



*Technical Assistance for Revising and Complementing the Feasibility Study
Regarding the Improvement of Navigation Conditions on the Romanian-Bulgarian Common Sector of
the Danube and Complementary Studies
- FAST DANUBE -*

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**Presentation Memorandum regarding the project
"Improvement of navigation conditions on the
Romanian-Bulgarian Danube common sector of the
Danube" for the issuance of the Environmental
Agreement**

Beneficiary: River Administration of Lower Danube R.A. Galati and the Agency for
Exploration and Maintenance of the Danube River Ruse

Prepared for the National Environmental Protection Agency

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Deputy Project Manager: Cristian Daniel Tarara

Made by: Halcrow Romania S.R.L.(Jacobs)
EPC Consultanta de mediu S.R.L.
Danube Delta National Research & Development Institute (DDNI)

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Halcrow Romania SRL
Carol Davila Street, Nr. 85
Floor 2, Room A,
Postal code 050453, Section 5
Bucuresti, Romania
T +40 311 065 376
F +40 311 034 189
www.jacobs.com

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(2352), Reciful fosilifer Seimenii Mari (2355), Dealul Allah Bair (2367), Ostrovul Soimul (IV.19.), Celea Mare-Valea lui Ene (IV.24), Padurea Cetate (IV.25.), Padurea Bratca (IV.26), Canaralele din Portul Harsova (2.369), Locul fosilifer Cernavoda (2.534), Punctul fosilifer Movila Banului	230
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Acronyms and Abbreviations

AFDJ Galati	River Administration of the Lower Danube R.A. Galati
AH	Habitat Alteration
ANAR	National Administration "Romanian Waters"
ANIF	National Agency for Land Improvements
ANM	National Meteorological Administration - Romania
ANPA	National Agency for Fisheries and Aquaculture
APM	Environmental Protection Agency - Romania
Bq	Becquerel - radioactivity measurement unit
C1	Species with global conservation concern. The site regularly hosts a significant number of globally threatened species or other species with global conservation concern.
C2	Concentrations of a species threatened at EU level. The site regularly owns at least 1% of the population of a species threatened at EU level (listed in Annex I and referred to in Article 4.1 of the EC Birds Directive).
C3	Congregations of migratory species that are not threatened at EU level. The site regularly owns at least 1% of a bird population of a migratory species not considered as being threatened at EU level (referred to in Article 4.2 of the EC Birds Directive) (not included in Annex I).
C4	Congregation - Great congregations. The site regularly owns at least 20,000 migratory water birds and / or 10,000 pairs of one or more marine migratory water bird's species.
C5	Congregation – funnel type site. The site is a bottleneck where at least 5,000 storks (Ciconiidae) and / or at least 3,000 raptors (Accipitriformes and Falconiformes) and / or 3,000 cranes (Gruidae) pass regularly during spring or autumn migration.
C6	Threatened species at EU level. The site is one of the five most important in the European region (NUTS region) targeted for a species or subspecies considered to be threatened in the European Union (i.e. listed in Annex I of the EC Birds Directive).
EC	The European Commission
CEF	Connecting Europe Facility Program
NPP	Nuclear-power plant
UC	Urbanism Certificate
dBA	Decibel corrected A
WFD	Water Framework Directive
DDNI	Danube Delta National R&D Institute
EIA	Environmental Impact Assessment
ENR	Low Navigation and Regulation Level (ENR) - Minimum navigation level and associated regulations
FH	Habitat Fragmentation

FS	Natura 2000 site Standard Form
GES	Greenhouse gases
ha	Hectare
GD	Government Decision
IAPPD Ruse	Agency for Exploration and Maintenance of the Danube River
ICPDR	International Cooperation for the Protection of the Danube River
IH	Improving Habitats
IUCN	International Union for Conservation of Nature
JDS	Joint Danube Surveys - a scientific expedition organized every six years by the ICPDR that bringing together experts and scientists from Austria, Slovakia, Hungary, Serbia, Croatia, the Republic of Bulgaria and Romania, the purpose of which is to monitor the state of the Danube River.
JV	Joint-venture
kg	Kilogram
km	Kilometer
m	Meter
m ²	Square meter
m ³	Cubic meter
m ³ /s	Cubic meters per second
mg	Milligram
mgL ⁻¹	Milligram per liter
MN75	Reference level Black Sea 1975 (altitude)
GMPT	General Master Plan for Transportation, Romania
MW	Megawatt
NAIADES	Navigation and Inland Waterway Action and Development in Europe - The NAIADES Action Plan is a Commission initiative to enhance the use of inland waterways in Europe as part of intermodal freight transport solutions to create a sustainable, competitive and environmentally friendly transport network.
ng	Nanogram
NPP	Nuclear Power Plant
N2k	Natura 2000 Sites
°C	Celsius degrees
GO	Governmental Ordinance, Romania
DSA	Disturbance of Species Activity
CP	Critical Point

pH	Hydrogen potential
HL	Habitat Loss
PHARE	Poland and Hungary: Assistance for Restructuring their Economies – EU financial aid program
PLATINA	PLATINA project, a FP7 project consisting of 23 partners from nine different states, to accelerate the achievement of NAIADES objectives. This multidisciplinary knowledge network will enable PLATINA to create the premises necessary to achieve the NAIADES objectives.
PM	Management Plan
Q	Flow
RAMSAR	The Ramsar Convention on Wetlands is an intergovernmental treaty (under the aegis of UNESCO) on wetlands as a habitat for aquatic birds internationally. The treaty was signed on 2 February 1971 in the Ramsar City of Iran and entered into force in 1975 (December 21st).
REP	Reducing Population Numbers
ROSCI	Site of Community Importance - Romania
ROSPA	Special Protection Area - Romania
S.A.	Corporation
RMS	Radioactivity Monitoring Station
ROS	Romanian Ornithological Society
SWIM	SMART Waterway Integrated Management
TEN-T	Trans-European Transport Network
TNMN	Trans National Monitoring Network
EU	European Union
WWF	World Wide Fund for Nature Organization
µg	Microgram
µScm ⁻¹	Micro Siemens per meter

1. Project name

"Improvement of navigation conditions on the Romanian-Bulgarian Danube common sector of the Danube"

2. Holder

<i>a) Beneficiary Name:</i>	
River administration of the Lower Danube - AFDJ, R.A. Galati (main beneficiary contractual)	Agency for the Exploration and Maintenance of the Danube River Ruse (IAPPD) (secondary beneficiary non-contractual)
<i>b) Address of the beneficiary, telephone, fax, e-mail address:</i>	
▪ Galati, Port Street, No. 32, postal code 800025, Romania; ▪ Phone: 0236 460812/0236 460 353/0236 460 016; ▪ Fax: 0236 460 847; ▪ E-mail: secretariat@afdj.ro; ▪ Website: http://www.afdj.ro/ro	▪ Ruse, Slavyanska 6, p.c. 7000, Republic of Bulgaria; ▪ Phone: (082) 823133, (082) 823134, (082) 823135, (082) 823136; ▪ Fax: (082) 823131; ▪ E-mail: appd@appd-bg.org ▪ Website: http://www.appd-bg.org/
<i>c) Name of the contact persons:</i>	
▪ General Manager - Dorian Dumitru	▪ Executive Director - Pavlin Tsonev

3. Description of the physical characteristics of the project

3.1 Project summary

Historical Conventions and bilateral Agreements signed by and between Romania and the Republic of Bulgaria establish the responsibility for the adequate maintenance of the navigation conditions from km 845.5 to km 610 and from km 610 to km 375 between AFDJ Galati, Romania and respectively IAPPD Ruse, Republic of Bulgaria.

The Romanian - Bulgarian sector of the Lower Danube is an important sector of the Pan - European Transport Corridor VII. The inland waterway between Romania and the Republic of Bulgaria makes the connection between the Black Sea and states like Serbia, Hungary, Austria, Germany, etc.

During summer-autumn periods, water flows are considerably decreasing in this sector of the river, and in certain sectors of the Danube fairway, the minimum criteria (2.5 m depth at ENR, 180 m with and curvature radius of 1,000 m) for proper navigation conditions, are not satisfied. This leads to dangerous navigation conditions and economic uncertainty with regard to this transport route. The cause that have led to the creation of this unfavorable situation for navigation is mainly due to natural, morphological and hydrological phenomena.

In this respect, preliminary studies were prepared through the PHARE Multi Country "Danube Navigation Improvement Study in the Republic of Bulgaria and Romania" with a Final Report dated December 1999 (Harris 1999). This study identified the main critical points for navigation along the Danube sectors administered by Romania and the Republic of Bulgaria, where the minimum criteria recommended by the Danube Commission for navigation are not met.

In 2007, the Romanian Ministry of Transport, with the support of the European Community, contracted the elaboration of a Feasibility Study to propose technical measures needed to meet the minimum requirements for navigation on the Danube Romanian-Bulgarian joint sector. The contract "Technical Assistance for Improvement of Navigation Conditions on the Romanian-Bulgarian Danube Joint Sector and Complementary Studies" reference EUROPEAID / 122137 / D / SV / RO was awarded on May 3, 2007 by the Ministry of Transports of Romania to Consortium consisting of Technum NV, Trapec SA, Tractebel Development Engineering SA, Compagnie Nationale Du Rhone and Safege. The Feasibility Study under this contract was completed in 2011, but without obtaining the Environmental Agreement.

On March 7, 2017, a service contract was signed between AFDJ Galati and Halcrow Romania "Technical Assistance for the Review and Completion of the Feasibility Study on Improvement of Navigation Conditions on the Romanian-Bulgarian Danube Joint Sector and Complementary Studies". The main objective of the project is to improve the navigation conditions and to increase traffic safety in the Danube joint sector between Romania and the Republic of Bulgaria by increasing the number of days (from 280 days / year to 340 days / year) in which the conditions for navigation according to the recommendations of the Danube Commission in Budapest are met and for increasing the traffic of transported goods (by 20%).

3.2 Justification of project necessity

Following the Feasibility Study finalized in 2011, the authorities of both countries agreed to significantly improve navigation in the Danube's shared section, their intention being to minimize periods of time when commercial navigation is not possible, both during winter in frost conditions, and in summer, when river flow rates tend to be very low. The Danube Commission recommends that the fairway width is 180 m, with a minimum depth of 2.5 m at ENR and a minimum curvature radius of 1,000 m for the Romanian-Bulgarian sector. For sectors where the minimum depth is not ensured, it will be consider reducing the width of the fairway to 150 m.

The activities that the two beneficiaries accomplish in order to meet these recommendations and to keep the navigation conditions viable include: measurements, information dissemination, navigable fairway signaling, use of tugs, icebreakers, and dredging of fairway and sand barss.

However, the effectiveness of maintenance dredging in order to maintain minimum navigation conditions is very short term (two dredging interventions in one year are also required) due to the sediment dynamics, hydrological regimes and the nature of the Danube River morphology. It has become evident that some technical solutions proposed in the 2011 study have become inapplicable due to significant morphological changes in some critical points of the river.

Therefore, the two beneficiaries decided to update the Feasibility Study from 2011 and identify the long-term solutions and the technical, environmental and financial management measures package to be acceptable and sustainable.

In conclusion, the main goal of the project is to identify the technical solutions to be implemented in order to ensure navigation conditions on the Romanian-Bulgarian joint sector of the Danube and to conduct river transport safely throughout the year.

3.3 The value of the investment

Given that the Feasibility Study is at an early stage of development, it is not possible to estimate the value of the investment. This will be available in future stages of the Feasibility Study, after finalizing the Cost Benefit Analysis for the project.

3.4 Proposed de implementation period

The proposed implementation period for the FAST Danube project is about 3 years. The execution plan for the works is presented in Chapter 3.5.12 Execution Plan.

3.5 Characteristic features of the project

3.5.1 Existing situation

The project covers the Danube sector, between Portile de Fier II and Chiciu-Silistra (between km 863 and km 375), for which it is desirable to ensure optimal navigation. The hydrotechnical works within the project will be carried out in the river bed and on the bank, in critical areas for navigation both on the territory of Romania and Bulgaria (see Figure 1) between km 845.5 and km 375.

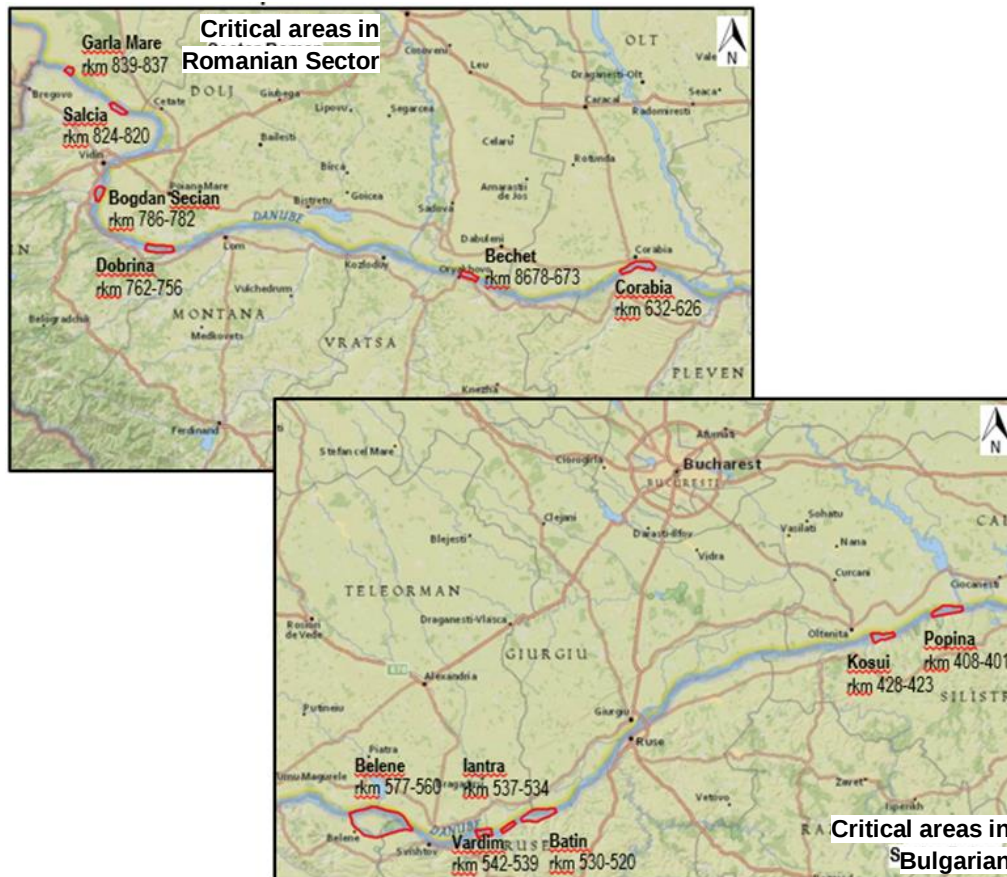


Figure 1 Critical sectors for Danube navigation between km 863 and km 375

In the navigation sector managed by the Romanian side, three critical areas were designated, and in the navigation, sector administered by the Bulgarian side two critical areas were designated (see Figure 2 and Figure 3).

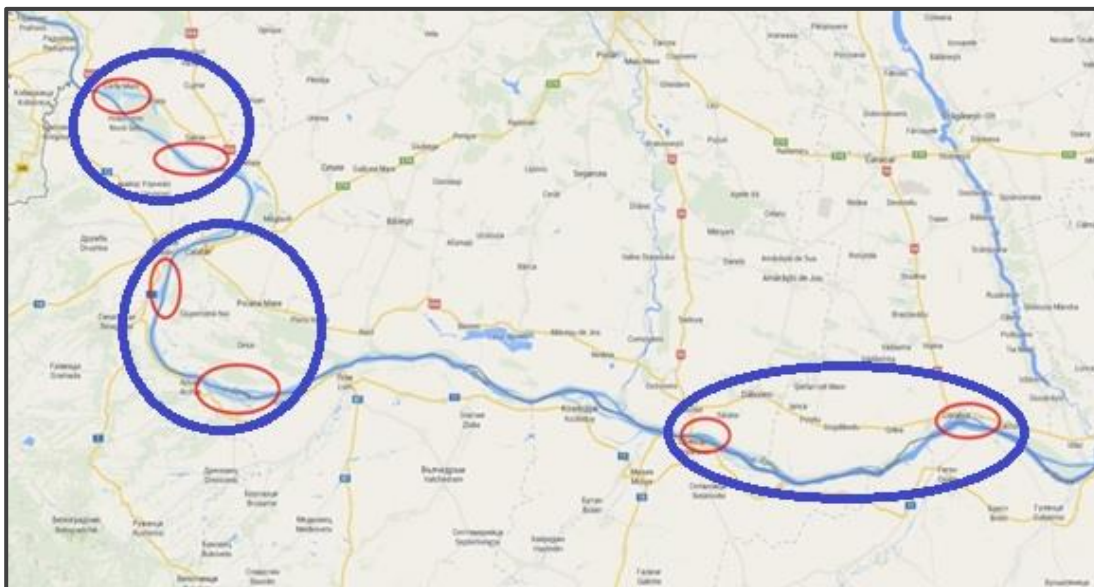


Figure 2 Critical areas in the navigation sector managed by the Romanian side

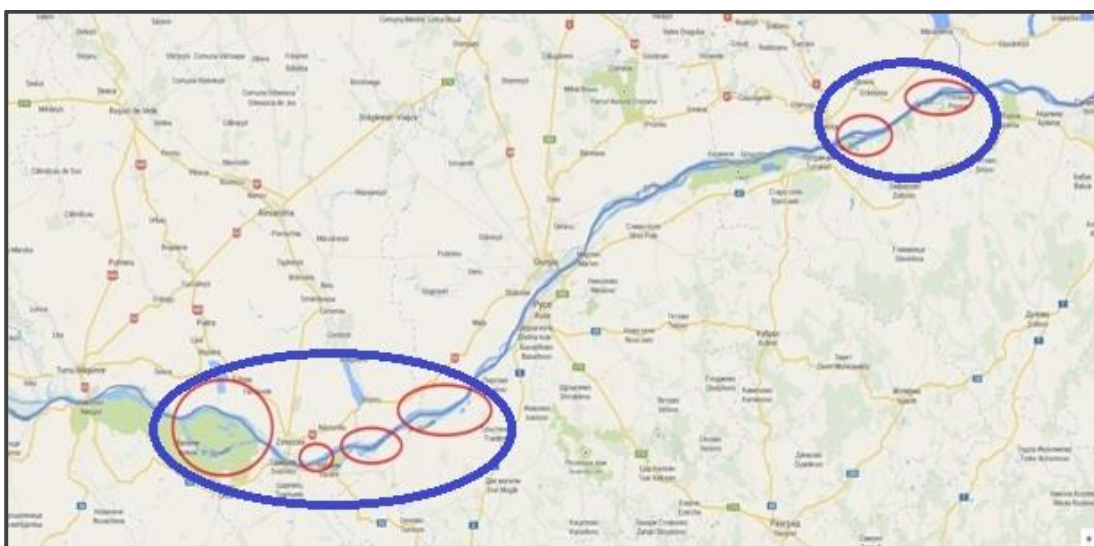


Figure 3 Critical areas in the navigation sector administered by the Bulgarian side

Within Critical Areas, several Critical Points (CPs) were delimited, as follows:

Critical areas administered by the Romanian side:

- Critical zone 1 from km 850 to km 818 that includes CP Garla Mare and Salcia;
- Critical zone 2 from km 786 to km 755 including CP Bogdan Secian and Dobrina;
- Critical zone 3 from km 678 to km 625 that includes CP Bechet and Corabia;

Critical areas administered by the Bulgarian side:

- Critical zone 4 from km 577 to km 520 including CP Belene, Vardim, Iantra and Batin;
- Critical zone 5 from km 428 to km 401 including CP Kosui and Popina.

The total length of critical areas along the river is 72 km. Table 1 shows the CP list for Danube navigation between Portile de fier II and Chiciu-Silistra respectively between km 863 and km 375 and their location relating to the counties / regions along the Danube in Romania and the Republic of Bulgaria.

In Annex C - Drawings is presented Drawing no. 1 – General Layout Plan, Critical Areas 1 - 5, Critical Points 01 - 12.

Table 1 List of critical points for Danube navigation in sectors between km 863 and km 375

Nr.	CP for navigation		County in Romania	Region in the Republic of Bulgaria
	km	Location		
1	839 – 837	Garla Mare - navigation sector managed by the Romanian side; 1 km south of Garla Mare, over 2 km in length	Mehedinti	Vidin
2	824 – 820	Salcia - navigation sector managed by the Romanian side; 3 km south of Salcia, over 4 km in length	Mehedinti	Vidin
3	786 – 782	Bogdan - Secian - navigation sector managed by the Romanian side; 3 km east of Dunavsti; 4 km south of Vidin; 2 km south-west of Ciuperceii Noi, over 4 km in length	Dolj	Vidin
4	762 – 756	Dobrina - navigation sector managed by the Romanian side; 8 km north of Archar; 3 km south of Desa, over 6 km in length	Dolj	Vidin / Montana
5	678 – 673	Bechet - navigation sector managed by the Romanian side; 3 km south of Bechet, 1 km north of Oryahovo, over 5 km in length	Dolj	Vratsa
6	632 – 626	Corabia – navigation sector managed by the Romanian side; 1 km south of Corabia, over 6 km in length	Olt	Plevna
7	577 – 560	Belene – navigation sector managed by the Bulgarian side; 1 km north of Belene, over 17 km in length	Teleorman	Plevna / Veliko Tarnovo
8	542 – 539	Vardim – navigation sector managed by the Bulgarian side; 5 km northeast of Vardim, over 3 km in length	Teleorman	Veliko Tarnovo / Ruse
9	537 – 534	Iantra – navigation sector managed by the Bulgarian side; 3 km north of Krivina, over 3 km in length	Teleorman	Ruse
10	530 – 520	Batin – navigation sector managed by the Bulgarian side; 3 km north of Krivina, over 3 km in length	Limita Teleorman/Giurgiu	Ruse
11	428 – 423	Kosui – navigation sector managed by the Bulgarian side; 6 km east of Oltenita, 0.5 km north of Pozharevo, over 5 km in length.	Calarasi	Silistra
12	408 – 401	Popina - navigation sector managed by the Bulgarian side; 1 km north of Popina, over 7 km in length.	Calarasi	Silistra

The existing situation in the 12 CPs analyzed is as follows:

3.5.1.1 Garla Mare – Romanian Sector

Location: 1 km south of Garla Mare; between km 839 – km 837, over 2 km in length. CP administered by AFDJ Galati.

Location description

River bed extends from 750 m upstream to 1,400 m downstream of this section. The river is divided by Garla Mare Island into two branches: the main branch (located south of the island, where the current fairway is located) and the secondary branch (north of the island). The banks are covered with abundant vegetation, and the island is mainly covered with trees.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- Widening of the riverbed leads to reduced depth of water;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$), the fairway from the right bank is only ~ 140 m wide and ~ 2.3 m deep.

Field observation

- The trajectory of the existing fairway has not changed since 1989;
- No bank erosion problems were observed;
- In low-flow periods, the fairway is narrow and optimal navigation conditions are not ensured.

3.5.1.2 Salcia – Romanian Sector

Location: 3 km south of Salcia; between km 824 – km 820, over 4 km in length. CP administered by AFDJ Galati.

Location description

Riverbed extends from 900 m upstream to 1,400 m downstream of this section. The banks are covered with abundant vegetation. A small island formed in the vicinity of the southern bank. Sand barss are visible in the northern half of the fairway at low debits.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- Widening of the riverbed leads to reduced depth of water;
- In periods of low flow ($<3,000 \text{ m}^3 / \text{s}$) the fairway is only ~ 170 m wide and ~ 2.2 m deep.

Field observations

- The left bank shows erosion processes;
- The riverbed is made of gravel, and the sand barss on both sides of the fairway are stable;
- The Bulgarian bank (right) is rocky.

3.5.1.3 Bogdan - Secian – Romanian Sector

Location: 3 km east of Dunavsti; 4 km south of Vidin; between km 786 – km 782, over 4 km in length. CP administered by AFDJ Galati.

Location description

The riverbed extends from 800 m upstream to 1,400 m downstream of this section. The river splits, resulting in a secondary fairway that is separate from the main fairway through an island. The fairway is affected by sedimentation processes. The banks are covered with abundant vegetation and the island is covered with trees.

Vidin port is located on the right bank, upstream of this CP. There is a sand bars on the left side of the main fairway.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- Widening of the riverbed leads to reduced depth of water;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$), the fairway on the left side of the island is only ~ 140 m wide and ~ 2.3 m deep.

Field observations

- Operational port on the right bank upstream of the CP;
- The fairway is too narrow and the water depth too shallow;
- Gravel extracted from the riverbed near km 784 for use in the construction industry.

3.5.1.4 Dobrina – Romanian Sector

Location: 8 km north of Archar; between km 762 – km 756, over 6 km in length. CP administered by AFDJ Galati.

Location description

Riverbed extends from 750 m upstream to 1,600 m downstream of this section. It is divided by two islands - Dobrina and Pietrisul and a series of sand barss are visible around the islands at low flow. The banks are covered with abundant vegetation, and the islands are mainly covered with trees.

In the past, the fairway position has moved from the right bank to the left bank due to sedimentation processes. The northern fairway is deeper, but the navigation width is not assured to the optimal parameters. For navigation it is preferable to use the northern fairway.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- Fairway width is not optimal for navigation;
- Erosion of the banks;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$), the northern fairway is ~ 110 m wide and ~ 2.3 m deep.

Field observations

- Sand barss are mobile in this sector;
- Current fairway alignment has been preserved since 1998, before that was south of Pietrisul Island;
- Near the left bank, between km 758 and km 759, the riverbed is made of gravel.

3.5.1.5 Bechet – Romanian Sector

Location: 8 km south of Bechet, 1 km north of Oryahovo; between km 678 – km 673, over 5 km in length. CP administered by AFDJ Galati.

Location description

Riverbed with ranges from 900 m upstream to 1,400 m downstream of this section. In low-flow periods, a large sand bars located in the center of the river divides the river into two branches. Currently, the North branch has a higher proportion of flow, and the fairway has been deflected on this branch, but not the optimum navigation

width. On both banks, at the upstream boundary of this section, there are ship mooring facilities. The banks are covered with abundant vegetation.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- In low-flow periods, the fairway width is not optimal for navigation;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$), the northern branch of the river is only ~ 80 m wide and ~ 1.8 m deep.

Field observations

- Every year dredging works are carried out;
- There have been erosion processes on the left bank, especially between km 675 and km 678; As a result of these processes there is a rapid retreat inland of the bank;
- Current alignment of the fairway, along the left bank, has existed since 1998;
- There are large sand bars south of the fairway.

3.5.1.6 Corabia – Romanian Sector

Location: 1 km south of Corabia; between km 632 – km 626, over 6 km in length. CP administered by AFDJ Galati.

Location description

Riverbed extends from 900 m upstream to 1,600 m downstream of this section. In the north of the river there are two large islands and a small island, and numerous sand bars are visible in the fairways around the islands. The banks are a mixture of slopes with natural vegetation and massive hydrotechnical structures and along the left bank there are anchoring points.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- In low-flow periods, the fairway width is not optimal for navigation;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$) the fairway is only ~ 170 m wide and ~ 1.9 m deep.

Field observations

- In 2015 and 2017 dredging works were carried out near the western end of the main island;
- The sediments are transported along the southern part of the island;
- Before 2011, the fairway passed through the north of the island. It was moved to pass south of the island when this route became too shallow. Curves on the old route have aggravated navigation for long convoys - the current direction straighter is preferred;
- The Corabia Port is currently closed because the fairway is not deep enough. The works proposed by the project will contribute to the opening of port access.

3.5.1.7 Belene – Bulgarian Sector

Location: 1 km north of Belene; between km 577 – km 560, over 17 km in length. CP administered by IAPPD Ruse.

Location description

Throughout this section, the riverbed is divided by the island of Belene, and the fairway passes north of it. This section of the river is the most difficult to navigate across the Danube-Romanian-Bulgarian sector. On the northern canal there are numerous mobile sand barss, and in low flow periods the fairway is only 40-60 m wide. There are multiple wrecks in the north of Belene Island.

A Bulgarian nuclear power plant is planned to be built in this area, which will catch water from an existing dam. There is a bottom threshold on the southern fairway at Kronstadt. The banks are covered with abundant vegetation. Belene Island is inhabited, and part of the land is used in agriculture.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- In low-flow periods, the fairway width is not optimal for navigation;
- Depth and width of the fairway in low flow conditions do not provide optimum conditions for navigation;
- The depth of water drops below 2.5 m for periods of 80-120 days per year;
- In periods of low flow ($<3,000 \text{ m}^3 / \text{s}$), the fairway is only ~ 60 m in width and ~ 1.2 m in depth.

Field observations

- The main problem of this sector is that the fairway has to be changed frequently because of the mobile sand barss;
- The left bank of the island of Belene at km 575 shows erosion processes;
- At km 571 vessels were intentionally wrecked to reduce the flow on the secondary fairway crossing Belene Island;
- The left bank of the river at km 571 shows erosion processes;
- Access to the south of Belene is forbidden because of the security problems associated with the presence of a Bulgarian penitentiary;
- The presence of a bottom threshold located on the southern bank of the river;
- At km 562, at the downstream end of the island there is a gravel bar.

3.5.1.8 Vardim – Bulgarian Sector

Location: 5 km northeast of Vardim; between km 542 – km 539, over 3 km in length. CP administered by IAPPD Ruse.

Location description

This section is located downstream of the Vardim Island, around which the river divides, and the main fairway passes northwards with a secondary fairway to the south. Large sand barss are visible on the main fairway. The banks are covered with abundant vegetation.

Defining the problem

- The distribution of the flow on the secondary (southern) fairway leads to an insufficient flow rate;
- In low-flow periods, the fairway width is insufficient for navigation;
- Mobile sand barss;
- Widening and dividing the riverbed, in association with reduced flow rates, leads to sedimentation;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$) the fairway is only ~ 90m wide and ~ 1.4m deep.

Field observations

- Fairway has been relocated 3 times over the last 25 years.

3.5.1.9 Iantra – Bulgarian Sector

Location: 3 km north of Krivina; between km 537 – km 534, over 3 km in length. CP administered by IAPPD Ruse.

Location description

Riverbed has a width of 1000 m on this section and, under low flow conditions, the fairway is only 60-100 m wide and less than 2.5 m deep. Large sand bars and wreckage also prevents navigation. The banks are covered with abundant vegetation.

Defining the problem

- Widening of the riverbed in association with reduced flow rates leads to sedimentation;
- In low-flow periods, the width and depth of the fairway are not optimal for navigation;
- Mobile sand bars;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$), the fairway is only ~ 60-100 m wide and a depth of less than 2.5 m.

Field observations

- The fairway was relocated in June 2017, when its depth at km 532.8 became too shallow. Currently, the fairway follows the left bank downstream of km 533;
- The Iantra River flows into the Danube on the right bank at km 537;
- At km 531.5, the fairway has a depth of only 2.3 m in low-flow periods.

3.5.1.10 Batin – Bulgarian Sector

Location: 2 km north of Batin; between km 530 and km 520, over 10 km in length. CP administered by IAPPD Ruse.

Location description

The riverbed extends from 800 m upstream to 1500 m downstream of this section, where the fairway goes north of the island of Batin, and a secondary fairway south of it. The North Fairway has large mobile sand bars and shallow water depths in low-flow periods. The banks are covered with abundant vegetation, the island of Batin being covered by trees. The river is very dynamic in this area.

Defining the problem

- Too high flow on the southern fairway, leading to an insufficient flow on the fairway;
- In low-flow periods, the width and depth of the fairway are not optimal for navigation;
- Mobile sand bars;
- Fairway enlargement and division, in association with reduced flow rates, lead to sedimentation;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$) the fairway is only ~ 90m wide and ~ 1.8m deep.

Field observations

- Fairway has been relocated 3 times over the last 25 years;
- A new island was formed 6-7 years ago, at km 522.5;
- Fairway at km 523 is only 50-70 m wide.

3.5.1.11 Kosui – Bulgarian Sector

Location: 6 km east of Oltenita; between km 428 – km 423, over 5 km in length. CP administered by IAPPD Ruse.

Location description

The channel widens from 800m upstream and downstream to 1400m wide along this section where the channel splits with the main navigation fairway running around the north side of Kosui island and a secondary channel flowing to the south. The Arges River flows into the Danube approximately 5km upstream. Kosui island is split in two by a 300m wide channel.

Defining the problem

- Too high flow on the southern fairway, leading to an insufficient flow on the fairway;
- In low-flow periods, the width and depth of the fairway are not optimal for navigation;
- Mobile sand bars;
- Fairway enlargement and division, in association with reduced flow rates, lead to sedimentation;
- In periods of low flow ($<3,000 \text{ m}^3 / \text{s}$), the fairway is only ~ 80 m wide and ~ 2.2 m deep.

Field observations

- An island extends upstream of this CP;
- Existing works of bank protection of the right bank between km 423 and 425;
- The fairway was moved south about 10 years ago due to the reduced width.

3.5.1.12 Popina – Bulgarian Sector

Location: 1 km north of Popina; between km 408 and km 401, over 7 km in length. CP administered by IAPPD Ruse.

Location description

Riverbed has a width of 1000 m on this section and under low flow conditions, the fairway has insufficient width and depth. An island is located to the right bank with a relatively small secondary fairway that passes south of the island. Large sand bars are visible in the river. River banks are covered with abundant vegetation. The fairway is along the left bank.

Defining the problem

- Fairway widening, in association with reduced flow rates, leads to sedimentation;
- In low-flow periods, the width and depth of the fairway are not optimal for navigation;
- Mobile sand bars;
- In low-flow periods ($<3,000 \text{ m}^3 / \text{s}$), the fairway is only ~ 170 m wide and ~ 1.9 m deep.

Field observations

- A new island is formed between km 403 and km 405 - vegetation begins to form and the island extends upstream;
- On the right bank there are bank protection works between km 401 and km 402;
- The left bank shows erosion processes between km 403 and km 405;
- At km 403, on the right bank, there is a hotel;
- The northern bank of the island at km 408 shows erosion processes.

3.5.2 Designed situation

The following types of interventions are proposed through the project:

- Recalibration of the fairway to meet the minimum requirements for depth, width and radius of curvature, by dredging in the current fairway area or on an alternate route (generally fairway alignments that have been used in the past), with storage of dredged material in selected areas so that by accumulation over time it contributes to a certain constraint of the riverbed in low-depth areas and the development of a sedimentation area over time;
- Narrowing, on certain sectors, the section of the riverbed in small waters areas (e.g. up to 4,300 m³ / s) by engineering works such as groynes and / or chevrons, in order to reduce the effects of lateral currents in the sedimentation processes on the exposed edge of the fairway, and concentration of longitudinal currents especially at high flow rates;
- Prevent the excessive development of bank erosion by carrying out bank protection works in the small - medium flow range, respectively up to the level of the river bank;
- Narrowing, on certain sectors the section of the riverbed in in the medium - high flow areas (e.g. > 8,000 m³ / s): island creation or extension of existing islands for local narrowing of the riverbed with reduced sedimentation potential in high water periods.

Depending on the hydro morphological particularities of each CP, a simpler or more complex combination of such types of intervention is proposed. Thus, for 9 out of the 12 CPs (Garla Mare, Salcia, Bogdan-Secian, Dobrina, Corabia, Vardim, Iantra, Batin and Kosui) only dredging works are proposed with the unloading of the dredged material in the riverbed in specially designated areas and for the rest of the CPs (Bechet, Belene and Popina) are proposed dredging activities and combinations of morpho - engineering works, as follows:

- Bechet (groynes, chevron, bank protection, island, fairway realignment, dredged material storage);
- Belene (groynes, chevrons, bank protection, fairway realignment, dredged material storage);
- Popina ((groynes, chevron, fairway realignment, dredged material storage);

Recalibration of the fairway is proposed only in Critical Points Bechet, Belene and Popina. Both the creation of a more sinuous fairway alignment and the accomplishment of the hydrotechnical works in these CPs will lead to a significant reduction of maintenance dredging activities after completion of the investment works.

Details of the types of works proposed for each CP are presented below in Chapters 3.5.2.1 - 3.5.2.12 and in Appendix C - Drawings, Plans 2 - 13.

The dimensioning of the proposed works (interventions complementary to the dredging of the fairway), morphological and / or engineering structures was done taking into account the following considerations:

- the elevation of the groynes and chevrons crown at + 1.0 m from the water level at ENR at a flow rate of approximately $Q = 2,800 - 3,000 \text{ m}^3 / \text{s}$;
- bank defense at the height of the banks of the riverbed;
- the maximum height of the islands at + 1,0 m from the water level at the dominant flow, $Q = 8,000 \text{ m}^3 / \text{s}$.

The proposed improvements to navigation will mainly consist of:

- 1) **Dredging:** includes both investment dredging to provide a new trajectory of the fairway (fairway realignment) and to ensure the depth required to carry out safe navigation and maintenance dredging for existing riverbed to maintain the minimum standards of navigation of the riverbed cross section after the completion of the works proposed by the project.

The dredged material will be deposited in the riverbed in specially chosen areas, so that by accumulation over time it contributes to narrowing of the riverbed in areas with shallow water. Dredged material storage areas shall be authorized by the competent authorities of Romania and the Republic of Bulgaria.

- 2) **Bank protection works:** include both light and massive defense works, with the primary role of reducing the banks erosion in areas where this process is particularly active.

Soft bank protection works: are works of high permeability, which increase the riverbed's rugosity, reduce the speed of the stream, favoring sedimentation of the material transported by floods (http://www.silvic.usv.ro/cursuri/ct_4.pdf). These are made of pre-seeded anti-erosion mattresses or fascines mattresses.

Hard bank protection works: are works of high durability and long exploitation life. These structures are proposed to execute from rip-rap. These structures help reduce the amount of eroded sediment from the bank and its morphological changes.

Depending on the stability conditions of the bank in the CP area, defense work will be done either from rockfill or rockfill in combination with anti-erosion mats.

- 3) **Groynes (spurs):** are open constructions, made in the riverbed, transversely on the current. One end of the groynes is embedded in the bank and the other is in the riverbed (O. Blagoi, A. Mitroi, Modern and classic solutions for water protection works, 2013). Typically, these structures are covered by water, but may also be partially exposed to very low water levels. The Groynes have the role of changing the local flow regime across the entire cross section of the riverbed (C. Mitoiu, G. Marin, River Engineering, River Regularization and embankments 1999).
- 4) **Chevrons (horseshoe / arched dams):** are arched structures located in the riverbed, they do not touch the banks. The open end of the arch is directed downstream and upwardly curved against the flow of water. These may be visible in low flow periods but are submerged in periods of high flow. Beside modifying the direction of flow and energy, with favorable consequences for improved navigation, the chevrons create aquatic habitats downstream. Chevrons are especially useful for reducing sedimentation in the river bed, reducing dredge maintenance volumes. Sometimes, when dredging is needed to improve navigation on the fairway, dredged sediments can be deposited behind the chevron, forming an island (US Army Corps of Engineers, the Upper Mississippi River Restoration Environmental Management Program, Fairway Modifications, 2008).
- 5) **Creation of new islands and extension of existing ones:** are works that aim to improve navigation conditions in the area by redirecting and concentrating the flow, while ensuring the protection and development of new river habitats.

3.5.2.1 Garla Mare – Romanian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up one dredging storage area approximately between km 840.1 and km 838.0.

Dredging activities will be carried out on the alignment of the fairway, in areas where the water depth is less than 3.5 m at ENR, on an area of approximately 3.0 ha, which represents about 3% of the fairway and about 0,5% of the riverbed area. The estimated volume of dredged material is about 72,000 m³.

The works proposed in CP Garla Mare, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 2 - Critical Zone 1, Critical Point 01 Garla Mare, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.2 Salcia – Romanian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up of two dredged material storage areas, one area along the Romanian bank approximately between km 823.2 and km 820.0 and one area along the Bulgarian bank, approximately between km 823.4 and km 822.0.

Dredging activities will be carried out on an area of approximately 0.1 ha, which represents approximately <0.1% of the fairway and approximately 0.01% of the area of the riverbed. The estimated volume of dredged material is about 20,000 m³.

The works proposed in CP Salcia, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 3 - Critical Zone 1, Critical Point 02 Salcia, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.3 Bogdan - Secian – Romanian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up one storage area for dredged material downstream of the existing island.

Dredging activities will be carried out on an area of approximately 4.7 ha, which represents about 5.3% of the fairway and about 0.7% of the surface area of the riverbed at ENR. The estimated volume of the dredged material is about 79,000 m³.

The works proposed in CP Bogdan - Secian, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 4 - Critical Zone 2, Critical Point 03 Bogdan-Secian, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.4 Dobrina – Romanian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up two storage areas for dredged material, one area located in the upstream part of the existing island, near the Romanian bank, approximately between 759.3 km and 758.5 km, and one area located on the left side of the island near the Bulgarian bank, approximately between km 762.2 and km 760.5.

Dredging activities will be carried out on an area of approximately 1.6 hectares, representing approximately 1.0% of the fairway and about 0.1% of the surface of the riverbed. The estimated volume of dredged material is approximately 195,000 m³.

The works proposed in CP Dobrina, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 5 - Critical Zone 2, Critical Point 04 Dobrina, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.5 Bechet – Romanian Sector

Scenario 1 - Morpho-engineering works

The scenario includes the following works:

- performing investment dredging works for the realignment of the fairway; achieving a more sinuous morphological alignment, approximately between km 678.8 and km 671.3;
- performing maintenance dredging works on the new created fairway alignment;
- construction of a chevron upstream of km 677.0;
- construction of 3 groynes on the Romanian bank in the area of km 678.0;
- performing bank protection works on the Romanian bank, approximately between km 678.2 and km 675.5;
- construction of one new island located approximately between km 673.6 and km 672.6, upstream of the existing island by creating a structure in the upstream part of the new island to facilitate the stabilization of the material over time;
- setting up two storage areas of dredged material (one behind the chevron and one near the Romanian bank, upstream of 674.0 km).

The new structures proposed will be a stabilizing factor for the realigned fairway, and the chevron will also contribute to sedimentation of material downstream of its location in the first of the two dredging storage areas.

Dredging activities will be carried out on an area of approximately 53 ha, representing about 48% of the new fairway and about 7.2% of the riverbed area at ENR. The estimated volume of dredged material is approximately 428,000 m³, and the estimated volume required for building the island is about 788,600 m³.

The works proposed in CP Bechet, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 6 - Critical Zone 3, Critical Point 05 Bechet, Scenario 1 Morpho-engineering works.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

Bank defense works will be realized from rip-rap where appropriate up to the winter flow rate ENR + 4m (<10,000 m³ / s), anti-erosion mattresses can be used for the rest of the slope. Groynes will be embedded in the bank for a length of 5 m from its limit.

For access to the bank for the execution of the groynes and bank protection works, it will be necessary to temporarily occupy a land area of approximately 6,550 m², of which 75 m² is permanently occupied (the surface of the groynes anchoring area in the bank).

Overlapping the area required to be temporarily occupied over the spatial distribution of trees in the CP area (data provided by the ROMSILVA National Forestry Administration), resulted in a total estimated area for

to be deforested, necessary for the execution of the works of approximately 6,550 m², out of which the area of 75 m² will be removed from the forestry circuit. Temporarily occupied lands will be brought to the initial state after the works are finished and reentered in the forestry circuit.

According to the data provided by the ROMSILVA National Forestry Administration, on the land area necessary to be deforested / removed from the forest circuit, poplar stands are mixed with various hardwood stands and is managed by the Dabuleni Forest District, Production Unit 1, Landscape Units 5A, 5C, 9D, 5C, 10A, 12B and 510B.

Estimated areas for deforestation / removal from the forestry circuit and the distribution of tree types in the CP Bechet area are presented in Annex C - Drawings, Drawing no. 26 - Critical Zone 3, Critical Point 05 Bechet, Estimated Area of Deforestation.

3.5.2.6 Corabia – Romanian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on existing fairway alignment and along the access channel in the port of Corabia, up to a depth of approximately 3.5 m at ENR.
- expanding the two existing islands by depositing dredged material in the shallow water area between them (creating a dredged material storage area, approximately between km 629.8 and km 628.6).

Dredging activities will be carried out on an area of about 26 hectares, representing about 17% of the fairway and about 2.15% of the riverbed area at ENR. The estimated volume of dredged material is about 577,000 cubic meters (including dredging volume for port access).

The proposed works in CP Corabia, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 7 - Critical Zone 3, Critical Point 06 Corabia, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.7 Belene – Bulgarian Sector

Scenario 1 - Morpho-engineering works

The scenario includes the following works:

- performing dredging works up to a depth of approximately 3.5 m at ENR, including changing the trajectory of the fairway; achieving a more sinuous morphological alignment, approximately between km 577.0 and km 558.0, realigning beginning from km 569.5;
- construction of two chevrons on the main branch, approximately between km 567.5 and km 565.5;
- construction of three groynes approximately in the area of km 569.0 and km 568.0;
- carrying out protection works on the Romanian bank approximately between km 572.0 and km 568.5;
- setting up a storage area for dredged material near the Romanian bank, approximately between km 561.2 and km 560.0.

The dredged material storage area will encourage the flow of water to the new fairway.

Dredging activities will be carried out on an area of about 63 hectares, of which about 14.4% on the current fairway and about 24.3% on realigned fairway. Dredging activities will occupy approximately 0.5% of the surface of the riverbed. The estimated volume of dredged material is about 1,458,000 m³.

The works proposed in CP Belene, including the areas along the navigable fairway, where dredging is required, are presented in Annex C - Drawings, Drawing no. 8 - Critical Zone 4, Critical Point 07 Belene, Scenario 1 Morpho-engineering works.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

Bank defense works will be realized from rip-rap where appropriate up to the winter flow rate ENR + 4m ($<10,000 \text{ m}^3 / \text{s}$), anti-erosion mattresses can be used for the rest of the slope. Groynes will be embedded in the bank for a length of 5 m from its limit.

For the access from the bank to the execution of the groynes and bank protection works, it will be necessary to temporarily occupy a land area of approximately $4,910 \text{ m}^2$, of which 75 m^2 are permanently occupied (the surface of the groynes anchoring area in the bank).

Overlapping the required area to be temporarily occupied over the spatial distribution of tree stands in the CP area (data provided by the ROMSILVA National Forestry Administration), it was found that no deforestation is necessary because the estimated area overlaps over a land with agricultural use. The area required execution of the groynes of 75 m^2 will be needed to be removed from the forestry circuit. Temporarily occupied lands will be brought to the initial state after the works are finished and replayed to the forestry circuit.

According to the data provided by the ROMSILVA National Forestry Administration, the land area needed to carry out the embankment works on the banks is managed by Alexandria Forest District, Production Unit 2, Landscape Units: "-", 5LEG3 and 11LEG3.

The estimated areas required for the execution of works and the distribution of tree types in CP Belene area are presented in Annex C - Drawings, Drawing no. 27 - Critical Zone 4, Critical Point 07 Belene, Surfaces estimated to be removed from the forest circuit.

3.5.2.8 Vardim – Bulgarian Sector

3.5.2.9 Scenario 1 - Dredge only

The scenario includes the following works:

- carrying out investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up three storage areas for the dredged material:
 - two zones in extension of the two existing islands: the extension of the island located near the Romanian bank will be done in its upstream part, approximately between km 541.0 and km 538.3; the expansion of the island near the Bulgarian bank will take place along the left bank, approximately between km 546.5 and km 542.2;
 - the third area is approximately between 537.8 km and 536.9 km.

Given that CP Vardim's location is close to the CP location of Iantra, the storage area for dredged material between km 537.8 and km 536.9 will be used for both locations.

The dredging activities will be carried out on an area of approximately 30 ha, representing about 13.1% of the current fairway and about 1.45% of the riverbed area at ENR. The estimated volume of the dredged material is about $390,000 \text{ m}^3$.

The works proposed in CP Vardim, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 9 - Critical Zone 4, Critical Point 08 Vardim, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.10 Iantra – Bulgarian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing out investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up a dredged material storage area, which will be located near the Romanian bank, approximately between km 537.8 and km 536.9.

Given that CP Vardim's location is close to the CP location of Iantra, the dredged material storage area between km 537.8 and km 536.9 will be used for both locations.

Dredging activities will be carried out on an area of approximately 0.7 ha, which represents about 1% of the current fairway and about 0.1% of the surface of the riverbed at ENR. The estimated volume of dredged material is about 30,000 m³.

The works proposed in CP Iantra, including areas along the navigable stretch where dredging works are required, are presented in Annex C - Drawings, Drawing no. 10 - Critical Zone 4, Critical Point 09 Iantra, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.11 Batin – Bulgarian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- setting up a dredged material storage area along the left bank of the island near the Bulgarian bank, approximately between km 529.6 and km 528.2.

These works will maintain a balance between the erosion - sedimentation processes in the critical point area.

Dredging activities will be carried out on an area of approximately 9.4 hectares, representing approximately 4.6% of the current fairway and about 0.5% of the surface area of the riverbed at ENR. The estimated volume of dredged material is about 45,000 m³.

The works proposed in CP Batin, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 11 - Critical Zone 4, Critical Point 10 Batin, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.12 Kosui – Bulgarian Sector

Scenario 1 - Dredge only

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- extending the two existing islands at their upstream ends by depositing dredged material and setting up two storage areas of the dredged material; the expansion of the large island will occur approximately between km 428.3 and km 426.9, and the expansion of the small island will be approximately between km 424.8 and km 422.4.

The dredging activities will be carried out on an area of approximately 4.8 ha, which represents about 3% of the current fairway and about 0.33% of the surface of the riverbed at ENR. The estimated volume of the dredged material is about 86,000 m³.

The works proposed in CP Kosui, including the areas along the navigable fairway, where dredging is required, are presented in Annex C - Drawings, Drawing no. 12 - Critical Zone 5, Critical Point 11 Kosui, Scenario 1 Dredge only.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

3.5.2.13 Popina – Bulgarian Sector

Scenario 1 - Engineering works (1)

The scenario includes the following works:

- performing dredging works up to a depth of about 3.5 m at ENR, including changing the trajectory of the fairway to achieve a more sinuous morphological alignment, approximately between 408.0 km and 401.5 km, realigning from km 407.5;
- construction of three groynes on the Romanian bank located approximately between km 407.6 and km 406.5;
- construction of a chevron upstream of km 405;
- setting up a storage area for the dredged material between approximately km 405.0 and km 403.5, downstream of the chevron.

Fairway realignment has been taken into account to avoid areas of shallow water that have created serious navigational problems. The route chosen for fairway realignment has also been used in the past, this sinuous route being considered more morphologically appropriate.

The dredged material storage area proposed to be located approximately between km 405.0 and km 403.5, downstream of the chevron, will encourage the direction of water flow towards the fairway, in the area where realignment works will be performed.

The dredging activities will be carried out on an area of approximately 32.4 ha, representing approximately 23% of the realignment fairway and about 3.4% of the riverbed area at ENR. The estimated volume of dredged material is approximately 837,000 m³.

The works proposed in Popina CP, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 13 - Critical Zone 5, Critical Point 12 Popina, Scenario 1 Engineering works (1).

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

For the construction of the groynes, a bank anchoring area of approximately 5 m length will be required.

For the access from the bank to the execution of the groynes and bank protection works, it will be necessary to temporarily occupy a land area of approximately 10,170 m², out of which 75 m² is permanently occupied (the surface of the groynes anchoring area).

Overlapping the area required to be temporarily occupied over the spatial distribution of the trees in the CP area (data provided by the ROMSILVA National Forestry Administration), resulted in a total estimated area to be deforested, necessary for the execution of works of approximately 10,170 m² area of which 75 m² will be removed from the forestry circuit. Temporarily occupied lands will be brought to the initial state after the works are finished and reentered to the forestry circuit.

According to the data provided by the ROMSILVA National Forestry Administration, on the land area necessary to be deforested / removed from the forest circuit, there are found willow trees, various hardwood poplar trees, poplar mixed with various hardwoods and soft essence. The estimated area is managed by the Mitreni Forestry District, Production Unit 1, Landscape Units: 6A, 9G, 10C, 11D, 11E, 13B, 13C, 15C, 17D, 17E, 11G, 19C, 19G and Production Unit 2: 46D, 46C, 5A, 5E, 5D, 5C, 39D and 29A.

The estimated areas required for the execution of works and the distribution of tree types in Popina CP area are presented in Annex C - Drawings, Drawing no. 28 - Critical Zone 5, Critical Point 12 Popina, Surfaces estimated to be removed from the forest circuit.

3.5.3 Profile and production capabilities

Not the case.

3.5.4 Description of the installation and technological circuits existing on site

Not the case.

3.5.5 Description of the production processes of the project

Not the case.

3.5.6 Raw materials, energy and used fuels, and the way of supply

To achieve the hydrotechnical works proposed by the project, large volumes of raw materials and materials will be needed. Therefore, they will be procured from economic operators who have enough capacity to deliver raw materials and building materials.

The hydrotechnical structures proposed by the project will be executed mainly using natural materials (stones, raw stone, gravel, sand, earth), geotextiles and other building materials.

In Table 2, the estimated quantities of materials required to perform the proposed construction work are presented.

Table 2 Estimated quantities of materials required to perform the construction works

CP	Scenario 1	Geotextile material [m ²]	Mixt sand, gravel, boulders (dikes core) [m ³]	Rip-rap (bank and outer dikes protection) [m ³]	Sand (island) [m ³]
Garla Mare	Dredge only	-	-	-	-
Salcia	Dredge only	-	-	-	-
Bogdan - Secian	Dredge only	-	-	-	-

CP	Scenario 1	Geotextile material [m ²]	Mixt sand, gravel, boulders (dikes core) [m ³]	Rip-rap (bank and outer dikes protection) [m ³]	Sand (island) [m ³]
Dobrina	Dredge only	-	-	-	-
Bechet	Morpho-engineering works	152,000	77,000	167,000	904,000
Corabia	Dredge only	-	-	-	-
Belene	Morpho-engineering works	57,000	65,000	80,000	-
Vardim	Dredge only	-	-	-	-
Iantra	Dredge only	-	-	-	-
Batin	Dredge only	-	-	-	-
Kosui	Dredge only	-	-	-	-
Popina	Engineering works 1	120,000	38,000	109,000	-

Rip-rap and mineral aggregates will be brought from stone and gravel quarries with sufficient production capacities, located both on the territory of Romania and Bulgaria. They will be loaded from the extraction site and transported by car in the nearest ports, and from here on the water, with suitable ships (barges), to the place where the works are put into operation, as required.

The geotextiles and other building materials will be purchased from specialized economic operators, located both on the territory of Romania and on the territory of the Republic of Bulgaria. The transport at their place of operation shall be carried out by road, rail and / or naval as required.

Ensuring electricity on site locations will be achieved through fuel-powered generators.

Barges and vehicles required to carry out construction activities will be fueled with off-site authorized distribution stations. The equipment used for the execution of the works will be fueled with fuel from approved metallic tanks, purchased as needed, without the need for storage on the site.

3.5.7 Connecting to utility networks in the area

The activities required by the project do not need connections to utility networks. The Danube fairway and the road and railway networks in Romania and the Republic of Bulgaria will be used for the transport of materials.

3.5.8 Description of the site restoration works in the affected areas

During the execution of the works for restoration of the sites affected by the execution of the proposed works, the following measures will be implemented:

- the proper management of waste resulting during the construction period;
- restoration of the vegetation layer and planting grass where removal was necessary;
- cleaning the areas where various activities took place - site organizing with temporary waste disposal areas, mobile toilets.

For the restoration of the vegetation layer, soil mixt with scrap of materials of any nature, non-fertile soil, clay or land originating from the lower layers scattered during the rehabilitation works, will not be used.

After the completion of the construction works, works will be carried out for bringing the land to the initial state, namely the rearrangement of the surfaces, that were temporarily occupied during the execution.

3.5.9 New access ways or changes to existing ones

For the construction works to be carried out in the Danube riverbed, the Danube fairway will be used and for the works to be carried out on the bank, if possible, the road and rail infrastructure of both countries will be used for the transport of materials, equipment and workers.

Considering that there are no access ways in the area of Danube banks from Batin, Belene and Popina CP, suitable for the transport of construction equipment and materials to reach the Danube bank, for performing the construction works temporary access roads will be necessary to be constructed, to connect the existing access ways and CP work area for the proposed to be built. bank protection and groynes. Where this is not possible, temporary access routes will ensure the traffic within the work area.

3.5.10 Natural resources used during construction and operation

The use of natural resources during the construction period will be indirect, as their use will be made through suppliers of building materials, including the use of mineral aggregates, wood material, refined crude oil.

The main natural resources to be used in the construction phase are: stone, boulders, gravel, sand and wood.

For the purchase of rock (sorted and unsorted rock) necessary for the construction of the hydrotechnical structures will be contracted quarries with sufficient capacities to ensure the required volume of rock (e.g. Niculitel Quarry, Niculitel Commune, Tulcea County, Revarsarea Quarry, Tulcea County, Derea - Anton – Suluk Quarry, Macin, Tulcea County in Romania and Rafaelo Quarry, Kireevo Village, Vidin Region in Bulgaria, etc.).

In addition, for the purchase of mineral aggregates (gravel and sand) there will be contacted quarries with enough capacity to provide the necessary volume of materials (e.g. Basarabi Quarry, Basarabi Village, Dolj County, Ipotesti Quarry, Ipotesti Village, Olt County, etc.).

Acquisition of wood material (rolls of faggot wood for the execution of fascines mattresses) will be made from the National Forestry Administration - ROMSILVA, County Forestry Directorates.

Water will have limited use during the construction period, as most of the building materials will be prepared off-site. The water to be used on the site of the site organizations for the preparation of building materials, spraying work areas and hygienic - sanitary activities will be purchased from specialized economic operators.

During the operating period, no natural resources will be used, with the exception of fuel, obtained by refining crude oil and which will be used for maintenance dredging activities of the navigable fairway.

3.5.11 Methods used in construction / demolition

The execution technology of the project works includes the activities described below. For the most part, construction works will be done under and from the water.

Dredging works. The dredging works will be executed on the existing fairway alignment and on a new alignment (fairway realignment) up to a 3.5 m depth at ENR, using a suction dredger. The dredged material is then pumped into the storage areas for dredged material (intelligent disposal of the material) or will be used to fill the geotextile tubing / bags needed to construct the new islands (see Figure 4).

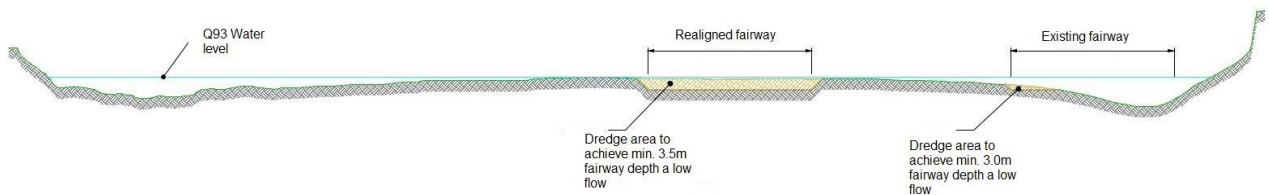


Figure 4 Cross section of dredging works

Execution of rip-rap works. These works are needed to build groynes, chevrons, bank protection and islands.

Excavation execution. These works are necessary for the execution of the groynes and bank protection and will be executed from the water and from the land. Excavations performed from the water will be done with the aid of a floating excavator, a dump-bucket type equipment, docked on a floating barge. For the excavations to be executed from the bank towards the navigable fairway, the cross section of the technical project in the respective area will be checked successively. The excavated material will be loaded into barge and transported to dredged material storage areas, the vegetal soil will be stored for reuse, and the rest of the excavation materials, depending on their nature, can be reused for fillings in dikes or transported to a landfill.

Execution of the groynes. The groynes will be built 1 m over ENR, a core made up of earth, unsorted rock or gravel / sand, and a shell made from rip rap (up to 1,500 kg). The slopes of the groynes will be executed with an approximate slope of 1:2 upstream and a slope of about 1:3 downstream. At the base of the groynes there is a separation layer consisting of a fascine mattress fixed on a geotextile membrane or a geotextile, which extends both downstream and upstream of the actual surface occupied by the groyne (see Figure 5). In the vicinity of the banks, the groynes will be provided with a low flow channel to allow the passage of fish and the reduction of sedimentation downstream of the groynes (see Figure 6).

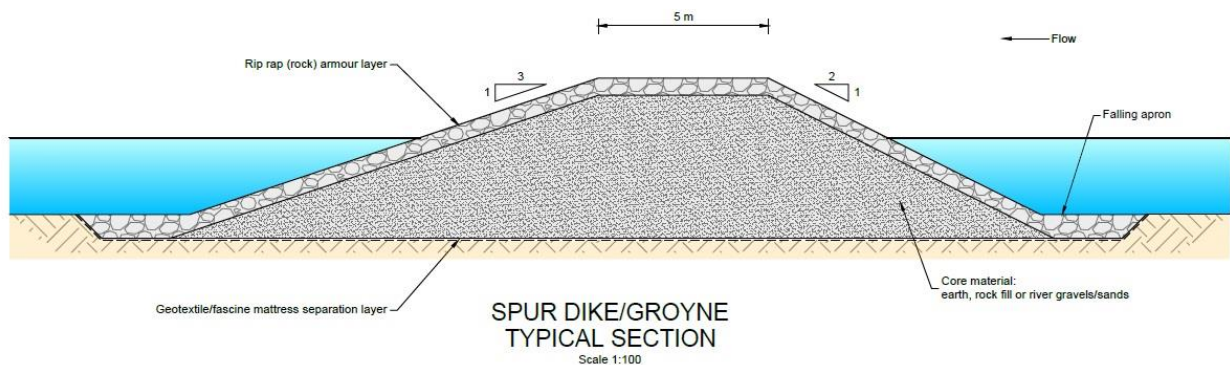


Figure 5 Cross section groyne / chevron

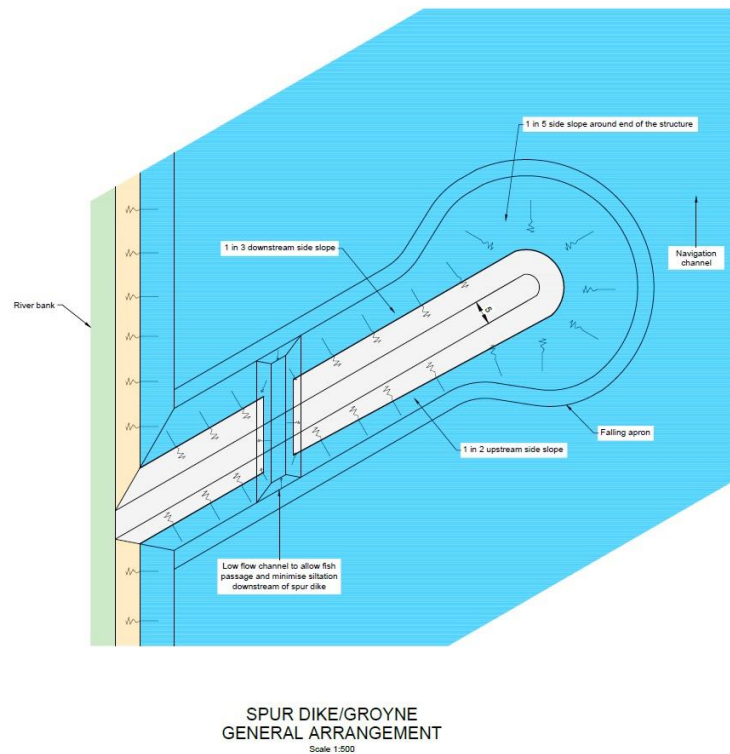


Figure 6 Groyne view from above

Execution of chevrons. The chevrons will be constructed with the crest at ENR + 1 m, respecting the same structure as the groynes shown in Figure 5, above. The two different structures differ from the point of view of form and position in the riverbed. The chevrons will have the shape of an arch, being placed in the river bed without touching the banks. The open end of the arch will be directed downstream and upstream curved against the flow direction (see Figure 7).

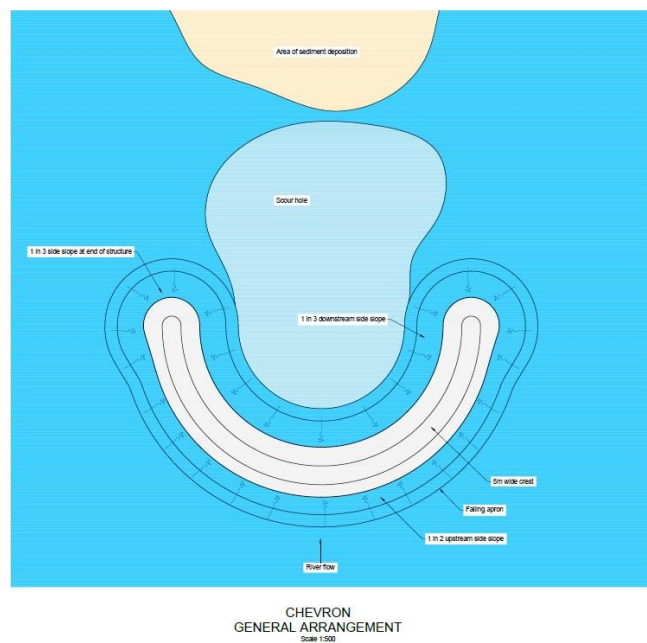


Figure 7 Chevron view from above

Execution of bank protection. For the works regarding the protection of the banks against erosion through the project are proposed to be executed two types of **bank protection**. The two types of bank protection differ in terms of the used materials and the layout of the protective layers:

- **Rip-rap bank protection:** bank protection will consist of a layer of rip-rap on a geotextile with separation and filtering role (see Figure 8);
- **Rip-rap and pre-seed mattresses bank protection:** bank protection will consist of a layer of rip-rap on a geotextile of separation and filtration, up to the level of typical winter flow; on the slope of the bank to continue the rip-rap layer will be fixed an anti-erosion mattress covered with a layer of vegetal soil, which will facilitate the development of herbaceous vegetation (see Figure 9);

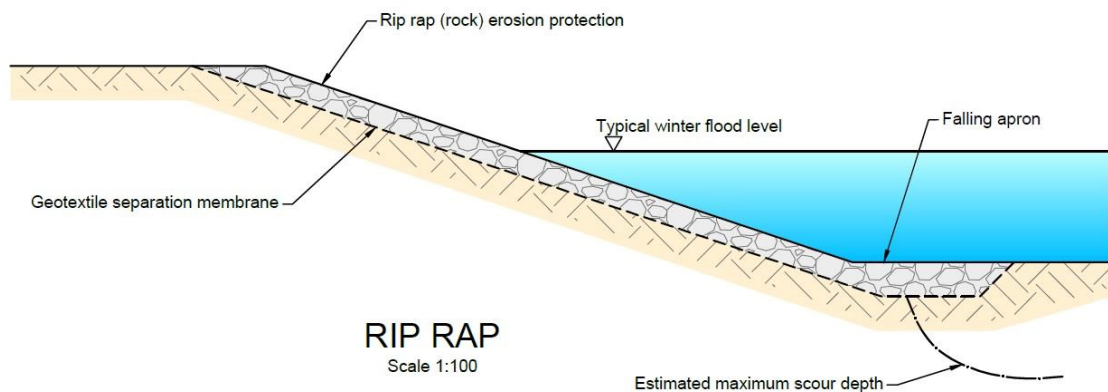


Figure 8 Rip-rap bank protection cross section

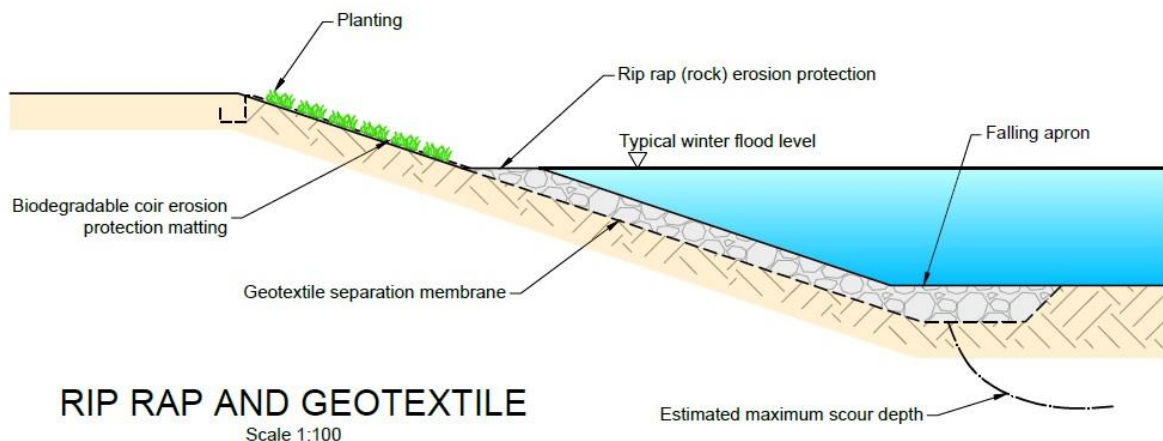


Figure 9 Rip-rap and pre-seed mattresses bank protection cross section

Land clearing works. Land clearing works will be carried out in the groynes anchoring areas on the banks and in the areas where bank protection works are required, as well as in the areas where the site organizations will be set up.

Land preparation works will mainly consist of the following activities:

- Removal of large vegetation (where applicable);
- Scraping the layer of vegetal soil to a thickness of approximately 0.3 m and storing it in specially designed spaces to facilitate further use;
- Removal of large stones from work platform area;

- Leveling the work platform;
- Correction by sloping and removing eroded areas of the banks.

The Constructor together with the local authorities will establish the place of storage for leaves, branches and other wood materials resulting from the cleaning of the land. For all these operations the permits and agreements provided by the legislation in force will be obtained.

Location of geotextiles on the bottom of the riverbed. Through the project, two methods are proposed to position the geotextiles at the foundations level:

- with the help of fascines mats and a ballast layer;
- using ballasted geotextile mattresses.

Fascines will be used for the construction of grids fixed on geotextile, acting as ballast in order to install it at the foundation level of the dykes, groynes, chevrons, the bank protection works (on the wet bank slope). Fascines grids will be made of faggot wood rolls, on a polygon, located on the bank, in the commissioning area. Fascines will be purchased from the Forestry Directorates through service contracts between the manufacturer and them. Fascines rolls will be transported by automobile from the place of purchase to the nearest port from the commissioning area, then transported on water by ships to the polygon where the mattresses will be made.

Fascine grids will be fixed to geotextile and launched to the water by a crane mounted on a floating body. For the positioning of the geotextile layer on the bottom of the water, the cells of the fascines grid will be filled starting from one end with the rip-rap.

The mattresses will be covered with gravel from upstream towards downstream along the same line perpendicular to the bank. After a complete mattress line is covered, the filing will start on the next line that will overlap with the anterior one for at least 1 m.

Another simplest method is the use of ballasted geotextile mattresses consisting of two layers of geotextile between which there is a layer of sand.

Geotextile has the role of separation, protection and filtration and contributes to the reduction of suspended matter, reducing the turbidity of water.

Building new islands or expanding existing ones. The new islands and expansion areas of the existing islands will be built from a base layer of sand and gravel dredged from the riverbed from the area adjacent to the islands. Since the upstream part of the islands will be subjected to the erosion process, it will be necessary to create a protection structure against erosion. The protective structure will be constructed from rip-rap. If needed, to construct the island's upstream area, non-woven geotextile tubes / bags filled with sand and / or dredged material will be used with a rock cover to create a storage area for the dredged material. The islands are proposed to be executed at 1 m above the level associated with the dominant flow (8,000 m³ / s). A vegetation layer will be installed over the base material to prevent erosion of the island during flooding periods, and planting herbaceous vegetation, planting shrubs and local trees (see Figure 10 and Figure 11) for stabilization. Dredging works will be done using a dredge that sucks the dredged material, and then pumped it directly onto the surfaces of the existing sandbars. Construction of new islands will take place in low-flow periods. In order to create the shape of the island according to the technical design, large machines (floating loaders / excavators) will be used, all the works being performed in the river bed.

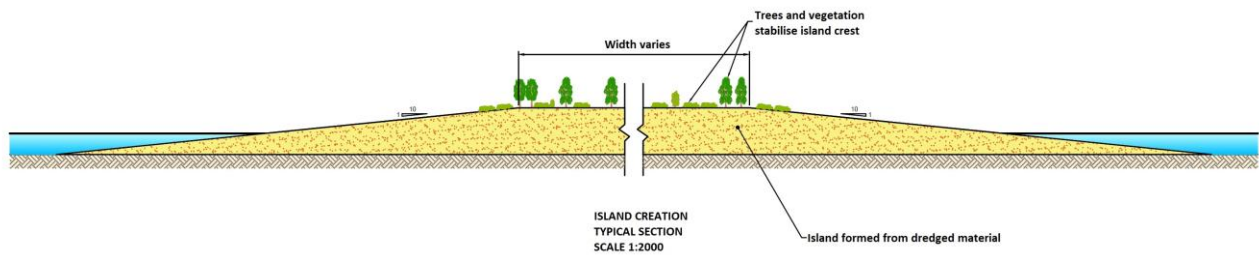


Figure 10 New created island cross-section

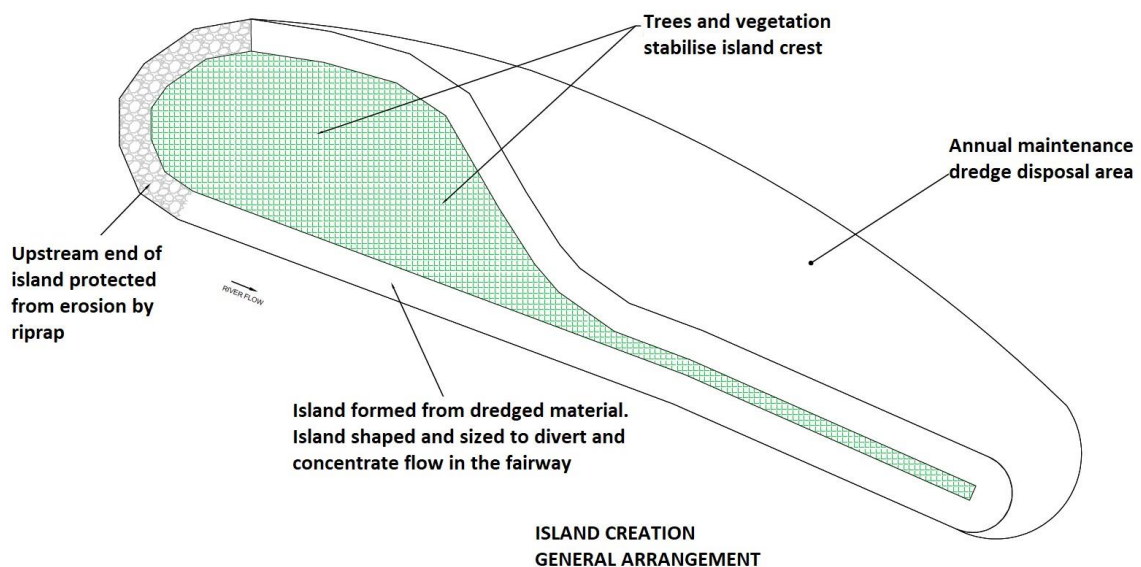


Figure 11 Island view from above

Materials loading / unloading activities. The mineral aggregates and other materials necessary for performing the construction works will be transported by auto vehicles from economic operators from the territory of Romania and Bulgaria to the ports closest to the place of operation according to the needs.

In the ports, the loading docks will be equipped with a floating crane (grab crane) and a normal crane. From port the stone will be transported with barges at the place of commissioning. Also, the rock will be unloaded from the barge using floating cranes equipped with a grapple or pull-out bay. Loading / unloading activities will be performed according to an approved schedule that takes into account the navigation restrictions.

Periodically, topo-hydrographic and cross-sections measurements will be done to ensure compliance with the technical design specifications for the placement of the layers of rip-rap, rock, gravel and sand.

3.5.12 Execution plan

According to the Manual on Good Practices in Sustainable Waterway Planning from the PLATINA website - *SWP 5.3 Infrastructure - Support interdisciplinary dialogue on environmentally sustainable waterway development*, the essential elements of an integrated project planning are:

- Identifying the integrated objectives of the project incorporating inland waterway transport objectives, environmental needs and other users of the river sector objectives such as nature protection, flood management and fisheries.
- Integrating relevant stakeholders from the initial phase of the project.

- The existence of an integrated planning process for the transposition of the objectives of the inland and environmental waterway transport into concrete measures within the project, thus ensuring "win-win results".
- Performing comprehensive environmental monitoring before, during and after project work.

Following the Multicriterial Analysis conducted for the hierarchy of the possible scenarios identified for each CP and for the selection of the preferred scenarios, a phased program for the implementation of the project was conceived.

Thus, the implementation of the project will be started by constructing the hydrotechnical structures from CP Bechet, Belene and Popina and carrying out dredging activities in all 12 CPs (the execution stage of the works).

In order to ensure favorable long-term navigation conditions, dredging maintenance activities will be carried out in all 12 CPs in the operation phase.

Because, the project will involve natural processes subject to difficult to anticipate changes, activities will be carried out to monitor the effects of the built structures on the environment and the hydro-morphological conditions throughout the project. Monitoring activities will begin before the construction phase and will continue during and after building activities.

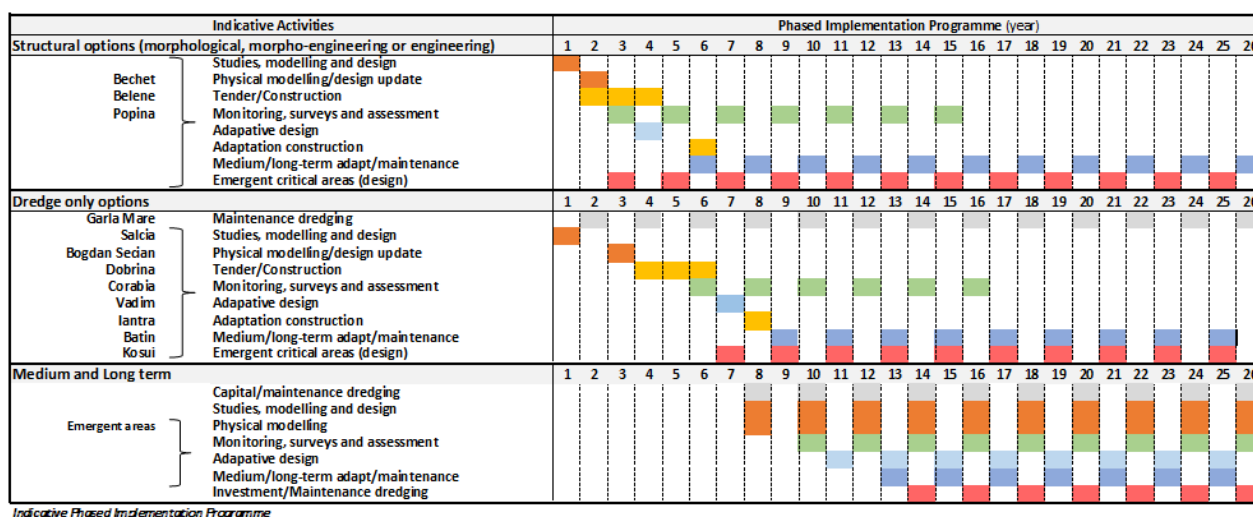


Figure 12 Execution plan

3.5.13 Relation with other existing or planned projects

Existing or planned projects to be performed in the area of the common sector of the Danube are:

- **Portile de Fier Hydropower Branch** manages the largest hydropower plants on the Danube River: Portile de Fier I, with an installed power of 1080 MW and Portile de Fier II, with the installed power of 250 MW. Both hydroelectric plants are operated in partnership with the Serbian side, the Romanian and Serbian power stations at Portile de Fier I cumulating 2.160 MW, and those from Portile de Fier II cumulating 500 MW. The Portile de Fier I and II can process a flow of 8,700 m³ / s. Iron Gate I is located 15 km upstream of Drobeta Turnu-Severin, and Portile de Fier II 60 km downstream. Navigation on the Danube is provided by locks made on both banks at both ends, with a combined traffic capacity of 52.4 million tonnes per year for one-way traffic and 37.2 million tonnes per year for two-way traffic. The Portile de Fier I system is one of the largest hydro-technical constructions in Europe and the largest on the Danube. Its lake with a volume of more than 2,200 million m³ extends from the dam to the Danube confluence with the Tisa River. The lake consists mainly of the Danube Gorges, the largest gorges in Europe, between Bazias and Orsova.

Considering that the Portile de Fier II Hydro Power Station is located upstream of the project site, during the execution period, for short periods of time, especially in periods with high flow, the Danube water level could increase suddenly and affect the construction and dredging activities. It is estimated that the cumulative impact will be low, taking into account that the competent authorities, through the issued authorizations, monitor the operation of the Portile de Fier II Hydro Power Plant, including the maximum water level of the river.

- The existing **Gravel and Sand Quarries** on the Danube already have a negative impact on the hydro morphological parameters of the Danube in the analyzed sector. In general, the effects of extracting sand and gravel from the riverbed are: changing the shape of the longitudinal profile, the variability of the deposits in the riverbed and the erosion process. According to the information posted on the site of the National Administration for Mineral Resources, there are the following areas of exploitation for sand and gravel on the Danube:
 - Giurgiu County: Danube Riverbed (Ostrov Dinu-Cama km 505-511); Slobozia Island (Danube km 494 + 500-499); Batin Island (Danube km 520-522 + 500);
 - Calarasi County: Calarasi (Danube km 376.5-377.0); Calarasi-Danube km 377.05-377.5; Danube km 390 + 700-km 391 + 600.

The existence of quarries in the project area could create a cumulative impact on water bodies by repeatedly increasing turbidity. Given the exploitation licenses are issued by the National Agency for Mineral Resources for a limited period, at this time it cannot be estimated how many ballasts will be operational at the start of works of the FAST Danube project. However, it should be mentioned that, the activities carried out within the ballasts are monitored by the authorities through the permits and permits. The economic operators must comply with the conditions imposed by the authorities in permits and licenses, such as: the quantities of exploited aggregates, the exploitation deadlines, the period necessary for the alluvial material in the riverbed to recover from exploitation. If quarries exploitations activities will occur inside the CP, it is considered that the cumulative impact will be reduced, limited in time. In case the quarries will be located outside the CP, it is estimated that the cumulative impact will be insignificant.

- **Existing fisheries and aquaculture.** In the project area there are 3 aquaculture sites located in the vicinity of the CP: Garla Mare, Belene and Popina.

„Garla Mare Fishery“ is an aquaculture farm with a surface of 268.75 ha of water, located in Garla Mare commune, Mehedinti County. The owner of the arrangement is the National Agency for Fisheries and Aquaculture (NAFA), and the administrator is S.C. Caviar S.R.L. from Drobeta Turnu Severin. The Danube-fishery communication channel is located on the Romanian bank in CP Garla Mare.

Considering that in the project there are no works that will lead to the decrease of the water level in the Danube, and the works proposed in the Garla Mare CP are represented by dredging works on existing fairway, which is located near the Bulgarian bank, it is considered that there will be no cumulative impact.

„Suhaia Fishery“ is a stockfarm aquaculture facility with a surface of 1,050.29 ha of water, located in Suhaia Commune, Teleorman County. The site is owned by NAFA / Local Council Suhaia / Donau Fish and is administered by S.C. Donau Fish S.R.L. from Suhaia, Teleorman County. The Danube-fishery communication channel is located on the Romanian bank in CP Belene.

Considering that in the project there are no works that will lead to the decrease of the water level in the Danube, and by the works proposed in CP Belene, in the Danube-Suhaia communication channel no bank defense is designed, it is considered that a cumulative impact will not be produced.

„Danube-Dorobantu Channel Fishery“ is a breeding aquaculture farm, with a surface of 48.5 ha, located in Dorobantu Commune, Calarasi County. The owner of the site is National Administration of Romanian Waters, the Buzau- Ialomita Water Directorate, and the administrator is S.C. Oltfish S.R.L. from Calarasi. Danube-fishery communication channel is located on the Romanian bank at the eastern boundary of CP Popina.

Considering that in the project there are no works that will lead to the decrease of the water level in the Danube, and the works designed for CP Popina are located more than 3 km away from the Danube-fishery communication channel, it is considered that there will be no cumulative impact.

- **The Local Development Strategy of FLAG-South Danube fishing area (SDL)** is a project funded under the Operational Program for Fisheries and Maritime Affairs 2014-2020, Axis 4 - Increasing employment and increasing territorial cohesion within the framework of the Measure III.2 - Implementation of local development strategies placed under the responsibility of the community (including running and starting costs). The duration of the project execution is until December 31, 2023 and aims at economic, social and environmental development of FLAG-South Danube fishing area (Bujoru, Crangu, Dracea, Fantanele, Izvoarele, Lisa, Nasturelu, Pietrosani, Seaca, Traian, Viisoara and Zimnicea localities) and the exploitation of the fisheries sector in a sustainable manner.

Considering that in the project there are no works that will lead to the decrease of the water level in the Danube, and the projected works will have the effect of improving the transport within the SDL project area, it is considered that the impact will be positive, except for the execution periods of the hydrotechnical structures and during dredging activities when the activities set out in SDL project (commercial fishing) could be affected. The possible impact will be temporary during the execution of the works and will disappear with the completion of the works.

- **The Energy Strategy of Romania 2018-2030, with the perspective of 2050, the Ministry of Energy** includes the realization of the Hydropower Complex Turnu Magurele-Nicopol. The Turnu Magurele-Nicopol hydro-technical project is of the utmost importance and a beneficial investment for both Romania and Bulgaria, the 810 MW installed power would add to the zonal production capacity and also bring both states closer to the European target set for 2030 on the 35% renewable energy share of the total energy produced. The Hydrotechnical Complex will be composed of:
 - two identical hydropower plants as equipment and power, one belonging to Romania located on the left bank, the other to Bulgaria located on the right bank;
 - two connection stations, one on the left bank and the other on the right bank, which are interconnected by an electric power line crossing the Danube;
 - two locks for navigation along with the corresponding navigation constructions, one on the left bank and the other on the right bank;
 - concrete spillway dams to evacuate the water during Danube high flow periods. Both the dam of the Romanian part and the dam of the Bulgarian part are located on the Pavel Island, on the left bank;
 - a speed lock and two stairs for fish;
 - fixed dams and the earth dam that connects to the high bank.
 - over the dam a bridge overlaid with two levels.

For the future hydropower complex, two sites were proposed, one at km 580 + 650 and the second a few km downstream, at km 587 + 260. The area at km 580 + 650 was analyzed between 1970 and 1980.

The construction of the Turnu Magurele - Nikopol Hydropower Complex would have an irreversible negative impact on biodiversity in the Corabia Critical Point area, modifying the hydro-morphological conditions in the area. If the two countries decide to start the project, the cumulative impact with the possible impact generated by the FAST Danube project will be negative.

- **Existing pumping stations.** Romania has along the Danube a network of land improvement works made up of irrigation and drainage systems. In the project area there are 5 connections to the land improvement network of the National Agency for Land Reclamation (NALR). Connections are represented by:
 - Water pumping station in the Danube - in CP Corabia;
 - Water pumping station in the Danube – in CP Batin;
 - Water pumping station in the Danube - CP Kosui;
 - Drainage pumping station - in CP Belene;
 - Drainage pumping station - in CP Iantra.

The above five stations were not operational in April 2019.

Considering that in the project there are no works that will lead to the decrease of the water level in the Danube, it is estimated that no cumulative impact will be generated.

- **Kozloduy Nuclear Power Plant (NPP)** - the largest consumer of Danube water is Kozlodui NPP. The plant is located on the administrative territory of the town of Kozlodui, in the village of Harlets, in the meadow of the Danube. According to the Environmental Impact Assessment Report for the Investment Proposal: Consortium DICON - ACCIONA ING, 2013, the Danube water intake and the pumping stations are located on the bank at km 687. Water from the Danube is used as cooling agent.

Considering that in the project there are no works that will lead to the decrease of the water level in the Danube, and the nearest CP - CP Dobrina, located upstream of the nuclear power plant is located at over 70 km distance is considered to have no cumulative impact.

- **SWIM (SMART Waterway Integrated Management)**, beneficiary AFDJ Galati - The SWIM project has as main objective the realization of an integrated concept for the implementation of the activities of relocation of the navigation fairway through dredging works. Within the SWIM project, a common IT platform will be developed to implement the necessary solutions for the rehabilitation of the fairway, which will be jointly implemented by the Romanian and Bulgarian waterway administrations. The pilot dredging actions for the change of the waterway trajectory will take place in the Corabia port area to improve access to the Port, in the CP Bechet area for the opening of a sustainable trajectory of the fairway and in the Calafat-Vidin bridge area for the opening of the second passageway under the bridge. For the completion of these pilot activities, the project budget provides the necessary funds for the acquisition of the dredging equipment (dredge, pontoon, maneuvering tug and 2 barges) and operational costs for 2 years. Funding is provided through the Connecting Europe Facility (CEF) program. Implementation period: 2016 - 2020.

The SWIM project will generate a positive impact on shipping companies and customers who use shipping services by ensuring optimum navigation conditions. And the major industries in the area will benefit from the implementation of the SWIM project. Since the early stages of the technical solutions for the improvement of navigation in the FAST Danube project have been taken into account the activities of the SWIM project so that the best measures are implemented using an integrated concept for navigation rehabilitation and navigation throughout the whole year. Correlated the two projects will have a positive impact. During the construction and operating period, FAST Danube will take into account the execution schedule of the SWIM project so that the two projects will be carried out in good conditions.

- **Danube - Black Sea navigable canal** - at the opening of the Danube-Black Sea Canal navigation, in 1984, only the minimal works necessary for the deployment of the maritime traffic were executed. The works to be completed are to protect and consolidate the high banks, and in 2015 works were executed on the right bank, km 43 + 387 - km 43 + 820,9. Not finishing the the works, the nature of the rocks, the influence of the hydrometeorological factors (wind, rain, snow) and repeated cycles of freezing - thaw can lead to landslides, with major implications for the general stability of the banks, with material transported in the fairway, as well as the deterioration of the already executed works. Period of realization: 1978 - 2025.

Considering the entrance to the Danube - Black Sea canal is located more than 90 km away, downstream of CP Popina it is considered that there will be no cumulative impact as a result of works both through the FAST Danube project and for the protection and consolidation of the banks of the Danube - Black Sea navigable channel.

- **Improvement of Danube navigation conditions between Calarasi and Braila, km375 - km175**, beneficiary AFDJ Galati - The overall objective of the project is to improve navigation conditions on the Danube between Calarasi and Braila, km 375-km 175. On the Danube sector located between Calarasi and Braila there are about 10 critical points for navigation, where the minimum water depth falls below 2.5 m, the minimum depth recommended by the Danube Commission. In 2016, the reception was completed at the completion of the works for 3 critical points (Bala, Epurasul, Ostrovul Lupu). The works consisted of bank defense, routing dams, bottom sill and dredges. The works have been and will be monitored for environmental impacts, as recommended by EC and international environmental organizations. A supplementary study has been contracted for the Bala CP, which includes a 3D analysis of continued work. Period of implementation: 2011 - present.

Although the construction works for the proposed structures for the Danube sector between Calarasi and Braila have begun, it is estimated that these will continue also during the period of execution of the works

proposed by the FAST Danube project. In this case, it is considered that during the execution of the works in certain CP within the two projects a cumulative impact will be generated. At the time of drafting this report, the frequency, magnitude and duration of the impact cannot be estimated. During the operation of the two projects it is considered that the cumulative impact will be much diminished, considering that both projects will implement the proposed impacts mitigation measures.

- **FAIRwaY - Rehabilitation and maintenance of the navigable waterway** - The FAIRwaY project was proposed by the partnership between Waterway Administrations from Austria (Via Donau), Slovakia (SVP), Hungary (OVF), Croatia (AVP), Bulgaria (APPD) and Romania (AFDJ Galati and ACN Constanta) and obtained funding through the Connecting Europe Facility (CEF) program. The purpose of the project is to implement the Master Plan for the Danube River Fairway Rehabilitation and Maintenance, elaborated in the framework of the EU Strategy for the Danube Region, Priority Area 1a - Inland Waterways. The partners' objectives in Romania are to develop and acquire: databases for information obtained from hydrology, hydrography, signaling, electronic mapping; computing systems and dissemination of water level forecasts; innovative technologies by monitoring the signaling scheme using AtoNs equipment, the use of autonomous land, air and water systems as a support for current administration activities; procedures and systems for identifying and monitoring the factors influencing navigation on the Romanian Danube sector. Within the project, AFDJ Galati will acquire two new ships that will be used for the measurement and signaling activities. Funding is provided through the Connecting Europe Facility (CEF). Transport 2014 for Multi-Annual Projects, Funding Objective 4 - Specific Call for Cohesion Funds, Priority 1 - Pre-identified Projects on Core Network Corridors - Inland Waterways and Ports. Implementation period: July 2015 - June 2020.

The implementation of the FAIRwaY project will have a positive impact on the conditions of the Danube navigation and, implicitly, on the FAST Danube project. During the FAST Danube project, the provisions included in the Master Plan for the Danube River Fairway Rehabilitation and Maintenance will be taken into account and will be implemented through the FAIRwaY project. In conclusion, the implementation of the two projects will generate a cumulative positive impact.

- **BRUA gas pipeline** - a new European gas transit corridor to connect the Republic of Bulgaria, Romania, Hungary and Austria. Construction works started in October 2018, and it is estimated that the pipeline will be operational in 2020. The gas pipeline will connect with the Republic of Bulgaria through the Giurgiu-Ruse connection.

Considering the construction period for the FAST Danube project is expected to begin in 2020 and the BRUA gas pipeline at that time will be in the commissioning period, it is not considered to have a cumulative impact as a result of the implementation of the two projects.

- **Belene nuclear power plant** - a new nuclear power plant is planned to be built on the Bulgarian bank in the area of Belene. Although the Bulgarian government has invested more than 1.5 billion euros for the purchase of equipment for the two nuclear reactors, in 2009 the project was stopped and in 2012 the Bulgarian government refused to build the nuclear power plant. In May 2018, the Bulgarian government announced in the media that it plans to resume the construction of the Belene nuclear power plant.

At the time of preparation of this document there are no clear indications of starting the construction of the nuclear power plant, but this possibility cannot be eliminated. However, this is unlikely to happen given the selection procedure of the contractors for the construction works has not started.

- **Together for the Danube** - the project, supported by a partnership between WWF and Coca-Cola, aims to restore wetlands and floodplains along the Danube and its tributaries by 2020 in six countries: Austria, Hungary, Croatia, Serbia, Romania and the Republic of Bulgaria. In Romania, ecological reconstruction works are proposed along the Danube between the localities Garla Mare and Vrata in Mehedinti County; it is also considering the preparation of studies and the identification of economic opportunities for the sustainable use of land that will support a new ecological reconstruction project.

Part of the proposed works to be done for the Together for Danube project are located in the vicinity of CP Belene. It is not considered that the works proposed by the FAST Danube project will affect the completion of this project. It is also not considered that the works proposed by FAST Danube will affect the wetlands and the floodplain of the Danube located between Garla Mare and Vrata. In CP Garla Mare it is proposed to carry out Dredge only works, activities currently carried out on the Danube by the AFDJ for the maintenance of the navigable fairway. The FAST Danube project does not foresee works that will

lead to a decrease in the Danube water level and so it is not considered that the project will lead to damage to the water supply of the wetlands and the Danube meadow included in the Danube Joint Project.

- **DANUBE SEDIMENT - Danube River Sediment Management - Restoring Balance in Danube Sediment** - The project, co-funded by the European Union through the Danube Transnational Program, aims to improve Danube River sediment and water management, as well as its morphology. The development period is January 2017 - June 2019. The first phase of the project provides for the collection of data on sediment transport and sediment balance analysis at the Danube, followed by the development of a guide on sediment management and a manual for stakeholders to include measures specific for improving sediment management in navigation, hydro power generation, flood risk management and river basin management.

The results obtained through the DANUBE SEDIMENT project were of great importance for the FAST Danube project. As the project reports will be published, they will be analyzed, and the information considered relevant to the FAST Danube project will be taken into account throughout the duration of the project. Taking into account the recommendations and the guidelines developed by the DANUBE SEDIMENT project in the FAST Danube project will lead to a positive cumulative impact.

- **DANUBE parks CONNECTED** - The project, co-funded by the European Union through the Danube Transnational Program, aims at combating the fragmentation of natural habitats through the rehabilitation and management of ecological corridors along the Danube. The project will run from January 2017 to June 2019. One of the components of the project is the Danube WILD island CORRIDOR program, dedicated to protecting islands that are representative of river dynamics and harboring characteristic species as well as creating a network of protected islands. The program comprises five steps: defining criteria for the identification of islands; mapping of the identified islands; evaluating the results obtained by applying the criteria and mapping; Stakeholder awareness; defining, implementing and monitoring protection measures.

The results of the DANUBE parks CONNECTED project, namely the mapping of the Danube islands and their classification according to their natural / anthropic character, have been included in the multi-criteria analysis phase of the FAST Danube project and have been a very important criteria in the choosing of preferred scenarios. Taking into account some of the works proposed by the FAST Danube project are located near the islands classified to Category A (natural islands) and to Category B (islands with a high ecological value and small anthropic changes), it is considered that it is possible to have an impact on of these islands.

- **Managing and restoring aquatic ecological corridors for river migratory species in the Danube river basin (MEASURES)** - this is a project funded by the Danube Transnational Program and runs from June 2018 to May 2021 and has as main objective the consolidation and protection of aquatic bio-corridors for migratory fish in the Danube and three specific objectives: harmonization of methodologies, identification and mapping of key habitats for migratory fish; developing a joint Danube river basin strategy to improve the river as an appropriate ecological corridor for migratory fish, including measures and recommendations for the protection and restoration of key habitats; developing a strategy for preserving sturgeon genetic reserves as representative species, including an appropriate model for propagation and artificial breeding facilities.

The results obtained under the MEASURES project will be of particular importance for the identification and mapping of key habitats for migratory fish in the Danube. Considering that in the project area over time, few studies and research have been carried out on the behavior of sturgeons, the results obtained in the MEASURES project will be of great scientific importance. In the FAST Danube project, since the multi-criteria analysis phase has been taken into account areas known to be potentially favorable to the development of sturgeon habitats. Although the choice of the FAST Danube project's preferred scenarios has taken this very important criterion into account, it is possible that further potential habitats for wintering, shelter or spawning for sturgeons may be identified after the stage of defining their favorite scenarios as a result of the continuation of the MEASURES research. A series of results from the MEASURES project have already been included in the project impact assessment on the sturgeon species and habitats of this site.

As the results of the MEASURES project will be available to the public, it will be analyzed, and the information considered relevant to the FAST Danube project will be taken into account, including the provisions of the Strategy for the Danube Ecological Corridor.

- **Sustainable conservation of Danube sturgeons through prevention and reduction of poaching and illegal trade in sturgeon products** - This project, coordinated by WWF Austria, in partnership with the Danube Delta Biosphere Reserve Administration, Leibniz-Institut für Zoo- und Wildlifeforschung (IZW) im Forschungsverbund Berlin e WW, WWF Serbia, WWF Romania, WWF Bulgaria and WWF Ukraine, is taking place between October 2016 - December 2020 and continues its efforts to stop the illegal fishing and marketing activities of the wild sturgeons in the Danube to achieve a significant improvement of their status. The project is funded by the European Union through the Life + program and by all the partners involved. Target groups in the Republic of Bulgaria, Romania, Serbia and Ukraine are fishermen and fishermen communities (including young people), local authorities and sturgeons' merchants. The proposed activities aim at improving the enforcement of legal regulations, supporting fishing communities in the development and implementation of business plans to provide alternative sources of income, their involvement in efforts to protect sturgeons and informing traders of relevant legislation in force.

The Sustainable Conservation of Danube sturgeon project will make an important contribution to sturgeon species, namely to increase the number of individuals in the Danube. Both the contribution of this project and the proposed measures for the protection of sturgeon species under the FAST Danube project will have a cumulative positive impact on sturgeon populations in the Danube.

- **Danube Floodplain restoration - Reducing the flood risk through floodplain restoration along the Danube River and tributaries** - is part of the Danube Transnational Program, Priority Axis 2 "Environmental and Cultural Responsibility in the Danube Region" and is a project of cooperation between the Danube basin countries to prevent floods and improve the management of transboundary waters. Project run period June 2018 - November 2020.

At the time of preparation of this report, no information was available on the results obtained with this project. As the project reports will be published, they will be analyzed, and the information considered relevant to the FAST Danube project will be taken into account throughout the project.

- **Placing under safety conditions of the Danube flood defense line on the identified sectors with significant technological risk:** Giurgiu - Malu Rosu - Gostinu - Greaca - Arges, Oltenita - Surlari-Dorobantu, Borcea de Sus - Borcea de Jos, Harsova-Ciobanu, Calmatui - Gropeni -Chiscani, Macin-Smardan - is one of the major integrated projects proposed in the Danube River Flood Risk Management Plan with the purpose of protecting the localities at risk of flooding in the case of 1% flood scenario. The project components are provided:
 - Consolidation works to Giurgiu - Malu Rosu - Gostinu - Greaca - Arges flood defense line for the protection of Giurgiu City and localities Oinacu, Gostinu, Prundu and Chirnogi - the water supply line of Oltenita City;
 - Consolidation works to Oltenita-Surlari-Dorobantu flood defense line for the protection of Oltenita City and the towns of Ulmeni, Spantov, Chiselet and manastirea (flooded localities in 2006, with the exception of Oltenita).

At the time of preparing this report, no information was available on the proposed works for the consolidation of the flood defense line in the above-mentioned areas, but considering the flood defenses are generally carried out at great distances from the banks, the potential works that are considered for placing under safety conditions the flood defense line will not overlap with the works proposed by the FAST Danube project.

The FAST Danube project for improving navigation conditions on the analyzed sector will be correlated with the above-mentioned projects and the activities proposed by the project will be planned thus do not affect the activities of the ongoing projects.

The FAST Danube project is included in the list of proposed investment projects from the General Master Plan of Transport of the Romanian, 2016 and in the list of proposed investment projects within the Updated National Management Plan for the national portion of the Danube river basin, approved by G.D. No. 80/2016.

3.5.14 Details on the alternatives that have been considered

3.5.14.1 Details on choosing the preferred Scenario

The selection process of the preferred scenarios was iterative, through the Multicriteria Analysis, which took into account the following criteria: technical / morphological, financial, social and environmental. Each of the four criteria covered a number of sub-criteria.

For each CP, a variable number of scenarios ranging from 2 to 5 were analyzed using the Multi-Criteria Analysis as follows:

- 2 scenarios for CP Kosui;
- 3 scenarios for CP: Garla Mare, Salcia, Bogdan Secian, Bechet, Vardim, Iantra and Popina;
- 4 scenarios for CP: Dobrina, Belene, Batin;
- 5 scenarios for CP Corabia.

After analyzing all the scenarios and ranking according to the score obtained for all criteria and sub-criteria, resulted in a short list of preferred scenarios - two preferred scenarios for each CP, as follows:

- Garla Mare:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Morphological works - island.
- Salcia:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Engineering works - chevron.
- Bogdan-Secian:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 – Engineering works- chevrons and bank protection.
- Dobrina:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Engineering works – groynes, bank protection with realignment of the fairway.
- Bechet:
 - Scenario 1 - Morpho-engineering works - groynes, chevron, island, bank protection and realignment the fairway;
 - Scenario 2 - Morphological work - islands, bank protection and realignment the navigable fairway.
- Corabia:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Engineering works - groynes and access channel in the port of Corabia.
- Belene:
 - Scenario 1 - Morpho-engineering works - chevrons, groynes, bank protection and fairway realignment;
 - Scenario 2 - Engineering works (1) - chevrons, groynes, bank protection and fairway realignment;

- Vardim:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Engineering works - chevrons.
- Iantra:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Engineering works - chevrons, bank protection and fairway realignment.
- Batin:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Morpho-engineering works (2) - Chevrons, submerged groynes and fairway realignment.
- Kosui:
 - Scenario 1 - Dredge only with in-channel disposal;
 - Scenario 2 - Morphological works – islands.
- Popina:
 - Scenario 1 - Engineering works (1) - chevrons, groynes and fairway realignment;
 - Scenario 2 - Engineering works (2) - groynes and fairway realignment;

In the following, the methodology for selecting the preferred scenario for the Environmental Criteria is detailed. Similarly, the selection of the preferred scenario was made for the other technical / morphological, financial and social criteria.

It should be mentioned that, although the FAST Danube project is a transport project, in the Multi-Criteria Analysis the share that was attributed to the fulfillment of the environmental criteria was 50 %, compared to the other technical / morphological, financial and social criteria that each had 16,7 %.

For the Environmental criteria, the following sub-criteria and criteria were analyzed to be met by the project implementation:

- Sub-criteria: Compliance with the provisions of the Water Framework Directive 2000/60/EC:
 - Maintaining or improving the "biological" status of the water bodies potentially influenced by the project;
 - Maintaining or improving the "hydro-morphological" status of the water bodies potentially influenced by the project;
 - Maintaining or improving the "chemical and physic-chemical" status of the water bodies potentially influenced by the project;
- Sub-criteria: Avoid a negative impact on Natura 2000 sites:
 - Maintaining or improving the site conservation status of the Habitats Directive 92/43/EEC;
 - Protection of bird species listed in Annex I of the Birds Directive 2009/147/EC.
- Sub-criteria: Minimize / avoid a negative impact on migratory fish, including sturgeons:
 - Improving the flow regime of the Danube to facilitate the migration of sturgeons and other species of migratory fish;

- o Preventing the deterioration of wintering areas for sturgeons and facilitating the emergence of such new areas;
 - o Preventing damaging the known spawning areas for sturgeons and other migratory fish and contributing to the emergence of new feeding areas for juveniles.
- Sub-objective: Environmental protection and mitigation / compensation for habitat loss:
 - o Protection / preservation of the wetlands and landscape and visual environment;
 - o Prevention of cultural heritage (archaeological resources);
 - o Impact minimization, other than that considered in other objectives: human population and health, air quality, soil and groundwater quality, climate change, material properties and noise and vibration.

The results of the Multi-Criteria Analysis clearly showed a preference for Scenario 1 "Dredge only" with in channel disposal in 9 of the 12 CPs (Garla Mare, Salcia, Bogdan-Secian, Dobrina, Corabia, Vardim, Iantra, Batin and Kosui), and for the rest of the CP (Bechet, Belene and Popina), resulted that, for Scenario 1, are preferable engineering works and morpho – engineering works (groynes, chevrons, bank protection and islands) and dredging activities.

In CP Garla Mare, Salcia, Bogdan-Secian, Dobrina, Corabia, Vardim, Iantra, Batin and Kosui Scenario 1 - Dredge only, it is considered by far the variant that will generate a lower impact on the environment than the works provided in Scenario 2, that would involve both the construction of hydrotechnical structures and the carrying out of dredging activities.

In the case of CP Bechet, Belene and Popina, Scenario 1 - Dredge only was rejected considering that on long-term dredging is not sustainable and lead to the expected results for improvement of the navigation conditions for very short periods of time (several months – confirmed by the need to dredge twice a year in the same CP, in 2018).

In the situation of CP Bechet, Belene and Popina, where by both scenarios' hydro-technical structures are proposed, the situation differs from one CP to another, and in the following will be presented the main aspects that led to the choosing of the preferred solution from the two scenarios proposed.

Critical Point Bechet

Following the Multi-Criteria Analysis of the 2 preferred Scenarios (Scenario 1 - Morpho-engineering works and Scenario 2 - Morphological works), it resulted that, Scenario 1 is the preferred one. The main scoring differences that led to the selection / choice of the preferred scenario are the following:

- Criteria - *Maintaining or improving the "hydro-morphological" status of the water bodies potentially influenced by the project:*
 - o On short term, was considered that Scenario 1 brings a **low negative contribution** to fulfill the criteria, compared with Scenario 2, which was considered to bring a **negative contribution** to fulfill the criteria;
 - o On medium term, was considered that, Scenario 1 brings a **neutral position** to fulfill the criteria, while Scenario 2 was considered to bring a **negative contribution** to fulfill the criteria;
 - o On long term, was considered that both scenarios are on a **neutral position** regarding the fulfillment of the criteria.
- Criteria - *Maintaining or improving the site conservation status of the Habitats Directive 92/43/EEC;*
 - o On short term, were considered that both Scenario 1 and Scenario 2 brings a **low negative contribution** to fulfill the criteria;

- On medium term, was considered that, Scenario 1 brings a **low negative contribution** to fulfill the criteria, while Scenario 2 was considered is on a **neutral position** regarding the fulfillment of the criteria.
- On long term, was considered that both scenarios are on a **neutral position** regarding the fulfillment of the criteria.
- Criteria - *Improving the flow regime of the Danube to facilitate the migration of sturgeons and other species of migratory fish*:
 - On short, medium and long term, it was considered that, both Scenario 1 and Scenario 2 **brings a poor negative contribution** to fulfill the criteria.

For the rest of the criteria, the score for both scenarios on short, medium and long term was the same.

Summing up the obtained scores for each criteria from the environmental objectives, resulted that the Scenario 1 is the preferred one. Similarly, summing up the selected scores for the other technical / morphological, financial and social primary objectives, it has been that Scenario 1 is the preferred.

Belene Critical Point

Following the Multi-Criteria Analysis of the 2 preferred Scenarios (Scenario 1 - Morpho-engineering works and Scenario 2 - Engineering works (1)), resulted that the, Scenario 1 was the preferred one. The main scoring differences that led to the selection / choice of the preferred scenario are the following:

- Criteria - *Maintaining or improving the site conservation status of the Habitats Directive 92/43/EEC*:
 - On short and medium terms, was considered that Scenario 1 brings a **low negative contribution** to fulfill the criteria, and Scenario 2 bring a **negative contribution** to the fulfil the criteria;
 - On long term, it was considered that Scenario 1 is on a **neutral position**, while Scenario 2 was considered to bring a **negative contribution** to fulfill the criteria.
 - On long term, it was considered that both scenarios are on a **neutral position** regarding the fulfillment of the criteria.
- Criteria - *Improving the flow regime of the Danube to facilitate the migration of sturgeons and other species of migratory fish*:
 - On short, medium and long term, was considered that Scenario 1 brings a **low negative contribution** to fulfill the criteria, while Scenario 2 brings a **negative contribution** to fulfilling the criteria.

For the rest of the criteria, the score for both scenarios on short, medium and long term was the same.

Summing up the obtained scores for each criteria from the environmental objectives, resulted that the Scenario 1 is the preferred one. Similarly, summing up the selected scores for the other technical / morphological, financial and social primary objectives, it has been that Scenario 1 is the preferred.

Critical Point Popina

Following the Multi-Criteria Analysis of the 2 preferred Scenarios (Scenario 1 - Engineering works (1) and Scenario 2 - Engineering works (2)), resulted that, Scenario 1 si the preferred one. The main scoring differences that led to the selection / choice of the preferred scenario are the following:

- Criteria - *Maintaining or improving the "biological" status of the water bodies potentially influenced by the project*:
 - On short term, it was considered that, both Scenario 1 and Scenario 2 brings a **negative contribution** to fulfill the criteria;

- On medium term, was considered that, Scenario 1 to be on a **neutral position** regarding the fulfillment of the criteria, while Scenario 2 was considered to bring a **low positive contribution** to fulfill the criteria;
 - On long term, it was considered that both scenarios are on a **neutral position** regarding the fulfillment of the criteria.
- Criteria - *Maintaining or improving the "hydro-morphological" status of the water bodies potentially influenced by the project:*
 - On short term, was considered that, Scenario 1 brings a **low negative contribution** to fulfill the criteria, compared with Scenario 2, which was considered to bring a **negative contribution** to fulfill the criteria;
 - In the medium term, Scenario 1 was considered to have a poor positive contribution to meeting the criterion, while Scenario 2 was considered to make a negative contribution to meeting the criterion;
 - In the long term, it was considered that both scenarios are on a **neutral position** regarding the fulfillment of the criteria.

For the rest of the criteria, the score for both scenarios on short, medium and long term was the same.

Summing up the obtained scores for each criteria from the environmental objectives, resulted that the Scenario 1 is the preferred one. Similarly, summing up the selected scores for the other technical / morphological, financial and social primary objectives, it has been that Scenario 1 is the preferred.

3.5.14.2 Details on the Scenario "zero" - without investment

From the incipient phase of the project, was analyzed also the alternative of not performing investments for the implementation of the project and maintaining the current condition of the navigation conditions on the Romanian-Bulgarian common sector of the Danube - **Scenario "zero" - without investments**.

Scenario "zero" - without investments, has not been considered as an applicable alternative for the project since the start of the project, given the serious navigation and safety problems faced by both end-users (navigators) and administrators in the Romanian-Bulgarian Danube common sector, like:

- Recording of long periods of time when commercial navigation is not possible both in winter during freezing and in summer, when the flows of river flow tend to be very low;
- The inefficiency on long-term of the maintenance dredging activities due to sediment dynamics, hydrological regimes and the nature of the Danube River morphology;
- Recording very high costs regarding maintenance dredging (in the current conditions two dredging interventions are required per year).

Starting from these considerations, the analysis of the **Scenario "zero" - without investments**, indicated that the improvement of navigation on the Danube could be achieved only by performing investment works such as: dredging activities and construction of hydrotechnical structures. For this reason, the **Scenario "zero" - no investment** was considered not applicable and was not included in the Multi-Criteria Analysis for detailed assessments.

In conclusion, the benefits of implementing the project, related to the potential negative impact (appeared especially during the execution period) support the implementation of this development project.

3.5.14.3 Details on the Scenario 2

3.5.14.3.1 Garla Mare – Romanian Sector

Scenario 2 - Morphological works

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- construction of a new island approximately between km 840.2 and km 838.2, upstream of the existing island, by creating a structure to facilitate the stabilization of the material over time in the upstream part of the island;

Construction of the new structure will encourage the directioning of the water flow toward the fairway, thus contributing to the optimum conditions for navigation.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Garla Mare, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 14 - Critical Zone 1, Critical Point 01 Garla Mare, Scenario 2 Morphological works.

3.5.14.3.2 Salcia – Romanian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- construction of a chevron near the Romanian bank at km 823 to the north of the current fairway.

Construction of the new structure will encourage the directioning of the water flow toward the fairway, thus contributing to the optimum conditions for navigation.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Salcia, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 15 - Critical Zone 1, Critical Point 02 Salcia, Scenario 2 Engineering works.

3.5.14.3.3 Bogdan - Secian - Romanian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- construction of a chevron at km 785;
- performing bank protection works on the Romanian bank, approximately between km 785.0 and km 783.5;
- performing bank protection works on the Bulgarian bank, approximately between km 785.3 and km 784.4.

Construction of the chevron will encourage the directioning of the water flow toward the fairway, thus contributing to the optimum conditions for navigation.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Bogdan - Secian, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 16 - Critical Zone 2, Critical Point 03 Bogdan-Secian, Scenario 2 Engineering works.

3.5.14.3.4 Dobrina – Romanian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing investment dredging works for realignment of the fairway and the achievement of a more sinuous morphological alignment, up to a depth of approximately 3.5 m at ENR, approximately between km 764.5 and km 758.8;
- performing bank protection works on the Romanian bank approximately between km 764.3 and 763;
- performing bank protection works on the left bank of the existing island, near the Bulgarian bank, approximately between km 762,8 and km 760,5;
- the construction of three groynes on the Romanian bank located approximately between km 763.5 and km 762.8;
- the construction of three groynes on the left bank of the existing island, near the Bulgarian bank, approximately between km 760.5 and km 759.9;
- setting up a storage area for dredged material in the upstream area of the existing island near the Romanian bank (Pietris Island) approximately between km 759.4 and km 758.5, by creating a structure that facilitates the stabilization of the material over time.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Dobrina, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 17 - Critical Zone 2, Critical Point 04 Dobrina, Scenario 2 Engineering works.

3.5.14.3.5 Bechet – Romanian Sector

Scenario 2 - Morphological works

The scenario includes the following works:

- performing investment dredging works to change the trajectory of the fairway and the achievement of a more sinuous morphological alignment, up to a depth of approximately 3.5 m at ENR, approximately between km 679 and km 671.3;
- the construction of two new islands (an island located approximately between km 677.2 and km 676.0) and the second island located approximately between km 673.6 and km 672.6, by creating structures to facilitate the stabilization of the materials;
- performing bank protection works on the Romanian bank approximately between km 678.2 and km 675.5;
- setting up two storage areas for dredged material (one behind the first island, which will be located approximately between km 677.0 and km 674.8 and one near the Romanian bank upstream km 674.0).

The creation of the new islands will be a stabilizing factor for the realigned fairway and the upstream development of an island in the form of a chevron will encourage the deposition of the material downstream and being a storage area for dredged material, in time will lead to the formation of a bigger island.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Bechet, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 18 - Critical Zone 3, Critical Point 05 Bechet, Scenario 2 Morphological works.

3.5.14.3.6 Corabia – Romanian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing dredging works on the alignment of the existing fairway and performing dredging obtaining a fairway along the access channel in Corabia port, up to a depth of approximately 3.5 m at ENR;
- extension of the two existing islands by depositing dredged material in the area of low water (setting up a storage area for dredged material, approximately between km 629.8 and km 628.6);
- building three groynes located on the right side of the upstream island, approximately between km 631.8 and km 630.2;
- the construction of three groynes located on the right side of the downstream island, approximately between km 628.8 and km 627.2.

Deposition of the dredged material at the upstream end of the largest island will encourage natural deposition of the material in this area and will lead in time, to the restriction of the water flow between the two islands. Thus, the water flow will be directed to the fairway.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Corabia, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 19 - Critical Zone 3, Critical Point 06 Corabia, Scenario 2 Engineering works.

3.5.14.3.7 Belene – Bulgarian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing dredging works for changing the trajectory of the fairway and achieving a more sinuous morphological alignment, up to a depth of approximately 3.5 m at ENR, approximately between km 566.0 and km 557.0;
- the construction of three groynes in the upstream part of the existing island between approximately km 565,5 and km 564,5;
- construction of two chevrons approximately between km 568.0 and km 566.0;
- performing bank protection works on the Romanian bank approximately between km 566.6 and km 565.0;
- setting up a storage area for dredged material near the Romanian bank, approximately between km 561.2 and km 560.0, which encourages the directioning of the water flow toward the fairway.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Belene, including the areas along the navigable fairway, where dredging is required, are presented in Annex C - Drawings, Drawing no. 20 - Critical Zone 4, Critical Point 07 Belene, Scenario 2 Engineering works.

3.5.14.3.8 Vardim – Bulgarian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing investment dredging works on the alignment of existing fairway up to a depth of approximately 3.5 m at ENR, between km 548 and km 538;
- construction of two chevrons near the Romanian bank, approximately between km 540.8 and km 539.0;
- construction of a chevron in the central part of the Danube riverbed, approximately downstream of km 545.0;
- setting up a storage area for dredged material near the Romanian bank, approximately between km 536.8 and km 537.8.

The construction of the three chevrons and the storage area for dredged material will encourage directioning of the water flow toward the fairway, facilitating the maintenance of optimal navigation conditions.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Vardim, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 21 - Critical Zone 4, Critical Point 08 Vardim, Scenario 2 Engineering works.

3.5.14.3.9 Iantra – Bulgarian Sector

Scenario 2 - Engineering works

The scenario includes the following works:

- performing investment dredging works up to a depth of about 3.5 m per ENR, approximately between km 538.0 and km 533.5;
- construction of two chevrons approximately between km 535.0 and km 533.8 and two chevrons approximately between km 531.8 and km 530.7;
- performing bank protection works on the Romanian bank approximately between km 535.0 and km 533.9;
- setting up a storage area for dredged material near the Romanian bank, approximately between km 537.8 and km 536.7.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Iantra, including areas along the navigable fairway where dredging works are required, are presented in Annex C - Drawings, Drawing no. 22 - Critical Zone 4, Critical Point 09 Iantra, Scenario 2 Engineering works.

3.5.14.3.10 Batin – Bulgarian Sector

Scenario 2 - Morpho-engineering works

The scenario includes the following works:

- performing investment dredging works to change the trajectory of the fairway and the achievement of a more sinuous morphological alignment, up to a depth of approximately 3.5 m at ENR, approximately on

the entire distance of the critical point (km 533.5 – km 521.8) except for a small area downstream of the critical point (km 521,8 - km 520,0) where the existing alignment is maintained;

- construction of a chevron on the upstream end of the existing island, approximately at km 524.4;
- construction of two chevrons at approximately km 532.0 and km 531.0;
- bank protection works on both banks (between km 532.0 – km 531.0 on the left bank and km 532.0 - km 530.5 on the right bank);
- construction of a six set of groynes inclined, submersible set, approximately between km 526.8 and km 525.8;
- setting up a storage area for dredged material, along the left bank of the island near the Bulgarian bank, approximately between km 529.8 and km 528.3.

The construction of the new structures will have as effect directioning of the water flow toward the fairway.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Batin, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 23 - Critical Zone 4, Critical Point 10 Batin, Scenario 2 Morpho-Engineering works.

3.5.14.3.11 Kosui – Bulgarian Sector

Scenario 2 - Morphological Works

The scenario includes the following works:

- performing investment dredging works on the existing fairway up to a depth of approximately 3.5 m at ENR;
- expansion of the two islands in their upstream ends through the creation of structures that facilitate the stabilization of the material over time; the expansion of the large island will occur approximately between km 428.3 and km 426.9; and the expansion of the small island will be performed approximately between km 424.8 and km 422.4;

These works will maintain a balance between the erosion - sedimentation processes in the critical point area.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in CP Kosui, including the areas along the navigable fairway, where dredging is required, are presented in Annex C - Drawings, Drawing no. 24 - Critical Zone 5, Critical Point 11 Kosui, Scenario 2 Morphological works.

3.5.14.3.12 Popina – Bulgarian Sector

Scenario 2 - Engineering Works (2)

The scenario includes the following works:

- Performing investment dredging works, including changing the trajectory of the fairway and achieving a more sinuous morphological alignment, up to a depth of approximately 3.5 m at ENR, approximately between km 409.0 and km 401.0 km, realigning starting from km 407,4;
- construction of six groynes on the Romanian bank, arranged as follows: three groynes located approximately between km 408.2 and km 406.2 and three groynes located approximately between km 405.1 and km 403.9;

- setting up a storage area for dredged material in the central area of the Danube riverbed approximately between km 405.0 and km 403.5.

Fairway realigning has been taken into account to avoid areas of shallow water that have created serious navigation problems, including in 2018. The route chosen for fairway realignment has also been used in the past, this sinuous route being considered more appropriate from a morphological point of view.

The storage area for dredged material proposed to be located approximately between km 405.0 and km 403.5 will encourage directioning of the water flow toward the fairway in the area where realignment works will be performed.

Maintaining on long-term of the depth of the fairway alignment will be achieved through maintenance dredging activities, up to a depth of approximately 3.0 m at ENR, in the operating stage.

The works proposed in Popina Critical Point, including the areas along the navigable fairway, where dredging works are required, are presented in Annex C - Drawings, Drawing no. 25 - Critical Zone 5, Critical Point 12 Popina, Scenario 2 Engineering works (2).

3.5.15 Other activities that may occur as a result of the project

Not the case.

3.5.16 Other permits required for the project

According to the Urbanism Certificates issued for the project (UC no. 183 / 19.06.2017, UC no. 280 / 02.11.2018, UC no. 489 / 26.11.2018, UC no. 3 / 10.01.2019, UC no. 682 / 13.09.2017 and UC no. 121 / 06.10.2017) the following approvals / agreements were requested in order to obtain the Construction Permit:

Permits and agreements on urban utilities and infrastructure:

- Power supply.

Other Permits and Agreements:

- Protected Natural Area Administrator.

Specific permits / agreements of the central public administration and / or their decentralized services:

- Ministry of National Defense – Major General State;
- National Administration of Romanian Waters;
- Romsilva Administration and County Forestry Directorates;
- Cadaster and land registration office;
- The Ministry of Transports;
- Ministry of Internal Affairs;
- River Administration of the Lower Danube;
- Romanian Intelligence Service;
- Special Telecommunications Service;
- Romanian Border Police;
- Directorate for Agriculture and Rural Development;
- State Inspectorate of Construction.

4. Description of required demolition works

Not the case.

5. Description of the project location

5.1 Distance to borders

The project takes place along the Romanian-Bulgarian Danube common sector, between Portile de Fier II and Chiciu-Silistra (between km 863 and km 375), which represent also the Romania's southern border with the Republic of Bulgaria. Given the location of the project towards the borders, it is mentioned that the project falls under the Convention on Environmental Impact Assessment in a Transboundary Context, adopted at Espoo on February 25, 1991, ratified by Law no. 22/2001, with subsequent completions (see Annex C - Drawings, Drawing no. 1 - General Layout Plan, Critical Areas 1-5, Critical Points 01-12).

5.2 Location of the site in relation with the cultural patrimony

The location of the CPs within the project against the elements of the cultural heritage was been performed taking into account the following:

- The updated list of historical monuments, approved by the Order of the Minister of Culture and Cults no. 2.314 / 2004, as subsequently amended;
- National archaeological repertoire stipulated by Government Ordinance no. 43/2000 on the protection of the archaeological heritage and the declaration of some archaeological sites as areas of national interest, republished, with the subsequent modifications and completions;
- Law no. 5 of 2000 regarding the approval of the National Spatial Planning Plan - Section III - Protected Areas, as amended and supplemented (Annex no. III).

According with the Law No. 5 of 2000, the Territorial Administrative Units (TAU) with a very high concentration of the cultural heritage of national interest along the Danube, on the Romanian-Bulgarian common sector, are: the commune of Garla Mare (Mehedinti County), the cities Calafat (Dolj County), Corabia (Olt County), Turnu Magurele, Zimnicea and Islaz commune (Teleorman county), Giurgiu city (Giurgiu county) and Oltenita city (Calarasi county).

The values of cultural heritage of national interest (historical monuments of outstanding national value) along the Danube, on the Romanian-Bulgarian common sector, identified in Annex III are the following:

- Fortresses:
 - Giurgiu fortress, TAU Giurgiu Municipality, Giurgiu County;
 - Turnu Fortress, TAU Turnu Magurele Municipality, Teleorman County;
- Bronze Age Settlements and Necropolis:
 - The settlement of the culture Garla Mare (middle bronze) (in the point "La Garloasca"), TAU Garla Mare commune, Mehedinti County;
- Dacian fortifications:
 - Geto-Dacian fortress, Zimnicea City, Teleorman County;
 - Flat and tumular necropolis; the Bronze Age necropolis; the settlement and the medieval necropolis (in the point "Campul mortilor"), TAU city of Zimnicea, Teleorman County;
- Ancient cities:
 - The ancient city of Sucidava, on the place of the Geto-Dacian settlement, UAT Corabia Town, Olt County.

The cultural heritage objectives are inscribed in the National Archaeological Repertory administered by the National Heritage Institute, subordinated to the Ministry of Culture and National Identities. The significant ones from the point of view of national and universal value, as well as those that are representative of the local cultural heritage, are also included in the List of Historical Monuments approved by Order no. 2.314 / 2004, with subsequent amendments and completions.

Law no. 5 of 2000 on the approval of the National Spatial Planning Plan - Section III - Protected Areas, with its subsequent amendments and completions, stipulates that the delimitation of the protected cultural heritage areas must be carried out by the local public administration authorities, based on specialized studies. Until these specialty studies and delimitation of protection zones have been established, the law establishes 100m historical monument protection areas in municipalities and towns, 200m in communes and 500m outside the localities, measured from the outer boundary of the land belonging to the historical monuments.

According with the available information in the National Archaeological Repertory, 8 cultural heritage objectives have been identified, located at a distance of no more than 1 km from the Danube and towards the CP limits, sufficient distance to include the general protection area maximum 500 m provided by the legislation in force. The list of identified cultural heritage objectives identified is shown in Table 3 below.

Table 3 List of cultural heritage sites located along the Danube, at a distance of no more than 1 km from the river bank, taken from the National Archaeological Repertory

No. crt.	County	TAU	Site Name	Site Description					Approx. distance toward Danube bank [km]	General protection area according Law 5/2000 [km]	Approx. location toward the critical point [km]
				RAN Code	LMI Code	Category	Type	Chronology			
1	Mehedinti	Garla Mare Commune	Rustic Villa from Garla Mare - km 840	111792	n/a	residential villa	rustic villa	Roman era / sec. II-III	0.12	0.5	Upstream of CP Garla Mare.
2	Olt	City of Corabia	The Roman-Byzantine fortress of Sucidava from Corabia - Celei	125551	OT-I-S-A-08492	residential villa	fortress	Latène, Bronze Age, Medieval Era, Hallstatt, Roman-Byzantine Era, Roman Era / sec. IV Chr. - Chr., XIV-XVIth century, 3rd-6th centuries, sec. IV - III a. Chr., Sec. I a. Chr. - I p. Chr.	1.0	0.1	North of CP Corabia, in the south - western part of Corabia.
3	Olt	City Corabia	The Roman-Byzantine settlement of Corabia-Celei	125551	OT-I-S-A-08491	civilian residence	settlement and necropolis	Roman Era, Roman-Byzantine Era / sec. II - III	1.0	0.1	North of CP Corabia, in the central part of Corabia.
4	Olt	City Corabia	Medieval settlement from Corabia - Celeiu neighborhood	125551	OT-I-S-B-08494	civilian residence	settlement	Medieval Era / sec. XIV - XVI	1.0	0.1	North of CP Corabia, in the central part of Corabia.
5	Olt	City Corabia	The Hallstattian settlement at Corabia	125551	n/a	civilian residence	settlement	Hallstatt	1.0	0.1	North of CP Corabia, in the central part of Corabia.

No. crt.	County	TAU	Site Name	Site Description					Approx. distance toward Danube bank [km]	General protection area according Law 5/2000 [km]	Approx. location toward the critical point [km]
				RAN Code	LMI Code	Category	Type	Chronology			
6	Olt	City Corabia	Roman Road from Corabia - Libertatii Street (Sucidava)	125551	OT-I-S-A-08495	construction	road	Roman Era / sec. II - III	1.0	0.1	North of CP Corabia, in the central part of Corabia.
7	Olt	City Corabia	Vadastra Settlement from Corabia - Malul Baltii	125551	n/a	civilian residence	settlement	Neolithic	1.0	0.1	North of CP Corabia, in the central part of Corabia.
8	Olt	City Corabia	Roman fountain from Corabia	125551	n/a	construction	fountain	Roman Era / sec. II	1.0	0.1	North of CP Corabia, in the central part of Corabia

5.3 Current and planned land uses both on the site and on the adjacent areas

Hydrotechnical works proposed based on the results of morphological, hydrographic and hydrodynamic investigations and on the hydraulic modeling (type of groynes, chevron, bank protection, dredging, artificial islands etc.) will be performed in the Danube and on the bank, on land plots covered permanent or temporary by the river waters.

The uses of the land on which the works will be performed are: areas covered by waters and bank areas with small forest areas and other lands with forest vegetation, small areas of pastures located outside the buildable areas and which generally belong to the public domain of the state according with the Law no. 213/1998 on public property and its legal regime.

According to the issued Urbanism Certificates, the works will be carried out in this way:

- Urbanism Certificate no. 183 / 19.06.2017, issued by the Calarasi County Council: between km 428 - 423 and km 408 - 401, for a length of 12 km;
- Urbanism Certificate no. 280 / 02.11.2018, issued by the Town Hall of Corabia: between km 632 and km 626 of the Danube;
- Urbanism Certificate no. 489 / 26.11.2018, issued by the Mehedinti County Council: in the Danube River area and the bank areas on the administrative territory of the communes Garla Mare and Salcia;
- Urbanism Certificate no. 3 / 10.01.2019, issued by the Giurgiu County Council: on the Danube and on the bank, in the outside construction area of Gaujani locality;
- Urbanism Certificate no. 682 / 13.09.2017 issued by the Dolj County Council: in the Danube and on the bank, on a total length of about 15 km (4 km at the Bogdan - Secian critical point, 6 km at the Dobrina critical point and 5 km at the critical point Bechet);
- Urbanism Certificate no. 121 / 06.10.2017 issued by the Teleorman County Council: between km 520 and km 577, on an area of 5,700,000 sqm.

5.3.1 Zoning and land use policies

Not the case.

5.4 Location of the project towards sensitive areas

5.4.1 Localization of the project towards the protected natural areas of national interest

Along the Danube sector, between the Portile de Fier II and Silistra, 12 natural protection areas of national interest, located at varying distances from the CPs, were identified and presented in the Table 4. Out of the 12 protected natural areas of national interest, 5 are Natural Reserves, one is Natural Park and 6 Areas designated as Other Protected Natural Areas. All 12 natural protection areas of national interest in the project area overlap over Natura 2000 sites and Ramsar sites. The location of the protected areas of national interest in the project area is presented in Annex C - Drawings, Drawing no. 29 - Location of the project towards the closest natural protected areas in the area, Critical Points 01 - 06 and Drawing no. 30 - Location of the project over the closest natural protected areas in the area, Critical Points 07-12.

Table 4 List of protected areas of national interest located in the project area

No.	Code	Name	Location toward the closest CP
1	RONPA0405	Pajistea Cetate din Lunca Dunarii	Approximately 3.9 km towards CP Salcia ; about 0.1 km away from the bank; overlaps over ROSCI0299 Danarea de la Garla Mare - Maglavit.
2	RONPA0409	Ciuperceni – Desa	Approximately 6.3 km towards CP Bogdan-Secian ; about 0.2 km from the bank; overlapping ROSCI0039 Ciuperceni-Desa, ROSPA0013 Calafat-Ciuperceni-Dunare and RO2112RIS Calafat - Ciuperceni - Danube.
3	RONPA0414	Balta Neagra	Approximately 5.5 km towards CP Dobrina ; about 5.5 km from the bank; overlapping ROSCI0039 Ciuperceni-Desa, ROSPA0013 Calafat-Ciuperceni-Dunare and RO2112RIS Calafat-Ciuperceni-Dunare.
4	RONPA0415	Balta Lata	<i>Along CP Dobrina</i> ; about 0.1 km away from the bank; overlapping ROSPA0013 Calafat-Ciuperceni-Dunare, ROSCI0039 Ciuperceni-Desa and RO2112RIS Calafat-Ciuperceni-Dunare just on the bank.
5	RORN0884	Zaval	Approximately 11.0 km towards CP Bechet ; about 5.5 km from the bank; overlaps over ROSPA0023 Confluence Jiu-Danube and ROSCI0045 Coridorul Jiului and RO2115RIS Confluenta Jiu-Dunare.
6	RONPA0403	Dunele Dabuleni	Approximately 8.4 km towards CP Bechet ; at about 8.4 km from the bank.
7	RONPA0684	Casa padurii din Padurea Potelu	Approximately 9.8 km towards CP Bechet ; about 0.5 km from the bank; overlaps over ROSPA0135 Nisipurile de la Dabuleni.
8	RORN0898	Ostrovul Gasca	<i>In CP Vardim</i> ; overlaps over ROSPA0108 Vedea-Dunare and ROSCI0088 Gura Vedei-Saica-Slobozia.
9	RORN0942	Cama - Dinu - Pasarica	<i>In CP Batin</i> ; overlaps the ROSPA0108 Vedea-Dunare and ROSCI0088 Gura Vedei-Saica-Slobozia.
10	ROPA0928	Parcul Natural Comana	Approximately 21 km towards CP Kosui , about 10 km away from the bank; overlaps over ROSPA0022 Comana and ROSCI0043 Comana.
11	RORN0871	Ostrovul Haralambie	Approximately 1.0 km towards CP Popina ; overlaps over ROSCI0131 Oltenita - Mostistea - Chiciu.
12	RORN0872	Ostrovul Ciocanesti	Approximately 6.7 km towards CP Popina ; overlaps over ROSCI0131 Oltenita - Mostistea - Chiciu and ROSPA0021 Ciocanesti - Dunare.

5.4.2 Location of the project towards wetlands - Ramsar sites

Romania has adhered to the Convention on wetlands of international importance, especially as a Ramsar aquatic bird habitat, since 1991. 19 Ramsar sites have been declared throughout Romania.

In the Ramsar Convention, wetlands have been defined as stretches of ponds, marshes, natural or artificial waters, permanent or temporary, where the water is drifting or flowing, sweet or salty, including stretches of sea water whose depth at reflux does not exceed 6 meters.

By signing the Ramsar Convention, Romania has undertaken to designate the wetlands on its territory to be included in the list of wetlands of international importance.

In addition to the efforts undertaken by Romania for the protection of wetlands, in 2000, at the initiative of Romania was signed the Declaration of cooperation between the Ministry of Environment and Water Resources of the Republic of Bulgaria, Ministry of Environment and Territorial Arrangement of the Republic of Moldova, Ministry of Waters and Environmental Protection in Romania and the Minister of Environment and Natural Resources of Ukraine on the creation of the Lower Danube Green Corridor. This Statement enrolled in the requirements of the Pan-European Strategy for the Conservation of Biological and Landscape Diversity, of that period (Address 22971 / LAV / 31.10.2007, issued by the Minister of Environment and Sustainable Development).

The principles of the Cooperation Declaration on the creation Green Corridor of the Lower Danube were:

- restoring the natural environment of the river and its tributaries;
- conservation of biological diversity, ecological restoration and protection of forests in the meadow,
- developing sustainable farming systems.

These principles are among the top three priority objectives of the Biodiversity Strategy for 2020, namely:

- Objective 1: Conservation and restoration of nature;
- Objective 2: Maintaining and improving ecosystems and related services;
- Objective 3: Ensure the sustainability of agriculture and forestry.

According to Address no. 22971 / LAV / 31.10.2007, issued by the Minister of Environment and Sustainable Development, Green Corridor the Lower Danube includes existing protected areas and protected areas proposed to be ecologically recovered from natural flood plains. These areas are divided in turn into:

- areas with full protection;
- buffer zones with differential protection regime, where human activities can be carried out as well as ecological reconstruction areas;
- areas where sustainable economic activities can take place.

Two of the most representative projects in the project area, included in the Green Corridor of the Lower Danube, were:

- "Danube wetland protection - pilot project in the Cama-Dinu islands area", proposed by Giurgiu Environmental Protection Agency, performed through PHARE 2001 Transboundary Cooperation Program;
- "Protecting and conserving biodiversity in the area of Iezer Calarasi", proposed by the Environmental Protection Agency Calarasi.

These projects were the first attempt to protect wetlands in the Danube meadow. At present, these wetlands are included in the Natura 2000 network of sites (ROSCI0088 Gura Vedei - Saica - Slobozia, ROSPA0108 Vedei - Dunare and ROSPA0051 Iezer Calarasi).

ROSPA0051 Iezer Calarasi was declared in 2013 as RAMSAR area.

Along the common Danube sector, there are 5 Ramsar sites. Their location towards the CPs is presented in Table 5, below and in Annex C - Drawings, Drawing no. 29 - Location of the project towards the closest natural protected areas in the area, Critical Points 01 - 06 and Drawing no. 30 - Location of the project over the closest natural protected areas in the area, Critical Points 07-12.

Table 5 The list of RAMSAR sites located in the project area

Nr.	Code	Name	Location towards the closest CP
1	RO2112RIS	Calafat - Ciuperceni - Dunare	In CP Bogdan-Secian; overlaps on ROSPA0013 Calafat-Ciuperceni-Dunare and ROSCI0039 Ciuperceni-Desa sites both on the bank and on one portion of the riverbed. In the CP right Dobrina; overlaps on ROSPA0013 Calafat-Ciuperceni-Danube and ROSCI0039 Ciuperceni-Desa just on the bank.
2	RO2063RIS	Bistret	Downstream of CP Dobrina, at about 14 km distance from the CP limit; ROSCI0039 Ciuperceni-Desa, ROSCI0045 Coridorul Jiului and ROSPA0010 Bistret.
3	RO2115RIS	Confluenta Jiu - Dunare	In CP Bechet; overlaps on ROSPA0023 Confluenta Jiu-Dunare, ROSPA0135 Nisipurile de la Dabuleni and ROSCI0045 Nisipurile de la Dabuleni both on bank and on a portion of the riverbed.
4	RO2065RIS	Confluenta Olt – Dunare	In CP Corabia; overlaps ROSPA0024 Confluenta Olt-Dunare and ROSCI0044 Corabia-Turnu Magurele both on the bank and on a portion of the riverbed; in the riverbed overlaps on the islands RO052, RO051 and RO121.
5	RO2066RIS	Suhaia	In CP Belene; overlaps ROSPA0102 Suhaia site both on the bank and on a portion of the riverbed; in the riverbed overlaps on the islands RO106, RO024 and RO126.

RO2112RIS Calafat - Ciuperceni - Dunare

The Site RO2112RIS Calafat - Ciuperceni - Danube is located in Dolj county and occupies a total area of 29,206 ha, of which an area of 7,084 ha is occupied by the wetland. RO2112RIS Calafat - Ciuperceni - Danube Site overlaps ROSPA0013 Calafat - Ciuperceni - Danube Site.

The Site RO2112RIS Calafat - Ciuperceni - Danube is located in the southwestern part of the Oltenia Plain, very close to the Danube River, comprises three Nature Reserves for the protection of migratory and water birds. Some of these species find ideal conditions for nesting, such as the White-tailed eagle (*Haliaeetus albicilla*), White Stork (*Ciconia ciconia*) and Eurasian Thick-knee/Stone Curlew (*Burhinus oedicnemus*). During the migration seasons, the site is also important for the Wood Sandpiper (*Tringa glareola*), the Dalmatian Pelican (*Pelecanus crispus*), the Eurasian spoonbill/Common spoonbill (*Platalea leucorodia*) and the Glossy Ibis (*Plegadis falcinellus*). Furthermore, the site represents habitats of community importance as natural eutrophic lakes with Magnopotamion, rivers with muddy banks and Chenopodion rubri and Bidention vegetation, dunes with Hippophaë rhamnoides and humid dune slacks. The site plays a very important role in mitigating Danube flood damages. The area was very wild in the past; after years of draining, however, and the construction of dykes and channels, the biodiversity has been reduced. The forests have been cut and many of the lakes have been dried and transformed into arable land. A management plan has been developed but not yet implemented (<https://rsis Ramsar.org/ris/2112>).

RO2063RIS Bistret

The Site RO2063RIS Bistret is located in Dolj county and occupies a total area of 27,482 ha, of which an area of 12,653 ha is occupied by the wetland. Within the Site RO2063RIS Bistret an area of 1.916 ha overlap the Site ROSPA0010 Bistret.

The Site RO2063RIS Bistret includes a mosaic of different habitats, including Bistret Lake, the Danube river, fishery and lagoon complexes, islands, meadows, agricultural land and forests that harbours a diversity of species of flora and fauna, especially birds. Being located along a major migratory route, the site is a nesting, resting and feeding site for many regionally and globally threatened bird species such as the endangered Red-breasted Goose (*Branta ruficollis*) and the Dalmatian Pelican (*Pelecanus crispus*). The site is used for agriculture; fishing and recreational activities. Bistret Lake acts as a water reservoir and influences the groundwater level. The area surrounding the Lake is of archaeological importance, with one of the most

important Bronze Age complexes on the Lower Danube. Potential threats are: operation of the fish farms, poaching and uncontrolled disposal of solid waste (<https://rsis Ramsar.org/ris/2063>).

Transboundary designation

The Site RO2063RIS Bistret is part of the "Bistret - Ibisha Island" Transboundary Ramsar Site together with the Site BG1227RIS Ibisha Island. The Transboundary Ramsar Site was established in April 2013 (<https://rsis Ramsar.org/ris/2063>).

RO2115RIS Confluenta Jiu - Dunare

RO2115RIS Site Jiu-Danube confluence is located in Dolj County and occupies a total area of 19,800 ha, of which the wet area occupies an area of 3,278 ha. RO2115RIS Site Jiu - Danube confluence overlaps the ROSPA0023 confluence Jiu - Danube. The site also includes a small part of the site ROSPA0135 Sands from Dabuleni and the ROSCI0045 Ji J Corridor (<https://rsis Ramsar.org/ris/2115>).

RO2115RIS Site Jiu-Danube confluence covers an important part of the Jiu River and a small part of the Danube's meadow. The site includes a wide variety of ecosystems: oak forests, poplar forests, small lakes, ancient river beaches, sand islands, dunes, marshes, canals, arable land, etc. The complexity of these ecosystems provides favorable conditions for the presence of a rich biodiversity. The site is also an important area for birds; some species find here ideal conditions for curb, such as *Crex crex*, White-tailed Sea-eagle (*Haliaeetus albicilla*), Stork (*Ciconia Ciconia*) and Eurasian Thick-knee (*Burhinus oedicephalus*). During the migration period, the site is important for Wood Sandpiper (*Tringa glareola*), the Dalmatian Pelican (*Pelecanus crispus*), the Eurasian Spoonbill (*Platalea leucorodia*) and the Glossy ibis (*Falcadellus falcinellus*). The site plays a very important role in the groundwater level. Fishing is a traditional activity within this site and offers recreational and tourist opportunities along several archaeological sites. The management plan is underway (<https://rsis Ramsar.org/ris/2115>).

RO2065RIS Confluenta Olt - Dunare

The Site RO2065RIS Confluenta Olt - Dunare is located in the Olt and Teleorman counties and occupy a total area of 46,623 hectares, of which an area of 7,302 ha is occupied by the wetland. Within the Site RO2065RIS Confluenta Olt - Dunare, on a surface of 20,960 ha overlap the Site ROSPA0024 Confluenta Olt - Dunare, and on the area of 9,256 ha overlap the Site ROSCI0044 Corabia - Turnu Magurele (<https://rsis Ramsar.org/ris/2065>).

The Site RO2065RIS Confluenta Olt - Dunare contain natural stretches of rivers Olt and Danube, alluvial meadows and forests, riparian mixed forests, sand islands, oxbow and temporary lakes, the site offers an ideal habitat for many species of waterbirds. Vulnerable Dalmatian Pelican (*Pelecanus crispus*) can be found as well as 33 bird species of European importance which rest, feed and breed in the site, such as Pygmy Cormorant (*Phalacrocorax pygmeus*). It is also important for different species of fish, amphibians and mammals. The site is used for agriculture, forestry, fishing, and recreational activities as well as hydropower production. Not having been much transformed by human use, many of the site's ecological functions are still intact and play an important role in flood protection and sediment trapping. The construction of hydropower plants, solid waste disposal, and poaching are some of the factors threatening the site. A transboundary Ramsar Site designation with Bulgaria is planned (<https://rsis Ramsar.org/ris/2065>).

RO2066RIS Suhaia

The site RO2066RIS Suhaia is located in the Teleorman county and occupy a total area of 19,594 ha, of which an area of 4,781 ha is occupied by the wetland. Within the Site RO2066RIS Suhaia on a area of 4,473 ha overlap on the Site ROSPA0102 Suhaia.

Located along a major migratory route and comprising Suhaia Lake, the Danube river, connecting channels, fishing ponds, reed beds, swamps and rice fields. The site offers habitat to numerous threatened species of birds which feed, rest and breed here, including 21 bird species of European importance as well as the globally vulnerable Dalmatian Pelican (*Pelecanus crispus*). Moreover, several threatened species of invertebrates, fish, amphibians, reptiles and mammals can be found, including the globally vulnerable European Mudminnow (*Umbra krameri*). Suhaia Lake plays a significant role in groundwater replenishment and for flood protection. Anthropogenic activities, which is done in the area of the site are: aquaculture, agriculture, forestry and

recreational activities. Illegal burning of vegetation, poaching and the overuse of fertilizers threaten the ecological character of the site (<https://rsis Ramsar.org/ris/2066>).

Transboundary designation

The site RO2066RIS Suhaia is part of the Transboundary Ramsar Site „Suhaia – Complexul insulelor Belene”, from which is part also the Site BG1226RIS Complexul insulelor Belene. The Transboundary Ramsar Site „Suhaia - Complexul insulelor Belene”, was established in April 2013 (<https://rsis Ramsar.org/ris/2066>).

5.4.3 Location of the project towards the existing islands on the Danube

Location of the project toward the wild islands on the Danube was done based on the information posted on the website of the project DANUBE parks CONNECTED – component of the Danube WILD island CORRIDOR, a co-financed project by the European Union through the Danube Transnational Program.

From the *character* point of view, the islands, through the project, the existing islands on the Danube were inventoried and classified into three categories, namely:

- Category A - natural islands (true wild areas of the river);
- Category B - islands with a high ecological value and small anthropic changes (forestry, planting, land use for various uses);
- Category C - all other islands that are subject to major anthropogenic uses but still have ecological value and functions in the Danube Habitats Corridor.

To preserve the wildlife character of the most natural islands (category A), the initiative of the DANUBE parks CONNECTED project is to designate them as "**wild islands**".

From the *origin* point of view, the islands were classified as such:

- Category A - Formed as a result of natural processes occurring in an active fairway of a river;
- Category B - Formed as a result of regularization activities, or strongly influenced by hydrological changes.
- Category C - islands formed on chevrons, routing dams, or other artificial structures.

From the point of view of *hydro-morphological changes*, the islands have been classified as such:

- Category 1 - almost natural;
- Category 2 - slightly modified;
- Category 3 - moderately modified;
- Category 4 - strongly modified;
- Category 5 - totally modified.

In the project area, a number of 39 natural islands, also called "wild islands" have been identified, 8 islands with a high ecological value and with small anthropic modifications and 13 islands with major anthropogenic modifications.

The list of the islands identified in the area of the critical points and in the neighboring areas (downstream and upstream of the critical points) is presented in Table 6. Also, in Table 6 are presented the characteristics of the islands: character, origin, location along the Danube, habitat features, occupied surface, hydro morphological characteristics and location to the nearest CP.

The location of the existing islands in the Danube riverbed in the vicinity of the CP, belonging to both the Romanian and Bulgarian territory are presented in Annex C - Drawings, Drawing no. 29 - Location of the project towards the closest natural protected areas in the area, Critical Points 01 - 06 and Drawing no. 30 - Location of the project over the closest natural protected areas in the area, Critical Points 07-12.

Table 6 List of the existing islands in the Project area (both islands belonging to the Romanian territory and islands belonging to the Bulgarian territory)

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
1	RO008	Os. Garla Mare	B	A	Hardwood and softwood	65.3	3	In CP Garla Mare; overlaps the site ROSCI0299 Dunarea la Garla Mare - Maglavit, ROSPA0046 Gruia - Garla Mare.
2	RO009	Os. Chichinete	A	A	Galleries of softwood, pastures and sand bars	22.0	3	Upstream CP Salcia; at about 2.3 km from the Critical Point Limit; overlaps the ROSCI0299 Dunarea la Garla Mare – Maglavit.
3	BG032NN	-	A	A	Sand bars and early vegetation	2.1	3	Upstream CP Salcia; at about 3.3 km from the Critical Point Limit; overlaps the BG0000631 Novo selo site.
4	BG033NN	-	A	A	Sandy banks, early vegetation and softwood galleries	4.1	3	In CP Salcia; does not overlap any protected area.
5	BG045	Bogdan Sechan	C	A	Poplar plantations and galleries of softwood	96.9	3	In CP Bogdan - Secian; does not overlap any protected area.
6	BG012G	Bliznak	C	B	Poplar plantations and galleries of softwood	39.7	2	CP Downstream Bogdan - Secian; at about 3.1 km from the Critical Point Limit; overlaps over BG0000532 Island Bliznatsi.
7	BG014	M_Bliznak	A	A	Hardwood, softwood and sand bars	17.0	2	CP Downstream Bogdan - Secian; at about 4.4 km from the Critical Point Limit; overlaps over BG0000532 Island Bliznatsi.
8	RO044	Os. Acalia	A	A	Hardwood, softwood and sand bars	54.7	2	Upstream of CP Dobrina; at about 2.6 km from the Critical Point Limit; overlaps the ROSPA0013 Calafat-Ciuperceni-Dunare sites, ROSCI0039 Ciuperceni-Desa RO2112RIS Calafat - Ciuperceni - Dunare.

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
9	BG031	Dovlek	A	A	Hardwood, softwood and sand barss	35.0	2	Upstream of CP Dobrina; at about 2.3 km from the Critical Point Limit; overlaps over the BG0000497 Archar site.
10	BG046	Dobrina	C	A	Poplar plantations, softwood galleries and sand barss	99.7	2	In CP Dobrina; does not overlap any protected area.
11	BG047	Skomen	C	B	Poplar plantations and galleries of softwood	124.4	2	In CP Dobrina; overlapping site BG0000182 – Orsolya.
12	RO040	Os. Pietris	A	A	Hardwood, softwood and sand bars	63.1	2	In CP Dobrina; overlaps the ROSPA0013 Calafat-Ciuperceni-Dunare and ROSCI0039 Ciuperceni-Desa, RO2112RIS Calafat - Ciuperceni - Dunare sites.
13	RO039	Os. Nebuna	A	A	Hardwood, softwood and sand bars	12.69	2	Downstream of CP Dobrina, approximately 4.8 km from the Critical Point Limit; overlaps the ROSPA0013 Calafat-Ciuperceni-Dunare sites, ROSCI0039 Ciuperceni-Desa and RO2112RIS Calafat - Ciuperceni – Dunare.
14	RO053	-	A	A	Galleries of softwood and sand bars	15.1	3	Upstream Bechet CP, about 3.3 km from the Critical Point Limit; overlaps the ROSPA0023 Confluienta Jiu-Dunare, ROSCI0045 Coridorul Jiului, RO2115RIS Confluienta Jiu-Dunare.
15	RO054	-	A	A	Galleries of softwood and sand bars	17.34	3	Upstream Bechet CP, about 4.3 km from the Critical Point Limit; overlaps the ROSPA0023 Confluienta Jiu-Dunare, ROSCI0045 Coridorul Jiului, RO2115RIS Confluienta Jiu-Dunare.

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
16	RO119	-	A	A	Galleries of softwood, sand bars and early vegetation	15.28	2	Downstream of CP Bechet , about 4.9 km from the Critical Point Limit; overlaps the ROSPA0135 Nisipurile de la Dabuleni, ROSCI0045 Coridorul Jiului and RO2115RIS Confluienta Jiu-Dunare.
17	RO120	-	C	A	Plants of poplar and softwood galleries	377.20	2	Downstream of CP Bechet , about 5.5 km from the Critical Point Limit; overlaps the ROSPA0135 Nisipurile de la Dabuleni, ROSCI0045 Coridorul Jiului and RO2115RIS Confluienta Jiu-Dunare.
18	BG049	Leskovets	C	A	Plants of poplar, softwood galleries	148.58	3	Downstream of CP Bechet , about 0.4 km from the Critical Point Limit; overlaps over the BG000334 Ostrov site.
19	BG059	-	C	A	Plants of poplar, softwood galleries	231.29	2	Downstream of CP Bechet , approximately 1.0 km from the Critical Point Limit; overlaps over the BG000334 Ostrov site.
20	RO052	-	B	A	Galleries of softwood and sand bars	37.2	2	In CP Corabia ; overlaps the ROSPA0024 Confluienta Olt-Dunare, ROSCI0044 Corabia-Turnu Magurele and RO2065RIS Confluienta Olt-Dunare.
21	RO051	-	A	A	Galleries of softwood and sand bars	6.1	2	In CP Corabia ; overlaps the ROSPA0024 Confluienta Olt-Dunare, ROSCI0044 Corabia-Turnu Magurele and RO2065RIS Confluienta Olt-Dunare.
22	RO121	Baloiu	C	A	Poplar plantations and galleries of softwood	124.1	2	CP Corabia ; overlaps the sites ROSPA0024 Confluienta Olt-Dunare, ROSCI0044 Corabia-Turnu Magurele and RO2065RIS Confluienta Olt-Dunare.

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
23	BG003	Magaretsa	B	A	Hardwood and softwood, human settlements	48.5	2	In CP Belene; overlapping sites BG0002017 Kompleks Belenski ostrovi; BG0000396 Persina and BGNPA0009 Persina Natural Park.
24	RO106	-	A	A	Galleries of softwood, sand bars and early vegetation	67.8	2	In CP Belene; overlaps over ROSPA 0102 Suhaia and RO2066RIS Suhaia.
25	BG052	Golyama Barzyn	B	A	Poplar plantations and galleries of softwood	402.0	2	In CP Belene; overlaps the sites BG0002017 Kompleks Belenski ostrovi, BG0000396 Persina and BGNPA0009 Persina Natural Park.
26	BG002	Milka	A	A	Galleries of softwood and sand barss	39.2	2	In CP Belene; overlaps over ROSPA0102 Suhaia, BG0002017 Kompleks Belenski ostrovi; BG0000396 Persina and BGNPA0009 Persina Natural Park.
27	BG055	Belene	C	A	Agricultural land, wetlands and galleries of softwood	4,457.4	2	In CP Belene; overlapping sites BG0002017 Kompleks Belenski ostrovi, BG0000396 Persina, BGNPA0009 Persina Natural Park, BGNPA0316 Persin-Iztok, BGNPA0034 Pepcihchi Blata and BGNPA0537 Persin.
28	BG053	Stureca	C	A	Poplar plantations and galleries of softwood	167.1	2	In CP Belene; overlaps the sites BG0002017 Kompleks Belenski ostrovi, BG0000396 Persina and BGNPA0009 Persina Natural Park.
29	BG034NN	-	B	A	Galleries of softwood and sand bars	1.6	2	In CP Belene; overlaps the sites BG0002017 Kompleks Belenski ostrovi, BG0000396 Persina and BGNPA0009 Persina Natural Park.

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
30	BG035NN	-	B	A	Sandy jugs, early vegetation and softwood galleries	5.5	2	In CP Belene; overlaps the sites BG0002017 Kompleks Belenski ostrovi, BG0000396 Persina and BGNPA0009 Persina Natural Park.
31	BG054	Predela	C	A	Agricultural land, poplar plantations and galleries of softwood	60.50	2	In CP Belene; overlaps the sites BG0002017 Kompleks Belenski ostrovi, BG0000396 Persina and BGNPA0009 Persina Natural Park.
32	RO024	-	A	A	Galleries of softwood and sand bars	38.4	2	In CP Belene; overlaps the ROSPA0102 Suhaia and RO2066RIS Suhaia sites.
33	RO126	-	C	A	Poplar plantations and galleries of softwood	266.8	2	In CP Belene, it overlaps the ROSPA0102 Suhaia and RO2066RIS Suhaia sites.
34	BG056	Vardim	C	A	Poplar plantations, galleries of hardwood and softwood	591.3	3	Upstream CP Vardim; at the critical point limit; overlaps BG0002018 Ostrov Vardim and BGNPA0076 Stariat Dab.
35	BG028	Malak Vardim	B	A	Poplar plantations and galleries of softwood	381.1	3	In CP Vardim; overlaps over the BG0002018 Ostrov Vardim site.
36	RO025	Ost. Gasca	B	A	Poplar plantations, galleries of hardwood and softwood	49.7	3	In CP Vardim; overlaps ROSPA0108 Vedeia-Dunare, ROSCI0088 Gura Vedeia-Saica-Slobozia and RONPA0898 Insula Gasca.
37	RO171	-	A	A	Sand bars and early vegetation	12.5	2	In the immediate vicinity of the Batin Critical Point limit; overlaps the ROSPA0108 Vedeia-Dunare and ROSCI0088 Gura Vedeia-Saica-Slobozia sites.

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
38	BG004NN	Doichov	A	A	Galleries of softwood and sand bars	12.3	2	In CP Batin; overlaps BG0002024 Ribarnitsi Mechka sites, BG0000232 Batin and BGNPA0514 Doichov island.
39	BG057	Batin	C	A	Poplar plantations and galleries of softwood	576.1	2	In CP Batin; overlaps BG0002024 Ribarnitsi Mechka and BG0000232 Batin sites.
40	RO030	-	A	A	Galleries of softwood and sand barss	81.6	2	Downstream of Batin CP, at about 1.0 km from the critical point limit; overlaps the ROSPA0108 Vedeia - Dunare and ROSCI0088 Gura Vedei - Saica - Slobozia and RONPA0942 Cama - Dinu-Pasarica sites.
41	BG023	Kosuy	C	A	Poplar plantations and galleries of softwood	306.2	3	In CP Kosui; overlaps BG0000237 Ostrov Pozharevo and BG0000530 Pozharevo-Garvan.
42	RO012	-	A	A	Hardwood and softwood	87.2	3	In CP Kosui; overlaps the sites ROSPA0136 Oltenita-Ulmeni, ROSCI0131 Oltenita-Mostistea-Chiciu and BGNPA0122 Pozharevo Island.
43	BG036NN	-	A	A	Galleries of softwood	4.8	3	In CP Kosui; overlaps BG0000237 Ostrov Pozharevo and BG0000530 Pozharevo-Garvan.
44	RO133	-	C	A	Poplar plantations and galleries of softwood	51.8	2	Upstream of CP Popina; about 1.2 km from the Critical Point limit; overlaps the sites ROSCI0131 Oltenita - Mostistea - Chiciu and ROSPA0136 Oltenita - Ulmeni.
45	BG001	Garvan	C	A	Poplar plantations and galleries of softwood	130.5	2	In CP Popina; overlapping site BG0000530 Pozharevo Garvan.

Nr.	Code	Name	Category	Origin	Habitat features	Surface [ha]	Hydro morphological modifications	Location towards the closest CP
46	RO014	Haralambie	A	A	Soft and hardwood	38.2	2	Downstream CP Popina ; at about 1.0 km from the Critical Point Limit; overlaps the sites ROSCI0131 Oltenita - Mostistea - Chiciu and RONPA0871 Ostrovul Haralambie.
47	RO015	—	A	A	Softwood and hard wood	208.85	2	Downstream CP Popina ; at about 6.7 km from the Critical Point Limit; overlaps the ROSCI0131 Oltenita - Mostistea - Chiciu sites, RONPA0872 Ostrovul Ciocanesti and ROSPA0021 Ciocanesti – Dunare.
48	BG009	Devnya	B	A	Poplar plantations and galleries of softwood	18.62	2	Downstream CP Popina ; at about 7.2 km from the Critical Point Limit; overlaps the BG0000241 Srebarna and BG64RIS Srebama sites.

5.5 Geographic coordinates of the project site

Geographic coordinates of the engineering works (groynes, chevron, bank protection) and morphological (storage areas of the dredged material, islands, dredging) proposed by project in each CP, in the national projection system Stereo 70, as a vector format (digital format) are attached to the electronic documentation in Annex D - Geographic coordinates of hydrotechnical works in the national projection system Stereo 70.

Considering the fact that, the Danube riverbed is subject to a complex and continuous hydro morphological process (with impact on bathymetry of the riverbed and bank position), it is possible that until the construction phase there is a need to reposition the works proposed by this project within the limits of the areas presented in the Annex C - Drawings, Drawings 2 - 25 and attached to the electronic documentation in Annex D - Geographic coordinates of hydrotechnical works in the national projection system Stereo 70.

5.6 Details of any considered alternative for site location

The location of the hydrotechnical works proposed by the project in each CPs was performed based on the results of the mathematical modeling according to the local hydro-morphological conditions. Subsequently, depending on the existence / absence of environmentally sensitive areas, the best options for the location of the structures were selected.

In the stage of selecting the preferred scenarios, for some analyzed scenarios, certain hydrotechnical structures were eliminated from the area initially proposed for their location, as the structures overlapped on:

- potential feeding habitats of the sturgeons (for example: In CP Bechet, at Scenario 1, the location of the groynes on the Bulgarian bank approximately between km 674,6 and km 674,2 was replaced with an island because the initially proposed groynes overlapped a potential feeding habitat of sturgeons). On this basis, the option was reconsidered and adapted to the field conditions;
- strictly natural reserves (eg: In CP Belene, one of the analyzed options before the Multicriteria Analysis, the location of the proposed groynes to be performed on the banks of Belene island approximately between 567.5 km and 566.0 km overlapped on a strictly protected areas that has led to the removal of this option);
- natural islands (true wild areas of the river) of Category A, according with the inventory and classification performed within the DANUBE parks CONNECTED Project - the Danube WILD island CORRIDOR (for example: in CP Corabia, the form and extension of the storage area for dredged material between the two islands RO052 - Category B islands (islands of high ecological value and small anthropogenic alterations) and RO121 island (Baloiu) - Class C Island (islands subject to major anthropogenic uses), originally proposed was modified so as not to overlap over the island RO051 - the island covered by Category A (the natural island).

Regarding the location of dredged material storage areas, the proposal to place them in the Danube riverbed resulted from the intention to implement the concept used in Europe and the world - "intelligent disposal", which means maintaining the dredged material in the riverbed and use it to improve the flow. Also, in this case, the choice of disposal location was made based on mathematical modeling results, including riverbed bathymetry, in shallow water areas with a high sedimentation potential inside CP boundaries. The storage of dredged material in these areas will contribute to encouraging the naturally process of sedimentation.

Ever since the initial design phase of the works, it has been studied the possibility of placing dredging material areas outside the boundaries of the protected natural areas within the project area, but after a detailed analysis, resulted that this approach would not be economically feasible. Taking into consideration the entire Danube-Romanian common sector, there are a multitude of protected natural areas, both on the Romanian and Bulgarian banks, forming a "continuous corridor of protected natural areas", the distance to the areas outside of the natural protected areas would have been very large and thus the option proved to be unfeasible.

6. Description of the significant possible effects of the project on the environmental

6.1 Sources of pollutants and installations for the retainment, evacuation and dispersion of pollutants in the environment

6.1.1 Water quality protection

6.1.1.1 Existing situation

Aspects regarding the characterization of surface water bodies

According with „The Danube River Basin District Management Plan – Update 2015, International Commission for the Protection of the Danube River, 2015, Map 19”, on the Danube sector where the project takes place there are 31 monitoring stations, from which 7 Operational Monitoring Stations and 24 Surveillance Monitoring Stations.

In 2015, in Danube sector where the project will take place was classified as being heavily modified („The Danube River Basin District Management Plan – Update 2015, International Commission for the Protection of the Danube River, 2015, Map 20”). A heavily modified water body is a water body, which as a result of the physical changes caused by anthropogenic activities, the character is substantially changed. No artificial water body has been designated on the Danube.

As far as the ecological potential of surface water bodies in the same year in the sector where the project is concerned has been assessed as moderate to poor. The chemical status of surface water bodies in the project area, in relation to priority substances, was estimated to be good, with a medium level of confidence („The Danube River basin District Management Plan - Update 2015", International Commission for the Protection of the Danube River, 2015, Map 20 ").

Aspects regarding the characterization of the state of groundwater bodies

The transnational groundwater management activities were initiated in 2002 and were triggered by the implementation of the WFD.

The Transnational Monitoring Network for groundwater include qualitative and quantitative monitoring.

In Danube sector where the project will take place it is monitored a single transnational groundwater body (GWB - 2), which extends both on the Romania territory (RO - 2) and on the Bulgaria territory (BG - 2). According with „The Danube River Basin District Management Plan – Update 2015, International Commission for the Protection of the Danube River, 2015, Map 4, Table 17”, groundwater body status of GWB – 2, for the period 2009 – 2021, was assessed to be good both from the point of view of quality and quantity.

Groundwater level in geotechnical drilling

A component of the Geotechnical Study conducted by GEOSOND for the project in July 2017 was the measurement of the groundwater level in the 30 geotechnical drilling on the Romanian bank.

Considering the geotechnical drillings were performed on the Danube bank at small distances from the river bed, the level of the underground water was closely related to the level of the Danube water.

According to the Geotechnical Survey, the level of groundwater measured in the geotechnical drilling carried out between 10.04.2017 - 26.05.2017 is presented in the Table 7.

Table 7 Groundwater level measured in geotechnical boreholes, 2017

Geotechnical boreholes	Location	Hydrostatic level(m)	Geotechnical boreholes	Location	Hydrostatic level (m)
F1	the Romanian bank	4.0	F32	the Romanian bank	4.3
F3	the Romanian bank	3.5	F34	the Romanian bank	2.4
F4	the Romanian bank	1.3	F36	the Romanian bank	3.5
F6	the Romanian bank	5.5	F38	the Romanian bank	6.0
F7	the Romanian bank	5.3	F40	the Romanian bank	0.6
F8	the Romanian bank	3.3	F41	the Romanian bank	5.0
F12	the Romanian bank	3.5	F42	the Romanian bank	4.0
F15	the Romanian bank	2.8	F44	the Romanian bank	3.5
F16	the Romanian bank	3.4	F45	the Romanian bank	4.1
F20	the Romanian bank	3.0	F46	the Romanian bank	4.0
F22	the Romanian bank	3.2	F48	the Romanian bank	3.0
F25	the Romanian bank	2.5	F49	the Romanian bank	4.1
F26	the Romanian bank	2.8	F55	the Romanian bank	3.6
F27	the Romanian bank	0.8	F57	the Romanian bank	3.0
F30	the Romanian bank	4.7	F59	the Romanian bank	2.5

Investigations and results on water quality

Results of the Joint Danube Survey 3, 2013

JDS3 was the world's biggest river research expedition in 2013.

The JDS is carried out every six years, by ICPDR. Previous campaigns were taken in 2001 (JDS1) and in 2007 (JDS2). During JDS3 (August – September 2013), the JDS3 ships travelled 2,375 km downstream the Danube River to the Danube Delta, assessing the Danube and many of its tributaries.

The JDS1 and JDS2 expeditions provided essential scientific information to help to identify the main issues in the region and their causes.

The scope of the JDS3 campaign was that to analyses if the "status" of waters had improved or deteriorated, as some key measures had already been put in place by ICPDR Member Countries.

During JDS3 campaign 68 samples were sampled along the Danube from spring to the Danube Delta. In the project area, samples were taken from 16 points, shown in the following figure.



The results of the 2013 research campaign are briefly outlined below:

1. General physico-chemical parameters and nutrients:
 - *Water temperature* in the samples varied between 17,8 °C at km 132 (Reni) and 23,3 °C at km 1586 (Rackeve-Soroksar Danube Arm).
 - *Measured conductivity* in Danube Lower sector was relatively constant, being around 400 μScm^{-1} .
 - *pH* in Danube sector where the project will take place ranged between 8.0 and 8.5 pH units.
 - *Dissolved oxygen* in the project area ranged between 6,5 and 9,0 $\text{mgL}^{-1}\text{O}_2$ and oxygen saturation between 80% and 100%; in particular, in Portile de Fier area, saturation of dissolved oxygen fell below 80%, reaching 67,6% downstream the dam.
 - *Total Nitrogen* in the project area varied around 1,50 mgL^{-1} N value.
 - *Total Phosphorous* varied between 0,05 si 0,08 mgL^{-1}P ; at the 847 km (upstream Timok) was measured the minimum concentration of 0,03 mgL^{-1}P .
 - *Ammonium* on the entire Danube was below the quantification limit of 0,04 mgL^{-1} N- NH_4 in most analyzed samples.
 - *Nitrogen* on the entire Danube was below the quantification limit of 0,006 mgL^{-1} N- NO_2 , with exception of two measured values downstream Portile de Fier and at the 837 km (Pristol/Novo Selo Harbour);
 - On the Lower Danube sector for *nitrogen* was recorded a minimum value of 0,90 mgL^{-1} N- NO_3 .
2. *Dissolved organic matter* in Danube sector where the project will take place varies between 2,00 and 3,00 mg/L.
3. Petroleum hydrocarbons concentration in suspended particulate matter, in project area varies around the values of 50 mg/kg, and the petroleum hydrocarbons concentration in sediments varies between 20 and 80 mg/kg. In JDS3 campaign the concentration of petroleum hydrocarbons in water samples was not determined, being determined only in the JDS1 and JDS2 campaigns.
4. *Priority and other organic substances*:
 - In JDS3 campaign *di(2-ethylhexyl)ftalat* (DEHP) concentrations were significantly lower compared to the results obtained in the JD2 campaign. In the project area, in most water samples collected no concentrations of DEHP were recorded, except for some samples in which, concentrations varied around the values of 0,2 – 0,4 $\mu\text{g/l}$. In suspended particulate matter samples DEHP concentrations varied between 1 and 3 mg/kg, and in sediment samples DEHP concentrations varied between 0 and 3,9 mg/kg.
 - *Polycyclic aromatic hydrocarbons* (PAH) concentrations from the collected samples (water, suspended particulate matter and sediments samples) from the project area have been in normal values.
 - *Pesticides* concentrations from the collected water samples from the project area varied between 0,037 and 0,09 $\mu\text{g/l}$, values well below the environmental quality standards provided in Directive 2008/105/EC on environmental quality standards in the field of water. Pesticides concentration from the collected suspended particulate matter and sediments samples, were below the limit of quantification in most of the analyzed samples.

In general, heavy metals and arsenic concentrations from water samples collected from the project area during JDS3 were like those in the campaigns JDS2 and JDS1. The results of the 3 campaigns regarding the heavy metals, metalloids and arsenic content in suspended particulate matter, have shown a very homogeneous and stable situation. Comparing the heavy metal and arsenic concentrations from sediments, during the 3 campaigns, it has been observed that most of them are smaller, some of them significantly smaller.

As regard groundwater investigations, during JDS3, were collected water samples from the existing abstraction wells along Danube and analyzed *the emerging substances*.

Emerging substances comprise potentially hazardous contaminants for which information on possible toxic effects for aquatic organisms and humans is often not available.

A number of emerging substances was detected in abstraction wells in the areas where the banks are acting as natural filter. The substances like amidotrizoic acid, iopamidol, acesulfame, benzotriazole or carbamazepine are known to be quite persistent in the aquatic environment and are mostly not completely retained by bank filtration. Due to the comparatively low concentration levels in the Danube, concentrations in

the abstraction wells were mostly below 0.1 µg/l for most substances. An exception was the artificial sweetener acesulfame which occurred in concentrations up to 1.1 µg/l in the Danube and was detected in most abstraction wells with a maximum concentration of 0.45 µg/l.

Also, was detected the presence of cyclamate in the abstraction wells. Traces of carbamazepine up to 23 ng/l were found in wells at three bank filtration sites. The 4-acetylaminoantipyrine was not detected in groundwater, while 4-formylaminoantipyrine occurred in two wells in concentrations up to 27 ng/l.

6.1.1.2 Sources of pollutants for water, discharge point or emissary

The main sources of water pollution during **the execution of the works** may be the following:

- construction works: land preparation work, sloping, etc., cause the entrainment of fine sediment particles; handling and putting into operation of building materials (aggregates, concrete, etc.) will cause emissions specific to each type of material;
- dredging works: will result in suspended matter, which will be trained downstream by the water flow; suspended materials will be produced as a result of the handling of the dredged material and the dragging of material of the riverbed; during the execution of the works, the amount of suspended matter will increase. Also, dredging may be done in possibly polluted sediments, but according to the Joint Danube Surveys (ICPDR) in 2013, there is no risk of ecotoxicological pollution of the water column.
- accidental loss of materials, fuels, waste oils, bilge water from barges, dredges, floating equipment, vehicles and machinery used;
- site organization locations by: household waste water, meteoric waters that wash the site platform, losses from fuel depots and other materials used in the construction process;
- inappropriate storage of resulting wastes and used materials.

During operation, the main sources of water pollution may be the following:

- carrying out dredge maintenance works: will result in material in suspension; during the execution of the works, the amount of suspended matter will increase; there is also the possibility of dredging in polluted sediments.
- accidental losses of fuels, waste oils, bilge water from barges, drags, floating equipment, vehicles and machinery used in dredging maintenance activities.

6.1.1.3 Wastewater treatment plants or pre-treatment plants

Waste water from ships used during the construction period will not be discharged into the Danube but will be taken over by specialized firms according to the regulations in force.

Also, the wastewaters that will result from the sites of the site organization will be discharged by external contractors, according to the regulations in force.

6.1.1.4 Measures to reduce water pollution

The main measures for ensuring the quality of water protection during **the execution of the works** will be:

- the use of dredging methods that produce lower amounts of suspended matter, for example, the aspirant dredge, significantly reduces entrainment of fine particles in the water column and the technology is accepted as environmentally friendly;
- making successive measurements of the concentration of suspended matter in water during the execution of works and stopping them for a limited period of time to allow suspended matter to settle;
- careful planning the works so that activities that lead to the increase of turbidity are intercalated with activities that have no effects on the water column; this will ensure the time needed to disperse suspended matter and even re-settlement it in the riverbed;

- storage of construction materials and waste resulting in this stage in specially designated spaces on the ships and on specially arranged areas within the site organization;
- adequate management of generated waste and surplus materials on site, in compliance with the legal provisions in force;
- proper maintenance of ships, vehicles and equipment to prevent oil or fuel losses;
- removal of damaged vessels, equipment, machinery or vehicles from the working fronts;
- prohibiting the washing of ships, equipment, machinery or vehicles and their technical and mechanical interventions in the work areas and within the site organization;
- supply with hazardous materials according to the works plan, so as to avoid their storage in the work area;
- preventing the discharge of bilge water and other materials into the Danube;
- construction works in periods with low water flows;
- prohibiting the execution of construction works in extreme weather conditions (rain, strong wind);
- endowment of site organizations with ecological sanitary groups;
- arranging site organizations at large distances along the Danube bank, in harbor, industrial and other areas, and avoiding their organization within protected natural areas (where possible);
- no raw materials, materials, waste will be allowed to be discharged into the Danube;
- vehicles, equipment and machinery will not be stationed near the Danube course;

Measures to ensure water quality protection during **the operating period** consist of:

- use of dredging methods that produce lower amounts of suspended matter;
- in situ, periodic measurements of the concentration of suspended matter in the water and stopping work for a limited period of time to allow suspended matter to settle;
- avoid accidental fuel and oil loss from ships and floating equipment;
- regular inspection and control of ships and floating equipment and compliance with their maintenance program;
- updating the accident prevention and control plan for dredging maintenance works;
- evacuation of bilge water in specially designated areas by authorized contractors.

6.1.2 Air protection

6.1.2.1 Existing situation

According to the annual reports on the state of the environmental factors in 2017 - the latest data published by APM Mehedinti, APM Dolj, APM Olt, APM Teleorman, APM Giurgiu and APM Calarasi, the air quality monitoring program in each county, was carried out as follows:

- In Mehedinti County, the air quality monitoring was carried out by means of a stationary automatic station (MH1) of industrial type with a radius of representative area between 100m and 1km. The station is located near the Mehedinti APM headquarters, in Drobeta Turnu Severin, and the Danube River. In the year 2017, the following pollutants were monitored: SO₂, NO₂, NO_x, NO, CO, O₃, Benzene, PM10 nephelometric, PM10 gravimetric, PM2.5 gravimetric and PM10 suspended particulate matter (Pb, Ni, Cd, As).
- In Dolj County the air quality was monitored by means of 6 automatic stations, DJ-1 - DJ-5 (urban, suburban, industrial-industrial, urban or suburban urban stations) located in the Craiova agglomeration and the DJ-6 station traffic) located at the entrance of Calafat, near the Roman-Bulgarian bridge. In 2017, the following concentrations of pollutants: SO₂, NO₂, NO_x, NO, CO, O₃, Benzene, gravimetric PM10 and PM2.5 gravimetric were monitored;

- In Olt County monitoring the air quality was carried out by means of an automatic station, located in Slatina. In 2017, the following pollutants were monitored: gravimetric SO₂, NO₂, NO_x, CO, O₃ and PM₁₀ and gravimetric PM₁₀ Pb_i;
- In Teleorman County air quality was monitored through 5 automatic stations: TR-1 Alexandria (urban background), TR-2 Turnu Magurele (traffic station), TR-3 Turnu Magurele (urban background station), TR-4 Turnu Magurele (industrial station), TR-5 Zimnicea (urban background) and 7 stations for the measurement of dust (monthly average samples), located in Alexandria, Turnu Magurele and Zimnicea. In 2017, the following pollutants were monitored: SO₂, NO₂, NO_x, NO, CO, O₃, BTEX, H₂S, NH₃, gravimetric PM₁₀ and gravimetric PM_{2.5};
- In Giurgiu County, the air quality monitoring was carried out by means of 4 automatic stations: GR-1 (traffic station located in Giurgiu), GR-2 (urban station located in Giurgiu), GR-3 (industrial station in the yard weather from Giurgiu), GR-4 (rural type station located in Branistea village). In 2017, the following pollutants were monitored: SO₂, NO₂, NO, PM₁₀ gravimetric, PM 2.5 gravimetric, Pb, O₃ and Benzene;
- In Calaras county, the air quality monitoring system was carried out by means of the two automatic monitoring stations, CL1 (traffic station - Belsugului street intersection with Prelungirea Bucuresti)) and CL2 (urban station - 71-179 Tudor Vladimirescu Street). in 2017, the following pollutants were monitored: SO₂, NO, NO₂, NO_x, CO, Pb (PM₁₀), PM₁₀, Benzene, Toluene, Ethylbenzene and O₃.

The results of air quality monitoring at in 2017

Nitrogen dioxide (NO₂) nitrogen oxide (NO_x)

- Mehedint County – there were no exceedances of the limit values for the NO₂ indicator, hourly (200 µg / m³) and annual (40 µg / m³) or the alert threshold (400 µg / m³), provided by Law no. 104/2011 on ambient air quality. On 04.01.2017, a maximum hourly NO₂ concentration of 61.25 µg / m³ was recorded, while the annual average was 13.32 µg / m³.
- Dolj County - the concentrations of nitrogen oxides recorded were lower in the urban area (21-23 µg / m³, at DJ-1 and DJ-2 stations), while DJ-3 stations recorded exceedances of the annual average (40 µg / m³). At the DJ-3 station there was only one overrun of the hourly value.
- Olt County - the average annual nitrogen concentration in the ambient air was 18.51 µg / m³ and was assessed using the annual limit value for human health protection (40µg / m³). The hourly limit value for the protection of human health (200µg / m³) was not exceeded in the measuring station. Also, there was no exceedance of the alert threshold value (400 µg / m³) for nitrogen dioxide.
- Teleorman County – only the TR-3 station had the minimum amount of records of over 70. The data recorded in all monitoring stations showed that the annual limit value for NO₂ was not exceeded.
- Giurgiu and Calaras counties - the NO₂ indicator could not be achieved because during the analyzed period the data collected were insufficient to meet the quality criteria according to Law 104/2011 on ambient air quality due to defective equipment

Sulfur dioxide (SO₂)

- Mehedinti County - there were no exceedances of the hourly (350µg / m³) and daily (125µg / m³) limit values for sulfur dioxide provided for in Law no. 104/2011 on ambient air quality. There was no exceedance of the alert threshold (500 µg / m³). On 07.11.2017, a single hourly maximum value of 91.1 µg / m³ was recorded, the annual average of sulfur dioxide concentrations being 11.36 µg / m³;
- Dolj County - there were no exceedances of hourly limit values, averages of recorded values ranging from 9-14 µg / m³;
- Olt County - the average annual concentration was 11.26 µg / m³; no exceedances of hourly and daily limit values have been recorded;
- Teleorman County - there were no exceedances of the annual limit value (20 µg / m³) in any station; in the TR-1 station the valid monitoring data is below 70%;
- Giurgiu County - there were not enough valid data for this pollutant;
- Calarasi County - there were no annual average values over the maximum admissible limit.

Carbon monoxide (CO)

- Mehedinti County - there were no exceedances of the limit value for human health ($10 \text{ mg} / \text{m}^3$). On 10.11.2017, a maximum hourly value of $5.27 \text{ mg} / \text{m}^3$ was recorded and the maximum daily value was $3.42 \text{ mg} / \text{m}^3$, the annual average was $0.29 \text{ mg} / \text{m}^3$;
- Dolj County - the annual concentrations of the CO concentrations were within the range of $0.16\text{-}0.39 \text{ mg} / \text{m}^3$;
- Olt County the average annual concentration was $0.13 \text{ mg} / \text{m}^3$, and the daily maximum values of the media were well below the limit value;
- Teleorman County - there were no exceedances of the limit value of $10 \text{ mg} / \text{m}^3$;
- Giurgiu County - there were enough valid data for this pollutant;
- In Calarasi County, the values recorded for CO did not exceed the maximum monthly value.

Ozone

- Mehedinti County - there were no exceedances of the limit values imposed by Law no. 104/2011 regarding the ambient air quality, except for exceeding the target values recorded on 5.08.2017 and 2.09.2017;
- Dolj county- is monitored only in DJ-3, DJ-4, DJ-5 and DJ-6 stations, no exceedances of the limit value have been recorded;
- Olt County -An average annual value of $56.06 \mu\text{g} / \text{m}^3$ was recorded, with no exceedances of the limit values being recorded;
- Teleorman County -there were exceedances of the daily value ($120 \mu\text{g} / \text{m}^3$) in: 1 day at TR-2 Turnu Magurele station, 1 day at TR-3 Turnu Magurele station, 2 days at TR-4 Turnu Magurele station and 9 days at the TR-5 Zimnicea station;
- Giurgiu County - in the GR-2 station there were not enough valid data for calculating the annual average value;
- Calarasi County - in CL2 station there were no exceedances of the target value for the protection of human health.

Suspensions (PM10 gravimetric)

- Mehedinti County, the PM10 concentrations did not exceed the limit values, except for 26 daily values recorded in January, February, October, March, November and December; in terms of the values determined for nephelometric PM10, there were 2 exceedances of the daily limit value;
- Dolj County there were 19 exceedances of the limit value in the DJ-1 station and 40 exceedances at DJ-3;
- Olt County - the recorded average concentration was $32.28 \mu\text{g} / \text{m}^3$, being below the daily limit value and the annual limit value;
- Teleorman County - only 70% of the data recorded in the monitoring stations were valid;
- Giurgiu County -there were no exceedances of the daily limit value at any of the stations, with the mention that in GR-1 and GR-2 stations there were not enough valid data for calculating the average values;
- Calarasi County - the annual average value was below the permitted limit value, even if there were monthly average exceedances.

Lead (Pb of PM10 gravimetric)

- Mehedinti County, the annual average recorded was $0.01 \mu\text{g} / \text{m}^3$, being below the annual limit of $0.5 \mu\text{g} / \text{m}^3$ according to the Law no. 104/2011 on ambient air quality. On 17.02.2017, the maximum value recorded was $0.0102 \mu\text{g} / \text{m}^3$;
- Dolj County - is not being monitored;

- Olt County - the annual average recorded was $0.003 \mu\text{g} / \text{m}^3$, below the annual limit value;
- Teleorman County - is not being monitored;
- Giurgiu County - in the GR-3 measuring station, the average annual recorded value was $0.0025 \mu\text{g} / \text{m}^3$, being below the annual limit value. No measured data was recorded in the GR-1 and GR-2 stations;
- Calarasi County - the annual average values recorded in the two stations were $0.008 \mu\text{g} / \text{m}^3$ and $0.012 \mu\text{g} / \text{m}^3$ respectively, being below the average annual limit value.

Cadmium

- Mehedinti County - an annual average of $0.23 \text{ ng} / \text{m}^3$ was recorded, below the annual limit of $5 \text{ ng} / \text{m}^3$ according to the law no 104/2011 On 01.01.2017 the maximum value was $0.9 \text{ ng} / \text{m}^3$;
- Olt county - it has an annual average of $0.4227 \text{ ng} / \text{m}^3$, being below the limit of $5 \text{ ng} / \text{m}^3$;
- Counties of Dolj, Teleorman, Giurgiu and Calarasi - cadmium is not monitored.

Nickel

- Mehedinti County, an average annual value of $3.35 \text{ ng} / \text{m}^3$ was recorded, being below the annual limit of $20 \text{ ng} / \text{m}^3$ according to the Law no. 104/2011 on the ambient air quality. On 02.02.2017, a maximum value of $4.7 \text{ ng} / \text{m}^3$ was registered;
- In the other counties in the project area, nickel is not monitored.

Arsenic

- Mehedinti County - an average annual value of $0.18 \text{ ng} / \text{m}^3$ was registered in, being below the annual limit of $6 \text{ ng} / \text{m}^3$ according to the Law no. 104/2011 on ambient air quality.
- In the other counties in the project area, arsenic is not monitored.

Suspended particles (PM 2.5 gravimetric)

- Mehedinti County - a maximum value of $59.6 \mu\text{g} / \text{m}^3$ was recorded on 27.02.2015 and the average annual value was $16.80 \mu\text{g} / \text{m}^3$;
- Teleorman County – PM 2.5 are monitored in TR-3 Turnu Magurele and TR-5 Zimnicea stations, which recorded annual average values of $17.66 \mu\text{g} / \text{m}^3$ and $19.64 \mu\text{g} / \text{m}^3$ respectively;
- Giurgiu County - there were not enough data for calculating the annual average value;
- Dolj County - there were no measurements for PM 2.5 gravimetric although the parameter is included in the monitoring program;
- Olt and Calarasi Counties – PM 2.5 gravimetric is not monitored.

Benzene

- Mehedinti County - the annual average recorded at the MH-1 station was $2.23 \mu\text{g} / \text{m}^3$. On 12.12.2017 the maximum hourly value of $43.28 \mu\text{g} / \text{m}^3$ was recorded;
- Dolj, Olt and Teleorman County - The values of this pollutant are not monitored in no measurements have been made due to technical problems of the apparatus;
- Giurgiu County, there were not enough valid data for the GR-1 and GR-4 stations for calculating the annual average value, a similar situation in Calarasi County.

Hydrogen sulfide (H₂S)

- Teleorman County - no measurements were made in 2017 for H₂S due to technical problems of the analyzer;
- In the other counties of the project area, hydrogen sulfide is not monitored.

6.1.2.2 Sources of pollutants for air, pollutants, including odors sources

During construction period, the main sources of air pollution may be the following:

- maneuvering the excavated soil from land preparation works for the bank defense and the embankment of the groynes in the bank: digging, stuffing, earthing - pollutants: particles;
- transport and storage of materials - pollutants: particles;
- handling of construction waste - pollutants: particles;
- operation of the motorized equipment used for dredging, filling, compacting and transportation of materials - pollutants: NO_x, SO₂, CO, metals containing metals (Cd, Cu, Cr, Ni, Se, Zn);

The sources specific to the construction period will be surface, open, free sources. Their operation will be intermittent, depending on the work schedule. After completion of the construction works, the pollution sources mentioned above will be significantly reduced.

During operation the main sources of air pollution can be mobile sources of combustion due to the operation of floating equipment and equipment used during dredging maintenance. Pollutants resulting from the combustion of fossil fuels in mobile sources are: sulfur oxides, nitrogen oxides (including nitrous oxide), carbon dioxide, carbon monoxide, methane, non-methane volatile organic compounds, particles (PM10 and PM 2,5) (Pb, Cd, Cr, Cu, Ni, Se, Zn), ammonia, polycyclic aromatic hydrocarbons.

6.1.2.3 Installations for the retainment and dispersion of pollutants in the atmosphere

Considering the purpose of the project, *the improvement of the navigation conditions*, for the accomplishment of the proposed works, no installations are needed for the containment and dispersion of the pollutants in the atmosphere.

6.1.2.4 Measures to reduce air pollution

The main measures for ensuring the air quality protection **during construction period** will be:

- the use of modern machinery equipped with engines whose emissions comply with the legislation in force;
- proper maintenance of shipping and road transport equipment;
- the use of shipping and road transport equipment so that there is no loss of material, especially for those with fine granulometry;
- covering building materials during shipping and road transport;
- cessation of building activities leading to intensive generation of suspended particles in the presence of strong winds;
- staging work (observing the work schedule) so that the emission producing operations do not overlap and there is a low level of pollutants in the atmosphere;
- reducing the discharge height of materials that can generate particulate emissions;
- the use of concrete prepared in specialized stations, avoiding the use of powdery construction materials in the work areas;
- shutting down machinery, ships and road vehicles during periods when they are not involved in activities.

The main measures to ensure the protection of air quality **during operation** consist in the use of modern, high-performance marine equipment equipped with low fuel consumption engines and whose emissions comply with the legislation in force.

6.1.3 Protection against noise and vibration

6.1.3.1 Noise and vibration sources

Existing situation

On the left bank of the Danube there are large areas of spontaneous and arboreal vegetation, as well as areas with human settlements (villages and towns of different sizes). Roads and road traffic are usually located a few km from the Danube, except for certain areas where roads go up to the bank (especially in coastal cities and ports). The perceived noise level in the bank area differs from one area to another but is generally relatively low due to the distance between the navigable fairway and the bank and the existence of the noise-reducing vegetation.

During the construction works the main sources of noise may be the following:

- the operation of the ships and road transport equipment necessary for the construction and dredging works;
- handling of building materials, dredged material and resulting wastes;
- traffic on the Danube and on the access roads in the areas where the materials are discharged and in / from the site organization areas.

Ships and road transport equipment may also be sources of vibration that can induce certain levels of vibrations that are perceptible, but without destructive effects, for receptors located near work areas.

During operation the main sources of noise can be the following:

- the operation of the ships and equipment necessary for the execution of the dredging works;
- handling of the dredged material;
- traffic on the Danube as a result of carrying out maintenance dredging activities and as a result of increased river transport.

6.1.3.2 Arrangements and equipment's for the protection against noise and vibration

Given the purpose of the project, the improvement of the navigation conditions, for the accomplishment of the proposed works, there is no need for protection against noise and vibrations.

6.1.3.3 Measures to reduce noise and vibration

The main measures for reduction of noise and vibrations during the construction period will be:

- adapting the daily work schedule in order to protect the sensitive receptors in the vicinity;
- performing construction and dredging work outside important periods of fish migration or birds (nesting period, presence of migratory birds);
- performing construction and dredging work only during the day;
- plan the works so that the noise-generating operations do not overlap and thus record a low noise level;
- equipping ships and road transport vehicles with noise and vibration reduction equipment (eg performance vibration dampers, efficient exhaust drums, etc.) - if applicable;
- the use of naval and road transport equipment with acoustic powers similar to those admitted according to GD no. 1756/2006 on limiting the level of noise emissions in the environment produced by equipment intended for use outside buildings;
- performing periodic technical checks to the equipment;
- maintenance and operation in normal parameters of the transport equipment;
- program the works so as to avoid the simultaneous use of many noise generating machines at high level;

- avoiding as much as possible machinery and trucks traffic through inhabited areas, and use of detour routes;
- reducing travel speed in sensitive areas and complying with traffic rules so that vibration parameters are below the limits imposed by the standards in force for inhabited areas;
- arranging site organizations and loading / unloading areas for building materials at considerable distances from neighboring residential areas; the minimum distance to areas with a regulated noise regime range from 50 m to 100 m;

The main measures for the reduction of noise and vibrations during the **operation period** will be:

- adapting the daily schedule of maintenance dredging to the need to protect sensitive receptors in the vicinity;
- performing dredging maintenance work outside important periods for fish migration or for birds (nesting period, presence of migratory birds);
- dredging works will be performed only during the day;
- equipping ships and road transport vehicles with noise and vibration reduction equipment (eg performance vibration dampers, efficient exhaust drums, etc.) - if applicable;
- the use of naval and road transport equipment with acoustic powers similar to those admitted according to GD no. 1756/2006 on limiting the level of noise emissions in the environment produced by equipment *intended for use outside buildings*;
- performing periodic technical checks to the equipment;
- maintenance and operation in normal parameters of the transport equipment;

6.1.4 Protection against radiation

6.1.4.1 Radiation sources

Existing situation

According to the Environmental Status Report in Mehedinti County in 2017, the sampling of water samples for measurements of the immediate global beta activity and after 5 days, was carried out within the standard program on the Danube River

Evolution of the average and maximum annual values of the specific global beta immediate activity of the Danube river water is presented in Figure 14.

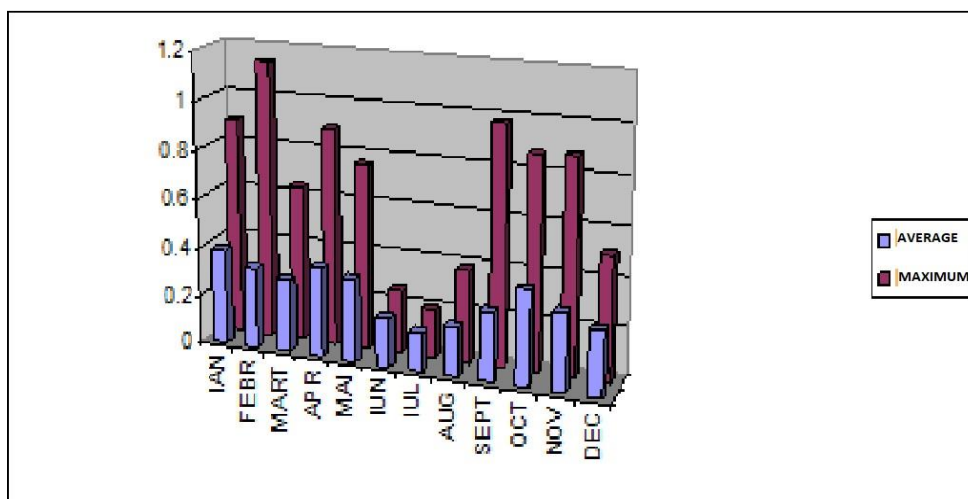


Figure 14 Variation of averages and maximum of Danube water global beta activity in 2017 - Immediate values [Bq / l]
(Source: Report on the state of the environment in Mehedinti County in 2017, APM Mehedinti)

Note: The surface water warning limit for global beta analysis (according to Order No 1978/2010 on the approval of the Regulation on the organization and functioning of the National Radioactivity Surveillance Network) is 20 Bq / m³.

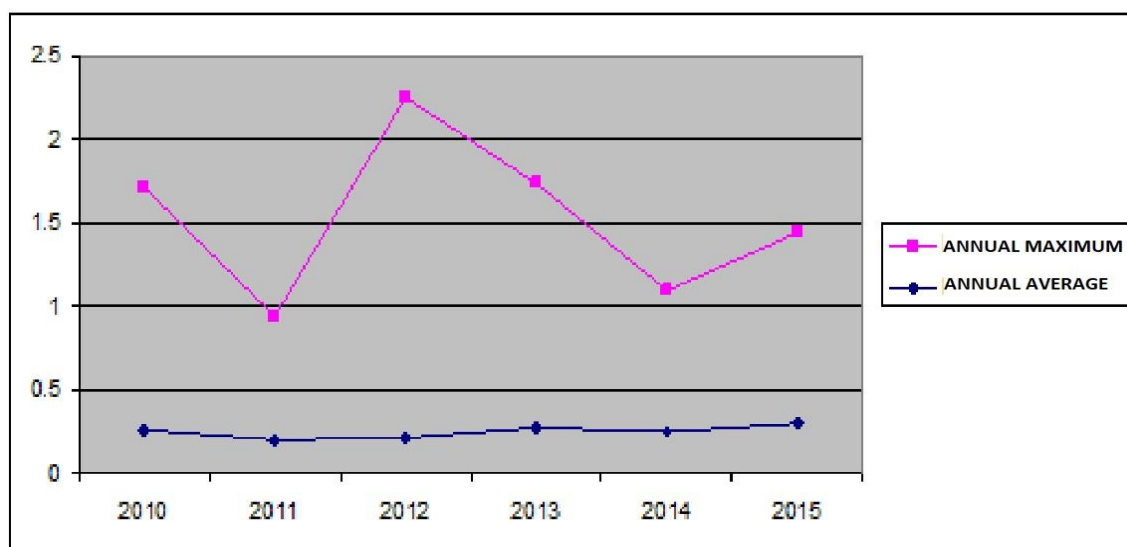


Figure 15 Variation of averages and annual maximum of Danube water global beta activity between 2010-2015 - Immediate values (Bq / l) (Source: Report on the state of the environment in Mehedinti County in 2015, APM Mehedinti)

From the analysis of the data presented in Figure 15, we observe, compared to the values recorded in 2010, the values in 2015 indicate a trend of increase of the annual average value and an increasing tendency of the annual maximum value.

The Danube Basin is radioactively monitored because of the presence of the Kozloduy NPP on the right bank of the river near Bechet. The Bechet and Craiova Monitoring System for Radioactivity of the Environment (RMS) is conducting a special monitoring program for the Kozloduy NPP. Daily or periodic samples are collected from five sampling points, samples of Danube water and groundwater from the monitored area. Subsequently, global beta (screening) measurements are performed).

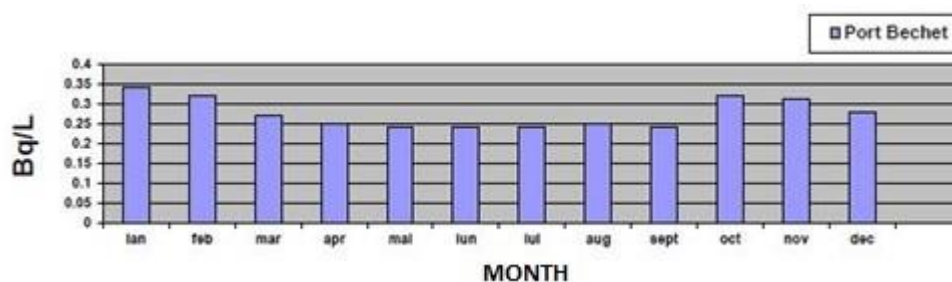


Figure 16 Variation of averages and annual maximum of Danube water global beta activity in 2015 – Bechet area (Bq / l)
(Source: Report on the state of the environment in Dolj County in 2015, APM Dolj)

The global beta artificial radioactivity of the Danube water samples (measured immediately) - Port Bechet ranged between 0.21 Bq / L - 0.66 Bq / L and the one measured 5 days after harvest ranged from 0.149 Bq / L - 0.46 Bq / L.

Spectrometric gamma measurements were performed on cumulative samples of Danube water from the sections: Port Bechet, Dabuleni and Bistret Lake. There were no artificial radionuclides identified as originated from Kozloduy NPP. No artificial radionuclides were found in groundwater samples taken from Nedeia and Ostroveni.

Global beta soil radioactivity varied in Bechet City between 161.1 Bq / kg - 541.6 Bq / kg with an average of 227.7 Bq / kg.

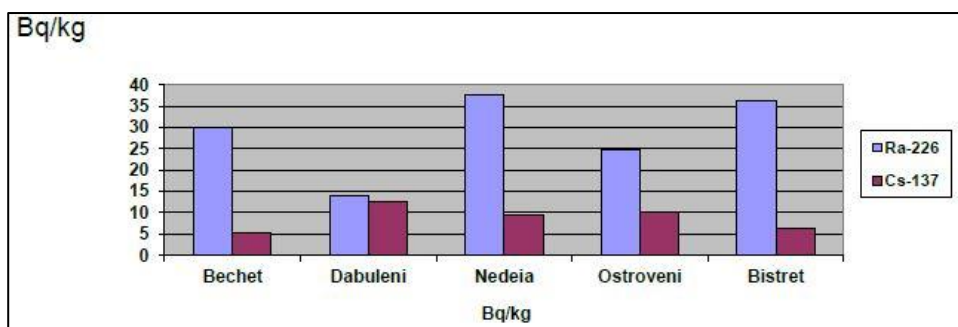


Figure 17 Concentration of Ra-226 and Cs-137 radionuclides from the soil samples taken from Kozloduy NPP Area in 2015
(Source: Report on the state of the environment in Dolj County in 2015, APM Dolj)

According to APM Dolj, the Cs-137 radionuclide source is the Chernobyl explosion, the radionuclide being present in the environment after the accident, the concentration decreasing each year.

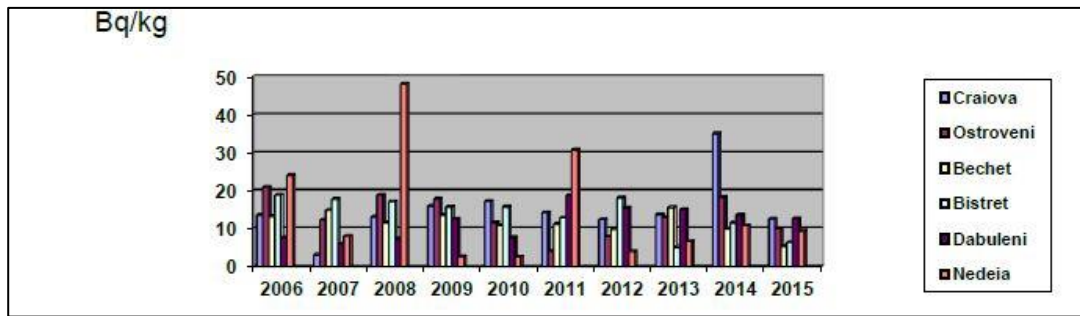


Figure 18 Multi-annual evolution of Cs-137 in soil samples from the Kozloduy NPP zone of influence in 2015 (Source: Report on the state of the environment in Dolj County in 2015, APM Dolj)

During 2015, in Teleorman County, the radioactivity of the Danube River was monitored daily. There were no exceedances of the warning value (2 Bq / l), with an annual average value of 0.269 Bq / l and a maximum annual value of 1.36 Bq / l.

Radiation sources will not be used during the execution works and/or operation.

6.1.4.2 Devices and equipment's for radiation protection

Considering the purpose of the project, the improvement of the navigation conditions, for the accomplishment of the proposed works, there is no need for radiation protection.

6.1.5 Soil and subsoil protection

6.1.5.1 Sources of pollutants for soil, subsoil, groundwater and deep water

Existing situation

Geology aspects of the area

According to Draft EIA Report – Section I: Portile de Fier II – Calarasi/Silistra (rkm 863 – 375), JV Technum N.V., Trapec S.A., Tractebel Development Engineering S.A., Companie Nationale du Rhone, Safege, september 2011, the geological structure on the Danube romanian bank is represented by aluvial and loess deposits, fluvial – lacustrine deposits and eolian deposits with ages between the Early - Late Holocene and the Early - Late Pleistocene. Besides these deposits, there also find gravels, sands, clays with coal intercalations and marls, with ages between Levantine, Dacian, Pontian, Meotian.

The Danube meadow is mainly a sediment accumulation area, the fine sediments being deposited over the gravel and coarse sand deposits. The thickness of the sedimentary cover strata increases towards the downstream, from 5 - 20 m, in the upstream area from the confluence with the Olt river, to 20 – 25 m in the area between the confluence with Olt and Mostistea rivers and reaching nearby Calarasi locality up to 30 m (Environmental Impact Assesment Report, 2011).

According to the Geological Map of Romanian, 1: 1.000.000 scale, Geological Institute, along Danube are found the following geological structures:

- In Mehedinti county - alluvial and loess deposits, alluvial deposits (Early Holocene) and alluvial and loess deposits (Late Pleistocene);
- In Dolj county – alluvial, eolian and marshland deposits – fixed sands – (Late Holocene), loess, alluvial and eolian deposits (Early Holocene), alluvial deposits and loess – salt marsh deposits (Late Pleistocene) and sandy – clay sandstone with coal (Levantine).
- In Olt county – alluvial and marshland deposits – fixed sands – (Late Holocene) and alluvial deposits and loess, aluvial deposits (Early Holocene).
- In Teleorman county - alluvial and loess deposits, alluvial deposits (Early Holocene) and alluvial and marshland deposits (Late Holocene).

- In Giurgiu county - alluvial and marshland deposits (Late Holocene), alluvial and loess deposits, alluvial deposits (Early Holocene) and sandy – clay sandstone with coal strata (Levantine).
- In Calarasi county – alluvial and marshland deposits (Early Pleistocene), alluvial and marshland deposits (Late Holocene).

The lithological structure of the project area

According to GEOSONG - Geotechnical Study in July 2017, 60 geotechnical boreholes with a depth of 15 m were performed during 10.04.2017 - 26.05.2017. 30 geotechnical boreholes were carried out on the Romanian bank and 30 on the bank Bulgarian.

Generally, on the Romanian bank up to the depth of 15 m there have been found fine soils, clay and dust, and medium sands to gravel.

Considering the large expansion of the project area, the Romanian – Bulgarian Danube joint sector area of approximately 470 km long, the location of the drilling points has been established so that there is a uniform distribution along the Danube. Thus, boreholes were executed at an average distance of 20 km from each other.

According to the borehole's logs attached to the geotechnical study, the lithological succession on the Romanian bank in the project area can be synthesized as follows:

In Mehedinti County:

- In F1 borehole (km 845) were found to 7.70 m deep, layers with fine granulometry (sandy dust and dusty sand), and a sand layer was intercepted in the base.
- In F3 (km 838) and F4 (km 821) boreholes, the fine granulometry layers of sandy dust, clayey dust, dusty clay and clayey sand were found up to the depths of 12.10 m and 3.70 m respectively. The layer package with the coarser granulometry represented by sandy gravel, sand and sand with gravel had a thickness of 2.90 m in F3 and 11.30 m in F4.

In Dolj county:

- In boreholes F7 (km 802), F8 (km 783), F12 (km 775) and F15 (km 758) the succession of layers with fine granulometry represented by: clayey sand, dusty sand, fine and medium sand, dusty clay, sandy clay, clayey dust and sandy dust were encountered up to the depth of 11,10 m in F7, 9,90 m in F8, 13,30 m in F12 and 7,00 m respectively in F15. A layer of coarse granulometry (gravel with sand and sandy gravel) with thicknesses of 2.50 m in F7, 5.10 m in F8 and 1.70 m in F12 was intercepted under these layers. In the F7 drilling under the sandy gravel layer a thin layer of dusty clay was encountered. In F15 there were found two layers of sandy gravel with thicknesses of 3.20 m and 1.50 m interposed by a layer of fine sand with a thickness of 3.30 m.
- In boreholes F6 (km 718), F20 (km 698) and F22 (km 678) the fine granulometry layers represented by: sandy dust, dusty sand, clayey sand, fine sand, clayey dust, dusty clay and dust was intercepted up to the depth of: 9.60 m in F6, 15.00 m in F20, 13.00 m in F22. In the base of F6 and F22 boreholes, a layer of sandy gravel of 5.40 m and 2.00 m respectively was found.

In Olt County:

- In boreholes F25 (km 661), F27 (km 633) and F55 (km 644) the fine granulometry layers represented by fine sand, dusty clay, dusty sand, clayey dust, sandy dust, clayey sand and sand was met up to depth: 13.30 m in F25, 15.00 m in F27 and 12.90 m respectively in F55. In the base on the F25 borehole, a sandy gravel layer was intercepted, followed by a layer of fine sand. In the base of the F55 borehole, a layer of gravel and sand was intercepted followed by a layer of fine sand.

In Teleorman County:

- In boreholes F40 (km 605), F26 (km 598) and F30 (km 580), the succession of fine granulometry layers it meet up to the boreholes base except borehole F26, in which, from the depth of 9.30 m we have layers of sandy gravel and sand with gravel. Also, a layer of non-homogeneous filling was intercepted in the F26 borehole, from the surface to the depth of 3.00 m. Fine granulometry layers are represented by: sandy dust, clayey sand, dusty sand, fine sand, clay and dusty clay.

- In the boreholes F32 (km 570), F34 (km 555), F36 (km 538) and F38 (km 534) the coarse layer of -gravel is replaced with sand layers at variable depths of 7.60 m in F32, 5.00 m in F34, 7.30 m in F36 and 5.30 m in F38. The fine granulometry layer is represented by: sandy dust, dusty clay, sandy dust, dusty sand, clayey sand, clayey dust and sandy clay.

In Giurgiu County:

- In the F41 (km 524) and F42 (km5 20) boreholes fine granulometry layers was intercepted consisting of sand, dusty clay, clayey dust and dusty sand to a depth of 11.20 m in F41 and 9.6 m in F42. At the base of the boreholes a layer of sandy gravel with a thickness of 3.80 m in F41 and 5.4 m in F42 was intercepted.
- In boreholes F44 (km495), F45 (km475) and F46 (km461) the succession of fine granulometry layers was intercepted up to a depth of 15.00 m in F44, 11.40 m in F45 and 12.60 m in F46, consisting of: sandy clay, sand, sandy dust, dusty clay, clayey dust, dusty sand, clayey sand. In the base of the boreholes, the gravel layer was encountered only in F45 and F46. In the F44 borehole were intercepted layers of sand with gravel and medium sand.

In Calarasi County:

- the F48 (km435) and F49 (km422) boreholes, the fine granulometry layers were intercepted up to a depth of 12.20 m in F48 and 14.00 m in F49. In the base on the F48 borehole, a layer of gravel sand with a thickness of 2.80 m was encountered, and in F49 a layer of sandy gravel of 1.00 m thickness was found.
- In boreholes F57 (km401) and F59 (km387) the succession of fine granulometry layers was intercepted up to a depth of 11.30 m in F57 and 5.90 m respectively in F59. In the base of the boreholes were intercepted sandy gravel layers and gravel with sand with variable thicknesses. In the F57 borehole under the gravel layer was intercepted a layer of fine sand with a thickness of 1.30 m.

Soil characterization aspects

On the romanian bank, in Danube meadow prevail intrazonal soils, which are mainly young soils and very young soils. The highest percentage is represented by weakly developed aluvial soils. In small areas there are moderately developed alluvial soils, formed on older aluvial deposits. Also, on relatively limited surfaces, are found early solidified alluviums and soils with excess moisture, hydromorphic and humic gley soils (Romanian Academy, Institute of Geography, 2005, Geography of Romania, Romanian Academy Publishing House, pp. 511-512).

Sometimes due to the intense evaporation of the water with salts which are deposited in the upper horizons, appear solonets soils.

Locally, appear zonal soils from molisols class, sandstone chernozems associations, chernozems and wet phreatic psamosols.

According with the Soil Map of Romania, 1:3.000.000 scale, Geological Institute, Pedological Studies and Research Institute, Florea, N et al, 1971, along Danube are found the following soil types:

- In Mehedinti county - sands and poorly solidified sands, river deposits (including alluvial soils) with or without carbonates, heavily levigated chernozems and sometimes chernozems. On the Danube bank, near Garla Mare island there are extensive sand dunes.
- In Dolj county - sands and poorly solidified sands, low and moderate levigated chernozems, marshy, aluvial soils with or without carbonates. On the banks of the islands Kutovo, Desa and Papadia were formed sand dunes.
- In Olt county - sands and poorly solidified sands, river deposits, low and moderate levigated chernozems, chernozems, alluvial soils with or without carbonates.
- In Teleorman county – chernozems, marshy, alluvial soils, low and moderate levigated chernozems, carbonate chernozems.
- In Giurgiu county – alluvial soils with or without carbonates, heavily levigated chernozems, marshy, river deposits.
- In county Calarasi – river deposits, alluvial soils, marshy.

Soil erosion and bank stability

Observations on soil erosion and on Romanian bank stability were done during field visits, from the period 06-09.04.2017 and 05-09.05.2017.

Extensive areas were observed where the bank is subject to the erosion process, which also led to the bank's collapse and affecting the vegetation in that area (both spontaneous vegetation and forest vegetation).

Besides areas affected by erosion, were identified areas where there are bank defenses.

Aspects regarding the characterization of the status of deep groundwater bodies

In the Danube basin, 11 underground cross-border bodies of water of high importance are monitored. The Danube sector on which the project is being carried out is monitored by a single cross - border body of groundwater (GWB - 2), which extends both on the territory of Romania (RO - 2) and on the territory of Bulgaria (BG - 2). According to "The Danube River Basin District Management Plan - Update 2015, the International Commission for the Protection of the Danube River, 2015, Map 4, Table 17", the status of the groundwater body, GWB - 2, for the period 2009-2021 rated as good in terms of both quality and quantity.

During the execution of the works the main sources of soil pollution may be the following:

- land clearing activities along the bank for bank protection works and anchoring area for groynes;
- digging and excavation in bank and riverbed for building construction;
- inadequate storage of construction waste, landfill waste (branches, cages, trunks) as well as excavated soil or other wastes;
- inappropriate storage of materials;
- storage of polluted dredged material in storage areas or its use in the creation of new islands;
- accidental leakage of fuel and / or oil from machinery or vehicles.

The project does not estimate that there will be sources of groundwater pollution during the execution of the works. Execution of construction works on the water avoids the action of bank pollution sources with possible effects on other bodies of surface water and groundwater.

During the operation of the works the main sources of soil pollution can be the following:

- maintenance work on bank protection and the groynes - bank end by occupying narrow areas of terrain;
- accidental leakage of fuel and / or oil from machinery or from vehicles.

The project is not expected to have groundwater pollution sources either during the execution period of the works or during the operation period.

6.1.5.2 Works and equipment's for soil and subsoil protection

In areas with intense bank erosion, the project proposes bank protection works to prevent bank erosion and storage of eroded material in the downstream area. As a result of intense erosion processes, annually the banks are eroded by approximately 1 m - 1.5 m. Because of this, it is considered that bank protection will play a positive role in erosion control.

6.1.5.3 Measures to reduce soil and subsoil pollution

The main measures for soil pollution reduction during **the execution of the works** will be:

- daily checking on the condition of the equipment;
- fueling of ship and road transport vehicles in distribution stations and not in the work area or in site organization;
- changing machine oil in specialized units and not in the work area or in site organization;
- temporary storage of construction waste on specially designed protected platforms;

- storage of domestic assimilable waste in the containers provided with lids, located in an appropriately arranged area and periodic disposal thereof by an authorized operator;
- the disposal of construction waste through authorized operators.

Since **during operation** most of the activities will be carried out on the water, there are no necessary measures to reduce the soil pollution.

6.1.6 Protection of terrestrial and aquatic ecosystems

6.1.6.1 Existing situation

6.1.6.1.1 Flora

In the project area the characteristic aspect of the Romanian bank is the meadow, with some local narrowing and enlargement from about 5-6 km to 10-15 km. Most of the meadow comprises the entire flood region, and local includes non-inundated portions. In some areas, the Danube meadow has been modified by hydro-technical (defense of bank, dykes, etc.) structures.

Besides the meadow area, there are numerous islands on the Danube with variable dimensions, the largest exceeding the length of about 10 km.

Vegetation is specific to the meadow. In the meadow area located between the flood protection dike (where it exists) and the riverbed dominates forests with willow and poplar (*Salix alba*, *Populus alba*, *Populus nigra*, *Populus canadensis*, *Populus deltoides*, *Ulmus*, *Fraxinus*) mixed with adventive species (*Amorpha fruticosa*, *Robinia pseudoacacia*, *Gleditsia triacanthos*, *Morus alba*), all of which were grown relatively recently, after the indigenous native vegetation of the meadow was largely deforested. Often, hanging species such as *Vitis silvestris*, *Humulus lupulus*, *Bryonia dioica*, *Periploca graeca* can be found. The average age of the trees varies between 10 and 20 years. The willow tree forest protects against floods and is an important nesting place for birds.

Aquatic plants include algae and higher order plants. These species prefer quiet waters, slow-flowing areas, or flooded floodplains. Their development is influenced by abiotic parameters such as water velocity, turbidity, light, shade, substrate, so that these species are good indicators for these parameters and for feeding conditions in the habitat.

On the Romanian bank of the Danube, the following types of vegetal formations are meet:

- Within the limits of Mehedinți County, in the Danube meadow and the confluence areas with tributaries, we find forests of willow (*Salix sp.*), poplar (*Populus sp.*) grasslands with orchard grass (*Dactylis glomerata*) and meadows foxtail (*Alopecurus pratensis*), aquatic vegetation (reed and rush). On the sandbanks Psamphilic vegetation and Black locust plantation (*Robinia pseudacacia*) are found.
- In the Dolj county, in the Danube meadow there are delightful forests, mesotrophic meadows and aquatic vegetation, partially modified by drainage works.
- In the Olt county, the azonal and intrazonal vegetation, arranged along the rivers, consists of willow trees, poplar trees, Euro-American poplar plantations, mesotrophic meadows and aquatic vegetation in lakes, and sandbanks with psamphilic vegetation.
- In the county of Teleorman, the azonal vegetation, along the in the Danube meadow and the confluence areas with tributaries, includes of willow trees, poplar tree and mesotrophic meadows.
- In Giurgiu County, the azonal and intrazonal vegetation existing in the Danube floodplain includes willow (*Salix alba*, *S. fragilis*) and poplar (*Populus alba*, *P. nigra*), alternating with hybrids of black poplar. Herbaceous vegetation consists of reedtop (*Agrostis alba*), meadow foxtail (*Alopecurus pratensis*). Hygrophilous vegetation consists of species such as *Scirpus sp.*, *Phragmites communis*, etc.
- In the Calarasi county, the azonal vegetation is characterized by the introduction of meadows made of willow and poplar, oak forests (*Quercus robur*), European ash (*Fraxinus excelsior*), elm (*Ulmus sp.*) And Euro-American poplar plantations, among which intersects meadows with *Agrostis stolonifera*,

Alopecurus pratensis, *Agropyron repens* and cultivated land. To these add the vegetation of the lakes. Intrazonal vegetation is represented by plant-halophilic associations.

The most common flora species in the project area are presented in Table 8.

Table 8 The most common species of flora from the project area

Herbaceous layer	<i>Geranium pusilum</i> , <i>Erodium cicutarium</i> , <i>Poa nemoralis</i> , <i>Bromus tectorum</i> , <i>Capella bursa-pastoris</i> , <i>Galium aparine</i> , <i>Papaver album</i> , <i>Medicago lupulina</i> , <i>Ranunculus repens</i> , <i>Trifolium repens</i> , <i>Carex spp.</i> , <i>Alopecurus pratensis</i> , <i>Potentilla reptans</i> , <i>Glechoma hirsuta</i> , <i>Anchusa arvense</i> , <i>Convolvulus arvense</i> , <i>Plantago media</i> , <i>P. lanceolata</i> , <i>Phragmites australis</i> , <i>Typha angustifolia</i> , <i>Lycopus europaeus</i> , <i>Anthriscus cerefolium</i> , <i>Juncus sp.</i> , <i>Eleocharis sp.</i> , <i>Silene sp.</i> , <i>Taraxacum officinale</i> , <i>Achillea sp.</i> , <i>Senecio vernalis</i> , <i>Artemisia absintium</i> , <i>Lamium purpureum</i> , <i>Vicia grandiflora</i> , <i>Vicia sp.</i> , <i>Stellaria media</i> , <i>Arctium lappa</i> , <i>Cynoglossum officinale</i> , <i>Euphorbia cyparissias</i> , <i>Silene alba</i> , <i>Poa pratensis</i> , <i>Alisma plantago-aquatica</i> , <i>Butomus umbellatus</i> , <i>Carex. Agrostis stolonifera</i> , <i>Cyperus michellianus</i> , <i>Eleocharis acicularis</i> , <i>Equisetum palustre</i> , <i>Iris pseudacorus</i> , <i>Juncus effusus</i> , <i>Mentha aquatica</i> , <i>Phragmites australis</i> , <i>Potamogeton sp.</i> , <i>Sagittaria sagittifolia</i> , <i>Typha sp.</i> , <i>Lythrum salicaria</i> , <i>Galium palustre</i> , <i>Bidens tripartita</i> , <i>Euphorbia palustris</i> , <i>Lycopus europaeus</i> , <i>Glechoma hirsuta</i> , <i>Galium aparine</i> , <i>Anthriscus cerefolium</i> , <i>Lamium purpureum</i> , <i>Erodium cicutarium</i> , <i>Geranium pusilum</i> , <i>Ranunculus repens</i> , <i>Rumex sp.</i> , <i>Capsella bursa-pastoris</i> , <i>Poa nemoralis</i> , <i>Taraxacum officinale</i> , <i>Erigeron annuus</i> , <i>Aster lanceolatus</i>
Bush layer	<i>Vitis silvestris</i> , <i>Humulus lupulus</i> , <i>Bryonia dioica</i> , <i>Rubus caesius</i> , <i>Amorpha fruticosa</i> , <i>Crataegus monogyna</i> , <i>Glycyrrhiza echinata</i> , <i>Tamarix ramosissima</i> , <i>Cornus sanguinea</i> , <i>Sambucus ebulus</i>
Tree layer	<i>Morus alba</i> , <i>Robinia pseudoacacia</i> , <i>Gleditsia triacanthos</i> , <i>Salix alba</i> , <i>Salix fragilis</i> , <i>Populus alba</i> , <i>Populus nigra</i> , <i>Populus deltoides</i> , <i>Populus canadensis</i> , <i>Fraxinus sp.</i> , <i>Fraxinus pensylvanica</i> , <i>F. angustifolia</i> , <i>Ulmus sp.</i> , <i>Quercus robur</i> , <i>Ailanthus altissima</i> , <i>Elaeagnus angustifolia</i>
Algae	<i>Enteromorpha intestinalis</i> , <i>Hydrodictyon reticulatum</i> , <i>Nitellopsis obtuse</i>
Aquatic vascular plants	<i>Azolla filiculoides</i> , <i>Ceratophyllum demersum</i> , <i>Elodea nuttallii</i> , <i>Lemna gibba</i> , <i>Lemna minor</i> , <i>Lemna turionifera</i> , <i>Myriophyllum spicatum</i> , <i>Najas marina</i> , <i>Najas minor</i> , <i>Potamogeton acutifolius</i> , <i>Potamogeton crispus</i> , <i>Potamogeton gramineus</i> , <i>Potamogeton luceus</i> , <i>Potamogeton nodosus</i> , <i>Potamogeton pectinatus</i> , <i>Potamogeton perfoliatus</i> , <i>Potamogeton pusillus</i> , <i>Potamogeton trichoides</i> , <i>Salvinia natans</i> , <i>Spirodela polyrhiza</i> , <i>Trapa natans</i> , <i>Vallisneria spiralis</i> , <i>Zannchellia palustris</i>
Helophyte	<i>Artemisia sp.</i> , <i>Bidens frondosa</i> , <i>Bidens radiata</i> , <i>Bidens sp.</i> , <i>Bolboschoenus maritimus</i> , <i>Butomus umbellatus</i> , <i>Chamaesyce glyptosperma</i> , <i>Cyperus flavescens</i> , <i>Cyperus fuscus</i> , <i>Cyperus glomeratus</i> , <i>Echinochloa crus-galli</i> , <i>Iris pseudacorus</i> , <i>Juncus bulbosus</i> , <i>Juncus conglomeratus</i> , <i>Lythrum salicaria</i> , <i>Mentha aquatica</i> , <i>Phalaris arundinacea</i> , <i>Phragmites australis</i> , <i>Polygonum lapathifolium</i> , <i>Polygonum sp.</i> , <i>Rorippa sp.</i> , <i>Rumex sp.</i> , <i>Schoenoplectus lacustris</i> , <i>Schoenoplectus triquetra</i> , <i>Sparganium emersum</i> , <i>Sparganium erectum</i> , <i>Typha angustifolia</i> , <i>Typha latifolia</i> , <i>Xanthium strumarium</i>
Invasive species	<i>Lgroynesdium draba</i> , <i>Erigeron annuus</i> , <i>Xanthium italicum</i> , <i>Amorpha fruticosa</i> , <i>Morus alba</i> , <i>Robinia pseudoacacia</i> , <i>Gleditsia triacanthos</i> , <i>Parthenocissus inserta</i> , <i>Ailanthus altissima</i> , <i>Acer negundo</i> , <i>Fraxinus pensylvanica</i> , <i>Conyza canadensis</i> , <i>Bidens tripartita</i> , <i>Aster lanceolatus</i> , <i>Bryonia dioica</i>

6.1.6.1.2 Fauna

The fauna species in the project area are dependent on both the aquatic and the terrestrial environment, being related to the characteristic conditions in the Danube.

According to the Joint Danube Surveys 3 - JDS (deployed by the International Commission for the Protection of the Danube River - ICPDR in 2013), the general characteristics of the Danube fauna are:

Macro-invertebrates

- In total, 460 vertebrate taxa were identified through all sampling techniques used;
- Insects, with 319 taxa, were the dominant component of communities. Diptera were the richest in insects order, with 222 taxa, with 200 species belonging to the Chironomidae family. In terms of abundance, Diptera plays an essential role in the Upper Danube section and decreases downstream;

Aquatic invertebrates

- Amphipods (especially invasive Corophiidae) are the dominant group in all sections of the Danube, growing downstream, while Oligochaeta and Mollusca have been found in increasing numbers in the middle and lower sections, where the Asian clam *Corbicula fluminea* occurs in high densities;
- Higher densities of EPT (*Ephemeroptera*, *Plecoptera* and *Trichoptera*) are limited to the upper section, where Trichoptera presents the highest densities within these sensitive groups. As far as the Chironomidae aquatic insects are concerned, they play an important role along the entire river;
- Some species were detected only in the middle region of the lower Danube riverbed by dredging: *Paramysis ullskyi*, *Schizoramphus scabriusculus*, *Niphargoides spinicaudatus*.

Terrestrial invertebrates

Types of habitats for many terrestrial species include aquatic and semi-aquatic areas as essential habitat elements.

- Species specific to erosive banks, such as hymenoptera, are most suited to river dynamics. Their habitats are constantly changing. A similar situation is found in the case of invertebrates on the sandbanks and islands: carabid beetles, bush crickets and mollusks are typical species. For example, Blue-winged sand Grasshopper (*Sphingonotus caeruleus*) has as habitat only on large sand stretches, while Green-winged Grasshopper (*Aiolopus thalassinus*) also live on sandbanks poor in vegetation;
- Other relevant species use low-banks as habitat, depending on certain stages of development or depending on the season.

Phyto benthos

Benthic algae (periphyton or phytobenthos) are the most successful primary producers in aquatic habitats. They are considered to be the main source of energy for superior trophic levels in many, if not most, in the temperate unshaded regions (Minshall 1978, Lamberti 1996). In large rivers, the leading role in primary production is held by phytoplankton (Vannote et al., 1981). Specific conditions in such rivers favor the development of phytoplankton and algal biofilms are often limited to the littoral area due to the limited availability of high flux turbidity. Phytoplankton, as a bioindicator, mirrors short-term environmental conditions, while benthic algae, which are exposed to fluctuations of environmental factors and water chemistry, reflect long-term aquatic health.

Phyto benthos, together with macrophytes, are identified as Biological Qualitative Elements in accordance with the Water Framework Directive (2000/60 / EC) and as such should be monitored for the identification of anthropogenic influences on aquatic ecosystems. Especially in rivers, Phyto benthos is considered to be a suitable parameter to determine the impact of nutrient pollution. In the Danube, nutrients have been identified as significant anthropogenic pressure that threatens river water quality (ICPDR, 2009). Under these conditions, benthic algae are an essential component of all biodiversity studies.

The Phyto benthos of the Danube was composed mainly of diatoms and cyanobacteria, with the last prevailing in the upper Danube. Algae biomass showed an increase in the lower part of the Danube and was most significantly influenced by phosphates and suspended solids.

Macrophytes

Macrophytes are aquatic plants living in the coastal area of lakes and rivers (Haslam, 2006). Taxonomically, they are composed of non-vascular plants (bryophytes), vascular plants (angiosperms) and macroalgae (charophyta, filamentous green algae, etc.). As a life form, macrophytes can be divided into emerging (helophyte) as well as submerged (hydrophilic) macrophyte floating. Surveillance of macrophytes does not stop in river, goes up to the banks of river because of water fluctuations. There are amphibian plants capable of living in and out of the water (amphiphytes), secondary water plants that prefer the wet habitat or plants related to water and species originating from ruderal and nitrophilous habitats. Vegetation of lakes and rivers helps to reduce bank erosion by absorbing some of the wave energy and serves as an animal habitat (Kalff, 2001). Macrophytes attract particles and associated nutrients that form the substrate for bacteria and periphyton. They are also the place of feeding, reproduction and hiding for benthic invertebrates and coastal fish, and a habitat for birds, amphibians, reptiles and mammals. Through an indestructible connection to aquatic habitat macrophytes, they are a very important biological element for assessing the ecological status of rivers and lakes. Therefore, they are chosen as one of the five biological elements for assessing the ecological status of water bodies in the WFD (2000). Macrophytes not only provide information on eutrophication, but also along with bank vegetation indicate the hydro morphological conditions of rivers and lakes and the natural state of aquatic ecosystems.

A total of 198 taxa belonging to bryophytes (35), ferns (4 taxa), angiosperms (150 taxa), charophytes (1 taxon) and other macroalgae (8 taxa) have been identified. In general, angiosperms were the dominant plant group in all sections of the river.

Phytoplankton

An essential element of quality in all major rivers is autotrophic phytoplankton. Photosynthetic processes by primary manufacturers are important in carbon-containing circuits and in the volume of oxygen. Accumulated biomass can serve as food for other trophic levels. The phytoplankton composition and the primary biomass produced indicate the trophic status of the body of water.

In most cases, phosphorus (P) is limited and for this reason is the most relevant nutrient for phytoplankton growth. Among the different forms, total phosphorus (TP) is assumed to be the most relevant. To judge any nitrogen deficiency (N) relative to phosphorus, it is necessary to determine the total concentration of inorganic nitrogen. Chlorophyll is used as a further biomass measurement. The development of diatoms can be estimated from the concentration of dissolved silicon dioxide.

Within JDS3, the chlorophyll distribution of biomass along the river corridor was significantly different from the previous measurement campaigns - JDS1 and JDS2. During the measurement campaigns in JDS1 and JDS2, three sections of the river were defined: a section upstream with small values, a middle section in which the values increased to a maximum and a downstream section with generally low values. During the 2013 study, these distinct sections were somewhat replaced by sections with low and high concentrations, alternatively. The highest concentrations of chlorophyll biomass were identified in the middle section of the river, between km 1481 (Baja) and 1159 (Sava downstream), as well as in the JDS1 and JDS2 campaigns.

The phytoplankton of the river has been largely characterized by centric diatoms, and chlorophytae have also played a major role in most sections. Cyanobacteria were not important (as mass) in sampling sections in the Danube river, while sometimes dominated the tributary plankton.

Fish

Over time, the Danube fish fauna has undergone profound changes due to hydrotechnical works and dams, water pollution, intensification of fishing, as well as due to the advancement of fishing methods and equipment.

Research on the ichthyofauna in the Romanian Danube area led to the identification of 45 species of fish, which are currently the subject of Danube fishing and are included in 13 families and 35 genres.

The intensification of dredging works and the extraction of the sand lead in time to the deterioration of the favorable places for the reproduction and growth of numerous fish species, causing the initial equilibrium of the watercourse to be altered by erosion, the increase of the fine suspension concentration, the clogging of the breeding sites, which leads to the asphyxia of the embryos. The extracted materials are generally gravel and sand.

In total, more than 139,000 individuals, representing 67 fish taxa, were caught during the JDS 3. Danube fish fauna is strongly influenced by non-native species found in all habitats, near the bottom of the river. The lower course of the Danube seems to be influenced by professional and recreational fishing and poaching. The main species of non-migratory fish in the project area are pike (*Esox lucius*), catfish (*Silurus glanis*), zander (*Stizostedion lucioperca*), carp (*Carprice carpio*), prussian carp (*Carassius gibelio*), crucian carp (*Carassius carassius*) asp (*Aspius aspius*), common perch (*Perca fluviatilis*), common rudd (*Scardinius erythrophthalmus*), bream (*Abramis brama*) etc.

The species of migratory fish encountered in the Danube that migrate over very long distances are the anadromous species migrating from the Black Sea to the Danube to reproduce (eg sturgeons, shads), and semi-migratory species resident in the Danube that undertake short migrations to reproduces, feed or winter. Semi-migratory species are species that live and reproduce in the same environment, namely freshwater, in the case of the Danube. Thus, some of these species living in the Danube or other flowing waters migrate to reproduce in stagnant waters. Because these migrations are shorter than the migrations of the anadromous species have been called semi-migratory species (Otel 2007).

In the project area, the anadromous species that migrate to Danube from the Black Sea for spawning and are not included in the list of protected species of Natura 2000 sites are: beluga sturgeon (*Huso huso*), russian sturgeon (*Acipenser gueldenstaedtii*), stellate sturgeon (*Acipenser stellatus*) and sterlet (*Acipenser ruthenus*).

According to the study "Preliminary Migratory Fish Habitat Assessment", prepared by DDNI Tulcea, 2018 based on the information collected during the field visits carried out in the project area, wintering areas were identified for sturgeons in Critical Points Bechet, Batin and Popina. In the other 9 Critical Points, at the time of the study it was not known the existence of other wintering areas for sturgeons near the Romanian bank.

Also, following field visits, bathymetric measurements, and analysis of the substrate of the riverbed, potential habitats for sturgeon deposition were identified in Critical Points Bechet, Corabia and Belene.

Subsequently, in 2019, other potentially or confirmed habitats for sturgeons (wintering, spawning and feeding) were identified in the project area based on the preliminary results obtained under the MEASURE Project and made available by WWF Bulgaria.

In Table 9 the potential and confirmed habitats for the sturgeons in the project area are presented, based on the investigations carried out by DDNI Tulcea in 2018 and based on the preliminary results selected within the MEASURE project.

The locations of potential and confirmed habitats for sturgeons in relation to the proposed works for Scenario 1 and Scenario 2 are presented in Annex C - Drawings, Drawings 2 - 13 (Scenario 1) and Drawings 14 - 25 (Scenario 2).

Table 9 Potential and confirmed habitats for sturgeons - (DDNI Tulcea, 2018 and the MEASURE Project, 2019)

Critical Point	DDNI Tulcea, 2018	Habitat type	Project Measures, 2019	Habitat type
Garla Mare	-	-	In the area between km 838 - 837, near the Bulgarian bank - potential habitat	Wintering

Critical Point	DDNI Tulcea, 2018	Habitat type	Project Measures, 2019	Habitat type
Salcia	-	-	-	-
Bogdan - Secian	-	-	-	-
Dobrina	-	-	-	-
Bechet	In the km 677.7 area, near the Romanian bank - potential habitat	Wintering	In the area between km 676 - 674, near the Bulgarian bank - potential habitat	Spawning
	In the km 674.2 area, near the Bulgarian bank - potential habitat	Spawning	-	-
Corabia	In the km 628 area, near the Romanian bank - potential habitat	Spawning	-	-
	In the km 626.2 area, near the Romanian bank - potential habitat	Feeding	-	-
Belene	In the km 572 area, near the Romanian bank - potential habitat	Feeding	In the area between km 578.2 - 577, near the Bulgarian bank - potential habitat	Spawning
	In the 569 km area, near the Romanian bank - potential habitat	Spawning	In the km 577 - 575 area, near the Bulgarian bank - confirmed habitat	Feeding
	In the of km 565.5 area, near the Romanian bank - potential habitat	Spawning	In the km 575 - 573 area, near the Bulgarian bank - potential habitat	Wintering
	-	-	In the km 567 - 564 area, near the Bulgarian bank - potential habitat	Wintering
	-	-	In the km 562-560 area, near the Romanian bank - potential habitat	Wintering
Vardim	-	-	In the km area 546 - 554, near the Bulgarian bank - potential habitat	Wintering
	-	-	In the km area 542 - 540, near the Bulgarian bank - potential habitat	Wintering
Iantra	-	-	-	-
Batin	In the km-523.5 area, near the Romanian bank - potential habitat	Wintering	In the km 528 - 523 area, near the Bulgarian bank - potential habitat	Wintering
Kosui	-	-	In km 430 - 427, near the Bulgarian bank - confirmed habitat	Feeding

Critical Point	DDNI Tulcea, 2018	Habitat type	Project Measures, 2019	Habitat type
Popina	In the km 409 area, near the Romanian bank - potential habitat	Feeding and wintering	In the km area 400 - 399, near the Bulgarian bank - potential habitat	Spawning
	In the 409 km area, near the Bulgarian bank - potential habitat	Spawning	-	-
	In the km 402.4 area, near the Romanian bank - potential habitat	Feeding	-	-

Considering the research regarding the migratory behavior of sturgeons in the Danube and their speed of swimming are limited in the project area, Table 10 presents for different sturgeon species the critical speeds of swimming taken from the literature.

Table 10 Comparison of the critical swimming speed of different sturgeon species, taken from Cheong T. S. 2006 et al. Evaluation of adult white sturgeon swimming capabilities and applications to fishway design

Species	Age	Length at fork [cm]	Critical speed of swimming [m/s]	Water temperature [°C]	References
Shovelnose Sturgeon (<i>Scaphirhynchus platyrhynchus</i>)	Adult	57-69	0.65 – 1.16	16°C	Adams et al. (1997)
Shovelnose Sturgeon (<i>Scaphirhynchus platyrhynchus</i>)	Juvenile	19.5 – 20.9	0.37	20°C	Adams et al. (2003)
	-	-	0.195	20°C	
Shovelnose Sturgeon (<i>Scaphirhynchus platyrhynchus</i>)	Juvenile	-	0.37 m/s at 20 °C and 0.194 m/s at 10 °C	20 and 10	Adams et al. (2003)
Lake Sturgeon (<i>Acipenser fulvescens</i>)	Adult	-	0.6 – 0.7	14°C	Peake et al. (1995)
Lake Sturgeon (<i>Acipenser fulvescens</i>)	Adult	06-132	"sustained" 0.84	-	Peake et al. (1997)
	-	-	"with momentum"= up to 1.8	-	
Lake Sturgeon (<i>Acipenser fulvescens</i>)	Juvenile	12 -15	"sustained" = 0.26	-	Peake et al. (1997)
	-	23 - 55	"with momentum"= up to 0.09	-	
Pallid Sturgeon (<i>Scaphirhynchus albus</i>)	Juvenile	19.6 – 21.1	0.36	20°C	Adams et al. (2003)
	-	-	0.15	10°C	

Species	Age	Length at fork [cm]	Critical speed of swimming [m/s]	Water temperature [°C]	References
Pallid Sturgeon (<i>Scaphirhynchus albus</i>)	Juvenile	-	0.65 – 1.16	17 -20	Krentz S. (1999)
Pallid Sturgeon (<i>Scaphirhynchus albus</i>)	Juvenile		0.36 m/s at 20 °C and 0.15 m/s at 10 °C	20 and 10	Adams et al. (2003)
Green Sturgeon (<i>Acipenser medirostris</i>)	Sub-adult	65	0.65	19°C	Lankford (2003)
Green Sturgeon (<i>Acipenser medirostris</i>)	-	-	2.1	-	Kelly (2011)

Amphibians and reptiles

Amphibians and reptiles have an important role in the food chain, whether they are insect and / or rodent consumers, or food for predatory species. Tadpoles, generally vegetarian, grow in large numbers and represent a significant proportion of biomass consumers. Subsequently, as adults and insectivorous, they enter the aquatic and terrestrial trophic chains. Reptiles, whether insectivorous or carnivorous, play an important role as secondary or tertiary consumers, usually in the terrestrial trophic chain, even if some species feed on the aquatic environment (Russell et al, 2000).

Many species are protected internationally; reducing their number can also affect predatory species (especially birds).

Birds

For large-scale or medium-scale processes, birds are important indicators in description of the river adjacent areas.

- Bird species, especially for the dynamics of sandbanks habitats and scarced vegetation islands: seagulls, grebes, charadriidae sp.;
- Bird species specific to reed areas: wood sandpiper and reed bunting;
- Species of birds specific to erosive banks: kingfisher; sand martin, European honey buzzard;
- In meadow forests, predatory species have their specific relevance: the grey heron, the cormorant, and other large birds that prefer the habitats of tall poplars.

According to the conclusions of the JDS 3 project, the bird species monitoring results correlate significantly with the results of the hydro-morphological assessment. The monitoring indicated the absence of the sand martin (*Riparia riparia*), and the low population density of the little ringed plover (*Charadrius dubius*) along the Upper Danube, indicating the modification of the hydro morphological processes. However, the large number of territories of the little ringed plover, on the last remaining sections of the Upper Danube indicates the high relevance of the restoration projects along the Danube River.

Mammals

The importance of mammals for the characterization of the Danube has 4 main aspects:

- Large mammals of the Danube forests (deer, wild boar);

- Medium-sized carnivorous species that prefer wetlands (ferret, otter);
- Small mammal species (*Micromys minutus*, *Neomys anomalus* and *Neomys fodiens*);
- Bats specific to forests and wetlands (nocturnal bat, brown bat with long ears).

The Danube bank is of importance for the survival of the common otter populations (*Lutra lutra*). The otter is a species with a higher conservation status among all 59 species. It is protected by the Bonn Convention (Annexes II and III), by the Bern Convention (Annex II), by the Washington Convention - CITES (Annex 1), EU Directive 92/43 (Annexes II and IV). It is also included in the Red List of IUCN - the International Union for Conservation of Nature - the Red Data Book, as a species almost threatened with extinction.

The marbled polecat, the steppe polecat, the wolf and the wild cat have a similarly high conservation status, but the Danube's bank is not of major importance for the survival of these species. The common hamster, the Romanian hamster and the European squirrel have also a high conservation status.

On the Romanian bank of the Danube the following fauna can be found:

- Within the limits of Mehedinti County, in the Danube meadow and confluence areas with the Danube tributaries: dung beetle (*Scarabeus* sp.), Hermann's tortoise (*Testudo hermanni*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*). Avifauna is richly represented by sedentary species, summer species, winter species and passage species. Fish fauna includes: pike (*Esox lucius*), catfish (*Silurus glanis*), zander (*Stizostedion lucioperca*), carp (*Cyprinus carpio*), prussian carp (*Carassius gibelio*), crucian carp (*Carassius carassius*), common perch (*Perca fluviatilis*), common rudd (*Scardinius erythrophthalmus*), bream (*Abramis brama*), tench (*Tinca tinca*), sturgeons, etc.
- In the Dolj County, predominates in the Danube meadow: rodents - Striped field mouse (*Apodemus agrarius*), water vole (*Arvicola terrestris*), European ground squirrel (*Citellus citellus*), European hare (*Lepus europaeus*), steppe polecat (*Mustela eversmanni*). There is also fox (*Vulpes vulpes*), roe deer (*Capreolus capreolus*), European badger (*Meles meles*), European mole (*Talpa europaea*), etc. The azonal and intrazonal fauna is characterized by the bird's fauna - great crested grebe (*Podiceps cristatus*), common snipe (*Gallinago gallinago*), mallard (*Anas platyrhynchos*), gray heron (*Ardea cinerea*), common hoopoe (*Upupa epops*), little egret (*Egretta garzetta*), northern lapwing (*Vanellus vanellus*), common quail (*Coturnix coturnix*), European bee-eater (*Merops apiaster*), sand martin (*Riparia riparia*), ruff (*Calidris pugnax*).
- In the Olt county, the fauna is made up of rodents of rodent's European hare (*Lepus europaeus*), European ground squirrel (*Citellus citellus*), common hamster (*Cricetus cricetus*), Striped field mouse (*Apodemus agrarius*) and the birds are represented by common pheasant (*Phasianus colchicus*), pallid harrier (*Circus macrourus*), long-legged buzzard (*Buteo rufinus*), Rough-legged Buzzard (*Buteo lagopus*) etc. There are also the following southern and Mediterranean species: beetle (*Scarabeus affinis*), balkan wall lizard (*Lacerta Taurica*), Megarian banded centipede (*Scolopendra cingulate*), Termites (*Reticulitermes lucifugus*), Spanish Sparrow (*Passer hispaniolensis*). Aquatic fauna is represented by pike (*Esox lucius*), catfish (*Silurus glanis*), zander (*Stizostedion lucioperca*), carp (*Cyprinus carpio*), prussian carp (*Carassius gibelio*), crucian carp (*Carassius carassius*), asp (*Aspius aspius*), common perch (*Perca fluviatilis*), common rudd (*Scardinius erythrophthalmus*), bream (*Abramis brama*), tench (*Tinca tinca*), sturgeon, etc.
- In the county of Teleorman, the fauna consists mainly of: steppe polecat (*Mustela eversmanni*), European ground squirrel (*Citellus citellus*), common hamster (*Cricetus cricetus*), Striped field mouse (*Apodemus agrarius*), and the most common bird species are: Eurasian Skylark (*Alauda arvensis*), common quail (*Coturnix coturnix*), mallard (*Anas platyrhynchos*), common coot (*Fulica atra*), etc. Azonal fauna is composed of wild boar (*Sus scrofa*), fox (*Vulpes vulpes*), European hare (*Lepus europaeus*), the small cormorant (*Phalacrocorax pygmaeus*), herons (*Ardea* sp., etc.).
- In the county of Giurgiu, it is represented in general by rodents, like common hamster (*Cricetus cricetus*), steppe polecat (*Mustela eversmanni*), field mouse (*Apodemus flavicollis*), and water birds like garganey (*Spatula querquedula*), purple heron (*Ardea purpurea*), northern lapwing (*Vanellus vanellus*), on common coot (*Fulica atra*), etc.). In the rivers and lakes there is a large variety of fish (pike - *Esox lucius*, carp - *Cyprinus carpio*, crucian carp - *Carassius carassius*, bream - *Abramis brama*, common rudd - *Scardinius erythrophthalmus* etc.).

- In the county of Calarasi, the area of the steppe and forests is populated with typical elements adapted to the cultivated land, European hare (*Lepus europaeus*), grass lizard (*Podarcis taurica*), the rape (*Coluber caspius*), steppe polecat (*Mustela eversmanni*), common quail (*Coturnix coturnix*). The fauna of meadows and lakes is much richer, being represented by the fox (*Vulpes vulpes*), the raccoon dog (*Nyctereutes procyonoides*), the Muskrat (*Ondatra zibethica*). The avifauna is extremely rich, in ponds and lakes we can find the mallard (*Anas platyrhynchos*), garganey (*Spatula querquedula*), mute swan (*Cygnus olor*).

The most common fauna species from the project area are presented in Table 11.

Table 11 The most common species of fauna found in the project area

Migratory and semi-migratory fish	beluga sturgeon (<i>Huso huso</i>), russian sturgeon (<i>Acipenser gueldenstaedtii</i>), stellate sturgeon (<i>Acipenser stellatus</i>) and sterlet (<i>Acipenser ruthenus</i>) and schraetzer (<i>Gymnocephalus schraetser</i>)
Non-migratory fish	carp (<i>Cyprinus carpio</i>), catfish (<i>Silurus glanis</i>), zander (<i>Stizostedion lucioperca</i>), prussian carp (<i>Carassius gibelio</i>) crucian carp (<i>Carassius carassius</i>), bream (<i>Abramis brama</i>), common perch (<i>Perca fluviatilis</i>), chub (<i>Leuciscus cephalus</i>),
Amphibians	common toad (<i>Bufo bufo</i>), green toad (<i>Bufo viridis</i>), edible frog (<i>Rana esculenta</i>), marsh frog (<i>Rana ridibunda</i>), agile frog (<i>Rana dalmatina</i>), European tree frog (<i>Hyla arborea</i>)
Reptiles	Hermann's tortoise (<i>Testudo Hermannii</i>), Snake-eyed skink (<i>Ablepharus kitaibelii</i>), European green lizard (<i>Lacerta viridis</i>), sand lizard (<i>Lacerta agilis</i>), dice snake (<i>Natrix tessellata</i>), Balkan wall lizard (<i>Podarcis Taurica</i>), Caspian whipsnake (<i>Dolichophis caspius</i>), Aesculapian snake (<i>Zamenis longissimus</i>), smooth snake (<i>Coronella austriaca</i>), grass snake (<i>Natrix natrix</i>)
Birds	hooded crow (<i>Corvus corone cornix</i>), eurasian blackbird (<i>Turdus merula</i>), eurasian magpie (<i>Pica pica</i>), eurasian buzzard (<i>Buteo buteo</i>), eurasian collared-dove (<i>Streptopelia decaocto</i>), rock dove (<i>Columba livia</i>), house sparrow (<i>Passer domesticus</i>), eurasian tree sparrow (<i>Passer montanus</i>), western jackdaw (<i>Coloeus monedula</i>), eurasian jay (<i>Garrulus glandarius</i>), great tit (<i>Parus major</i>), wood nuthatch (<i>Sitta europaea</i>), common hoopoe (<i>Upupa epops</i>), eurasian golden oriole (<i>Oriolus oriolus</i>), common cuckoo (<i>Cuculus canorus</i>), European bee-eater (<i>Merops apiaster</i>), eurasian sparrowhawk (<i>Accipiter nisus</i>), peregrine falcon (<i>Falco peregrinus</i>), lesser whitethroat (<i>Sylvia curruca</i>), common moorhen (<i>Gallinula chloropus</i>), common snipe (<i>Gallinago gallinago</i>), great crested grebe (<i>Podiceps cristatus</i>), Great cormorant (<i>Pharacrocorax carbo</i>), gray heron (<i>Ardea cinerea</i>), ruddy shelduck (<i>Tadorna ferruginea</i>), gadwall (<i>Anas strepera</i>), whiskered tern (<i>Chlidonias hybrida</i>), common kingfisher (<i>Alcedo atthis</i>), pied avocet (<i>Recurvirostra avosetta</i>).
Mammals	eurasian water shrew (<i>Neomys fodiens</i>), muskrat (<i>Ondatra zibethicus</i>), wild cat (<i>Felis silvestris</i>), coypu (<i>Myocastor coypus</i>), wild boar (<i>Sus scrofa</i>), fox (<i>Vulpes vulpes</i>), roe deer (<i>Capreolus capreolus</i>), European hare (<i>Lepus europaeus</i>), Mushroom (<i>Mustela putorius</i>), European mole (<i>Talpa europaea</i>), European ground squirrel (<i>Citellus citellus</i>),

6.1.6.2 Identify sensitive areas that may be affected by the project

The identification of the sensitive areas that can be affected by the project is presented in Chapter 5.4. Project Planning vs. Sensitive Areas, in Chapter 12.1. Location of the Project vs. Protected Natural Areas of

Community Interest. Name and code of protected areas of community interest can be found in Annex C - Drawings, Plan no. 31- Location of the project in relation to the nearest natural protected areas in the area, Critical Points 01 - 06 and Plan no. 32 - Location of the project in relation to the nearest natural protected areas in the area, Critical Points 07-12.

6.1.6.3 Work, equipment and measures for the protection of biodiversity, nature monuments and protected areas

The main measures for the protection of biodiversity during work execution will be:

- reduction of dredging material volumes and reduction of riverbed areas requiring capital dredging (in areas where the current fairway alignment reaches depth of 3.5 m at ENR - no dredging activities will be performed and the existing bathymetry of the bed in that area is not will change);
- choosing capital dredging methods with lower impact on the environment (e.g. suction dredge);
- reuse of dredged material for the creation of new habitats;
- avoiding unloading dredged material in deep-water areas where there is uncertainty about the use as a breeding habitat for sturgeons, in their feeding areas or in wintering areas for adult sturgeon specimens;
- depositing dredged material in shallow water areas on existing sandbanks or behind goynes and chevrons;
- careful planning of works to set specific time periods for each type of work performed, respecting sensitive periods, especially for fish and bird species.
- avoiding dredging and bank protection works during the reproduction period of the migratory species of fish;
- completion of the proposed works (groynes, chevrons, islands, dredging activities, bank protection) outside the breeding periods of migratory species (March - June);
- avoiding work in potential areas of being reproduction habitats of endangered migratory species;
- monitoring the water turbidity at critical points and downstream of them, so that if turbidity is high, shut down activity for a short period of time to allow sedimentation of suspended particles; resuming work in the shortest possible time;
- avoiding disturbing effects during nesting period in areas where nesting birds are present near the work front;
- the desired scope is that the changes made to the river morphology generated by the construction of the islands and the chevron will not generate high velocities of water;
- drafting and implementing a Monitoring Plan that includes details of potential impacts and measures to minimize impacts on potentially affected species, with attention to fish migratory species, in order to be able to track the evolution over time of possible impact on them;
- inclusion in the Dredging Plan of the provisions for monitoring the quality of sediment, water and biodiversity;

From the selection stage of the Preferred Scenarios, technical measures have been considered for the protection of biodiversity, such as:

- application of the concept of "intelligent disposal" of the dredged material; the use of dredged material for the settlement of shallow water areas favoring the sedimentation of the material from the riverbed, thus eliminating the dredged material from the Danube riverbed;
- the location of hydrotechnical structures was chose as to avoid favorable areas for susceptible species and strictly protected areas within protected natural areas;
- reducing the footprint size of the groynes, chevrons and reducing bank protection length.

During operation, the main measures for the protection of biodiversity will be about the same as at the one in execution of the works stage, except for measures related to the construction of structures that will no longer be applicable at this stage. The main measures are:

- choosing maintenance dredging methods with lower impact on the environment (e.g. suction dredge);
- re-use dredged material to further develop islands and create new habitats;
- avoiding unloading dredged material in deep-water areas where there is uncertainty about the use as a reproductive habitat for sturgeons, into their feeding areas or the potential wintering areas of adult sturgeon specimens;
- depositing dredged material in shallow water areas on existing sandbanks or behind groynes and chevrons;
- avoiding dredging during the breeding period of migratory species (March - June);
- monitoring water turbidity at critical points and downstream of them during dredging works;
- monitoring the species of migratory fish to assess the real impact on them and to identify the necessary measures to reduce the possible negative impact generated by the works done.

At this stage, the potentially affected biodiversity components of the project, including fish migratory species will continue to be monitored, to assess the impacts on them and to respond to the situation where the impact differs from the forecast. In the event of adverse effects on biodiversity, additional measures will be identified and applied to mitigate the negative impact.

6.1.7 Protection of human settlements and other public interest objectives

6.1.7.1 Identify public interest objectives

The existing cultural heritage sites, located on the Romanian Danube bank in the project area, are presented in Chapter 5.2. Location of the site in relation to the cultural heritage.

6.1.7.2 Work, equipment and measures for the protection of human settlements and protected and / or publicly protected objects

For the protection of sites that contain cultural heritage values not identified to date, if any archaeological elements are discovered during the construction works related to the project, the Constructor will comply with the relevant legislative requirements in Romania.

Considering the work to be done through the project, it is not considered that they will have an impact on human settlements, so no measures are needed to protect human settlements.

However, the works may disturb the recreational activities of the population in the project area. To protect the population during recreational activities, construction works will be planned so that weekend works are avoided, when the population is generally engaged in recreational activities.

6.1.8 Prevention and waste management generated on site during project design / during operation, including disposal

6.1.8.1 List, quantities of the waste generated

The main wastes generated during the construction works are as follows:

Non-hazardous waste

- Waste from building and dredging activities:
 - Mixtures of construction and demolition waste (code 17 09 04);
 - Wood waste (code 17 02 01),

- Concrete (code 17 01 01),
- Iron and steel waste (code 17 04 05),
- Gravel waste (code 17 05 08),
- Soil and rocks, other than those specified in 17 05 03 (code 17 05 04) - waste from excavation activities;
- Dredging waste other than those specified in 17 05 05 (code 17 05 06) - wastes from dredging activities;
- Geotextile waste (code 17 06 04) insulating materials other than those specified in 17 06 01 and 17 06 03;
- Packaging waste: paper and cardboard packaging (code 15 01 01), plastic packaging (code 15 01 02), wood packaging (code 15 01 03), metal packaging (code 15 01 04);
- Waste from staff activities:
 - Mixed household waste (code 20 03 01);

Hazardous waste

- Waste from building and dredging activities:
 - Soil and rocks containing hazardous substances (code 17 05 03 *);
 - Dredged material containing hazardous substances (code 17 05 05 *);
 - Gravel waste containing hazardous substances (code 17 05 07 *).
- Engine, transmission and lubrication oils waste:
 - Insulating and heat transmission synthetic oils (code 13 03 08 *);
- Waste from navigation activity:
 - Inland navigation bilge oils (code 13 04 01 *).

The main wastes generated during operation are as follows:

Non-hazardous waste

- Waste from dredging activities:
 - Dredging waste other than those specified in 17 05 05 (code 17 05 06) - waste from dredging activities;
- Waste from staff activities:
 - Mixed household waste (code 20 03 01);

Hazardous waste

- Waste from dredging activities:
 - Dredged material containing hazardous substances (code 17 05 05 *);
- Engine, transmission and lubrication oils waste:
 - Insulating and heat transmission synthetic oils (code 13 03 08*);
- Wastes from navigation activity:
 - Inland navigation bilge oils (code 13 04 01*).

The estimated amount of construction waste that will be generated during the construction period of PC Bechet, Belene and Popina is shown in **Table 12**.

Table 12 Estimated amount of waste from construction materials

CP	Scenario	Geotextile materials [m ²]	Mix sand, gravel, rough rock [m ³]	Rip-rap [m ³]
Bechet	Morpho-engineering works	8,400	1,700	5,800
Belene	Morpho-engineering works	4,500	11,800	5,700
Popina	Engineering works 1	3,300	1,900	5,500

Waste management will be the responsibility of the Contractor of Construction Works, who will draw up and implement the Waste Management Plan.

Dredged material

Dredging will involve both capital and maintenance dredging. Both during the construction works and during operation, the project imposes the implementation of the widely used concept in Europe and in the world of "intelligent disposal". This concept involves keeping the dredged material in the riverbed and using it to improve flow.

The dredged material will be deposited in shallow water areas with a high sedimentation potential. In such cases, the dredging activities will contribute to the natural sedimentation process. The dredged material storage areas proposed in each CP are presented in Appendix C - Drawings, Plans no. 2 - 13.

Also, dredged material will be used to expand existing islands and create new islands (at an early stage) and encourage their growth / development over time in "mature islands."

Removing the dredged material from the riverbed would have a significant hydro morphological negative impact on the Danube, Considering that the river is affected by a huge deficit of finely suspended matter, resulting in a 10-fold lower turbidity upstream and about 3 times smaller downstream, the main consequence of the huge deficit of fine matter in suspension is reflected in the high erosion rate of the banks of about 2,000,000 m³ / year.

The estimated quantities of dredged material in each CP during the construction period are shown in Table 13.

Table 13 Estimated quantity of dredged material in the CP during the execution period

CP	Material quantity [m ³]
Garla Mare	72,000
Salcia	20,000
Bogdan - Secian	79,000
Dobrina	195,000
Bechet	428,800
Corabia	577,000
Belene	1,458.000
Vardim	390,000
Iantra	30,000
Batin	45,000
Kosui	86,000
Popina	837,000

6.1.8.2 Program for prevention and reduction of the quantities of waste generated

During the construction works, the contractor of the construction works has the obligation to prepare and implement a Program for prevention and reduction of the quantities of waste generated. The program for prevention and reduction of the quantities of waste generated will include the following minimum requirements:

- inventory of types of waste generated by waste categories;
- identifying the activities carried out during the waste-generating works and how to manage them;
- identifying measures to manage generated waste;
- identifying measures to prevent and reduce the amount of waste generated.

The for prevention and reduction of the quantities of waste generated must comply with the waste hierarchy to encourage waste generation prevention and efficient and effective waste management so as to reduce their negative environmental impacts.

In national and European legislative provisions, the following priorities are applied:

- prevention / reduction of waste production;
- re-use;
- recycling;
- energy recovery;
- disposal / storage.

Adequate waste management will lead to the reduction of the amount of waste generated and disposed of by storage, and of potential risks to the environment and the population.

Also, during **operation**, the contractor of the dredging works is obligated to prepare and implement a Program for prevention and reduction for the quantities of waste generated for each ship / barge involved in the dredging activities.

Both during the construction works and during the operation period, the project imposes the implementation of the widely used concept in Europe and in the world of "intelligent disposal". This concept involves keeping the dredged material in the riverbed and reuse it for creation of shallow water areas that favor the natural sedimentation of the material from the riverbed.

The project involves setting up dredged material storage areas, even from the construction period. The capital dredging activities and dredged material storage areas that will be set up at all critical points during the construction works will continue with the maintenance dredging activities and storage of the material in the specially designed areas.

Considering along the Danube there are a lot of protected natural areas, implicitly in the project area, it was found that near the PC there are no areas that are not included in the protected area network. Thus, it was virtually impossible to choose areas of storage of dredged material outside protected areas.

Considering this reason, the choice of the dredged material storage areas was made within the Multicriteria Analysis of the analyzed scenarios, based on the bathymetric measurements, the mathematical modeling results and the localization of the natural protected areas in the project area. Thus, in PC zones the dredged material storage areas were proposed to be set up in areas with a natural tendency to sedimentation, so as not to modify the local morphological characteristics of the riverbed. Unloading of additional material in these areas will encourage the sedimentation character of the area.

The placement of the dredged material storage areas in the PC is presented in Annex C - Drawings, Drawing no. 2 - 13.

6.1.8.3 Waste Management Plan

During the construction works, the contractor of the construction works has the obligation to develop and implement a Waste Management Plan. The ways of efficient and legally manage generated waste at this stage will take in consideration the following:

- inventory of the types and quantities of waste that will be produced, including their hazard class;
- assess possibilities for reducing solid waste generation, especially hazardous or toxic waste types;
- determining the modalities and responsibilities for implementation of waste management measures;
- separate collection and capitalization of materials with potential for recovery (wood, metal, plastics);
- strict monitoring of hazardous waste, its temporary storage in safe conditions and deliver to final disposal or disposal through authorized operators.

Within the site organization, the contractor of the construction works will set up a specially designed area for collecting and managing the waste that will result from the construction works. The storage area will be provided with containers, bins, labeled according to the legislation in force. Temporary waste storage will be carried out separately on type of waste generated. The collection of waste by authorized operators will be planned according to the works schedule, so as to avoid temporary storage of large quantities of waste within the site organization.

During **operation**, the maximum degree of recovery of the waste will also be pursued. The contractor of the construction works has the obligation to produce a Waste Management Plan and to implement it on barges, dredges, floating equipment used in dredging maintenance activities. Waste management methods at this stage are similar to those of the construction period, with the reference that waste generated on barges, drags, floating equipment will be collected separately and temporarily stored in specially arranged spaces on board, up to their recovery / disposal by authorized contractors.

In the case of the necessity to carry out maintenance works for the hydrotechnical works, the waste generated will be capitalized / eliminated according to the type of waste on contract basis by authorized operators.

6.1.9 Management of hazardous chemicals and substances

6.1.9.1 Dangerous substances and chemicals used and / or produced

During construction period the project does not plan the use of toxic or dangerous substances for the construction of hydrotechnical structures. However, the presence of floating work equipment and vessels, ships and dredges are still a risk factor for leaking fuels, oils and other substances.

To prevent leakage of fuel, oils and other substances, it is recommended constantly checking the equipment used. In case of accidental pollution, as soon as possible the provisions of the Plan for Prevention and Control of Accidental Pollution will be applied.

6.1.9.2 Managing hazardous substances and chemicals and ensuring the protection of environmental and human health factors

Barges, vessels and dredges needed for activities during the execution and operation of the works will be fuel with fuels in authorized off-site distribution stations. The equipment used for the construction works will be fuel from homologated metallic tanks, stored in specially designated areas of ships.

6.2 Use of natural resources, especially soil, land, water and biodiversity

When carrying out navigation improvement work, only materials complying with the national regulations in force, as well as national legislation and standards harmonized with European Union legislation shall be used.

The use of natural resources during construction works will be indirect, as their use will be made through suppliers of building materials, including the use of mineral aggregates, wood and oil refined fuels.

In the operating period, natural resources will be used in the situation when maintenance works for the hydrotechnical constructions will be necessary.

7. Description of the environmental aspects likely to be significantly affected by the project

7.1.1 Impact on the quality and quantity of water

7.1.2 The potential impact during the execution of the works

During the execution of the works a negative impact on the water quality generated by the water is expected:

- increasing the turbidity due to the execution of the hydrotechnical structures proposed in Bechet Belene and Popina Critical Points, the achievement of the dredging activities and the deposition of the dredged material in the riverbed in all 12 Critical Points;
- the production of accidental pollution with fuels or used oils due to the operation of barges, dredges and floating equipment during the execution of the proposed works in all 12 Critical Points.

Construction works of groynes, chevrons, bank protection and islands will lead to the local increase of suspended matter in the water in the material settling periods (stone) in the riverbed, but this effect will be rapidly diminished as a result of water and dispersion downstream of the suspended matter.

The construction of the groynes will encourage the progressive development of areas with low water, sedimentation area, outside the fairway. Behind the chevrons will develop sedimentation processes that, over time, will evolve into island formations, generally submerged. Construction of bank protections will reduce the banks erosion, which is very aggressive on the Danube's left bank, making it disappear in about 50 years, 53 km² of riparian habitats, compared to about 17 km² newly created sedimentation areas.

During dredging works, the speed of the current does not change but only the mode of the vector velocity distribution, which is orientated along the dredged alignment. In freshly dredged areas, there will be a natural tendency to deposit sediments (transported by the river). In these areas it will always be necessary to perform maintenance dredging works. This effect is local and negligible in comparison with the river transport capacity.

Dredging (of maintenance and of investment) and deposition of dredged material in the riverbed can have a negative impact on water quality by increasing the turbidity. During the dredging works specified in the project, fine materials will be engaged by the water flow, increasing the concentration of suspended matter in water in downstream areas. The period it will occur the dispersion of the fine materials downstream, will depend on the riverbed configuration, the water flows, the Danube flow in those periods, and the alluvial transport capacity of the water flows, as well as the granulometry of the riverbed material. The impact in this case is temporary and will occur over a relatively small distance downstream, considering that most of the material from the riverbed has larger dimensions than suspended matter. The local increase of the suspended matter concentrations depends also on the type of dredging equipment, the total amount of the dredged material and the duration and timing of the works.

Given the fact that, dredging activities involve the removal of relatively recent deposits of river deposits from the riverbed, it is estimated that the suspended matter concentrations may reach values comparable to those during the floods. In conclusion, it is estimated that, the impact of the increase in suspended matter concentrations on water quality is local, in the short term.

On the other hand, it should be mentioned that, the dredging works will also have a beneficial effect from the hydro-morphological point of view, considering that the Danube is affected by a huge deficit of suspended fine matter, leading to a 10 times lower turbidity in the sector upstream and about 3 times smaller in the downstream sector. The main consequence of the huge deficit of suspended fine matter is reflected in the high erosion rate of the banks of about 2,000,000 m³/year.

The presence of dredging equipment, barges and floating equipment can generate accidental pollution with fuels or used oils during the execution of the proposed works in all 12 Critical Points but given the proposed measures to ensure water quality protection during the execution of works, the impact can be considered as insignificant.

Regarding the potential impact on groundwater bodies, it is estimated that the works proposed by the project will have an insignificant effect on phreatic groundwater levels. In the areas where bank protection will be constructed, the drainage section on the designed sectors will be narrowed, which could lead to a slight increase in phreatic groundwater levels, upstream of the built structure.

In areas close to the river, the phreatic groundwater levels are directly dependent on fluctuations of Danube water level. Thus, in the areas where the works proposed by the project will lead to the increase of the Danube water level, there will be an insignificant effect on the phreatic groundwater level. Considering that the Danube water level, will increase in generally up to a few centimeters in the immediate vicinity of the newly built structures, the increase in the phreatic groundwater level will be practically imperceptible. Also, the risk of affecting the river connectivity with the groundwater will be extremely low considering the protective material of the front parts of the groynes, chevrons, islands and bank protections will be made of rip rap that will ensure a high degree of permeability.

Considering that the works will mostly take place in the Danube riverbed, and only in some locations on the bank, it is estimated that there will be no impact on deep groundwater.

The potential impacts of the activities during the execution of the works on the quality and the quantitative water regime, depending on its characteristics will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: reversible and irreversible (local increase of current speed in the structures area);

- The extent of the impact: locally, generally limited to the work perimeters from the critical points area and to the downstream areas of the work perimeters;
- The duration of the impact: on short-term during the execution of the works and permanent (local increase of the current speed in the structures area);
- The probability of the impact: probably and sure;
- The magnitude of the impact: of reduced magnitude;
- Transboundary nature of the impact: will be generated a transboundary impact in the Republic of Bulgaria.

Measures to reduce water pollution are presented in Chapter 6.1.1.3. Considering that, production of an impact on water quality and quantity regime is not significant, there is no need to provide measures to avoid, reduce or improve the significant impact on water quality.

7.1.3 The potential impact during the operating period

During the operation of the works a negative impact on the water quality is expected to be generated by:

- Local increase of the current speed, of the Danube water level, of the erosion/sedimentation processes and of the turbidity due to the execution of the hydrotechnical structures proposed in Bechet, Belene and Popina Critical Points;
- Increase of the turbidity because of maintenance dredging activities in all 12 Critical Points;
- Accidental pollution with fuels or used oils due to the operation of barges and dredges during the execution of the maintenance dredging works in all 12 Critical Points.

According with the results of mathematical modeling, the development of the proposed structures will not lead to a dramatic increase of the maximum speed field. However, where the speeds from the current or realigned fairway are naturally higher than the preferred maximum value of 1.4 m/s, there will be difficulties in limiting the speeds within the fairway to less than 1.4 m/s after building structures.

Simulations of the mathematical model for the analyzed scenarios were performed for the following flows: 2.580 m³ / s (Q94), 5.000 m³ / s (Q5000), 8.000 m³ / s (Q8000) and 14.000 m³ / s (Q14000).

In the *Bechet Critical Point*, the development of the proposed works could lead to local speed increases along the realigned fairway, near the structures for flows of 2,580 m³/s, 5,000 m³/s and 8,000 m³/s. Maximum speeds will increase as follows:

- from 0.8 m/s to 1.2 m/s at a flow rate of 2.580 m³/s;
- from 1.0 m/s to 1.2 m/s at a flow rate of 5,000 m³/s;
- from 1.2 m/s to 1.4 m/s at a flow rate of 8,000 m³/s.

Additionally, speeds decrease could record for the flows of 2,580 m³/s and 5,000 m³/s flows, with the speeds decreasing until the point of stagnation flow.

For the flow of 14,000 m³/s, the speed field barely may change.

In *Belene Critical Point*, the development of the proposed works could lead to the local increases of maximum speeds in the realigned fairway near the structures at all four considered flows. Maximum speeds will increase as follows:

- from 1.2 m/s to over 2.0 m/s at a flow rate of 2.580 m³/s;
- from 1.0 m/s to over 2.0 m/s at a flow rate of 5,000 m³/s;
- from 1.6 m/s to 2.0 m/s at a flow rate of 8,000 m³/s;
- from 1.6 m/s to 2.0 m/s at a flow rate of 14.000 m³/s.

Additionally, speeds decrease could record downstream of chevrons and between the groynes for the flows of 2,580 m³/s and 5,000 m³/s, with the speeds decreasing until the point of stagnation flow.

In *Popina Critical Point*, the development of the proposed works could lead to the local increase of the maximum speeds in the realigned fairway, near the proposed structures, at the flows of 2,580 m³/s and 5,000 m³/s. Maximum speeds will increase as follows:

- from 0.8 m/s to 1.4 m/s at a flow rate of 2,580 m³/s;
- from 1.0 m/s to 1.4 m/s at a flow rate of 5,000 m³/s.

Additionally, speeds decrease could record downstream of chevrons and between the groynes for the flows of 2,580 m³/s and 5,000 m³/s, with the speeds decreasing until the point of stagnation flow.

For flows of 8,000 m³/s and 14,000 m³/s, the speed field barely may change.

Synthesizing, in Bechet Belene and Popina Critical Points, in the vicinity of the constructed structures, the simulated maximal speed increase field for all 4 considered flows, will be between 0.2 and 1.0 m/s.

In Critical Points where only dredging works will be done, the simulations have led to similar results in terms of speed field, with the current conditions in each CP.

It should be mentioned also that, according to the mathematical modeling results, the development of the proposed structures will not lead to an increase of the Danube water level in the 9 critical points where only dredging works are proposed. In the case of the Bechet, Belene and Popina Critical Points, where hydrotechnical structures are proposed to be built, it is estimated that the water level will increase, decrease or be at a stationary level:

- In Bechet Critical Point – increases with 0.06 m as against the Scenario "Dredge Only" at a flow rate of 2,580 m³/s, increases with 0.04 m as against the Scenario "Dredge Only" at a flow rate of 5,000 m³/s, increases with 0.03 m as against the Scenario "Dredge Only" at a flow rate of 8,000 m³/s and increases with 0.02 m as against the Scenario "Dredge Only" at a flow rate of 14,000 m³/s.
- At the Belene Critical Point – decreases with 0.17 m as against the Scenario "Dredge Only" at a flow rate of 2,580 m³/s, increases with 0.11 m as against the Scenario "Dredge Only" at a flow rate of 5,000 m³/s, increases with 0.05 m as against the Scenario "Dredge Only" at a flow rate of 8,000 m³/s and increases with 0.04 m as against the Scenario "Dredge Only" at a flow rate of 14,000 m³/s.
- In Popina Critical Point – increases with 0.16 m as against the Scenario "Dredge Only" at a flow rate of 2,580 m³/s, increases with 0.09 m as against the Scenario "Dredge Only" at a flow rate of 5,000 m³/s, increases with 0.01 m as against the Scenario "Dredge Only" at a flow rate of 8,000 m³/s and maintaining the same level as against the Scenario "Dredge Only" at a flow rate of 14,000 m³/s.

The simulated changes in Danube water level in each CP following the implementation of the proposed works are presented in Table 14.

Table 14 The simulated changes in Danube water level in each CP

Simulated flow	2,580 m³/s		5,000 m³/s		8,000 m³/s		14,000 m³/s	
Scenario	Water level (m BS75)	The difference as against "Dredge Only" (m)	Water level (m BS75)	The difference as against "Dredge Only" (m)	Water level (m BS75)	The difference as against "Dredge Only" (m)	Water level (m BS75))	The difference as against "Dredge Only" (m)
Garla Mare - Dredge Only	27.93	0.00	29.93	0.00	31.91	0.00	35.10	0.00
Salcia - Dredge Only	27.24	0.00	29.26	0.00	31.23	0.00	34.41	0.00
Bogdan – Secian - Dredge Only	25.71	0.00	27.76	0.00	29.71	0.00	32.83	0.00
Dobrina - Dredge Only	25.10	0.00	27.02	0.00	28.94	0.00	32.04	0.00
Bechet -Morpho-engineering works	21.64	0.06	23.46	0.04	25.30	0.03	28.23	0.02
Corabia - Dredge Only	19.86	0.00	21.42	0.00	23.09	0.00	25.84	0.00
Belene – Morpho-engineering works	17.46	-0.17	18.84	0.11	20.39	0.05	23.06	0.04
Vardim - Dredge Only	15.45	0.00	16.86	0.00	18.56	0.00	21.39	0.00
Iantra - Dredge Only	14.59	0.00	16.17	0.00	18.00	0.00	20.94	0.00
Batin - Dredge Only	14.29	0.00	15.91	0.00	17.73	0.00	20.65	0.00
Kosui - Dredge Only	9.85	0.00	11.40	0.00	13.33	0.00	16.59	0.00
Popina – Engineering works (1)	8.64	0.16	10.32	0.09	12.31	0.01	15.63	0.00

Local growth of the erosion process (in front of the structures) and the sedimentation process (downstream of structures) are two interdependent processes that have a beneficial contribution to the sediment dynamics of the bedrock. The eroded material in front of the structures will tend to be deposited downstream, resulting new areas with favorable conditions for the development of new terrestrial or aquatic habitats.

During the operating period maintenance dredging activity may have a negative impact on water quality by increasing the turbidity. The impact of maintenance dredging will be proportional with dredged volumes. Taking into consideration that, for the maintenance dredging activity, much smaller quantities of sediment will be dredged than during the period of execution of the investment dredging works, it is considered that the impact on water quality during the operating period will be locally, much lower than the one of the execution periods of the works and limited in time.

Accidental pollution with pollutants of Danube water may also occur because of functioning of the dredging equipment's, but given the impact mitigation measures, this impact can be considered insignificant.

A particularly important aspect to be mentioned in terms of simulation of the changes made to the average riverbed level is the results of the interdependence tests after the execution of the works proposed in the 12 Critical Points.

In Figure 19, from below can be seen the following:

- It is not expected that there will be almost no significant change in riverbed levels downstream of the 12 Critical Points, suggesting that, the changes of the morphology of the river will only cause changes in the Critical Points area;
- It is estimated that, there will be changes in the riverbed morphology in the area upstream of Belene Critical Point and very little upstream Bechet Critical Point;
- The proposed solutions in most of the Critical Points are not dependent on the solutions proposed in the neighboring critical points, with a possible exception of the area between Critical Points Vardim and Batin.

In conclusion, Critical Points Garla Mare, Salcia, Bogdan-Secian, Dobrina, Bechet, Corabia, Belene, Kosui and Popina can be considered as "independent" Critical Points - the changes produced in a CP will not affect any upstream either downstream CP. Critical Points Vardim, Iantra and Batin can be considered "dependent" critical points - the changes made in a CP can produce effects at the critical points located either upstream or downstream.

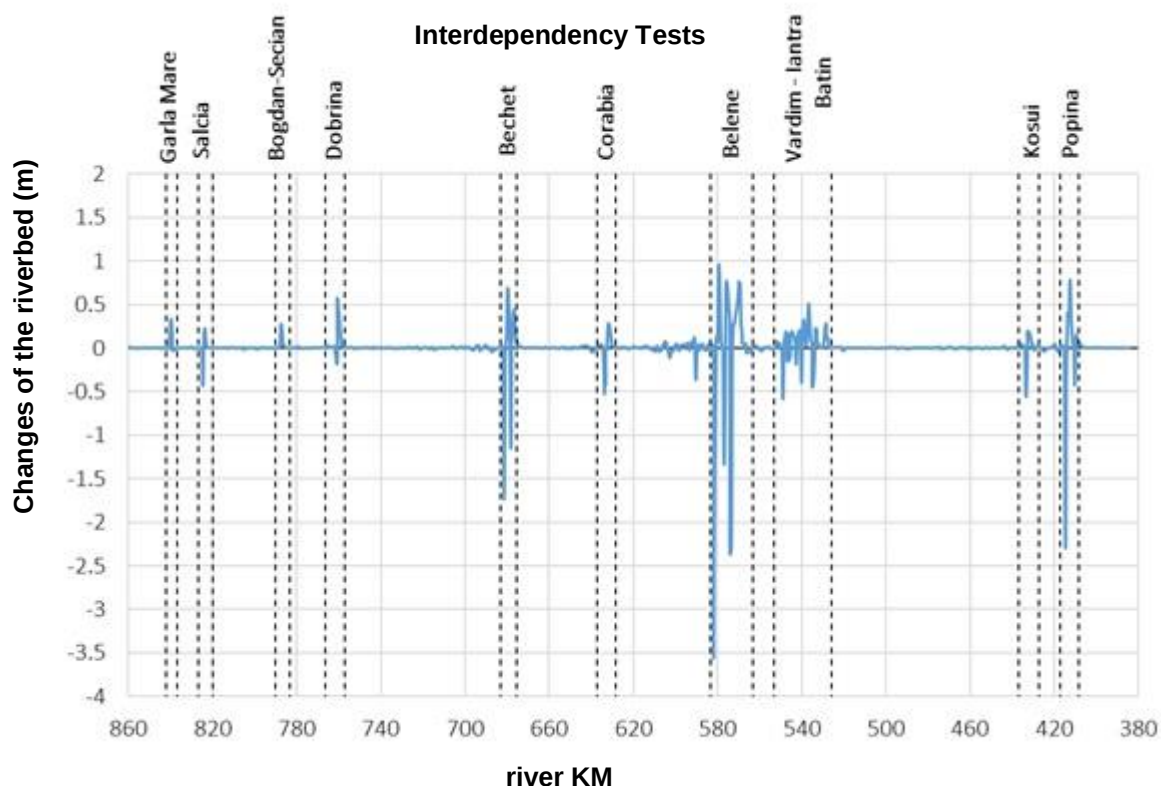


Figure 19 Results of the interdependence tests to simulate changes produced at the average riverbed in Critical Points

The potential impacts of the activities during the operation of the works on the quality and quantity of the water, depending on its characteristics will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: reversible and irreversible (local increase of current speed in the structures area);

- The extent of the impact: locally, generally limited to the work perimeters from the critical points area and to the downstream areas of the work perimeters;
- The duration of the impact: on short-term during the execution of the works and permanent (local increase of the current speed in the structures area);
- The probability of the impact: probably and certain;
- The magnitude of the impact: of reduced magnitude;
- Transboundary nature of the impact: will be generated a transboundary impact in the Republic of Bulgaria.

Measures to reduce water pollution are presented in Chapter 6.1.1.3. Considering that, production of an impact on water quality and quantity regime during the operation phase is not significant, there is no need to provide measures to avoid, reduce or improve the significant impact on water quality.

7.2 Impact on air quality

7.2.1 The potential impact during the execution of the works

During the execution of the works, it is expected that emissions of some pollutants and suspended particulates will increase because of the following emission-generating operations:

- Exhaust emissions from internal combustion engines of the ships, barges and floating equipment's used for construction and dredging and from motor vehicles used for the transport of the material to the place of takeover of the naval transport - in all the 12 Critical Points;
- Dust emissions which are associated with the excavation, handling and commissioning of the building materials (especially of those powdered), of the earth, leveling and bank-sloping of the work areas, as well as other specific works - in Bechet, Belene and Popina Critical Points, where hydrotechnical structures will be built.
- Dust emissions produced by wind action in material storage areas and open operational areas by entraining fine particles into the atmosphere. Dust emission level will be different from one day to another, depending on the level of activity, meteorological conditions and of the specifics of operations - in Bechet, Belene and Popina Critical Points, where hydrotechnical structures will be build.

The potential impacts of activities during the execution of the works, on air quality, depending on its characteristics, will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: reversible;
- The extent of the impact: locally, limited in general to the work area in critical points or to the materials taking over area from the auto vehicles into the naval transport vehicles;
- The duration of the impact: temporarily during the execution of the works;
- The probability of the impact: certain;
- The magnitude of the impact: of reduced magnitude;
- Transboundary nature of the impact: no transboundary impact will be generated in the Republic of Bulgaria.

Measures to reduce air pollution are presented in Chapter 6.1.2.3. Considering that, the impact on air quality is not significant, there is no need to provide measures to avoid, reduce or improve the significant impact on air quality.

7.2.2 The potential impact during the operating period

During the operating period, it is expected an increase of the exhaust emissions from internal combustion engines of the ships, barges and floating equipment's used to perform maintenance dredging works, which will be performed in all 12 Critical Points.

It is also expected to increase emissions because of increased traffic on the Danube after ensuring the navigation conditions at all critical points.

The potential impacts of activities during the operating period, on air quality, depending on its characteristics, will be:

- The nature of the impact:
 - *maintenance dredging activity*: negative;
 - *traffic on the Danube*: negative.
- The type of the impact:
 - *maintenance dredging activity*: direct;
 - *traffic on the Danube*: indirectly.
- The reversibility of the impact:
 - *maintenance dredging activity*: reversible;
 - *traffic on the Danube*: irreversible.
- The extent of the impact:
 - *maintenance dredging activity*: locally, limited in areas where maintenance dredging is performed;
 - *traffic on the Danube*: in the neighboring areas along the Danube.
- The duration of the impact:
 - *maintenance dredging activity*: temporary, during the execution of the works;
 - *traffic on the Danube*: permanent.
- The probability of the impact:
 - *maintenance dredging activity*: certain;
 - *traffic on the Danube*: certain.
- The magnitude of the impact:
 - *maintenance dredging activity*: of reduced magnitude.
 - *traffic on the Danube*: of medium magnitude.
- Transboundary nature of the impact:
 - *maintenance dredging activity*: no transboundary impact will be generated;
 - *traffic on the Danube*: a transboundary impact will be generated in the Republic of Bulgaria.

Measures to reduce the impact on air quality are presented in Chapter 6.1.2.3. Considering that, the impact on air quality is not significant, there is no need to provide measures to avoid, reduce or improve the significant impact on air quality.

The Traffic Study for the area of influence of the project, including short, medium and long-term forecasts on the emissions generated by the traffic on the Danube, will be finalized in a further stage of development of the Feasibility Study. Air emissions calculation will be made available after the Traffic Study is completed.

7.3 Noise and vibration

7.3.1 The potential impact during the execution of the works

During the execution of the works, it is expected that the noise and vibration levels will increase as a result of the following noise and vibration generating operations:

- noise from the functioning of equipment used for dredging and disposal of dredged material in specially designated areas (barges, hydraulic dredgers, floating cranes, loaders, etc.) in all 12 Critical Points;
- noise from the functioning of the equipment used for the construction works, from naval and road transportation of the materials in Bechet, Belene and Popina Critical Points.

In the vicinity of the functional equipment used for construction works or dredging activities, the estimated noise level will be approximately 90dBA. In the loading / unloading areas of the construction materials, the estimated noise level will be approximately 75dBA. The noise generated by the transport vessels depends on the ship type, speed, maintenance status, etc. Similarly, the noise generated by the means of road transport depends on their type, speed, etc. Transportation of materials by lorries will be performed using the existing road network in the area of interest. In general, the road network crosses the settlements in the region, thus affecting the acoustic environment of the areas adjacent to the road used.

The noise from the equipment used and from the ships carrying the dredged material and construction materials spreads both underwater and above it. No negative impact is expected on areas with regulated noise requirements, located at a minimum distance that varies from 50m to 100m depending on the area's specificity. However, it is expected that the noise propagated in the water will affect the aquatic fauna species and determine the separation of the areas in which they live. After the noise has ceased in that area, it is also expected that aquatic fauna species less sensitive to aquatic disturbances will return to the area (non-migratory fish species).

At some critical points, the noise of the site activities can disturb the birds, especially during nesting. It is known that some bird species do not seem to be disturbed by a higher-level noise source as long as the source is not directed towards the nest, the resting or feeding place.

However, during the nesting period, especially during choosing their nest and during the nest construction, birds are much more careful, more cautious, more sensitive, leaving the nest site as soon as they are disturbed by the noise or the presence of humans, or by permanent movement of the equipment. The black stork, the imperial eagle and the white-tailed eagle are some of the bird species that do not tolerate nesting or the proximity of humans at distances less than 300-500 m from the nest.

Also, the operation of the equipment can disturb the generated noise, the insectivorous birds that seek and hunt insects flying over the water.

Vibrations resulting from the execution of excavation work, the laying of stone layers or the transport of materials can also cause a negative impact on terrestrial and aquatic fauna.

The potential impact of the activities during the execution of the works on the noise and vibration level, depending on its characteristics, will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: reversible;
- The extent of the impact: local, generally limited to the work area in the area of the critical points or to the take-off area of the materials from the vehicles in the ship's means of transport;
- The duration of the impact: temporarily, during the execution of the works;
- The probability of the impact: certain;
- The magnitude of the impact: low magnitude,

- Transboundary nature of the impact: no transboundary impact will be generated.

The noise and vibration reduction measures are presented in Chapter 6.1.3.3. Given that the impact of high noise and vibration is not significant, it is not necessary to provide measures to avoid, reduce or ameliorate the significant impact on air quality.

7.3.2 Potential impact during the operating period

In the operational period it is expected to increase the noise level from the operation of ships, barges and floating equipment used to carry out maintenance dredging works that will be carried out in all 12 Critical Points.

It is also expected to increase the noise level as a result of increased traffic on the Danube after ensuring the navigability conditions at all critical points. However, it is not to be expected that the future traffic of the Danube's navigable waterway will be a source of noise beyond the limits set for the settlements along the Bulgarian and Romanian banks.

The potential impact of the activities of the operation of the works in terms of noise production, depending on its characteristics, will be:

- The nature of the impact:
 - *maintenance dredging activities: negative;*
 - *traffic on the Danube: negative.*
- The type of the impact: direct;
 - *maintenance dredging activities: direct;*
 - *traffic on the Danube: indirectly.*
- The reversibility of the impact:
 - *maintenance dredging activities: reversible;*
 - *traffic on the Danube: reversible.*
- The extent of the impact:
 - *maintenance dredging activities: local, limited in areas where maintenance dredging is carried out;*
 - *traffic in the Danube: in the areas immediately adjacent to the Danube riverbanks.*
- The duration of the impact:
 - *maintenance dredging activities: temporarily during the execution of the works;*
 - *traffic on the Danube: permanently during navigation on the Danube.*
- The probability of the impact:
 - *maintenance dredging activities: certain;*
 - *traffic on the Danube: certain.*
- The magnitude of the impact:
 - *maintenance dredging activities: low magnitude,*
 - *traffic on the Danube: low magnitude.*
- Transboundary nature of the impact: no transboundary impact will be generated in Bulgaria.
 - *maintenance dredging activities: no transboundary impact will be generated;*
 - *traffic on the Danube: a transboundary impact will be generated in Bulgaria.*

Measures to reduce the impact on air quality are presented in Chapter 6.1.3.3. Since the impact on air quality is not significant, it is not necessary to provide measures to avoid, reduce or ameliorate the significant impact on air quality.

The traffic study for the area of influence of the project, including short, medium and long-term forecasts of the noise level produced as a result of traffic intensities on the Danube, will be finalized at a later stage of the Feasibility Study. Calculation of noise levels will be available after completion of the Traffic Survey.

7.4 Impact on soil and subsoil

7.4.1 Potential impact on the execution period of the works

During the execution of the works, it is expected to produce an impact on the soil as a result of the hydro-technical structures requiring embedding in the following Critical Points: Bechet (bank protection), Belene (bank protection) and Popina (bank protection).

The works provided by the project (groynes, chevrons, islands, dredging) will be mostly made in the Danube riverbed, with the exception of the areas where hydro-technical works (groynes) require embedding.

The bank protection and the groynes edges will be constructed in areas that are temporarily or permanently covered by water.

The current land use where the works will be carried out is represented mainly by water-covered areas and riverbank areas with arboreal vegetation (willow, poplar mixed with hardwood species) and areas covered with grass vegetation.

The embedding zone in the riverbanks will have a local impact on the ground in riverbank areas, through land clearing at riverbank embedding points (where necessary), by digging in the bank or bottom of the riverbank for laying the construction. These works will impact the soil on a narrow strip along the bank, in the area adjacent to the construction, mainly due to: loss of the soil layer and modification of the soil structure.

In terms of bank protection, it should be noted that, depending on the local hydrodynamic conditions, bank protection can be made from buried rip rap to the typical level for winter floods, in which case it is not necessary to lay the rock bed on the whole slope of the riverbank. For this type of bank protection, the excavation works will only affect the base area of the riverbank. In this case, it is not expected to produce an impact on the soil.

If the period of time between the clearing works and the execution of the constructions will be extended as a result of the occurrence of unforeseen situations, this will lead to the erosion of the banks and eventually to the bank collapse in the areas where excavations were made at the base of the riverbank.

In conclusion, the works provided by the project will lead to the temporary or long-term disturbance of the soils on a narrow strip along the bank, in the perimeter of the execution of the works.

In terms of storage, the dredged material in the critical sections for navigation is considered to have no impact on the soil, as it will be deposited directly in specially selected areas of the Danube bed, without being temporarily deposited on the banks.

As far as the site organization is concerned, their arrangement will be the responsibility of the contractor of the construction works. If necessary, the organization of offshore construction sites will be located near Bechet Critical Points, Belene and Popina, in areas approved by local authorities.

The project does not foresee the use of toxic or dangerous substances for the construction of hydro-technical constructions.

The potential impact of the activities during the execution of the works on the soil, depending on its characteristics will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: irreversible;
- The extent of the impact: local, limited to bank protection areas (Bechet Critical Points, Belene) and in the embedding areas in the riverbank (Bechet Critical Points, Popina);
- The duration of the impact: temporarily, during the execution of the works;
- The probability of the impact: certain;
- The magnitude of the impact: low magnitude;

- Transboundary nature of the impact: no cross-border impact will be generated.

Measures to reduce the impact on subsoil soil quality are presented in Chapter 6.1.5. Considering that the impact on soil and subsoil is not significant, it is not necessary to provide measures to avoid, reduce or ameliorate the significant impact on soil and subsoil quality.

7.4.2 Potential impact during the operating period

During the operation of the works, it is expected to produce an impact on the soil as a result of the presence of hydrographic structures embedded in the riverbank, Bechet points (bank protection and groynes), Belene (bank protection) and Popina (groynes) Critical Points. The impact will result from the occupation of some riverbank areas by bank protection and the extremities of the groynes and the modification of the precipitation infiltration regime in the perimeter of the constructions.

It is not expected to produce an impact on the soil as a result of maintenance dredging activities, the dredged material being stored in the riverbed in the areas specially arranged and regulated by the National Administration "Apele Romane".

The potential impact of the activities during the operation of the works on the soil, depending on its characteristics, will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: irreversible;
- The extension of the impact: local, limited to riverbank areas occupied by bank protection and embedding areas of the groynes in Bechet, Belene and Popina Critical Points;
- The duration of the impact: permanent during the operation of hydrotechnical structures (bank protection and groynes);
- The probability of the impact: Certain;
- The magnitude of the impact: low magnitude,
- Transboundary nature of the impact: no cross-border impact will be generated.

Considering that the impact of soil and subsoil during the operation of the works is not significant, it is not necessary to provide measures to avoid, reduce or ameliorate the significant impact on soil and subsoil quality.

7.5 Impact on biodiversity

7.5.1 The potential impact during the execution of the works

During the execution of the works, a negative impact on the biodiversity (especially aquatic flora and fauna) is to be expected to be generated by:

- the increased turbidity level due to the construction of the hydrotechnical structures proposed in Bechet, Belene and Popina Critical Points, to the dredging activities and to the disposal of the dredged material in the riverbed in all 12 Critical Points;
- modification of the shelter and food areas of the aquatic and terrestrial fauna due to the construction of the hydrotechnical structures proposed in Bechet, Belene and Popina Critical Points and as a result of the dredging activities and the disposal of the dredged material in the bed in all 12 Critical Points;
- fragmentation of the Danube course (upstream and downstream the river sector), thus sharing the ecosystem in two areas with different habitat characteristics as a result of the bank protection proposed at Bechet Critical Points, Belene and Popina;
- alteration of the distribution of migratory and non-migratory fish species in the upstream and downstream river sectors as a result of construction works, dredging and disposal of dredged material in the 12 Critical Points;

- disturbance of the fish migration paths following the execution of the hydrotechnical structures proposed in Bechet, Belene and Popina Critical Points;
- disturbance of aquatic and terrestrial habitats through the nature of activities carried out in all 12 Critical Points;
- accidental pollution with fuel or used oil as a result of the operation of barges, dredges and floating equipment during the execution of the proposed works in all 12 Critical Points.

Most of the proposed works to be done through the project are located in the Danube bed and on riverbank areas. In some sectors along the Danube, changes have occurred over time, by hydrotechnical arrangements, while the unseen sectors have preserved the natural character of the area.

Disposal of the dredged material on the riverbed can generate both negative and positive impact. The main forms of impact are:

- affecting habitats or spawning sites or brood development;
- burial of slow or sedentary species;
- decreasing the quality of habitats due to increased turbidity and reduced visibility;
- disturbance of protected areas and species due to noise and emissions generated during the execution of works;
- creation of new habitats or extension of existing habitats.

Aquatic plants such as algae and higher order plants that prefer quiet, slow-flowing areas or ponds in floodplains, may be affected by altered abiotic parameters such as water velocity, turbidity, light, shade, substrate. Changing these parameters would indirectly lead to alteration of feeding conditions in the habitat.

In the case of works to be carried out on the riverbanks, it is estimated that conditions may occur that will affect the fauna species whose habitat is located in the immediate vicinity of the bank front or riverbank base and the disturbance of the flora as a result of cleaning, clearing works and excavation works.

For riverbank access to works from Bechet, Belene and Popina Critical Points, the areas on the riverbank with arboreal vegetation (willow, arboreal species of hardwoods, poplar mixed with hardwood species and arboreal species of hard essences), and areas covered with grass vegetation. The herbivorous vegetation will recover after the disturbing factor has been withdrawn. Reducing stress on flora and fauna is an essential factor in habitat restoration.

In the areas where deforestation will be needed, the impact on the stands will be irreversible. Temporarily occupied lands will be brought to the initial state after the works are finished and returned to the forestry circuit.

It should be mentioned that, generally on the bank, the area covered with autochthonous vegetation was replaced with planted arboreal vegetation.

In case of accidental pollution with fuel or used oil due to the operation of barges, dredges and floating equipment, it is possible to have an impact on water quality and sediment, affecting the flora and fauna of the area. The intensity of impact will depend on the severity of accidental pollution. Given that on each barge or dredge will be implemented a plan to prevent and combat accidental pollution, it is not expected to have a significant impact on flora and fauna.

Terrestrial fauna species close to work fronts will tend to retreat to remote areas due to the noise generated by construction work. It is expected that the impact on terrestrial fauna species will be diminished.

The species of invertebrates specific to erosive riverbanks are the most adapted to river dynamics. Their habitats are constantly changing. A similar situation is presented by invertebrates on sandbars and holms. Other invertebrate species use low banks as habitat, depending on certain stages of development or depending on the seasons.

Given the dynamics of terrestrial invertebrates, no significant impact on these species is expected.

Phytobenthos, macrophytes and phytoplankton are the species most affected by the construction and dredging projects proposed by the project, with a significant impact on them.

Construction activities could lead to the deterioration of favorable locations for the reproduction and growth of many migratory species (including sturgeons) and non-migratory species. Changing the initial equilibrium of the erosion water course, increasing the concentration of suspended matter, clogging the breeding sites could lead to asphyxia of the embryos. Also, the presence of newly constructed structures in the water can constitute physical barriers in the general migration of migratory fish species (including sturgeons) and non-migratory species.

Dredging activities (investment and maintenance) can have an impact on migratory fish, including sturgeons due to habitat loss, hydraulic drift, turbidity and underwater noise and interruption of the migratory fish species life cycle.

Solid suspensions in river water or materials (sand / organic matter) resulting from dredging and deposited in the riverbed in inappropriate areas may affect the reproductive, feeding or wintering habitats of migratory fish. In the case of migratory fish habitats, the storage of dredged material can affect the fauna of benthic invertebrates, which are an important source of food for them during migration (e.g. young sturgeons that migrate downstream and feed in these areas). In the case of reduction habitats, inappropriate storage may lead to alteration of the substrate which fish are spawning. The typical sturgeon habitat for reproduction is a rough substrate consisting of rock, gravel, boulders, and in the case of storage of the dredged material, it would be modified, being covered with sand, soil or other organic matter resulting from dredging.

Considering that the knowledge of sturgeon's migratory behavior, spawning areas, juvenile survival, etc. are limited in the project area, it is very likely that there are other unknown areas for spawning, wintering and feeding areas. Studying in detail the behavior of sturgeons and inventing habitats favorable to their development would require a monitoring program developed over several years, which is impossible to achieve at the current stage of the project due to time and budget considerations.

Since Lower Danube is the last sector on the river, where these populations could spawn and reproduce, the potential impact of the project on sturgeon species will be analyzed in detail starting from the premise of the worst-case scenario "The worst-case scenario").

In addition to the negative impact of newly built structures are expected to produce a positive impact also. Chevron type structures (U-shaped or U-shaped riverbeds with upstream tip) will have a dual role - to improve navigation by deviating flows to the fairway and creating habitats with varying depths and low velocities of water.

In the area behind the chevrons erosion pits will appear and further downstream there will form sedimentation areas, which will lead to the formation of sand bars over time. These sedimentation areas behind the chevron can serve as storage areas for the dredged material that lead over time to the formation of the islands. The zones where the flow is slowed are suitable for wintering or shelter for the juvenile. The vegetation that will develop on the new construction structure is a source of fish food.

Overall, chevron structures are considered to compensate for the loss of habitats of some fish species by creating new habitats.

In the case of the groynes, from the early stages of the project, technical measures for the protection of fish species were taken into account, namely the creation near the bank of a channel allowing the migration of fish along the bank.

The bird species that may be affected as a result of the construction work are generally bird species whose habitats are found on the sandbars and holms, bird species specific to reed areas, those specific to erosive riverbanks and predatory ones. No significant impact on bird species is expected.

In the case of mammals, it is believed that construction works could produce a minor impact on medium-sized carnivorous species that prefer wetlands, small mammals and bats (if present in the immediate vicinity of the work front).

The preliminary identification of the cause-effects-impact related to the proposed works in the execution stage is presented in Table 15 and the estimation of the potential impact associated with the project in the execution stage is presented in Table 16.

Table 15 Preliminary identification of the cause-effect-impact-related consequences of the proposed works in the execution stage

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components													Associated form of impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic plants	Terrestrial plants	Aquatic invertebrates	Terrestrial invertebrates	Invasive plant species	Migratory and semi-migratory fish	Non-migratory fish	Amphibians	Reptiles	Birds	Mammals	
Execution	Investment dredging / fairway realignment	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Hydro morphological modification of habitats	☑		☑		☑		☑	☑	☑					HA
		Changing water chemistry	☑		☑		☑		☑	☑	☑					HA
		Aquatic fauna mortality					☑			☑	☑					RPN
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Groynes	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Disturbing the fish migration paths								☑						DSA
		Disruption of aquatic and terrestrial habitats	☑	☑												HL/HA
		Final occupation of surfaces with natural vegetation		☑		☑		☑	☑			☑	☑	☑	☑	HL
		Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Changing the flow regime	☑		☑		☑		☑	☑	☑			☑		DSA
		Burying slow or sedentary species					☑			☑	☑					RPN
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Chevrans	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Disturbing the fish migration paths								☑						DSA
		Disruption of aquatic and terrestrial habitats	☑	☑												HL/HA
		Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Changing the flow regime	☑		☑		☑		☑	☑	☑			☑		DSA
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Bank protection (hard type)	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Fragmentation of the Danube course	☑	☑	☑	☑	☑	☑				☑	☑		☑	HF/DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Disruption of aquatic and terrestrial habitats	☑	☑												DSA
		Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Hydro morphological changes to habitats	☑		☑		☑		☑	☑	☑					HA
		Burying slow or sedentary species					☑			☑	☑					RPN

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components													Associated form of impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic plants	Terrestrial plants	Aquatic invertebrates	Terrestrial invertebrates	Invasive plant species	Migratory and semi-migratory fish	Non-migratory fish	Amphibians	Reptiles	Birds	Mammals	
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Creation of new islands and / or extension of existing islands	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Disruption of aquatic and terrestrial habitats	☑	☑												DSA
		Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Changing the flow regime	☑		☑		☑		☑	☑	☑			☑	☑	HA
		Burying slow or sedentary species					☑			☑	☑					RPN
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Dredging material storage areas	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Disruption of aquatic and terrestrial habitats	☑	☑												DSA
		Affect habitats or spawning sites or brood development	☑				☑			☑	☑					HA
		Burying slow or sedentary species					☑			☑	☑					RPN
		Alteration of aquatic plants feeding conditions			☑											HA
		Hydro morphological changes to habitats	☑		☑		☑		☑	☑	☑					HA
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Performing land clearing, excavation works in the riverbank area - water level	Disruption of aquatic and terrestrial habitats	☑	☑												HA
		Disturbance of grass vegetation				☑						☑	☑	☑		HA
		Removal of tree vegetation				☑								☑	☑	HA
		Burying slow or sedentary species					☑			☑	☑					RPN
		Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Operating barges, dredges, floating equipment's	Production of accidental pollution with fuel or waste oil	☑		☑		☑			☑	☑	☑			☑	HA/DSA
		Atmospheric emissions				☑		☑				☑	☑	☑	☑	DSA
		The penetration of invasive species	☑		☑				☑							HA
		Noise					☑			☑	☑	☑	☑	☑	☑	DSA
Execution	Organization of construction site	Temporary occupation of surfaces with natural vegetation		☑		☑		☑	☑			☑	☑	☑	☑	HA
		Production of accidental pollution with fuel or waste oil	☑	☑	☑	☑	☑	☑				☑	☑	☑	☑	HA
		Atmospheric emissions		☑		☑		☑				☑	☑	☑	☑	HA

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components													Associated form of impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic plants	Terrestrial plants	Aquatic invertebrates	Terrestrial invertebrates	Invasive plant species	Migratory and semi-migratory fish	Non-migratory fish	Amphibians	Reptiles	Birds	Mammals	
		Storage of materials and waste		☑		☑		☑				☑	☑	☑	☑	HA
		Noise and vibration									☑	☑	☑	☑	DSA	
		Artificial lighting					☑				☑	☑	☑	☑	DSA	
Execution	Existing access roads	Atmospheric emissions		☑		☑		☑				☑	☑	☑	☑	HA
		Noise and vibration						☑				☑	☑	☑	☑	HA
		Collision with terrestrial fauna						☑				☑	☑	☑	☑	RPN
		The penetration of invasive species		☑		☑		☑								HA

Legend:
HL - Habitat Loss
HA - Habitat Alteration
HF - Habitat Fragmentation
DSA - Disturbance of Species Activity
RPN - Reduction of Populations Number
IH - Improving Habitats

Table 16 Estimation of the potential impact associated with the project in the execution stages

Stage	Interventions (causes)	Effects	Associated form of impact generated	Estimated potential impact								
				Impact nature	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Execution	Investment dredging / fairway realignment	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	Yes
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	Yes
		Hydro morphological modification of habitats	HA	Negative	Direct	Yes	Regional	Short	Once	Very likely	Reversible	No
		Changing water chemistry	HA	Negative	Direct	No	Local	Short	Once	Probable	Reversible	No
		Aquatic fauna mortality	RPN	Negative	Direct	Yes	Zonal	Short	Once	Probable	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Short	Once	Very likely	Reversible	No
Execution	Groynes	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disturbing the fish migration paths	DSA	Negative	Direct	No	Regional	Temporary	Intermittent	Very likely	Reversible	Yes
		Disruption of aquatic and terrestrial habitats	HL/HA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Final occupation of surfaces with natural vegetation	HL	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Final occupation of some riverbed areas	HL	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Changing the flow regime	DSA	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Burying slow or sedentary species	RPN	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No
Execution	Chevrans	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disturbing the fish migration paths	DSA	Negative	Direct	No	Regional	Temporary	Intermittent	Very likely	Reversible	Yes

Stage	Interventions (causes)	Effects	Associated form of impact generated	Estimated potential impact								
				Impact nature	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
		Disruption of aquatic and terrestrial habitats	HL/HA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Final occupation of some riverbed areas	HL	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Changing the flow regime	DSA	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No
Execution	Bank protection (hard type)	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Fragmentation of the Danube course	HF/DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disruption of aquatic and terrestrial habitats	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Final occupation of some riverbed areas	HL	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Hydro morphological changes to habitats	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Burying slow or sedentary species	RPN	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No
Execution	Creation of new islands and / or extension of existing islands	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disruption of aquatic and terrestrial habitats	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Final occupation of some riverbed areas	HL	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Changing the flow regime	HA	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Burying slow or sedentary species	RPN	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No

Stage	Interventions (causes)	Effects	Associated form of impact generated	Estimated potential impact								
				Impact nature	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Execution	Dredging material storage areas	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Periodic	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disruption of aquatic and terrestrial habitats	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Affect habitats or spawning sites or brood development	HA	Negative	Direct	No	Local	Long	Without interruptions	Very likely	Irreversible	Yes
		Burying slow or sedentary species	RPN	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Alteration of aquatic plants feeding conditions	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Probable	Reversible	No
		Hydro morphological changes to habitats	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No
Execution	Performing land clearing, excavation works in the riverbank area - water level	Disruption of aquatic and terrestrial habitats	HA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disturbance of grass vegetation	HA	Negative	Direct	No	Local	Permanent	Once	Very likely	Reversible	No
		Removal of tree vegetation	HA	Negative	Direct	No	Local	Permanent	Once	Very likely	Irreversible	No
		Burying slow or sedentary species	RPN	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
		Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Once	Very likely	Reversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No
Execution	Operating barges, dredges, floating equipment's	Production of accidental pollution with fuel or waste oil	HA/DSA	Negative	Direct	Yes	Local	Short	Accidental	Unlikely	Reversible	No
		Atmospheric emissions	DSA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Reversible	No
		The penetration of invasive species	HA	Negative	Secondary	Yes	Regional	Long	Accidental	Probable	Reversible	No
		Noise	DSA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Reversible	No
Execution	Organization of construction site	Temporary occupation of surfaces with natural vegetation	HA	Negative	Direct	No	Local	Short	Without interruptions	Probable	Reversible	No
		Production of accidental pollution with fuel or waste oil	HA	Negative	Direct	Yes	Local	Short	Accidental	Unlikely	Reversible	No

Stage	Interventions (causes)	Effects	Associated form of impact generated	Estimated potential impact								
				Impact nature	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
		Atmospheric emissions	HA	Negative	Direct	Yes	Local	Short	Intermittent	Very likely	Reversible	No
		Storage of materials and waste	HA	Negative	Direct	No	Local	Short	Intermittent	Probable	Reversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Short	Intermittent	Very likely	Reversible	No
		Artificial lighting	DSA	Negative	Direct	No	Local	Short	Intermittent	Probable	Reversible	No
Execution	Existing access roads	Atmospheric emissions	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Reversible	No
		Noise and vibration	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Reversible	No
		Collision with terrestrial fauna	RPN	Negative	Direct	Yes	Local	Temporary	Accidental	Probable	Reversible	No
		The penetration of invasive species	HA	Negative	Secondary	Yes	Regional	Long	Accidental	Probable	Reversible	No

Legend:
HL - Habitat Loss
HA - Habitat Alteration
HF – Habitat fragmentation
DSA - Disturbance of Species Activity
RPN - Reduction of Populations Number
IH - Improving Habitats

For biodiversity components for which no significant impact is expected, Chapter 6.1.6.2 outlines the main measures for biodiversity protection.

7.5.2 The potential impact during the operational period

During the operational period, a negative impact on biodiversity (especially aquatic flora and fauna) generated by:

- the increase of turbidity as a result of the dredging activities and the disposal of the dredged material in the riverbed in all 12 Critical Points;
- changing the shelter and food grounds of aquatic and terrestrial fauna as a result of dredging activities and depositing the material dredged in the riverbed in all 12 Critical Points;
- fragmentation of the Danube course (the upstream river sector and the downstream river sector), thus sharing the ecosystem in two areas with different biotope characteristics following the presence of bank protection at Bechet, Belene and Popina Critical Points;
- the alteration of the distribution of migratory and non-migratory fish species in the upstream and downstream river sectors as a result of the dredging and depositing of the dredged material in the 12 Critical Points;
- disturbance of aquatic habitats by carrying out dredging activities and depositing dredged material in the riverbed in all 12 Critical Points;
- development of the invasive species in the 12 Critical Points, as a result of the intensification of trade, tourism and cross-border transport of goods;
- accidental pollution with fuel or used oil as a result of the operation of barges, dredges and floating equipment during the execution of the proposed works in all 12 Critical Points.

The potential impact on biodiversity during the operational period will affect the same components of biodiversity as in the Construction Stage, but it will be much diminished compared to the impact generated in the Construction Stage, considering that in this stage there will be performed only maintenance dredging activities and storage of dredged material. The amount of dredged material in the Operational Stage will be much diminished compared to the construction period.

Hydraulic modelling with the new structures has shown that in the vicinity of the structures there will be small changes to water velocities, and although hydro-technical works executed in the riverbed will be considered as barriers to the normal migration of migratory species including sturgeons, the deepening of the fairway at over 3.5m at ENR a has a positive impact on sturgeons, for example, swimming in deep water areas with high turbidity. Thus, the migration of sturgeons upstream will be favored by the deep water after dredging.

Another positive impact that will be generated during the period of operation on the flora and fauna species is the creation of new habitats in the dredging areas of the islands and the accumulation of sedimentary material behind the groynes and chevrons.

If the monitoring program determines that the impact on the different components of the biodiversity is not the estimated one, then additional impact reduction measures will be taken to produce positive effects over the previous stage.

Invasive species represent a threat to indigenous biodiversity along the Danube, given the rapid acclimatization of their spread and the capture of indigenous flora and fauna. Early detection and control measures of invasive species is essential before they become acclimatized.

The preliminary identification of the cause-effect-impact-related impact associated with the proposed works in the Operational Stage is presented in Table 17 and the estimation of the potential impact associated with the project in the Operational Stage is presented in Table 18.

Table 17 Preliminary identification of the cause-effect-impact-related effects of the proposed works in the operation stage

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components													Associated form of impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic Plants	Terrestrial Plants	Aquatic invertebrates	Terrestrial invertebrates	Invasive plant species	Migratory and semi-migratory fish	Non-migratory fish	Amphibians	Reptiles	Birds	Mammals	
Operation	Maintenance dredging	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Hydro morphological changes of habitats	☑		☑		☑		☑	☑	☑					HA
		Aquatic fauna mortality					☑			☑	☑					RPN
		Noise and vibration					☑			☑	☑			☑	☑	DSA
Operation	Groynes	Final occupation of surfaces with natural vegetation		☑		☑		☑	☑			☑	☑	☑	☑	HL
		Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Changing the areas of fish passage	☑							☑	☑					DSA
		Changing the flow regime	☑		☑		☑		☑	☑	☑			☑		DSA
		Creating new habitats	☑				☑			☑	☑			☑		IH
Operation	Chevrans	Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Changing the areas of fish passage	☑							☑	☑					DSA
		Creating new habitats	☑				☑			☑	☑					IH
		Changing the flow regime	☑		☑		☑		☑	☑	☑			☑		DSA
Operation	Bank protection (hard type)	Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Fragmentation of the Danube course	☑	☑	☑	☑	☑	☑				☑	☑		☑	HF/DSA
Operation	New islands and / or existing islands expansion	Final occupation of some riverbed areas	☑		☑		☑		☑	☑	☑					HL
		Changing the flow regime	☑		☑		☑		☑	☑	☑			☑	☑	HA
		Changing shelters and food places								☑	☑					DSA
		Changing the areas of fish passage								☑	☑					DSA
		Creating new habitats or expanding existing habitats	☑				☑			☑	☑			☑		IH
Operation	Dredging material storage areas	Increase of turbidity	☑		☑		☑			☑	☑			☑	☑	HA/DSA
		Changing shelters and food places								☑	☑					DSA
		Alteration of the distribution of migratory and non-migratory species								☑	☑					DSA
		Disruption of aquatic and terrestrial habitats	☑	☑												DSA
		Affect habitats or spawning sites or brood development	☑				☑			☑	☑					HA
		Burying slow or sedentary species					☑			☑	☑					RPN
		Creating new habitats or extending existing habitats	☑				☑			☑	☑					IH
		Alteration of aquatic plants feeding conditions			☑											HA
		Hydro morphological changes to habitats	☑		☑		☑		☑	☑	☑					HA

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components													Associated form of impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic Plants	Terrestrial Plants	Aquatic invertebrates	Terrestrial invertebrates	Invasive plant species	Migratory and semi-migratory fish	Non-migratory fish	Amphibians	Reptiles	Birds	Mammals	
Operation	Commercial and tourist naval traffic	Noise and vibration					☑			☑	☑	☑	☑	☑	☑	DSA
		Atmospheric emissions		☑		☑		☑				☑	☑	☑	☑	HA
		Accidental pollution of dangerous products	☑		☑		☑		☑	☑	☑			☑	☑	HA
		Collision with aquatic fauna								☑	☑				☑	RPN
		The penetration of invasive species	☑		☑		☑			☑	☑					HA/RPN
		Noise and vibration					☑			☑	☑			☑	☑	DSA

The legend:
HL - Habitat loss
HA - habitat alteration
HF - Habitat fragmentation
DSA - disturbance of species activity
RPN - reduction of population
IH - Improving Habitats

Table 18 Estimation of the potential impact associated with the project in the operation stage

Stage	Interventions (causes)	Effects	Associated form of impact generated	Estimated potential impact								
				Nature impact	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Operation	Maintenance dredging	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Periodic	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Long	Periodic	Very likely	Reversible	Yes
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Long	Periodic	Very likely	Reversible	Yes
		Hydro morphological changes of habitats	HA	Negative	Direct	Yes	Regional	Long	Periodic	Very likely	Reversible	No
		Aquatic fauna mortality	RPN	Negative	Direct	Yes	Zonal	Long	Periodic	Probable	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Short	Periodic	Very likely	Reversible	No
Operation	Groynes	Final occupation of surfaces with natural vegetation	HL	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Final occupation of some riverbed areas	HL	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Changing the areas of fish passage	DSA	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Irreversible	Yes
		Changing the flow regime	DSA	Negative	Direct	Yes	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Creating new habitats	IH	Positive	Secondary	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
Operation	Chevrans	Final occupation of some riverbed areas	HL	Negative	Direct	Yes	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Changing the areas of fish passage	DSA	Negative	Direct	No	Regional	Permanent	Without interruptions	Very likely	Irreversible	Yes
		Creating new habitats	IH	Positive	Secondary	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Changing the flow regime	DSA	Negative	Direct	Yes	Local	Permanent	Without interruptions	Very likely	Irreversible	No
Operation	Bank protection (hard type)	Final occupation of some riverbed areas	HL	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Fragmentation of the Danube course	HF/DSA	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
Operation	New islands and / or existing islands expansion	Final occupation of some riverbed areas	HL	Negative	Direct	Yes	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Changing the flow regime	HA	Negative	Direct	Yes	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Changing the areas of fish passage	DSA	Negative	Direct	No	Local	Permanent	Without interruptions	Very likely	Reversible	Yes
		Creating new habitats or expanding existing habitats	IH	Positive	Secondary	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
Operation	Dredging material storage areas	Increase of turbidity	HA/DSA	Negative	Direct	No	Local	Temporary	Periodic	Very likely	Reversible	No
		Changing shelters and food places	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Alteration of the distribution of migratory and non-migratory species	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Disruption of aquatic and terrestrial habitats	DSA	Negative	Direct	No	Local	Temporary	Intermittent	Very likely	Reversible	Yes
		Affect habitats or spawning sites or brood development	HA	Negative	Direct	No	Local	Long	Without interruptions	Very likely	Irreversible	Yes
		Burying slow or sedentary species	RPN	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No

Stage	Interventions (causes)	Effects	Associated form of impact generated	Estimated potential impact								
				Nature impact	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
		Creating new habitats or extending existing habitats	IH	Positive	Secondary	No	Local	Permanent	Without interruptions	Very likely	Irreversible	No
		Alteration of aquatic plants feeding conditions	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Probable	Reversible	No
		Hydro morphological changes to habitats	HA	Negative	Direct	Yes	Local	Temporary	Intermittent	Very likely	Irreversible	No
		Noise and vibration	DSA	Negative	Direct	Yes	Local	Temporary	Once	Very likely	Reversible	No
Operation	Commercial and tourist naval traffic	Atmospheric emissions	HA	Negative	Indirect	Yes	Regional	Long	Periodic	Very likely	Irreversible	Yes
		Accidental pollution of dangerous products	HA	Negative	Indirect	Yes	Local	Short	Accidental	Unlikely	Reversible	No
		Collision with aquatic fauna	RPN	Negative	Direct	Yes	Regional	Long	Accidental	Probable	Irreversible	No
		The penetration of invasive species	HA/RPN	Negative	Secondary	Yes	Regional	Long	Accidental	Probable	Irreversible	Yes
		Noise and vibration	DSA	Negative	Indirect	Yes	Local	Long	Periodic	Probable	Reversible	No

The legend:
HL - Habitat Loss
HA - Habitat Alteration
HF - Habitat Fragmentation
DSA - Disturbance of Species Activity
RPN - Reduction of Populations Number
IH - Improving Habitats

The measures to avoid, reduce or ameliorate the impact on biodiversity in the Operation Stage are presented in Chapter 6.1.6.3. Activities, Facilities and Measures for the Protection of Biodiversity, Natural Monuments and Protected Areas.

7.6 Impact on population and human health

7.6.1 Potential impact during the execution of works

During the execution of the works, both positive impact and negative impact on the population in the project area are expected.

The positive impact will be generated by the creation of new jobs to carry out the work proposed by the project and will lead to the improvement of the living conditions (and indirectly of the human health) of the staff employed locally. This positive impact will occur until completion of construction and maintenance dredging work. If necessary, the staff can be trained according to the workplace requirements.

The positive impact generated by the project through the creation of new jobs will lead to the improvement of living conditions (and indirect human health) of local staff, especially in Critical Points Bechet, Belene and Popina, during the construction and dredging works. In the rest of the critical points, the number of jobs will be lower as only dredging activities will be performed.

At the same time, during the execution of the works, a negative impact on the population generated by the:

- Noise and emissions generated by the operation of floating equipment's, barges, ships in the area - in all 12 Critical Points;
- disruption of sports activities and other recreational activities along the Danube banks - in all 12 Critical Points;
- interruption of the functioning of the Danube drinking water treatment plants - in all 12 Critical Points.

Noise and emissions could have an impact on the population that is in the works area. Considering that most of the localities are more than 2 km away from the Danube's left bank, it is estimated that the impact on the population in the riparian counties is insignificant.

The perturbation of fishing activities either as a result of the increase in the noise produced by construction or dredging equipment and its propagation in the water or as a result of the increase of the turbidity of the water in that area, it is only temporary and will cease at the completion of the construction works. This impact will be temporary (during the execution of the works and until the turbulence of the water) and will produce limited space areas (the working area and downstream of this area, where the turbidity is generally higher).

The disturbance of other recreational activities due to the intensification of the noise generated by the construction and dredging equipment, by shipping or the discomfort caused by the presence of the workers in the area, is temporary and will cease with the completion of the construction works. The recreational areas are generally located near the Danube riverside towns (located at great distances from the critical points) and recreational activities take place at the end of the weekend (on weekends) when construction activities are not carried out, it is estimated that the impact on recreational areas will be insignificant.

The Danube is an important source of water supply for certain localities and is destined for human consumption after a treatment process. Increasing turbidity in the Danube water intake areas may have a negative impact on the population as a result of interruption in the operation of drinking water treatment systems, possibly even when drinking water supplies to the public are interrupted.

The potential impact of the activities of the execution period of the works on the population and human health, depending on its characteristics will be:

- The nature of the impact:
 - *creation of new jobs: positive;*
 - *a disturbance of the population and recreational activities: negative.*
- The type of the impact:
 - *creation of new jobs: direct;*
 - *a disturbance of the population and recreational activities: direct.*
- The reversibility of the impact:
 - *creation of new jobs: reversible;*
 - *a disruption of the population and recreational activities: reversible;*
- The extent of the impact:
 - *creation of new jobs: local, especially in Bechet Critical Points, Belene and Popina and limited in the other 9 Critical Points;*
 - *a disturbance of the population and recreational activities: local in the areas near the work fronts within the 12 Critical Points.*
- The duration of the impact:
 - *creation of new jobs: temporarily, during the execution of the works;*
 - *a disturbance of the population and recreational activities: temporarily during the execution of the construction works;*
- The probability of the impact:
 - *creating new jobs: certain;*
 - *a disruption of the population and recreational activities: probably.*
- The magnitude of the impact:
 - *creation of new jobs: medium magnitude;*
 - *a disturbance of the population and recreational activities: of low magnitude.*
- Transboundary nature of the impact:
 - *creating new jobs: a cross-border impact will be generated for the population of Bulgaria in the navigation sector managed by the Bulgarian side;*
 - *a disruption of the population and recreational activities: a cross-border impact will be generated in Bulgaria in the navigation sector managed by the Bulgarian side.*

Air pollution reduction measures are presented in Chapter 6.1.7. Considering that the impact on the population and human health is not significant, to which is added a positive impact, it is not necessary to provide for measures to avoid, reduce or ameliorate the significant impact on the population and human health.

7.6.2 Potential impact during operating period

After the implementation of the investment, a positive impact is expected from both economic and social point of view, as a result of the improved navigation conditions on the Danube. Increasing commercial and tourist traffic, improving vessel access conditions, will have a positive impact on the economic development of the area.

Also, after the implementation of the project, there will be a series of positive aspects that will lead to economic development not only in the project area but also at European level:

- completing the rehabilitation of the EU's strategic river corridor, extending from the North Sea to the Black Sea;
- increasing the level of commercial and tourist fluvial traffic, which will benefit from adequate long-term navigation conditions and will positively influence the economic development of the Danube riparian countries, especially Romania, Bulgaria and Serbia, including the increase of new employment through creating new jobs in port cities along the Lower Danube;
- improvement of access to the Romanian and Bulgarian river ports;
- improvement of connections for tourist and commercial shipping between Western and Central Europe to the Black Sea through the Danube-Black Sea Canal or the Sulina Canal;

- creating the conditions for encouraging the development of agro-tourism in the villages along the Danube.

The potential impact of the activities of the period of operation of the works on the population and on human health, depending on its characteristics will be:

- The nature of the impact: positive;
- The type of the impact: direct;
- The reversibility of the impact: irreversible;
- The extent of the impact: at European level, in Danube riparian countries;
- The duration of the impact: permanently during the time of the shipping (economic and tourist) traffic on the Danube;
- The probability of the impact: certain;
- The magnitude of the impact: high magnitude,
- Transboundary nature of the impact: a cross-border impact will be generated for the Danube riparian population, in particular in Bulgaria and Serbia.

Considering that the impact on the population and human health is positive, there is no need to provide for measures to avoid, reduce or ameliorate the significant impact on human population and health.

7.7 Impact on historical and cultural heritage

7.7.1 The potential impact during the execution of the works

According to the information available in the National Archaeological Repertory, the closest archaeological objectives of the critical points are located about 0.8 - 1 km away from them.

Under these conditions, it is considered that the works proposed to be executed within the project in the critical points will not affect the existing and known archaeological sites, located on the Romanian Danube bank.

However, during the execution of excavation and dredging works related to the project, there is a potential risk of affecting any unidentified archaeological objectives to date in the project area, such as bridge ruins or ancient port facilities. In order to protect any unidentified archaeological objectives to date, we will proceed in accordance with the relevant legislative requirements in Romania.

7.7.2 The potential impact during the operating period

Considering the distance to which the closest archaeological objectives of the critical points are located, it is expected that during the Operation period no impact will be generated on the existing and known archaeological objectives, located on the Romanian Danube bank.

Considering the maintenance dredging activities to be carried out during the operating period will take place on the existing alignment of the navigable channel (which in the construction stage has already been dredged), there is no potential risk to identify any unidentified archaeological objectives. As mentioned above, this risk could only occur in the Stage of execution of the works.

7.8 Impact on landscape and visual environment

7.8.1 Current situation

The landscape in the areas of the project sites is determined by the plain - the major landform and the specific river meadow environment. The river meadow micro-landform has variations over small distances and the environmental conditions are varied.

In the lowlands on the Danube river bank, natural phenomena such as floods, erosion of the river bank occur, and in areas with no forests the influence of wind on the micro-landform is felt. Other elements that determine

river meadow specific features include secondary arms and ponds, as well as temporarily flooded areas. Other landscape features have emerged as a result of the embankment works and construction of partitioning dykes.

Very important elements of the landscape are given by vegetation, with forest and coppice areas or areas covered with small vegetation.

The landscape along the Danube has the following features: the river meadow is wide, sometimes with fixed and mobile dunes, with willow and poplar coppices, sometimes with pedunculate oak and ash with southern lianas, grasslands with arenicol, mezo and halophile vegetation and agricultural land.

In some portions, the Danube river meadow is drained, embanked, partially arranged and used as agricultural land, the landscape being heavily changed by human action.

In most areas, landscapes on the left bank of the Danube are similar without significant differences:

- low banks;
- many areas covered with forest and some areas with grasslands;
- seasonal vegetation depending on the season;
- some areas of sand and gravel that appear at low water levels;
- islands and secondary arms;
- agricultural areas at some distance.

In addition to this, the landscape along the Danube has as its element the water flowing into a large river bed with many islands, holms and secondary branches. Landscapes also include river ships that run upstream or downstream.

In the Danube river meadow, the landscapes are influenced by natural processes that have strong dynamics. Landscapes are determined by the seasonal rhythms of bioclimatic factors and by the annual increases and decreases in levels and flows, which cause changes in landscape distribution. Landscape variability is both temporal and, above all, spatial, unlike terraced landscapes that have greater stability.

In some areas, the landscape is determined by the natural transformations of anthropogenic ecosystems that are no longer used, and the vegetation and appearance do not correspond to either the natural meadow or the agricultural used meadow. On such surfaces the landscape is controlled by ecosystems in transformation. Because of the deficiencies in the use and maintenance of the landscaping surfaces, processes of returning to the wild condition of the anthropic landscape have arisen.

The landscape features, according to the field visits conducted in April and May 2017, are:

Silistra area

- abundant vegetation, including forests;
- no deforested or reforested areas were observed;
- at Chiciu - the used wood storage area;
- downstream of Chiciu - grain silos with direct loading / on-board feature;
- Chiciu area - Hotel Baden and Monica Restaurant;
- port activities - Chiciu and Silistra.

Silistra – Popina area

- abundant vegetation, including forests;
- no deforested areas were observed;
- the Bulgarian river bank starts to be higher than the Romanian one after the Vetren island;
- frequent river bank erosion - fallen trees;
- reforested areas (e.g. km 392).

Popina area

- active processes of river bank erosion - fallen trees;
- abundant vegetation, including forests;
- reforested areas were observed;
- no river bank protection works, or deforested areas were observed;
- sand strips are visible in the Danube river bed.

Popina – Kosui area

- the Bulgarian river bank is higher than the Romanian bank;
- abundant vegetation, including forests;
- forested areas were observed;
- no deforested areas were observed;
- frequent river bank erosion - fallen trees.

Kosui area

- the Bulgarian river bank is higher than the Romanian bank;
- frequent river bank erosion - fallen trees.
- abundant vegetation, including forests, especially on the islands of Malak Kosui and Kosui;
- no deforested areas were observed;
- forested areas were observed;
- without forests that extend to the bank - only spontaneous vegetation;
- islands of Malak Kosui and Kosui;
- river bank protection and embankment from the Malak Kosui Island (approximately km 422).

Kosui – Giurgiu area

- forest exploitation near the Gostinu Island (approximately km 474);
- Grain silos with loading and landing area (approx. 474.2 km); river bank protection in the area;
- Oltenita Shipyard - km 429;
- Gostinu Island - km 475;
- the Romanian river bank is affected by erosion, with poplar forests on the bank, trees drowned in water, before and after Oltenita;
- sand strips visible from the surface in the river bed (approximately 437 km);
- forests before and after Oltenita;
- deforested areas on the Romanian river bank - approx. km 438;
- cliff erosion near Gostinu.

Batin - Giurgiu area

- the river bank is relatively flat, generally with abundant vegetation and some river bank erosion traces;
- bank protection observed at the entrance to Giurgiu port area;
- many islands / holms observed along this sector: the Danube islands also present in the Batin Critical Point area, km 520-51; Cama Dinu Island, between km 511 - 508, closer to the Romanian bank; the island closer to the Romanian bank, km 508 - 505;
- the islands are characterized by abundant vegetation;
- locally flooded areas and river banks erosion traces;
- Connection channel to the Danube, in the area of Slobozia, km 496;
- Navigation Palace Giurgiu - km 494.

Iantra area

- the river bank is relatively flat, shows abundant vegetation and local erosion traces;
- an island covered with abundant and flooded vegetation, seen upstream from the critical point (km 538);

Belene – Vardim area

- The river bank is relatively flat, generally shows abundant vegetation (trees / shrubs) and erosion traces;
- bank protections were observed in the partially damaged part of the Interagro pumping station (km 555), as well as in the area of Zimnicea port and the Interagro biofuel plant;
- islands observed on the Danube in the critical Vardim area, characterized by abundant vegetation: e.g. Gasca Island - between km 540 and 539;
- Vardim island - observed from the km 546, characterized by abundant vegetation.

Corabia - Belene area

- The river bank is relatively flat, characterized by abundant vegetation (trees / shrubs), frequent erosion traces;
- numerous islands / holms present in the Belene Critical Point area, such as Berzina Mica (between km 572-571), Milka (between km 571-568), Condur (between km 564-562), Cinghinea (between km 562 - 558), close to the Romanian bank;
- islands / holms are generally characterized by abundant vegetation, local sandy areas or flooded areas, and in some places the river bank shows erosion traces;
- bird nests observed on the Romanian bank in the km 570 area;
- ponds / pastures observed between km 615 - 614, confluence area Olt - Danube (km 605) and island of Pavel (km 591-579);
- the river bank protection is partially damaged at Interagro area (pumping station) at km 600 and bank protection in the area of Turnu Magurele port between km 598 - 597;
- confluence Olt - Danube - km 605;
- birds (ducks) observed in the Olt-Danube confluence area.

Bechet area- Corabia

- the river bank has generally abundant vegetation (trees / shrubs) and shows frequent erosion traces;
- the river bank is relatively flat, river bank vegetation and erosion traces present in the area between km 632-630;
- in the Corabia port area, bank protections (between km 630 - 628) were observed;
- marsh lands & ponds observed in the vicinity of the Romanian bank in the area of Corabia;
- Between km 628 - 626, the river bank shows frequent erosion traces; Bird nests on the river bank were observed on this sector;
- islands / holms were observed on the Danube in the critical point area of Corabia, characterized by abundant vegetation (trees and shrubs) and locally flooded: the island in the vicinity of the Romanian bank, between km 632 and km 631; Baloiu Island, between km 629 - 626; area where trees were cut between km 627 - 626;
- numerous islands / holms were seen on the Bechet (critical point exit) and Corabia (critical point entrance) sectors, characterized by abundant vegetation (trees and shrubs) and flooded localities: island near the Romanian bank, km 669-668; Papadia island, close to the Romanian bank, between km 668 - 662 + 500; deforestation was observed (km 667); the Gradistea Island, close to the Romanian bank, between km 648 and 646; islet / island, close

to the Romanian bank, km 643; Baikal Island, close to the Romanian bank, between km 643 and km 636.

Dobrina area - Bechet

- the river bank is relatively flat, mostly covered with abundant vegetation (trees / shrubs);
- frequent river bank erosion traces observed during field visit;
- portions near the Romanian bank are reimpounded (km 678 - 677);
- debris / plastic waste (PET) present on the navigable channel from the Jiu - Danube confluence area;
- bank protection observed in the Bechet port area;
- numerous islands / holms observed on the Dobrina and Bechet sector, characterized by abundant vegetation (trees and shrubs) and local floods: e.g. Nebuna Island - km 752 - 750; Linovo Island, starting from the confluence of the Rast - Danube River (km 738 - 735); Island Tibar, in the vicinity of the Romanian bank (km 719 - km 716 + 500); Ostrov in the area of the Romanian bank (km 693), near the confluence Jiu - Danube; Carabula Island on the Romanian bank (between km 689 - km 687);
- the confluence of the Rast River with the Danube, km 738;
- birds (pelicans) observed in km 713;
- confluence Gîrla Nedeia - Danube - km 698;
- confluent river Jiu with the Danube (between km 692 - 691) - • debris / plastic waste (PET) were observed;
- confluence Jiu - Danube, km 682.

Bogdan Secian – Dobrina area

- the river bank is relatively flat, with abundant vegetation (trees and shrubs) and local erosion traces;
- pastures in area km 758;
- island / Dobrina Island between km 762 - 759, with abundant vegetation (trees + shrubs);
- the island of Pietrisu between km 759 and km 757, present in the vicinity of the Romanian bank, with abundant and local flooded vegetation (downstream from the Dobrina critical point);
- agricultural land (pastures) present in the bank area;
- Desa Island, close to the Romanian bank (km 767 - 765) with abundant vegetation.

Calafat– Bogdan Secian area

- the river bank is relatively flat from the port of Calafat, with vegetation present on the river bank, especially on the km 793-789 and 787-786 sectors, respectively the agricultural fields (meadows) on the rest of the sector;
- in general, the river bank shows signs of erosion;
- trees and farmlands (pastures) present in the river bank area, almost the full length of the critical point Bogdan Secian;
- Bogdan Secian island between km 784 - 782 with abundant vegetation (trees + shrubs);
- cut trees / deforested on the Romanian bank at the exit area of the critical point Bogdan Secian;
- Calafatul Mare Island (between km 792 - km 789) - abundant and sometimes flooded vegetation.

Gruia - Calafat area

- the relatively flat Romanian bank with frequent erosion traces;
- agricultural lands / meadows on the Romanian bank;
- casemates observed on the Romanian bank;
- bank protection (partially damaged) in the area of the channel linking Garla Mare to the Danube fish farm;
- Garla Mare island with abundant vegetation (flooded downstream);
- vegetation (shrubs and trees), especially from the km 833 area;
- sandy areas present on the Romanian bank;
- recreational areas / beaches on both sides;
- bank protection in Cetate port area;
- alongside this sector, a number of holms / islands have been observed, characterized by abundant vegetation (trees and shrubs) and sometimes flooded.

7.8.2 The potential impact during the execution of the works

During the execution of the works, a negative impact on the landscape generated by the project is expected:

- the presence of dredging equipment in all 12 Critical Points;
- the presence of barges, floating equipment, construction equipment, personnel involved in construction activities and site organizations in the Bechet, Belene and Popina areas Critice Points;
- the actual execution of the construction works at Bechet, Belene and Popina Critical Points.

The dredging equipment used during the construction of the works provided in the project does not constitute new elements in the Danube landscape, but their number and length of stay are higher on some sections, thus generating an impact on the landscape.

Also, during the execution of the works, in the work area of Bechet Critical Points, Belene and Popina there will be a larger number of convoys of barges, vessels for the transport of construction materials and dredging material, equipment's. The impact generated by their presence on the landscape will be local and temporary.

The site organization that will be located on the river bank near Critical Points Bechet, Belene and Popina will be arranged in suitable areas for such uses - port areas, industrial areas, etc. and will not impact the landscape.

The actual construction of the hydrotechnical structures in the Critical Points Bechet, Belene and Popina will produce a change of the landscape during the works, in the area of their location, by the accumulation of construction materials, the digging of the foundations, bank-spooling's and land preparation for the bank protection works.

The potential impact of the activities during the execution of the works on the landscape, depending on its characteristics, will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: reversible and irreversible (bank protection works preparations);
- The extent of the impact: local, generally limited to the critical area perimeter;
- The duration of the impact: temporarily, during the execution of the works;
- The probability of the impact: certain;
- The magnitude of the impact: of low magnitude,
- Transboundary nature of the impact: no cross-border impact will be generated.

Given that the impact of landscaping on the landscape is insignificant, it is not necessary to provide for measures to avoid, reduce or ameliorate the significant impact on the landscape.

7.8.3 Potential impact during the operating period

During the operating period, a negative impact on the landscape generated by the project is expected:

- the presence of dredging equipment in all 12 Critical Points;
- creation of dredging material disposal areas in critical points;
- the presence of built hydrotechnical structures (groynes, chevrons, new islands and bank protection) in Critical Points Bechet, Belene and Popina.

Maintenance dredging works will be carried out on the existing line of waterway navigation. During the construction period, the presence of dredging equipment in the area of critical points will generate a temporary negative impact on the landscape, although their presence are not new elements in the Danube landscape.

Creating dredged material storage areas will cause changes to the landscape just by being present in the bed. Over time, dredged material storage areas will turn into islands. The newly created islands will not make a discordant note with the current Danube landscape, which can be confused with the incipient stages of formation with sand bars created naturally on the Danube, and in the late stages of formation with the naturally formed islands.

Building different types of structures to maintain the minimum level required for navigation will influence the landscape:

- Groynes: experience shows that often intensive sedimentation sectors form behind the groynes, which may lead to the formation of temporary and / or permanent islands. This means there will be a visual but insignificant impact on the landscape; also, in periods with low flows of Danube waters, when groynes can emerge (on average about 2 months per year) will generate a visual impact, being viewed as foreign landscapes.
- Chevrons: experience shows that often behind the chevron are formed sectors with large accumulations of sediments, which can lead to the formation of temporary or permanent islands. They will be more visible but will not have a significant impact on the landscape; in periods with low flows of Danube waters when the chevrons can become emery (on average about 2 months per year) a visual impact will be generated, being viewed as foreign objects to the landscape.
- Bank protection: in most cases, it presents itself as a structure of rip raps along the bank, breaking not only physically but also visually, the relationship between the river and its valley; depending on the rate at which bank consolidation works will be carried out, they may be visible for most of the year or may be issued;
- Newly created islands: The visual impact is insignificant, similar to the one generated by the creation of dredging material storage areas. This type of structure fits best into the Danube's natural landscape.

The potential impacts of the activities of the period of operation of the works on the landscape, depending on its characteristics, will be:

- The nature of the impact: Positive (dredging material storage areas) and negative (hydrotechnical structures);
- The type of the impact: direct;
- The reversibility of the impact: reversible (in the case of groynes and chevrons when they become submerged) and irreversible (in the case of portions of bank protections during most of the year);
- The extend of the impact: local, at the locations of the Bechet, Belene and Popina Critical Points;

- The duration of the impact: Temporarily, in periods with low flows of Danube waters (hydro-technical structures emerge on average about 2 months per year) and permanent (portions of bank protections during most of the year);
- The probability of the impact: Certain;
- The magnitude of the impact: low magnitude;
- Transboundary nature of the impact: Cross-border impact will be generated in Bulgaria only during periods when structures are above water.

In order to reduce the impact on the landscape, technical measures to reduce the impact have been taken into account - reducing the size of the structures so that the visual impact can be reduced while creating the desired effect on local hydro morphological conditions and improving the navigability conditions.

Given that the impact of landscape changes is insignificant, there is no need to provide for measures to avoid, reduce or ameliorate the significant impact on the landscape.

7.9 Impact of the project on climate change

7.9.1 Current situation

7.9.1.1 General data

The climate is temperate continental, with very hot summers, small amounts of precipitation and cold winters, marked by irregular intervals, with strong blizzards and frequent heating periods. A number of special influences mark the territory, namely: the Mediterranean influence in Mehedinti and Dolj, marine influences from the counties of Constanta and Dobric, with strong differences between winter and summer temperatures. In the south-east, they can feel a number of Nordic influences, with cold north-south to southwest winds, strong winds and very cold winters.

Climate conditions and weather parameters are influenced by the following factors:

- the small facade distance a great course of water;
- the absence of high landform forms (mountains), which allows the penetration of cold air masses of Arctic origin (anti-cyclic dorsal) from the northeast, followed by a drastic drop in temperature and sometimes accompanied by snow falls.

The data on the climatic conditions characteristic of the Danube sector related to the project are obtained from the following meteorological stations:

- **Romania** - Drobeta Turnu Severin, Calafat, Bechet, Turnu Magurele, Zimnicea, Giurgiu, Oltenita si Calarasi;
- **Bulgaria** - Novo Selo, Vidin, Lom, Oryahovo, Somovit, Nikopol, Svishtov, Ruse, Obraztsov Chiflik, Slivo pole, Tutrakan, Silistra and from Archar precipitations measuring station.

The location of the weather stations on the Bulgarian bank is shown in Figure 20.

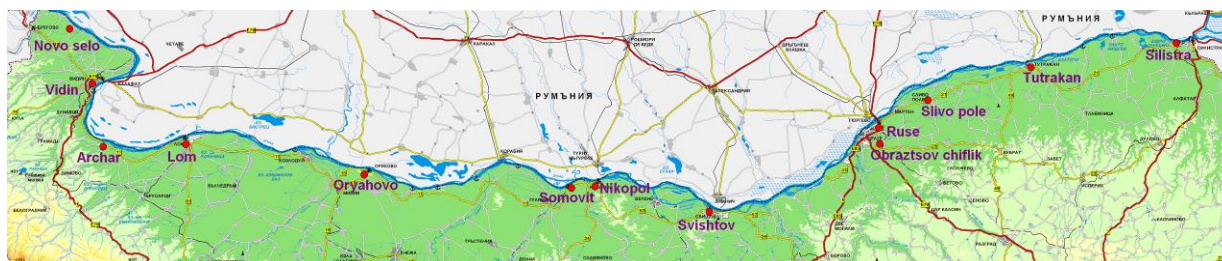


Figure 20 Location of weather stations along the Bulgarian Danube sector (EIA Source, 2012)

7.9.1.2 The temperature

Generally, the climate is characterized by hot and dry summers and cold winters. Average annual temperatures are between 11-12 ° C, descending from upstream to downstream. The absolute minimum air temperatures were -30 ° C, and the absolute maximum temperatures recorded exceeded 40 ° C.

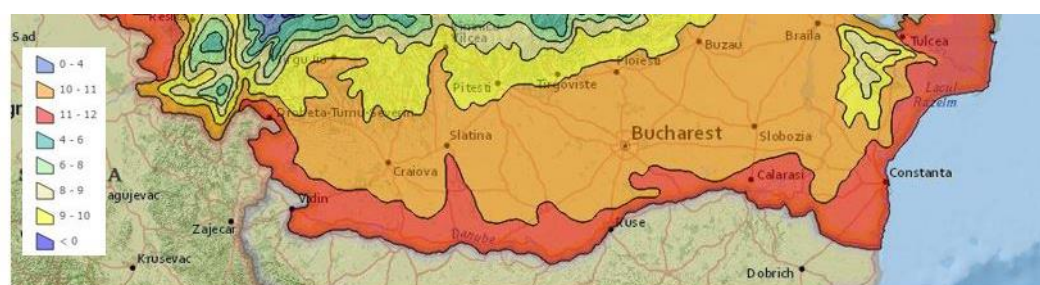


Figure 21 Multi-annual average temperatures along the Romanian Danube sector (Source: National Meteorological Administration (ANM), 2012 -<https://www.arcgis.com/home/item.html?id=d6d8149786254124bcf279b9524cbbbe1>)

Table 19 presents the average monthly temperatures, the average annual temperature and the annual amplitude recorded between 1901-2000 and 2015, 2016 and 2017, respectively, at the meteorological stations Calafat and Turnu Magurele.

Table 19 The air temperature (monthly and annual average) in the years 1901-2000, 2015, 2016 and 2017 at the meteorological stations Calafat and Turnu Magurele (Source: NMA, according to the Romanian Statistical Yearbook 2016, 2017, 2018)

Meteorological station	Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average	Annual Amplitude
		Monthly average (degrees Celsius)													
Calafat	1901/2000	-1,4	0,6	5,7	11,9	17,4	21	23,3	22,8	18,2	11,9	5,7	1,0	11,5	24,7
	2015	-0,2	2,0	6,3	11,4	18,4	21,6	24,6	24,4	19,8	10,9	8,3	3,6	12,6	24,8
	2016	-2,0	7,2	7,8	14,9	16,8	23,1	24,6	23,2	19,6	10,6	5,4	2,2	12,8	26,6
	2017	-5,3	1,6	10,5	11,9	17,4	24,4	25	24,9	-	-	7,0	3,8	-	-
Turnu Magurele	1901/2000	-2,3	0,3	5,6	12,2	17,6	21,3	23,3	22,5	18,1	11,8	5,7	0,5	11,4	25,6

Meteorological station	Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average	Annual Amplitude
		Monthly average (degrees Celsius)													
	2015	1,7	1,0	6,6	12,7	19,4	21,8	26,3	24,5	19,7	10,8	9,4	5,5	13,3	25,3
	2016	-3,4	6,8	8,0	14,4	16,5	23,3	25,2	23,8	19,3	10,9	5,9	-0,3	12,5	28,6
	2017	-5,6	0,3	9,5	11,6	17,2	23,3	24,2	24,3	19,4	11,8	6,5	3,5	12,2	29,9

In **Error! Reference source not found.**, the absolute and absolute minimum and annual minimum temperatures recorded in the years 1901-2000, 2015, 2016 and 2017 respectively at the Calafat and Turnu Magurele meteorological stations.

Table 20 The absolute and absolute minimum and absolute minimum temperatures recorded in the years 1901-2000, 2015, 2016 and 2017 at the meteorological stations Calafat and Turnu Magurele (Source: NMA, according to the Romanian Statistical Yearbook 2016, 2017, 2018)

Meteorological station	January	February	March	April	May	June	July	August	September	October	November	December	Absolute maximum	The absolute
Calafat														
1901 - 2000														
Maximum monthly	20,5	22,4	27,6	34,5	36,6	39,5	43,2	41,3	39,8	31,6	25,9	21,2	43,2	-
The year	1993	1990	1952 1994	1985	1969	1908	2000	1945	1946	1991	1970	1989	4.06. 2000	-
Monthly minimum	-29,2	-24,6	-15,7	-3,0	1,6	6,2	9,0	7,3	-1,3	-6,2	-16,2	-21,8	-	-29,2
The year	1947	1950	1963	1912	1952	1962	1913	1904	1977	1988	1988	1948	-	8.01. 1947
2015														
Maximum monthly	19,5	11,6	19,5	27,6	31,1	35,3	39,4	40,9	37,7	24,7	24,9	18,6	40,9	-
Day	11	27	26	17	6	14	20	12	1	5	19	28	12.08 .2015	-
Monthly minimum	-24,1	-14,7	-1,5	1,8	9,6	10,8	12,9	13,1	9,1	1,1	-3,3	-8,5	-	-24,1
Day	1	11	20	4, 11	13	22	12	24	9	29	2	31	-	1.01. 2015
2016														
Maximum monthly	17,5	23,3	25,4	33,1	31,6	36,8	37,5	36,1	33,4	27,8	18,0	19,9	37,5	
Day	29	22	31	18	30	24	14	1	11	1, 2	2	11	14.07. 2016	

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 Bulgarian Danube common sector of the Danube" for the
 issuance of the Environmental Agreement

Meteorological station	January	February	March	April	May	June	July	August	September	October	November	December	Absolute maximum	The absolute
Minimum monthly	-20,4	-3,2	-1,9	-0,8	7,2	11,2	12,4	11,5	5,8	0,5	-13,0	-9,1		-20,4
Day	23	7	26	27	18	8	9	13	27	29	30	1		23.01. 2016
2017														
Maximum monthly	12,5	20,8	25,7	26,7	30,6	39,9	38,7	42,2	36,2	29,6	19,6	18,9	42,2	
Day	2	23	30	28	31	29	22	6	2	20	2	25	6.08. 2017	
Monthly minimum	-20,3	-10,9	-0,8	1,9	4,9	12,4	14,4	9,2	3,4	3,3	-2,9	-4,1		-20,3
Day	27	1	27	22	11	10	18	24	30	3	29	11		27.01. 2017
Turnu Magurele														
1901 - 2000														
Maximum monthly	18,0	24,1	29,6	34,2	38,8	38,2	43,2	41,4	40,0	36,4	26,7	22,0	43,2	-
The year	1983	1995	1951	1985	1950	1957	1987	1952	1946	1952	1963	1903	25.07 .1987	-
Monthly minimum	-30,0	-26,0	-22,2	-4,6	0,5	5,0	9,0	6,6	-2,5	-5,8	-18,2	-25,0	-	-30
The year	1942	1950	1929	1923	1938	1911	1974	1981	1977	1988	1993	1933	-	25.01 1942
2015														
Maximum monthly	15,7	14,2	20,8	28,5	30,6	34,6	39,2	37,0	37,3	24,5	22,2	16,0	39,2	-
Day	11	23	26	27	19	14	30	12, 16	5	5	11	27	30.07 .2015	-
Monthly minimum	-19,8	-8,2	-2,4	-1,1	8,5	10,0	12,1	13,4	9,0	0,2	-2,0	-6,8	-	-19,8
Day	1	10	22	10	12	22	12	24	9	29	2	31	-	1.01.2 015
2016														
Maximum monthly	10,5	22,9	23,8	31,8	31,3	38,0	36,6	38,2	33,4	27,7	19,7	15,3	38,2	
Day	28, 29	23	31	18	30	17	14	1	17	2	7	11	1.08. 2016	
Minimum monthly	-20,2	-4,5	-2,4	0,9	4,7	10,3	12,8	11,7	6,2	-0,3	-3,6	-13,2		-20,2
Day	20	7	17	27	18, 19	9	9	14	24	29	30	14		20.01. 2016
2017														

Meteorological station	January	February	March	April	May	June	July	August	September	October	November	December	Absolute maximum	The absolute
Maximum monthly	7,6	19,9	23,2	29,5	29,8	39,1	40,9	38,5	35,8	26,4	21,9	18,3	40,9	
Day	2	28	22	28	31	29	1	5	2,17	17	13	16	1.07. 2017	
Monthly minimum	-19,3	-12,9	-1,4	0,0	4,3	12,4	13,7	9,3	6,4	0,6	-1,5	-6,6		-19,3
Day	12	1	27	22	11	10	5	25	29	3	1	22		12.01. 2017

7.9.1.3 Precipitations

The average annual precipitations in the adjacent regions of the Danube River has a significant fluctuation - between 500 mm and 600 mm (Figure 22). The maximum precipitations level is recorded in June, while the minimum level is recorded in February and there are some transition elements (a secondary peak in the autumn and winter of a secondary low in summer).

The annual average of rainfall decreases from upstream to downstream, and the absolute maximum rainfall over a 24-hour period exceeds 150 mm.



Figure 22 Multiannual average rainfall along the Romanian Danube sector (Source: NMA, 2012 - <https://www.arcgis.com/home/item.html?id=d6d8149786254124bcf279b9524cbb1>)

In Table 21 are presented the monthly average precipitations quantities and the annual average recorded between 1901-2000 and 2015, 2016 and 2017, respectively, at the meteorological stations Calafat and Turnu Magurele.

Table 21 Amounts of monthly average rainfall and annual average recorded in the years 1901-2000 and 2015, 2016 and 2017 at the meteorological stations Calafat and Turnu Magurele (Source: NMA, according to the Romanian Statistical Yearbook 2016, 2017, 2018)

Meteorological station	YEAR	January	February	March	April	May	June	July	August	September	October	November	December	Annual average
		mm												
Calafat	1901 – 2000	39,0	36,1	37,0	47,8	60,0	63,2	46,4	36,0	39,3	47,1	52,0	48,9	532,8
	2015	29,4	60,8	63,5	31,2	23,6	79,6	6,8	38,2	55,8	81,4	90,7	0,3	561,3
	2016	68,6	32,3	87,4	26,6	103,6	49,8	88,6	39,8	57,2	88,3	83,8	0,1	726,1
	2017	42,9	24,7	47,5	52,6	82,4	4,0	40,6	44,6	21,8	-	40,8	78,6	480,5
Turnu Magurele	1901 – 2000	68,6	32,3	87,4	26,6	103,6	49,8	88,6	39,8	57,2	88,3	83,8	0,1	726,1
	2015	42,9	24,7	47,5	52,6	82,4	4,0	40,6	44,6	21,8	-	40,8	78,6	480,5
	2016	68,6	32,3	87,4	26,6	103,6	49,8	88,6	39,8	57,2	88,3	83,8	0,1	726,1
	2017	42,9	24,7	47,5	52,6	82,4	4,0	40,6	44,6	21,8	-	40,8	78,6	480,5

7.9.1.4 Fog phenomenon and atmospheric inversion

The fog observed along the whole valley of the Danube is mainly caused by temperature inversions (inverse temperature drop). Inversions appear most frequently in November, December, January and February.

7.9.1.5 Winds

The wind direction is influenced by the valley of the river, with a predominant frequency from the west and northwest (10-15%) between the Iron Gates and Calafat, west and east (20-25%) between Bechet and Turnu Magurele and north- east and southwest (20-25%) between Giurgiu and Greaca.

Atmospheric calming has variable values depending on the local landforms and the orientation of the valley: 46.7% in Drobeta-Turnu Severin, 49.2% in Calafat, 54.7% in Bechet, 34.4% in Turnu Magurele, 38.2% in Giurgiu, 18.8% in Calarasi.

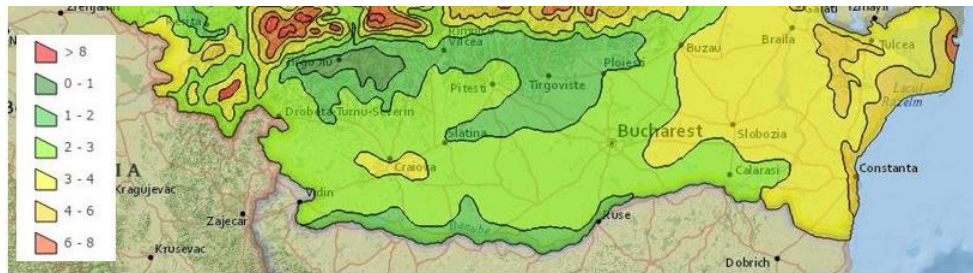


Figure 23 Wind speed - multiannual environments along the Romanian Danube sector (Source: NMA, 2012-
<https://www.arcgis.com/home/item.html?id=d6d8149786254124bcf279b9524cbbef1>)

7.9.1.6 The frost phenomenon

Floating ice along the Bulgarian Danube River sector can be observed during winter - from December to March. On average, the ice lasts for 91 days and the ice floats for 74 days. The average annual probability of occurrence of the phenomenon in the Bulgarian navigational part is 82%. The specific position of the Iron Gates Hydroelectric Power Plant, which narrows the channel, has an essential influence on the formation of ice along the Lower Danube. Free floating of ice in the Middle Danube is limited. Upstream of the Iron Gates, a new layer of ice is formed in local weather and under a reduced water flow rate. In the spring, usually 8 days after the ice begins to melt, the Danube River is totally free of ice.

7.9.2 The potential impact during the execution of the works

Taking into account the specificities of the activities that will be carried out for the improvement of navigation conditions on the Danube and the use of modern machinery equipped with engines whose emissions will comply with the current legislation it is estimated that during the execution of the works there will be no significant impact, in terms of greenhouse gas (GHG) emissions, on climate change.

The potential impacts of climate-related activities on the climate, depending on its characteristics, will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: reversible;
- The extent of the impact: local, limited to work area areas of the 12 Critical Points;
- The duration of the impact: temporary, during execution of works;
- The probability of the impact: certain;
- The magnitude of the impact: low magnitude;
- Transboundary nature of the impact: a cross-border impact on the climate in the project area will be generated in Bulgaria.

Considering that the impact on the climate during the execution of the works is not significant, it is not necessary to provide for measures to avoid, reduce or ameliorate the significant impact on the climate.

The main measures to reduce the impact on the climate foreseen in the project during the execution of the works are:

- the use of modern machinery for the construction of the proposed structures and dredging activities, equipped with engines whose emissions will comply with the current legislation (reduction of greenhouse gas production);
- the use of naval transportation of raw materials and materials instead of road transportation to reduce greenhouse gas emissions;

- Creation of dredged material storage areas within the critical points limits in order to reduce the transport distances of the dredged material from the dredging areas to the storage area for reducing the production of greenhouse gases.

7.9.3 Potential impact during the operating period

During the operating period, the main impact on climate change is related to GHG emissions as a result of increased traffic on commercial and tourist transport on the Danube.

The European Commission promotes the inland waterway transport system, as it is mainly characterized by reliability, energy efficiency and high transport capacity.

Inland waterway transport is a competitive alternative to road and rail transport, being an "environmentally friendly" alternative to energy consumption and the level of noise generated. In addition, inland waterway transport provides a high degree of safety, particularly with regard to the transport of dangerous goods.

The project also includes the reduction of energy consumption, with a positive impact on the reduction of indirect GHG emissions, considering the energy consumption per km / ton of goods transported on inland waterways is about 17% of the road transport and 50% of the railway transport (https://ec.europa.eu/transport/modes/inland_en).

Another source of greenhouse gas emission, potentially impacting climate change, is maintenance dredging of the navigable waterway, but this activity generates almost negligible emissions compared to emissions from traffic on the Danube.

Overall, the project will lead to a reduction in GHG emissions, aligning with the major climate change objectives of the EU 2020 Strategy:

- 20% reduction of GHG emissions compared to the reference level recorded in 1990;
- achieving a 20% share of renewable energy consumption;
- 20% increase in energy efficiency.

The potential impact of the activities during the construction works period on the climate, depending on its characteristics will be:

- The nature of the impact: negative;
- The type of the impact: direct;
- The reversibility of the impact: irreversible;
- The extent of the impact: at European level, in Danube riparian countries;
- The duration of the impact: permanently during the time of the shipping (economic and tourist) traffic on the Danube;
- The probability of the impact: certain;
- The magnitude of the impact: low magnitude;
- Transboundary nature of impact: a cross-border impact on the climate in the Danube riparian countries will be generated, especially in Bulgaria and Serbia.

Given that the impact of the project on climate change will not be significant, there is no need to provide for measures to avoid, reduce or mitigate the significant impact on climate change.

The main measures to reduce the impact on climate change provided in the project during the operating period of the works are:

- use for dredging, modern dredging, engines with emissions that will comply with current legislation, with direct effect on the reduction of greenhouse gas emissions;
- adopting the technical solution to reuse the dredged material for the creation / expansion of the islands, this measure leads to the reduction of the greenhouse gas production that could have

been generated if another source for the exploitation of the material needed for the works was needed;

- adopting the technical solution to create new green areas by constructing new islands and expanding existing ones, over which, over time, different types of herbaceous and arboricola vegetation will develop, having the direct effect of retaining carbon dioxide in new stands developed;
- adopting the technical solution for fixing the bank protection at the typical level for the winter floods with fascines that will be covered with grass and implicitly the retention of carbon dioxide in the flooded areas;
- the use of water transportation on the Danube instead of road transportation for freight and tourist transport.

7.10 Impact of climate change on the project

7.10.1 The potential impact during the execution and operation of the works

The impact of climate change on the project is assessed globally for the lifetime of the project, both for the construction stage and the operating period.

Despite all the global efforts to reduce GHG emissions, global average temperatures will continue to rise in the next period, requiring urgent adaptation measures to the effects of climate change.

The interventions proposed in the project include measures to adapt to the effects of climate change along with risk management.

Just as economic sectors and human activities have proven to be negatively affected by climate change and the inland waterway transport sector is influenced by global warming.

In the field of inland waterway transport, the main effects of climate change are related:

- Prolonged periods of drought in correlation with increasing water demand and extreme temperatures - lowering the Danube level;
- periods of floods caused by torrential rains and heavy long-term rainfall - increasing the level of the Danube.

The impact of climate change on water bodies consists of seasonal changes in leakage, low flow situations and water shortages with the possibility of becoming more severe, the occurrence of more abundant and frequent rainfalls, both locally and regionally, but which are not relevant to the frequency and magnitude of floods and changes in biodiversity and aquatic and terrestrial ecosystems.

During the construction stage prolonged periods of drought and extreme temperatures could have a greater impact on the project compared to the operating period when the navigation conditions will be greatly improved as a result of the project implementation.

The guiding principles behind the development of the design concept for the FAST Danube project were designed to provide flexibility and adaptability to respond to climate change. These design principles were:

- working with the river natural morphological processes;
- recognizing uncertainty as an inherent part of design;
- favoring the use of adaptive structures instead of rigid structures.

Given the guiding principles in all design features of the FAST Danube project there were integrated technical and engineering characteristics able to provide flexibility and respond to future climate change.

Increasing the risk level associated to climate change can lead to the following effects:

- impaired navigation on the Danube during periods of drought and low flows;
- affecting wetlands along the Danube and related ecosystems by reducing the amount of water stored during drought and low water flows;

- damage to hydrotechnical structures during floods;
- changing river bed due to significant sediment transport during floods;
- damage to river banks and erosion process ecosystems during flood periods;
- Increased maintenance costs, unexpected;
- floods along the Danube (including protected natural areas) and damage to flood defenses.

The potential impact of climate change on activities during the construction and operation of the works, depending on its characteristics, will be:

- Nature of impact: negative;
- Type of impact: direct;
- Reversibility of impact: reversible;
- Expansion of impact: on the Danube-Danube joint Romanian-Bulgarian sector;
- Duration of impact: temporarily, in periods of extreme weather conditions;
- Probability of impact: probably;
- Magnitude of impact: of reduced magnitude;
- Cross-border nature of impact: a cross-border impact on the project will be generated in Bulgaria.

Given that the impact of climate change on the project will not be significant, there is no need to provide for measures to avoid, reduce or mitigate the significant impact on climate change.

The main measures to reduce the impact of climate change on the project, foreseen in the project, during the operating period of the works are:

- Geotechnical design of groynes and chevrons to allow increase or lower their crest level to respond to changes in low flow / drought conditions or to respond to future climatic changes in magnitude (or frequency) of floods;
- The islands are characteristic elements of the river being inherently flexible to changes both to the river bed and to the flow regime as well as in the sediment transport regime through natural morphological processes of erosion and deposition. As it is provided in the concept of islands design, it is expected that over time, they will change shape, size and extension due to hydro morphological changes;
- Works for bank protection have been designed so that there is a combination of:
 - a heavy engineering structure to ensure bank stability against erosion;
 - a vegetal structure that seeks to maintain terrestrial habitats and biodiversity and thereby mitigate the environmental impact under climate change.
- Consideration of 3.5 m dredging depths at ENR - dredging investment and corresponding to 3.0 at ENR m - maintenance dredging, higher than the minimum depth recommended by the Danube Commission (2.5 m) to fulfill the minimum navigation conditions was a measure to prevent the effects of future climate change as a result of prolonged droughts.
- The deepening of the fairway by dredging works and the creation of areas favoring the directing of the flow towards the channel by constructing the proposed structures, constitutes, as a whole, a technical measure to reduce the impact of climate change on navigability on the Danube;
- The deepening of the fairway through dredging works and the creation of deep-water areas along the channel throughout the year is a measure to reduce the impact of climate change on the aquatic ecosystem by limiting the uncontrolled algal development (lack of oxygen);
- Careful staging of building or dredging works so that they do not overlap over periods of time conducive to heavy floods and long-lasting rainfall;
- Arrangement of site organizations in areas located along existing flood defenses;
- Interruption of activities in case of extreme meteorological phenomena (storm, floods, fog, frost);

- Protect and insure executed works, equipment and machinery in safe areas, in the event of floods.

8. Provisions for environmental monitoring

Considering that the works foreseen by the project will be carried out in the Danube bed and embedded in banks (groynes), the project is proposed to carry out a monitoring program of the main environmental components, in three stages namely:

- before starting construction works;
- during the execution period;
- during the operating period.

The main purpose of the Monitoring Program carried out in all three stages is to track and estimate the evolution in time of the effects produced by the project works and to allow works adaptation if certain environmental conditions change different way, comparing with the estimations made during the preparation of the Feasibility Study.

The monitoring of the main environment components potentially affected by the project implementation prior to the commencement of the construction works is of particular importance for establishing the initial environmental conditions that will be considered as baseline values for the follow-up monitoring program.

Chapter 6.1 presents the main sources of pollutants and the proposed mitigation measures for each environmental factor during the execution of the construction works and during the operating period.

The contractor of the construction works will be responsible for providing and ensure all the facilities for the control of the emissions of environmental pollutants.

Taking into account the scale at which the project is being carried out, on a length of almost 500 km along the Danube, monitoring must be carried out on two different scales: at the scale of the whole surface water body in the project area (from Iron Gate II to Chiciu) and at the local scale, in the influence areas of the hydro-technical works carried out at the critical points.

The monitoring of the whole water body: Iron Gates II - Chiciu will be carried out through the national monitoring program developed by the National Agency "Romanian Waters" (ANAR) as provided by the National Management Plan for the share transnational monitoring programs of the International Danube River Basin - Transnational Monitoring Network (TNMN), developed by the International Commission for the Protection of the Danube River (ICPDR) and through other monitoring programs to be carried out during the project implementation period. All these monitoring programs aim to identify the general trends in water quality and the quality of habitats and species as set out in the Water Framework Directive, the Habitats Directive, the Birds Directive.

The monitoring of the whole water body: Iron Gates II - Chiciu will be correlated with local scale monitoring, in the areas of influence of the proposed works for the critical points. Local scale monitoring will be done through the project and will identify the local and temporary effects in the vicinity of the works.

The monitoring program carried out in the three stages of the project will include monitoring of the following parameters:

The monitoring program will mainly include:

- details of the works execution schedule;
- environmental components, monitoring criteria, sub-criteria;
- location of monitoring points;

- monitored indicators for each point, methodology and frequency;

The main environmental components that will be included in the monitoring program are:

- benthos and benthic plants;
- migratory fish, including sturgeon species;
- birds;
- water quality;
- sediment quality;
- soil quality;
- air quality;
- noise and vibration levels.

As regards the targeted fish species, they will be monitored by experimental fishing using classical methods and electric fishing. Sturgeons are the most sensitive species, among those that can be affected and are of international interest. During the monitoring phases, the impact of construction works on migration behavior will be assessed. Specimens of the target species must be captured alive and not injured. The number of individuals for each target species to be studied during the project must be sufficient to be statistically processed. Respectively, a minimum of 30 specimens of each species per migratory season in the case of anadromous migratory sturgeons because of their small number and the fact that the target species are on the verge of extinction, a total number of 30 specimens is considered enough for all three species (Beluga sturgeon, Stellate sturgeon and Russian sturgeon).

Gender will be determined for the analyzed species, based on the sexual dimorphism present in each species or will be established (using a digital endoscope) and the weight (the magnitude correlates with the weight of the transmitter in the case of the acoustic-marked species). Fish handling must be fast and careful. It is essential to use sterile surgical equipment.

The sectors affected by the project represent only part of the sturgeon territory, being dependent both by the movement conditions (water depth, turbidity) and also by the feeding and reproduction conditions (favorable habitats, benthic invertebrates, fish species).

As general objectives, the monitoring of migratory ichthyofauna must follow:

- characterization of populations: age structure and size classes, distribution, abundance, habitat preference;
- establishment of the reproductive potential - the proportion of reproductive females;
- tracking and confirming migration periods for breeding, wintering, feeding;
- characterizing preferred habitats for breeding and feeding;
- migration monitoring periods for migratory fish

In Table 22 details are presented on the species of migratory and semi-migratory fish in the Lower Danube.

Table 22 Data on species of migratory and semi-migratory fish * from the Lower Danube (Otel 2007; Antipa 1909; Khodorevskaya 2009; Anon 1997)

No.	Species	Scientific Name	Spread across the Romanian Danube sector	Migration period	Reproduction period.	IUCN status	Substrate used for spawning	Depth Reproduction. [m]
1	Beluga sturgeon	<i>Huso huso</i>	From the mouth of the Danube to PF II	February- March / August- December	March April	Critical	stony and crevices	6-20
2	Russian sturgeon	<i>Acipenser gueldenstaedtii</i>	From the mouth of the Danube to PF II	February - May / August - November	April - June	Critical	clay, gravel or sand, away from mud	8-20
3	Stelate sturgeon	<i>Acipenser stellatus</i>	From the mouth of the Danube to PF II	March - April / September - November	April- May	Critical	sandy bottom, gravel or sand, protected from mud	8-10
4	Sterlet	<i>Acipenser ruthenus</i>	From the mouth of the Danube to PF II	March	April -May	vulnerable	pebble or gravel	4-5
5	Pontic shad	<i>Alosa immaculata</i>	From the mouth of the Danube to PF II	February	March - May	vulnerable	in the mass of water	-
6	Azov shad	<i>Alosa tanaica</i>	From the mouth of the Danube to PF II	March	April - June	unthreatening	Mass in the water	-
7	Sichel	<i>Pelecus cultratus</i>	Throughout the Lower Danube	April	May- June	unthreatening	semi-pelagic	-
8	Asp	<i>Aspius aspius</i>	Throughout the Lower Danube	April	may -June	unthreatening	subtle substrate from the bottom of the water	-
9	Balon's ruffe	<i>Gymnocephalus baloni</i>	Throughout the Danube	February March	March -to May	unthreatening	On plants or on the bottom of the water	-

No.	Species	Scientific Name	Spread across the Romanian Danube sector	Migration period	Reproduction period.	IUCN status	Substrate used for spawning	Depth Reproduction. [m]
10	Schraetzer	<i>Gymnocephalus schraetzer</i>	Throughout the Danube	March	April- May	unthreatening	strong substrate, current	-

Note: * There are several species of fish that could make short migrations, but their migration and biology are less well known

Fish populations in the project area will be monitored to identify potential changes within each species and distribution of age classes, changes that may be caused by alteration of the flow regime (water temperature rises, current speed decreases, changes of aquatic plants composition). Different complementary methods are needed, such as telemetry studies, population genetics studies, analysis of invertebrate fauna in feeding habitats, etc. to obtain sufficient information on fish populations, and it will also be necessary seasonal estimation of the inventory.

At the same time, the habitats will be mapped, which is an essential operation for identifying available habitats and differentiating between construction-induced changes and other changes.

Since it is not possible to assess the entire stock of fish from a large river, such as the Danube, or from a river sector, representative samples should be obtained to estimate changes in species composition or age structure populations. Thus, most of the potential species living in the area must be tracked by different methods and in different seasons.

In Table 23 is presented the calendar of migratory fish in the Lower Danube, downstream of the Iron Gates II.

Table 23 The calendar of migratory fish in the Lower Danube downstream of Portile de Fier II * (Otel 2007; Antipa 1909; Khodorevskaya 2009; Anon 1997)

No.	Species Name	Scientific Name	Direct. hab.	Month											
				1	2	3	4	5	6	7	8	9	10	11	12
1	Beluga sturgeon	<i>Huso huso</i>	H		U	U	R	D	J	J	J	U	U	U	
2	Russian sturgeon	<i>Acipenser gueldenstaedtii</i>	H		U	U	R	D	J	J	J	U	U	U	
3	Stellate sturgeon	<i>Acipenser stellatus</i>	H			U	U	R	D	J	J	U	U	U	
4	Sterlet	<i>Acipenser ruthenus</i>	H			U	R	D	D	J					
5	Pontic shad	<i>Alosa imaculata</i>	H		U	U	R	R	D	J	J				
6	Azov shad	<i>Alosa tataica</i>				U	R	R	D	D					
7	Sichel	<i>Pelecus cultratus</i>					U	R	R	D					
8	Asp	<i>Aspius aspius</i>					U	R	R	D			U	U	

No.	Species Name	Scientific Name	Direct. hab.	Month											
				1	2	3	4	5	6	7	8	9	10	11	12
9	Balon's ruffe	<i>Gymnocephalus baloni</i>			U	U	R	R							
10	Schraetzer	<i>Gymnocephalus schraetzer</i>				U	R	R							

Legend:

Bold text	Species of anadromous migratory fish
Normal text	Semi-migratory fish species
U - Upstream	The important period for upstream migration
D - Downstream	The important period for downstream migration of adults
J – Juveniles	The important period for downstream migration of juveniles
R (Reproduction)	The important period for reproduction in the Danube
H	Habitats directive

Note: * There are several species of fish that could make short migrations, but their migration and biology are less well known

9. Link to other normative acts and / or plans / programs / strategies / planning documents

9.1 Justification of the project classification, as the case may be, in the provisions of other national normative acts transposing the Community legislation

The project aims to implement measures for improv navigation on the Romanian-Bulgarian sector by increasing traffic safety on the Danube and increasing the number of days per year in which the minimum navigation conditions on the Danube Rinway are met.

The main features of the project are the following:

- is a navigation infrastructure project;
- the expected result is the increase in the quantity of goods / merchandises transported on the Danube;
- works are proposed through the project to increase the flow rate on the fairway, to bring the fairway width to normal parameters, to facilitate the creation of new islands or the deepening of the navigation line and to reduce the erosion processes of the banks; the works will be executed mostly in the riverbed and on the banks (in the case of bank protection works);
- the proposed works are located on the border of Romania with the Republic of Bulgaria, along the Danube, on the territories of both states on the Romanian-Bulgarian sector;
- the project is located in a Natura 2000 biogeographical region characterized by the presence of numerous protected areas along the Danube on both banks.

Taking into account the particularities of the project, the main relevant national regulatory acts (transposed from the Community legislation), applicable to it and important for the procedural and technical aspects, are presented in the following.

The legal framework in Romania

Regulations on the Danube River

Romania has adhered to the following conventions and European and international agreements on the Danube River:

- The Convention on the Navigation on the Danube, signed in Belgrade in 1948, together with the two annexes and the Additional Protocol (1998), ratified by Decree no. 298/1948 published in the Official Gazette of Romania on 30 October 1948.
- The bilateral agreement between Romania and the Republic of Bulgaria on the maintenance and improvement of the navigable waterway on the Romanian-Bulgarian Danube sector, signed in Sofia in 1955, approved in Romania by the Council of Ministers Decision no. 305 of 10 March 1956.
- The Co-operation Convention for the Protection and Sustainable Use of the Danube River, signed in Sofia in 1994, ratified by the Romanian Parliament by Law no. 14 on February 27, 1995.

The main provisions of these conventions and agreements are presented in Chapter 6.1.

In October 2016, through GD no. 666/2016, the General Transport Master Plan (GTMP) of Romania, which includes strategic objectives for the development of the transport sector in Romania over a period of time until 2040, was approved and entered into force. The GTMP integrates the provisions of the European transport policy stipulated in the Third White Paper (2011) as well as the EU Strategy for the Danube Region and considers the prioritization of the TEN-T projects.

Among the proposals included in the GMPT are the improvement of the Danube's navigability which will ensure the achievement of Operation objectives set for the shipping.

An important aspect regarding the approach of projects targeting the Romanian-Bulgarian sector of the Danube River is that it represents a large part of the border between Romania and the Republic of Bulgaria, covering a length of about 470 km.

According to Emergency Ordinance no. 105/2001 on the state border of Romania, approved by Law no. 243/2002, with subsequent modifications and completions, in the case of flowing waters, including the Danube River, the state border is the one established by the agreements, conventions and agreements between Romania and the neighboring states, taking into account the fact that the principle generally accepted by international regulations is that the border passes in the middle of the main channel.

Regulations on Environmental Impact Assessment

The assessment of the impact of a project on the environment is regulated in Romania by the following normative acts:

- Law 292/2018 on the assessment of the impact of certain public and private projects on the environment, repealing GD no. 445/2009 and Order no. 135/2010 approving the Methodology for the implementation of the environmental impact assessment for public and private projects;
- Order no. 863/2002 approving the methodological guidelines applicable to the stages of the framework procedure for environmental impact assessment;
- Law no. 86/2000 on the ratification of the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, signed at Aarhus on 25 June 1998.

The provisions of Directive 2011/92 / EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52 / EU, which entered into force on 15 May 2014, are transposed by Law 292/2018, in force since 09 January 2019, replacing GD 445/2009.

If the environmental impact assessment project affects a protected natural area of Community interest, an assessment of its effects on the natural protected area of Community interest must be carried out in accordance with the provisions of Order no. 19/2010 for approving the Methodological Guide on Appropriate Assessment of the potential effects of plans or projects on protected natural areas of Community interest.

If the project can have a potential cross-border impact, the following regulations apply:

- Law no. 22/2001 ratifying the Convention on environmental impact assessment in a transboundary context, adopted, in Espoo on 25 of February 1991;
- Order no. 864/2002 approving the Environmental Impact Assessment procedure in a transboundary context and public participation to the decisions on transboundary impact projects.

Air quality regulations

The Air Framework Directive 2008/50 / EC has been transposed into Romanian legislation by the Law no. 104/2011 on the ambient air quality, modified and completed by the Decision no. 336/2015, by the Decision no. 806/2016 and Law 203/2018.

The law establishes in annex no. 2 all agglomerations and areas for the assessment and management of ambient air quality. Pollutants for which ambient air quality assessment, including emissions from mobile sources, is provided are given in Annex no. 1 while the requirements for the assessment of sulfur dioxide, nitrogen dioxide, nitrogen oxides, particulate matter PM10 and PM2,5, lead, benzene, carbon monoxide, ozone, arsenic, cadmium, nickel and benzo (a) pyrene, are provided in Annex no. 3.

The law also provides for the preparation of air quality plans in the agglomerations and established assessment areas, the methodology being provided by GD no. 257/2015.

Regulations on water management

The general framework for water management in Romania is set by the Water Law no. 107/1996, with subsequent amendments and completions. The provisions of the Water Framework Directive 2000/60 / EC, as subsequently amended and supplemented, have been taken over in Romanian legislation by a series of normative acts that have brought amendments to the Water Law as follows:

- Law no. 310/2004 amending and supplementing the Water Law no. 107/1996 (definitions, provisions, annexes to the Framework Directive 2000/60 / EC);
- Law no. 112/2006 amending and supplementing the Water Law no. 107/1996 (pollution control, sand and gravel extraction, waterway dredging, water and aquatic ecosystems protection, flood protection). The places and conditions for the storage of the dredged material are established annually by ANAR, AFDJ and CN - Constanta Navigable Canals Administration;
- Government Emergency Ordinance (EGO) no. 12/2007 for amending and completing some norms transposing the Acquis Communautaire in the field of environmental protection (new articles to the Water Law no 107/1996 regarding the communication with the European Commission and with the EU member states);
- GEO no. 3/2010 for amending and completing the Water Law no. 107/1996, approved with amendments and completions, by Law no. 146/2010 (further amendments to the correction and completion of transposition of the Framework Directive);
- Law no. 196/2015 for the modification and completion of the Water Law no. 107/1996 (list of priority substances);
- Decision no. 570/2016 regarding the approval of the Program for the gradual elimination of discharges, emissions and losses of priority hazardous substances and other measures for the main pollutants (amendments to the list of priority substances in the Water Law No. 107/1996);

- GEO no. 94/2016 amending and supplementing the Water Law no. 107/1996 (transposes the amendments to the Water Framework Directive by Directive 2014/101 / EU);
- GEO no. 78/2017 for the modification and completion of the Water Law no. 107/1996

The quality of surface water is regulated by Order no. 161/2006 for the approval of the Normative regarding the classification of surface water quality for establishing the ecological status of the water bodies.

According to the legislative calendar, by the end of 2009, the National Management Plan for the part of the Danube river basin was drawn up, covering the territory of Romania, representing the synthesis of the Basin Management Plans related to the 11 hydrographic basins in Romania. The National Management Plan included measures foreseen until 2015 and was approved by GD no. 80/2011. The national management plan was updated in 2015 for the period 2016-2021 and was approved by GD no. 859/2016.

The provisions of Directive 2007/60 / EC on the assessment and management of flood risks have been transposed into the Romanian legislation by the Water Law no. 107/1996, with subsequent modifications and completions, and by GD no. 846/2010 for the approval of the National Strategy for flood risk management in the medium and long term.

The Water Law establishes obligations for central public authorities regarding flood risk management, namely the preliminary flood risk assessment for each river basin, the development of hazard maps and flood risk management plans for potentially identified sensitive areas, as well as the revisions thereof.

For the Danube River, the Flood Risk Management Plan has been developed, together with the flood risk management plans for the other river basins in Romania, through GD no. 972/2016.

The national strategy for flood risk management in the medium and long term establishes the application of policies, procedures and practices with the objectives of identifying risks, analyzing and evaluating them, treating, monitoring and re-evaluating the risks in order to mitigate them.

Regulations on Biodiversity and Protected Areas

Regarding the conservation of biodiversity and the protected areas regime, Romania has joined the following European and international conventions:

- Convention on Biological Diversity adopted at the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, ratified by Law no. 58/1994 published in the Official Gazette on 2 August 1994;
- Convention on Wetlands of International Importance especially as Waterfowl Habitat, signed at Ramsar in 1971 and amended by the Paris Protocol of 3 December 1982, to which Romania adhered by Law no. 5/1991 published in the Official Gazette on 26 January 1991;
- Convention on the Conservation of Wildlife and Natural Habitats in Europe, adopted in Berne in 1979, to which Romania adhered by Law no. 13/1993 published in the Official Gazette on 25 March 1993.

The natural protected areas of national or international interest were identified by Law no. 5/2000 with subsequent modifications approving the National Territory Plan - Section III - Protected Areas, which provides the obligation of the central and local public administration authorities to indicate these areas in the territory planning documentation at the levels of counties, municipalities, towns and communes.

By GD no. 2151/2004 on the establishment of the protected natural habitat regime for new areas, a number of national and natural parks have been defined together with scientific reserves, nature monuments, nature reserves and special bird's protection areas. The list of protected natural areas was subsequently extended by GD no. 1581/2005, GD nr. 1143/2007, GD no. 1066/2010 or GD no. 1217/2010.

In 2007, Directive 92/43 / EEC (Habitats Directive) and Directive 2009/147 / EC (Birds Directive) were transposed into Romanian legislation by GEO no. 57/2007 on the regime of natural protected areas, conservation of natural habitats, wild flora and fauna, approved by Law no. 49/2011, with subsequent amendments and completions.

GEO no. 57/2007 establishes the categories of natural protected areas, natural habitats types, wild flora and fauna species and other natural heritage assets subject to the special protection, conservation and sustainable use regime, their identification, establishment, organization, development and regime of the national network of protected natural areas, their management, protection and conservation measures, responsibilities and attributions.

GEO no. 57/2007 also provides that if a project subject to an environmental impact assessment could significantly affect a protected natural area of Community interest, it must also be subject to an appropriate assessment of the potential effects on the protected natural area of Community interest, taking into account its conservation objectives.

After enforcement of GEO no. 57/2000, by GD no. 1284/2007, 108 special protection areas were declared as an integral part of the European ecological network Natura 2000 in Romania. The list was later extended to a number of 148 SPAs through GD no. 971/2011 amending and supplementing GD no. 1284/2007.

Also, by Order no. 1964/2007, 273 protected natural areas were declared as SCI, the list being subsequently extended to 382 SCI by Order 2387/2011 for amending and completing the Order no. 1964/2007.

Cultural heritage regulations

In March 1990 Romania joined the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage of 1972, by Decree no. 187/1990, and in April 2007 to the Convention on the Protection of the Underwater Cultural Heritage of 2001, by Law no. 99/2007.

The main regulatory acts identifying the cultural heritage built in Romania and regulating its regime are the following:

- Ordinance no. 68/1994 on the protection of the national cultural heritage, which defines the historical monuments as being represented by all the real estate assets that are valuable from an archaeological, historical, architectural, religious, urban, artistic, landscape or technical-scientific point of view. The Ordinance includes general provisions on the categories of historical monuments and classification methods, ownership, authorities' roles and responsibilities, ways of protection and conservation;
- Ordinance no. 43/2000 on the protection of the archaeological heritage and declaring some archaeological sites as areas of national interest, which regulates the general juridical regime of the discoveries and archaeological research, as well as the protection of the archaeological heritage, part of the national cultural patrimony;
- Law no. 5/2000 regarding the approval of the National Land Planning Plan - Section III - Protected Areas, which identifies the areas comprising cultural heritage values and indicating the national cultural heritage values that require the establishment of protected areas;
- Ordinance no. 47/2000 establishing measures for the protection of historical monuments that are part of the World Heritage List, introducing special protection measures;
- Law no. 422/2001 on the protection of historical monuments, with subsequent modifications and completions, which regulates the general legal regime of historical monuments, establishing the methods for inventory and classification, protection measures, the ways of interventions on the historical monuments, the institutions and the specialized bodies with roles in the protection historical monuments, responsibilities of owners and public authorities, and financing arrangements for the protection of historical monuments;

- Order no. 2314/2004 regarding the approval of the Historical Monuments List, updated, and the List of lost Historic Monuments, with the subsequent modifications and completions.

9.2 Plan / program / strategy / programming / planning document of the project

The Improvement of Navigation Conditions on the Romanian-Bulgarian common Danube sector is included in the list of proposed investment projects within the Master Plan of the Romanian General Transport Plan, the revised version of the Report on the Short, Medium- and Long-Term Master Plan, July 2015.

The project is also included in the National Management Plan related to the Romanian share of the International River basin of Danube River, for the period 2016-2021.

10. Works for organization of construction site

10.1 Description of the works required for the organization of the site

The construction works contractor will be responsible for the work required for construction site organization (selection of locations, access routes, needed gear and equipment).

In the Pre-Construction Stage, the Contractor of the Construction Works will decide whether for the construction of the hydrotechnical structures proposed by the project it will be necessary to arrange some bank-side organizations (Critical Points areas: Bechet, Belene and Popina) or opt for the organization based on floating barges/dredges to be used during the works.

In case of the bank-side option for working site organizations, the following types of works will be required:

- Delimiting, enclosing the building site and placing the information panel with the name of the work and contractor;
- Preparation of the land areas in order to place the site's facilities by removing the vegetation waste, removing the vegetal soil and storing it for future reuse, leveling, compaction (if applicable);
- Marking the position of barracks, warehouses, parking lots for vehicles and equipment, work platforms and storage areas (materials, waste);
- Construction of perimeter ditches for collecting any potential accidental pollution;
- Location of locker rooms, barracks and platforms for storage of construction materials, location of firefighting facilities, electric generator, canteen and toilets, arrangement of selective waste collection points;
- Arranging the traffic routes inside the site organization for the vehicles, machinery and personnel.
- Washing/cleaning facility for the vehicles and equipment leaving the site.

In the case of site organization based on barges and dredges used for construction activities, most of the facilities needed for the construction of the site will be already available onboard (such as staff facilities). For the facilities have to be arranged they will be organized based on the needs and the available space on board.

10.2 Location of the site organization

In case of opting for the bank-side organization, the location of the site organization will be established with the agreement of the City Hall within which the works will be carried out. These will be located on the public domain (if possible) as close as possible to the areas in which the works will be done, avoiding inhabited or restricted areas. If there are no areas belonging to the public domain, private and can be used, subject to previous signing of related renting contracts with the landowners.

The location of the site organization will be the responsibility of the Contractor, who will decide, the most advantageous solutions and location, with the acceptance of the City Hall, where the works will be carried out.

Site organizations will not be located in areas affected by geotechnical instability phenomena. They will also not be located in areas with construction restrictions for railway infrastructure, road transport, telecommunications, electricity or natural gas.

10.3 Describe the environmental impact of the site organization work

In the case of bank-side construction site organizations, there could be a negative impact on the following environmental factors:

- Soil quality, as a result of the removal of vegetal soil layer, changes in the soil structure due to compaction activities, leakage of soil pollutants and their soil infiltration through rainwater, inadequate storage of materials and wastes resulted from the construction activities, accidental pollution with fuels, lubricants etc;
- Air quality as a result of generated emissions of dust and specific pollutants from combustion of fossil fuels generated by construction equipment and vehicles;
- Noise and vibration due to the operation of machinery and equipment.

In case of barges or dredges site organization, there will be no potential impact on soil quality but on Danube water as a result of accidental discharges of bilge water, liquid waste, fuel, etc.

Dust emissions will be reduced as they will only occur as a result of the handling of powdery construction materials.

The noise nuisance to the neighboring inhabitants will be reduced considering that the distance between the working front and the nearest inhabited areas would be higher, and the alignment of the existing vegetation on the Danube banks will act as a protective screen.

10.4 Sources of Pollutants and Installations for Retaining, Discharging and Dispersing Pollutants in the Environment During Construction Organization

The main sources of pollutants within the site organization may be the following:

- Wastewater from the construction site;
- Runoff waters that washed the site platform;
- Spillages from fuel storages or other materials used in the construction process;
- Storage of materials;
- Handling of construction waste and inappropriate storage thereof;
- Operation of equipment and machinery;
- Traffic within the site organization;
- Accidental pollution.

10.5 Facilities and measures to control emissions of pollutants into the environment

The main measures recommended for the control of emissions of pollutants into the environment during the construction of the site are the following:

- Enclosing the location of the site organization and maintaining it permanently under strict cleaning conditions (in case of bank-side site organization);
- Based on the location of raw materials sources or their temporary storage, optimal transportation routes should be decided as much as possible, both in terms of distances but also considering the crossed sensitive areas – navigation transport would be more advisable;
- Construction equipment working schedule should be optimized so that the emissions of gaseous pollutants are as low as possible and the impact on air quality will be minimal;

- Maintaining the perfect state of functioning of the equipment's and vehicles, through periodical inspections in specialized workshops;
- Immediate stop of work in case of malfunction of equipment;
- Proper management of generated waste;
- Restoration of the areas affected by the worksite organization works – bringing the land to its initial state (in case of bank-side site organization);
- Proper maintenance of machines and equipment to avoid noise caused by defective machines;
- Immediate intervention and repair in the event of equipment failure, to eliminate the cause of the noise;
- Prohibition of the disposal of waste or waste water resulting from site organizations directly on the ground or in surface water;
- In case of accidental pollution followed by leakage of fuel / oil on the ground or surface water, immediate action shall be taken to identify the cause of the leakage and to eliminate the source, to avoid the extent of the affected area, immediate measures will be taken to limit and remove the pollution;
- Compliance with the environmental legislation in force throughout the period of execution of the works, implementation of the necessary measures for the prevention of the surface, soil or air pollution, etc., as well as for the protection of the health of the population.

11. Site restoration works upon completion of the investment

11.1 Proposed works for site rehabilitation upon completion of the investment in case of accidents and / or cessation of activity

The project does not provide for decommissioning activities for the hydro-technical works executed by the project.

Restoring the areas near shoreline protection to the initial state will consist of levelling, compaction and redeposition of the fertilized layer at the beginning of work on the workpiece. The fertilized soil from the working aisle will be stored separately from the excavated soil. The soil surplus will be transported in places indicated by the Mayoralties on which the works will be carried out, being either used for filling or transport to landfills if it is contaminated.

11.2 Aspects related to the prevention and response of instances of accidental pollution

To prevent accidental spillage of fuel, oils and other substances, it is recommended that you constantly check the equipment and equipment used. In case of accidental pollution, the oil or fuel reaching the ground shall be removed with absorbent material as soon as possible according to the provisions of the accident prevention and control plan in case of emergency.

accident prevention and control plan in the event of an emergency will include a series of preventive and intervention measures in case of accidental pollution, such as:

- Take the necessary steps to prevent accidents of any kind in the work area of the site;
- Interruption of activities in case of extreme meteorological phenomena (storm, floods, fog, frost);
- If a flood is announced, the contractor of the construction works will take the necessary measures to protect the works and equipment in safe areas;
- Appropriate signaling of the river bed working front;
- Signaling ships and dealers according to the river navigation regulations;

- Regular training of staff on observance of the rules of labor protection and river navigation;
- Verify and maintain equipment maintenance equipment in accordance with the maintenance plan so that they are in good working order and free from oil and fuel losses.
- Fuel Supply of Ships, Desserts and Plumber Equipment in Fuel Stations.

All barges, dredges and floating equipment will be equipped with intervention and fire-fighting equipment. Avoid such accidents by permanently checking the work equipment and by forbidding open fire.

11.3 Aspects related to the closure / decommissioning / demolition of the installation

It's not necessary.

11.4 Ways of restoring of the initial condition / rehabilitation for further use of the land

The project does not provide for decommissioning activities for the hydro-technical works executed by the project.

Near hydrotechnical structures, after the completion of the works, the surplus of materials, waste (if any) will be removed, so that it will return to conditions similar to those of the beginning of the works.

Where necessary (areas where deforestation, removal) have been carried out, replanting of trees will be carried out using only native species and the conditions for redeposition of the vegetation layer will be restored.

12. Aspects of appropriate assessment

12.1 Location of the project towards natural protected areas of community interest. Name and code of protected areas of community interest

The project is being carried out on the Danube River Danube, between Iron Gates II (Romanian Portile de Fier II) and Chiciu-Siliștea (between km 863 and km 375), for which it is desirable to ensure optimal airworthiness. The main objective of the project is to identify the technical solutions to be implemented to ensure navigation conditions on the Romanian-Danish joint sector of the Danube and to conduct the Danube transport safely throughout the year in accordance with the recommendations of the Commission Danube in Budapest.

The works proposed within the project will be carried out in five areas, designated as critical areas for airworthiness, both on the territory of Romania and the Republic of Bulgaria, located between km 845.5 and km 375. Hydrotechnical works will be carried out both in the river bed, and on shore, in designated critical areas, and / or upstream and downstream of them.

In the navigation sector managed by the Romanian side, three critical areas were designated, and two critical areas were designated in the navigation sector managed by the Bulgarian side. Each critical area includes several CPs to intervene to ensure optimal airworthiness, six of which are located in the navigation sector managed by the Romanian side (Garla Mare, Salcia, Bogdan-Secian, Dobrina, Bechet and Corabia) and six in the navigation sector managed by the Bulgarian side (Belene, Vardim, Iantra, Batin, Kosui and Popina).

About the Natura 2000 sites, on the Romanian side there were identified 15 areas of special bird's protection (SPA) designated on the basis of the provisions of the Birds Directive and 7 sites of community importance (SCI), which contain habitats and species protected under the provisions of the Habitats Directive. All Natura 2000 sites located in the Danube sector were selected for analysis starting from km 845.5 to the first 375 km downstream.

The location of the proposed works (related to Scenario 1) to the Natura 2000 sites (distances in km) are presented in Tables 24-28.

Geographic coordinates of engineering works (groynes, chevron, bank protection) and morphological (dredging material, islands, dredging) proposed by project in each CP in the Stereo 70 national projection system as a vector (digital format) are attached to the electronic documentation in Annex D - Geographic coordinates of hydrotechnical works in the national projection system Stereo 70.

Table 24 Location of proposed works to Natura 2000 sites related to Critical Zone 1, from km 850 to km 818, comprising CP Garla Mare and Salcia

Code and N2k site name	Location of site proposed works (km)		CP 1 - Garla Mare	CP 2 - Salcia
			Description of proposed works	
			✓ Investment dredging ✓ 1 disposal area for dredged material	✓ Investment dredging ✓ 2 dredging storage areas
ROSCI0299 Dunarea la Garla Mare - Maglavit	Overlapping		Yes	Yes
	Proximity (km)		-	-
ROSPA0046 Gruia - Garla Mare	Overlapping		-	-
	Proximity (km)	upstream	0,06	-
		downstream	-	4,4
ROSPA0074 Maglavit	Overlapping		-	-
	Proximity (km)	upstream	-	7,3
		downstream	-	-

Table 25 Localization of proposed works to Natura 2000 sites related to Critical Zone 2, from km 786 to km 755, comprising CP Bogdan Secian and Dobrina

Code and N2k site name	Location of site proposed works (km)		CP 3 - Bogdan – Secian	CP 4 - Dobrina
			Description of proposed works	
			✓ Investment dredging ✓ 1 disposal area for dredged material	✓ Investment dredging ✓ 2 dredging storage areas
ROSCI0039 Ciuperceni-Desa	Overlapping		Yes	Yes
	Proximity (km)		-	-
ROSPA0013 Calafat-Ciuperceni-Dunare	Overlapping		Yes	Yes
	Proximity (km)		-	-

Table 26 Localization of proposed works to Natura 2000 sites related to Critical Zone 3, from km 678 to km 625, including CP Bechet and Corabia

Code and N2k site name	Location of site proposed works (km)		CP5 - Bechet	CP 6 - Corabia
			Description of proposed works	
			✓ Investment dredging for channel realignment ✓ 1 chevron ✓ 3 groynes ✓ bank protection ✓ 1 the new island ✓ 2 dredging material disposal areas	✓ Investment dredging on the existing channel and access channel to Corabia port ✓ Extend existing islands by creating a dredging material storage area
ROSCI0045 Coridorul Jiului	Overlapping		Yes	-
	Proximity (km)		-	-
ROSPA0023 Confluenta Jiu-Dunare	Overlapping		Yes	-
	Proximity (km)		-	-
ROSPA0010 Bistret	Overlapping		-	-
	Proximity (km)	upstream	-	-
		downstream	30	-
ROSPA0135 Nisipurile de la Dabuleni	Overlapping		Yes	-
	Proximity (km)		-	-
ROSCI0044 Corabia - Turnu Magurele	Overlapping		-	Yes
	Proximity (km)		-	-
ROSPA0024 Confluenta Olt-Dunare	Overlapping		-	Yes
	Proximity (km)		-	-

Table 27 Localization of proposed works to Natura 2000 sites related to Critical Zone 4, from km 577 to km 520, comprising CP Belene, Vardim, Iantra and Batin

Code and N2k site name	Location of site proposed works (km)	CP 7 - Belene	CP 8 - Vardim	CP 9 - Iantra	CP 10 - Batin
		Description of proposed works			
		✓ Investment dredging for channel realignment ✓ Investment dredging on the existing channel ✓ 2 chevrons ✓ 3 groynes ✓ bank protection ✓ 1 dredging material storage area	✓ Investment dredging ✓ 3 dredging material storage areas (2 of which were created by extending existing islands)	✓ Investment dredging ✓ 1 dredging material storage area	✓ Investment dredging ✓ 1 dredging material storage area
ROSPA0102 Suhaia	Overlapping	Da	-	-	-
	Proximity (km)	-	-	-	-
ROSCI0088 Gura Vedei - Saica – Slobozia	Overlapping	-	Yes	Yes	Yes
ROSPA0108 Vedeia - Dunare	Overlapping	-	Yes	Yes	Yes

Table 28 Localization of proposed works to Natura 2000 sites related to Critical Zone 5, from km 428 to km 401, comprising CP Kosui and Popina

Code and N2k site name	Location of site proposed works (km)		CP 11 - Kosui	CP 12 - Popina
			Description of proposed works	
			✓ Investment dredging ✓ Extend existing islands by creating 2 dredging storage areas	✓ Investment dredging for channel realignment ✓ Investment dredging on the existing channel ✓ 3 groynes ✓ 1 chevron ✓ 1 dredging material storage area
ROSPA0090 Ostrovu Lung – Gostinu	Overlapping		-	-
	Proximity (km)	upstream	-	-
		downstream	32	-
ROSPA0038 Dunare – Oltenita	Overlapping		-	-
	Proximity (km)	upstream	-	-
		downstream	2,6	-
ROSCI0131 Oltenita - Mostistea - Chiciu	Overlapping		Yes	Yes
	Proximity (km)		-	-
ROSPA0136 Oltenita – Ulmeni	Overlapping		Yes	Yes
	Proximity (km)		-	-
ROSPA0021 Ciocanesti – Dunare	Overlapping		-	-
	Proximity (km)	upstream	-	5,9
		downstream	-	-
ROSCI0022 Canaralele Dunarii	Overlapping		-	-
	Proximity (km)	upstream	-	24
		downstream	-	-
ROSPA0039 Dunare-Ostroave	Overlapping		-	-
	Proximity (km)	upstream	-	24
		downstream	-	-
ROSPA0051 Iezerul Calarasi	Overlapping		-	-

Code and N2k site name	Location of site proposed works (km)		CP 11 - Kosui	CP 12 - Popina
			Description of proposed works	
			✓ Investment dredging ✓ Extend existing islands by creating 2 dredging storage areas	✓ Investment dredging for channel realignment ✓ Investment dredging on the existing channel ✓ 3 groynes ✓ 1 chevron ✓ 1 dredging material storage area
	Proximity (km)	upstream	-	23
		downstream	-	-

12.2 Presence and number / areas covered by species and habitats of community interest in the project area

12.2.1 General Elements

The analysis of the populations of the species and habitats of the community interest in the area of interest of the project was based on the data from the evaluations carried out within the Natura 2000 Management Plans (presented in the following chapters), representing the most relevant sources of existing data at the moment. For Natura 2000 sites that have not approved Management Plans, the information has been extracted from the Natura 2000 Standard Forms. Complementary to this analysis, we present the conservation status of species and habitats of community interest, where this information exists in the mentioned documents, being an essential parameter to be considered in the Appropriate Assessment procedure. We mention that the habitats and species of community interest included in Annex I and Annex II of the Habitats Directive, and Annex I of the Birds Directive, respectively in Annex no. 3: Species of plants and animals whose conservation requires the designation of special areas of conservation and special avifauna protection areas of the Government Emergency Ordinance no. 57/2007 on the regime of natural protected areas, conservation of natural habitats, wild flora and fauna, approved with amendments and completions by Law no. 49/2011, with subsequent amendments and completions.

According to available public data, half of the 22 Natura 2000 sites in the project area have approved Management Plans:

- ROSCI0299 Dunarea de la Garla Mare – Maglavit;
- ROSPA0074 Maglavit;
- ROSCI0039 Ciuperceni-Desa;
- ROSPA0013 Calafat – Ciuperceni – Dunare;
- ROSCI0045 Coridorul Jiului;
- ROSPA0023 Confluenta Jiu-Dunare;
- ROSPA0010 Bistret;
- ROSPA0135 Nisipurile de la Dabuleni;
- ROSPA0038 Dunare – Oltenita;
- ROSCI0022 Canaralele Dunarii;
- ROSPA0039 Dunare-Ostroave.

The presence and number / areas covered by species and habitats of community interest from the 11 Natura 2000 sites in the project area, which have Management Plans, are presented in Table form below, depending on the information contained therein. The information presented on habitat surfaces, population sizes (number of individuals or pairs) and their outlook are not uniform for all Natura 2000 sites, because for 7 of the sites Management Plans were developed using the Sincron model (ROSCI0299, ROSPA0074, ROSCI0039 & ROSPA0013, ROSPA0135, ROSCI0022 and si ROSPA0039), and for other sites Management Plans have different formats.

Following the inventory and mapping studies carried out to develop Management Plans, in some cases there were no habitats / species (marked with Green in the Table) mentioned in the Standard Forms, but also the presence of other habitats / species (marked with grey in the Table) which were not included in the Standard Forms. In the analysis were also included the species (listed in Annex I and Annex II of the Habitats Directive and Annex I of the Birds Directive) identified by drawing up inventory and mapping studies for the implementation of Management Plans.

Regarding the other 11 sites for which there are not yet approved Management Plans, for 8 of them there are ongoing projects that include the elaboration of Management Plans financed under the High Infrastructure Operational Program namely:

- ROSCI0044 Corabia - Turnu Magurele (estimated date of official publication– 2019);
- ROSPA0024 Confluenta Olt – Dunare (estimated date of official publication– 2019);
- ROSCI0088 Gura Vedei - Saica – Slobozia (without overlapping surfacesROSPA0108 Vedeia – Dunare) (estimated date of official publication– 2019);
- ROSPA0090 Ostrovu Lung – Gostinu (estimated date of official publication – 2019);
- ROSCI0131 Oltenita - Mostistea – Chiciu (estimated date of official publication – 2019);
- ROSPA0136 Oltenita – Ulmeni (estimated date of official publication– 2019);
- ROSPA0021 Ciocanesti – Dunare (estimated date of official publication– 2019);
- ROSPA0051 Iezerul Calarasi (estimated date of official publication – 2020).

For these Natura 2000 sites, requests were sent to beneficiaries of funding projects to obtain the available information from the Interim Reports / Field Reports / Data Sheets, etc. with regard to a number of parameters (e.g. the area of the habitats of community interest, the favourable habitats of the species of community interest, the spatial distribution, the conservation status, etc.). The following project beneficiaries responded to the requests:

- Equilibrium Association (ROSCI0044, ROSPA0024, ROSCI0131, ROSPA0136 and ROSPA0021), specifying that all data on species and habitats, such as conservation status, threats, etc. will be available in the final and not intermediate format, the final format of which will be posted on the two project websites during 2019;
- The Bio-Romania Association (ROSCI0088 - without the surface that overlaps with ROSPA0108 and ROSPA0090), specifying that in April 2019 the Management Plan will be submitted in the final version, and it will also be posted on the site project.

For 3 of the sites, no management plans have been developed and no projects are currently underway to include such a component: ROSPA0046 Gruia-Garla Mare (the latter having only the overlapping management plan with ROSCI0306 Jiana), ROSPA0102 Suhaia and ROSPA0108 Vedeia-Danube.

Regarding the location of the proposed project (related to Scenario 1) in relation to the Natura 2000 sites, out of the 22 Natura 2000 sites in the project area, 13 effectively overlap with the elements of the project, 9 being located in the vicinity of the project elements. Out of the 13 overlapping, only 6 have Approved Management Plans.

In sections 12.2.2 - 12.2.23, the 22 Natura 2000 sites identified in the project area are briefly described, and in section 12.24 are presented the habitats and species of community interest in these sites, together with surfaces and flocks, where available.

12.2.2 ROSCI0299 Dunarea de la Garla Mare – Maglavit

ROSCI0299 Dunarea de la Garla Mare – Maglavit is located in the continental biogeographic region (100%), being located in the administrative region South-West Oltenia, stretching over an area of 9,487.6 ha.

The area is characterized by the presence of a mosaic of habitats that harmoniously combines the dry land with the wetland, the most important part of the site being populated by a large number of species of conservation interest of mammals, reptiles and amphibians, fish and other important species. According to the Natura 2000 Standard Specification, the designated species include (see Table 29): *Spermophilus citellus*, *Lutra lutra*, *Emys orbicularis*, *Bombina bombina* and *Triturus dobrogicus*.

12.2.3 ROSPA0046 Gruia - Garla Mare

The ROSPA0046 Gruia - Garla Mare site is located in the Continental biogeographic region (100%), located in the administrative region of Southwest Oltenia, stretching over an area of 2,963.9 ha in the floodplain of the Danube, following the shape of the left bank of the river. Within this site the emergent vegetation could not grow too much, but the subdermal (*Myriophyllum* and *Potamogeton* predominates) is abundant and supports the nests of certain bird species, such as the large cornice *Podiceps cristatus* and the white-cheeked *Chlidonias hybridus* cheekbones.

Balta Gruia attracts in this area an impressive number of birds, both species and individuals, both in the summer and cold season, according to the Natura 2000 Standard, the site being designated for the protection of 20 bird species of Community interest listed in Annex I of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 30) and of other 51 regular migratory species not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Aythya nyroca*, *Falco cherrug*, *Phalacrocorax pygmaeus*, *Nycticorax nycticorax*, *Ardea purpurea*, *Egretta garzetta*, *Ardeola ralloides*, *Haliaeetus albicilla* and *Botaurus stellaris*;
- ✓ during the migration period for the species: *Phalacrocorax pygmaeus*, *Phalacrocorax carbo*;
- ✓ For wintering for the following species: *Aythya ferina*, *Phalacrocorax pygmaeus*.

According to the Romanian Ornithological Society (ROS), the site has been designated as IBA (Important Bird Areas) according to the following criteria developed by BirdLife International: C1 - Conservation Global Conservation Species, C2 - Concentrations of a Threatened Species EU, C3 - Congregations of migratory species not threatened at EU level and C6 - Threatened species at EU level.

12.2.4 ROSPA0074 Maglavit

ROSPA0074 Maglavit is located in the continental biogeographical region (100%), located in the South-West Oltenia administrative area, covering an area of 3,642.5 ha. In this floodable area of the Danube, between the towns of Cetate and Calafat, several lakes were formed (Fountain Banului Lake, Hunia Lake, Lake Maglavit, Golenti Lake), the water vegetation here allowing favourable conditions to be created, which attracted many bird species.

According to the Natura 2000 Standard, the site has been designated for the protection of 34 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 31), as well as other 78 species of birds with regular migrations not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Ciconia ciconia*, *Chlidonias hybridus*, *Himantopus himantopus*, *Recurvirostra avosetta*, *Ardea purpurea*, *Egretta garzetta* and *Emberiza hortulana*;
- ✓ during the migration period for the species: *Pythia nyroca*, *Platalea leucorodia*, *Falco vespertinus*, *Pluvialis apricaria*, *Larus minutus*, *Philomachus pugnax*, *Phalacrocorax pygmaeus*, *Nycticorax nycticorax*, *Sterna hirundo* and *Tringa glareola*;
- ✓ For wintering for the following species: *Anser albifrons*, *Phalacrocorax pygmaeus*.

According to ROS, the site has been designated as IBA (Important Bird Areas) according to the following criteria developed by BirdLife International: C1 - Conservation Global Conservation Species and C4 - Congregation - Large Congregations. During the migration period, the site hosts more than 20,000 birds of prey, being a potential candidate for the RAMSAR site.

As a result of the studies carried out for the elaboration of the RIFPA0074 Maglavit avifauna protection area management plan, the presence of another bird species of Community interest (marked in grey in Table 31), which does not appear in the Standard Site Form: *Asio flammeus*. Thus, this species of community interest (listed on Annex I of the Birds Directive).

12.2.5 ROSCI0039 Ciuperceni-Desa

The ROSCI0039 Ciuperceni - Desa site is located in the continental biogeographic region (100%), located in the administrative region South-West Oltenia. The site spans an area of 39,560.10 ha. Over time there have been many changes in this area: indigo, drainage, irrigation and desertion in the Danube Meadow, deforested forests, plows converted into farmland or lakes for fish breeding, changes that have had a particular impact on bird species in the area. This site also includes the Ciuperceni Desa Ornithological Reserve, which covers an area of 200 hectares, Bala Lata with an area of 28 ha and the Black Forest with a surface of 1.20 ha, Ciurumela Forest.

The site is distinguished by the habitats of *Salix alba* and *Populus alba*. Ciurumela Forest is situated on the site of a former nursery, being famous for the huge acacia specimens reaching 70-80 cm in diameters and 30-35 m in height, far exceeding the dimensions naturally made in the home country - North America, having the role of fixing the moving sand, which was once in the South of Oltenia, was a real problem. At the shelter of the acacia woods there is an interesting vegetation, which shelters a rare plant - cervical Molugo.

According to the Natura 2000 Standard, the designated species include (see Table 32): *Spermophilus citellus*, *Lutra lutra*, *Emys orbicularis*, *Bombina bombina* and *Triturus dobrogicus*.

12.2.6 ROSPA0013 Calafat-Ciuperceni-Dunare

The ROSPA0013 Calafat-Ciuperceni-Danube Site is located in the Continental biogeographical region (100%), located in the administrative area South-West Oltenia, covering an area of 29,379.3 ha. This site overlaps with the ROSCI0039 Ciuperceni-Desa site.

According to the Natura 2000 Standard, the site has been designated for the protection of 34 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 33), as well as other 71 regular bird migration species not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Ardea purpurea*, *Ardeola ralloides*, *Aythya nyroca*, *Botaurus stellaris*, *Burhinus oedicephalus*, *Caprimulgus europaeus*, *Chlidonias hybridus*, *Chlidonias niger*, *Ciconia ciconia*, *Ciconia nigra*, *Circus aeruginosus*, *Coracias garrulus*, *Egretta alba*, *Egretta garzetta*;
- ✓ in the migration period for: olds, gangs and rates;
- ✓ For wintering for: rates and finds.

During the migration period, the site hosts more than 20,000 birds of the pond, being a potential candidate for the RAMSAR site.

12.2.7 ROSCI0045 Coridorul Jiului

ROSCI0045 Coridorul Jiului is located in the continental biogeographic region (100%), located in the administrative region of South-West Oltenia. The site is spread over an area of 71,362.7 ha, along the middle

and lower course of Jiu. By its position, with its length in the direction NNV-SSE of approx. 129 km, crosses 4 and 27% respectively of the 15 ecoregions (Getic Plateau, Gavanu-Burdea Plains, Silvestra of the Romanian Plain, Danube Meadow) of Romania's continental biogeographical region, on a 355-meter difference, 405 m altitude.

According to the Natura 2000 Standard, the site concentrates 9 and 32% of the 28 types of natural forest habitats protected by Romanian and Community legislation, of which 2 are protected (91E0 *, 91I0 *).

As a result of the inventory and map studies conducted for the elaboration of the ROSCI0045 Protected Natural Landscape Management Plan - Jiu Corridor, ROSPA0023 Jiu-Danube Confluence, ROSPA0010 Bistret, Dranic Fossil Plant and Zaval Forest: "Final Report on the Conservation Status, Mapping and Assessment for the habitats in the ROSCI0045, ROSPA0010, ROSPA0023, Zaval and Fossilifer sites "and" The final report on the inventory, mapping and assessment of the conservation status of the species in the areas ROSCI0045, ROSPA0010, ROSPA0023, Zaval and Frontier Fossilifer Dranic " of habitats / species (marked with green in **Table 34**) and the presence of other habitats / species (marked with grey in **Table 35**) that do not appear as specified in the Standard Form. Thus, the following species and habitats of community interest (only those listed on Annex I and Annex II of the Habitats Directive) were included in the analysis: 4 types of habitats, 8 invertebrate species, 2 species of fish, 2 species of amphibians and 3 mammalian species (see **Table 34**).

12.2.8 ROSPA0023 Confluenta Jiu-Danube

ROSPA0023 Confluenta Jiu - Dunare is located in the continental biogeographic region (100%), being located in the administrative region South-West Oltenia, stretching over an area of 19,530.2 ha.

Due to the diversity of habitats, Jiu Meadow is a rich habitat area, with meadows and meadows, orchards, meadows, agricultural land, wetlands - ponds and canals and numerous anthropogenic habitats.

According to the Natura 2000 Standard, the site has been designated for the protection of 37 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 35), as well as other 76 species of regularly migratory birds not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Crex crex*, *Haliaeetus albicilla*, *Ciconia ciconia*, *Burhinus oedicnemus*;
- ✓ during the migration period for the species: *Tringa glareola*, *Pelecanus crispus*, *Platalea leucorodia*, *Plegadis falcinellus*;
- ✓ For wintering for: *Phalacrocorax pygmaeus*.

During the migration period, the site hosts more than 20,000 birds of the pond, being a potential candidate for the RAMSAR site.

12.2.9 ROSPA0010 Bistret

ROSPA0010 Bistret is found in the continental biogeographical region (100%), located in the South-West Oltenia administrative region. The site covers an area of 2,057.4 ha, with its composition at approx. 4 km away from the Danube, the Danareni-Bistret fishing complex, with an area of 2,030 hectares, resulting from the systemization of the Bistret-Carna-Nasta-Nedeia lagoon complex, with an area of 22,000 ha and an important floristic and faunistic diversity. These habitat types, by positioning on an important migratory route for poultry species through a varied trophic offer, are favourable conditions for many species of aquatic birds (zoophages in general and ichthyophages in particular) representing important temporary or occasional stationary places for migratory and sedentary bird species.

According to the Natura 2000 Standard, the site has been designated for the protection of 36 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 36), as well as other 76 species of regularly migratory birds not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Platalea leucorodia*, *Ardeola ralloides*, *Egretta garzetta*, *Aythya nyroca*, *Circus aeruginosus*;
- ✓ during the migration period for: most limes;
- ✓ For wintering for: rare and find species.

During the migration period, the site hosts more than 20,000 birds of the pond, being a potential candidate for the RAMSAR site.

12.2.10 ROSPA0135 Nisipurile de la Dabuleni

ROSPA0135 Nisipurile de la Dabuleni are located in the continental biogeographic region (100%), administratively being located in the South-West Oltenia region, stretching over an area of 11,009.2 ha, in the Danube Delta to the east of the confluence with the Jiu River.

The main types of land present in this area are: agricultural land, tree plantations, orchards, river grids, as well as permanent wetlands and temporary waters. Also, the presence of sand, sandy soil causes the appearance of a dune relief, well represented inside the site, giving the whole area a semiarid character with aridity and desertification, leading to the disappearance of the vegetal carpet.

According to the Natura 2000 Standard, the site has been designated for the protection of 18 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 37) as well as three other species of regularly migratory birds not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Falco vespertinus*, *Emberiza hortulana*, *Coracias garrulus*, *Lanius collurio* and *Lanius minor*;
- ✓ during the migration period for: *Aythya nyroca* and herds of *Ardeola ralloides* and *Platalea leucorodia*.

As a result of the studies carried out for the elaboration of the Integrated Management Plan for the Natura 2000 site ROSPA0135 Sands from Dabuleni and the protected area of national interest 2,667 Forest House of the Potelu forest, there were found 4 other species of birds of community interest (marked with grey in Table 37), which were not mentioned in the Standard Site Template, namely: *Chlidonias hybridus*, *Ciconia nigra*, *Circus aeruginosus* and *Eretret alba* (*Ardea alba*). Thus, these 4 species of community interest (listed in Annex I of the Birds Directive).

12.2.11 ROSCI0044 Corabia - Turnu Magurele

ROSCI0044 Corabia - Turnu Magurele is located in the continental biogeographical region (100%), administratively being located in the South-Muntenia and South-West Oltenia regions, covering an area of 8,354.1 ha.

The site is located in the Lower Danube Floodplain, having a special ecological value through the presence of 5 types of habitats of community interest: alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0),

mixed rivers with *Quercus robur*, *Ulmus laevis* and *Fraxinus excelsior* or *Fraxinus angustifolia* (91F0), with a lot of wildlife (*Vitis sylvestris*), but also many spider species with *Salix alba* and *Populus alba* (92A0), alluvial meadows from *Cnidion dubii* (6440) and harsh oligo-mesotrophic waters with *Chara* spp. 6440).

According to the Natura 2000 Standard Species, the designated species include: *Theodoxus transversalis*, *Bombina bombina*, *Triturus dobrogicus*, *Spermophilus citellus*, *Lutra lutra*, and many species of fish (*Romanogobio albipinnatus* (*Gobio albipinnatus*), *Gymnocephalus baloni*, *Gymnocephalus schraetser*, *Pelecus cultratus*, *Alosa immaculata*).

12.2.12 ROSPA0024 Confluenta Olt - Dunare

ROSPA0024 Confluenta Olt - Dunare confluence is found in the continental biogeographic region (100%), administratively being located in the South-Muntenia and South-West Oltenia regions. The site has an area of 20,483.8 ha. The area is a sector of the lower meadow's natural meadow, little influenced by human presence.

According to the Natura 2000 Standard, the site has been designated for the protection of 18 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 39) of other 66 bird species with regular migration not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the following species: *Phalacrocorax pygmaeus* *Coracias garrulus*;
- ✓ During the migration period for the species of: species, geese, pelicans, swans;
- ✓ for wintering for: rattles, gangs, pelicans, swans.

During the migration period, the site hosts more than 20,000 birds of the pond, being a potential candidate for the RAMSAR site.

12.2.13 ROSPA0102 Suhaia

ROSPA0102 Suhaia is located in the continental biogeographic region (100%), located in the administrative region of Sud Muntenia, stretching over an area of 4,516 ha.

Suhaia Lake, used for intensive fish farming, is fed to the north by the Calmatui River, which forms a "micro delta" when it flows into the lake. In this area there are numerous species of water birds (cormorants, egrets, old people, shovels, etc.), the western side of the lake (where we encounter extensive reedbeds, intersected by water channels and flooded lands - former rice fields). the attractive area for a variety of limestone birds (old people, reed spiders, lakes, etc.). The agricultural areas between the lake and the Suhaia and Danube farms are important feeding sites for the migratory water species or for the wintering areas.

According to the Natura 2000 Standard, the site has been designated for the protection of 38 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 40), as well as of other 70 species of regularly migratory birds not listed in Annex I.

The site is of particular importance for nesting populations of the following species: *Platalea leucorodia*, *Egretta garzetta*, *Himantopus himantopus*, *Nycticorax nycticorax*, *Phalacrocorax pygmeus* and *Aythya nyroca*.

During the migration period, the site hosts more than 20,000 birds of the pond, being a potential candidate for the RAMSAR site.

12.2.14 ROSCI0088 Gura Vedei - Saica – Slobozia

The ROSCI0088 Gura Vedei - Saica - Slobozia site is located in the continental biogeographical region (100%), administratively being located in the South - Muntenia region, stretching over an area of 10,137.8 ha.

Located in the lower basin of Vedea River, the Gura Vedei - Saica - Slobozia site is part of the Danube Delta, Lunca-Pasarea subunit, including the dig-mal area.

According to the Natura 2000 Standard, the site is distinguished by the presence of 2 types of habitats of community interest: mixed riparian forests with *Quercus robur*, *Ulmus laevis* and *Fraxinus excelsior* or *Fraxinus angustifolia* (91F0) with a lot of wildlife (*Vitis sylvestris*) many spells with *Salix alba* and *Populus alba* (92A0). Specified species include *Unio crassus*, *Bombina bombina*, *Emys orbicularis*, *Spermophilus citellus*, *Lutra lutra*, as well as numerous species of bats (*Rhinolophus mehelyi*, *Myotis emarginatus*, *Myotis myotis*) and species (of which we mention: *Romanogobio albipinnatus* (*Gobio albipinnatus*), *Gymnocephalus baloni*, *Gymnocephalus schraetser*, *Zingel streber*, *Alosa immaculata*).

12.2.15 ROSPA0108 Vedea - Dunare

The ROSPA0108 Vedea - Dunare site is found in the continental biogeographical region (100%), administratively being located in the South - Muntenia region, with an area of 22,404.2 ha.

The ROSPA0108 site is located in the Lower Danube Meadow, including the lower basin of the Vedea River. From a geomorphologic point of view, meadow is the predominant unit. Fluvial beams of almost exclusively alluvial deposits are characteristic. The habitats developed here are habitats of flowing continental freshwater (on the Vedea river), meadow forests or harbours of *Salix alba* from lower places and *Populus alba* forests on higher floodplains.

According to the Natura 2000 Standard, the site has been designated for the protection of 25 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 42), as well as other 64 regular migratory species not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the species: *Platalea leucorodia*, *Egretta garzetta*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Aythya nyroca*, *Haliaeetus albicilla*, *Ciconia nigra*, *Himantopus himantopus*, *Sterna hirundo* and *Sterna albifrons*;
- ✓ in the migration period for aquatic bird species; in winter the presence of the codels is noticeable.

12.2.16 ROSPA0090 Ostrovu Lung – Gostinu

ROSPA0090 Ostrovu Lung - Gostinu is located in the continental biogeographic region (100%), administratively located in the South - Muntenia region, with an area of 2,544 ha.

The site is a wetland located in the Lower Danube Meadow, including habitats of forests, meadows, ponds and ponds. They are used as nesting and feeding habitats for many bird species, including rare and vulnerable species at national and European levels. It was formerly covered by the former Greek Balta, drained in 1965 for use as agricultural land.

According to the Natura 2000 Standard, the site has been designated for the protection of 51 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 43), as well as other 69 regular bird migration species not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the species: *Aythya nyroca*, *Ardeola ralloides*, *Plegadis falcinellus*, *Egretta garzetta*, *Milvus migrans*, *Ixobrychus minutus*, *Sterna albifrons*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Botaurus stellaris*, *Ardea purpurea* and *Nycticorax nycticorax*;
- ✓ during the migration period for the species: *Phalacrocorax pygmaeus*, *Sterna hirundo*, *Larus minutus*, *Ciconia ciconia*, *Platalea leucorodia* and *Philomachus pugnax*.

Because it fulfils the criteria C1 - Species with global conservation concern and C2 - Concentrations of a species threatened at European Union level, according to BirdLife International, the site ROSPA0090 is also designated as IBA (Important Bird Areas - Areas of Importance of Avifaunistic).

12.2.17 ROSPA0038 Dunare – Oltenita

ROSPA0038 Danure - Oltenita is located in the continental biogeographic region (99.85%) and steppe (0.15%), from the administrative point of view being located in the South - Muntenia region, with an area of 5,927.8 ha.

The site is located in the Lower Danube Meadow, between km 451-430, and is dominated by the presence of agricultural land. They are covered by water that stays about 40-50 days a year when the Danube level is high. The water is discharged through two pumping stations - Dunarica and Greaca. The agricultural lands are part of the indigestible Greaca-Arges-Chirnogi enclosure, which has a two-dike flood protection system built in 1932 and two dams built in 1967. This site features wetland habitats favourable to bird species, among which geese, white fronted goose, heron, egrets, various terns' species.

According to the Natura 2000 Standard, the site has been designated for the protection of 21 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 44), as well as other 60 species of regularly migratory birds not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the species: *Aythya nyroca*, *Ciconia nigra*, *Himantopus himantopus* and *Ixobrychus minutus*;
- ✓ during the migration period for the species: *Aythya nyroca*, *Ardeola ralloides*, *Phalacrocorax pygmaeus*, *Platalea leucorodia*, *Ciconia ciconia*, *Egretta alba* and *Egretta garzetta*.

Because it fulfils the criteria C1 - Species with global conservation concern, C2 - Concentrations of a species threatened at EU level and C6 - Species threatened at EU level, according to BirdLife International, the site ROSPA0038 is also designated as Important Bird Areas (IBAs).

As a result of the studies carried out for the ROSPA0038 Dunare-Oltenita site management plan, the presence of another 7-bird species of Community interest (grey in Table 44), not mentioned in the Standard Site, was found: *Alcedo atthis*, *Dendrocopos medius*, *Dryocopus martius*, *Haliaeetus albicilla*, *Lanius collurio*, *Picus canus*, *Sylvia nisoria*. Thus, these seven species of community interest (listed on Annex I of the Birds Directive)).

12.2.18 ROSCI0131 Oltenita - Mostistea – Chiciu

ROSCI0131 Oltenita - Mostistea - Chiciu is in the steppe biogeographic region (100%), from the administrative point of view being located in the South - Muntenia region, with an area of 11,521 ha.

This site is taking place in the Lower Danube Meadow in the Oltenita (the Arges River) and Calarasi. This sector represents a transition zone between the meadow and the Baltic Danube through its hydromorphological characteristics. Delimitation between the Danube meadow and the plain in the north is done by a 10-12 m thick. In the landscape of the meadow there are several higher areas: at Oltenita (the congee due to Arges), Spantov and high beams between Mostistea and Calarasi. The rest of the territory is predominantly of medium altitudes, but also of low surfaces like the old lacquered lavatories, currently drained.

The site is especially important for the mosaic of land cover classes (agricultural land, forests, shoreline, lakes, degraded lands, grasslands) that offer favourable habitats to different species. Avifauna has the largest number of species in this site due to the numerous habitats of feeding, nesting, breeding and resting:

- ✓ Nests on the waterfront: common kingfisher, bee-eaters, sand martin, wagtail;
- ✓ Riverside coppice: nithingale, blackbird, cuckoo, European roller;
- ✓ Danube ponds: mallard, garganey, geese, white fronted goose, red breasted goose, heron, egrets, common and curly pelican, large and small cormorant, mute swan, whooper swan and tundra swan.

It is also noted the presence of raptors: the field eagle, the black kite, saker falcon, little owl.

According to the Natura 2000 Standard, the site is distinguished by the presence of 4 types of habitats of Community interest (Table 45): Wetlands with *Chenopodium rubri* and *Bidenton* vegetation (3270), Natural eutrophic lakes with vegetation type *Magnopotamion* or *Hydrocharition* (3150), Oligotrophic spp. To mesotrophic vegetation of *Littorelletea uniflorae* and / or *Isoëto-Nanojuncetea* (3130) and Low altitude meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510). Specified species include 21 fish species, 3 amphibian species and one mammalian species (*Lutra lutra*).

12.2.19 ROSPA0136 Oltenita – Ulmeni

ROSPA0136 Oltenita - Ulmeni is located in the steppe biogeographic region (100%), administratively being located in the South - Muntenia region, with an area of 12,405 ha.

The site is located in the Lower Danube Floodplain, between km 401-425, including the Danube course, islands, forest fund and agricultural land (Surlarii - Dorobantu dammed enclosure). The site largely corresponds to the former Olariz Oltenita IAS paddy, being crossed by a network of irrigation and drainage channels. The land is covered by water that stays about 40-50 days a year when the Danube level is high, which is then discharged by pumping stations. Both watering irrigation channels and flooded farmland are favourable feeding habitats for aquatic birds. Also, during the non-flood period, sand banks are used to shelter large populations of *Pelecanus crispus* (sometimes at least 1% of the European population of the species).

According to the Natura 2000 Standard, the site has been designated for the protection of 12 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 46) as well as other 4 species of regularly migratory birds not listed in Annex I.

The site is particularly important for *Ciconia ciconia* nesting populations for feeding immature specimens and especially for aquatic birds during migration or winter.

12.2.20 ROSPA0021 Ciocanesti – Dunare

ROSPA0021 Ciocanesti - Dunare is in the steppe biogeographic region (100%), administratively being located in the South - Muntenia region, with an area of 801.2 ha.

The site corresponds to the Boianu farm. The farm's surface is covered by 12 water basins with abundant submerged vegetation, as well as dikes and canals where emerald palm plants are present. In the rest of the site there are pastures, agricultural land, poplar plantations and a meadow forest on the Danube.

According to the Natura 2000 Standard, the site has been designated for the protection of 27 bird species of Community interest listed in Annex I of Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 47), as well as another 39 species of birds with regular migration not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the species: *Himantopus himantopus*, *Ardea purpurea*, *Egretta garzetta*;
- ✓ during the migration period for the species: rates, find, pelicans grown;
- ✓ wintering for the following species: rates, find.

During the migration period, the site hosts more than 20,000 birds of prey, being a potential RAMSAR site candidate.

12.2.21 ROSCI0022 Canaralele Dunarii

ROSCI0022 Canaralele Dunarii falls within the steppe biogeographic region (100%), administratively being located in the South - East and South - Muntenia region, with an area of 26.109,9 ha.

The site includes the Danube course, habitats with riparian vegetation and rock limestone habitats. Inside the site there are: the archaeological reserve of Carsium fortress, the geological reserves Fossil Site Cernavoda, the Fossil site Movila Banului and Topalu Neo-Jurassic Reef. Threatened species are included in the national red list and endemic associations. The site is an important point on the migration path of birds, being proposed for SPA protection. It is also an important area for the reproduction and migration of sturgeons.

The site is particularly important for the mosaic of habitats, from hygrophiles to xerophiles.

According to the Natura 2000 Standard, the site is characterized by the presence of 15 types of habitats of community interest (see Table 48), including Ponto - Sarmatic Hardwood *Tubaris* (40C0 *), Ponto - Sarmatic Steps (62C0 * Forest vegetation with fluffy oak (91AA *), Euro-Siberian silversmith vegetation with *Quercus* sp. (91I0 *). Specified species include 2 plant species, 2 invertebrate species, 15 species of fish, 4 herpetofauna and 3 mammalian species.

12.2.22 ROSPA0039 Dunare-Ostroave

ROSPA0039 Dunare-Ostroave site is in the steppe biogeographic region (100%), administratively located in the South-East and South-Muntenia region, with an area of 16,243.8 ha.

ROSPA0039 is located in the Danube Delta and includes islands covered with natural forests and plantations. Habitats are mainly represented by meadows and meadows. Inside the site also appears the Cernavoda Fossil Point.

According to the Natura 2000 Standard, the site has been designated for the protection of 39 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 49), as well as other 10 species of regularly migratory birds not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the species: *Coracias garrulus*, *Falco vespertinus*, *Aythya nyroca*, *Platalea leucorodia*, *Egretta garzetta*, *Nycticorax nycticorax*, *Plegadis falcinellus*, *Phalacrocorax pygmaeus*, *Ardea purpurea*, *Haliaeetus albicilla*, *Ardeola ralloides*, *Lanius minor*, *Caprimulgus europaeus* and *Milvus migrans*;
- ✓ during the migration period for the species: *Plegadis falcinellus*, *Phalacrocorax pygmaeus*, *Aythya nyroca*, *Sterna hirundo*, *Tringa glareola*, *Himantopus himantopus* and *Ciconia ciconia*;
- ✓ wintering for the species: *Branta ruficollis* and *Phalacrocorax pygmaeus*.

Because it fulfils the criteria C1 - Species with global conservation concern, C2 - Concentrations of a species threatened at EU level and C6 - Species threatened at EU level, according to BirdLife International, the site ROSPA0038 is also designated as Important Bird Areas (IBAs) of Avifaunistic Importance).

12.2.23 ROSPA0051 Iezerul Calarasi

ROSPA0051 Iezerul Calarasi is in the steppe biogeographic region (100%), administratively being located in the South - Muntenia region, with an area of 5,008.7 ha.

This site includes a natural lake that remained after the partial restoration of Iezer Calarasi. It has undergone anthropogenic changes such as indigestion and water supply in the Danube through artificial channels. The habitats present here are extensive vegetation areas with reed and rush, as well as meadows and agricultural crops.

According to the Natura 2000 Standard, the site has been designated for the protection of 31 bird species of Community interest listed in Annex I to Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Table 50), as well as other 61 species of regularly migratory birds not listed in Annex I.

The site is particularly important for:

- ✓ nesting populations of the species: *Aythya nyroca* and *Ardea purpurea*;
- ✓ during the migration period for the species: *Phalacrocorax pygmaeus*, *Cygnus cygnus*, *Branta ruficollis*, *Anser albifrons*, *Tringa glareola*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Egretta garzetta*, *Philomachus pugnax*, *Ciconia ciconia*, *Egretta alba*, *Chlidonias niger*, *Mergus albellus* *Sterna hirundo*;
- ✓ wintering for the species: *Platalea leucorodia*, *Pelecanus onocrotalus* and *Plegadis falcinellus*.

During the migration period, the site hosts more than 20,000 birds, being a potential RAMSAR site candidate.

Because it meets the criteria C1 - Species with global conservation concern, C2 - Concentrations of a threatened species at EU level, C3 - Congregations of migratory species not threatened at EU level and C4 - Congregation - Large congregations, according to BirdLife International, the site ROSPA0051 is also designated as IBA (Important Bird Areas).

12.2.24 Habitats and species of community interest in Natura 2000 sites in the project area

The following tables present the habitats and species of community interest from the 22 Natura 2000 sites in the project area, together with information on their areas and herds, as well as their location, where the information is available.

Table 29 The presence and herds / areas covered by species and habitats of community interest in ROSCI0299 Danube at Garla Mare - Maglavit (overlapping with project elements) according to the Natura 2000 Management Plan ROSCI0299 Danarea la Garla Mare - Maglavit and the data provided by the custodians

No.	Taxonomic group	Cod habitat/ specie N2k Habitat code / species N2k	Name of habitat / species N2k	Presence and herds / areas covered by N2k species and habitats, according to PM	Surface covered by N2k species and habitats, according to calculations in GIS - habitat polygons, custodian data (ROS)
1.	Habitats	92A0	<i>Riverside coppices with Salix alba and Populus alba</i>	Min.: 400 m ² Max.: 1.200 m ² Total: 518,21 ha	-
2.	Herpetofauna	1188	<i>Bombina bombina (habitat)</i>	population evaluation*: C - 0-2% 1.000-5.000 i	97,37 ha
3.		1220	<i>Emys orbicularis (habitat)</i>	50-100 de pairi 100 - 500 i	207,22 ha
4.		1993	<i>Triturus dobrogicus (habitat)</i>	Species present in Balta Golenti and Balta Mare 100-500 i Population in the site 0-2% of the national population	70,18 ha
5.	Fish	6144	<i>Romanogobio albipinnatus (Gobio albipinnatus) (habitat)</i>	Species present throughout the Danube area within the Protected Areas and in Hunia Lake. Average density at sampling points: 10 individuals / 100 m2 5.000-10.000 i	423,40 ha
6.		2511	<i>Romanogobio kessleri (Gobio kessleri)</i>	Distribution of the species: unidentified in the area	Distribution of the species: not identified in the area
7.		5339	<i>Rhodeus amarus (Rhodeus sericeus amarus) (habitat)</i>	C	590,78 ha
8.	Mammals	1335	<i>Spermophilus citellus (habitat)</i>	100-500 i (Class 3)" In Aria Protejata a population of hundreds is estimated, the species being identified on ruderalized meadows between Maglavit and Munta Mountains, Maglavit and Danube forests, ruderalized meadows near Cetate, Pristol Surface of the habitat of the species in the protected natural area: ~ 1ha Appropriate area of the habitat of the species in the protected natural area: ~ 3 ha	-
9.		1355	<i>Lutra lutra (habitat)</i>	Species present in ponds near the Danube: Balta Maglavit, Balta Golenti Balta Vrata, Balta Salcia, Balta Mare	195,58 ha

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No.	Taxonomic group	Cod habitat/ specie N2k Habitat code / species N2k	Name of habitat / species N2k	Presence and herds / areas covered by N2k species and habitats, according to PM	Surface covered by N2k species and habitats, according to calculations in GIS - habitat polygons, custodian data (ROS)
				National population 2,200-2,600 copies Population in the site 0-2% of the national population => between 0 and 44 - 52 local specimens	

* The size and density of the species population present in the site relative to the population present at national level

Table 30 The presence of species of community interest in ROSPA0046 Gruia - Garla Mare (near the project), according to the Natura 2000 Standard Form
 (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0046>)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Category	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Cons.	Iso.	Glo.
1.	A029	<i>Ardea purpurea</i>	R	7	15	p	C		C	C	C	C
2.	A024	<i>Ardeola ralloides</i>	R	50	70	p	C		C	B	C	B
3.	A060	<i>Aythya nyroca</i>	R	30	50	p	P		C	B	C	C
4.	A021	<i>Botaurus stellaris</i>	R	3	5	p	P		C	C	C	C
5.	A196	<i>Chlidonias hybridus</i>	R	200	250	p	P		B	B	C	B
6.	A197	<i>Chlidonias niger</i>	R	10	20	p	C		C	B	C	C
7.	A081	<i>Circus aeruginosus</i>	R	2	2	p	P		D			
8.	A231	<i>Coracias garrulus</i>	R	25	40	p	P		C	B	C	C
9.	A027	<i>Egretta alba</i>	W	10	40	i	P		C	B	C	C
10.	A026	<i>Egretta garzetta</i>	R	50	70	p	C		D			
11.	A511	<i>Falco cherrug</i>	R	1	2	i	P		B	A	C	B
12.	A075	<i>Haliaeetus albicilla</i>	W	3	5	i	P		C	B	C	B
13.	A131	<i>Himantopus himantopus</i>	R	2	2	p	P		C	B	C	C
14.	A022	<i>Ixobrychus minutus</i>	R	20	25	p	P		C	B	C	B
15.	A023	<i>Nycticorax nycticorax</i>	R	40	50	p	C		C	B	C	B
16.	A019	<i>Pelecanus onocrotalus</i>	C				R		D			
17.	A393	<i>Phalacrocorax pygmeus</i>	R	110	130	p	C		C	B	C	B
18.	A393	<i>Phalacrocorax pygmeus</i>	W	240	240	i	C		C	B	C	B
19.	A393	<i>Phalacrocorax pygmeus</i>	C	300	800	i	C		C	B	C	B
20.	A034	<i>Platalea leucorodia</i>	R	20	30	p	C		C	B	C	B
21.	A032	<i>Plegadis falcinellus</i>	R	8	10	p	C		C	B	C	C

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 issuance of the Environmental Agreement

22.	A193	<i>Sterna hirundo</i>	C				C		D			
23.	A193	<i>Sterna hirundo</i>	R				P		D			

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
 - Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
 - Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 31 Presence and Effects of Species of Community Interest in ROSPA0074 Maglavit (in the vicinity of the Project), according to the Management Plan of the Special Bird's Protection Area ROSPA0074 Maglavit

No.	Code N2k	Name of species	Presence and numbers / areas covered by N2k species and habitats
1.	A229	<i>Alcedo atthis</i>	There were 3 to 4 pairs in the vicinity of the wetlands, Hunia, Maglavit, Cetate.
2.	A255	<i>Anthus campestris</i>	The field has 20 to 30 pairs, distributed in: Hunia area, Maglavit area and Golenti area.
3.	A029	<i>Ardea purpurea</i>	It was monitored in the Maglavit area and it was found that the population surveyed is 4-5 pairs.
4.	A024	<i>Ardeola ralloides</i>	Estimated at about 5-8 individuals near Hunia Lake and the Maglavit area.
5.	A222	<i>Asio flammeus</i>	The places where the field rust was identified are Hunia, Lake Maglavit and Golenti, where there are nesting and living conditions for this species. The number of pairs in the site is estimated at 3 pairs.
6.	A060	<i>Aythya nyroca</i>	The population surveyed with red rates was 30-40 pairs observed in the lakes area: Ban Fountain, Hunia, Golenti and Maglavit.
7.	A043	<i>Buteo rufinus</i>	The number of pairs in the site is estimated at 4-5 pairs. Places of its identification within the area are frequent, the Cetate, Pajistea Maglavit, near Hunia Lakes, Golenti and Maglavit lakes.
8.	A196	<i>Chlidonias hybridus</i>	Approximately 70 to 80 pairs have been reported as a result of field investigations in the area of the lakes: Hunia, Banului Fountain, Maglavit and Golenti, considering that their number can be even higher on the vegetation in the protected area studied
9.	A197	<i>Chlidonias niger</i>	The size and density of the black guaranty population is insignificant compared to the population present on the territory of Romania. In the studied site, the black hoop does not nest, during the passage there were observed 20 - 25 specimens of the black chirighita - <i>Chlidonias niger</i> , in the Hunia, Golenti and Maglavit lakes.
10.	A031	<i>Ciconia ciconia</i>	During the study, the population surveyed by white storks is about 20-24 pairs with chicken, from 2 to even 4 chickens / nest. The species could be seen in the Golenti, Hunia lakes.
11.	A030	<i>Ciconia nigra</i>	Within the Protected Natural Area ROSPA0074 Maglavit, the species was observed in a number of 7 - 20 specimens, in the Golenti Lake area, in the Maglavit Pajiste area, Hunia Lake area and Cetate area.
12.	A080	<i>Circaetus gallicus</i>	It was identified in a small flock, with 5 to 6 specimens being recorded in the Maglavit grassland area. Other copies were observed in flight in the Hunia and Golenti areas
13.	A081	<i>Circus aeruginosus</i>	- 10 pairs - hunted in the Hunia lakes, Fountain Banul and Golenti.
14.	A082	<i>Circus cyaneus</i>	They were surprised to overpass 4-5 individuals within the site, Hunia, Maglavit and Golenti.
15.	A089	<i>Clanga pomarina (Aquila pomarina)</i>	Represented by a small flock, two pairs are observed in the Maglavit grassland, a pair near Lake Golenti and one copy near the Danube and the Hunia area.
16.	A231	<i>Coracias garrulus</i>	It was reported as nesting bird in the Maglavit 10 pairs, and in the Hunia and Golenti lakes 15 pairs.
17.	A429	<i>Dendrocopos syriacus</i>	The species was observed in the Cetate meadows - 6 pairs and Maglavit - 8 pairs.
18.	A027	<i>Egretta alba (Ardea alba)</i>	Passage species present in a staff of 10 - 20 specimens. The species was observed in the area of Lake Hunia and Golenti.

No.	Code N2k	Name of species	Presence and numbers / areas covered by N2k species and habitats
19.	A026	<i>Egretta garzetta</i>	The species was observed in the fountains Banana Fountain - 1 pair, Golenti - 5 pairs, Hunia - 7 pairs and Maglavit - 4 pairs.
20.	A379	<i>Emberiza hortulana</i>	90 pairs
21.	A097	<i>Falco vespertinus</i>	Represented by a low flock, the estimated number being between 16 and 70 individuals. The species was observed in flight in the Maglavit and Cetate Ponds, as well as in Hunia Lake area.
22.	A131	<i>Himantopus himantopus</i>	The species was observed in 8-14 pairs distributed as follows: in the area of Lake Hunia and Maglavit, Golenti and Basarabi.
23.	A022	<i>Ixobrychus minutus</i>	Due to the hidden habitat of the species, it was found that the herd is uncertain - about 30-40 pairs, oscillating depending on the conditions offered by the habitat. The species was observed in the Hunia, Golenti and Banana lakes, as well as in the Maglavit Pajistea.
24.	A338	<i>Lanius collurio</i>	Approximately. 14 to 17 pairs. The species was observed in the Golenti and Hunia, Basarabi and Maglavit lakes.
25.	A339	<i>Lanius minor</i>	30 to 70 pairs, being observed in the Maglavit and Hunia area.
26.	A177	<i>Larus minutus</i>	Species that use the site for migration, the size and density of the small seagull population are insignificant to the population present in Romania. Only 25 to 30 copies per passage are estimated.
27.	A023	<i>Nycticorax nycticorax</i>	Old-night populations have been monitored, being reported approximately. 20 to 60 individuals, in the Hunia and Maglavit lakes.
28.	A393	<i>Phalacrocorax pygmaeus</i>	50 to 100 individuals near the Golenti and Hunia lakes.
29.	A151	<i>Philomachus pugnax</i>	Compact nests can be observed during the spring - autumn passage, and in the summer season: May - July, only isolated specimens. A number of about. 300-400 individuals in the Golenti, Hunia and Maglavit lakes.
30.	A034	<i>Platalea leucorodia</i>	The species is frequent on the ponds in the floodplain area of the area, being observed in the number of 30-60 individuals in the area of the lakes Fantana Banului, Maglavit, Golenti and Hunia.
31.	A032	<i>Plegadis fasciellus</i>	The species is frequent on the ponds in the floodplain area of the area, being observed in the number of 30-60 individuals in the area of Banana Fountain, Maglavit, Golenti and Hunia.
32.	A140	<i>Pluvialis apricaria</i>	10 to 16 individuals. The species was observed in the Hunia, Golenti, Banului and Maglavit lakes.
33.	A132	<i>Recurvirostra avosetta</i>	10 to 15 copies. The species was observed in the area of Banana Fountain, Golenti, Hunia and Maglavit.
34.	A193	<i>Sterna hirundo</i>	1 to 7 pairs. The species was observed in the lakes of Hunia, Golenti, Fountain of the Ban.
35.	A229	<i>Sylvia nisoria</i>	Effect of 70-100 individuals, observed in flight, above water level, looking for food. The species was observed in the lakes Fantana Banului, Golenti, Maglavit and Hunia.

Gray - appear in PM but do not appear in FS.

Table 32 The presence and number / areas covered by species and habitats of community interest in ROSCI0039 Ciuperceni-Desa (overlapping with project elements), according to the Integrated Management Plan of Ciuperceni-Desa protected areas (ROSCI0039 Ciuperceni-Desa, ROSPA0013 Calafat-Ciuperceni-Dunare, 2,392 Ciuperceni Desa, 2.398, Balta Lata, 2.397)

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
1.	Habitats	1530*	Pannonic and Ponto-Sarmatic salt steppes and salt marshes	1.988,25 ha
2.		2160	Dunes with <i>Hippophaë rhamnoides</i>	198,82 ha
3.		2190	Humid dune slacks	31,81 ha
4.		3130	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoeto-Nanojuncetea</i>	397,65 ha
5.		3140	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara spp.</i>	795,30 ha
6.		3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation	397,65 ha
7.		3270	Rivers with muddy banks with <i>Chenopodion rubri</i> pp and <i>Bidention</i> pp vegetation	39,76 ha
8.		6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	397,65 ha
9.		6510	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)	397,65 ha
10.		6120*	Xeric sand calcareous grasslands	397,65 ha
11.		91F0	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmion minoris</i>)	39,76 ha
12.		91I0*	Euro-Siberian steppic woods with <i>Quercus spp</i>	198,82 ha
13.		92A0	Riverside coppice or <i>Salix alba</i> and <i>Populus alba</i> galleries	795,30 ha
14.	Plants	1516	<i>Aldrovanda vesiculosa</i>	It was not found.
15.		2285	<i>Colchicum arenarium</i>	In the pastures and oak forests. Status of [temporal] presence: resident; Position [spatial] status: marginal; Status of presence [management]: native.
16.		1428	<i>Marsilea quadrifolia</i>	In the area of Arcerului ponds, Lata, Ciuperceni, Marginita. Status of [temporal] presence: resident; Position [spatial] status: marginal; Status of presence [management]: native.

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
17.	Invertebrates	4056	<i>Anisus vorticulus</i>	In the southern central part of the area. Class 2, 50-100 i 0-2% site area - national area ratio
18.		4013	<i>Carabus hungaricus</i>	Class 2, 50-100 i 0-2% site area - national area ratio
19.		1088	<i>Cerambyx cerdo</i>	Class 1, 10-50 i 0-2% site area - national area ratio
20.		1089	<i>Morimus funereus</i>	-
21.	Fish	1130	<i>Aspius aspius</i>	Class 2, 50-100 i 0-2% site area - national area ratio
22.		1149	<i>Cobitis taenia</i>	Class 3, 50-100 i 0-2% site area - national area ratio
23.		6144	<i>Romanogobio albipinnatus (Gobio albipinnatus)</i>	Class 3, 100 - 500 i 0-2% site area - national area ratio
24.		2555	<i>Gymnocephalus baloni</i>	insufficient or unreliable data
25.		1157	<i>Gymnocephalus schraetser</i>	Class 2, 50-100 i 0-2% site area - national area ratio
26.		2522	<i>Pelecus cultratus</i>	Class 2, 50-100 i 0-2% site area - national area ratio
27.		4125	<i>Alosa immaculata (Alosa pontica)</i>	insufficient or unreliable data
28.		1145	<i>Misgurnus fossilis</i>	insufficient or unreliable data
29.		5339	<i>Rhodeus amarus (Rhodeus sericeus amarus)</i>	Class 3, 500-1000 i 0-2% site area - national area ratio
30.		1146	<i>Sabanejewia aurata</i>	insufficient or unreliable data
31.	Herpetofauna	1188	<i>Bombina bombina</i>	Class 3, 500-1000 i 0-2% site area - national area ratio
32.		1993	<i>Triturus dobrogicus</i>	-
33.		1220	<i>Emys orbicularis</i>	Class 1, 10-50 i 0-2% site area - national area ratio
34.	Mammals	1355	<i>Lutra lutra</i>	Traces and habitats inhabited by the species have been identified on the territory of the area, in the areas: Balta Lata, Balta Tarov, Arca Balta
35.		1335	<i>Spermophilus citellus</i>	Class 3, 100-500 i 0-2% site area - national area ratio

Table 33 The presence and number of species of community interest in ROSPA0013 Calafat - Ciuperceni - Dunare (overlapping with project elements), according to the Integrated Management Plan of Ciuperceni - Desa protected areas (ROSCI0039 Ciuperceni-Desa, ROSPA0013 Calafat-Ciuperceni-Dunare, 2.392 Ciuperceni Desa, 2.398 Balta Lata, 2.397 balta Neagra)

No.	Cod N2k	Name of species	Presence and number / areas covered by N2k species and habitats
1.	A229	<i>Alcedo atthis</i>	Class 0, 1-10 i 0-2%, corresponding to class "C" - site area - national area ratio
2.	A705	<i>Anas platyrhynchos</i>	Class 3, 100 - 500 i 0-2%, corresponding to class "C" - site area - national area ratio
3.	A634-B	<i>Ardea purpurea</i>	Class 0, 0 - 10 i 0-2%, corresponding to class "C" - site area - national area ratio
4.	A635	<i>Ardeola ralloides</i>	In ROSPA0013 Calafat - Ciuperceni - Dunarea, Balta Jdeg, Balta Marginita, Balta Copacelu, Balta Cocoru
5.	A060-A	<i>Aythya nyroca</i>	Class 3, 100 - 500 i 0-2%, corresponding to class "C" - site area - national area ratio
6.	A688-B	<i>Botaurus stellaris</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
7.	A396	<i>Branta ruficollis</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
8.	A133	<i>Burhinus oedicnemus</i>	Class 0, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
9.	A224	<i>Caprimulgus europaeus</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
10.	A734	<i>Chlidonias hybridus</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
11.	A197	<i>Chlidonias niger</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
12.	A667-B	<i>Ciconia ciconia</i>	Class 3, 100 - 500 i 0-2%, corresponding to class "C" - site area - national area ratio
13.	A030-A	<i>Ciconia nigra</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
14.	A081	<i>Circus aeruginosus</i>	Class 3, 100 - 500 i 0-2%, corresponding to class "C" - site area - national area ratio
15.	A082	<i>Circus cyaneus</i>	Class 3, 100 - 500 i 0-2%, corresponding to class "C" - site area - national area ratio
16.	A231	<i>Coracias garrulus</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
17.	A038-A	<i>Cygnus cygnus</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio

No.	Cod N2k	Name of species	Presence and number / areas covered by N2k species and habitats
18.	A027	<i>Egretta alba (Ardea alba)</i>	It was not identified during 2012 research
19.	A098	<i>Falco columbarius</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
20.	A689	<i>Gavia arctica</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
21.	A075	<i>Haliaeetus albicilla</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
22.	A617-B	<i>Ixobrychus minutus</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
23.	A246	<i>Lullula arborea</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
24.	A767-A	<i>Mergellus albellus</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
25.	A073	<i>Milvus migrans</i>	Class 3, 100 - 500 i 0-2%, corresponding to class "C" - site area - national area ratio
26.	A610-A	<i>Nycticorax nycticorax</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
27.	A094	<i>Pandion haliaetus</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
28.	A020	<i>Pelecanus crispus</i>	Class 0, 0 - 10 i 0-2%, corresponding to class "C" - site area - national area ratio
29.	A019	<i>Pelecanus onocrotalus</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
30.	A393	<i>Phalacrocorax pygmeus</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio
31.	A607-B	<i>Platalea leucorodia</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
32.	A700	<i>Plegadis falcinellus</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
33.	A193	<i>Sterna hirundo</i>	Class 2, 50-100 i 0-2%, corresponding to class "C" - site area - national area ratio
34.	A166	<i>Tringa glareola</i>	Class 1, 10 - 50 i 0-2%, corresponding to class "C" - site area - national area ratio

Table 34 The presence and number / areas covered by species and habitats of community interest in ROSCI0045 Coridorul Jiului (overlapping with project elements), according to the Final Report on the inventory, mapping and assessment of the conservation status of the habitats in the ROSCI0045, ROSPA0010, ROSPA0023, Padurea Zaval and Locul Fosilifer and the Final Report on the inventory, mapping and assessment of the conservation status of the species in the ROSCI0045, ROSPA0010, ROSPA0023, Padurea Zaval and Locul Fosilifer Dranic Locations

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
1.	Habitats	1530*	Pannonic salt steppes and salt marshes	648 ha 648 / 10.200.000 - the surface area of the habitat in the site and its surface at national level
2.		2130*	Fixed coastal dunes with herbaceous vegetation ('grey dunes')	367 ha 52 % - percentage of habitat area in the site reported on its surface at national level
3.		2190	Humid dune slacks	210 ha 210 / 40.000 = 0,52% - percentage of habitat area in the site reported on its surface at national level
4.		3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	121 ha 121 / 340.000 = 0,035 % - percentage of habitat area in the site reported on its surface at national level
5.		3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	0,88 ha Unknown - site surface area and surface area report nationwide
6.		3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation	0,35 ha 0,35 / 470.000 - the surface area of the habitat in the site and its surface at national level
7.		3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation	0,35 ha 0,35 / 2.430.000 - the surface area of the habitat in the site and its surface at national level
8.		3270	Rivers with muddy banks with Chenopodium rubri pp and Bidens pp vegetation	15,33 ha 15,33 / 330.000 = 0,004% - percentage of habitat area in the site reported on its surface at national level
9.		6240*	Sub-Pannonic steppic grasslands	121,76 ha 121,76 / 280.000 = 0,043 % - percentage of habitat area in the site reported on its surface at national level
10.		6260*	Pannonic sand steppes	3.101 ha There is no data on the area occupied at national level
11.		6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	1,85 ha 1,85 / 645.000 - the surface area of the habitat in the site and its surface at national level

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
12.		6510	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)	252 ha 252 / 702.000 = 0,03 % - percentage of habitat area in the site reported on its surface at national level
13.		6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	127,70 ha 127,7 / 352.000 = 0,03 % - percentage of habitat area in the site reported on its surface at national level
14.		6120*	Xeric sand calcareous grasslands	1.609,5 ha 1.609,5 / 10.000 = 16,09 % - percentage of habitat area in the site reported on its surface at national level
15.		9130	Asperulo-Fagetum beech forests	1.786 ha 1.786 / 610.000 = 0,29 % - percentage of habitat area in the site reported on its surface at national level
16.		91E0*	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i> , <i>Salicion albae</i>)	257 ha 257 / 12.660 = 2,03 % - percentage of habitat area in the site reported on its surface at national level
17.		91M0	Pannonian-Balkan turkey oak –sessile oak forests	10.125 ha 10.125 / 527.000 = 1,92% - percentage of habitat area in the site reported on its surface at national level
18.		9170	Galio-Carpinetum oak-hornbeam forests	3.700 ha 3.700 / 800.000 = 0,46 % - percentage of habitat area in the site reported on its surface at national level
19.		91Y0	Dacian oak & hornbeam forests	2.958 ha 2.958 / 560.000 = 0,52 % - percentage of habitat area in the site reported on its surface at national level
20.		92A0	Black sea and Mediterranean basins alluvial forests dominated by <i>Salix alba</i> and <i>Populus alba</i> galleries	6.172 ha 6.172 / 121.800 = 5,06 % - percentage of habitat area in the site reported on its surface at national level
21.		91I0*	Euro-Siberian steppic woods with <i>Quercus</i> spp	3.157 ha 3.157 / 140.000 = 2,25 % - percentage of habitat area in the site reported on its surface at national level
22.		91F0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i> , <i>Salicion albae</i>)	4.333 ha 4.333 / 78.300 = 5,53 % - percentage of habitat area in the site reported on its surface at national level
23.	Plants	1898	<i>Eleocharis carniolica</i>	1

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
24.		1428	<i>Marsilea quadrifolia</i>	500 – 1000 i (class 4) – 1 locality 0,005 ha - area of the habitat of the species in the site
25.	Invertebrates	4013	<i>Carabus hungaricus</i>	Permanent (sedentary / resident) population: 10 - 50 i Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C"
26.		4014	<i>Carabus variolosus</i>	Abundance: This is the case
27.		1088	<i>Cerambyx cerdo</i>	Abundance: Rare Permanent population (sedentary / resident): 1,000 - 5,000 i Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 320 ha
28.		1044	<i>Coenagrion mercuriale</i>	It was not identified on the site Presence excluded
29.		4045	<i>Coenagrion ornatum</i>	The presence was uncertain
30.		1065	<i>Euphydryas aurinia</i>	Abundance: common Permanent population (sedentary / resident): 5,000 - 10,000 i Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 358 ha
31.		4048	<i>Isophya costata</i>	It was not identified on the site Presence excluded
32.		1083	<i>Lucanus cervus</i>	Species present in all cverts in the site Permanent population (sedentary / resident): 5,000 - 10,000 i Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 358 ha
33.		1042	<i>Leucorrhinia pectoralis</i>	The presence was uncertain
34.		1061	<i>Lycaena dispar</i>	Abundance: common Permanent (sedentary / resident) population: 5.00 - 1.000 i Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 3.853 ha
35.		1089	<i>Morimus funereus</i>	Abundance: common Permanent population (sedentary / resident): 5,000 - 10,000 i

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
				Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 1,630 ha
36.		4054	<i>Pholidoptera transsylvanica</i>	It was not identified on the site Presence excluded
37.		1032	<i>Unio crassus</i>	Abundance: certain presence Valves have been identified on the beach of the Jiu valley on both sides
38.	Fish	4125	<i>Alosa immaculata</i>	Abundance: common Site population: 6.000-10.000 i (class 6)
39.		1130	<i>Aspius aspius</i>	Abundance: common Site population 500-1,000 i (class 4)
40.		1138	<i>Barbus meridionalis</i>	Abundance: common Site population 500-1,000 i (class 4)
41.		1149	<i>Cobitis taenia</i>	Abundance: common Site population 1,000-5,000 i (class 5)
42.		1124	<i>Romanogobio albipinnatus</i> (<i>Gobio albipinnatus</i>)	Abundance: common Population in the site: 10,000-50,000 i (class 7)
43.		2511	<i>Romanogobio kessleri</i> (<i>Gobio kessleri</i>)	Abundance: common Site population 500-1,000 i (class 4)
44.		2555	<i>Gymnocephalus baloni</i>	has not been identified within the site
45.		1157	<i>Gymnocephalus schraetser</i>	Abundance: common Site Population 50-100 i (Class 2)
46.		1145	<i>Misgurnus fossilis</i>	Abundance: common Population in the site 10,000-50,000 i (class 7)
47.		2522	<i>Pelecus cultratus</i>	Abundance: common Population in sit 100-500 i (class 3)
48.		5339	<i>Rhodeus amarus</i> (<i>Rhodeus sericeus amarus</i>)	Abundance: common Site population 10,000-50,000 i (class 7)
49.		1146	<i>Sabanejewia aurata</i>	Abundance: common Site population 500-1,000 i (class 4)
50.		1160	<i>Zingel streber</i>	Abundance: common Site population 500-1,000 i (class 4)
51.		1159	<i>Zingel zingel</i>	Abundance: common Site population 500-1,000 i (class 4)

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
52.	Herpetofauna	1188	<i>Bombina bombina</i>	Abundance: common Permanent (sedentary / resident) population: 5.000.000 - 10.000.000 i Surface of habitat sp. in site: 685 ha
53.		1193	<i>Bombina variegata</i>	Abundance: common Permanent (sedentary / resident) population: 10,000 - 50,000 i Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 8.950 ha
54.		1166	<i>Triturus cristatus</i>	Abundance: common
55.		1193	<i>Triturus dobrogicus</i>	Abundance: common Permanent population (sedentary / resident): 1,000 - 5,000 i Ratio between in site sp. population size and the national population size: 2-15% corresponding to class "B" Surface of habitat sp. in site: -
56.		1220	<i>Emys orbicularis</i>	Abundance: common Permanent population (sedentary / resident): 1,000 - 5,000 i Ratio between in site sp. population size and the national population size: 2-15% corresponding to class "B" Surface of habitat sp. in site: -
57.	Mammals	1352	<i>Canis lupus</i>	Abundance: This is the case Permanent population (sedentary / resident): 2-10 copies (Class 0) The population within the site is variable as number of copies and presence, both at inter-annually and inter-seasonal level Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 45,000 ha
58.		1355	<i>Lutra lutra</i>	Abundance: This is the case Species size: 25-45 individuals (7-10 families) Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. In site: Approximately 170 km of rivers, plus lakes, canals, temporary ponds, swamps, etc. Water glow: 85.74 sq. Km Meadows: 64.3 sq. km

No.	Taxonomic group	Habitat code / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
59.		1361	<i>Lynx lynx</i>	Abundance: very rare Population with temporary status in the process of dispersal and / or search for new areas of rest, but especially for feeding: Class 0 (0-5 specimens) Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: 10.000 - 15.000 ha
60.		1335	<i>Spermophilus citellus</i>	Abundance: certain presence Permanent (sedentary / resident) population: Class 7 (10,000-50,000 copies) Ratio between in site sp. population size and the national population size: 0-2%, corresponding to class "C" Surface of habitat sp. in site: grassland: 92,8 sq. km; Agricultural lands: 107,1 sq. km
61.		1354	<i>Ursus arctos</i>	Abundance: very rare Population present only temporarily (uses the protected natural area for rest and / or feeding) Class 0 (0-10 copies) . The population within the site is variable as number of copies and presence on both inter-annually and inter-seasonal level. The number of <i>Ursus arctos</i> specimens that are frequenting the site is highly dependent on the management of the <i>Urpus</i> population with permanent status in the Parang Mountains, as well as the preservation of the current forest corridors linking the forests of the North Jid Corridor to the mountain habitats.

Gray - appear in PM but do not appear in FS.

Green - Appears in FS but does not appear in PM.

Table 35 The presence and number / areas of species of community interest in ROSPA0023 Confluenta Jiu-Dunare (overlapping with project elements), according to the Final Report on the inventory, mapping and assessment of the conservation status of the species in the ROSCI0045, ROSPA0010, ROSPA0023, Padurea Zaval si Locul Fosilifer Dranic

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
1.	A229	<i>Alcedo atthis</i>	Class 1, 30 – 70 p , 0-2%, corresponding to class "C" - site area - national area ratio 2.000 – 3.000 ha
2.	A255	<i>Anthus campestris</i>	Class 3, 80 – 150 p , 0-2%, corresponding to class "C" - site area - national area ratio, 3.000 – 4.000 ha
3.	A029	<i>Ardea purpurea</i>	Class 1, 10 – 30 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 – 5.000 ha
4.	A060-A	<i>Aythya nyroca</i>	-
5.	A021	<i>Botaurus stellaris</i>	Class 0, 2– 5 males , 0-2%, corresponding to class "C" - site area - national area ratio 2.000 – 3.000 ha
6.	A133	<i>Burhinus oediconemus</i>	Class 1, 20 – 40 p , 0-2%, corresponding to class "C" - site area - national area ratio 2.000 – 3.000 ha
7.	A403	<i>Buteo rufinus</i>	2 – 4 p , 0-2%, corresponding to class "C" - site area - national area ratio 9.000 – 9.500 ha
8.	A224	<i>Caprimulgus europaeus</i>	Class 2, 50 – 100 p , 0-2%, corresponding to class "C" - site area - national area ratio 8.000 – 8.500 ha
9.	A196	<i>Chlidonias hybridus</i>	Class 2, 50 – 100 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 – 5.000 ha
10.	A197	<i>Chlidonias niger</i>	Class 2, 50 – 100 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 – 5.000 ha
11.	A031	<i>Ciconia ciconia</i>	Class 3, 80 – 120 p , 0-2%, corresponding to class "C" - site area - national area ratio 9.000 – 9.500 ha
12.	A030	<i>Ciconia nigra</i>	Class 3, 200 – 500 i , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 – 5.000 ha
13.	A081	<i>Circus aeruginosus</i>	Class 0, 3 – 6 p ,

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
			0-2%, corresponding to class "C" - site area - national area ratio 2.000 - 3.000 ha
14.	A089	<i>Clanga pomarina (Aquila pomarina)</i>	Class 0, 5 – 10 i , 0-2%, corresponding to class "C" - site area - national area ratio 9.000 – 9.500 ha
15.	A231	<i>Coracias garrulus</i>	Class 1, 30 – 70 p , 0-2%, corresponding to class "C" - site area - national area ratio 3.000 – 4.000 ha
16.	A122	<i>Crex crex</i>	Class 1, 20 – 40 males , 0-2%, corresponding to class "C" - site area - national area ratio 1.000 – 2.000 ha
17.	A238	<i>Dendrocopos medius</i>	Class 3, 100 – 150 p , 0-2%, corresponding to class "C" - site area - national area ratio 8.000 - 8.500 ha
18.	A429	<i>Dendrocopos syriacus</i>	Class 3, 100 – 150 p , 0-2%, corresponding to class "C" - site area - national area ratio 8.000 - 8.500 ha
19.	A027	<i>Egretta alba (Ardea alba)</i>	Class 1, 30 – 50 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 – 5.000 ha
20.	A026	<i>Egretta garzetta</i>	Class 1, 20 – 40 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 - 5.000 ha
21.	A321	<i>Ficedula albicollis</i>	Class 3, 100 – 150 p , 0-2%, corresponding to class "C" - site area - national area ratio 8.000 - 8.500 ha
22.	A075	<i>Haliaeetus albicilla</i>	Class 0, 1 – 2 p , 0-2%, corresponding to class "C" - site area - national area ratio 2.000 - 3.000 ha
23.	A131	<i>Himantopus himantopus</i>	Class 1, 30 – 50 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 - 5.000 ha
24.	A022	<i>Ixobrychus minutus</i>	Class 2, 50 – 70 p , 0-2%, corresponding to class "C" - site area - national area ratio 2.000 - 3.000 ha
25.	A338	<i>Lanius collurio</i>	Class 3, 120 – 200 p , 0-2%, corresponding to class "C" - site area - national area ratio 3.000 – 4.000 ha

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
26.	A177	<i>Larus minutus</i>	Class 3, 80 – 100 i , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 - 5.000 ha
27.	A246	<i>Lullula arborea</i>	Class 3, 80 – 150 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 - 5.000 ha
28.	A073	<i>Milvus migrans</i>	120 – 160 p brooder (2004),
29.	A020	<i>Pelecanus crispus</i>	The species was not identified on the site
30.	A072	<i>Pernis apivorus</i>	Class 0, 2 – 5 p , 0-2%, corresponding to class "C" - site area - national area ratio 9.000 -9.500 ha
31.	A393	<i>Phalacrocorax pygmeus</i>	Class 1, 15 – 40 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 -5.000 ha
32.	A034	<i>Platalea leucorodia</i>	The species was not identified on the site
33.	A032	<i>Plegadis falcinellus</i>	The species was not identified on the site
34.	A132	<i>Recurvirostra avosetta</i>	Class 1, 15 – 40 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 -5.000 ha
35.	A195	<i>Sterna albifrons</i>	Class 1, 15 – 30 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 -5.000 ha
36.	A193	<i>Sterna hirundo</i>	Class 1, 15 – 40 p , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 -5.000 ha
37.	A166	<i>Tringa glareola</i>	Class 3, 100 – 150i , 0-2%, corresponding to class "C" - site area - national area ratio 4.000 – 5.000 ha

Green - Appears in FS but does not appear in PM

Table 36 The presence and number / areas of species of community interest in ROSPA0010 Bistret (near the project), according to the Final Report on the inventory, mapping and assessment of the conservation status of the species in the ROSCI0045, ROSPA0010, ROSPA0023, Padurea Zaval si Locul Fosilifer Dranic

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
1.	A299	<i>Alcedo atthis ispida</i>	5 – 10 p , 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha
2.	A042	<i>Anser erythropus</i>	Insufficient data. According to the Natura 2000 site, 4 individuals are wintering or passing the site.
3.	A255	<i>Anthus campestris</i>	The species was identified only once between the Danube and the site (south of it) at the edge of a wheat crop. In migration: possible 5 – 10 i (compared to neighboring sites; we did not notice the species in ROSPA0014), 0-2 % , corresponding to class "C" - site area - national area ratio, 600 ha
4.	A029	<i>Ardea purpurea</i>	In migration: possible 1 - 10 i . 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha
5.	A024	<i>Ardeola ralloides</i>	It was not observed. 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha
6.	A060	<i>Aythya nyroca</i>	In migration: possible 5 - 15 i . 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha
7.	A021	<i>Botaurus stellaris</i>	0 - 2 p , 0-2 % , corresponding to class "C" - site area - national area ratio 1.916 ha
8.	A396	<i>Branta ruficollis</i>	In migration: possible 5 – 10 individuals , (compared to neighboring sites; we did not notice the species in ROSPA0014), 0-2 % , corresponding to class "C" - site area - national area ratio
9.	A133	<i>Burhinus oedicephalus</i>	8 - 12 p (according Natura 2000 SF), 0-2 % , corresponding to class "C" - site area - national area ratio, 500 ha
10.	A021	<i>Chlidonias hybrida</i>	In migration: possible 5 – 10 individuals , (compared to neighboring sites; we did not notice the species ROSPA0014), 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha – 2.500 ha
11.	A197	<i>Chlidonias niger</i>	10 - 1000 i , 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha
12.	A031	<i>Ciconia ciconia</i>	10 - 60 i , 0-2 % , corresponding to class "C" - site area - national area ratio, 1.916 ha

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
13.	A030	<i>Ciconia nigra</i>	2 - 6 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
14.	A080	<i>Circaetus gallicus</i>	In migration: possible 5 – 10 individuals (compared to neighboring sites; we did not notice the species ROSPA0014), 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
15.	A081	<i>Circus aeruginosus</i>	5 - 20 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
16.	A082	<i>Circus cyaneus</i>	5 - 10 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha – 3.000 ha
17.	A231	<i>Coracias garrulus</i>	5 - 10 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 150 - 200 ha
18.	A038	<i>Cygnus cygnus</i>	insufficient data 0-2 %, corresponding to class "C" - site area - national area ratio,
19.	A429	<i>Dendrocopos syriacus</i>	5 – 10 (20) p, 0-2 %, corresponding to class "C" - site area - national area ratio, 10- 50 ha
20.	A027	<i>Egretta alba (Ardea alba)</i>	In migration: 1 – 250-300 i, 2-15%, corresponding to class "C" - site area - national area ratio, 1.916 ha
21.	A026	<i>Egretta garzetta</i>	5 - 200 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
22.	A075	<i>Haliaeetus albicilla</i>	In migration: possible 1 - 5 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
23.	A131	<i>Himantopus himantopus</i>	15 - 30 p, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha – 2.500 ha
24.	A022	<i>Ixobrychus minutus</i>	4 - 10 p, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
25.	A299	<i>Lanius collurio collurio</i>	50 p, with young 200 i, 1.000 ha
26.	A068	<i>Mergellus albellus</i>	insufficient data

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
			0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
27.	A023	<i>Nycticorax nycticorax</i>	5 - 10 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
28.	A020	<i>Pelecanus crispus</i>	1 - 200 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
29.	A019	<i>Pelecanus onocrotalus</i>	5 - 10 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
30.	A393	<i>Phalacrocorax pygmaeus</i>	In migration: possible 7 - 33 individuals , 0-2 %, corresponding to class "C" - site area - national area ratio
31.	A151	<i>Philomachus pugnax</i>	In migration: possible 12 - 549 individuals , (compared to neighboring sites; we did not notice the species ROSPA0014), 0-2 %, corresponding to class "C" - site area - national area ratio,
32.	A034	<i>Platalea leucorodia</i>	In migration: 2 - 100 p , 1.916 ha
33.	A032	<i>Plegadis falcinellus</i>	1 - 10 i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha
34.	A120	<i>Porzana parva</i>	insufficient data, 0-2 %, corresponding to class "C" - site area - national area ratio, insufficient data
35.	A132	<i>Recurvirostra avosetta</i>	5 - 30 (40) i, 0-2 %, corresponding to class "C" - site area - national area ratio, 1.916 ha - 2.500 ha
36.	A193	<i>Sterna hirundo</i>	5 - 10 p, 0-2 %, corresponding to class "C" - site area - national area ratio, 2.000 ha

Table 37 The presence and number / areas of species of community interest ROSPA0135 Nisipurile de la Dabuleni (overlapping with project elements), according to the Integrated Management Plan for the Natura 2000 site ROSPA0135 Nisipurile de la Dabuleni and the protected area of national interest 2,667 Casa padurii din padurea Potelu

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
1.	A255	<i>Anthus campestris</i>	30 - 50 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 50 – 100 ha
2.	A024	<i>Ardeola ralloides</i>	10 - 20 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 20 – 30 ha
3.	A060	<i>Aythya nyroca</i>	2 - 2 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 20 – 30 ha
4.	A021	<i>Botaurus stellaris</i>	5 - 10 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 20 – 30 ha
5.	A133	<i>Burhinus oedicnemus</i>	10 - 15 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 200 – 300 ha
6.	A224	<i>Caprimulgus europaeus</i>	5 - 10 pairs hacking, 0-2 corresponding to class "C" - site area - national area ratio 20 – 30 ha
7.	A196	<i>Chlidonias hybridus</i>	60 – 70 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 50 – 100 ha
8.	A031	<i>Ciconia ciconia</i>	8 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 1.500 – 2.000 ha
9.	A030	<i>Ciconia nigra</i>	3 - 5 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 40 -50 ha
10.	A081	<i>Circus aeruginosus</i>	5 - 8 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 20 – 30 ha
11.	A231	<i>Coracias garrulus</i>	30 - 50 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 500 – 600 ha
12.	A027	<i>Egretta alba (Ardea alba)</i>	20-30 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 50 – 100 ha

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
13.	A026	<i>Egretta garzetta</i>	20 - 50 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 100 - 200 ha
14.	A379	<i>Emberiza hortulana</i>	10 - 20 pairs brooder, 0-2 %, corresponding to class "C" - site area - national area ratio 20 – 30 ha
15.	A097	<i>Falco vespertinus</i>	20 - 30 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 1050 – 2000 ha
16.	A617	<i>Ixobrychus minutus</i>	10 - 20 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 20 – 30 ha
17.	A338	<i>Lanius collurio</i>	60 - 80 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 1.000 – 1.200 ha
18.	A339	<i>Lanius minor</i>	20 - 30 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 50 – 60 ha
19.	A246	<i>Lullula arborea</i>	20 - 30 pairs hacking, 0-2 %, corresponding to class "C" - site area - national area ratio 30 – 40 ha
20.	A023	<i>Nycticorax nycticorax</i>	50 - 100 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 100 - 200 ha
21.	A607-B	<i>Platalea leucorodia</i>	This species was NOT identified in ROSPA0135
22.	A307	<i>Sylvia nisoria</i>	15 - 30 individuals, 0-2 %, corresponding to class "C" - site area - national area ratio 30 – 50 ha

Gray - appear in PM but do not appear in FS

Table 38 The presence of habitats and species of community interest in ROSCI0044 Corabia - Turnu Magurele (overlapping with project elements) according to the Natura 2000 Standard Form (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSCI0044>)

Habitats				Site evaluation			
No.	Code	Surface [ha]	Quality of data	A B C D	A B C		
				Representativeness	Relative Surface	Conservation	Overall
1.	3140	0	G	C	C	C	C
2.	6440	0	G	B	C	B	B
3.	91E0*	0	G	B	C	B	B
4.	91F0	0	G	B	C	B	B
5.	92A0	0	G	B	C	B	B

Representativeness - the degree of representativeness of the habitat type within the site: A: excellent representativeness, B: good representativeness, C: significant representativeness, D: insignificant presence;
Relative surface - site area covered by the natural habitat relative to the total area covered by that type of natural habitat within the national territory. This criterion will be expressed as a percentage "p" to be selected from the database according to information held: A : 100> p> 15% B: 15> p> 2% C: 2> p> 0%;
Conservation status - The degree of conservation of the structures and functions of the natural habitat type in question as well as the possibilities for restoration / reconstruction. This criterion comprises the following three sub-criteria: i) the degree of conservation of the structure, ii) the degree of conservation of the functions iii) recovery possibilities. Thus, it applies to the global classification after the three sub-criteria A: excellent conservation, B: good conservation, C: medium or reduced preservation;
Global assessment - Global site value assessment for the conservation of the natural habitat type. A: excellent value, B: good value C: considerable value.

No.	Code	Population in the site							Site evaluation			
		Name of species	Tip	Size		Unity	Cat.	Quality of data	A B C D Pop.	A B C		
				Min	Max					Con.	Iso.	Glo.
1	4125	<i>Alosa immaculata</i>	P				P		C	B	B	B
2	4125	<i>Alosa immaculata</i>	R				R		C	B	B	B
3	1130	<i>Aspius aspius</i>	P				P		B	B	C	B
4	1188	<i>Bombina bombina</i>	P				P		C	B	C	B
5	1149	<i>Cobitis taenia</i>	P				P		C	B	C	B
6	1124	<i>Romanogobio albipinnatus (Gobio albipinnatus)</i>	P				P		C	B	C	B
7	2511	<i>Romanogobio kessleri (Gobio kessleri)</i>	P				P		D			
8	2555	<i>Gymnocephalus baloni</i>	P				P		C	B	B	B
9	1157	<i>Gymnocephalus schraetzer</i>	P				P		C	B	B	B
10	1355	<i>Lutra lutra</i>	P						C	B	C	B

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No.	Code	Population in the site							Site evaluation			
		Name of species	Tip	Size		Unity	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
11	1145	<i>Misgurnus fossilis</i>	P				P		C	B	C	B
12	2522	<i>Pelecus cultratus</i>	P				P		C	B	C	B
13	1134	<i>Rhodeus amarus (Rhodeus sericeus amarus)</i>	P				P		C	B	C	B
14	1335	<i>Spermophilus citellus</i>	P				P		C	B	C	B
15	4064	<i>Theodoxus transversalis</i>	P				R		B	B	B	B
16	1993	<i>Triturus dobrogicus</i>	P				P		C	B	B	B
17	1160	<i>Zingel streber</i>	P				P		B	B	C	B
18	1159	<i>Zingel zingel</i>	P				P		B	B	C	B

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codees in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
 - Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
 - Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 39 Presence and Effects of Species of Community Interest in ROSPA0024 Confluenta Olt-Dunare (overlapping with project elements), according to Natura 2000 Standard Form
 (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0024>)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1.	A229	<i>Alcedo atthis</i>	R	4	6	p	P		D			
2.	A060	<i>Aythya nyroca</i>	R	25	28	p	P		D			
3.	A133	<i>Burhinus oedicnemus</i>	R	4	10	p	P		C	B	C	B
4.	A196	<i>Chlidonias hybridus</i>	C	80	150	i	P		D			
5.	A197	<i>Chlidonias niger</i>	C	50	100	i	P		C	B	C	C
6.	A231	<i>Coracias garrulus</i>	R	16	20	p	P		C	B	C	C
7.	A038	<i>Cygnus cygnus</i>	C	1	5	i	P		D			
8.	A238	<i>Dendrocopos medius</i>	R	6	10	p	P		D			
9.	A379	<i>Emberiza hortulana</i>	R				P		C	B	C	B
10.	A097	<i>Falco vespertinus</i>	R	15	25	p			C	B	C	B
11.	A131	<i>Himantopus himantopus</i>	C	2	10	i	P		D			
12.	A023	<i>Nycticorax nycticorax</i>	R	12	20	p	P		C	B	C	C
13.	A393	<i>Phalacrocorax pygmeus</i>	R	350	450	p	P		B	B	C	C
14.	A234	<i>Picus canus</i>	R	6	10	p	P		D			
15.	A034	<i>Platalea leucorodia</i>	C	30	60	i	P		D			
16.	A195	<i>Sterna albifrons</i>	C	70	140	i	P		C	B	C	C
17.	A193	<i>Sterna hirundo</i>	C	200	400	i	P		C	B	C	C
18.	A166	<i>Tringa glareola</i>	C	500	1000	i	P		C	C	C	C

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codes in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:

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- a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
- b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
- c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
- d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 40 Presence and Effects of Species of Community Interest in ROSPA0102 Suhaia (overlapping with project elements), according to Natura 2000 Standard Forma
 (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0102>)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1.	A229	<i>Alcedo atthis</i>	R	30	40	p	P		C	B	C	B
2.	A029	<i>Ardea purpurea</i>	R	30	40	i	P		C	B	C	C
3.	A024	<i>Ardeola ralloides</i>	R	80	100	p	P		C	B	C	B
4.	A060	<i>Aythya nyroca</i>	C	200	300	i	P		C	B	C	C
5.	A060	<i>Aythya nyroca</i>	R	10	20	p	P		C	B	C	C
6.	A021	<i>Botaurus stellaris</i>	R	3	4	p	P		C	B	C	C
7.	A396	<i>Branta ruficollis</i>	W	170	1200	i	C		C	B	B	B
8.	A196	<i>Chlidonias hybridus</i>	R	150	200	p	C		C	B	C	B
9.	A197	<i>Chlidonias niger</i>	C	2500	3000	i	R		C	B	C	B
10.	A031	<i>Ciconia ciconia</i>	C	800	1500	i	P		C	B	C	C
11.	A030	<i>Ciconia nigra</i>	C	30	40	i	P		C	B	C	C
12.	A081	<i>Circus aeruginosus</i>	R	2	4	p	P		C	B	C	B
13.	A231	<i>Coracias garrulus</i>	R	30	100	p	P		C	B	C	B
14.	A122	<i>Crex crex</i>	R	8	10	p	C		D			
15.	A038	<i>Cygnus cygnus</i>	C	10	18	i	P		D			
16.	A027	<i>Egretta alba</i>	W	20	30	i	P		C	B	C	C
17.	A027	<i>Egretta alba</i>	C	60	100	i	P		C	B	C	C
18.	A026	<i>Egretta garzetta</i>	R	50	60	p	P		C	B	C	B
19.	A098	<i>Falco columbarius</i>	W	10	15	i	P		C	B	C	C
20.	A097	<i>Falco vespertinus</i>	R	7	12	p			C	B	C	B
21.	A135	<i>Glareola pratincola</i>	R	8	12	p	P		C	C	B	B
22.	A127	<i>Grus grus</i>	C	20	20	i	P		D			
23.	A075	<i>Haliaeetus albicilla</i>	W	3	4	i	P		D			
24.	A131	<i>Himantopus himantopus</i>	R	80	100	p	C		B	B	C	B
25.	A022	<i>Ixobrychus minutus</i>	R	80	100	p	P		C	B	C	B
26.	A338	<i>Lanius collurio</i>	R				C		D			
27.	A339	<i>Lanius minor</i>	R				C		D			
28.	A177	<i>Larus minutus</i>	C	3	30	i	P		D			

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No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D Pop.	A B C		
				Min	Max					Con.	Iso.	Glo.
29.	A023	<i>Nycticorax nycticorax</i>	R	80	100	p	C		C	B	C	B
30.	A020	<i>Pelecanus crispus</i>	C	30	210	i	C		B	B	B	B
31.	A019	<i>Pelecanus onocrotalus</i>	C	30		i	P		C	B	B	B
32.	A393	<i>Phalacrocorax pygmeus</i>	C	200	500	i	P		C	B	C	B
33.	A393	<i>Phalacrocorax pygmeus</i>	R	100	120	p	P		C	B	C	B
34.	A151	<i>Philomachus pugnax</i>	C	8000	10000	i	C		C	B	C	B
35.	A034	<i>Platalea leucorodia</i>	R	27	35	p	P		B	B	C	B
36.	A032	<i>Plegadis falcinellus</i>	R		40	p	C		D			
37.	A132	<i>Recurvirostra avosetta</i>	R	20	30	p	C		B	B	C	B
38.	A195	<i>Sterna albifrons</i>	R		10	p	P		D			
39.	A193	<i>Sterna hirundo</i>	R	30	40	p	C		C	B	C	C
40.	A397	<i>Tadorna ferruginea</i>	R		4	p			C	B	C	B
41.	A166	<i>Tringa glareola</i>	C	1000	2200	i	P		C	A	C	C

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codes in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
 - c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
 - d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 41 The presence of habitats and species of community interest in ROSCI0088 Gura Vedei - Saica - Slobozia (overlapping with project elements) according to the Natura 2000 Standard Form (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSCI0088>)

Habitats				Site evaluation			
No.	Code	Surface [ha]	Quality of data	A B C D	A B C		
				Representativeness	Relative Surface	Conservation	Overall
1	91F0	0	G	D			
2	92A0	0	G	B	C	B	B

Representativeness - the degree of representativeness of the habitat type within the site: A: excellent representativeness, B: good representativeness, C: significant representativeness, D: insignificant presence;
Relative surface - site area covered by the natural habitat relative to the total area covered by that type of natural habitat within the national territory. This criterion will be expressed as a percentage "p" to be selected from the database according to information held: A : 100> p> 15% B: 15> p> 2% C: 2> p> 0%;

Conservation status - The degree of conservation of the structures and functions of the natural habitat type in question as well as the possibilities for restoration / reconstruction. This criterion comprises the following three sub-criteria: i) the degree of conservation of the structure, ii) the degree of conservation of the functions iii) recovery possibilities. Thus, it applies to the global classification after the three sub-criteria A: excellent conservation, B: good conservation, C: medium or reduced preservation;

Global assessment - Global site value assessment in terms of conservation of the natural habitat type. A: excellent value, B: good value C: considerable value.

No.	Code	Name of species	Population in the site						Site evaluation			
			Tip	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1	4125	<i>Alosa immaculata</i>	R				C		B	B	C	B
2	4125	<i>Alosa immaculata</i>	P				C		B	B	C	B
3	1130	<i>Aspius aspius</i>	P				P		C	B	C	B
4	1188	<i>Bombina bombina</i>	P				C		C	B	C	B
5	1149	<i>Cobitis taenia</i>	P				P		C	B	C	B
6	1220	<i>Emys orbicularis</i>	P				P		C	B	C	B
7	1124	<i>Romanogobio albipinnatus</i> (<i>Gobio albipinnatus</i>)	P				P		C	B	C	B
8	2555	<i>Gymnocephalus baloni</i>	P				P		C	B	B	B
9	1157	<i>Gymnocephalus schraetzer</i>	P				P		C	B	B	B
10	1355	<i>Lutra lutra</i>	P				P		C	B	C	B

No.	Code	Name of species	Population in the site						Site evaluation			
			Tip	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
11	1310	<i>Miniopterus schreibersii</i>	C				P		C	B	C	B
12	1310	<i>Miniopterus schreibersii</i>	P				P		C	B	C	B
13	1145	<i>Misgurnus fossilis</i>	P				P		C	B	C	B
14	1321	<i>Myotis emarginatus</i>	P				P		C	B	C	B
15	1321	<i>Myotis emarginatus</i>	C				P		C	B	C	B
16	1324	<i>Myotis myotis</i>	P				P		C	B	C	B
17	1324	<i>Myotis myotis</i>	C				P		C	B	C	B
18	1303	<i>Rhinolophus hipposideros</i>	P				P		C	B	C	B
19	1303	<i>Rhinolophus hipposideros</i>	C				P		C	B	C	B
20	1302	<i>Rhinolophus mehelyi</i>	P				P		C	B	B	B
21	1302	<i>Rhinolophus mehelyi</i>	C				P		C	B	B	B
22	1134	<i>Rhodeus amarus</i> (<i>Rhodeus sericeus amarus</i>)	P				P		C	B	C	B
23	1146	<i>Sabanejewia aurata</i>	P				P		C	B	C	B
24	1335	<i>Spermophilus citellus</i>	P				P		C	B	C	B
25	1032	<i>Unio crassus</i>	P				P		C	B	C	B
26	1160	<i>Zingel streber</i>	P				P		C	B	C	B
27	1159	<i>Zingel zingel</i>	P				P		C	B	C	B

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codes in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% > p > 15%; B: 15% > p > 2%; C: 2% > p > 0%; D: insignificant population;

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b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;c) Iso. - Izolate: gradul de izolare a populatiei prezente pe amplasament in raport cu gama naturala a speciilor. A: populatie (aproape) izolata; B: populatie neizolata, dar pe marginea zonei de distributie; C: populatie neizolata in intervalul extins de distributie;
d) Glo. - Global: the global assessment of site value for the conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 42 Presence and Effects of Species of Community Interest in ROSPA0108 Vedeia - Dunare (overlapping with project elements), according to the Natura 2000 Standard Form
 (http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0108)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D Pop.	A B C		
				Min	Max					Con.	Iso.	Glo.
1.	A402	<i>Accipiter brevipes</i>	R	1	2	p	C		C	B	C	B
2.	A229	<i>Alcedo atthis</i>	R	12		p	C		D			
3.	A029	<i>Ardea purpurea</i>	R	5	10	p	R		C	B	C	B
4.	A029	<i>Ardea purpurea</i>	C	70	100	i	R		C	B	C	B
5.	A024	<i>Ardeola ralloides</i>	R	50	60	p	C		C	B	C	C
6.	A060	<i>Aythya nyroca</i>	C	300	400	i	P		C	B	C	B
7.	A060	<i>Aythya nyroca</i>	R	25	34	p	P		C	B	C	B
8.	A031	<i>Ciconia ciconia</i>	C	500	1000	i	P		C	B	C	B
9.	A031	<i>Ciconia ciconia</i>	R				P		C	B	C	B
10.	A030	<i>Ciconia nigra</i>	C	40	60	i	R		C	B	C	B
11.	A030	<i>Ciconia nigra</i>	R	1	2	p	R		C	B	C	B
12.	A081	<i>Circus aeruginosus</i>	C	80	100	i	R		C	B	C	C
13.	A081	<i>Circus aeruginosus</i>	W	10	15	i	R		C	B	C	C
14.	A081	<i>Circus aeruginosus</i>	R	2	4	p	R		C	B	C	C
15.	A082	<i>Circus cyaneus</i>	W	4	6	i	R		C	B	C	B
16.	A082	<i>Circus cyaneus</i>	C	20	30	i	R		C	B	C	B
17.	A231	<i>Coracias garrulus</i>	R	20	30	p	C		C	B	C	B
18.	A027	<i>Egretta alba</i>	R	1	3	p	P		C	B	C	B
19.	A027	<i>Egretta alba</i>	W	20	30	i	P		C	B	C	B
20.	A026	<i>Egretta garzetta</i>	C	300	500	i	P		C	B	C	B
21.	A026	<i>Egretta garzetta</i>	R	45	80	p	P		C	B	C	B
22.	A097	<i>Falco vespertinus</i>	C	200	300	i	C		C	B	C	B
23.	A097	<i>Falco vespertinus</i>	R	5	10	p	C		C	B	C	B
24.	A075	<i>Haliaeetus albicilla</i>	R	1	1	p	C		C	B	C	B
25.	A075	<i>Haliaeetus albicilla</i>	W	4	6	i	C		C	B	C	B
26.	A075	<i>Haliaeetus albicilla</i>	C	5	10	i	C		C	B	C	B
27.	A131	<i>Himantopus himantopus</i>	R	15	27	p	P		C	B	C	C
28.	A131	<i>Himantopus himantopus</i>	C	70	150	i	P		C	B	C	C

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No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
29.	A022	<i>Ixobrychus minutus</i>	C	20		i	P		C	B	C	B
30.	A022	<i>Ixobrychus minutus</i>	R	20	24	p	P		C	B	C	B
31.	A023	<i>Nycticorax nycticorax</i>	R	40	60	p	C		C	B	C	B
32.	A020	<i>Pelecanus crispus</i>	C	3	11	i	P		C	B	C	B
33.	A019	<i>Pelecanus onocrotalus</i>	C				R		C	B	C	B
34.	A393	<i>Phalacrocorax pygmeus</i>	C	1000		i	R		C	A	C	A
35.	A393	<i>Phalacrocorax pygmeus</i>	W	240		i	R		C	A	C	A
36.	A034	<i>Platalea leucorodia</i>	R	18	24	p	P		C	B	C	B
37.	A034	<i>Platalea leucorodia</i>	C				C		C	B	C	B
38.	A032	<i>Plegadis falcinellus</i>	C				C		D			
39.	A132	<i>Recurvirostra avosetta</i>	C	50	150	i	C		C	B	C	B
40.	A132	<i>Recurvirostra avosetta</i>	R		40	p	C		C	B	C	B
41.	A195	<i>Sterna albifrons</i>	R	4	8	p	C		C	B	C	B
42.	A195	<i>Sterna albifrons</i>	C	50	70	i	C		C	B	C	B
43.	A193	<i>Sterna hirundo</i>	C	800	1500	i	C		C	B	C	B
44.	A193	<i>Sterna hirundo</i>	R	30	80	p	C		C	B	C	B

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codees in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
 - c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
 - d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 43 The presence and number of species of community interest in ROSPA0090 Ostrovu Lung - Gostinu (near the project), according to the Natura 2000 Standard Form
 (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0090>)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1.	A402	<i>Accipiter brevipes</i>	R	2	3	p	P		C	A	C	A
2.	A229	<i>Alcedo atthis</i>	R	30	40	p	C		C	B	C	B
3.	A255	<i>Anthus campestris</i>	R				R		D			
4.	A089	<i>Aquila pomarina</i>	C	40		i	P		D			
5.	A029	<i>Ardea purpurea</i>	C				R		D			
6.	A024	<i>Ardeola ralloides</i>	R	100	200	p	R		B	A	C	B
7.	A060	<i>Aythya nyroca</i>	R	8	10	p	R		C	B	C	C
8.	A060	<i>Aythya nyroca</i>	C	60	80	i	R		C	B	C	C
9.	A021	<i>Botaurus stellaris</i>	R		1	p	R		D			
10.	A396	<i>Branta ruficollis</i>	C	30		i	V		C	A	C	B
11.	A133	<i>Burhinus oedicephalus</i>	R	4	5	p	P		C	B	C	B
12.	A403	<i>Buteo rufinus</i>	R	1	1	p	R		C	B	C	C
13.	A224	<i>Caprimulgus europaeus</i>	R				R		D			
14.	A196	<i>Chlidonias hybridus</i>	R	60		p	P		C	B	C	B
15.	A196	<i>Chlidonias hybridus</i>	C	400		i	P		C	B	C	B
16.	A031	<i>Ciconia ciconia</i>	C	300	700	i	R		C	B	C	C
17.	A031	<i>Ciconia ciconia</i>	R	30	120	i	R		C	B	C	C
18.	A030	<i>Ciconia nigra</i>	C	42		i	R		C	A	C	B
19.	A030	<i>Ciconia nigra</i>	R	1	2	p	R		C	A	C	B
20.	A080	<i>Circaetus gallicus</i>	R	1		p	C		C	B	C	B
21.	A081	<i>Circus aeruginosus</i>	C	12	15	i	R		D			
22.	A081	<i>Circus aeruginosus</i>	W	3	5	i	R		D			
23.	A082	<i>Circus cyaneus</i>	W	15	20	i	C		C	B	C	C
24.	A083	<i>Circus macrourus</i>	C	10		i	C		C	B	C	A
25.	A231	<i>Coracias garrulus</i>	R	40	45	p	C		C	A	C	B
26.	A038	<i>Cygnus cygnus</i>	W	120	133	i	C		B	A	C	B
27.	A238	<i>Dendrocopos medius</i>	R				R		D			
28.	A236	<i>Dryocopus martius</i>	R				C		D			

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No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
29.	A026	<i>Egretta garzetta</i>	R	100	200	i	C		C	A	C	B
30.	A097	<i>Falco vespertinus</i>	R	8	9	p	R		C	B	C	B
31.	A321	<i>Ficedula albicollis</i>	C				C		D			
32.	A320	<i>Ficedula parva</i>	C				C		D			
33.	A075	<i>Haliaeetus albicilla</i>	R	1	1	p	R		C	A	C	B
34.	A075	<i>Haliaeetus albicilla</i>	C	4		i	R		C	A	C	B
35.	A092	<i>Hieraaetus pennatus</i>	C	5		i	C		D			
36.	A131	<i>Himantopus himantopus</i>	R	24	26	p	C		B	B	C	B
37.	A022	<i>Ixobrychus minutus</i>	R	40	50	p	C		C	A	C	B
38.	A338	<i>Lanius collurio</i>	R				C		D			
39.	A339	<i>Lanius minor</i>	R				C		D			
40.	A176	<i>Larus melanocephalus</i>	C	40	70	i	R		D			
41.	A177	<i>Larus minutus</i>	C	400	500	i	R		C	B	C	B
42.	A246	<i>Lullula arborea</i>	R				V		D			
43.	A073	<i>Milvus migrans</i>	R				P		D			
44.	A073	<i>Milvus migrans</i>	C	5	10	i	P		D			
45.	A023	<i>Nycticorax nycticorax</i>	R	120	130	p	V		C	A	C	B
46.	A094	<i>Pandion haliaetus</i>	C	20		i	V		C	B	C	B
47.	A020	<i>Pelecanus crispus</i>	C	34		i	V		C	A	C	B
48.	A019	<i>Pelecanus onocrotalus</i>	C	120		i	V		C	A	B	B
49.	A393	<i>Phalacrocorax pygmeus</i>	C	200	500	i	V		C	A	C	B
50.	A393	<i>Phalacrocorax pygmeus</i>	W	240	300	i	V		C	A	C	B
51.	A151	<i>Philomachus pugnax</i>	C	200	300	i	V		D			
52.	A234	<i>Picus canus</i>	P	20	40	i	R		D			
53.	A034	<i>Platalea leucorodia</i>	C	30	40	i	R		D			
54.	A032	<i>Plegadis falcinellus</i>	R	10	20	p	R		C	A	C	B
55.	A032	<i>Plegadis falcinellus</i>	C	100	200	i	R		C	A	C	B
56.	A132	<i>Recurvirostra avosetta</i>	R	7	8	p	P		C	B	C	B
57.	A195	<i>Sterna albifrons</i>	C	60	70	i	P		B	B	C	B
58.	A195	<i>Sterna albifrons</i>	R	12		p	P		B	B	C	B

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No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
59.	A193	<i>Sterna hirundo</i>	C	1000	1200	i	P		C	B	C	B
60.	A307	<i>Sylvia nisoria</i>	R				R		D			
61.	A166	<i>Tringa glareola</i>	C	80		i	R		D			

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codees in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
 - c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
 - d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 44 The presence and number / areas of species of community interest in ROSPA0038 Dunare - Oltenita (in the vicinity of the project), according to the ROSPA0038 Dunare - Oltenita Site Management Plan

No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
1.	A229	<i>Alcedo atthis</i>	Nestled: 10 - 15 pairs , Conservation status: B - good
2.	A024	<i>Ardeola ralloides</i>	Passage: 0 - 15 individuals , Conservation status: C - medium / low
3.	A060	<i>Aythya nyroca</i>	
4.	A021	<i>Botaurus stellaris</i>	Nestled: rare, 0 - 1 pairs , Conservation status: C - medium / low
5.	A196	<i>Chlidonias hybridus</i>	Passage: 100 individuals , Conservation status: C - medium / low
6.	A197	<i>Chlidonias niger</i>	Passage: 20 individuals , Conservation status: C - medium / low
7.	A031	<i>Ciconia ciconia</i>	Passage: 50 individuals , Conservation status: C - medium
8.	A030	<i>Ciconia nigra</i>	Passage: 20 - 30 individuals , Conservation status: C - medium / low
9.	A238	<i>Dendrocopos medius</i>	Passage: 10 - 30 pairs , Conservation status: B - good
10.	A236	<i>Dryocopus martius</i>	Passage: 5 - 10 pairs , Conservation status: B - good
11.	A027	<i>Egretta alba</i> (<i>Ardea alba</i>)	Passage and winter: 5 individuals , Conservation status: C - medium / low
12.	A026	<i>Egretta garzetta</i>	Passage: 15 - 20 individuals , Conservation status: C - medium / low
13.	A075	<i>Haliaeetus albicilla</i>	Resident: 5 individuals , Conservation status: B - good
14.	A131	<i>Himantopus himantopus</i>	Resident: 20 individuals , Conservation status: C - medium / low
15.	A022	<i>Ixobrychus minutus</i>	Passage: 10 individuals , Conservation status: C - media
16.	A338	<i>Lanius collurio</i>	Nestled: 80 - 100 pairs , Conservation status: B - good
17.	A068	<i>Mergellus albellus</i>	Passage: 0 - 5 individuals , Conservation status: C - medium / low
18.	A073	<i>Milvus migrans</i>	Passage: 2 - 4 individuals , Conservation status: C - reduce

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No.	Code N2k	Name of species	Presence and number / areas covered by N2k species and habitats
19.	A023	<i>Nycticorax nycticorax</i>	Passage: 5 individuals , Conservation status: C - medium / low
20.	A020	<i>Pelecanus crispus</i>	Passage: 0 - 5 individuals , Conservation status: B - good
21.	A393	<i>Phalacrocorax pygmaeus</i>	hibernation: 10 individuals , Conservation status: B - good
22.	A151	<i>Philomachus pugnax</i>	Passage: 20 individuals , Conservation status: C - reduce
23.	A234	<i>Picus canus</i>	Resident: 5 - 15 pairs , Conservation status: B - good
24.	A119	<i>Porzana porzana</i>	Passage: 0 - 5 pairs , Conservation status: C - medium / low
25.	A195	<i>Sterna albifrons</i>	Passage: 5 individuals , Conservation status: C - reduce
26.	A032	<i>Sterna hirundo</i>	Passage 20 individuals , Conservation status: C - medium / low
27.	A307	<i>Sylvia nisoria</i>	Nestled: 30 - 60 pairs , Conservation status: B - good
28.	A166	<i>Tringa glareola</i>	Passage: 10 individuals , Conservation status: C - medium / low

Green - Appears in FS but does not appear in PM

Gray - occur in PM, but do not appear in FS (the species have been identified in the site and proposed to be included in the Standard Form (according to the ROSPA0038 Dunare-Oltenita Site Management Plan))

Table 45 The presence of habitats and species of community interest in ROSCI0131 Oltenita - Mostistea - Chiciu (overlapping with project elements) according to the Natura 2000 Standard Form (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSCI0131>)Error! Not a valid link.

Habitats				Site Evaluation			
No.	Code	Surface [ha]	Quality of data	A B C D	A B C		
				Representativeness	Relative Surface	Conservation	Overall
1.	3130	0	G	B	C	B	B
2.	3150	0	G	D			
3.	3270	0	G	B	C	B	B
4.	6510	0	G	B	C	B	B

Representativeness - the degree of representativeness of the habitat type within the site: A: excellent representativeness, B: good representativeness, C: significant representativeness, D: insignificant presence;
Relative surface - site area covered by the natural habitat relative to the total area covered by that type of natural habitat within the national territory. This criterion will be expressed as a percentage "p" to be selected from the database according to information held: A : 100> p> 15% B: 15> p> 2% C: 2> p> 0%;

Conservation status - The degree of conservation of the structures and functions of the natural habitat type in question as well as the possibilities for restoration / reconstruction. This criterion comprises the following three sub-criteria: i) the degree of conservation of the structure, ii) the degree of conservation of the functions iii) recovery possibilities. Thus, it applies to the global classification after the three sub-criteria A: excellent conservation, B: good conservation, C: medium or reduced preservation;

Global assessment - Global site value assessment in terms of conservation of the natural habitat type. A: excellent value, B: good value C: considerable value

No.	Code	Name of species	Population in the site					Site evaluation				
			Tip	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1	4125	<i>Alosa immaculata</i>	P				P		B	B	B	B
2	4125	<i>Alosa immaculata</i>	R				R		B	B	B	B
3	1130	<i>Aspius aspius</i>	P				P		B	B	C	B
4	1188	<i>Bombina bombina</i>	P				P		B	B	C	B
5	1149	<i>Cobitis taenia</i>	P				P		C	B	C	C
6	1220	<i>Emys orbicularis</i>	P				P		C	B	C	B
7	1124	<i>Romanogobio albipinnatus</i> (<i>Gobio albipinnatus</i>)	P				P		C	B	C	B
8	2511	<i>Romanogobio kessleri</i> (<i>Gobio kessleri</i>)	P				P		D			
9	2555	<i>Gymnocephalus baloni</i>	P				P		D			
10	1157	<i>Gymnocephalus schraetzer</i>	P				P		B	B	B	B
11	1355	<i>Lutra lutra</i>	P				P		C	B	C	B

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No.	Code	Name of species	Population in the site					Site evaluation				
			Tip	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
12	1145	<i>Misgurnus fossilis</i>	P				P		C	B	C	B
13	2522	<i>Pelecus cultratus</i>	P				P		C	B	C	B
14	1134	<i>Rhodeus amarus</i> (<i>Rhodeus sericeus amarus</i>)	P				P		D			
15	1993	<i>Triturus dobrogicus</i>	P				P		C	B	B	B
16	2011	<i>Umbra krameri</i>	P				P		C	C	B	C
17	2011	<i>Umbra krameri</i>	C				P		C	C	B	C
18	1160	<i>Zingel streber</i>	P				P		C	B	C	B
19	1159	<i>Zingel zingel</i>	P				P		B	B	C	B

• Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);

• Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codees in accordance with Article 12 and 17 reporting (see reference portal);

• Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;

• Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);

• Site evaluation:

a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;

b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;

c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;

d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 46 Presence and Effects of Species of Community Interest in ROSPA0136 Oltenita - Ulmeni (overlapping with project elements), according to the Natura 2000 Standard Form (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0136>)

No.	Code	Name of species	Site population						Site evaluation			
			Tip	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1.	A024	<i>Ardeola ralloides</i>	C	800	1000	i	V		C	A	C	C
2.	A060	<i>Aythya nyroca</i>	C	130	240	i	C		C	A	C	C
3.	A060	<i>Aythya nyroca</i>	R	12	14	p	C		C	A	C	C
4.	A196	<i>Chlidonias hybridus</i>	C	300	500	i	C		D			
5.	A031	<i>Ciconia ciconia</i>	C	600	800	i			C	B	C	B
6.	A031	<i>Ciconia ciconia</i>	R	50		i			C	B	C	B
7.	A083	<i>Circus macrourus</i>	C	3		i	P		C	B	C	C
8.	A231	<i>Coracias garrulus</i>	R		8	p	C		C	C	C	C
9.	A177	<i>Larus minutus</i>	C	30	50	i	C		D			
10.	A020	<i>Pelecanus crispus</i>	C		50	i	R		B	A	C	B
11.	A151	<i>Philomachus pugnax</i>	C	300	500	i	C		D			
12.	A034	<i>Platalea leucorodia</i>	C	120	140	i	P		C	B	C	C
13.	A195	<i>Sterna albifrons</i>	R	2	5	p	C		C	A	C	C
14.	A193	<i>Sterna hirundo</i>	C	200		i	C		C	A	C	C
15.	A193	<i>Sterna hirundo</i>	R	20	50	p	C		C	A	C	C

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codes in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;

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- c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
- d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 47 The presence and number of species of community interest in ROSPA0021 Ciocanesti - Dunare (near the project), according to the Natura 2000 Standard Form
 (http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0021)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1.	A029	<i>Ardea purpurea</i>	C	80	120	i	P		C	B	C	B
2.	A024	<i>Ardeola ralloides</i>	C	20	200	i			D			
3.	A060	<i>Aythya nyroca</i>	R	24	31	p			C	B	C	B
4.	A060	<i>Aythya nyroca</i>	C	130	240	i			C	B	C	B
5.	A021	<i>Botaurus stellaris</i>	R	2	4	p			C	C	C	C
6.	A396	<i>Branta ruficollis</i>	C	120	130	i			C	B	C	B
7.	A138	<i>Charadrius alexandrinus</i>	C	26	40	i			C	C	C	C
8.	A138	<i>Charadrius alexandrinus</i>	R	3	6	p			C	C	C	C
9.	A196	<i>Chlidonias hybridus</i>	C	200	400	i			D			
10.	A197	<i>Chlidonias niger</i>	C	200	400	i			C	B	C	B
11.	A031	<i>Ciconia ciconia</i>	C	600	800	i			C	B	C	C
12.	A031	<i>Ciconia ciconia</i>	R	8	8	p			C	B	C	C
13.	A038	<i>Cygnus cygnus</i>	C	24	32	i			C	B	C	C
14.	A027	<i>Egretta alba</i>	C	12	40	i			D			
15.	A026	<i>Egretta garzetta</i>	R				P		D			
16.	A026	<i>Egretta garzetta</i>	C	60	200	i	P		D			
17.	A131	<i>Himantopus himantopus</i>	C	40	50	i			C	B	C	C
18.	A131	<i>Himantopus himantopus</i>	R	12	32	i			C	B	C	C
19.	A022	<i>Ixobrychus minutus</i>	R	12	20	p			C	B	C	C
20.	A068	<i>Mergus albellus</i>	C	2	6	i			D			
21.	A073	<i>Milvus migrans</i>	C	2	4	i			D			
22.	A023	<i>Nycticorax nycticorax</i>	C	200	300	i	P		C	B	C	B
23.	A023	<i>Nycticorax nycticorax</i>	R				P		C	B	C	B
24.	A020	<i>Pelecanus crispus</i>	C	30	70	i			C	B	C	B
25.	A393	<i>Phalacrocorax pygmeus</i>	C	40	130	i			D			
26.	A151	<i>Philomachus pugnax</i>	C	200	600	i			D			
27.	A034	<i>Platalea leucorodia</i>	C	120	140	i			C	B	C	B

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No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
28.	A032	<i>Plegadis falcinellus</i>	C	20	80	i			D			
29.	A119	<i>Porzana porzana</i>	R	7	8	p			D			
30.	A132	<i>Recurvirostra avosetta</i>	C	20	40	i			D			
31.	A195	<i>Sterna albifrons</i>	R	12	50	p			B	B	C	B
32.	A193	<i>Sterna hirundo</i>	C	180	500	i			C	B	C	B
33.	A166	<i>Tringa glareola</i>	C	40	80	i			D			

- Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
- Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codees in accordance with Article 12 and 17 reporting (see reference portal);
- Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
- Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
- Site evaluation:
 - a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
 - b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
 - c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
 - d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 48 The presence and number / areas covered by species and habitats of community interest in ROSCI0022 Canaralele Dunarii (near the project), according to the Management Plan for Natural Protected Areas: ROSCI0022 Canaralele Dunarii, ROSCI0053 Dealul Allah Bair, ROSPA0002 Allah Bair Capidava, ROSPA0017 Canaralele de la Harsova, ROSPA0039 Dunare-Ostroave, Reciful neojurassic de la Topalu (2352), Reciful fosilifer Seimenii Mari (2355), Dealul Allah Bair (2367), Ostrovul Soimul (IV.19.), Celea Mare-Valea lui Ene (IV.24), Padurea Cetate (IV.25.), Padurea Bratca (IV.26), Canaralele din Portul Harsova (2.369), Locul fosilifer Cernavoda (2.534), Punctul fosilifer Movila Banului

No.	Taxonomic group	Code habitat / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
1.	Habitats	3130	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoeto-Nanojuncetea</i>	S_total (estimated in the Standard Form) = 129.7 ha S_total (estimated after field checks) = 0 ha The habitat was not identified in the site. Considered to be wrongly identified.
2.		3140	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara spp</i>	S_total (estimated in the Standard Form) = 26 ha S_total (estimated after field checks) = 0 ha The habitat was not identified in the site. Considered to be wrongly identified.
3.		3150	Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation	S_total (estimated in Standard Form) = 2.6 ha S_total (estimated after field checks) = 266.1 ha The identified surface is much higher than what is estimated in the Standard Form
4.		3270	Rivers with muddy banks with <i>Chenopodion rubri pp</i> and <i>Bidenton pp</i> vegetation	S_total (estimated in the Standard Form) = 259.43 ha S_total (estimated after field checks) = 153 ha The estimated surface is lower than the one estimated in the Standard Form
5.		40C0*	Ponto-Sarmatic deciduous thickets*	S_total (estimated in the Standard Form) = 259.43 ha S_total (estimated after field checks) = 515.2 ha The identified area is greater than that estimated in the Standard Form.
6.		62C0*	Ponto-Sarmatic steppes	S_total (estimated in Standard form) = 2,594.3 ha S determined = 259.98 ha The determined area is much smaller (about 10 times) than the surface estimated in the Standard Form.
7.		6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	S_total (estimated in the Standard Form) = 259.43 ha S_total (estimated after field checks) = 0 ha The habitat has not been identified on the ground; however, its presence in extremely limited ranges is not excluded
8.		6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	S_total (estimated in the Standard Form) = 129.7 ha S_total (estimated after field checks) = 1,183.93 ha

No.	Taxonomic group	Code habitat / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
				The identified area is greater than what is estimated in Formularul Standard.
9.		6510	Lowland hay meadows	S_total (estimated in the Standard Form) = 259.43 ha S_total (estimated after field checks) = 89.1 ha The identified area is smaller than the one estimated in the Standard Form.
10.		91AA*	Ponto-Sarmatic eastern white oak woods	S_total (estimated in Standard Form) = 197 ha S_total (estimated after field checks) = 8.7 ha The identified area is much smaller than the one estimated in the Standard Form.
11.		91I0*	Euro-Siberian steppic woods with Quercus spp *	S_total (estimated in Standard Form) = 98.58 ha S_total (estimated after field checks) = 522.5 ha The identified area is greater than that estimated in the Standard Form.
12.		91F0	Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia, along the great rivers (Ulmenion minoris)	S_total (estimated in the Standard Form) = 259.43 ha S_total (estimated after field checks) = 157.72 ha The identified area is smaller than the one estimated in the Standard Form.
13.		91M0	Pannonian-Balkan turkey oak –sessile oak forests	S_total (estimated in the Standard Form) = 49.29 ha S_total (estimated after field checks) = 8.7 ha The identified area is smaller than the one estimated in the Standard Form.
14.		92A0	Riverside coppice with Salix alba and Populus alba galleries	S_total (estimated in the Standard Form) = 9,858.34 ha S_total (estimated after field checks) = 5,318.23 ha The identified area is smaller than the one estimated in the Standard Form
15.		92D0	Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae)	S_total (estimated in the Standard Form) = 5.18 ha S_total (estimated after field checks) = 104.78 ha The area now identified is more than 20 times the size initially estimated in the Standard Form.
16.	Plants	2236	<i>Campanula romanica</i>	The size of the species population in the protected area is estimated at approx. 30 - 50 individuals. Area of the habitat of the species in the protected natural area: it is estimated at 2 - 8 ha. The habitat is represented by the meadows and pastures located on the rocky substrate, steep stony areas, rocky vegetation

No.	Taxonomic group	Code habitat / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
17.		2079	<i>Moehringia jankae</i>	10 - 20 individuals. Area of the habitat of the species in the protected natural area: 2 - 5 ha. The species is part of the rocky vegetation communities. Therefore, its habitat is represented by the rocky area of the steppe meadows situated on the hilly hills of the site. Individuals of the species grow by the cracks of the rocks.
18.	Nevertebrate	4056	<i>Anisus vorticulus</i>	unknown (following several successive samplings, more than 60 samples were analyzed, no specimens of this species were identified, although there are specific habitats, the samples were taken from the end of March until August 2014). Surface of the habitat of the species in the protected natural area: 15 - 20 ha - is the estimated size of the habitat surface in the Danube channels protected natural area
19.		4064	<i>Theodoxus transversalis</i>	
20.	Pesti	4125	<i>Alosa immaculata</i>	5,000 - 10,000 ex. In the passage on the Danube. The catch was captured between Ghindaresti and Harsova and km: 298, 300, 345, 373. Area of habitat of the species in the protected natural area: 8,042 ha
21.		4127	<i>Alosa tanaica</i>	5.000 – 10.000 ex. <i>Alosa tanaica</i> is a migratory species that does not have fishing quotas (for catching it would be necessary to use the gillnets with the side of the eye = 28 mm), fishing gear not allowed to authorized fishermen fishing on the asphalt. At Km 300 (N 44o35'51.6 "; E 28o01'80.8") and km 263, 345, 369 - 370, 373. Area of habitat of the species in the protected natural area: 8,042 ha
22.		1130	<i>Aspius aspius</i>	5.000.000 – 10.000.000 ex. The species was captured at almost all points in which the Danube was fished, respectively 254, 272, 276, 277, 298, 300, 317, 319, 321, 329, 336, 338, 342, 363, 365, 367. In the material captured were found two ages (avat 0 and avat 1). At the same time, all the investigated areas have witnessed attacks of the mature specimens of the avatars. Area of habitat of the species in the protected natural area: 8,042 ha.
23.		1149	<i>Cobitis taenia</i>	100.000 – 500.000 exemplare.

No.	Taxonomic group	Code habitat / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
				At km 254, 294, 298, 367 and on the Cernavoda hot water channel (areas with sandy and / or rocky substrate and poor water current). From the total surface area of 8.042 ha, only 1-3% is the specific habitat. Area of the habitat of the species in the protected natural area: 80 - 241 ha.
24.		2484	<i>Eudontomyzon mariae</i>	0 – 1.000 ex. Area of the habitat of the species in the protected natural area: 80 - 241 ha.
25.		2555	<i>Gymnocephalus baloni</i>	500.000 – 1.000.000 exemplare. At km 272, 319 (Fermecatu arm), 336, 338 and 365 (adjacent piles), Canariu Baci Rasova and Cernavoda hot water channel, km 298. It was estimated that the size of the population in the protected natal area is high (according to the information obtained by to authorized fishermen in the protected natural range the species varies from abundant to very abundant).
26.		1157	<i>Gymnocephalus schraetser</i>	100,000 to 500,000 copies (based on information obtained from authorized fishermen in the protected natural range, the species varies from abundant to very abundant). His presence is signaled in Ghindaresti and Harsova and km 255, 300, 313, 317, 319, 329, 336, 338, 363, 365). Gymnocephalus schraetser was captured at km. 313. Area of habitat of the species in the protected natural area: 8,042 ha.
27.		1145	<i>Misgurnus fossilis</i>	10.000 – 5000 ex. Its presence is signaled by authorized fishermen in the Ghindaresti and Harsova localities and at km 300, 319, 336, 365, especially in the ponds adjacent to the main course, but the team of experts failed to capture it. Surface of the habitat of the species in the protected natural area: 8,041 ha.
28.		2522	<i>Pelecus cultratus</i>	10,000 to 50,000 copies The presence of the species is signaled by authorized fishermen in Ghindaresti and Harsova and at km: 300, 317, 329, 336, 338, 363, 365, 373. Except for the Danube sector between the Ghindaresti and Harsova localities where it was reported as abundant, in the rest of the mentioned points, the species is rarely encountered. In general, the population trend of the species is declining.

No.	Taxonomic group	Code habitat / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
				Area of habitat of the species in the protected natural area: 8,042 ha.
29.		6144	<i>Romanogobio albipinnatus (Gobio albipinnatus)</i>	100.000 – 200.000 ex. The species was captured at km 367 and on the Cernavoda hot water channel (sandy and / or stony bottom areas and poor water flow). It has been appreciated that in favorable areas the densities can exceed 1 copy / 20 m2. In other areas, atypical of the species's ethology, it is completely lacking. It is estimated that from the total area of 8,042 ha, only 1-3% is the specific habitat. The biological stock captured was exclusively brood of that year. Area of the habitat of the species in the protected natural area: 80 - 241 ha.
30.		2511	<i>Romanogobio kessleri (Gobio kessleri)</i>	5.000 – 10.000 ex. At km 329, 336 and 367. The species was not captured in any of the points where chickens of that year were found to be of <i>R. albipinnatus</i>, <i>Barbus barbus</i>, <i>Chondrostoma nasus</i>, it was considered that the species population was reduced. Area of the habitat of the species in the protected natural area: 80 - 241 ha.
31.		5339	<i>Rhodeus amarus (Rhodeus sericeus amarus)</i>	50,000 - 100,000 copies. The species was captured at Seimeni in the flooded Veriga area, also at km 272 and km 294. It was reported by authorized fishermen at Ghindaresti and Harsova (as very abundant), and at km 336, 338, 363 only as the presence. Area of the habitat of the species in the protected natural area: 804 ha.
32.		1146	<i>Sabanejewia aurata</i>	50.000 – 100.000 exemplare. For the following km: 300, 319, 336, 365. Surface of the habitat of the species in the protected natural area: 80 - 241 ha.
33.		1160	<i>Zingel streber</i>	5.000 - 10.000 ex. At km 303, Fetesti had and according to the statements of authorized fishermen, the presence of the species is also reported at km 229, 300, 319, 336, 338, 363. Their abundance is generally reduced, the fish were accidentally caught in the gillnets. Catching fish is particularly difficult from specific behavior, preferring deep-sea areas, strong water streams and rocky substrates.

No.	Taxonomic group	Code habitat / species N2k	Name of habitat / species N2k	Presence and number / areas covered by N2k species and habitats
				Surface of the habitat of the species in the protected natural area: 5,310 ha
34.		1159	<i>Zingel zingel</i>	5.000 – 10.000 ex. At 342, at the Dunarea Veche dig and according to the statements of authorized fishermen, the presence of the species is reported at km 329, 336 and 363. Their abundance is generally reduced, the fish being accidentally caught in the cold season (on the order of several specimens). Catching fish is particularly difficult due to species ethology, which prefers deep-sea areas, strong water and rocky substrates. Surface of the habitat of the species in the protected natural area: 5.310 ha.
35.	Herpetofauna	1188	<i>Bombina bombina</i>	Permanent population (sedentary / resident): 10,000 - 50,000 individuals. Surface of the habitat of the species in the protected natural area: The total surface area for overlapping is 25,943 ha, of which about 10 - 15% is the habitat surface of the species
36.		1993	<i>Triturus dobrogicus</i>	Permanent population (sedentary / resident): 1,000 - 5,000 individuals. Surface of the habitat of the species in the protected natural area: The total area taking into account overlaps is 25,943 ha, of which about 10 - 15% is the area of the habitat of the species.
37.		1220	<i>Emys orbicularis</i>	Permanent (sedentary / resident) population: 100-500 adults. Surface of the habitat of the species in the protected natural area: The total area taking into account overlaps is 25,943 ha, of which about 35 - 40% is the area of the species species habitats.
38.		1219	<i>Testudo graeca</i>	Permanent population (sedentary / resident): 500 - 800 individuals. Surface of the habitat of the species in the protected natural area: 7,000 ha
39.	Mamifere	1355	<i>Lutra lutra</i>	40 to 50 copies. Area of habitat of the species in the protected natural area: 15,000 - 16,000 ha
40.		2609	<i>Mesocricetus newtoni</i>	█
41.		1335	<i>Spermophilus citellus</i>	█

Verde – apar in FS, dar nu apar in PM

Table 49 The presence and number / areas of species of community interest in ROSPA0039 Dunare-Ostroave (in the vicinity of the project), according to the Management Plan for Protected Natural Areas: ROSCI0022 Canaralele Dunarii, ROSCI0053 Dealul Allah Bair, ROSPA0002 Allah Bair Capidava, ROSPA0017 Canaralele de la Harsova, ROSPA0039 Dunare-Ostroave, Reciful neojurasic de la Topalu (2352), Reciful fosilifer Seimenii Mari (2355), Dealul Allah Bair (2367), Ostrovul Soimul (IV.19.), Celea Mare-Valea lui Ene (IV.24), Padurea Cetate (IV.25.), Padurea Bratca (IV.26), Canaralele din Portul Harsova (2.369), Locul fosilifer Cernavoda (2.534), Punctul fosilifer Movila Banului

No.	Code N2k	Name of the species	Presence and number / areas covered by N2k species and habitats
1.	A402	<i>Accipiter brevipes</i>	Nesting Species in site: 2 pairs. Nesting: 0.3-0.4% site area - national area ratio, 8.993 ha
2.	A293	<i>Acrocephalus melanopogon</i>	Present on the site during the nesting period, being a rare occurrence (4-5 pairs). Nesting: 0.5 - 1% site area - national area ratio, 1,338 ha
3.	A229	<i>Alcedo atthis</i>	50 pairs, 0 - 2% site area - national area ratio, 5.173 ha
4.	A634	<i>Ardea purpurea</i>	90 - 120 pairs, 6 - 8% site area - national area ratio, 2,122 ha
5.	A024	<i>Ardeola ralloides</i>	90 pairs 0.8 - 1.6% site area - national area ratio, 2,122 ha
6.	A396	<i>Branta ruficollis</i>	120 de individuals 03-0,7% site area - national area ratio, 5.935 ha
7.	A224	<i>Caprimulgus europaeus</i>	20 pairs. 0.15 - 0.3% site area - national area ratio, 703ha
8.	A196	<i>Chlidonias hybridus</i>	Nesting: 60 pairs, in Passage: 400 - 600 individuals, Nesting: 0.3 - 0.5% site area - national area ratio; Passage: 2 - 3% site area - national area ratio, 1.347 ha
9.	A197	<i>Chlidonias niger</i>	400 individuals. 45 - 50% site area - national area ratio, 1.347 ha
10.	A031	<i>Ciconia ciconia</i>	Nesting: 50 - 85 pairs, in Passage: 1.200 - 2.400 individuals, Nesting: 0.83 - 1.41% site area - national area ratio; Passage: 0.4 - 0.8% site area - national area ratio, 2.324 ha
11.	A030	<i>Ciconia nigra</i>	4 pairs, 0.25 - 0.5% site area - national area ratio, 10.656 ha
12.	A081	<i>Circus aeruginosus</i>	14 - 20 pairs 0.35 - 0.5% site area - national area ratio, 1.811 ha
13.	A231	<i>Coracias garrulus</i>	70 - 80 pairs (Non-resident nesting population, which uses the natural protected area for reproduction). 1 - 1.2% site area - national area ratio, 9.006 ha
14.	A236	<i>Dryocopus martius</i>	10 pairs, 0.01 - 0.015% site area - national area ratio, 8.993 ha
15.	A026	<i>Egretta garzetta</i>	320 pairs, 4 - 8% site area - national area ratio, 1.718 ha
16.	A379	<i>Emberiza hortulana</i>	60 pairs, .01 - 0.026% site area - national area ratio (Class "D" in the Natura 2000 standard form). 116 ha
17.	A511	<i>Falco cherrug</i>	1 - 3 individuals, 0.8 - 2% site area - national area ratio, 10.872 ha
18.	A097	<i>Falco vespertinus</i>	18 - 21 pairs, 1.2 - 1.4% site area - national area ratio (Class "C" of the Natura 2000 standard form), 1.512 ha
19.	A075	<i>Haliaeetus albicilla</i>	Nesting: 3 - 4 pairs, In passage: 17 individuals, Nesting: 4 - 5.33% site area - national area ratio; In the passage: 7.72 - 8% site area - national area ratio, 14.856 ha
20.	A131	<i>Himantopus himantopus</i>	24 individuals, 0.4 - 0.5% site area - national area ratio, 1.718 ha
21.	A617	<i>Ixobrychus minutus</i>	40 pairs, 0.26 - 0.3% site area - national area ratio, 1.718 ha
22.	A338	<i>Lanius collurio</i>	40 pairs, 0.001% site area - national area ratio (Class "D" of the Natura 2000 standard form), 1.448 ha
23.	A339	<i>Lanius minor</i>	54 pairs (Non-resident Nestledoare population, which uses the natural protected area for reproduction). 0,04 % raport arie – supr. nationala, 1.448 ha
24.	A177	<i>Larus minutus</i>	400 individuals, 0 - 2% site area - national area ratio, 2.177 ha
25.	A023	<i>Nycticorax nycticorax</i>	470 – 520 individuals, 5.85 - 6.5% site area - national area ratio, 1.430 ha
26.	A094	<i>Pandion haliaetus</i>	20 individuals (The population in the passage that uses the protected natural area for rest and / or feeding), 5 - 10% site area - national area ratio, 11.141 ha
27.	A020	<i>Pelecanus crispus</i>	20 - 50 individuals (The population in the passage that uses the protected natural area for rest and / or feeding), 2.5 - 6.25% site area - national area ratio, 6.021 ha
28.	A019	<i>Pelecanus onocrotalus</i>	50 - 150 individuals (The population in the passage that uses the protected natural area for rest and / or feeding), 1.1 - 2% site area - national area ratio, 6.021 ha
29.	A393	<i>Phalacrocorax pygmeus</i>	Nesting: 90 - 120 pairs; Wintering: 240 individuals; In passage: 300 individuals, Nesting: 0.85 - 1.14% site area - national area ratio; Wintering: 2 - 5% site area - national area ratio; in passage: 2 - 6% site area - national area ratio, 5.733 ha
30.	A234	<i>Picus canus</i>	30 pairs,

No.	Code N2k	Name of the species	Presence and number / areas covered by N2k species and habitats
			0.03 - 0.05% site area - national area ratio, 9.253 ha
31.	A034	<i>Platalea leucorodia</i>	144 - 160 pairs use the natural protected area during reproduction, 12 - 13% site area - national area ratio, 1.430 ha
32.	A032	<i>Plegadis falcinellus</i>	Nesting: 120 - 130 pairs; In passage: 230 - 400 de individuals, Nesting: 4 - 4.3% site area - national area ratio; in passage: 8 - 15% site area - national area ratio, 1.430 ha
33.	A120	<i>Porzana parva</i>	12 pairs, 0.19 - 2% site area - national area ratio, 848 ha
34.	A13	<i>Recurvirostra avosetta</i>	8 individuals (The population in the passage that uses the protected natural area for rest and / or feeding), 0.13 - 0.2% site area - national area ratio (Class "D" in the Natura 2000 standard form), 693 ha
35.	A195	<i>Sterna albifrons</i>	Nesting: 25 - 30 pairs, In passage: 400 individuals Nesting: 4,16 - 5 % raport arie – supr. nationala, In passage: 12 - 13,3 % raport arie – supr. nationala, 2.177 ha
36.	A193	<i>Sterna hirundo</i>	3 - 4 pairs, 15 - 20% site area - national area ratio, 11.031 ha
37.	A193	<i>Sterna hirundo</i>	1.000 – 2.000 individuals, 2.5 - 5% site area - national area ratio, 2.177 ha
38.	A307	<i>Sylvia nisoria</i>	< 5 pairs, 0,001% area ratio - supr. (Class "D" of the Natura 2000 standard form) 747 ha
39.	A166	<i>Tringa glareola</i>	80 individuals (The population in the passage that uses the protected natural area for rest and / or feeding), 0.32% site area - national area ratio, 5.977 ha

Table 50 Presence and Effects of Species of Community Interest in ROSPA0051 lezerul Calarasi (in the vicinity of the Project), according to the Natura 2000 Standard Form
(<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0051>)

No.	Code	Name of species	Population in the site						Site evaluation			
			Type	Size		Unit	Cat.	Quality of data	A B C D	A B C		
				Min	Max				Pop.	Con.	Iso.	Glo.
1.	A042	<i>Anser erythropus</i>	W	2	5	i			B	B	C	B
2.	A029	<i>Ardea purpurea</i>	R	15	18	p	C		C	B	C	B
3.	A024	<i>Ardeola ralloides</i>	C	20	200	i	C		D			
4.	A060	<i>Aythya nyroca</i>	R	20	40	p	R		C	B	C	C
5.	A021	<i>Botaurus stellaris</i>	R	2	4	p	C		C	B	C	C
6.	A396	<i>Branta ruficollis</i>	C	500	7000	i	C		B	B	C	B
7.	A396	<i>Branta ruficollis</i>	W	1500		i	C		B	B	C	B
8.	A138	<i>Charadrius alexandrinus</i>	C	26	40	i	C		D			
9.	A196	<i>Chlidonias hybridus</i>	R	40	70	p	C		C	B	C	B
10.	A196	<i>Chlidonias hybridus</i>	C	2000		i	C		C	B	C	B
11.	A197	<i>Chlidonias niger</i>	C	200	400	i	C		C	A	C	B
12.	A197	<i>Chlidonias niger</i>	R	5	15	p	C		C	A	C	B
13.	A031	<i>Ciconia ciconia</i>	C	1500	2000	i	C		C	B	C	C
14.	A031	<i>Ciconia ciconia</i>	R	30	40	i	C		C	B	C	C
15.	A081	<i>Circus aeruginosus</i>	R	2	4	i	C		D			
16.	A038	<i>Cygnus cygnus</i>	C	120	143	i	C		C	B	C	B
17.	A027	<i>Egretta alba</i>	C	40	210	i	C		C	B	C	B
18.	A027	<i>Egretta alba</i>	R	8	20	i	C		C	B	C	B
19.	A026	<i>Egretta garzetta</i>	R	70	150	i	C		C	B	C	B
20.	A026	<i>Egretta garzetta</i>	C	60	200	i	C		C	B	C	B
21.	A131	<i>Himantopus himantopus</i>	C	400	600	i	P		B	B	C	C
22.	A131	<i>Himantopus himantopus</i>	R	12	32	p	P		B	B	C	C
23.	A022	<i>Ixobrychus minutus</i>	R	12	20	p	C		C	B	C	C
24.	A177	<i>Larus minutus</i>	C	250	300	i	P		C	B	C	B
25.	A068	<i>Mergus albellus</i>	C	45	54	i	C		D			
26.	A073	<i>Milvus migrans</i>	C	2	4	i	C		D			
27.	A023	<i>Nycticorax nycticorax</i>	R	30	60	i	C		C	B	C	B
28.	A020	<i>Pelecanus crispus</i>	W	20	144	i	R		B	C	A	C
29.	A020	<i>Pelecanus crispus</i>	C	30	100	i	R		B	C	A	C
30.	A019	<i>Pelecanus onocrotalus</i>	C	300	600	i	R		C	B	B	B
31.	A393	<i>Phalacrocorax pygmeus</i>	C	500	800	i	C		C	B	C	B
32.	A393	<i>Phalacrocorax pygmeus</i>	W	300	400	i	C		C	B	C	B
33.	A151	<i>Philomachus pugnax</i>	C	1000	1500	i	C		C	B	C	B
34.	A034	<i>Platalea leucorodia</i>	C	190	310	i	C		C	B	C	B
35.	A032	<i>Plegadis falcinellus</i>	C	250	270	i	P		C	B	C	B
36.	A119	<i>Porzana porzana</i>	R	7	8	p	C		D			
37.	A132	<i>Recurvirostra avosetta</i>	C	20	40	i	C		D			
38.	A195	<i>Sterna albifrons</i>	C	12	50	i	R		C	B	C	C
39.	A193	<i>Sterna hirundo</i>	C	700	800	i	C		C	B	C	B
40.	A166	<i>Tringa glareola</i>	C	40	80	i	R		D			

• Type: P = permanent, R = reproduction, C = concentration, W = winter (for plant and non-migratory species used permanently);
• Unit: i = individuals, p = pairs or other units according to the standard list of population units and Codees in accordance with Article 12 and 17 reporting (see reference portal);
• Abundance categories (Cat.): C = frequent, R = rare, V = very rare, P = present - to fill if data is deficient or in addition to population size information;
• Quality of data: G = "good" (eg based on studies); M = "Moderate" (for example, based on partial data with extrapolation); P = "Poor" (eg gross estimate); VP = "Very Poor" (use only this category if you can not estimate the size of the population, in this case the population size fields may be empty, but the "Abundance Categories" field must be filled in);
• Site evaluation:
a) Pop. - Population: the size and density of the populations present on the site in relation to the populations present on the national territory. A: 100% & gt; = p & gt; 15%; B: 15% & gt; = p & gt; 2%; C: 2% & gt; = p & gt; 0%; D: insignificant population;
b) Con. - Conservation: the degree of conservation of the habitat characteristics that are important for the species in question and the possibilities of restoration. A: excellent conservation, B: good conservation, C: medium or reduced preservation;
c) Iso. - Isolated: degree of isolation of the population present on the site in relation to the natural range of the species. A (near) isolated population; B: non-isolated population, but on the edge of the distribution area; C: non-isolated population in the extended distribution range;
d) Glo. - Global: global assessment of the site's value for conservation of the species concerned. A: excellent value; B: good value; C: significant value.

Table 51 The synthesis of the species and habitats of community interest (listed in Annex I and Annex II of the Habitats Directive and Annex I of the Birds Directive) present in the Natura 2000 sites in the project area, according to the information available in the Natura 2000 Standard Forms and in the Management Plans

No.	Natura 2000 component	Code habitat / species	Habitat / species name	ROSCI0299	ROSPA0046	ROSPA0074	ROSCI0039	ROSPA0013	ROSPA0010	ROSCI0045	ROSPA0023	ROSPA0135	ROSCI0044	ROSPA0024	ROSPA0102	ROSPA0108	ROSCI0088	ROSPA0090	ROSPA0038	ROSCI0131	ROSPA0136	ROSPA0021	ROSPA0039	ROSPA0051	ROSCI0022
1.	Habitats	91E0*	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)							X			X												
2.		6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>				X			X			X												X
3.		9130	<i>Asperulo-Fagetum</i> beech forests							X															
4.		91Y0	Dacian oak & hornbeam forests							X															
5.		2160	Dunes with <i>Hippophaë rhamnoides</i>				X																		
6.		91AA*	Ponto-Sarmatic eastern white oak woods																						X
7.		91I0*	Euro-Siberian steppic woods with <i>Quercus spp</i>				X			X															X
8.		9170	Galio-Carpinetum oak-hornbeam forests							X															
9.		3140	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara spp</i>				X			X			X												X
10.		2190	Humid dune slacks				X			X															
11.		6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels							X															X
12.		6510	Lowland hay meadows				X			X										X					X
13.		3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation				X			X										X					X
14.		3130	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoeto-Nanojuncetea</i>				X			X										X					X
15.		91M0	Pannonian-Balkan turkey oak –sessile oak forests							X															X
16.		1530*	Pannonic salt steppes and salt marshes				X			X															
17.		40C0*	Ponto-Sarmatic deciduous thickets*																						X
18.		62C0*	Ponto-Sarmatic steppes																						X
19.		91F0	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmenion minoris</i>)				X			X			X				X								X
20.		3270	Rivers with muddy banks with <i>Chenopodion rubri pp</i> and <i>Bidention pp</i> vegetation				X			X										X					X
21.		92A0	Riverside coppice with <i>Salix alba</i> and <i>Populus alba</i> galleries	X			X			X			X				X								X
22.		92D0	Southern riparian galleries and thickets (<i>Nerio-Tamaricetea</i> and <i>Securinegion tinctoriae</i>)																						X
23.		3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation							X															
24.		6120*	Xeric sand calcareous grasslands				X			X															
25.		2130*	Fixed coastal dunes with herbaceous vegetation ('grey dunes')							X															
26.		6240*	Sub-Pannonic steppic grasslands							X															
27.		6260*	Pannonic sand steppes							X															
28.	Plants	1516	<i>Aldrovanda vesiculosa</i>				X																		
29.		2236	<i>Campanula romanica</i>																					X	
30.		2285	<i>Colchicum arenarium</i>				X																		
31.		1898	<i>Eleocharis carniolica</i>							X															
32.		1428	<i>Marsilea quadrifolia</i>				X			X															
33.		2079	<i>Moehringia jankae</i>																						X

No.	Natura 2000 component	Code habitat / species	Habitat / species name	ROSCI0299	ROSPA0046	ROSPA0074	ROSCI0039	ROSPA0013	ROSPA0010	ROSCI0045	ROSPA0023	ROSPA0135	ROSCI0044	ROSPA0024	ROSPA0102	ROSPA0108	ROSCI0088	ROSPA0090	ROSPA0038	ROSCI0131	ROSPA0136	ROSPA0021	ROSPA0039	ROSPA0051	ROSCI0022
34.	Invertebrates	4056	<i>Anisus vorticulus</i>				X																		X
35.		4064	<i>Theodoxus transversalis</i>										X												X
36.		4013	<i>Carabus hungaricus</i>				X			X															
37.		1088	<i>Cerambyx cerdo</i>				X			X															
38.		1089	<i>Morimus funereus</i>				X			X															
39.		4045	<i>Coenagrion ornatum</i>							X															
40.		1042	<i>Leucorrhinia pectoralis</i>							X															
41.		1083	<i>Lucanus cervus</i>							X															
42.		4054	<i>Pholidoptera transsylvanica</i>							X															
43.		1032	<i>Unio crassus</i>							X							X								
44.		4014	<i>Carabus variolosus</i>							X															
45.		1044	<i>Coenagrion mercuriale</i>							X															
46.		1065	<i>Euphydryas aurinia</i>							X															
47.		4048	<i>Isophya costata</i>							X															
48.		1060	<i>Lycaena dispar</i>							X															
49.	Fish	4125	<i>Alosa immaculata</i>				X			X			X				X			X					X
50.		4127	<i>Alosa tanaica</i>																						X
51.		1130	<i>Aspius aspius</i>				X			X			X				X			X					X
52.		1149	<i>Cobitis taenia</i>				X			X			X				X			X					X
53.		2484	<i>Eudontomyzon mariae</i>																						X
54.		2555	<i>Gymnocephalus baloni</i>				X			X			X				X			X					X
55.		1157	<i>Gymnocephalus schraetser</i>				X			X			X				X			X					X
56.		1145	<i>Misgurnus fossilis</i>				X			X			X				X			X					X
57.		2522	<i>Pelecus cultratus</i>				X			X			X							X					X
58.		5339	<i>Rhodeus amarus</i> (<i>Rhodeus sericeus amarus</i>)	X			X			X			X				X			X					X
59.		6144	<i>Romanogobio albipinnatus</i> (<i>Gobio albipinnatus</i>)	X			X			X			X				X			X					X
60.		2511	<i>Romanogobio kessleri</i> (<i>Gobio kessleri</i>)	X						X			X							X					X
61.		1146	<i>Sabanejewia aurata</i>				X			X							X								X
62.		2011	<i>Umbra krameri</i>																	X					
63.		1160	<i>Zingel streber</i>							X			X				X			X					X
64.		1159	<i>Zingel zingel</i>							X			X				X			X					X
65.		1138	<i>Barbus meridionalis</i>							X															
66.	Herpetofauna	1188	<i>Bombina bombina</i>	X			X			X			X				X			X					X
67.		1993	<i>Triturus dobrogicus</i>	X			X			X			X							X					X
68.		1166	<i>Triturus cristatus</i>							X															
69.		1220	<i>Emys orbicularis</i>	X			X			X							X			X					X
70.		1219	<i>Testudo graeca</i>																						X
71.		1193	<i>Bombina variegata</i>							X															
72.	Mammals	1355	<i>Lutra lutra</i>	X			X			X			X				X			X					X
73.		2609	<i>Mesocricetus newtoni</i>																						X
74.		1310	<i>Miniopterus schreibersii</i>														X								
75.		1321	<i>Myotis emarginatus</i>														X								
76.		1324	<i>Myotis myotis</i>														X								
77.		1303	<i>Rhinolophus hipposideros</i>														X								
78.		1302	<i>Rhinolophus mehelyi</i>														X								
79.		1335	<i>Spermophilus citellus</i>	X			X			X			X				X								X
80.		1352	<i>Canis lupus</i>							X															
81.		1361	<i>Lynx lynx</i>							X															
82.		1354	<i>Ursus arctos</i>							X															
83.	Birds	A402	<i>Accipiter brevipes</i>													X		X					X		
84.		A293	<i>Acrocephalus melanopogon</i>																				X		
85.		A229	<i>Alcedo atthis</i>			X		X	X		X			X	X	X		X	X				X		
86.		A042	<i>Anser erythropus</i>						X															X	
87.		A255	<i>Anthus campestris</i>			X			X		X	X					X								
88.		A089	<i>Aquila pomarina</i>			X				X							X								
89.		A634-B	<i>Ardea purpurea</i>		X	X		X	X		X				X	X		X				X	X	X	
90.		A635	<i>Ardeola ralloides</i>		X	X		X	X			X			X	X		X	X		X	X	X	X	
91.		A222	<i>Asio flammeus</i>			X																			
92.		A060-A	<i>Aythya nyroca</i>		X	X		X	X		X	X		X	X	X		X	X		X	X		X	
93.		A688-B	<i>Botaurus stellaris</i>		X			X	X		X	X			X			X	X			X	X	X	
94.		A396	<i>Branta ruficollis</i>					X	X					X							X	X	X	X	
95.		A133	<i>Burhinus oedicnemus</i>					X	X		X	X		X				X							
96.		A403	<i>Buteo rufinus</i>			X					X							X							
97.		A224	<i>Caprimulgus europaeus</i>					X			X	X						X					X		
98.		A682-B	<i>Charadrius alexandrinus</i>																			X		X	
99.		A734	<i>Chlidonias hybridus</i>		X	X		X	X		X	X		X	X			X	X		X	X	X	X	
100.		A197	<i>Chlidonias niger</i>		X	X		X	X		X			X	X			X				X	X	X	
101.		A667-B	<i>Ciconia ciconia</i>			X		X	X		X	X			X	X		X	X		X	X	X	X	
102.		A030-A	<i>Ciconia nigra</i>			X		X	X		X	X			X	X		X	X				X		

No.	Natura 2000 component	Code habitat / species	Habitat / species name	ROSCI0299	ROSPA0046	ROSPA0074	ROSCI0039	ROSPA0013	ROSPA0010	ROSCI0045	ROSPA0023	ROSPA0135	ROSCI0044	ROSPA0024	ROSPA0102	ROSPA0108	ROSCI0088	ROSPA0090	ROSPA0038	ROSCI0131	ROSPA0136	ROSPA0021	ROSPA0039	ROSPA0051	ROSCI0022
103.		A080	<i>Circaetus gallicus</i>			X			X									X							
104.		A081	<i>Circus aeruginosus</i>		X	X		X	X		X	X			X	X		X					X	X	
105.		A082	<i>Circus cyaneus</i>			X		X	X							X		X							
106.		A083	<i>Circus macrourus</i>															X			X				
107.		A231	<i>Coracias garrulus</i>		X	X		X	X		X	X		X	X	X		X			X		X		
108.		A122	<i>Crex crex</i>								X				X										
109.		A038-A	<i>Cygnus cygnus</i>					X	X					X	X			X				X		X	
110.		A238	<i>Dendrocopos medius</i>								X			X				X	X						
111.		A429	<i>Dendrocopos syriacus</i>			X			X		X														
112.		A236	<i>Dryocopus martius</i>															X	X				X		
113.		A027	<i>Egretta alba</i>		X	X		X	X		X	X			X	X		X				X		X	
114.		A697	<i>Egretta garzetta</i>		X	X			X		X	X			X	X		X	X			X	X	X	
115.		A379	<i>Emberiza hortulana</i>			X						X		X									X		
116.		A511	<i>Falco cherrug</i>		X																		X		
117.		A098	<i>Falco columbarius</i>					X							X										
118.		A097	<i>Falco vespertinus</i>			X						X		X	X	X		X					X		
119.		A321	<i>Ficedula albicollis</i>								X							X							
120.		A320	<i>Ficedula parva</i>															X							
121.		A689	<i>Gavia arctica</i>					X																	
122.		A001-A	<i>Gavia stellata</i>					X																	
123.		A625-B	<i>Glareola pratincola</i>												X										
124.		A639-A	<i>Grus grus</i>												X										
125.		A075	<i>Haliaeetus albicilla</i>		X			X	X		X				X	X		X	X				X		
126.		A092	<i>Hieraaetus pennatus</i>															X							
127.		A131	<i>Himantopus himantopus</i>		X	X			X		X			X	X	X		X	X			X	X	X	
128.		A617-B	<i>Ixobrychus minutus</i>		X	X		X	X		X	X			X	X		X	X			X	X	X	
129.		A338	<i>Lanius collurio</i>			X			X		X	X			X			X	X				X		
130.		A339	<i>Lanius minor</i>			X						X			X			X					X		
131.		A176	<i>Larus melanocephalus</i>															X							
132.		A177	<i>Larus minutus</i>			X					X				X			X			X		X	X	
133.		A246	<i>Lullula arborea</i>					X			X	X						X							
134.		A767-A	<i>Mergellus albellus</i>					X	X										X			X		X	
135.		A073	<i>Milvus migrans</i>					X			X							X	X			X	X	X	
136.		A610-A	<i>Nycticorax nycticorax</i>		X	X		X	X			X		X	X	X		X	X			X	X	X	
137.		A094	<i>Pandion haliaetus</i>					X										X					X		
138.		A020	<i>Pelecanus crispus</i>					X	X		X				X	X		X	X		X	X	X	X	
139.		A019	<i>Pelecanus onocrotalus</i>		X			X	X						X	X		X					X	X	
140.		A072	<i>Pernis apivorus</i>								X														
141.		A393	<i>Phalacrocorax pygmeus</i>		X	X		X	X		X			X	X	X		X	X			X	X	X	
142.		A151	<i>Philomachus pugnax</i>			X			X						X			X	X		X	X		X	
143.		A234	<i>Picus canus</i>											X				X	X				X		
144.		A607-B	<i>Platalea leucorodia</i>		X	X		X	X		X	X		X	X	X		X			X	X	X	X	
145.		A700	<i>Plegadis falcinellus</i>		X	X		X	X		X				X	X		X				X	X	X	
146.		A140	<i>Pluvialis apricaria</i>			X																			
147.		A719	<i>Porzana parva</i>						X																
148.		A119	<i>Porzana porzana</i>																X			X		X	
149.		A132-A	<i>Recurvirostra avosetta</i>			X			X		X				X	X		X				X	X	X	
150.		A631-B	<i>Sterna albifrons</i>								X			X	X	X		X	X		X	X	X	X	
151.		A193	<i>Sterna hirundo</i>		X	X		X	X		X			X	X	X		X	X		X	X	X	X	
152.		A307	<i>Sylvia nisoria</i>			X						X						X	X				X		
153.		A397-A	<i>Tadorna ferruginea</i>												X										
154.		A166	<i>Tringa glareola</i>					X			X			X	X			X	X			X	X	X	

X - identified in PMs through biodiversity mapping and inventory studies, is not listed in the FS of the site;

X - does not appear at all in the PM, was listed in the FS of the site;

X - appears in the PM, was not the date of the last FS version, but during the biodiversity mapping and inventory studies, the habitat / species was not identified/

12.3 Justification of the direct link of the project and its need for the conservation management of the protected natural areas of community interest

The main purpose of the project is to identify the technical solutions to be implemented in order to ensure the optimal conditions of navigation on the Romanian-Bulgarian joint sector of the Danube and safe transportation on the Danube, throughout the year, in accordance with recommendations from the Danube Commission in Budapest. Thus, the project has no direct link and is not necessary for the management of the conservation of protected natural areas of community interest overlapping or adjacent to it.

The project is necessary to maintain / develop the socio-economic activities, including the local communities existing within and in the immediate vicinity of the Natura 2000 network in the project area.

12.4 Potential impact assessment of the project on species and habitats in protected natural areas of Community interest

12.4.1 Identification of potential impacts and forms of impact

The methodology considered for the project analysis proposes a differentiation between the concept of "effect" and "impact" concept. The **effects** are related to the changes caused by the bio-physical environment as a direct consequence of the causes (interventions) generated by the project (both in the Execution Stage and in the Operational Stage). The effects mainly include: changing the morphology of the river, changing the flow regime, creating physical or behavioral barriers, noise, emissions of pollutants, waste. The **impacts** include changes in sensitive receptors and Natura 2000 components (Natura 2000 habitats, population populations, and habitats of Natura 2000 species).

Identifying the effects implied the following steps:

- Analysis of interventions proposed within the project;
- Identification of the activities resulting from executions and the operation of the project components;
- Identification of the changes (effects) taking place in the physical environment as a result of the realization and operation of the project components.

The quantifiable effects and those that lead with certainty to the appearance of a form of impact are of main interest for the evaluation.

The preliminary assessment of the impact forms on the species and habitats of community interest in the Natura 2000 sites in the project area aimed at identifying those forms of impact for which there is a risk of reaching significant thresholds in the absence of measures to avoid and reduce impacts:

- **Habitat Loss (HL):** the loss of some habitats of community interest, of favorable habitats for the various stages of development and of activities of species of community interest (breeding, resting, feeding, etc.) as a result of the construction works on land, as well as on the surface of the river bed;
- **Habitat Alteration (HA):** hydro morphological alterations and / or physical, chemical and biological parameters at habitats level at terrestrial level, but especially changes in river morphology and in close to the river habitats, leading in time to change the initial equilibrium of the course water (e.g. dredging and sand extraction can lead to erosion phenomena, increase in fine suspension concentrations, clogging and deterioration of favorable breeding and growth sites for fish species, etc.);
- **Habitats Fragmentation (HF):** mainly for the Danube fish species, both directly through the implementation of hydrotechnical structures (e.g. groynes), whose main purpose is to change the flow regime at the local level, as well as to modify flow regime across the entire cross section (C. Mitoiu, G. Marin, River Engineering, Regularization of River Whites and Indigestion, 1999), but indirectly by changing the depth and speed of the water;

- Disturbance of Species Activity (DSA): by increasing noise and vibration levels, increasing water turbidity, artificial lighting in sensitive natural areas near the critical points targeted by the project;
- Reduction of Populations Number of fauna species (RPN) due to their increased mortality: taking into account a broader spectrum of species that mainly include animals with reduced mobility (eg aquatic invertebrates).

Also, as a result of the implementation of rigid hydrotechnical structures such as groynes and chevrons, as well as the creation of new islands and / or the extension of existing islands, new habitats may emerge or some areas of ecological interest existing for species of community interest may be extended, which can contribute to an improvement of their habitats (IH). This form of positive impact mainly refers to:

- Groynes: their construction will favor the progressive development of small sedimentation depth areas, besides the accumulation of sedimentary material behind the groynes, which may lead to the formation of temporary and / or permanent islands;
- Chevrons: erosion pits will form in the area behind the chevrons, and downstream of these will form sedimentation zones, which will lead to the formation of sandbars over time. The sedimentation areas behind the chevron can serve as storage areas for the dredged material, which lead to the formation of islands where the flow is slower, being suitable places for wintering or shelter for some species of fish. The vegetation that will develop on the newly built structure can be a source of fish food;
- Creation of new islands and / or extension of existing islands: the new islands and expansion areas of existing islands will in themselves create new habitats or the extension of ecological areas of interest for certain species of community interest.

12.4.1.1 Dredging Works (including fairway realignment and dredged material disposal)

The main effects associated with dredging works are represented by:

- Removal of the benthic organisms

During all dredging operations, removal of the riverbed material also eliminates the organisms that live on and in the sediments (benthic organisms). With the exception of some species of animals that live deeper than the first portion of dislocated substrate or some mobile surface animals that can survive a dredging event by fleeing, dredging may lead to the complete removal of organisms from the site of excavation.

Usually, if the channel has been subjected to a maintenance dredge that continues over many years, it is unlikely that there will be well-developed benthic communities in that area or in the immediate vicinity of the area. As a result, their loss due to regular maintenance dredging is unlikely to have significant effects on the ecological diversity of the area. However, certain species and communities are more sensitive to the dangers generated by dredging than others.

The recovery of habitats disturbed by dredging depends ultimately on the nature of the new sediment in the dredging site, the sources and types of re-colonizing organisms and the extent of disturbance (UKMPA Center, 2001). In soft sediment environments, the recovery of livestock communities generally occurs relatively quickly, and more rapid recovery of communities has been observed in areas exposed to periodic disturbances, such as channels where maintenance dredging is practiced.

Recovery rates are usually quicker in sediment strongly disturbed from estuaries, which are dominated by opportunistic species. Generally, recovery times increase in stable gravel and sand habitats, dominated by long-lasting components with complex biological interactions that control the community's structure.

These findings are supported by studies of the Estuar system in Georgia, USA, which suggests that maintenance dredging has only a short-term effect on the communities of mud and clay sediment organisms. Although there is almost total removal of organisms during dredging, recovery begins within 1 month, and in 2 months communities are reported to be similar to pre-dredging conditions (UKMPA Center, 2001).

Other studies suggest that the impact of dredging is relatively short in areas with high mobility of sediments (Hall, Basford & Robertson 1991). For example, complete recovery of benthic organisms in a canal in the Wadden estuary took place within 1 year of the removal of sediment from this highly sandy environment (UKMPA Center, 2001).

According to a study on a river in Poland, habitat changes resulting from dredging have influenced the qualitative and quantitative structure of present fauna (Dabkowski, 2016). In case of fauna belonging to the order of Coleoptera, there were observed increases in abundance and number of species in this order. In the same study, it was observed that restoration was slower in typical populations for flowing waters (reopholy and reobiontes). After dredging, species with less stringent ecological requirements were observed, and the most demanding and environmentally conservative species did not appear (e.g. *Elmis aenea* and *Limnius volckmari*). It is possible that the disappearance of the *E. aenea* Species in this case is correlated with changes in the quality of the substrate.

➤ Sediment in suspension and turbidity

Both during dredging and material disposal operations it was observed that increasing the amount of sediment in suspension and consequently increasing water turbidity can affect organisms that feed through filtration (UKMPA Center, 2001). Also, young fish can be affected if the suspension sediments are blocked in gills and high mortality of young fish has been observed in highly turbid waters (Wilbur 1971). It is more likely that adult fish will avoid areas with a large amount of suspended sediment, unless the amount of food increases as a result of organic matter growth (UKMPA Center, 2001).

Increases in turbidity lead to a decrease in depth to which light can penetrate into the water column, thereby affecting submerged vegetation.

The degree of sediment resuspension and turbidity due to dredging and material disposal operations depends on four main variables (UKMPA Center, 2001):

- The size, density and quality of the dredged sediment;
- Dredging and storage method;
- Hydrodynamic regime in the dredging and storage area (current direction and speed, mixing rate);
- Existing water quality and its characteristics (suspended sediment level and existing turbidity).

Dredging often does not generate more suspended sediment than commercial river transportation, bottom fishing or the one generated by strong storms (UKMPA Center, 2001).

➤ Changing water chemistry

Dredging can lead to nutrient contamination by sediment dislocation. It can also increase the concentration of organic carbon dissolved by excavating contaminated sediments due to historical or current anthropic activities (organic fertilizers, oil spills and so on.) (Nayar et al, 2007).

Dredging can cause dispersion of pollutants by attaching to dispersed sediment surfaces, adversely affecting water quality. Dredged dispersants may dissolve oxygen dissolved by oxidation, leading to a decrease in its level, which can lead to high mortality of fish species (Manap & Voulvoulis, 2016), but also of other aquatic species, or may cause discouragement of fish migration. However, it is important to point out that the removal of oxygen in the water is only temporary (UKMPA Center, 2001).

➤ Modifications of hydrodynamic regime and geomorphology

Although all dredging activities can cause a certain change in hydrodynamic flow, the magnitude and type of effect will be related to the overall excavation size compared to the overall system / river size. Most of the reported negative effects of dredging on hydrodynamics and geomorphology are associated with investment / investment dredging.

➤ Disposal of the dredged material to the storage site

The dredging material will have an asphyxyation effect on the benthic organisms at the place of storage. Continuous removal of the material resulted from the maintenance dredging at storage sites may prevent the development of stable benthic communities, and partial or complete benthic productivity is an adverse effect that should be accepted at regularly used storage sites (UKMPA Center, 2001).

Except for this initial effect of asphyxyation of the benthic communities at the storage site, the potential for other effects as a result of disposal operations will be directly related to the storage site itself, depending on the characteristics of the dredged material and the hydrodynamic conditions at the site for storage.

When the storage site is overloaded with large amounts of material resulting from maintenance dredging, in a short period of time, clogging of the storage site may occur, and asphyxyation may adversely affect adjacent habitat areas. In contrast, removing dredged material can also have beneficial effects by creating a new habitat, depending on the storage location.

In the short term, as a result of dredging interventions, another effect with potential impact may arise especially on species of community interest in the project area, namely the increase in noise and vibration levels, which can lead to disturbance of species activity by: disturbance of spawning sites, disturbance of brood development (in the case of fish species), disturbance of bird species, etc.

The impact assessment of the dredging works to be carried out in the Appropriate Assessment Study will be based on developing conceptual models that analyze the cause-effect-impact relationship for all types of interventions proposed in the project. In Figure 24 presents a synthetic graphical representation of the model under development for dredging works.

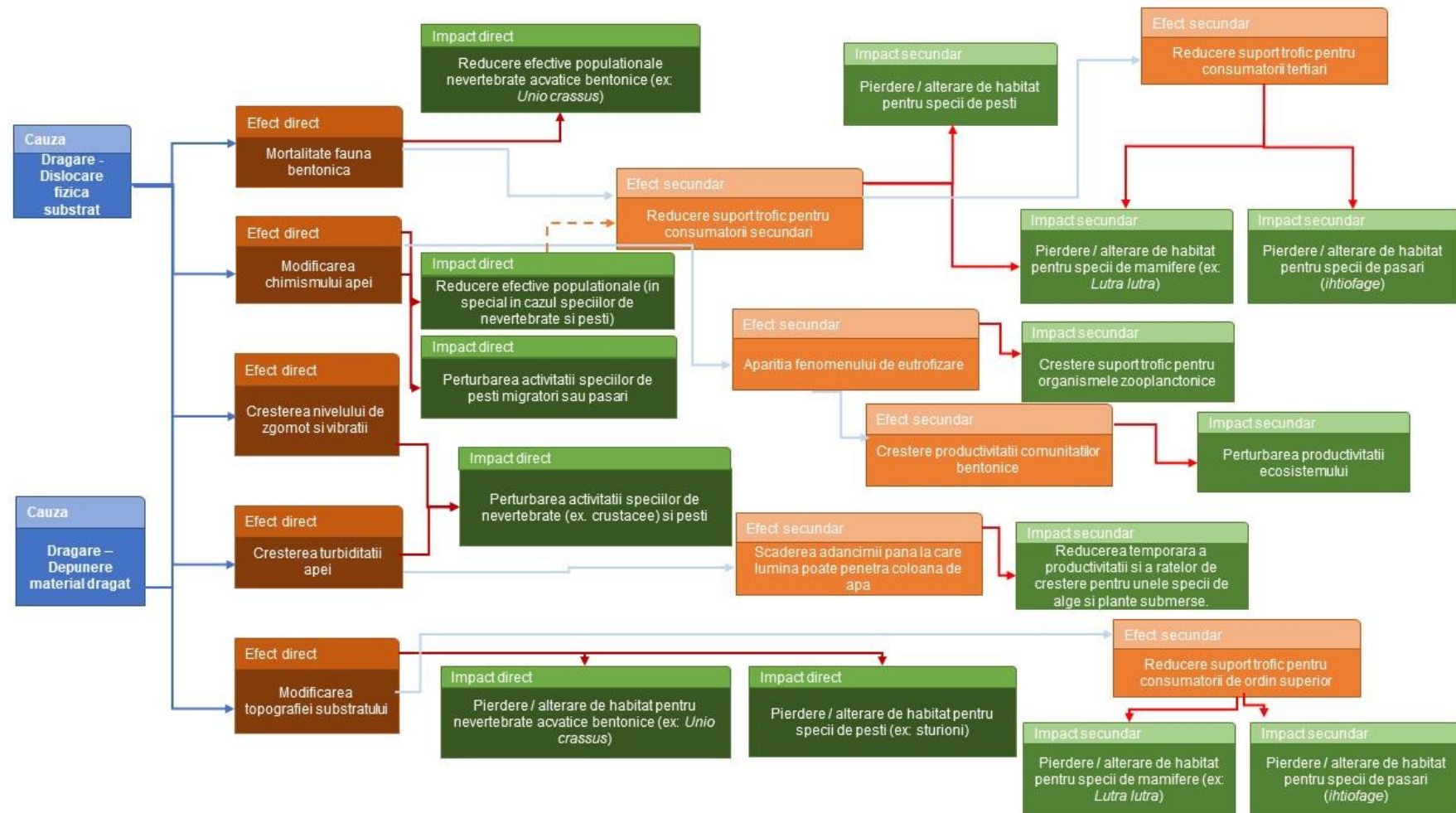


Figure 24 Preliminary conceptual framework for impact analysis of dredging works

12.4.1.2 Groynes

After analyzing the literature, the main effects and impacts caused by the groynes are presented below. These have primarily a direct effect on the hydrodynamics of the river, which influences its sedimentary dynamics. Changing the physical-chemical properties of water, as well as modification of hydro morphology, can lead to different forms of impact on biodiversity.

The main effects associated with the groynes are represented by:

➤ Effects on the watercourse

The installation of the groynes leads to an increase in the speed and flow in the central part of the river, an increase in the velocity from the peak of the groynes to the opposite bank, the increase of the horizontal swirling currents leading to fluctuations of the water level, amplified by the increase of the water level upstream of the groynes and lowering the level downstream (Yossef, 2002). A study on the Mississippi River has seen increases in flood water levels, which may be partly correlated with hydrotechnical arrangements built to improve navigation, such as hippocampus (Huthoff et al., 2012). In the field of groynes, the water velocity is reduced (Buczyńska et al, 2018).

➤ Effects on hydro morphology

The groynes lead to a narrowing of the river leading to the aforementioned effects on the speed of the water. The narrowing leads to increased stress on the river bed, resulting in increased river bed erosion and deepening of the river (Yossef, 2002, Savić et al., 2013). Erosion effects may also occur in the vicinity of the groynes, around the Proximity (Yossef, 2002). Also, the installation of groynes leads to the accumulation of sediment deposits in the groynes-fields (Yossef, 2002).

➤ Effects on fauna

The installation and presence of groynes can have both negative and positive effects. Thus, the negative effects are mainly related to the actual construction of the groynes, which can lead to the loss / alteration of the habitats by modifying the topography of the substrate and the banks. It can also provide habitat conditions for invasive fish species (Collas et al., 2018). In addition, the dynamic conditions in the groynes tip area can alter the age or species structure in the area. Thus, they are tolerated by few reophyll species, but in the groynes fields the current is weaker, being preferred by limnobiontes and limnophiles (Buczyńska et al., 2018). Also, young reophyll fish species are dominant at the peak of the groynes, compared with other river habitats, being responsible for the pressure on insect larvae (Bischoff & Wolter, 2001).

The positive effects due to the groynes are mainly related to the diversification of natural habitats. Groynes have even been used in ecological restoration (Buczyńska et al., 2018) because they can satisfy similar functions to previously existing natural habitats, such as the areas delimited by tree trunks and wood debris.

Another important negative effect of the implementation of groynes hydrotechnical structures is the appearance of physical or behavioral barriers to the migration of migratory species.

12.4.1.3 Chevrons

The purpose of the implementation of the chevron type hydrotechnical structure is to improve the navigability (increase of water depth at low flows, reduce the maintenance dredging), modify the division of the flows (on the side arms), regulate the river, stabilize the navigable channel.

The main effects, considered to have a high or at least moderate biodiversity impact from the implementation of these types of structures, are related to (ICPDR, 2010):

- Hydrodynamics:
 - ✓ Water level: determines the increase of the water depth at low flows to the banks;
 - ✓ Flow rate: Decreases the flow rate in the side arms;
 - ✓ Shear Strength: Determining the shear force in the side arms.
- Sediment transport: decreases the carrying capacity of the lateral arms.
- River Morphology: Decreases morpho dynamics in lateral arms.

Particular attention should also be paid to erosion processes due to increased stresses of shear forces on waterways, such as sedimentation on side arms.

12.4.1.4 Bank protection (massive type)

The main effects generated by the implementation of "bank protection" work include limiting the natural capacity of the river to erode and change in response to floods, which in turn can increase the local flood risk (Addy et al. 2016). Other physical effects include channel narrowing that leads to increased river velocities, which in turn can erode riverbeds.

The construction of these types of works can lead to the immediate loss of bank habitats, a habitat loss of species such as *Riparia riparia*, blue seagull (*Alcedo atthis*), otter (*Lutra lutra*), as well as many young species of fish (Addy et al., 2016).

Among the short-term effects we mention: increased water turbulence, noise and vibration, and the death of certain wildlife species, especially those with reduced mobility.

In the long term, the potential effects may include a reduction in the complexity of the canal and of the flood area necessary to create habitat diversity (interruption / reduction of lateral connectivity), a particularly worrying issue when both banks of the river are protected (Addy et al., 2016).

The preliminary identification of the cause-effect-impact relationship, together with the identification of potentially affected biodiversity components, both in the Stage of Operation and the Operating Stage, is presented in Table 52.

Table 52 Preliminary identification of the cause - effects - impacts associated with the interventions proposed by the project stages execution and operation

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components												Association of the main impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic plants	Plants	Aquatic invertebrates	Terrestrial invertebrates	Fish	Amphibians	Reptiles	Birds	Small mammals (including bats)	Large mammals	
Execution	Organization of construction sites	Temporary occupation of surfaces with natural vegetation		☑		☑		☑		☑	☑	☑	☑	☑	HA
Execution	Organization of construction sites	Atmospheric emissions		☑		☑		☑		☑	☑	☑	☑		HA
Execution	Organization of construction sites	Storage of materials and waste		☑		☑		☑		☑	☑	☑	☑	☑	HA
Execution	Organization of construction sites	Accidental leakage of dangerous products	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	HA
Execution	Organization of construction sites	Noise and vibration								☑	☑	☑	☑	☑	DSA
Execution	Organization of construction sites	Artificial lighting						☑		☑	☑	☑	☑	☑	DSA
Execution	Access roads	Definitive occupation of surfaces with natural vegetation		☑		☑		☑		☑	☑	☑	☑	☑	HL
Execution	Access roads	Atmospheric emissions		☑		☑		☑		☑	☑	☑	☑		HA
Execution	Access roads	Noise and vibration						☑		☑	☑	☑	☑	☑	DSA
Execution	Access roads	Collision with wildlife						☑		☑	☑	☑	☑	☑	RPN
Execution	Access roads	The penetration of allochthonous / invasive species		☑		☑		☑							HA
Execution	Investment dredging / Fairway realignment	Hydro morphological changes to habitats	☑		☑		☑		☑						HA
Execution	Investment dredging / Fairway realignment	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Execution	Investment dredging / Fairway realignment	Changing water chemistry	☑		☑		☑		☑						HA
Execution	Investment dredging / Fairway realignment	Noise and vibration					☑		☑			☑		☑	DSA
Execution	Investment dredging / Fairway realignment	Mortality of wildlife					☑		☑						RPN
Execution	Investment dredging / Fairway realignment	The penetration of allochthonous / invasive species					☑								RPN
Execution	Dredging material storage areas	Definitive occupation of the surfaces from the riverbed	☑		☑		☑		☑						HL
Execution	Dredging material storage areas	Hydro morphological changes to habitats	☑		☑		☑		☑			☑		☑	HA
Execution	Dredging material storage areas	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Execution	Dredging material storage areas	Changing water chemistry	☑		☑		☑		☑						HA
Execution	Dredging material storage areas	Noise and vibration					☑		☑			☑		☑	DSA
Execution	Dredging material storage areas	Mortality of wildlife					☑		☑						RPN
Execution	Groynes - embedded in the river bank	Definitive occupation of surfaces with natural vegetation		☑		☑		☑		☑	☑	☑	☑	☑	HL
Execution	Groynes - embedded in the river bank	Definitive occupation of the surfaces from the riverbed	☑		☑		☑		☑						HL
Execution	Groynes - embedded in the river bank	Changing the flow regime	☑		☑		☑		☑			☑		☑	HA
Execution	Groynes - embedded in the river bank	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Execution	Groynes - embedded in the river bank	Noise and vibration					☑		☑	☑	☑	☑	☑	☑	DSA
Execution	Groynes - embedded in the river bank	Mortality of wildlife					☑		☑						RPN
Execution	Chevrons	Definitive occupation of the surfaces from the riverbed	☑		☑		☑		☑						HL

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components												Association of the main impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic plants	Plants	Aquatic invertebrates	Terrestrial invertebrates	Fish	Amphibians	Reptiles	Birds	Small mammals (including bats)	Large mammals	
Execution	Chevrons	Changing the flow regime	☑		☑		☑		☑			☑		☑	HA
Execution	Chevrons	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Execution	Chevrons	Noise and vibration					☑		☑			☑			DSA
Execution	Chevrons	Mortality of wildlife					☑		☑						RPN
Execution	Bank protection (hard type)	Definitive occupation of surfaces with natural vegetation		☑		☑		☑		☑	☑	☑	☑	☑	HL
Execution	Bank protection (hard type)	Definitive occupation of the surfaces from the riverbed	☑		☑		☑		☑						HL
Execution	Bank protection (hard type)	Hydro morphological changes to habitats	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	HA
Execution	Bank protection (hard type)	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Execution	Bank protection (hard type)	Noise and vibration					☑		☑	☑	☑	☑	☑	☑	DSA
Execution	Bank protection (hard type)	Mortality of wildlife					☑		☑						RPN
Execution	Islands (creating new islands and / or extending existing ones)	Definitive occupation of the riverbed	☑		☑		☑		☑						HL
Execution	Islands (creating new islands and / or extending existing ones)	Changing the flow regime	☑		☑		☑		☑			☑		☑	HA
Execution	Islands (creating new islands and / or extending existing ones)	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Execution	Islands (creating new islands and / or extending existing ones)	Noise and vibration					☑		☑	☑	☑	☑	☑	☑	DSA
Execution	Islands (creating new islands and / or extending existing ones)	Mortality of wildlife					☑		☑						RPN
Operating	Maintenance dredging	Hydro morphological changes to habitats	☑		☑		☑		☑						HA
Operating	Maintenance dredging	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Operating	Maintenance dredging	Changing water chemistry	☑		☑		☑		☑						HA
Operating	Maintenance dredging	Noise and vibration					☑		☑			☑		☑	DSA
Operating	Maintenance dredging	Mortality of wildlife					☑		☑						RPN
Operating	Dredging material storage areas	Increase of turbidity	☑		☑		☑		☑			☑		☑	HA/DSA
Operating	Dredging material storage areas	Changing water chemistry	☑		☑		☑		☑						HA
Operating	Dredging material storage areas	Noise and vibration					☑		☑			☑		☑	DSA
Operating	Dredging material storage areas	Mortality of wildlife					☑		☑						RPN
Operating	Groynes - embedded in the river bank	The emergence of physical or behavioral barriers					☑		☑					☑	HF
Operating	Groynes - embedded in the river bank	Creating new habitats or expanding existing ecological areas of interest										☑			IH
Operating	Chevrons	The emergence of physical or behavioral barriers					☑		☑						HF
Operating	Chevrons	Creating new habitats or expanding existing ecological areas of interest							☑			☑			IH

Stage	Interventions (causes)	Effects	Potentially affected biodiversity components												Association of the main impact generated
			Aquatic habitats	Terrestrial habitat	Aquatic plants	Plants	Aquatic invertebrates	Terrestrial invertebrates	Fish	Amphibians	Reptiles	Birds	Small mammals (including bats)	Large mammals	
Operating	Bank protection (hard type)	The emergence of physical or behavioral barriers			☑		☑		☑	☑				☑	HF
Operating	Islands (creating new islands and / or extending existing ones)	Creating new habitats or expanding existing ecological areas of interest		☑	☑	☑		☑		☑	☑	☑	☑	☑	IH
Operating	Intensification of the naval traffic	Atmospheric emissions		☑		☑		☑		☑	☑	☑	☑		HA
Operating	Intensification of the naval traffic	Accidental leakage of dangerous products	☑		☑		☑		☑			☑		☑	HA
Operating	Intensification of the naval traffic	The penetration of allochthonous / invasive species	☑		☑		☑		☑						HA/RPN
Operating	Intensification of the naval traffic	Noise and vibration					☑		☑			☑	☑	☑	DSA
Operating	Intensification of the naval traffic	Artificial lighting					☑	☑				☑	☑	☑	DSA
Operating	Intensification of the naval traffic	Collision with wildlife							☑					☑	RPN

Form of impact:
HL - Habitat Loss;
HA - Habitat Alteration;
HF - Habitat Fragmentation,
DSA - Disruption of Species Activity,
RPN - Reduction of Populations Number;
IH - Improving Habitats.

12.4.2 Predicting impacts

Impact prediction is a qualitative and quantitative assessment of impact forms. The parameters taken into account for impact assessment are:

- ✓ Project stage: execution, operation;
- ✓ Nature of impact: positive, negative;
- ✓ Type of impact: direct, secondary, indirect;
- ✓ cumulative potential: yes / no;
- ✓ Spatial expansion: local, local (outside N2k), local (inside N2k), zonal, regional, ecological corridor;
- ✓ Duration: short, medium, long;
- ✓ Frequency: accidental, once / temporarily, intermittently, periodically, without interruption;
- ✓ Probability: uncertain, unlikely, probable, very likely;
- ✓ Reversibility: reversible, irreversible;
- ✓ Cross-border nature: yes / no.

Table 53 Presentation Memorandum on the project "Improvement of Navigation Conditions on the Romanian-Bulgarian Danube Joint Sector" for the issuance of the Environmental Agreement

Evaluation parameter	Valuation parameters variables	Description of the characteristics of the variables of the evaluation parameters
Nature impact	Positive	Changes contribute to improving the status / achievement of a favorable conservation status of the habitat / species.
	Negative	Changes contribute to worsening the condition / not favoring favorable conservation status of the habitat / species.
Impact type	Direct	The primary impact form produced by the occurrence of an effect.
	Secondary	The impact form generated by a direct impact.
	Indirect	The form of impact that occurs not due to a project-generated effect, but to activities that are encouraged to occur as a consequence of the project.
Potential cumulative	Yes	The impact has the potential to generate, along with other effects / impacts from the same project or from different projects, greater changes in the N2k site.
	Not	There is no risk that this impact will produce, along with other impacts, greater changes in the N2k site.
Spatial expansion	Local	Small areas inside or outside N2k sites.
	Local (outside N2k)	Small areas outside N2k sites.
	Local (inside N2k)	Small surfaces inside a N2k site.
	zonal	Whole N2k site (or much of it).
	Regional	Two or more N2k sites.
	The ecological corridor	All the Danube course.
Duration	Short term	Impact occurs only during the intervention (in the Construction Stage).
	Medium term	The impact is manifested during the construction works and for a short post-construction period (3 to 5 years).
	Long term	The impact is manifested throughout construction and operation (> 5 years).
	Accidentally	The impact is only due to an accident (accidental pollution).

Evaluation parameter	Valuation parameters variables	Description of the characteristics of the variables of the evaluation parameters
Frequency	Once / Temporarily	The impact is manifested only once in one of the stages of the project. Most often associated with a short duration
	Intermittent	The impact is repeated / discontinuous, with an unknown frequency.
	Periodic	The impact is manifested repeatedly, with a known frequency.
	Without interruptions	The impact is manifested continuously after the occurrence of the occurrence (Caution! It must be correlated with the parameter "Duration": "without interruption" on "medium term" means that the impact is continuous during the construction period).
Probability	Uncertain	The probability of producing the impact is unknown, and most certainly it will not occur.
	Unlikely	The probability of impact is low - it is likely to occur.
	Probable	The likelihood of impact is high - it is very likely to occur.
	Very likely	Impact generation is safe.
Reversibility	Reversible	After the impact has disappeared, the N2k species / habitat can return to the original conditions.
	Irreversible	The impact does not allow returning to the initial conditions of the affected N2k species / habitat.
Transboundary nature	Yes	The impact has the potential to generate changes in the cross-border context.
	Not	Impactul nu are potentialul de a genera modificari in context transfrontiera.

Estimation of the potential impact associated with the project, both in the Implementation Stage and in the Operational Stage, is shown in Table 54 for each form of impact generated by the main effects of the interventions proposed by the project.

Table 54 Estimation of the potential impact associated with the project in the execution and operating phases

Stage	Interventions (causes)	Effects	Combination of the main form of impact generated	Estimated potential impact								
				Nature impact	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Execution	Organization of construction sites	Temporary occupation of surfaces with natural vegetation	HA	Negative	Direct	No	Local	Short term	Fara intrerupere	Probabil	Reversible	No
Execution	Organization of construction sites	Atmospheric emissions	HA	Negative	Direct	Yes	Local	Short term	Intermitent	Foarte probabil	Reversible	No
Execution	Organization of construction sites	Storage of materials and waste	HA	Negative	Direct	No	Local	Short term	Intermitent	Probabil	Reversible	No
Execution	Organization of construction sites	Accidental leakage of dangerous products	HA	Negative	Direct	Yes	Local	Short term	Accidental	Improbabil	Reversible	No
Execution	Organization of construction sites	Noise and vibration	DSA	Negative	Direct	Yes	Local	Short term	Intermitent	Foarte probabil	Reversible	No
Execution	Organization of construction sites	Artificial lighting	DSA	Negative	Direct	No	Local	Short term	Periodic	Probabil	Reversible	No
Execution	Access roads	Definitive occupation of surfaces with natural vegetation	HL	Negative	Direct	Yes	Local	Long term	Fara intrerupere	Probabil	Reversible	No
Execution	Access roads	Atmospheric emissions	HA	Negative	Direct	Yes	Local	Long term	Intermitent	Foarte probabil	Reversible	No
Execution	Access roads	Noise and vibration	DSA	Negative	Direct	Yes	Local	Long term	Intermitent	Foarte probabil	Reversible	No
Execution	Access roads	Collision with wildlife	RPN	Negative	Direct	Yes	Local	Long term	Accidental	Probabil	Reversible	No
Execution	Access roads	The penetration of allochthonous / invasive species	HA	Negative	Secondary	Yes	Regional	Long term	Accidental	Probabil	Reversible	No
Execution	Investment dredging / Fairway realignment	Hydro morphological changes to habitats	HA	Negative	Direct	Yes	Regional	Short term	O singura data	Foarte probabil	Reversible	No
Execution	Investment dredging / Fairway realignment	Increase of turbidity	HA/DSA	Negative	Direct	No	Local (in interiorul N2k)	Short term	O singura data	Foarte probabil	Reversible	No
Execution	Investment dredging / Fairway realignment	Changing water chemistry	HA	Negative	Direct	No	Local (in interiorul N2k)	Short term	O singura data	Probabil	Reversible	No
Execution	Investment dredging / Fairway realignment	Noise and vibration	DSA	Negative	Direct	Yes	Local (in interiorul N2k)	Short term	O singura data	Foarte probabil	Reversible	No
Execution	Investment dredging / Fairway realignment	Mortality of wildlife	RPN	Negative	Direct	Yes	Zonal	Short term	O singura data	Probabil	Ireversible	No
Execution	Investment dredging / Fairway realignment	The penetration of allochthonous / invasive species	RPN	Negative	Secondary	Yes	The ecological corridor	Long	Accidentally	Probable	Irreversible	Yes
Execution	Dredging material storage areas	Obtaining definitive surfaces from the riverbed	HL	Negative	Direct	Yes	Regional	environment	Without interruptions	Very likely	Reversible	No
Execution	Dredging material storage areas	Hydro morphological changes to habitats	HA	Negative	Direct	Yes	Regional	environment	Without interruptions	Probable	Reversible	No
Execution	Dredging material storage areas	Increase of turbidity	HA/DSA	Negative	Direct	Not	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Dredging material storage areas	Changing water chemistry	HA	Negative	Direct	Not	Local (inside N2k)	Short	Once	Probable	Reversible	No
Execution	Dredging material storage areas	Noise and vibration	DSA	Negative	Direct	Yes	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Dredging material storage areas	Mortality of wildlife	RPN	Negative	Direct	Yes	zonal	Short	Once	Unlikely	Irreversible	No

Stage	Interventions (causes)	Effects	Combination of the main form of impact generated	Estimated potential impact								
				Nature impact	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Execution	Groynes - embedded in the river bank	Definitive occupation of surfaces with natural vegetation	HL	Negative	Direct	Yes	Local	Long	Without interruptions	Very likely	Irreversible	No
Execution	Groynes - embedded in the river bank	Obtaining definitive surfaces from the riverbed	HL	Negative	Direct	Yes	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Groynes - embedded in the river bank	Changing the flow regime	HA	Negative	Direct	Yes	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Groynes - embedded in the river bank	Increase of turbidity	HA/DSA	Negative	Direct	Not	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Groynes - embedded in the river bank	Noise and vibration	DSA	Negative	Direct	Yes	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Groynes - embedded in the river bank	Mortality of wildlife	RPN	Negative	Direct	Yes	zonal	Short	Once	Unlikely	Irreversible	No
Execution	Chevrons	Obtaining definitive surfaces from the riverbed	HL	Negative	Direct	Yes	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Chevrons	Changing the flow regime	HA	Negative	Direct	Yes	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Chevrons	Increase of turbidity	HA/DSA	Negative	Direct	Not	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Chevrons	Noise and vibration	DSA	Negative	Direct	Yes	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Chevrons	Mortality of wildlife	RPN	Negative	Direct	Direct	zonal	Short	Once	Unlikely	Irreversible	No
Execution	Bank protection (hard type)	Definitive occupation of surfaces with natural vegetation	HL	Negative	Direct	Direct	Local	Long	Without interruptions	Very likely	Irreversible	No
Execution	Bank protection (hard type)	Obtaining definitive surfaces from the riverbed	HL	Negative	Direct	Direct	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Bank protection (hard type)	Hydro morphological changes to habitats	HA	Negative	Direct	Direct	zonal	Long	Without interruptions	Very likely	Irreversible	No
Execution	Bank protection (hard type)	Increase of turbidity	HA/DSA	Negative	Direct	Direct	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Bank protection (hard type)	Noise and vibration	DSA	Negative	Direct	Direct	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Bank protection (hard type)	Mortality of wildlife	RPN	Negative	Direct	Direct	zonal	Short	Once	Unlikely	Irreversible	No
Execution	Islands (creating new islands and / or extending existing ones)	Definitive occupation of the river bed	HL	Negative	Direct	Direct	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Islands (creating new islands and / or extending existing ones)	Changing the flow regime	HA	Negative	Direct	Direct	Regional	Long	Without interruptions	Very likely	Irreversible	No
Execution	Islands (creating new islands and / or extending existing ones)	Increase of turbidity	HA/DSA	Negative	Direct	Direct	Local (inside N2k)	Short	Once	Very likely	Reversible	No

Stage	Interventions (causes)	Effects	Combination of the main form of impact generated	Estimated potential impact								
				Nature impact	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Execution	Islands (creating new islands and / or extending existing ones)	Noise and vibration	DSA	Negative	Direct	Direct	Local (inside N2k)	Short	Once	Very likely	Reversible	No
Execution	Islands (creating new islands and / or extending existing ones)	Mortality of wildlife	RPN	Negative	Direct	Direct	zonal	Short	Once	Unlikely	Irreversible	No
Operation	Maintenance dredging	Hydro morphological changes to habitats	HA	Negative	Direct	Direct	The ecological corridor	Long	Periodic	Very likely	Reversible	No
Operation	Maintenance dredging	Increase of turbidity	HA/DSA	Negative	Direct	Direct	Local (inside N2k)	Long term	Periodic	Very probable	Reversible	No
Operation	Maintenance dredging	Changing water chemistry	HA	Negative	Direct	Not	Local (inside N2k)	Long	Periodic	Probable	Reversible	No
Operation	Maintenance dredging	Noise and vibration	DSA	Negative	Direct	Yes	Local (inside N2k)	Short	Periodic	Very likely	Reversible	No
Operation	Maintenance dredging	Mortality of wildlife	RPN	Negative	Direct	Yes	zonal	Long	Periodic	Probable	Irreversible	No
Operation	Dredging material storage areas	Increase of turbidity	HA/DSA	Negative	Direct	Not	Local (inside N2k)	Long	Periodic	Very likely	Reversible	No
Operation	Dredging material storage areas	Changing water chemistry	HA	Negative	Direct	Not	Local (inside N2k)	Long	Periodic	Probable	Reversible	No
Operation	Dredging material storage areas	Noise and vibration	DSA	Negative	Direct	Yes	Local (inside N2k)	Long	Periodic	Very likely	Reversible	No
Operation	Dredging material storage areas	Mortality of wildlife	RPN	Negative	Direct	Yes	zonal	Long	Periodic	Unlikely	Irreversible	No
Operation	Groynes - embedded in the river bank	The emergence of physical or behavioral barriers	HF	Negative	Direct	Yes	The ecological corridor	Long	Without interruptions	Probable	Irreversible	Yes
Operation	Groynes - embedded in the river bank	Creating new habitats or expanding existing ecological areas of interest	IH	Positive	Secondary	Not	Local	Long	Without interruptions	Probable	Irreversible	No
Operation	Chevrons	The emergence of physical or behavioral barriers	HF	Negative	Direct	Yes	The ecological corridor	Long	Without interruptions	Probable	Irreversible	Yes
Operation	Chevrons	Creating new habitats or expanding existing ecological areas of interest	IH	Positive	Secondary	Not	Local	Long	Without interruptions	Probable	Irreversible	No
Operation	Bank protection (hard type)	The emergence of physical or behavioral barriers	HF	Negative	Direct	Yes	zonal	Long	Without interruptions	Probable	Irreversible	No
Operation	Islands (creating new islands and / or extending existing ones)	Creating new habitats or expanding existing ecological areas of interest	IH	Positive	Secondary	Not	Local	Long	Without interruptions	Probable	Irreversible	No
Operation	Intensification of the naval traffic	Atmospheric emissions	HA	Negative	Indirect	Yes	The ecological corridor	Long	Periodic	Probable	Irreversible	Yes
Operation	Intensification of the naval traffic	Accidental leakage of dangerous products	HA	Negative	Indirect	Yes	Regional	environment	Accidentally	Unlikely	Reversible	No

Stage	Interventions (causes)	Effects	Combination of the main form of impact generated	Estimated potential impact								
				Nature impact	Impact type	Potential cumulative	Extension	Duration	Frequency	Probability	Reversibility	Transboundary nature
Operation	Intensification of the naval traffic	The penetration of allochthonous / invasive species	HA/RPN	Negative	Secondary	Yes	The ecological corridor	Long	Accidentally	Probable	Irreversible	Yes
Operation	Intensification of the naval traffic	Noise and vibration	DSA	Negative	Indirect	Yes	Local (inside N2k)	Long	Periodic	Probable	Reversible	No
Operation	Intensification of the naval traffic	Artificial lighting	DSA	Negative	Secondary	Not	Local (inside N2k)	Long	Periodic	Probable	Reversible	No
Operation	Intensification of the naval traffic	Collision with wildlife	RPN	Negative	Direct	Yes	Regional	Long	Accidentally	Probable	Irreversible	No

Form of impact:
HL - Habitat Loss
HA - Habitat Alteration
HF - Habitat Fragmentation
DSA - Disturbance of Species Activity
RPN - Reduction of Populations Number
IH - Improving Habitats

From the cross-border impact point of view, in the previous table, all those forms of impact that may appear upstream and downstream of the Danube Romanian-Bulgarian sector have been marked "Yes".

The interventions proposed in the project, both in the Execution Stage and in the Operational Stage, are causes that can generate effects / alterations of the bio-physical environment leading mainly to the generation of several types of impacts on the species and habitats of community interest, among which the most significant ones considered in the present analysis are represented by (see section 1.4.1): habitat loss, habitat alteration, habitat fragmentation, disruption of species activity, reduction of populations number of fauna species, as well as improving habitats favorable to species of community interest. All these types of impacts finally focus on two key aspects: the reduction / increase of habitat areas and the reduction / increase of populations number, which are the main parameters in assessing the conservation status of habitats and species.

To evaluate the impact on the conservation status of Natura 2000 species and habitats in the Appropriate Assessment Stage, we propose the conceptual framework based on the cause-effect-impact relationship presented in Figure 25.

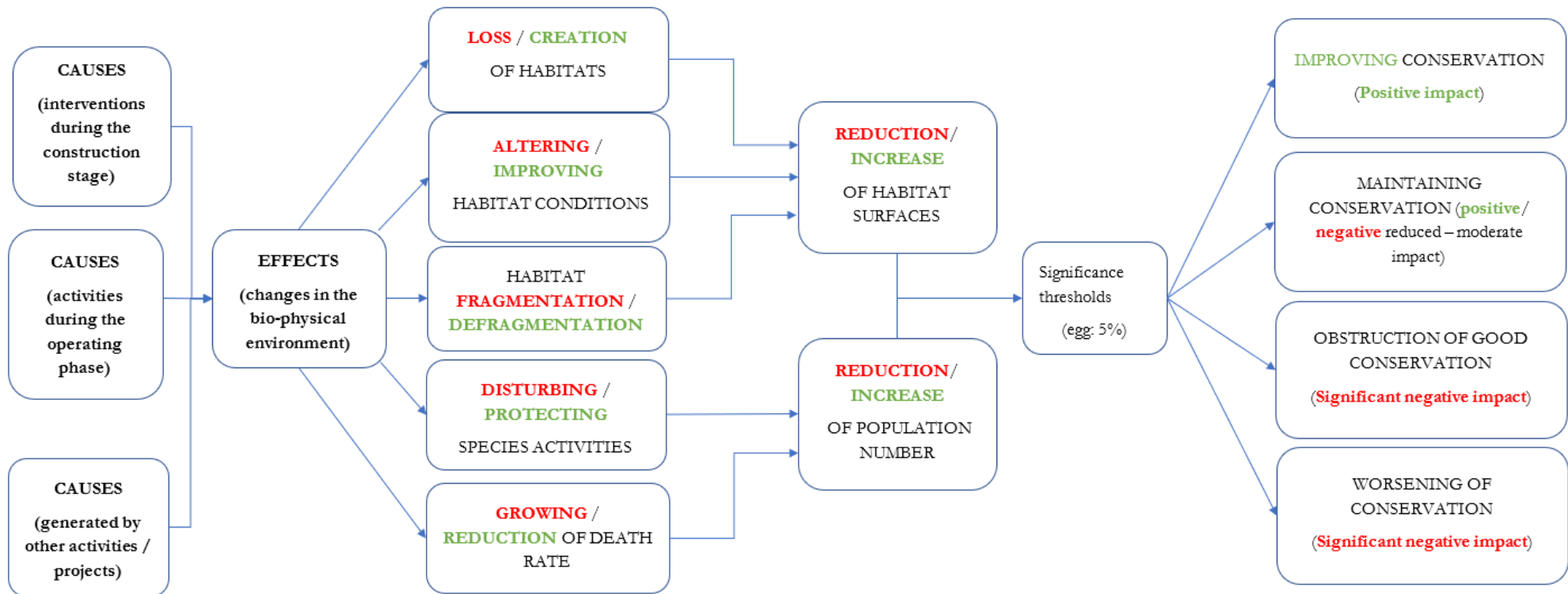


Figure 25 The conceptual framework for adequate assessment

The activities proposed within this project can generate significant impacts on protected species in Natura 2000 sites identified in the project area. The groups of species most exposed to a significant impact are represented by fish (mainly sturgeon species) and aquatic invertebrates (mainly *Unio crassus*).

We appreciate that developing of the Appropriate Assessment Study is extremely necessary for assessing in detail the impact of each proposed activity as well as to formulate appropriate measures to avoid and reduce significant negative impacts. Also, the Appropriate Assessment Study should assess the efficiency of the avoidance and reduction measures and propose a more detailed monitoring program to ensure that residual impacts will not reach the materiality thresholds during the execution and operating periods.

13. Aspects regarding the impact of the project on water bodies

13.1 Project location

Hydrographic basin

The project will be developed in the Danube hydrographic basin, on the Lower Danube, in the Romanian - Bulgarian common sector, from km 845.5 to km 375 on the Romanian bank.

Water course: name and cadastral code

The water course where the project will take place is the Danube, the lower course - cadastral code XIV-1.000.00.00.00.0.

Water body (surface and /or groundwater): name and code

The surface water body where the project is carried out is RORW14.1_B3 Dunarea – Portile de Fier II - Chiciu. According to the Updated Danube River Basin Management Plan of Danube Delta, of the Dobrogea Hydrographic Area and of the Coastal Waters, the water body RORW14.1_B3 was classified as strongly modified with a moderate ecological potential (Table 55).

A heavily modified water body is one water body which, because of physical changes caused by anthropogenic activities, its character is substantially changed. No artificial water body has been designated on the Danube.

Table 55 Characteristics of the RORW14.1_B3 Dunarea – Portile de Fier II - Chiciu water body, taken from the Updated Management Plan of the Danube River of the Danube Delta of the Dobrogea Hydrographic Area and of the Coastal Waters

Country / km	Code	Name	Description
Romania / km 863-km 375	RORW14.1_B3	Dunarea - Portile de Fier II – Chiciu	Heavily modified water body. moderate ecological potential

Considering that, the proposed works by the project will be carried out in the Danube riverbed, for the impact assessment were also considered the surface and groundwater bodies located in the immediate vicinity of the Danube riverbed, which are in interdependence with the Danube. According with the Updated Management Plan of the Hydrographic Basins Jiu, Olt, Arges - Vedea and Buzau – Ialomita, surface and groundwater bodies (name and code) on the left bank of the Danube, located in the area of the 12 critical points, are presented in Table 56.

Table 56 Name and code of the surface and groundwater bodies located in the area of the critical points, taken from the Updated Management Plans of the Hydrographic Basins Jiu, Olt, Arges - Vedea and Buzau - Ialomita

CP	Surface/Groundwater body	
	Name	Code
Garla Mare	Balta Garla Mare	Lake: ROLW14.1_B190
	Balta Vrata	Lake: ROLW14.1_B199
	Lunca si terasele Dunarii-Calafat	Groundwater: ROJI06
Salcia	-	-
Bogdan-Secian	Balta Ciuperceni	Lake: ROLW14.1_B192
	Lunca si terasele Dunarii-Calafat	Groundwater: ROJI06
Dobrina	Balta Lata	Lake: ROLW14.1_B197
Bechet	-	-
Corabia	Lunca Dunarii (Bechet - Turnu Magurele)	Groundwater: ROOT09
Belen	Acumularea Suhaia	Lake: ROLW14.1.31_B2
	Lunca Dunarii (Bechet - Turnu Magurele)	Groundwater: ROOT09
Vardim	Lunca Dunarii (Bechet - Turnu Magurele)	Groundwater: ROOT09
Iantra	Lunca Dunarii (Giurgiu – Oltenita)	Groundwater: ROAG07
Batin	R. Vedea intre loc. Bujoru si Dunare	River: RORW9.1_B8
	Garla Iancului/Suhaia	River: RORW14.1.31_B3_D
	Lunca Dunarii (Giurgiu – Oltenita)	Groundwater: ROAG07
Kosui	Lunca Dunarii (Oltenita-Harsova)	Groundwater: ROIL11
Popina	Lunca Dunarii (Oltenita-Harsova)	Groundwater: ROIL11

13.2 Ecological status/ecological potential and chemical status of the surface water body

According with the "Updated Danube River Basin Management Plan. of Danube Delta. of the Dobrogea Hydrographic Area and of the Coastal Waters" for the surface water body RORW14.1_B3 Dunare – Portile de Fier II – Chiciu, the ecological status is moderate/the ecological potential is moderate and the good chemical state is not achieved (Table 57).

According with the Updated Management Plans of the Hydrographic Basins Jiu, Olt. Arges - Vedea and Buzau – Ialomita, for the water bodies classified as natural lakes from the project area, the ecological status/ecological potential and the chemical status is good, except for the water body ROLW14.1_B190 – Balta Garla Mare, for which the ecological status/ecological potential will be established in a further stage.

Table 57 Ecological status/ecological potential and chemical status of surface water bodies in the project area, taken from the Updated Management Plans of the Hydrographic Basins Jiu and Arges - Vedea

CP	Surface water body			
	Name	Code	Environmental status/ Ecological potential	Chemical status
Garla Mare	Balta Garla Mare	Lake: ROLW14.1_B190	Will be set up in a further stage	Good
	Balta Vrata	Lake: ROLW14.1_B199	Good	Good
Salcia	-	-	-	-
Bogdan-Secian	Balta Ciuperceni	Lake: ROLW14.1_B192	Good	Good
Dobrina	Balta Lata	Lake: ROLW14.1_B197	Good	Good
Bechet	-	-	-	-
Corabia	-	-	-	-
Belen	Acumularea Suhaia	Lake: ROLW14.1.31_B2	Good	Good
Vardim	-	-	-	-

CP	Surface water body			
	Name	Code	Environmental status/ Ecological potential	Chemical status
Iantra	-	-	-	-
Batin	R. Vedea intre loc. Bujoru si Dunare	River: RORW9.1_B8	Good	Good
	Garla Iancului/Suhaia	River: RORW14.1.31_B3_D	Good	Good
Kosui	-	-	-	-
Popina	-	-	-	-

Legend:

RW - river; LW - natural lake.

In the Critical Point Batin, for the surface water body ROHWLW14.1.31_B2. exceptions from the environmental objectives apply, ecological status/ecological potential - moderate.

13.3 Quantitative and chemical status of the groundwater body

The existing situation of the groundwater bodies provides an overview of the quantitative and chemical status of the groundwater bodies from each hydrographic basin from the project area, showing the trends of the concentration of pollutants anthropogenic induced on long-term.

Groundwater bodies are classified in two categories, i.e. good and poor, both for the quantitative and the chemical status.

According to the Updated Management Plans of the Hydrographic Basins Jiu, Olt, Arges - Vedea and Buzau – Ialomita, the quantitative status of the groundwater bodies from the project area is good and the chemical status varies between good, and locally poor qualitative status (Table 58).

Table 58 The quantitative and chemical status of the groundwater bodies from the project area, taken from the updated Management Plans of the Hydrographic Basins Jiu, Olt, Arges - Vedea and Buzau - Ialomita

CP	Groundwater body				
	Name	Category	Quantitative status	Chemical status	Description
Garla Mare	Lunca si terasele Dunarii-Calafat	Groundwater: ROJI06	G	P	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 5-30m; moderate degree of protection.
Salcia	-	-	-	-	-
Bogdan -Secian	Lunca si terasele Dunarii-Calafat	Groundwater: ROJI06	G	P	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 5-30m; moderate degree of protection.
Dobrina	-	-	-	-	-
Bechet	-	-	-	-	-
Corabia	Lunca Dunarii (Bechet - Tr. Magurele)	Ground ater: ROOT09	G	G	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 3-12m; moderate degree of protection.
Belene	Lunca Dunarii (Bechet - Tr. Magurele)	Groundwater: ROOT09	G	G	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary

CP	Groundwater body				
	Name	Category	Quantitative status	Chemical status	Description
					age; covering strata of 3-12m; moderate degree of protection.
Vardim	Lunca Dunarii (Bechet - Tr. Magurele)	Groundwater: ROOT09	G	G	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 3-12m; moderate degree of protection.
Iantra	Lunca Dunarii (Giurgiu – Oltenita)	Groundwater: ROAG07	G	G*	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 1-5m; moderate degree of protection.
Batin	Lunca Dunarii (Giurgiu – Oltenita)	Groundwater: ROAG07	G	G*	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 1-5m; moderate degree of protection.
Kosui	Lunca Dunarii (Oltenita-Harsova)	Groundwater: ROIL11	G	G	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 1-3m; unsatisfactory degree of protection.
Popina	Lunca Dunarii (Oltenita-Harsova)	Groundwater: ROIL11	G	G	Phreatic groundwater body. porous - permeable type in meadow deposits and terraces of Quaternary age; covering strata of 1-3m; unsatisfactory degree of protection.

Legend:

B - good;

B* - poor local quality;

S - weak.

13.4 Environmental Objectives of the Identified Water Bodies

According with the Updated Management Plans of the Hydrographic Basins Jiu and Arges – Vedeia. the environmental objectives for surface water bodies were established according to the surface water body category. namely: natural water bodies (rivers. lakes). heavily modified water bodies (rivers. water storage dams) and artificial water bodies. For the protected areas that include surface water bodies. the objectives are those provided by specific legislation. being characteristic of the protected area categories.

The environmental objective established for the surface water body Portile de Fier II - Chiciu. in the the Updated Management Plan of the Danube River. of the Danube Delta. of the Dobrogea Hydrographic Area and of the Coastal Waters, is the ecological status/ecological potential and the good chemical status. The proposed term for reaching the target status of the surface water body is 2021.

According with the Updated Management Plans of the Hydrographic Basins Jiu and Arges – Vedeia, the environmental objectives for natural lake water bodies are good ecological and chemical status, except for the Balta Garla Mare water body, for which the environmental objective for the ecological status will be established in a future stage of the Hydrographic Basin Management Plan. For the other groundwater bodies the environmental objectives have been met.

Table 59 presents the environmental objectives of surface water bodies located in the project area.

Table 59 Environmental objectives established for surface water bodies, taken from the Updated Management Plans of the Hydrographic Basins Jiu and Arges – Vedea

CP	Surface water bodies				
	Name	Code	Environmental objective		
			Ecological status/ Ecological potential	Chemical status	Deadline
Garla Mare	Balta Garla Mare	ROLW14.1_B190	Will be set up in a further stage	Good	2015
	Balta Vrata	ROLW14.1_B199	Good	Good	2015
Salcia	-	-	-	-	-
Bogdan-Secian	Balta Ciuperceni	ROLW14.1_B192	Good	Good	2015
Dobrina	Balta Lata	ROLW14.1_B197	Good	Good	2015
Bechet	-	-	-	-	-
Corabia	-	-	-	-	-
Belene	Acumularea Suhaia	Lac: ROLW14.1.31_B2	Good	Good	2015
Vardim	-	-	-	-	-
Iantra	-	-	-	-	-
Batin	R. Vedea intre loc. Bujoru si Dunare	Rau: RORW9.1_B8	Good	Good	2015
	Garla Iancului/ Suhaia	Rau: RORW14.1.31_B3_D	Moderate (2015)	Good	2015
Kosui	-	-	-	-	-
Popina	-	-	-	-	-

Table 60 presents the environmental objectives for the groundwater bodies in the project area.

Table 60 Environmental objectives established for groundwater bodies taken from the Updated Management Plans of the Hydrographic Basins Jiu and Arges – Vedea and Buzau - Ialomita

CP	Groundwater bodies				
	Name	Code	Environmental objective		
			Quantitative status	Quality status	Quantitative / qualitative Deadline
Garla Mare	Lunca si terasele Dunarii-Calafat	Groundwater: ROJI06	Good	Good	2015/2027
Salcia	-	-	-	-	-
Bogdan-Secian	Lunca si terasele Dunarii-Calafat	Groundwater: ROJI06	Good	Good	2015/2027
Dobrina	-	-	-	-	-
Bechet	-	-	-	-	-
Corabia	Lunca Dunarii (Bechet - Tr. Magurele)	Groundwater: ROOT09	Good	Good	2015/2015
Belene	Lunca Dunarii (Bechet - Tr. Magurele)	Groundwater: ROOT09	Good	Good	2015/2015
Vardim	Lunca Dunarii (Bechet - Tr. Magurele)	Groundwater: ROOT09	Good	Good	2015/2015

CP	Groundwater bodies				
	Name	Code	Environmental objective		
			Quantitative status	Quality status	Quantitative / qualitative Deadline
Iantra	Lunca Dunarii (Giurgiu – Oltenita)	Groundwater: ROAG07	Good	Good	2015/2015
Batin	Lunca Dunarii (Giurgiu – Oltenita)	Groundwater: ROAG07	Good	Good	2015/2015
Kosui	Lunca Dunarii (Oltenita-Harsova)	Groundwater: ROIL11	Good	Good	2015/2015
Popina	Lunca Dunarii (Oltenita-Harsova)	Groundwater: ROIL11	Good	Good	2015/2015

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Annex A. River Administration of the Lower Danube River R.A. Galati Documents

Annex B. Halcrow Romania S.A. Documents

Annex C. Drawings

- Drawing no. 1 – General Layout Plan, Zone Critice 1 – 5, Puncte Critice 01 - 12
- Drawing no. 2 - Critical Zone 1, Critical Point 01 Garla Mare, Scenario 1 Dredge only.
- Drawing no. 3 - Critical Zone 1, Critical Point 02 Salcia, Scenario 1 Dredge only.
- Drawing no. 4 - Critical Zone 2, Critical Point 03 Bogdan-Secian, Scenario 1 Dredge only.
- Drawing no. 5 - Critical Zone 2, Critical Point 04 Dobrina, Scenario 1 Dredge only.
- Drawing no. 6 - Critical Zone 3, Critical Point 05 Bechet, Scenario 1 Morpho-engineering works.
- Drawing no. 7 - Critical Zone 3, Critical Point 06 Corabia, Scenario 1 Dredge only.
- Drawing no. 8 - Critical Zone 4, Critical Point 07 Belene, Scenario 1 Morpho-engineering works.
- Drawing no. 9 - Critical Zone 4, Critical Point 08 Vardim, Scenario 1 Dredge only.
- Drawing no. 10 - Critical Zone 4, Critical Point 09 Iantra, Scenario 1 Dredge only.
- Drawing no. 11 - Critical Zone 4, Critical Point 10 Batin, Scenario 1 Dredge only.
- Drawing no. 12 - Critical Zone 5, Critical Point 11 Kosui, Scenario 1 Dredge only.
- Drawing no. 13 - Critical Zone 5, Critical Point 12 Popina, Scenario 1 Engineering works (1).
- Drawing no. 14 - Critical Zone 1, Critical Point 01 Garla Mare, Scenario 2 Morphological works.
- Drawing no. 15 - Critical Zone 1, Critical Point 02 Salcia, Scenario 2 Engineering works.
- Drawing no. 16 - Critical Zone 2, Critical Point 03 Bogdan-Secian, Scenario 2 Engineering works.
- Drawing no. 17 - Critical Zone 2, Critical Point 04 Dobrina, Scenario 2 Engineering works.
- Drawing no. 18 - Critical Zone 3, Critical Point 05 Bechet, Scenario 2 Morphological works.
- Drawing no. 19 - Critical Zone 3, Critical Point 06 Corabia, Scenario 2 Engineering works.
- Drawing no. 20 - Critical Zone 4, Critical Point 07 Belene, Scenario 2 Engineering works.
- Drawing no. 21 - Critical Zone 4, Critical Point 08 Vardim, Scenario 2 Engineering works.
- Drawing no. 22 - Critical Zone 4, Critical Point 09 Iantra, Scenario 2 Engineering works.
- Drawing no. 23 - Critical Zone 4, Critical Point 10 Batin, Scenario 2 Morpho-Engineering works.
- Drawing no. 24 - Critical Zone 5, Critical Point 11 Kosui, Scenario 2 Morphological works.
- Drawing no. 25 - Critical Zone 5, Critical Point 12 Popina, Scenario 2 Engineering works (2).
- Drawing no. 26 - Critical Zone 3, Critical Point 05 Bechet, Estimated Area of Deforestation.
- Drawing no. 27 - Critical Zone 4, Critical Point 07 Belene, Surfaces estimated to be removed from the forest circuit
- Drawing no. 28 - Critical Zone 5, Critical Point 12 Popina, Surfaces estimated to be removed from the forest circuit
- Drawing no. 29 - Location of the project towards the closest natural protected areas in the area, Critical Points 01 – 06
- Drawing no. 30 - Location of the project over the closest natural protected areas in the area, Critical Points 07-12

Annex D. Geographic coordinates of hydrotechnical works in the National Projection System Stereo 70

The geographic coordinates of the works are attached to the electronic documentation.