainable transport system dedicated to both tourists and locals, with little investment in infrastructure.

- **Infrastructure**

Given that the main mode of transport is on water infrastructure requires existing hydrographic network represented by lower maintenance costs compared to roads, but has a constant need for maintenance (difficult freezing conditions, silting) and given the ecological value of the area, need protection. At the same time costs are significant if considered the seasonality use of this infrastructure - due to tourist seasons. A priority of this is controlling and monitoring the boats used and encouraging existing fleet to boom, where needed, to reduce the negative environmental impacts. Alternative network of biking routes is also important to visit the area. The

supportive infrastructure - the pontoons type, intermodal centers or power plants must also be renovated to take into account of the need to develop a sustainable transport system. Given the tourist and ecological value of the area, this study recommends the development of other types of infrastructure of the road type.

- **Environment and Regulations**

The environmental impact of different types namely pollution is an important issue because the value of this area and is difficult to control due to the main activity that the area relies on, namely tourism. Therefore, the creation of a management system is deemed necessary, to permanently compare data obtained from land, environmental protection and tourists demand. In the context of such a management system, the existing regulations should be renewed and imposed on all vessels entering the area DDBR.

- **Culture and tradition**

Being a place with a strong identity, all strategies, including travel and those aimed at preserving local traditions, should promote transport and local craft production, and use rowing lotca, along with other activities such as fishing, photography and bird watching that involve its use.

- **Strategic Development**

The development of this area, along the Danube, as a main objective of ecological value, it offers many opportunities to develop high-impact programs. Many studies been made, subject of several development strategies, Transdanube being one thereof.

The opportunity study conducted has defined a set of objectives to be attained by a transport system to support a sustainable development of the Danube Delta Biosphere Reserve. These are grouped based on existing transport typologies, as well as analysis, and is reflected in a set of measures similarly grouped.

La nivel administrativ

Objective	Measures
Creating a management system of transport in DDBR	Identifying an institution / working group which have legal and operational capacity to manage in a flexible manner transportation system Creating a database Creating an adaptive regulation based on periodic conditions observed

Public transport and freight

Objectives	Measures
Diversification of routes Encouraging tourists to use as much as possible the	Efficiency of public transport routes Creating new public transport connections between the three arms of the Danube

existing public transport

Cost efficiency		Equipping routes with necessary services for both operators and users
Reducing resource consumption and environmental impact		Diversification of existing fleet to use different capacity boats to meet the demand according to season and area.
Supporting all modes (personal bikes, kayaks) and modal exchanges		Providing low-impact boats and motors. Also on less used routes and low flow periods would be appropriate to use smaller boats and small engines. Identification of financing investment in infrastructure.
		Keeping mix between public transport and freight transport.
		Craft equipping for bicycle or personal kayaks

Private transport

Objectives

Cost reduction
Reduce environmental impact
Encouraging traditional transport modes

Measures

Special endorsement for access by boat into DDBR.

This should be accompanied by a guide and an introductory course explaining the rules that must be observed in the territory.

Accreditation of crafts designed to carry tourists. Motor boats for the transport of tourists must ensure a standard of safety and comfort and fit the objectives set to reduce environmental impact, using hybrid or fuel-efficient engines.

Defining a sustainable transport network for tourists – "Soft mobility".

This suggests a network of channels to be used by oar boats or electric motors boats (though not exclusively). Based on these three types of "packages" of transport for tourists that will benefit both visitors and community local, are proposed.

Proximity trails developed near established tourist centers and near settlements where a large number of tourists is concentrated.

On these trails boat rides will be offered in traditional - "lotca" led by a local guide, routes will not 2h or 4h rowing longer, in total.

The "rent a boat" system. Rowboat or electric motor boats will be made available in local rental centers and will used between different destinations or return to the starting point.

Tourist tours - Tracks 2-7 days for rowing boats with or without a guide. The purpose of these trails is to provide the opportunity of visiting different landscapes within a tourism package.

These routes will be available also with individual boats and can be combined with hiking trails or biking.

Support Infrastructure

Boats rental and maintenance centers with a minimum equipment for tourists. Centers may be shared dinghy, rowing boats for rent or electric, personal and even rowing boats (kayaks, canoes) may be retained for a certain period of time.

In localities where there is land availability, intermodal nodes are proposed - to allow the visiting Delta by segments using several means of transport (boat, car, bike, etc.).

Electricity supply stations. It proposes the use of alternative sources of electricity generation - for example solar panels.

Mooring Infrastructure

Places for camping tourism circuits.

Refuges.

- b) The following are completed chapters that define the object of Feasibility Study and will be included in the Specifications for achieving a Feasibility Study, observing GO nr.28 / 2008 on approving the technical- economic framework content of the documentation related to public investments and the structure and methodology of elaborating the general estimate for investment objectives and intervention works.

- **The object of procurement contract**

South East Regional Development Agency (SE RDA) launches direct acquisition procedure of advisory services of transportation system within the Transdanube project -"Sustainability of transport and tourism along the Danube". After purchasing the bidding contract the following will result: *Feasibility study -"Ecologic transport in accredited area "ecotourism destination" between Chilia and Sulina arms.*The Transport network analyzed in the feasibility study should follow the proposals resulting from the opportunity study conducted, which includes several components.

- **General Information**

The Transdanube project is implemented by SE ADR, as a partner and funded within South East Europe Transnational Cooperation Program, Priority Axis "Improving accessibility", Key Area of Intervention "Improve coordination in promoting, planning and operation for primary and secondary transport networks."The project aims to improve the general accessibility and quality of transport services in the Danube region.

- **Content of feasibility study**

The investment object that is the subject of this feasibility study is an integrated green transport dedicated to tourists.

This transport system will be based mainly on oars or electric motors boats and has as main objective diversification the current tourism offer to minimize its impact on the environment and benefit the local economy.

To develop the study, the opportunity study will be consulted

It will comprise the following subsystems:

A. Proximity trails developed near tourist centers established near localities where a large number of tourists are concentrated. In some cases the starting point is very close to the resort, and no s network of smaller channels , interesting enough for this activity, can be found in the very vicinity, it is recommended to identify a starting point to which tourists will be led by other motor boats.

These routes will be limited to 2 hours of paddling, equivalent to about 9 – 10 km.

On these trails visitors will be led by a local attendant traditional craft - "lotca". A proposal was made to establish a partnership between local operators, local government and DDBRA, to delegate the maintenance of these trails to local operators. This will encourage their involvement in the maintenance and control activity along these routes, taking over some of the tasks of the institutions, which will be forced to take other transportation management activities in DDBR.

The starting points of these routes, configuring and their equipping are proposed to be studied in this feasibility study. It will take into account the configuration of channels, the possibility of using existing infrastructure (platforms, tourist centers, pontoons, etc.).

This feasibility study will be correlated with existing and proposed travel packages and other projects related to tourism (in this strategy or outside it) to size and phase the investments in fleet and infrastructure support.

Pursuant to current analysis, in the accredited "ecotourism destination" between Chilia and Sulina area six start six stations are proposed:

1. Chilia Veche - Devil's Lake area
2. Sulina
3. Crisan
4. Mile 23
5. Maliuc
6. Tulcea - Canala Mila 35

B. The "rent a boat" system. Rowboat or electric motor boats will be available in local rental centers, and can be used between different destinations or return to the starting point.

This transportation system will respond in particular to visitors who want to enjoy the freedom to choose visiting routes individually and to establish their own paths.

In the feasibility study location choices of boat rental centers need to be analyzed as well as the number, type and equipment and the potential funding sources and forms of management of the proposed system.

C. "*Tours Trails* for rowing boats, with or without a guide. The purpose of these trails is to provide the opportunity of visiting different landscapes within a package holiday and offer the experience of silence among nature with portions devoted exclusively to rowboat; these portions of the route will be proposed outside areas and tour circuits dedicated to motor boats, thus away from the noise and impact.

These routes will be made by individual boats and combined cycle hiking trails. Fleet capacity and equipment necessary for these packages need to be studied.

For optimal functionality of the types of water routes proposed above supportive infrastructure will required. Constructive solutions tailored to the site, using local materials and technologies and local labor, with minimal impact environmental, are required.

D. *Eco-tourism centers* - Tourist Information Centers, which can be combined where appropriate with some of the facilities, as listed below.

E. *Boats Rental and maintenance centers* with minimum equipment for tourists boats. Such centers may be shared lotca, rowing or electric boats for rent, even personal rowing boats (kayaks, canoes) may be retained for a certain period of time.

F. In localities where land accessibility is available, *intermodal nodes are proposed* - to allow the visiting the Delta by segments, using several means of transport (boat, car, bike, etc.). Also they will be coupled with rental centers, rather as an added feature of them.

G. electricity power stations. Given the desire to minimize environmental impact and that the areas where using electrically powered boats proposed, are not in close proximity to settlements it has been proposed to use alternative sources of electricity generation - for example solar panels. Needs and location possibilities of them need to be assessed.

H. Mooring Infrastructure, although reduced to the minimum, may be necessary in certain situations.

I. Along the trails, to the possible extent, the use local such as accommodation and boarding services was proposed, to support the local economy. Studying the feasibility of creating campsites dedicated exclusively to performing these circuits, possibly limiting the stay time to two nights stay is also considered. They will be located exclusively in the vicinity of towns and tourist centers, equipped with a minimum of services. To this end it is appropriate to use existing infrastructure, such as jetties managed by DDBRA.

J. Refuges, where only housing / occasional camping under extreme conditions that do not allow continuation of the route, will be allowed.

According to GD 28/2008, the feasibility study will have the following **Frame- Content**

A. Written parts

General data

1. name the investment objective;
2. location (county, town, street, number);
3. The holder of the investment;
4. investment beneficiary;
5. Study developer

General information on the project

1. The current situation and information about the entity responsible for implementing the project;
2. a description of the investment:
 - a) the findings of the pre-feasibility study or detailed plan for long term investments (where developed in advance) on the current situation, the necessity and desirability of promoting investment and economic and technical scenario selected;
 - b) technical and economic scenarios in which the investment project objectives can be achieved (if prior to feasibility study , no pre-feasibility study or a detailed plan for long-term investment has been conducted):
 - Proposed scenarios (minimum two);
 - Scenario recommended by the developer;
 - Advantages recommended scenario;

c) design, functional and technological description, as appropriate;

3. Technical data of the investment:

a) the area and location;

b) the legal status of the land to be occupied;

c) permanent occupations of land situation: the total area of land being built whether incorporated/unincorporated;

d) field studies:

- Surveying including topographical plans with locations of landmarks, lists of landmarks in the national reference system;

- Geotechnical study comprising drilling site plans, complex records with the results of laboratory analysis of groundwater, geotechnical report with recommendations for foundation and consolidation;

- Other specialized studies, as appropriate;

e) the main features of the construction of the investment objective, industry-specific and constructive variants of realization of the investment, the optimum recommendation for approval;

f) the existing situation and analysis of consumer utilities:

- The need for utilities to promote the proposed variant;

- Insurance technical solutions for utilities;

g) environmental impact assessment findings;

4. Duration of achievement and main phases; Scoreboard investment.

Estimated costs of the investment

1. The total amount of general estimate detailing the structure;

2. staggering costs in conjunction with achieving the investment chart.

Cost-benefit analysis:

1. identify and define investment goals, including specification of the reference period;

2. analysis of options;

3. financial analysis, including calculation of financial performance indicators: cumulative flow, current net value, internal rate of return and cost-benefit ratio;

4. economic analysis, including calculation of economic performance indicators: current net value, internal rate of return and cost-benefit ratio;

5. sensitivity analysis;

6. risk analysis.

Sources of investment financing; sources of investment financing are constituted in accordance with the law and consist of equity, bank loans, state budget funds / local budget, external loans contracted or guaranteed by the state, external grants and other legal sources.

Estimates of labor force employed by the investment

1. The number of jobs created in the execution phase;
2. The number of jobs created during the operational phase.

The main technical and economic indicators of the investment

1. The total amount (INV) including VAT (thousands lei)
(prices - month, year, 1 euro = lei)

of which:

- Construction and assembly (C + M);
2. staged/staggered investment (INV / C + M):
 - Year I;
 - Second year;
 3. realization period (months);
 4. capacity (in physical units and value);
 5. other specific indicators of the industry in which the investment, as appropriate.

Approvals and agreements in principle

1. The beneficiary of investment opinion on the necessity and appropriateness of the investment;
2. certificate of urbanism;
3. Opinions on the insurance principle utilities (heat and electricity, gas and water utilities, telecommunications, etc.);
4. environmental agreement;
5. other notices and agreements specific principle.

B. Drawings:

1. Location plan in the area (1: 25000-1: 5000);
2. The general plan (1: 2000-1: 500);
3. General Architectural plans and sections, strength, facilities, including plans for coordination of all specialties that contribute to the project;
4. Special plans, longitudinal profiles, cross sections, as appropriate.

- **Working Methodology**

The Consultant will follow and observe the guidelines and interconnections between the previous results of the project, in consultation with all the documents created in the project and under the direct coordination of SERDA and especially the opportunity studies mentioned above.

The consultant will review all territorial planning documents, CSP Tulcea, GUPs main cities of the Delta, the Delta Development Plan and other relevant documents in the planning and spatial furnishing

The consultant will conduct a field research to collect data needed for the analysis of transport infrastructure proposed by Opportunity Study.

Throughout the implementation period of the contract, at least a working meeting with institutions / organizations relevant to the subject of this feasibility study will be held.

- **Framing the acquisition/investment in CPV code**

Consulting services in the field of the transport system, CPV code 71311200.

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OVERALL CONCLUSIONS

This document sets the bases of the mobility strategy in the Danube Delta, anticipating economic, social and infrastructure changes that will be required in the development of the area and which will be supported by financial interventions at national and at European level.

Starting from the need to ensure a transportation system that meets the needs of local people and tourists, while responding to both the criteria for the sustainable exploitation of natural resources and ecosystem conservation and taking into account specific constraints determined by the complex problem of Biosphere Reserves, this study identifies current problems in the system and outlines several directions for a transportation system with minimal impact to the environment and responsible behavior towards nature. A sustainable transport policy must address issues of increasing traffic volume, noise, pollution and transport arrangements that have no impact on the environment.

This strategy proposes several sets of measures, that together will be able to ensure a transport system adjusted to local needs and especially to the tourism profile of the area, without which no sustainable development of the Danube Delta is possible.

The investment object that is the subject of this feasibility study is an integrated green transport dedicated to tourists. This transport system will be based mainly on oars or electric motors boats and has as main objective diversification the current tourism offer to minimize its impact on the environment and benefit the local economy.

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