Fairway Rehabilitation and Maintenance Master Plan for the Danube and its navigable tributaries:

NATIONAL ACTION PLANS

UPDATE MAY 2020

Developed within the **EU co-financed project FAIRway Danube**

Version 18.06.2021

Co-financed by the Connecting Europe Facility of the European Union

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1 Executive summary

These action plans illustrate the status and planned next steps for rehabilitation and maintenance activities in the Danube riparian countries. They are based on the Fairway Rehabilitation and Maintenance Master Plan for the Danube and its navigable tributaries as it was endorsed by a large majority of the Danube Transport Ministers in December 2014. By means of the action plans at hand, the **implementation status of the Master Plan shall be monitored**. Continuous updates are foreseen to provide the necessary information. This document provides the altogether eleventh update of the Master Plan and comprises an overview of the fairway situation during 2019. Furthermore, taken and planned measures as well as the resulting budget needs and financing gaps for 2020 are illustrated. This document also includes information of the ecological status of the Danube and the relevant aspects, e.g. legal permits, related to maintenance and rehabilitation measures.

According to the Danube River Basin Management Plan 2015 by the International Commission for Protection of the Danube River (ICPDR), the **majority of the Danube is classified as heavily modified water body with moderate or worse ecological potential.** In order to achieve good ecological potential and status (natural water bodies) as required by the Water Framework Directive, **an integrated planning approach is applied in the Danube countries** as regards navigational maintenance and rehabilitation measures.

Fairway conditions were very favourable in in the first seven months of 2019 along the entire Danube. From **January until mid-July** minimum fairway depths were mostly exceeded on all parts of the Danube; water levels remained above Low Navigable Water Level (LNWL) for the entire period. Only at the Lower Danube (at the Romanian critical sector Cochirleni) some days with fairway depths below 2.5 m occurred in January, due to lower water levels in winter.
In the **beginning of August** water levels dropped rapidly and remained below or just slightly above Low Navigable Water Level until the end of the year, resulting in fairway depths below 2.50 m at several critical locations, particularly on the Central and Lower Danube.

Nevertheless, **extensive maintenance dredging and fairway marking activities** at least prolonged the period of stable fairway conditions and significantly improved fairway availability during the low water season in summer, especially on the Lower Danube. In Romania and Bulgaria dredging works were carried out in several critical sectors in 2019, amongst others in Bechet (RO), Caragheorghe (RO), Cochirleni (RO), Vardim (BG) and Belene (BG). The most critical location was again Cochirleni (RO), where the minimum fairway depth of 2.50 m was not achieved for 93 days. In general, **the riparian states on the Lower Danube are closer to reaching the maintenance target.**

Continuous efforts have to be made in order to achieve good fairway conditions in the coming years. This particularly entails the **continuation of targeted maintenance and rehabilitation measures** and **securing sufficient national budgets for the necessary operative tasks.** This specifically includes the provision of up-to-date user information and the execution of fairway marking and dredging activities.

Executive summary

Considerable investments have been initiated in the last years since launching the Master Plan. The amount varies, with **Croatia, Romania and Bulgaria having satisfied more than half of the national investment needs declared in 2014. Hungary has invested significantly more than the investment needs declared in 2014.** Many of the investments were taken in the framework of the FAIRway Danube project and most of the available investment budget is based on EU co-financing. This underlines the important role of the European Union to realize the objectives of the Master Plan. Nevertheless, in some countries, **major shares of the investment needs until 2020, as stated in the Master Plan, are not yet secured.** The national contributions via (co-)financing or the institutional capacities on national level are sometimes not sufficient to implement the necessary projects.

2 Introduction

Purpose of action plans

In their conclusions of 3rd December 2014 regarding the Fairway Rehabilitation and Maintenance Master Plan for the Danube and its Navigable Tributaries, a large majority of the Danube Transport Ministers agreed to "take the necessary measures (...) to deal within the framework of fairway maintenance with the critical fairway sections identified in the Master Plan, to establish for this purpose national roadmaps which identify individual actions, responsibilities, funding resources and intermediate milestones for the implementation of these measures and to communicate these roadmaps by 30th June 2015 to the relevant coordinating bodies". This is in line with Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network, obliging EU Member States to preserve a good navigation status, while respecting the applicable environmental law. In the Danube Region the "Joint Statement on Guiding Principles for the Development of Inland Navigation and Environmental Protection in the Danube Basin", endorsed in 2007 by the ICPDR (International Commission for the Protection of the Danube River), Danube Commission and the International Sava River Basin Commission (ISRBC), thereby is a key tool providing guidance for the planning and implementation of waterway projects.

The Master Plan and the action plans are **designed as living documents**. Therefore, their structure and content is constantly under review and will be elaborated in order to provide the highest level of transparency and the greatest benefit for the waterway administrations with regard to their maintenance and rehabilitation activities. The aim is to standardise and simplify the data gathering process as much as possible; the use of electronic support tools is under preparation.

In general, the national action plans at hand **create a high level of transparency** which was not available in the years before. Detailed information on operational rehabilitation and maintenance activities are presented. The Master Plan and the corresponding national action plans have therefore opened the black box of previously nationally oriented waterway management approaches for all involved stakeholders. **Transparent illustration of planned and implemented measures** allows coordinated action on national as well as corridor level. **Cost and budget information** allows evaluating efficiency and improving the capability to act on the long run.

The basic maintenance philosophy applied throughout the Master Plan is an important step towards **implementing the most effective, environmentally sound and cost-efficient measures possible.** Improved monitoring/surveying activities create the needed high quality data basis to identify the best measures including **exploiting the potential of fairway realignment** to the maximum extend where possible and reduce dredging interventions as much as possible and purposeful.

Scope of action plans

Based on the ministerial conclusions of December 2014, Priority Area 1a of the EU Strategy for the Danube Region initiated the elaboration of national action plans in spring 2015. They follow a harmonized structure in order to provide an improved overview of actions taken and planned along the Danube.

The action plans shall be updated continuously in order to serve as a proper monitoring and documentation tool as regards planning of budget and activities. Contents for these updates will be provided in the framework of the CEF-financed FAIRway Danube project for the countries that are project partners (Austria, Slovakia, Hungary, Croatia, Romania, Bulgaria). The remaining Danube riparian countries are integrated via PA1a – Inland Waterways of the European Strategy for the Danube Region and will be asked to contribute data. **From 2020, the frequency of updates has been changed to one update per year, which should take place in May and cover the preceding year.** Data on the **status of critical locations, hydrological conditions and implemented measures for the full preceding year** will be provided along with data on the operational budgets and investments taken.

The **summarising tables on costs and budgets** in this report allow only limited comparison between the riparian states, as the national accounting practices vary (e.g. some countries summarize more activities under "maintenance and rehabilitation" than others). The main purpose is to **illustrate the cost and budget development over the years per country, to indicate financing needs and to outline the shares of national and European funding.**

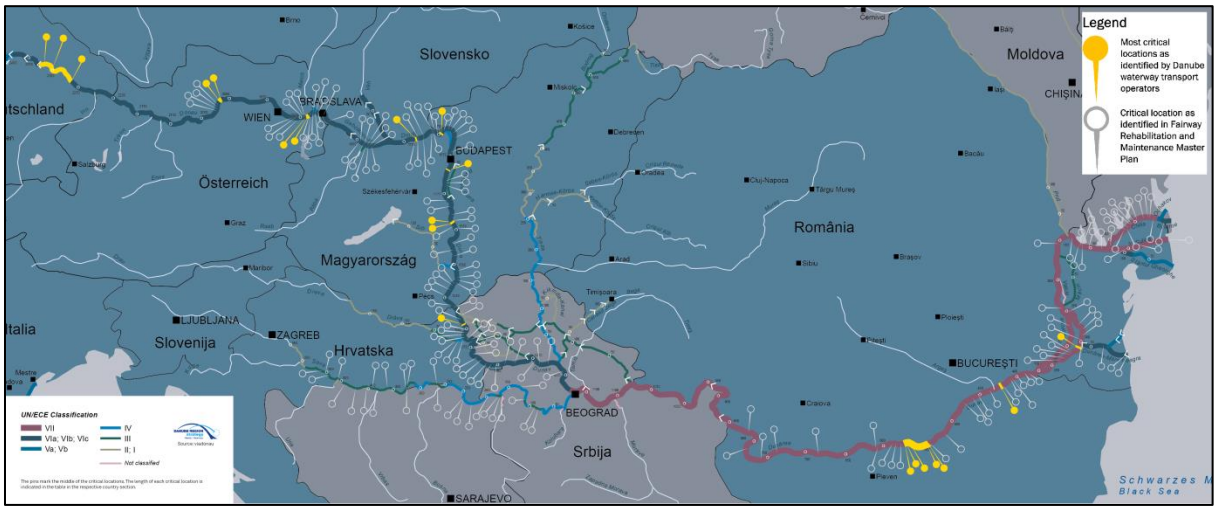
Scope of current report

This document updates the tenth National Action Plans of October 2019 for the Fairway Rehabilitation and Maintenance Master Plan for the Danube and its Navigable Tributaries. It is the tenth Action Plan to be elaborated within the FAIRway Danube project.

It focuses on the most critical sections as identified by a sample of 24 important shipping organisations and waterway administrations in December 2014. From the user perspective, the locations and stretches marked yellow in the map and listed in the table below cause the biggest navigational problems and should consequently be treated with the highest priority. For reporting purposes, some of the locations have been grouped in the country chapters.

In some country chapters, a number of critical sections has been added to the ones selected by the shipping organisations. This was the case, if the responsible waterway administrations considered it necessary to additionally report on the status of these locations due to their critical state.

As a general remark, it has to be stated that the exact situation of the critical sections varies over the years due to the intense dynamics of the river.



location and length (km)			right bank / left bank	name of section or location
river-km (from - to)		length		
2,321.70	2,312.00	9.50	DE / DE	Straubing (lock)–Straubing-Sand (port)
2,312.00	2,282.50	29.70	DE / DE	Straubing-Sand (port)–Deggendorf
2,282.50	2249,90	32.50	DE / DE	Deggendorf – Vilshofen (backwater Kachlet)
2,014.60	2,013.50	1.10	AT / AT	Weißenkirchen
2,010.20	2,008.90	1.30	AT / AT	Dürnstein
1,888.60	1,887.60	1.00	AT / AT	Treuschütt
1,885.00	1,883.50	1.50	AT / AT	Hainburg
1,735.50	1,733.70	1.80	HU / SK	Nyergesújfalu
1,698.00	1,697.00	1.00	HU / HU	Dömös
1,638.40	1,637.40	1.00	HU / HU	Budafok
1,559.80	1,559.70	0.10	HU / HU	Dunaföldvár
1,558.50	1,557.50	1.00	HU / HU	Solt
1,408.20	1,400.00	8.20	HR / RS	Apatin
568,20	567,80	0.40	BG / RO	Milka Island
567,00	566,70	0.30	BG / RO	Belene Island
562,00	561,50	0.50	BG / RO	Coundur Island
541,60	541,00	0.60	BG / RO	Vardim Island
538,50	537,00	1.50	BG / RO	Giska Island
425,90	425,20	0.70	BG / RO	Kosui Island
309,00	308,00	1.00	RO / RO	Cochirleni

Recommended Levels of Service

Notwithstanding the provisions of the TEN-T Regulation (1315/2013), the "European Agreement on Main Inland Waterways of International Importance" (AGN) and the "Recommendations on Minimum Requirements for Standard Fairway Parameters, Hydrotechnical and Other Improvements on the Danube" published by the Danube Commission, the waterway management experts represented in the project NEWADA duo[1] recommended different minimum Levels of Service for the different phases in the waterway maintenance cycle. The recommended minimum Level of Service related to fairway depth for the Danube and its navigable tributaries was thereby defined as **2.50m at Low Navigable Water Level** (LNWL or ENR / Étiage navigable et de regularisation), i.e. on 94% (343 days) of the year, calculated on the basis of the discharge observed over a period of 30 years with the exception of ice periods. In some river sections however, e.g. in Germany[2], Slovakia and Hungary, this target is not valid, as it is not achievable by stream regulation and maintenance measures due to physical preconditions. This aspect remains valid throughout this document.

The recommended **target** of the Fairway Rehabilitation and Maintenance Masterplan is to provide a **fairway depth exceeding 2.5 m[3] at least on as many days per year as show actual water levels equal to or above the statistical Low Navigable Water Level (LNWL)**[4]. Therefore, information on the status of critical locations is only valid in relation to the hydrological conditions in the same period.

It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is also displayed in the national chapters.

The recommended fairway widths for the minimum depth (both based on NEWADA duo) were defined in order to represent a **"deep fairway channel"** and comprise a range of values for different bend radii for a reference (i.e. the most common) vessel or convoy going downstream in one-way traffic. Higher fairway widths are needed in sharper bends of the waterway, as the drift angle of the respective vessel must be accounted for.

This "deep fairway channel" should be available already prior to low water periods to prevent obstacles to navigation already in advance. Once a fairway depth of 2.5m at LNWL (ENR) for this minimum fairway width (minimum LoS) has been established by dredging or realigning the course of the fairway, the recommended fairway widths shall be maintained in their entirety according to the 2013 Danube Commission Recommendations (Section 7.2.2. of the "Recommendations on Minimum Requirements for Standard Fairway Parameters, Hydrotechnical and Other Improvements on the Danube").

The targeted minimum widths of the fairway (NEWADA duo Level of Service 1) are provided below.

[1] http://www.newada-duo.eu/
[2] In addition, Germany was not a project partner in NEWADA duo and thus did not agree to the NEWADA duo Levels of Service. For the section Straubing-Vilshfoen, 2.0m are set as target value by the German waterway administration
[3] Or the respective target value relevant for the special section (e.g. 2.0 m in Straubing-Vilshofen on the German Danube)
[4] LNWL = the water level reached or exceeded at a Danube water gauge on an average of 94% of days in a year (i.e. on 343 days) over a reference period of several decades

- 40 – 80 m in Austria (CEMT class VIb-VIc)
- 60 to 100 m in Slovakia and on the Slovakian – Hungarian border section (CEMT class VIb – VIc)
- 80 to 120 m in Hungary (CEMT class VIb – VIc)
- 80m in Croatia, Serbia, Romania and Bulgaria (including border sections, excluding the maritime Daube). No range for bend radii is defined, as there is usually no passing of vessels and convoys in bends in these sections. Reference vessels for Croatia: (3x2 or 2x3 barges; CEMT class VI C.) Reference vessels for Serbia (AGN classification VIc-VII); reference vessels for Romania and Bulgaria (CEMT class VII)

The overall aim is to implement the recommended Levels of Service on the fairway with reduced physical interventions, which lowers costs as well as environmental impacts. The key precondition to achieve this aim is to establish an improved information basis on the actual status of the critical waterway locations. In order to be able to monitor the development of the "deep fairway channel" (minimum LoS), to decide on the optimum measures under the given circumstances and to provide the users of the waterway with the needed information on a regular basis, monitoring of fairway depths at critical locations has to take place at high frequency (at least once a month). Only such a high quality decision basis allows designing more effective and efficient measures. With the few exceptions mentioned above, this recommended Level of Service should normally be achievable with conventional maintenance measures (ranging from surveying, fairway marking/relocation to dredging), that is, without structural interventions on the infrastructure. Thus, the Master Plan lists measures and costs not only related to dredging, but also for related processes such as surveying or data analysis. Capital dredging – main structural interventions - is not addressed in general.

For the **reporting of conducted rehabilitation and maintenance measures** a graphical approach was chosen to visualise all activities in greatest detail, adding the local and temporal dimension of the works done.

Multifunctional use of rivers

Apart from the impact of navigation laws on rehabilitation and maintenance activities, further legislation related to aspects like forest, fishery, flood risk and environment need to be taken into account. These Action Plans shall elaborate particularly on the environmental aspects of the measures taken.

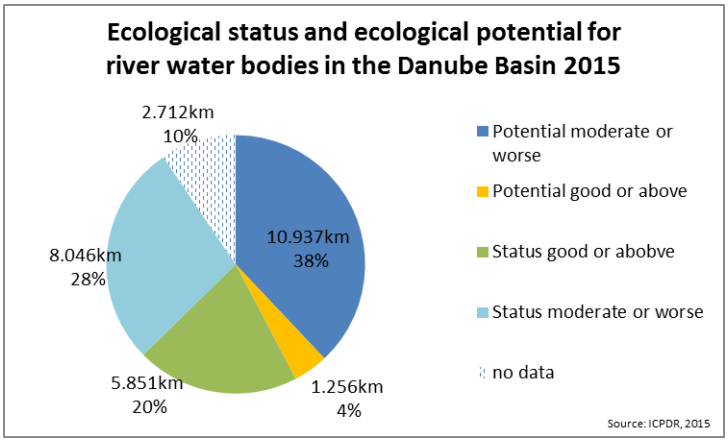
Official notifications or permits are needed from the competent national authorities related to water law, nature protection law, and (in some countries) national park law in the context of waterway maintenance measures. The authorities responsible for issuing these environmental permits comply with the goals of the legal instruments of the European Union, such as the Water Framework Directive 2000/60/EC (WFD) or the Environmental Impact Assessment Directive (85/337/EEC) and the Habitats Directive (92/43/EEC) in connection with the Birds Directive (2009/147/EC) which form the NATURA 2000 network. Further relevant Directives may be the Strategic Environmental Impact Assessment Directive (2001/42/EC), the Flood Risk Management Directive (2007/60/EC) and the Public Participation Directive (2003/35/EC).

Implications of the Water Framework Directive

The **Water Framework Directive** requires Member States in Article 4.1(a) (i) to "implement the necessary measures to prevent deterioration of the status of all bodies of surface water". Another goal is to protect, enhance, (and restore) these water bodies in order to reach or keep the good chemical and ecological status (or potential, if the water body is classified as heavily modified or artificial) until 2015. An assessment of the situation and measures towards the achievement of these goals must be laid down in River Basin Management Plans. As achieving these goals by 2015 is not realistic for all water bodies, updates of the plans were/are foreseen in 2015 and 2021.

The International Commission for the Protection of the Danube River has currently updated the Danube River Basin Management (DRBM) Plan by end 2015[5]. The plan addresses the key issues requiring joint actions on the basin-wide level (Level A) and is accompanied by more detailed plans on the national level (Level B).

According to the Danube River Basin Management Plan 2015-2021, about 20% of the Danube river basin surface waters have a status good or above (which is the ultimate aim within the WFD), about 4% show a good or above potential. About 49% of the River Water Bodies are at risk or possibly at risk to achieve good ecological status by 2021, about 40% of that share is due to future or ongoing alterations.



The plan also states that “hydropower generation, navigation and flood protection are the key water uses that cause hydromorphological alterations. (...) The alteration of natural hydromorphological conditions can have negative effects on aquatic populations, which might result in failing the EU WFD environmental objectives.”

According to a decision of the European Court of Justice in 2015[6] as regards a dredging project on the river Weser, the following two main conclusions as regards application of the WFD in practice

[5] http://www.icpdr.org/main/activities-projects/river-basin-management

[6] A ECJ process between the Federal Republic of Germany and the German Federation for the Environment and Nature Conservation (Bund für Umwelt und Naturschutz Deutschland e.V.); (Case C–461/13)

can be derived and may also serve as guidelines for practical implementation of maintenance and rehabilitation measures on the Danube and its navigable tributaries[7]:

1. Article 4.1(a) (i) to (iii) of the Water Framework Directive must be interpreted as meaning that the Member States are required – unless derogation is granted – to refuse authorization for a specific project if it may lead to a deterioration of the status of a body of surface water, or where it jeopardises the attainment of good surface water status, or of good ecological potential and good surface water chemical status by the date laid down by the Directive.

2. The term "deterioration of the status" of a body of surface water, as described in Article 4.1(a) (i), must be interpreted as meaning that a deterioration exists as soon as the status of at least one quality element, according to Annex V of the Directive, deteriorates by one class –even if this deterioration does not lead to a deterioration in the classification of the respective body of surface water altogether. If a quality element according to Annex V is however already in the lowest class, any deterioration of that respective element constitutes a "deterioration of the status" of the body of surface water.

Based on practical experience of waterway administrations, maintenance activities do not have significant negative influence on the status of a waterway in the majority of cases[8]. However, in cases where maintenance activities are liable to cause deterioration of the water status or put at risk the achievement of environmental objectives, they may only be authorised when all conditions under the exemption of article 4(7) WFD are met:

(a) all practicable steps are taken to mitigate the adverse impact on the status of the body of water;

(b) the reasons for those modifications or alterations are specifically set out and explained in the river basin management plan required under Article 13 and the objectives are reviewed every six years;

(c) the reasons for those modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives set out in paragraph 1 are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development, and

(d) the beneficial objectives served by those modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option.

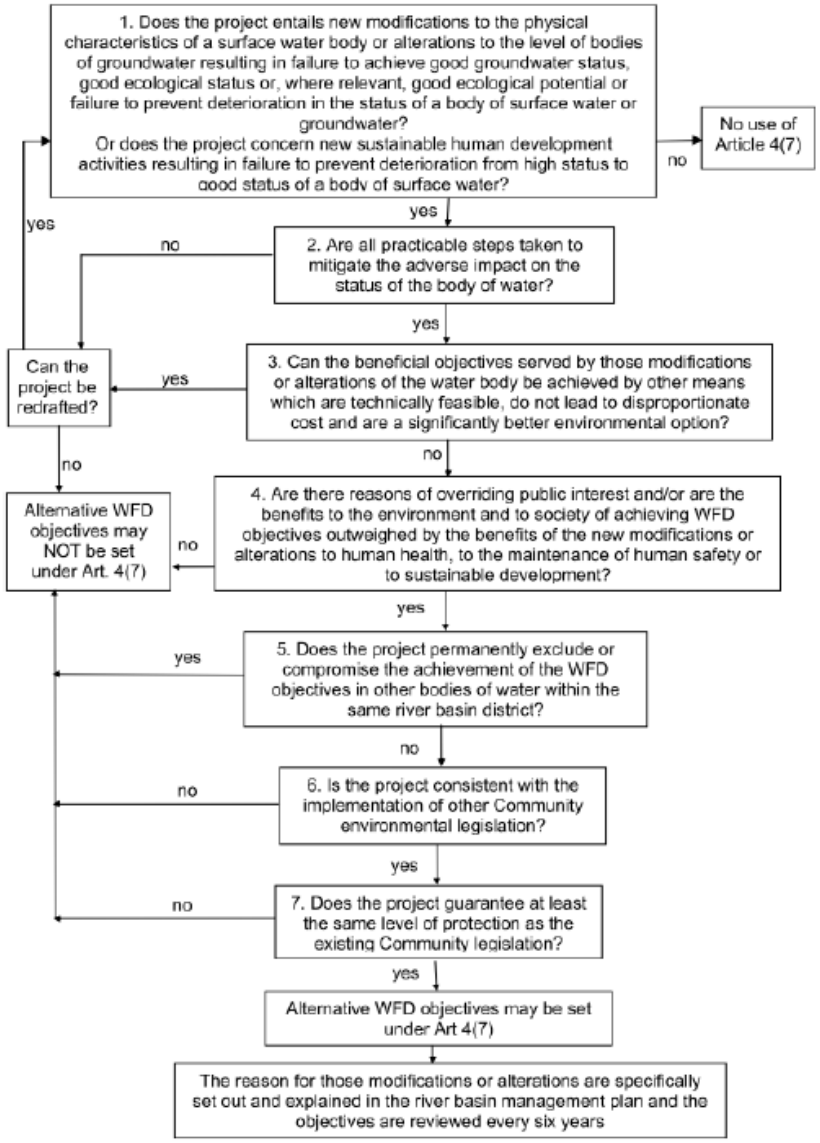
For small projects that do not fall within the scope of the EIA Directive (85/337/EEC), a generic approach can be used within this procedure in order to reduce the assessment burden[9].

[7] For more information, see the Weser press release: http://curia.europa.eu/jcms/upload/docs/application/pdf/2015-07/cp150074en.pdf
[8] See, e.g., „Leitfaden Umweltbelange bei der Unterhaltung von Bundeswasserstraßen“, Bundesminister für Verkehr und digitale Infrastruktur, Bundesanstalt für Gewässerkunde (Hrsg.), Bonn, 2015, p.12
[9] Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance Document No 20 on exemptions to the environmental objectives, European Communities, Luxembourg, 2009 , p.25

Introduction

The DRBM Plan lists Key Future Infrastructure Projects (FIP) for navigation in its Annex and assesses it regarding their compliance with the WFD objectives and potential applicability of Art 4(7). The FIP comprise solely capital interventions.

The following figure[10] provides an example for an iterative approach regarding application of Art 4(7):



[10] Idem, p.26

NATURA 2000

Natura 2000 sites are not excluded from further infrastructural development. Planned projects need to be assessed regarding their impact on existing genetics, species and ecosystem diversity and, if necessary, rejected or accepted with conditions.

As it is the case within the Water Framework Directive, maintenance activities are usually not seen as "project" as defined by the Habitats Directive. Thus, a full impact assessment is only necessary in exceptional cases[11]. However, if a maintenance measure might have a significant influence as regards the objectives of the Habitat Directive, an assessment has to be performed. In this case, basically the same (but strongly simplified) procedures apply as within a standard impact assessment. For further guidance on application of the Birds and Habitats Directives in navigation related activities, a reference is made to the Guidance Document on Inland Waterway Transport and Natura 2000[12], issued by the European Commission's Directorate-General for Environment in 2012.

Application of Joint Statement principles

In October 2007, a "Joint Statement on Inland Navigation and Environmental Sustainability in the Danube River Basin" was concluded by the ICPDR, the Danube Commission and the International Sava Commission. It is in essence aimed at finding the balance between good ecological status (as required by the WFD) and good navigation status (as required by article 15(3)b of the TEN-T guidelines).

The Joint Statement (...) "addresses, first of all, structural interventions and measures on rivers serving inland waterway transport; non-structural measures will also have to be undertaken to successfully upgrade and sustain inland waterway transport economically. (...) Full respect of the existing legal framework, including all relevant transport and environment legislation (national legislation, EU directives and international requirements), is a pre-condition for any activity in the Danube region."

Some of the most important principles included in the Joint Statement refer to the early **involvement of key stakeholders** and the **creation of a transparent planning process based on comprehensive data**. The Master Plan as such and the continuous update of national action plans have been also created for this reason.

In the years after 2007, the responsible government authorities and interest groups met regularly to discuss the progress achieved so far and how to improve the application of the Joint Statement in waterway projects. Activities on the Fairway Rehabilitation and Maintenance Master Plan have also been presented in the framework of these regular meetings, as well as in the context of the interdisciplinary PA1a Steering Group meetings of the European Union Strategy for the Danube Region.

The rehabilitation and maintenance measures and activities monitored within the context of the Master Plan (surveying, fairway relocation, dredging and better information) have the character of

[11] Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance Document No 20 on exemptions to the environmental objectives, European Communities, Luxembourg, 2009 , p.25
[12] http://ec.europa.eu/environment/nature/natura2000/management/docs/IWT_BHD_Guidelines.pdf

reversible interventions, as recommended by the Joint Statement. **Effects of measures are monitored and – if relevant – adapted** in the context of the national permitting processes. The overall effects of measures shall be summarised in the action plans at hand.

Lastly, the transboundary FAIRway Danube project and the EUSDR support the **use of best practice measures** to improve navigation through the established cooperation mechanisms between waterway administrations.

The FAIRway Danube project

The FAIRway Danube project (07/2015 – 06/2020) is the main overarching initiative to implement the activities of the Danube Fairway Master Plan. Seven project partners represent six riparian states (viadonau (Austria), SVP – Slovak Watermanagement Enterprise (Slovakia), OVF - Orszagos Vizugyi Foigazgatosag together with NDA - Nemezeti Infrastruktura Fejleszto Zrt. (Hungary), MMPI – Ministry of the Sea, Transport and Infrastructure (Croatia), EAEMDR - Executive Agency for Exploration and Maintenance of the Danube River (Bulgaria), AFDJ - Administration of the Lower Danube (Romania), ACN - Administration of the Navigable Canals (Romania)).

As a first step, FAIRway Danube coordinates the updates of the national action plans of the countries participating in the project. The remaining countries (Germany, Bosnia and Hercegovina, Serbia, Moldova and Ukraine) are invited to provide their contributions via the EU Strategy for the Danube Region (Priority Area 1a on Inland Waterways). The related country chapters are attached to this report as an Annex. Further activities within FAIRway Danube comprise:

- Outlining of pilot activities for hydrological services based on the national action plans
- Coordinated purchase of advanced equipment for hydrological services (gauging stations, surveying vessels etc.)
- Realization and Evaluation of pilot activities:
    - Basic data for all critical sections
    - Coherent monitoring scheme for the navigation status
    - Harmonised water level forecasts
    - Optimized relocation of the fairway
- Develop innovative approaches
- Prepare documentation for selected future implementation measures

The FAIRway budget amounts to 23.4 Mio €, including an EU co-financing (CEF) of 19.6 Mio €.

Adoption of action plans

The Action Plans are prepared within the FAIRway project. The FAIRway Steering Committee will be asked to approve the Action Plans for the countries participating in the project (Austria, Slovakia, Hungary, Croatia, Romania and Bulgaria) from a technical point of view. However, the Steering Group of PA1a remains the body responsible for final coordination and adoption of the Action Plans for all Danube riparian countries.

3 Synthesis and conclusions

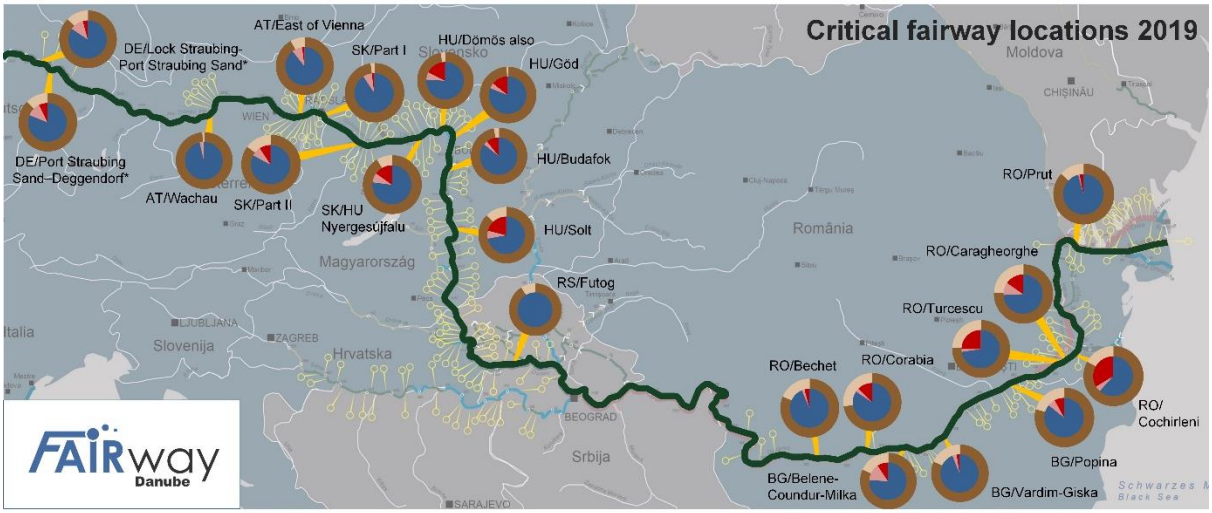
3.1 Fairway conditions

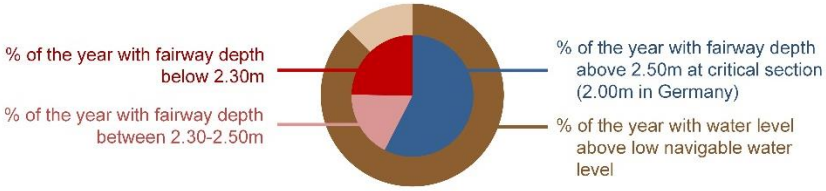
Fairway conditions were very favourable in in the first seven months of 2019 along the entire Danube. From **January until mid-July** minimum fairway depths were mostly exceeded on all parts of the Danube; water levels remained above Low Navigable Water Level (LNWL) for the entire period. Only at the Lower Danube (at the Romanian critical sector Cochirleni) some days with fairway depths below 2.5 m occurred in January, due to lower water levels in winter.
In the **beginning of August** water levels dropped rapidly and remained below or just slightly above Low Navigable Water Level until the end of the year, resulting in fairway depths below 2.50 m at several critical locations, particularly on the Central and Lower Danube.

It is noteworthy that **extensive maintenance dredging and fairway marking activities** at least prolonged the period of stable fairway conditions and significantly improved fairway availability during the low water season in summer, especially on the Lower Danube. In Romania and Bulgaria dredging works were carried out in several critical sectors in 2019, amongst others in Bechet (RO), Caragheorghe (RO), Cochirleni (RO), Vardim (BG) and Belene (BG). The most critical location was again Cochirleni (RO), where the minimum fairway depth of 2.50 m was not achieved for 93 days. In general, **the riparian states on the Lower Danube are closer to reaching the maintenance target.**

The figure below provides a **status overview of the main critical locations on the Danube in 2019**. Locations are only displayed if they showed a critical status in the reporting period. For each critical location, the **figure illustrates the situation as regards fairway availability (inner circle)** – i.e. the effectiveness of interventions by the waterway managers, **in relation to the water levels (outer circle)** – i.e. the given hydrological framework conditions that cannot be influenced by the waterway managers.

High water levels, measured at static gauging stations, do not automatically guarantee sufficient fairway depths over the fairway width which is required for navigation. Due to the intense dynamics in the free-flowing river sections, the morphology of the riverbed and thus fairway depth and/or width may change rapidly. Maintenance interventions are needed to provide the required fairway parameters under the given hydrological circumstances.





* In the free flowing section between Straubing and Vilshofen a fairway depth of 2.50m is neither developable nor maintainable. In this section the objective is to maintain the fairway depth of 2.00m related to Low Navigable Water Level. Depicted values in Germany therefore refer to 2.00m fairway depth.

The recommended **target** of the Fairway Rehabilitation and Maintenance Master Plan is to provide a **fairway depth exceeding 2.5 m**[13] **at least on as many days per year as show actual water levels equal to or above the statistical Low Navigable Water Level (LNWL)**[14]. *This situation would correspond to an equal share of the blue and the dark brown circle in the figure above.*

<u>Key facts displayed in the "Critical fairway locations 2019" figure</u> above:

The **recommended Level of Service of 2.50 m fairway depth**[17] at Low Navigable Water Level **could not be reached in some of the main critical locations** throughout the year 2019 (inner blue circle does not reach the level of the outer dark brown circle). Nevertheless, hydrological conditions were much more favourable in the first nine months of 2019 than in 2018 (smaller share of the light brown colour in the outer circle) resulting in increased fairway availability, compared to the previous year.

Riparian states especially on the Lower Danube are **closer to reaching the maintenance target** of providing 2.50 m fairway depth at Low Navigable Water Level, due to targeted dredging interventions conducted in 2018 and 2019.

In **some sections, fairway depths just slightly below 2.50 m could be provided for some days** (light red colour in the inner circle). In other locations the maintenance target was even overachieved.

[13] Or the respective target value relevant for the special section (e.g. 2.0 m in Straubing-Vilshofen on the German Danube)
[14] LNWL = the water level reached or exceeded at a Danube water gauge on an average of 94% of days in a year (i.e. on 343 days) over a reference period of several decades

Please note: **For detailed interpretation, the individual conditions of the critical sections and locations illustrated in the country chapters of the Action Plans need to be considered**, as the causes, detailed locations and severity of the critical sections are strongly varying. For example, some sections continuously provide fairway depths just slightly below 2.50m.

In addition, supporting measures like providing high quality information on the morphology of the critical section to skippers can improve navigability significantly, especially during low water periods.

In the next figure, the **fairway availability of critical locations in 2019 is compared with the previous years.** Locations are displayed if they had been identified as critical by waterway users in 2014 and if data for 2012–2018 was available. Analogous to the first figure, the targeted availability of 2.5m fairway depth[17] at Low Navigable Water Level would correspond to an *equal height of the blue/ green (availability of 2.5m fairway depth) and the grey (water level above Low Navigable Water Level) columns in the figure below.*

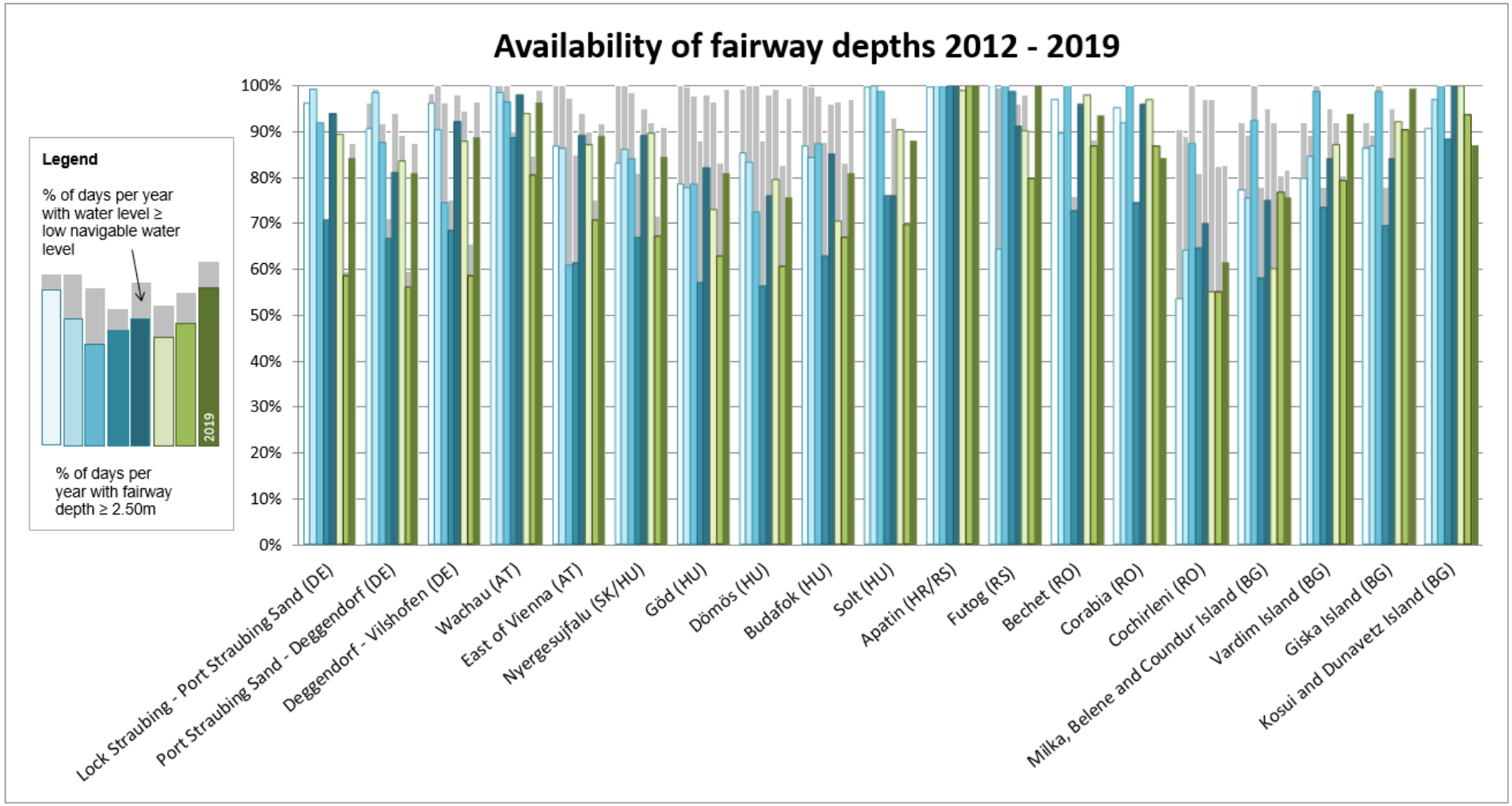
The fairway widths in the figure are minimum widths for minimum Levels of Service which were defined based on the usual traffic volumes on the respective sections.

Key facts illustrated in the "Fairway availability 2012–2018" figure on the next page:

Fairway availability varies quite intensely (predominantly dependent on hydrological conditions and implemented maintenance measures).

The figure clearly illustrates the (possible) gap between the available water levels and the actual fairway depths. The **sections for which the gap is the largest over the years show the biggest need for maintenance and/or rehabilitation interventions**. Highly critical locations in terms of maintenance and rehabilitation can be identified: the Hungarian Danube, the area around Milka/ Belene/Coundur (BG) and Cochirleni (RO). The section Straubing–Vilshofen (DE) is also critical in terms of navigation conditions. In some Danube sections, measures that go beyond maintenance and rehabilitation would have been required in order to reach the recommended Level of Service.

As already mentioned, it is important to take the depth classes close to 2.5m into account when interpreting this graphic, as these provide a certain range of navigability although not meeting the 2.5m threshold: 2.4m and 2.3m fairway depth was provided on 30 days East of Vienna, on 27 days at Nyergesújfalu, on 17 days in Cochirleni and on 54 days in the Belene/Milka/Coundur area.


Availability of fairway depths 2012 - 2019
Legend
% of days per year with water level ≥ low navigable water level
2019
% of days per year with fairway depth ≥ 2.50m
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Lock Straubing - Port Straubing Sand (DE)
Port Straubing Sand - Deggendorf (DE)
Deggendorf - Vilshofen (DE)
Wachau (AT)
East of Vienna (AT)
Nyergesujfalu (SK/HU)
Göd (HU)
Dömös (HU)
Budafok (HU)
Solt (HU)
Apatin (HR/RS)
Futog (RS)
Bechet (RO)
Corabia (RO)
Cochirleni (RO)
Milka, Belene and Coundur Island (BG)
Vardim Island (BG)
Giska Island (BG)
Kosui and Dunavetz Island (BG)

3.2 Expenditures and budgets for maintenance and rehabilitation

The good hydrological conditions in the first seven months of 2019 along with targeted maintenance and rehabilitation measures contributed to the achievement of the recommended Levels of Service in many critical sections. This was only possible due to sufficient respective operational budget being provided on a national level. In order to achieve better fairway conditions and to avoid critical situations in the coming years, the **continuation of targeted maintenance and rehabilitation measures has to be secured. Accordingly, necessary national operational budgets have to be secured and crucial investments have to be taken.**

Operational costs

The operational expenditures for the year 2019 and the required operational budgets for 2020 are of proportionate size in all countries**. It is noteworthy that no country is expecting financing gaps for the year 2020; all required operational budgets for the coming year are secured.** In Bulgaria over 4 Mn. EUR are earmarked for dredging works (for 3 years). For details on the operational budgets, please study the country sections.

	required operational budget 2019 (reported in May 2019)	operational expenditures 2019 (reported in May 2020)	required operational budget 2020	secured operational budget 2020	remaining financing gap 2020
AT	5 384 429	4 574 139	5 212 172	5 212 172	0
SK	2 088 000	1 755 435.28	1 551 406	1 551 406	0
HU	966 000	244 435	966 000	966 000	0
HR	1 183 000	1 131 000	1 183 000	1 183 000	0
RO (AFDJ and ACN)	17 520 267 (5 688 330 for locks)	13 196 991 (4 400 246 for locks)	15 095 059 (5 120 835 for locks)	15 095 059 (5 120 835 for locks)	0 (0 for locks)
BG	4 033 751	2 865 496	3 831 751	4 893 649	0

Investment costs

Considerable investments have been initiated in the last years since the launch of the Master Plan. The amount varies, with **Croatia, Romania and Bulgaria having satisfied more than half of the national investment needs declared in 2014. Hungary has invested significantly more than the investment needs declared in 2014.** Many of the investments were taken in the framework of the FAIRway Danube project and most of the available investment budget is based on EU co-financing.

	required investments 2014-2020 according to FRMMP	secured investment costs (state budget or other financing) and investments taken*	% thereof EU co-financed	remaining financing gap (% of required investment costs according to FRMMP)
AT	0	568 000	0%	0%
SK	8 080 000	1 989 200	84%	75.4%
HU	4 333 700	25 057 987	72.7%	1.3%**
HR	4 588 000	2 756 000	53.4%	48.3%
RO	41 058 000 (thereof locks: 400 000)	29 271 660 (thereof locks: 200 000)	41.8% (locks: 85%)	28.7% (locks: 50%)
BG	21 132 000	19 434 767	85%	24.7%

* Some countries have taken investments in areas not foreseen in the FRMMP. For detailed information please check the respective national action plan.
** An investment gap of 60 000 EUR remains for the provision of water level and forecast information as well as information on fairway depths.

Nevertheless, especially in Slovakia **major shares of the investment needs until 2020, as stated in the Master Plan, are not yet secured**. The national contributions via (co-)financing are sometimes not sufficient.

3.3 Environmental impacts

According to the Danube River Basin Management Plan 2015 by the International Commission for Protection of the Danube River (ICPDR), the majority of the Danube is classified as heavily modified water body with moderate or worse ecological potential. In order to achieve good ecological potential and status (natural water bodies) as required by the Water Framework Directive, an **integrated planning approach is applied in the Danube countries** as regards navigational maintenance and rehabilitation measures. Information on environmental measures and legal permits related to dredging interventions is provided in the country chapters.

4 Austria

viadonau– Österreichische Wasserstraßen-Gesellschaft mbH (state owned) is responsible for fairway maintenance, rehabilitation and upgrade.

4.1 AT | Status report on main critical locations including water level information 2012 – 2019

The **recommended Level of Service of 2.5m fairway depth at Low Navigable Water Level** would correspond to an equal height of the blue columns (availability of 2.5m fairway depth) and the white columns framed in blue (water level equal to or above Low Navigable Water Level) in the figures below.
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

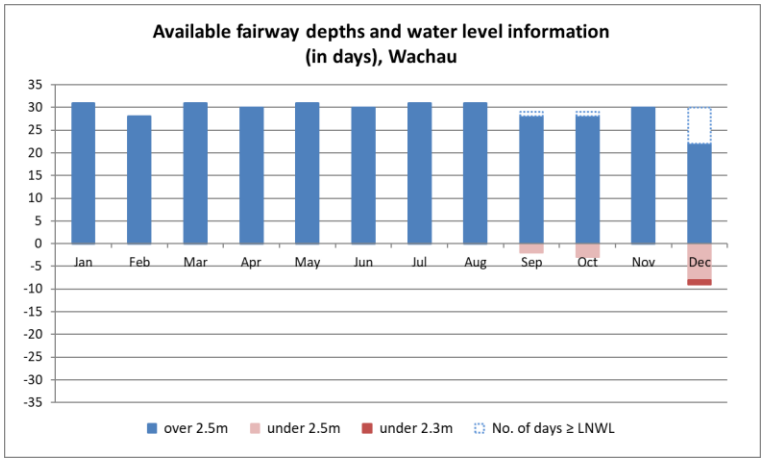
Number of days with fairway depths ≥ 2.50m on main critical locations *for a fairway width according to Level of Service 1 (40 - 80m)*

Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Wachau	366	359	352	323	359	342	294	352
East of Vienna	318	315	222	224	326	317	258	326

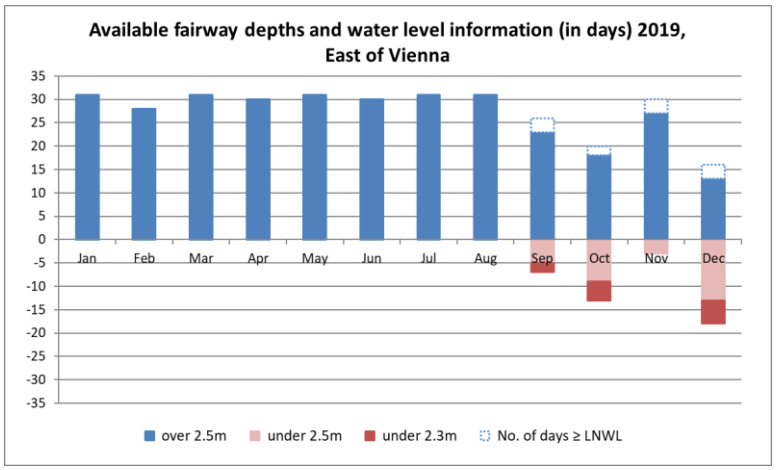
Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Wachau	Kienstock + Dürnstein	366	365	365	330	355	341	309	361
East of Vienna	Wildungsmauer + Thebener-straßl	366	365	355	310	343	328	274	335

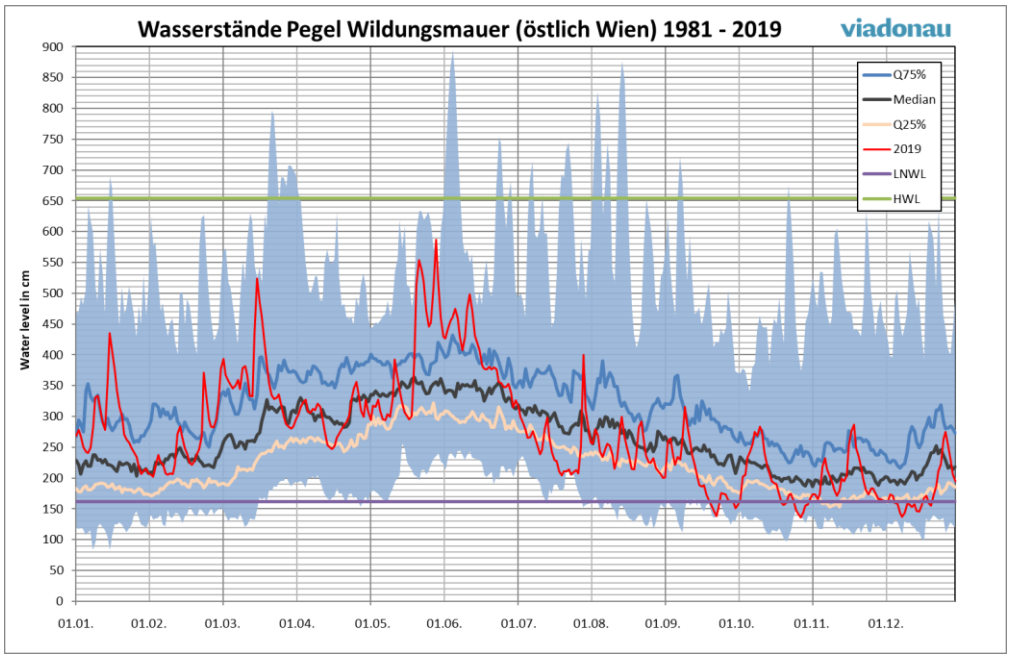
**Note from hydrological department: Data is operational data and can be subject to change.*



In the first nine months of 2019 the Austrian Danube saw extremely good hydrological conditions and fairway depths above 2.5m for almost the entire period. In the second half of September water levels dropped, resulting in several days on which fairway depths of 2.5m could not be reached (East of Vienna).



4.2 AT | Hydrological conditions at main critical locations 2019



** This data is preliminary raw data and may be subjected to change.*

In the first nine months of 2019, hydrological conditions were very favourable until the second half of September, when water levels dropped below LNWL for four days (East of Vienna). In October, November and December several days with water levels below LNWL occurred.

4.3 AT | Key issues and related activities 2019

Related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014) and last updated in October 2017:

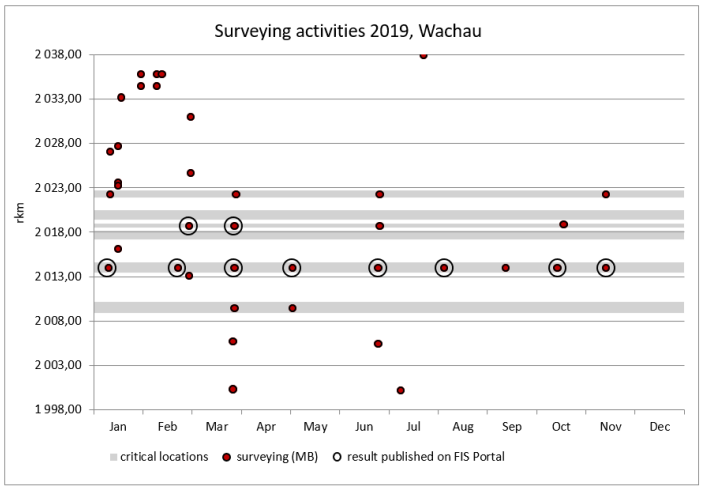
	Key issues	*Need for action*	*Activities performed 2019*
AT 01	Maintaining water level measurements during extreme weather events	Establishment of back-up energy supply systems at automatic gauging stations	*Key issue resolved, no new information.*
AT 03	Limited flexibility and limited dredging capacity on the market due to small number of dredging service providers	Support opening-up of limited market for dredging activities	*Multi-annual framework contract for dredging services with contractors in force since August 2015.*
AT04	High expenditures for maintenance dredging especially in the shallow sections East of Vienna	Implementation of structural, hydraulic engineering works such as groynes	*The shallow section Rote Werd was optimised in March 2018. Since then, in 2019 only one maintenance dredging had to be performed in this area.* *In autumn 2019 the ford Regelsbrunn was optimised. On the left bank a gravel island was established. The aim is to reduce the necessary maintenance dredging in this area of the fairway.*
AT05	Providing proper and up-to-date user information on available fairway depths in critical sectors	Display of recent surveying results of shallow sections in a differentiated manner	*Designation and display of "deep navigation channel" **(equivalent to the Level of Service 1)** within the existing fairway and integration in the published maps (finalised).*

4.4 AT | Review of monitoring, rehabilitation and maintenance activities 2019

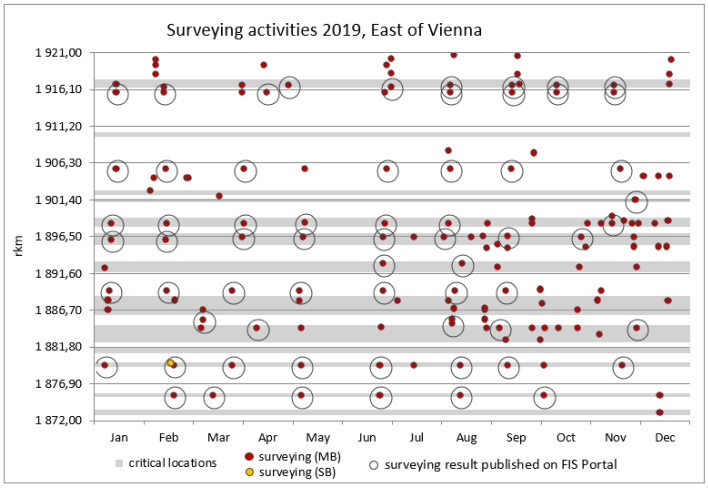
The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical locations as itemised in the Rehabilitation and Maintenance Master Plan (version December 2014) was last updated in September 2017.

Riverbed surveying activities 2019

In 2019, the following hydrographic surveys were carried out according to the surveying plan.



Survey results were published on the FIS Portal mainly for the worst critical location Weißenkirchen (rkm 2013.50 – 2014.60).



In the Danube section east of Vienna the most critical locations Regelsbrunn, Rote Werd and Treuschütt were surveyed roughly once per month and survey results published for user information purposes. The new critical location Lobau at rkm 1916.30 – 1917.50 was also monitored intensively and survey results were presented to the waterway users on the FIS Portal.

Fairway marking activities 2019

Due to the very limited cross-section of the Austrian stretch of the Danube, fairway relocation is usually no significant option for fairway maintenance at viadonau. In July 2017 the amendment of the Waterway Act (Wasserstraßengesetz) entered into force which transfers all fairway marking responsibilities (water- and landside fairway marking) from the Austrian Supreme Navigation Authority (“Oberste Schifffahrtsbehörde - OSB”) to viadonau. The Supreme Navigation Authority still conducts weekly monitoring tours and in case navigation signs are missing or should be relocated,

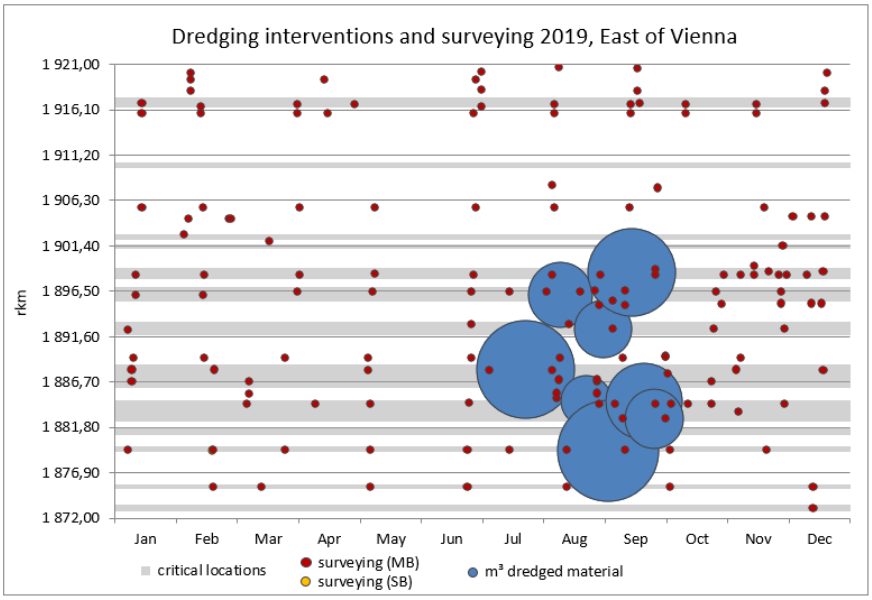
this information is registered in the Austrian marking database. viadonau then implements the required changes along the fairway. As of 2018, viadonau implements fairway marking and relocation on the Austrian Danube with modernised equipment. For that purpose, a marking vessel and new buoys for the entire Austrian stretch were purchased in 2017. By February 2018, all buoys were exchanged for new ones. The pilot phase for the remote control of the buoys' positioning by means of satellite positioning is still ongoing (all buoys are equipped with respective modules).
In August 2019 fairway widths were reduced in some locations to 100m. These changes were also published in the IENCs.

Dredging activities 2019

Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m³	Permits (see next table)
	from river-km	to river-km	from river-km	to river-km						
Treuschütt I (ford and sediment trap)	1888.38	1887.70	1908.18	1907.90	15.07.2019	01.08.2019	Gravel	Dumping	21972.67	2
Rote Werd (ford)	1896.33	1895.88	1896.33	1895.84	05.08.2019	14.08.2019	Gravel	Creation of island	9652.19	1
Aschach lock (access to lock)	2162.60	2162.25	2162.20	2162.00	12.08.2019	12.08.2019	Fine sediment	Dumping	551.70	3
Ottensheim lock (access to lock)	2146.69	2146.25	2146.40	2146.00	13.08.2019	14.08.2019	Fine sediment	Dumping	2476.10	4
Wallsee lock (access to lock)	2094.45	2093.95	2094.00	2093.65	19.08.2019	21.08.2019	Fine sediment	Dumping	7709.10	5
Hainburg I (ford)	1884.85	1884.55	1895.70	1894.50	19.08.2019	26.08.2019	Gravel	Dumping	6054.80	1
Wendeplatz Theben (ford)	1879.60	1879.09	1895.70	1895.15	26.08.2019	09.09.2019	Gravel	Dumping	23612.57	1
Petronell-Witzelsdorf (ford)	1892.98	1891.95	1895.70	1895.45	27.08.2019	03.09.2019	Gravel	Dumping	7689.21	1
Regelsbrunn (ford)	1898.98	1898.00	1908.00	1907.50	04.09.2019	24.09.2019	Gravel	Dumping	17570.34	1
Hainburg II (ford)	1884.93	1884.32	1899.23	1898.75	16.09.2019	24.09.2019	Gravel	Dumping	13420.47	1
Röthelstein (lateral sedimentation)	1882.98	1882.50	1889.70	1889.30	24.09.2019	26.09.2019	Gravel	Dumping	8087.85	1

Referenced and relevant permits	Title of permit (original language)	Permitting authority	Permit applicable		Valid until	Type of permit (e.g. environmental, water, navigation law)	Main conditions for permit
			from river-km	to river-km			
1	WSD – generelles Projekt "Regulierungsmaßnahmen zur Verbesserung der Schiffahrtsverhältnisse auf der Donau stromab des KW Freudenau"	Federal Ministry for Agriculture, Forestry, Environment and Water Management	1910.00	1872.70	21/03/2099	Water Law	• A maximum of 50 % of dredged gravel may be used for structuring measures (river banks, islands), the rest is to be dumped into the river • After high waters sediment in ford areas has to be removed as fast as possible at a width of 80/100 m • As far as possible, ecological aspects shall be accounted for when planning single measures • Dredging measures shall be kept to a minimum
2	Geschiebefang in der Furt Treuschütt	Administrative District Authority Bruck an der Leitha	1888.35	1887.70	30/04/2027	Water Law, Navigation Law, Nature Conservation Law	• Establishment of ecological construction supervision and hydraulic construction supervision, drafting 5-annual monitoring reports. Final report after 10 years • Monitoring the return rates in the sediment trap • Safety distance to the gravel lower edge of at least 2.50 m • Avoiding a bottom punch
3	Donaukraftwerk Aschach	Federal Ministry for Agriculture and Forestry	2163.40	2161.80	31/12/2050	Water Law, Navigation Law, Nature Conservation Law	• Dredging measures are to be performed in due time in order to prevent negative effects on navigation due to sedimentation
4	Donaukraftwerk Ottensheim-Wilhering	Federal Ministry for Agriculture and Forestry	2147.60	2145.85	31/12/2059	Water Law, Navigation Law, Nature Conservation Law	• Dredging measures are to be performed in due time in order to prevent negative effects on navigation due to sedimentation
5	Donaukraftwerk Wallsee-Mitterkirchen	Federal Ministry for Agriculture and Forestry	2096.50	2093.65	31/12/2055	Water Law, Navigation Law, Nature Conservation Law	• Dredging measures are to be performed in due time in order to prevent negative effects on navigation due to sedimentation

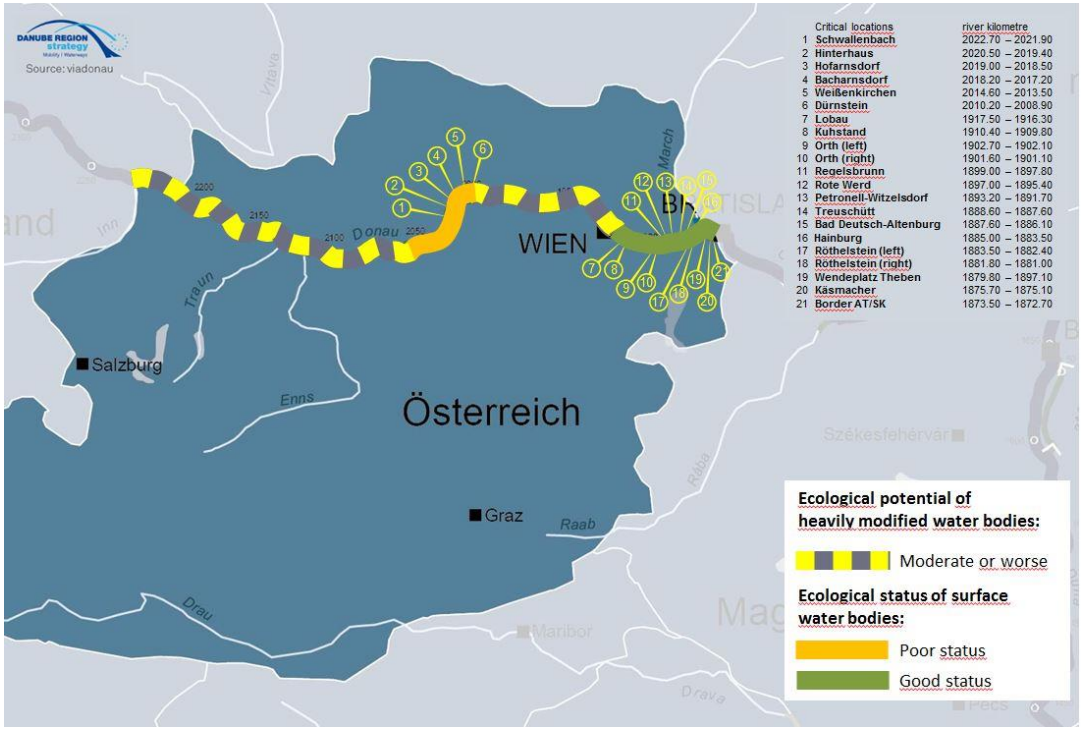
In the period 2019, 118 797 m³ were dredged for commercial navigation. The dredging interventions are reported in combination with the surveying activities. This illustrates the strong dependency of dredging works on up-to-date surveying results. Prior to, during and after dredging works the respective critical locations were surveyed in addition to the regular surveying tours.
In the section east of Vienna smaller dredging works were carried out at the most critical fords. At the ford Treuschütt (rkm 1888.35 – 1887.70), about 21,973 m³ were dredged at the ford and excavated from the bed load trap.



4.5 AT | Summary of current ecological status and environmental impacts

The main stretch of the Austrian Danube is declared as “Heavily modified water bodies – Final Designation” according to the Water Framework Directive. The only two exceptions pertain to the free-flowing sections in the Wachau and the section to the east of Vienna. These two sections are designated as “Natural water bodies”.

The following map displays the ecological status and ecological potential of the Austrian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Austria.

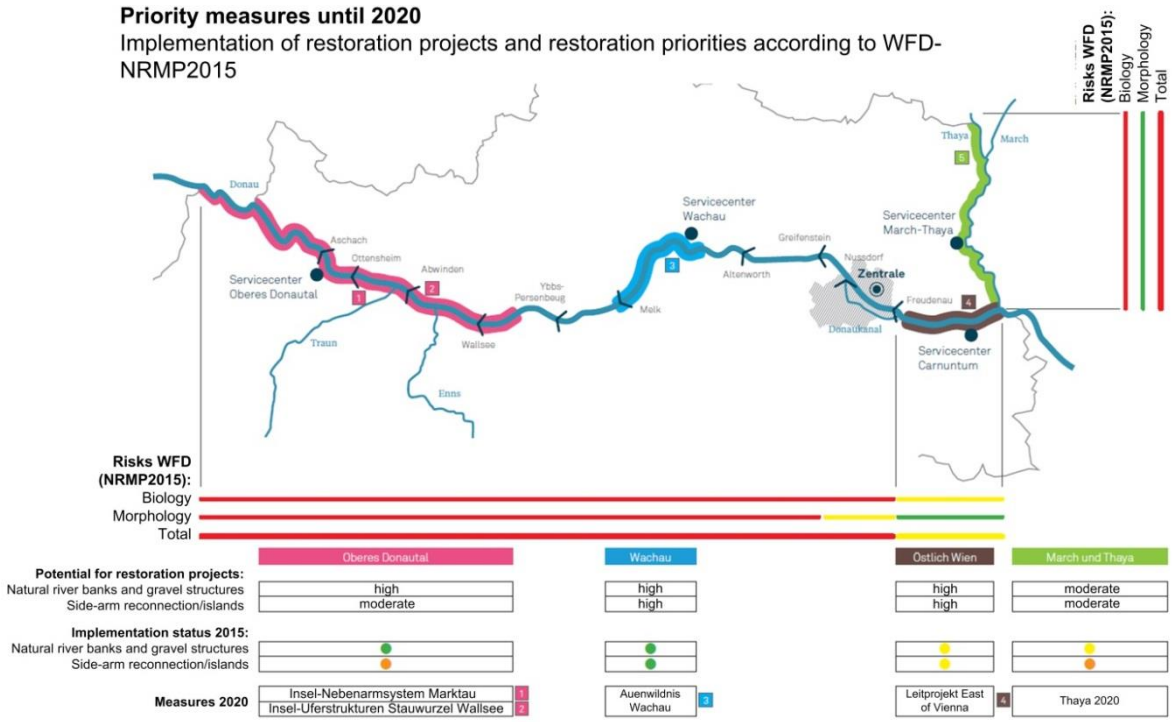


Ecological status and ecological potential of surface water bodies
(Source: DRBM Plan – Update 2015)

The designation as heavily modified water body of main parts of the Danube is mainly attributed to barrages for hydropower generation within the draft national water management plan for Austria (2015), whereas the attainment of good ecological status is considered to be achieved to the east of Vienna. Good ecological status is estimated to be achievable and possible in the Wachau, whereas good status is already achieved east of Vienna. For the heavily modified water bodies measures are to be implemented for the achievement of the good ecological potential.

Measures to improve environmental conditions

A significant number of measures have already been taken between 2009 and 2015 to improve river continuity, reconnecting wetlands/floodplains and hydrological alterations like impoundments, ensuring ecological flows. Structural projects to improve the ecological status and ecological potential of the Danube in Austria and priorities are displayed on the map below.



As explained by the draft national water management plan for Austria (2015):

- "The Austrian Danube is characterised by a chain of hydropower plants affecting the sediment regime of the Danube. One of the two free flowing sections left is between Vienna (downstream of hydropower plant Freudenau) and the Austrian-Slovakian border where the character of a mountain river is still maintained. This river section shows an ongoing erosion of the riverbed at an average rate of 2.0 to 3.5 cm per year. The decreasing water tables of the Danube and of the associated groundwater seriously affect and endanger the ecology

of the floodplains in the "Donau-Auen National Park". In addition, inadequate and seasonally strongly fluctuating fairway depths in this section of the river substantially affect navigation."

- "The *Integrated River Engineering Project on the Danube to the East of Vienna* was launched to improve the hydromorphology of the river and ecology of the floodplains (in line with equivalent levels of flood protection) as well as to improve the fairway conditions in this section of the Danube. The main measures are i) the granulometric improvement of the river bed to provide long-term stabilisation of the river bed and of groundwater conditions; ii) restoring lateral connectivity and removing parts of the river bank for long-term stabilisation of the ecological conditions in the National Park "Donau-Auen"; and iii) innovative low water regulation measures which improve fairway conditions for navigation." The pilot project phase is already concluded; the new *"Catalogue of Measures for the Danube east of Vienna"* provides the framework for further activities in the free flowing section east of Vienna. Further information on the project is provided on the project's website: http://www.viadonau.org/en/.

Navigation maintenance measures and environmental impacts

Maintenance works are executed in the framework of navigation law (Wasserstraßengesetz BGBl. I Nr.177/2004), water law (Grundsatzgenehmigungsbescheid "Regulierungsmaßnahmen zur Verbesserung der Schifffahrtsverhältnisse auf der Donau stromab des KW Freudenau" of 14th August 2003) and the National Park Act (BGBl. I Nr. 17/1999).

By the end of 2015 a general permit was obtained for carrying out maintenance activities outside of the central fairway east of Vienna for a period of 5 years. The project study, which provided the basis for the permit "Erhaltungsmaßnahmen außerhalb der zentralen Fahrrinne östlich von Wien auf dem Gebiet des Nationalparks Donau-Auen – Strom-km 1915.00 bis 1880.00" was developed in close cooperation with involved key stakeholders. The project study systematically analyses the impacts of maintenance activities on natural species, taking into account opinions drawn up by official experts on nature conservation and water ecology.

4.6 AT | Budget status February 2020

Investments taken for FRMMP implementation 2014 – 2019

Need areas	Required investments 2014 – 2020 according to FRMMP	Secured investment costs (state budget or other financing) and investments taken	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	0	0	0	0
Surveying of the riverbed	0	0	0	0
Water level gauges	0	0	0	0
Marking of the fairway	0	568 000[1]	0%	0
Availability of locks / lock chambers	0	0	0	0
Information on water levels and forecasts	0	0	0	0
Information on fairway depths	0	0	0	0
Information on marking plans	0	0	0	0
Meteorological information	0	0	0	0
Other needs	0	0	0	0
Sum (Euro)	**0**	**568 000**	**0%**	**0**

[1] Costs for the new marking craft which was purchased and put into operation in August 2017.

Operational expenditures for conducted activities 2019 and budget needs 2020

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	1 966 859[1]	2 364 006[2]	2 364 006[2]	0
Surveying of the riverbed	773 311	940 288	940 288	0
Water level gauges	971 464	1 040 779	1 040 779	0
Marking of the fairway	711 446	753 125	753 125	0
Availability of locks / lock chambers[3]	-	-	-	-
Information on water levels and forecasts	151 059	113 974	113 974	0
Information on fairway depths[4]	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
Sum (Euro)	**4 574 139**	**5 212 172**	**5 212 172**	**0**

[1] This amount includes only dredging expenditures, not the additional expenditures of 2 327 290 EUR resulting from dumping the excavated material further upstream. The dredging expenditures are significantly lower than in past years, due to the positive impact of river engineering measures east of Vienna.
[2] Only dredging budget. Additional 1 119 517 EUR are available for costs resulting from the dumping of excavated material further upstream.
[3] In Austria, the Verbund Hydropower AG is responsible for maintaining the lock infrastructure (revisions). viadonau has no expenditures in this area.
[4] Information on fairway depths is provided on the DoRIS website (http://www.doris.bmvit.gv.at/) and the DoRIS mobile App. Since many other services are provided as well (e.g. bridge clearance), the expenditures and budget needs for information on fairway depths cannot be displayed separately.

4.7 AT | Outlook: actions, milestones and funding sources

AT 03: Limited dredging market		
Conducted activities:	Europe-wide tendering or dredging contracts in order to attract additional tenderers, e.g. from Germany, the Netherlands or Slovakia etc. Feasibility of purchasing a dredging pontoon for in-house use in "emergency cases". In order to cut down on reaction times and procedures, a multi-annual framework contract was prepared and Europe-wide tendering took place in spring 2015.	
Current shortcomings:	According to public procurement law, contract must be awarded to tenderer with lowest prices; problem in cases of parallel actions (several critical sectors to be dredged at once) if in both cases the same tenderer is awarded (bottleneck = equipment)	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: Sufficient funding is available through national/company budgets	
Next steps:	see description of conducted activities	in force since August 2015
AT 04: High expenditures for maintenance dredging		
Planned activities:	Optimisation of the last major ford area in the entire Austrian Danube stretch: ford Regelsbrunn in 2019/2020	
Current shortcomings:	Insufficient fairway parameters in shallow sections east of Vienna during low water periods	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No negative impacts to be expected, since possible environmental impacts are taken into account during the planning phase: The **Catalogue of Measures for the Danube east of Vienna** covers a multitude of river engineering measures in the free flowing section east of Vienna. The measures are designed to stabilize the decrease in water levels, preserve the unique habitats of the Danube floodplains and create a waterway
	Which measures are taken to mitigate these impacts?	

		infrastructure that fulfils the requirements of safe and economic navigation.
	Is water status still expected to deteriorate?	No
Possible funding:	Budget availability 2019/2020: Sufficient funding is available through national/company budgets	
Next steps:	Planning and preparatory work for many individual measures listed in the Catalogue of Measures are in progress	Optimisation until 2020

5 Slovakia

SVP - Slovak Water Management Enterprise (state owned) is responsible for fairway maintenance, rehabilitation and upgrade.

SHMÚ - Slovak Hydrometeorological Institute (state owned) is responsible for hydrological data.

5.1 SK | Status report on main critical locations including water level information 2012 – 2019

For the Slovak section of the Danube (common AT-SK, national, common SK-HU), the main critical locations are stretches rkm 1880 - 1863 with reference gauge station in Devin, rkm 1810 – 1785 with reference gauge station Medvedov and rkm 1765 – 1710 with reference gauge station in Sturovo. The most critical section on the entire Slovak stretch of Danube regarding the available width and depth is on rkm 1735.5 – 1733.7 (Cenkov = Nyergesujfalu) which is situated on common SK-HU stretch of the Danube.

The **recommended Level of Service of 2.5m fairway depth at Low Navigable Water Level** would correspond to an equal height of the blue columns (availability of 2.5m fairway depth) and the white columns framed in blue (water level equal to or above Low Navigable Water Level) in the figures below.
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

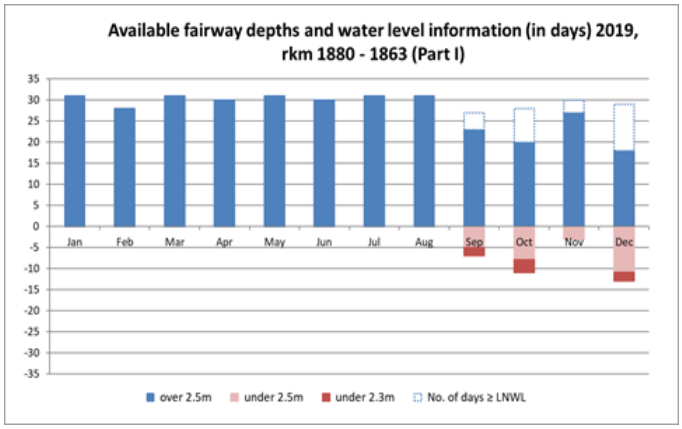
Number of days with fairway depths ≥ 2.5m on main critical locations *for a fairway width according to Level of Service 1 (targeted minimum fairway widths are 60 to 100 m in Slovakia; on the Slovakian-Hungarian border section, on the Slovakian-Austrian section it is 40 to 80 m)*

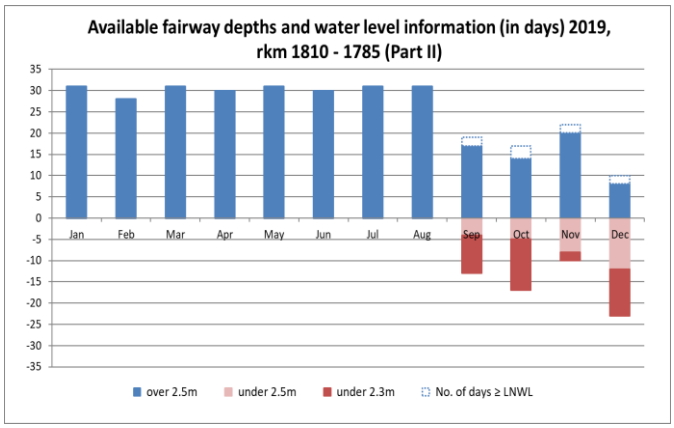
Critical location	2012	2013	2014	2015	2016	2017	2018	2019
part I. (rkm 1880 – 1863)	366	365	365	287	310	304	254	331
part II. (rkm 1810 – 1785)	360	341	359	307	338	324	236	302
part III. (rkm 1765 – 1710) including Nyergesújfalu	303	324	300	223	319	303	224	281

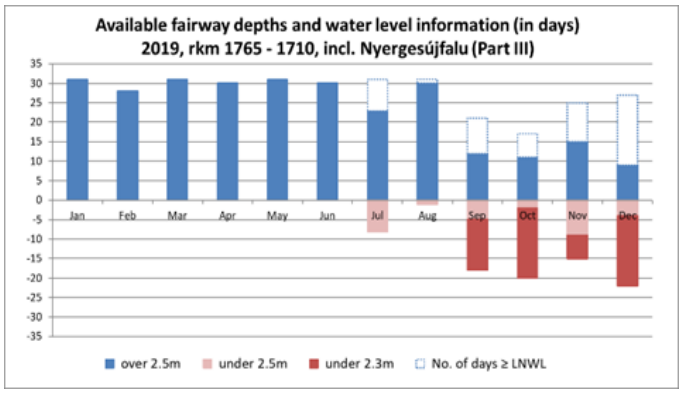
Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauge	2012	2013	2014	2015	2016	2017	2018	2019
part I. (rkm 1880 – 1863)	Devin	366	362	349	294	345	340	324	357
part II. (rkm 1810 – 1785)	Medvedov / Gonyu	366	362	348	259	325	326	252	311
part III. (rkm 1765 – 1710) including Nyergesújfalu	Sturovo / Komarom	319	334	292	288	353	332	259	333

In 2019, for all three measured sections, part I. (rkm 1880 – 1863) fairway depth of 2.5 m and more were realised on 331 days (90.7%), for part II. (rkm 1810 – 1785) on 302 days (82.7 %) and for part III. (rkm 1765 – 1710) on 281 days (77 %).



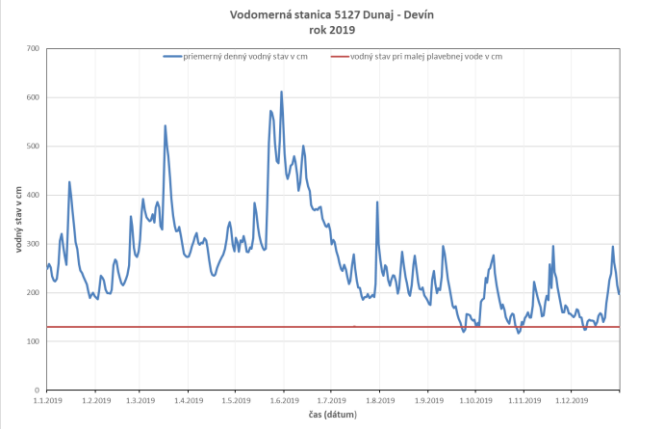


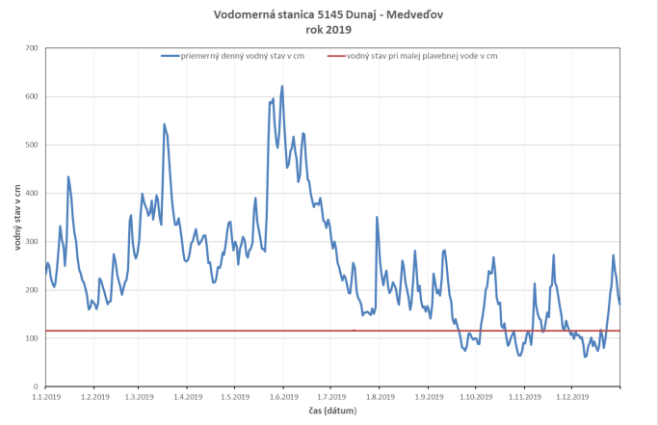


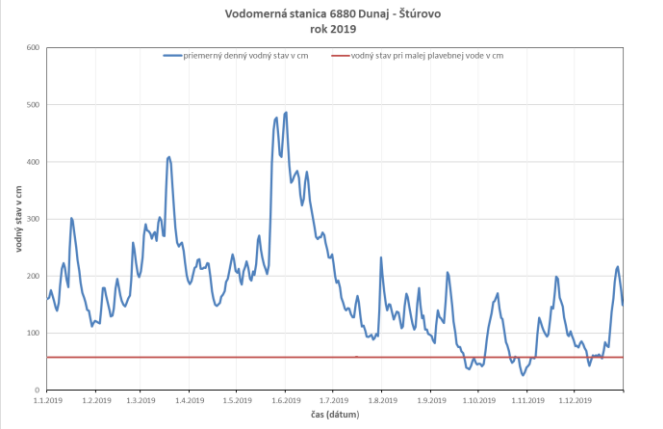
In part II., at the most critical section at rkm 1792.10 – 1791.60 – Klížska Nemá 1, fairway depths were below 2.3 m on 34 days. In part III., at the most critical section at rkm 1735.50 – 1733.70 – Čenkov (in HU language Nyerge-sujfalu) fairway depths were below 2.3 m on 55 days.

The main reasons for not meeting the Level of Service and availability of 2.5m depth, except for adverse hydrological conditions, is that on Part II. and Part III. the river bottom is from stone (stony riverbed or stony threshold – rocky bottom) which is actually not possible to remove via currently used technology for dredging (maybe detonation and removing of the stone after that). In Part I. the regular dredging intervention was done according to plan.

5.2 SK | Hydrological conditions at main critical locations 2019







In January and February 2019, the hydrological conditions were a little bit worse compared to the same period of last year, but still water levels were above LNWL. In March 2019, the situation was better that last year in the same period. From April to mid-September the situation was constant, except for the period end-May to end June, when water levels were a bit higher. In the second half of September water levels dropped below LNWL and after that event increased and this scenario was being repeated regularly until the end of year (drop down-increase). Also, this scenario has an influence on the fact that major appearance of critical stretches (see critical locations charts) were in the last 4 months of 2019.

In 2019, the number of days with water levels ≥ LNWL on critical locations were:

part I. (rkm 1880 – 1863) Devin ->	357 days of 365 days
part II. (rkm 1810 – 1785) Medvedov / Gonyu ->	311 days of 365 days
part III. (rkm 1765 – 1710) including Nyergesújfalu ->	333 days of 365 days

5.3 SK | Key issues and related activities 2019

Related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014):

	Key issues	*Need for action*	*Activities performed 2019*
SK 01	Level of detail of monitoring data is suboptimal for exact and cost-effective planning of dredging interventions	Support acquisition of up-to-date multi-beam sounding vessels, equipment and software	*Pilot operation (accompanied by technical problems on the new surveying vessel, but primarily marking vessel).*
SK 02	Out-of-date information technology, missing database for monitoring data	Support establishment of Fairway Management System	*Finalizing of WAMS specification, WAMS public tender launched and completed, documentation submitted for control to the Ministry of Transport and Construction of the Slovak Republic.*
SK 03	Insufficient number of skilled staff to monitor the fairway	Secure education and provision of well-trained staff in the short, medium and long term	*Staff trainings completed, continuation of pilot operation.*
SK 04	Different departments performing the monitoring as an impediment to efficient planning	Support coordination of interfaces and establishment of common database for planning of interventions	*Common database will secure better harmonisation of the performing of the monitoring activities - implementation of the national WAMS database (within the FAIRway Danube project), WAMS specification was finalized, realized public procurement, documentation submitted for control to the Ministry of Transport and Construction of the SR.*
SK 05	Different coordinate systems used for measurements in border stretches as an impediment to efficient planning	Support cross-border harmonisation of monitoring standards	*Harmonization via transboundary water commissions ongoing, exchange processes and data format agreed, cooperation works.*
SK 06	Old and dredging and marking fleet and equipment	Support acquisition of up-to-date dredging and marking vessels and equipment	*Marking vessel:* *delivery in May 2019* *The marking vessel was constructed during 2018/2019; process of transfer of this vessel through the Ministry of Transport to the end user - Slovak Watermanagement Enterprise (SVP) was done.*
SK 07	Lack of staff and resulting missing flexibility in case of urgencies (related to dredging activities)	Secure education and provision of well-trained staff in the short, medium and long term	*No developments.*

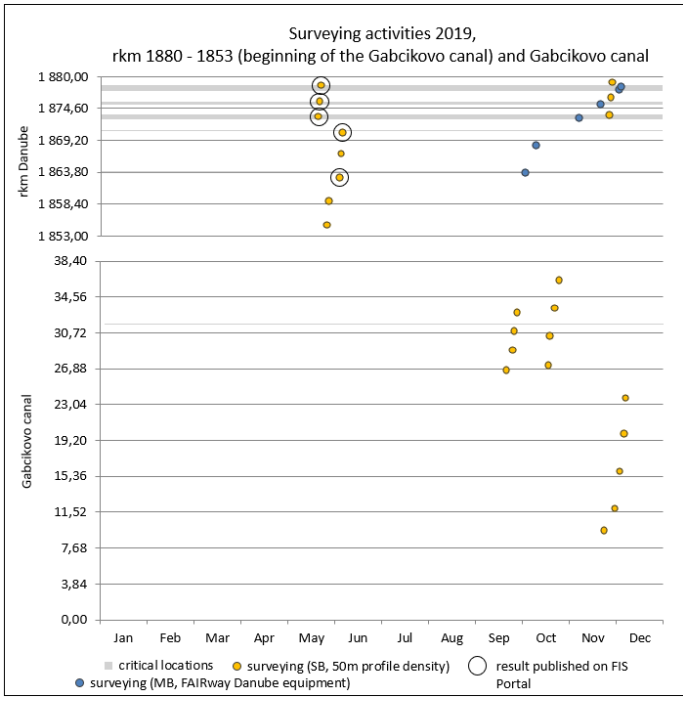
SK 08	Frequent need to adjust fairway marking as substitution for dredging activities	Support implementation of semi-automated marking plans based on a common Fairway Management System	*Fairway marking done on weekly basis, dredging performance done according to the plan (Project of Dredging – internal material).*

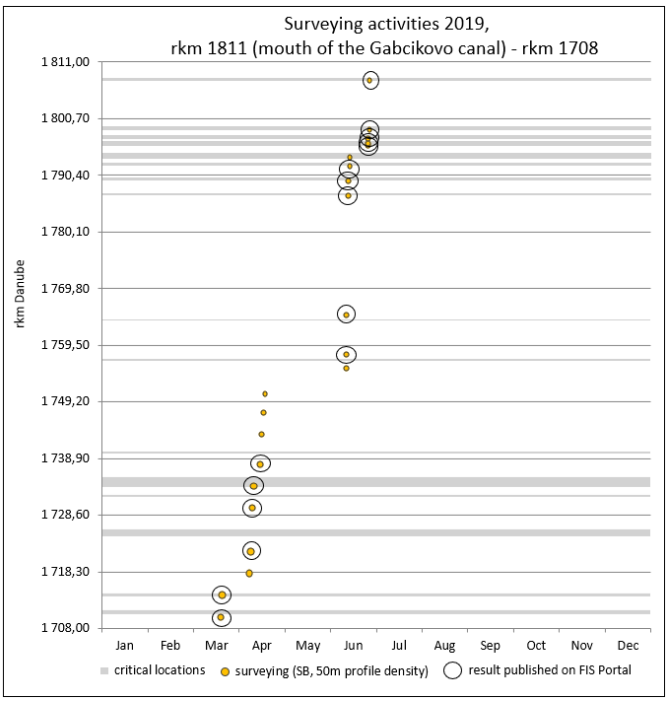
5.4 SK | Review of monitoring, rehabilitation and maintenance activities 2019

The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical locations as itemised in the Rehabilitation and Maintenance Master Plan (version December 2014) was last updated in September 2017.

Riverbed surveying activities 2019

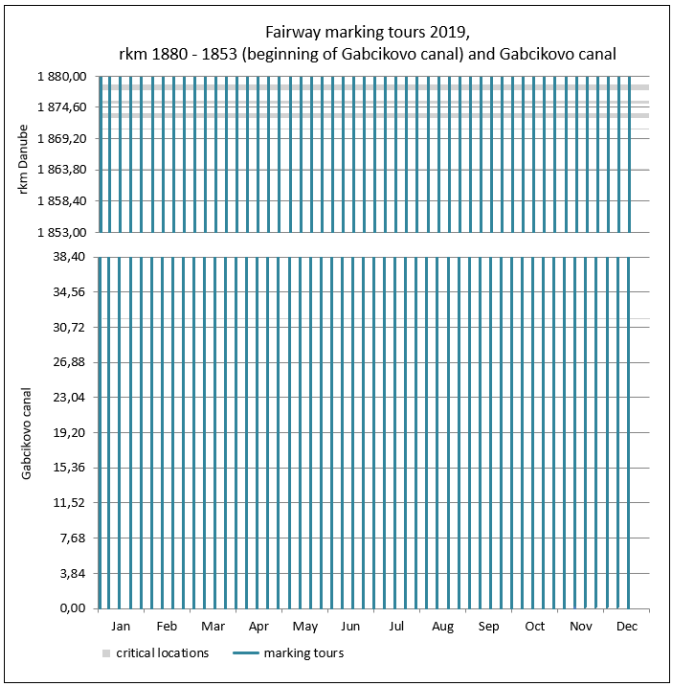
The following riverbed surveying activities took place according to the annual procedure. Critical locations are monitored within the yearly measurement of the entire Slovakian stretch, but since 2015 SVP is performing extra measurements of the critical sections besides the entire stretch measurement. Surveying is conducted with a single-beam echo-sounder; the profiles are 50m apart. Surveying in 2019 was conducted according to the plan for 2019, starting in March (with SB), since the beginning of September also with MB, so both surveying vessels (SB & MB) are in operation.

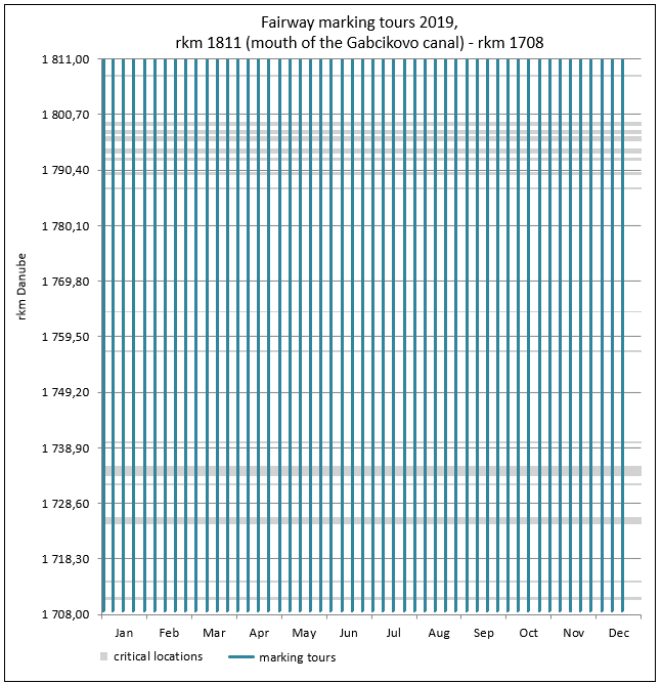




Fairway marking activities 2019

The fairway marking is done on a weekly basis in Slovakia based on the approved Project of the Marking of the fairway. The marking vessel is also equipped with an echo-sounder, so the marking tours also serve as quick checks of the fairway. Nevertheless, data is not post-processed but used solely for the purpose of marking. Changes of the fairway have not been done in 2019, only the minor changes were realised by the marking vessels staff with movement of the buoys based on actual water level condition (entire stretch).





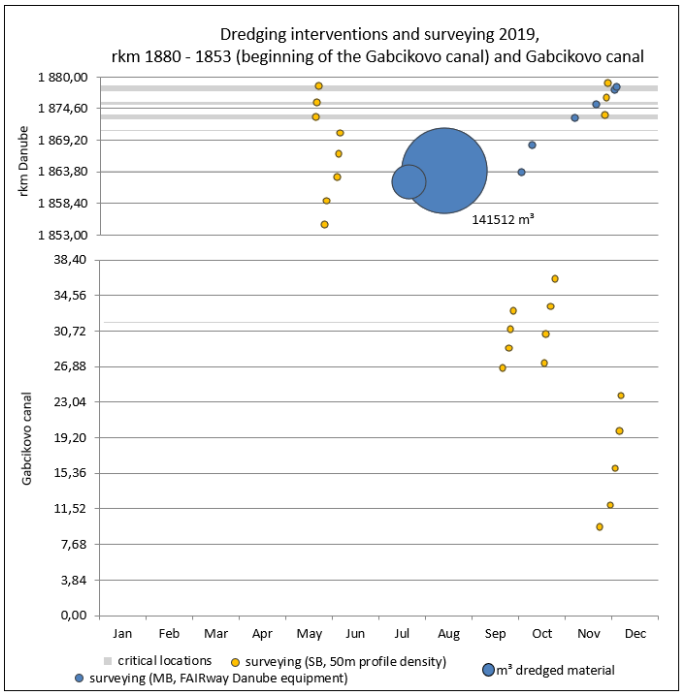
Dredging activities 2019

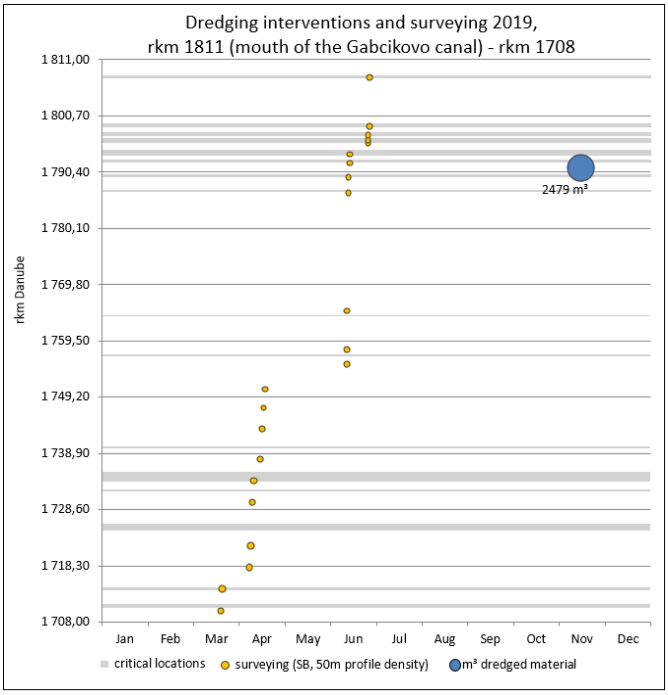
SVP is doing the maintenance of the fairway based on the parameters of the fairway which have to be guaranteed, width of the fairway on rkm 1790 -1880 is 120m (depth 2.5m + 0.2m) and on rkm 1790 – 1709.8 is 150m (depth 2.8m + 0.2m).

In total, 167 440 m³ were dredged for commercial navigation in 2019. All bottlenecks were permanently monitored during the mentioned period. Dredging at rkm 1864.70 – 1863.00 took place from mid-April until mid of December (141 512 m³), at rkm 1863.00 – 1861.00 from mid of April until end of October (23 449 m³) and at rkm 1791.50 – 1791.30 from 11th until 18th of November (2 479 m³).

SVP is according to the Act No. 338/2000 Coll. on Inland Navigation the only enterprise which is authorized and responsible to perform fairway marking and works related to marking (dredging included). Thus, only a permission from the Transport Authority is needed, who publishes navigation notices for the time period which is needed for dredging works. These notices ensure navigation safety and are published on the website of the Transport Authority.

The Slovak Ministry of Environment approves the „Plan of dredging works“ for one year. In case that the dredged material is stored on the banks near the Danube and the places are in a protected area, permissions from relevant organisations are needed in addition

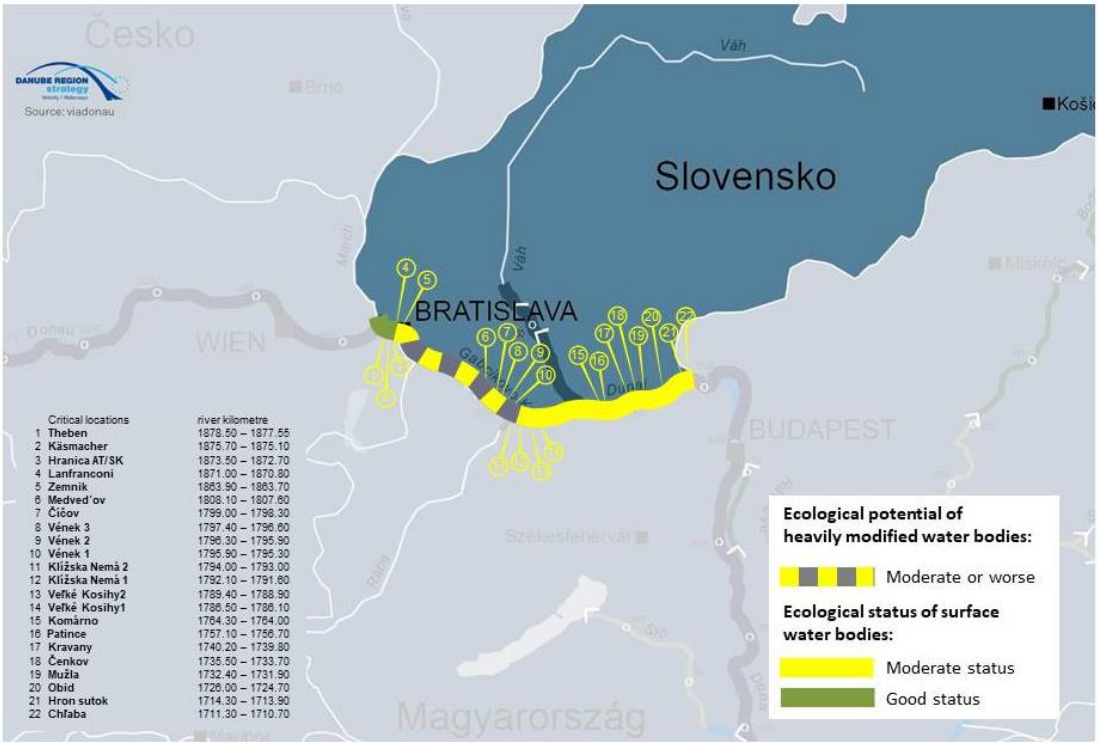




5.5 SK | Summary of current ecological status and environmental impacts

The Danube river stretch is in the Slovak Republic divided into four surface water bodies, two of them have been designated as heavily modified water bodies and two as natural water bodies and three of mentioned water bodies are transboundary.

The following map displays the ecological status and ecological potential of the Slovakian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Slovakia.



Ecological status and ecological potential of surface water bodies
(Source: DRBM Plan – Update 2015)

According to the DRBM Plan – Update 2015, one of the natural water bodies is in good ecological status and one is in moderate ecological status, designated with high confidence level. Both of heavily modified water bodies are in moderate ecological potential designated with medium confidence level. As environmental objectives for both natural water bodies a good ecological status is assigned and for both heavily modified water bodies good ecological potential is assigned. Hydro-morphological conditions of heavily modified water bodies are affected by lateral connectivity interruptions and morphological alterations.

Measures to improve environmental conditions

On the three water bodies not reaching the environmental objectives yet, the positive impacts of realised measures is expected until 2021, but still are in the risk of not reaching the targets. For example on the natural water body in moderate ecological status there is a risk of not reaching the targets due to change of biotopes. Measures to improve hydro-morphological conditions were realized, namely reconnection of wetlands/floodplains along the Slovakian part of the Danube River.

Navigation maintenance measures and environmental impacts

Maintenance works are executed in the framework of inland navigation law (Zákon o vnútrozemskej plavbe č. 338/2000 Z.z) and in the frame of water law (Zákon o vodách 364/2004 Z.z.) where is mentioned that SVP as the waterway administration is responsible for the maintenance of fairway and waterway in Slovakia.

Actually, there is no project which focuses on the analyses of the impacts of the maintenance activities on environment on Slovak stretch of the Danube River.

5.6 SK | Budget status February 2020

Investments taken for FRMMP implementation 2014 – 2019

Need areas	Required investments 2014 – 2020 according to FRMMP	Secured investment costs (state budget or other financing) and investments taken	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	6 100 000	0	-	6 100 000
Surveying of the riverbed	450 000	578 400	85%	0
Water level gauges	-	-	-	-
Marking of the fairway	1 510 000	1 390 800	85%	0
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	20 000	20 000	0%	0
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
Sum (Euro)	**8 080 000**	**1 989 200**	**84%**	**6 100 000**

Operational expenditures for conducted activities 2019 and budget needs 2020

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	1 163 905	800 000	800 000	0
Surveying of the riverbed	84 719	281 406	281 406	0
Water level gauges	-	-	-	-
Marking of the fairway	506 811.28	470 000	470 000	0
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-

Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
Sum (Euro)	**1 755 435.28**	**1 551 406**	**1 551 406**	**0**

5.7 SK | Outlook: actions, milestones and funding sources

SK 01: Level of detail of monitoring data is suboptimal for exact and cost-effective planning of dredging interventions		
Planned activities:	Support acquisition of up-to-date multi-beam sounding vessels, equipment and software, managing of the purchase (within FAIRway Danube)	
Current shortcomings:	Missing of the multi-beam sounding vessel	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2018/2019: Funding through Project FAIRway (CEF)	
Next steps:	Contracting of equipment Delivery of equipment / pilot operation	Vessel with multi-beam device delivered in 2018; performed trainings; pilot operation (started in June 2019) with technical problems.
SK 02: Out-of-date information technology, missing database for monitoring data		
Planned activities:	Support establishment of Waterway Management System (WAMS); Establishment, development and installation of the management system is planned within the implementation of the FAIRway Slovakia project	
Current shortcomings:	Missing system	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2018/2019: Funding through Project FAIRway (CEF)	
Next steps:	Preparation of the specification for national WAMS, award of Service Contract for software implementation and operation of the national WAMS.	Finalizing of WAMS specification, completion of public procurement, documentation submitted for control to the Ministry of Transport and Construction of the SR.

Action Plan: Slovakia

SK 03: Insufficient number of skilled staff to monitor of the fairway		
Planned activities:	Actually, only experienced staff available (but close to retirement), securing well-trained staff after purchasing the new surveying vessel (within FAIRway Slovakia)	
Current shortcomings:	Lack of new experienced staff due to company budget limitation (budget depending on Ministry annual budget)	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2018/2019: Funding through Project FAIRway (CEF) and company budget	
Next steps:	Purchase new surveying vessel, need of having newly trained staff – parallel execution of FAIRway Pilots and annual surveying performance.	Performed trainings: ship handling (October 2018), data processing (November 2018); further training June 2019, trainings completed, continuation of pilot operation.
SK 04: Different departments performing the monitoring as an impediment to efficient planning		
Planned activities:	Development and installation of the common database, monitoring done by hydro-morphology department (single-beam) & by Branch Danube (before and after dredging intervention)	
Current shortcomings:	Missing common database	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2018/2019: Funding through Project FAIRway (CEF)	
Next steps:	Preparation of the specification of the national WAMS database (FAIRway Danube project), connection with common WAMOS database (also FAIRway Danube project).	WAMS specification was finalized, realized public procurement, documentation submitted for control to the Ministry of Transport and Construction of the SR. Implementation is planned in 2020 after the WAMS contract signing.
SK 05: Different coordinate systems used for measurements in border stretches as an impediment to efficient planning		
Planned activities:	Actually, exchanging of the data is based on UTM coordinate system and all cross-border partners exchange the data according to the agreements done on TWC level	
Current shortcomings:	A little bit complicated exchange process	

Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2018/2019: Funding through company budget, CBC funds	
Next steps:	Data exchange in format necessary for processing is agreed and harmonised on TWC level, cooperation works.	No new information.
SK 06: Old and dredging and marking fleet and equipment		
Planned activities:	Acquisition of the new marking vessel (within FAIRway Danube) Modernisation and purchasing of new dredgers later in next investment project	
Current shortcomings:	Old fleet of dredgers (high maintenance fee), old marking vessels, modernisation and acquisition requested	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2018/2019: Project FAIRway (CEF) for marking vessel (multi-operational vessel), for dredgers – follow up investments funds	
Next steps:	Pilot operation of marking vessel.	Pilot operation of marking vessel started in June 2019, the trainings continued, technical problems were encountered during the pilot operation.
SK 08: Frequent need to adjust fairway marking as substitution for dredging activities		
Planned activities:	Installation of the Fairway Management System (planned within the FAIRway Danube project – WAMOS/WAMS databases) within the project Danube STREAM: installation of the marking plans applications, harmonisation with marking department (marking trips done on weekly basis)	
Current shortcomings:	Missing management system or common database	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable

Action Plan: Slovakia

Possible funding:	Budget availability 2017/2018/2019: Funding through Danube Transnational Programme (Danube STREAM project) and CEF (FAIRway Project)	
Next steps:	WAMS/WAMOS databases: activities within the FAIRway Danube project. Marking Plans Applications: definition of the structure of the database (possibility of using existing database structure developed within NEWADA duo – Marking plans task).	WAMS/WAMOS databases: activities within the FAIRway Danube project. Marking Plans Applications: definition of the structure of the database (possibility of using existing database structure developed within NEWADA duo – Marking plans task).

6 Hungary

The **General Directorate of Water Management** is responsible for fairway maintenance. It has three subordinated regional organizations (Water Directorate, VIZIG) for waterway maintenance on the Danube:

1. North-Transdanubian Water Directorate (1,811-1,708 rkm)
2. Middle-Danube-Valley Water Directorate (1,708-1,560 rkm)
3. Lower-Danube-Valley Water Directorate (1,560-1,433 rkm)

6.1 HU | Status report on main critical locations including water level information 2012 – 2019

Section rkm 1811 - 1708

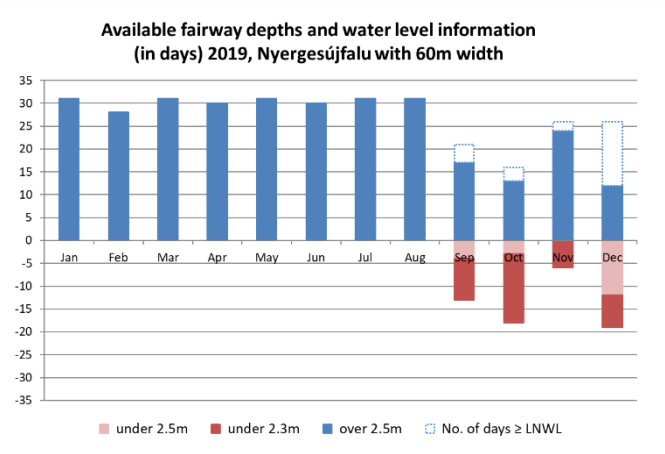
Number of days with fairway depths ≥ 2.5m on main critical locations (as identified by the Danube waterway users in a survey by PA1a concluded in December 2014)

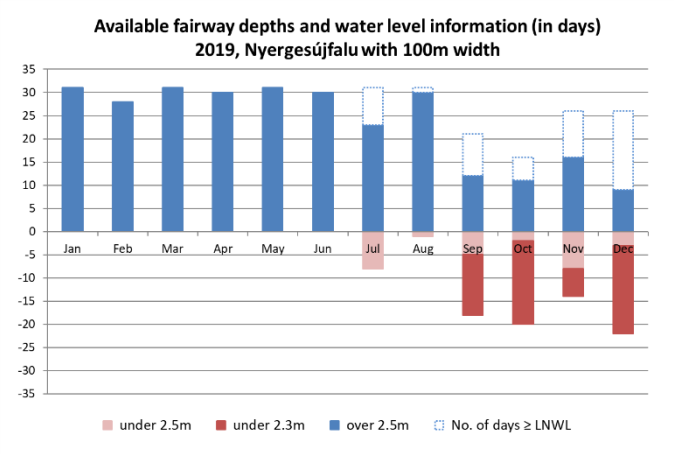
Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Nyergesújfalu critical location with **60 meters** wide fairway	304	314	307	244	326	327	245	309
Nyergesújfalu critical location with **100 meters** wide fairway	286	304	256	213	293	304	215	282

Fairway width (range of values accounts for different curve radii): 60 to 100 m in Slovakia and Slovak - Hungarian border section (Nyergesújfalu) based on Fairway Rehabilitation and Maintenance Master Plan.

Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauge	2012	2013	2014	2015	2016	2017	2018	2019
Nyergesújfalu	Esztergom	366	365	360	294	349	336	261	332





Section rkm 1,708 - 1,560

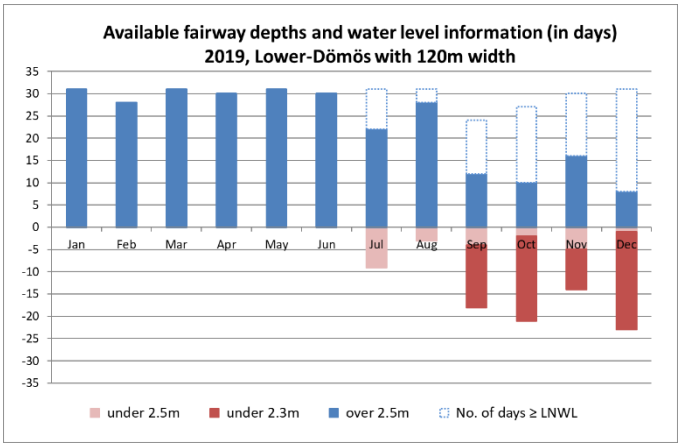
The critical location Kisapostag is no longer critical and will no longer be part of future statistics.

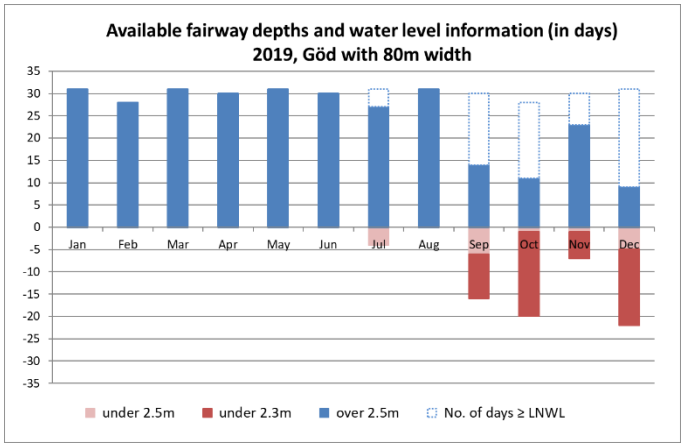
Number of days with fairway depths ≥ 2.5m on main critical locations

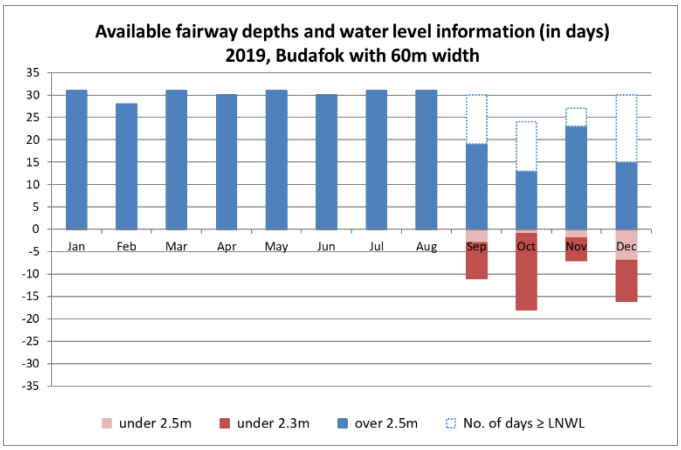
Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Göd critical location with **80 meters** wide fairway	287	284	286	208	299	266	229	296
Dömös alsó critical location with **120 meters** wide fairway	312	304	264	205	279	290	221	277
Budafok critical location with **60 meters** wide fairway	318	308	319	229	310	257	244	296

Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Dömös-alsó	Nagymaros	363	365	365	322	357	362	302	355
Göd	Budapest	366	364	357	320	357	352	304	362







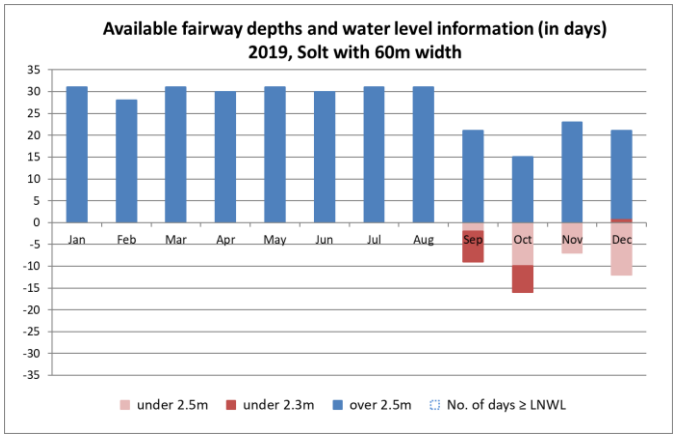
Section rkm 1,560 - 1,433

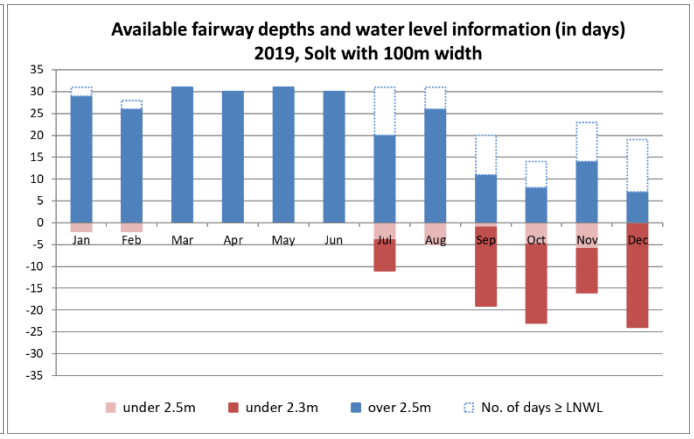
Number of days with fairway depths ≥ 2.5m on main critical locations

Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Solt critical location with **60 meters** wide fairway	365	365	360	277	344	330	254	322
Solt critical location with **100 meters** wide fairway	293	318	232	210	277	284	208	263

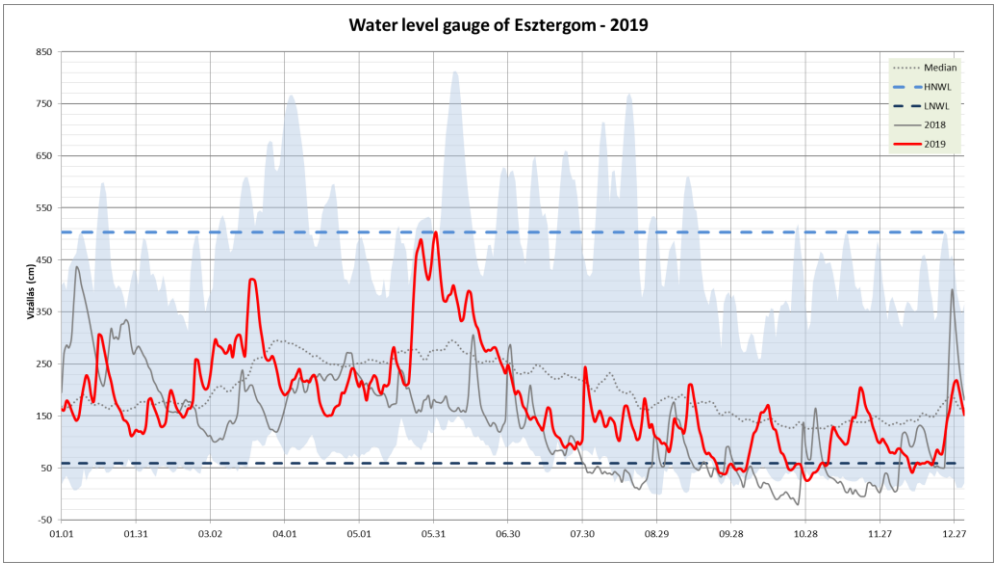
Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Solt	Dunaföldvár	366	364	358	270	339	326	251	319





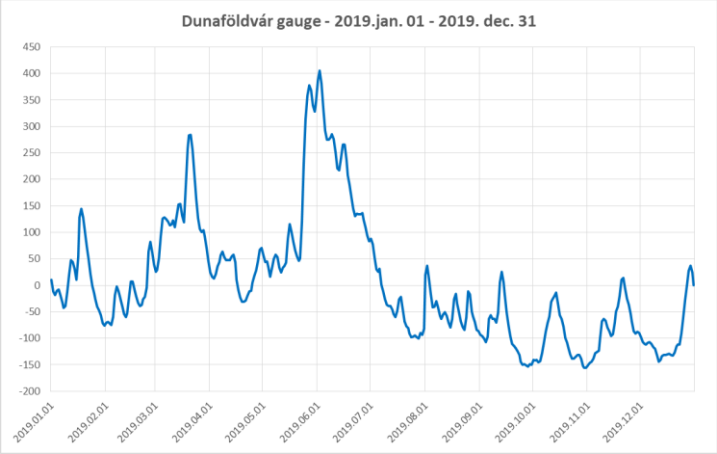
6.2 HU | Hydrological conditions at main critical locations 2019



Esztergom gauge is the reference gauge for the critical bottleneck Nyergesújfalu.

Navigation conditions on the Danube 1811-1708 rkm in 2019 have improved compared to the extremely shallow year 2018 due to the average water discharge of the Danube. The average water level at the Esztergom water gauge was 185 cm in 2016, 169 cm in 2017, 137 cm in 2018 and 178 cm in 2019.

In 2019 there were 33 days when the water level was below navigational low water level compareD with the years 2016 (16), 2017 (28), 2018 (106).



Dunaföldvár gauge is the reference gauge for the critical bottleneck Solt.

6.3 HU | Key issues and related activities 2019

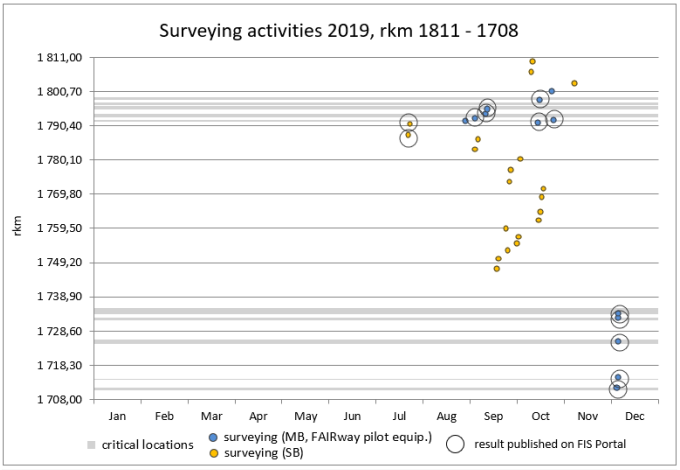
Related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014) and last updated 2016:

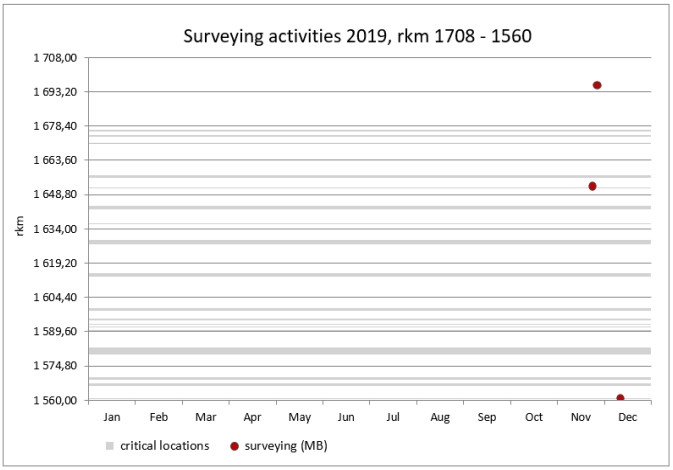
	Key issues	*Need for action*	*Activities performed 2019*
HU 01	Level of detail of monitoring data is suboptimal for exact planning	Support acquisition of up-to-date multi-beam sounding equipment and vessels	*The FAIRway Danube multi-beam vessel was delivered in August 2019 and put into pi-lot operation.*
HU 02	Old monitoring equipment and fleet (related to fairway mark-ing)	Support acquisition of up-to-date vessels and mainte-nance-free buoys that make marking more cost-effective	*Three different kinds of AIS system (for the remote control of buoys) was delivered in June 2019 to EDUVIZIG. The pilot activity has started.*
HU 03	Integration of updated fairway depths data in the IENC	Support skippers with continu-ously updated charts	*Latest edition of IENC charts: IENC 2.3 ED6 with depths data was published on 17.12.2019.*

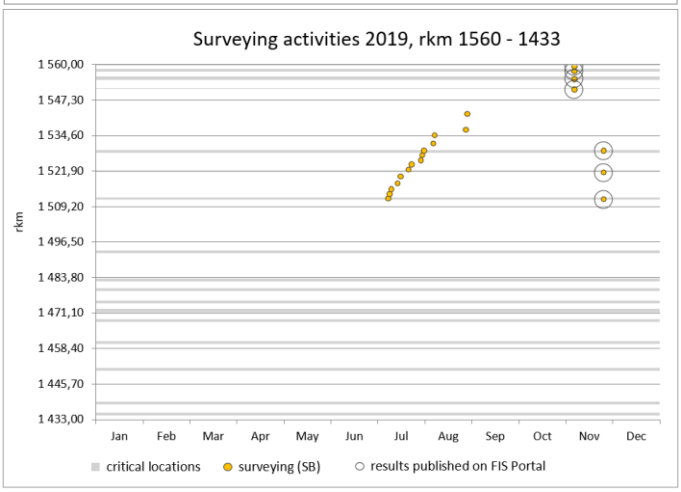
6.4 HU | Review of monitoring, rehabilitation and maintenance activities 2019

The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the hori-zontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical locations is itemised in the Rehabilitation and Maintenance Master Plan (version December 2014).

Riverbed surveying activities 2019



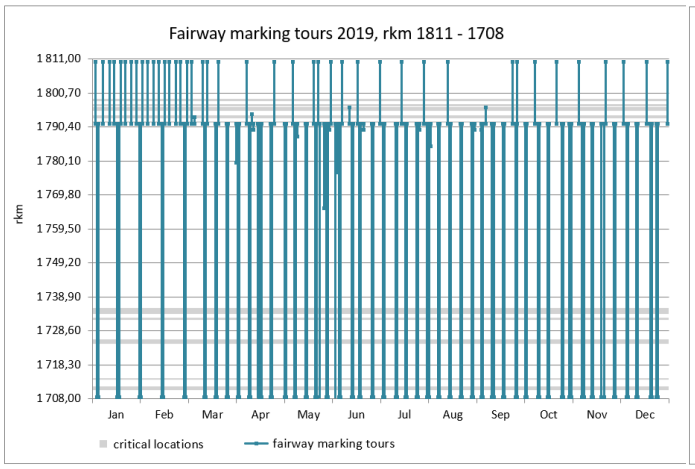


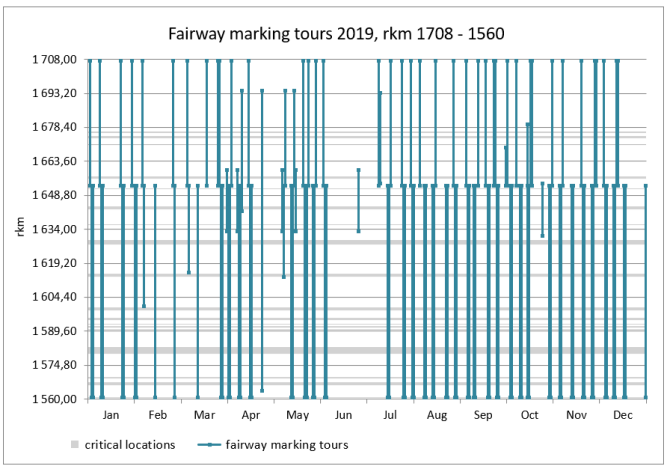


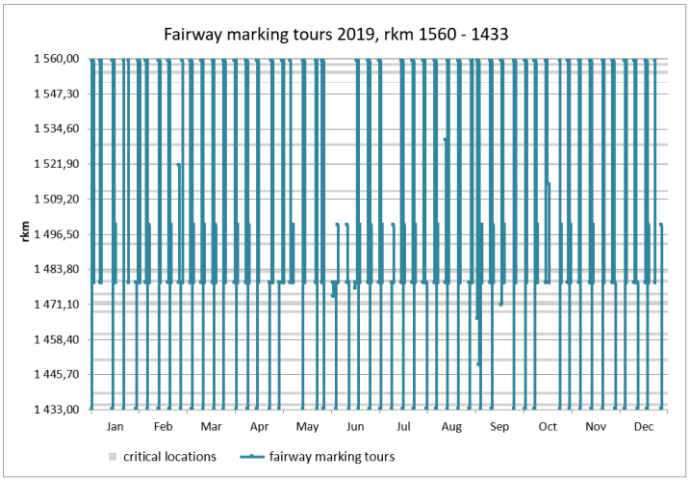
Surveys were conducted during low water season. KDV VIZIG was not able to conduct surveys in the sector rkm 1708-1560 in the period January- October, as the surveying vessel was out of order.

Fairway marking activities 2019

Regular marking tours were conducted according to the Work Plan.





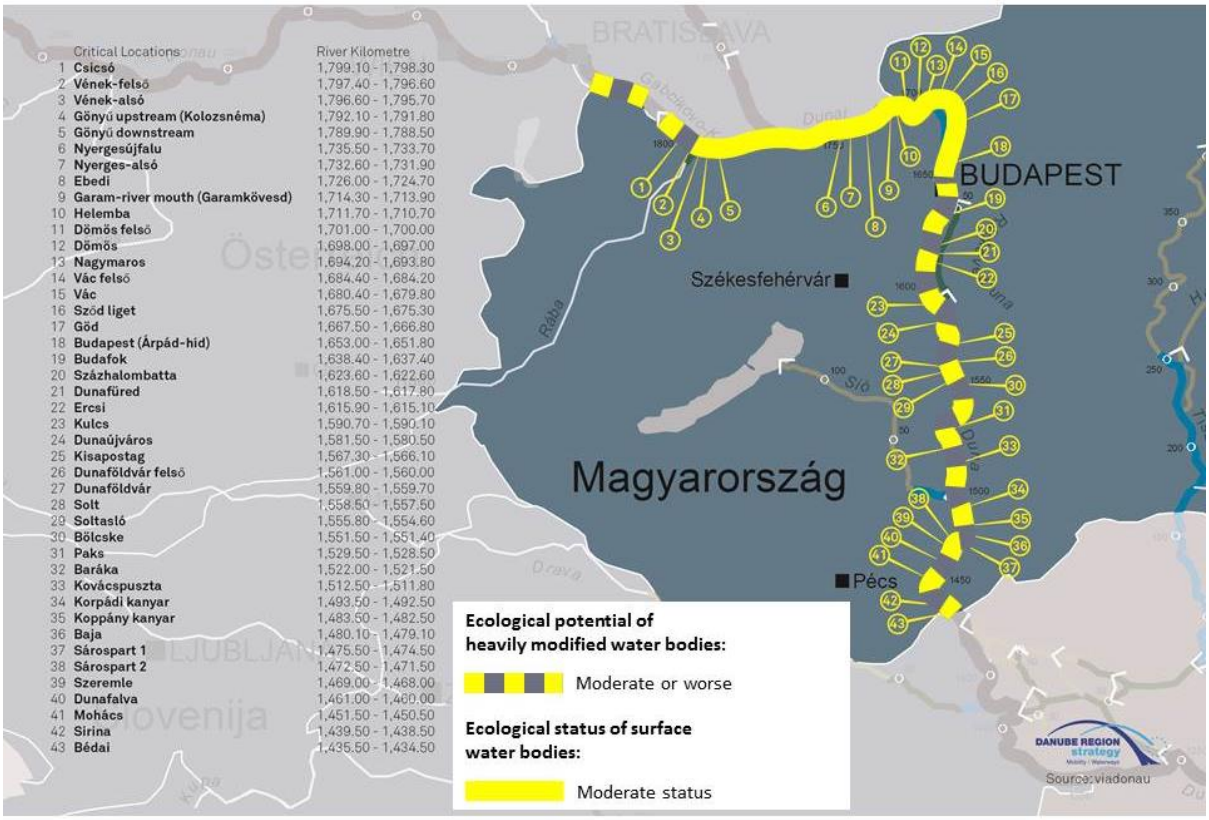


Dredging activities 2019

No dredging activities were performed in 2019 on the Hungarian Danube.

6.5 HU | Summary of current ecological status and environmental impacts

The Hungarian section of the Danube is divided into 7 sections. The main stretch of the Hungarian Danube is declared as “Heavily modified water bodies – Final Designation” according to the Water Framework Directive. The only two exceptions are above Budapest; these are designated as “Natural water bodies”.



The map above displays the ecological status and ecological potential of the Hungarian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Hungary.

Ecological status and ecological potential of surface water bodies
(*Source: draft Hungarian NRBM Plan – Update 2015*)

The ecological status of the two natural water bodies is moderate; the good ecological status is estimated to be achievable in 2027. The designation as heavily modified water body of main parts of the Danube is mainly attributed to bank revetment, which was supported by biological elements. The good ecological potential is estimated to be achieved as follows: in 2021 1 pc, in 2027 2 pc's and after 2027 2pc's. For the heavily modified water bodies measures are to be implemented in order to achieve good ecological potential.

Measures to improve environmental conditions

Between 2009 and 2015 several measures have been taken to achieve the better ecological status/potential: improving drinking water quality, improving wastewater collection and treatment, reconnecting wetlands/floodplains.

As explained by the draft National Water Management Plan for Hungary (2015):

- The section named "Danube at Szigetköz" was regulated for flood protection and navigation. In 2015 several structures were built to provide connectivity between the main riverbed and the side branches. The erosion of the riverbed is significant, it exceeds 2 meters. The decreasing water levels of the Danube and of the associated groundwater seriously affect the groundwater-dependent ecosystems and the water supply of the side branches, and endanger the bank-filtered water resources. Because the water level decrease makes the side branches dry up and separate often, some unique and valuable habitats will be lost.
- Due to the flood protection measures (river regulation, flood control and the associated sediment mining) the danger of the icy floods is decreased, ensuring the required size fairway and the flood protection structures protect the flood free areas at the lower Hungarian Danube section named "Danube between Sió outfall and state border".

Because of the riverbed morphology alterations and the fords the required fairway parameters cannot be guaranteed at the section named "Danube between Gönyű and Szob". There are 10 fords and 7 narrow sections according to the 2013 river survey. The measures to improve the navigability have to be in line with the other river users' interest and to keep or improve the good ecological status – as an objective of the integrated river management. For the Danube as protected ecological corridor and Natura 2000 area, treatment and maintenance plans are under development or are already finished. The development of the shipping and the maintenance of the fairway are typically measures, which may restrict the aims of the Water Framework Directive. According to the Water Framework Directive, the 4.7 exemption test is necessary.

Navigation maintenance measures and environmental impacts

On the Danube fairway setting of the waterway should be established based on local characteristics and dimensions of a typical convoy given by international treaties, laws and regulations. Based on the Danube Commission recommendations (DK/TAG 77/11) for fairway depth it is necessary to ensure a safe journey with a min. 25 dm draft depth.

In the Vienna-Belgrade section (1921.05 to 1170.00 rkm) the fairway width should be at least 120-150 m, but in justified cases (e.g. in the case of sections which are in unfavourable situation because of the geo-morphological conditions, those sections which were in the focus of the general assembly of the Danube Commission when issuing decision no. DK/TAG 69/18) the reduction of the minimum fairway width is allowed if the safety of navigation is ensured.

Maintenance works are executed in the framework of Act. No. XLII of 2000 on water transport and regulation No. 17/2002. of the minister for environment and water. According to the regulation, fairway maintenance activities shall be based on an activity plan, which is prepared by the waterway administration each year by the end of March, and has to be approved by the competent regional water authority.

6.6 HU | Budget status February 2020

Investments taken for FRMMP implementation 2014 – 2018

Need Areas	Required investments 2014 – 2020 according to FRMMP	Secured investment costs (state budget or other financing) and investments taken	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	150 000	6 200 000	85%	0
Surveying of the riverbed	749 700	1 722 051	59%	0
Water level gauges	150 000	6 705 128	50%	0
Marking of the fairway	3 187 000	8 675 000	85%	0
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	50 000	10 000	85%	40 000
Information on fairway depths	0	20 000	85%	20 000
Information on marking plans	47 000	320 000	85%	0
Meteorological information	0	775 641	50%	0
Other needs	0	630 167	85%	0
Sum (Euro)	**4 333 700**	**25 057 987**	**72.7%**	**60 000**

Operational expenditures 2019 and budget needs 2020

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	-	34 000	34 000	0
Surveying of the riverbed	56 000	130 000	130 000	0
Water level gauges	1 300	7000	7000	0
Marking of the fairway	187 135	650 000	650 000	0
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	-	10 000	10 000	0
Information on fairway depths	-	5 000	5 000	0
Information on marking plans	-	5 000	5 000	0
Meteorological information	-	32 051	32 051	0
Other needs	0	125 000	125 000	0
Sum (Euro)	**244 435**	**966 000**	**966 000**	**0**

6.7 HU | Outlook: actions, milestones and funding sources

HU 01: Level of detail of monitoring data is suboptimal		
Planned activities:	Purchasing multi-beam sounding equipment and surveying vessel within FAIRway project	
Current shortcomings:	Currently, there are no shortcomings identified	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	not relevant
	Which measures are taken to mitigate these impacts?	not relevant
	Is water status still expected to deteriorate?	not relevant
Possible funding:	CEF 85%, National budget 15% Action no. 2014-EU-TMC-0231-S	
Next steps:	The vessel was delivered and put into pilot operation. Pilot operation will be going on until the end of the project.	until 2021
HU 02: Old monitoring equipment and fleet (related to fairway marking)		
Planned activities:	Purchasing equipment within national CEF project called "*Improving fairway marking on the Hungarian section of the Danube in the Rhine-Danube corridor*" • Fairway marking vessels - 3 pcs • High-speed patrol boats - 3 pcs • Intelligent light buoys - 115 pcs • New floating unlighted buoys - 210 pcs • Light bank markers - 55 pcs • New bank marks and navigation control marks - 300 pcs • New river km marks - 400 pcs	
Current shortcomings:	Currently, there are no shortcomings identified	

Environmental relevance of planned activities:	What are the main expected environmental impacts?	not relevant
	Which measures are taken to mitigate these impacts?	not relevant
	Is water status still expected to deteriorate?	not relevant
Possible funding:	CEF 85%, National budget 15% Action no. 2014-HU-TMC-0605-W	
Next steps:	Procurement of equipment.	tbd
HU 03: Integration of fairway depths data in the IENC		
Planned activities:	Develop v2.3 format iENC with updated bathymetric data	
Current shortcomings:	Currently, there are no shortcomings identified	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	not relevant
	Which measures are taken to mitigate these impacts?	not relevant
	Is water status still expected to deteriorate?	not relevant
Possible funding:	CEF 50%, National budget 50% Action no. 2014-HU-TM-0619-W	
Next steps:	Regular yearly update to be published in 2020 spring time.	2020

7 Croatia

MMPI – Ministry of the Sea, Transport and Infrastructure is responsible for fairway maintenance, rehabilitation and upgrade.

7.1 HR | Status report on main critical locations including water level information 2012 – 2019

The **recommended Level of Service of 2.5m fairway depth at Low Navigable Water Level** would correspond to an equal height of the blue columns (availability of 2.5m fairway depth) and the white columns framed in blue (water level equal to or above Low Navigable Water Level) in the figures below.
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

<u>Danube</u>

Number of days with fairway depths ≥ 2.5m on main critical locations
(for a fairway width of 100m)

Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Apatin *	366	365	365	365	366	363	365	365

*Data provided by PLOVPUT

The Danube stretch in Croatia is characterised by sufficient depths but, due to river morphology (large number of sandbars and islands), the achieved fairway width varies. The Apatin sector is characterised by an unstable riverbed, where the flow direction during the low water period is highly subjected to changes. Therefore, the available depth during the same water level may not have the same values. The table below shows the number of days related to the achieved fairway width.

Number of days below 200/150/120m width (and depth over 2.5m)

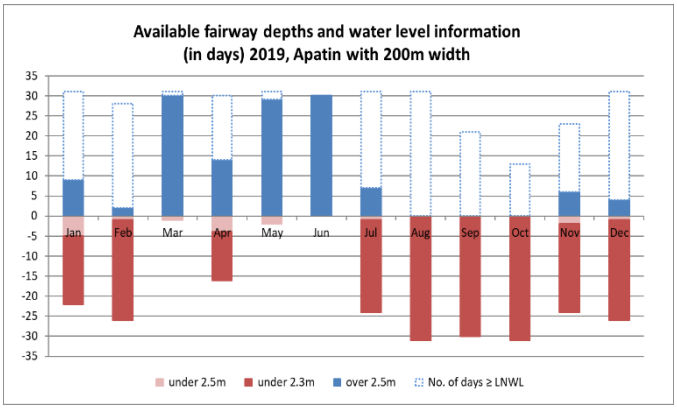
Crtitical sector in 2018 (Jan-Dec)	200 x 2,5	150 x 2,5	120 x 2,5	100 x 2,5
Apatin *	131	209	365	365

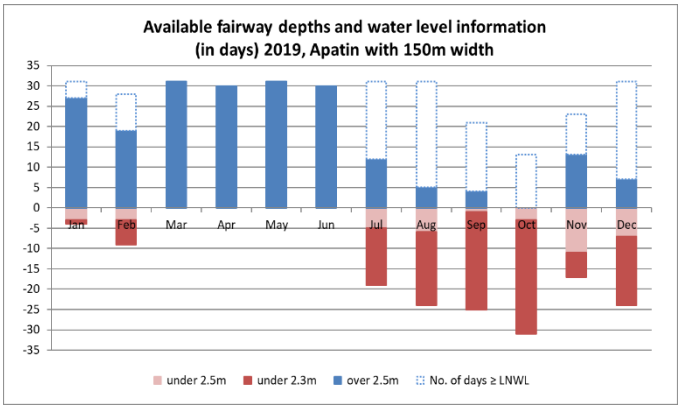
*Data provided by PLOVPUT

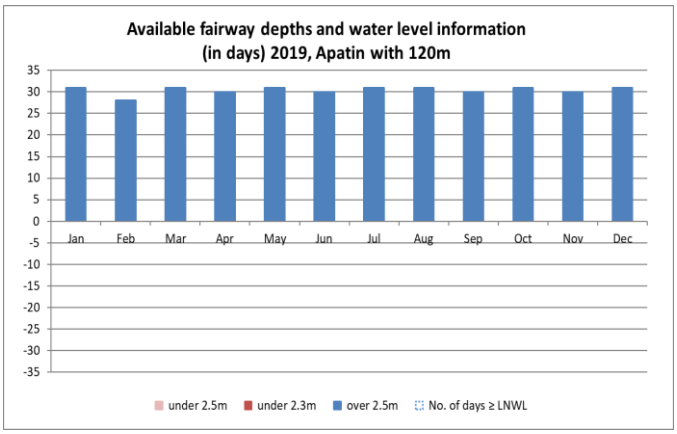
Number of days with water levels ≥ LNWL on main critical locations

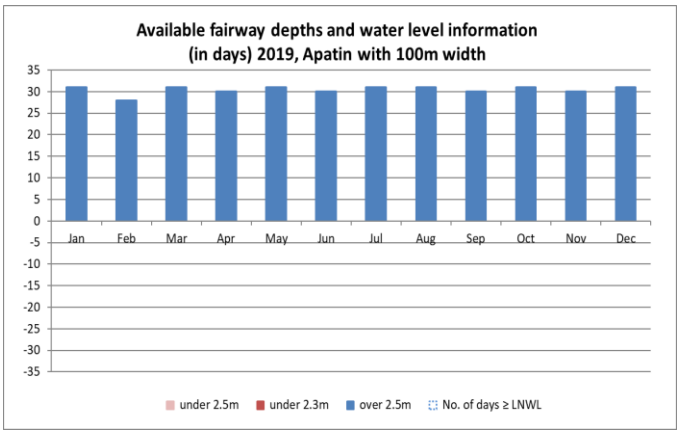
Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Apatin *	Apatin	366	365	365	315	353	352	266	331

*Data provided by PLOVPUT





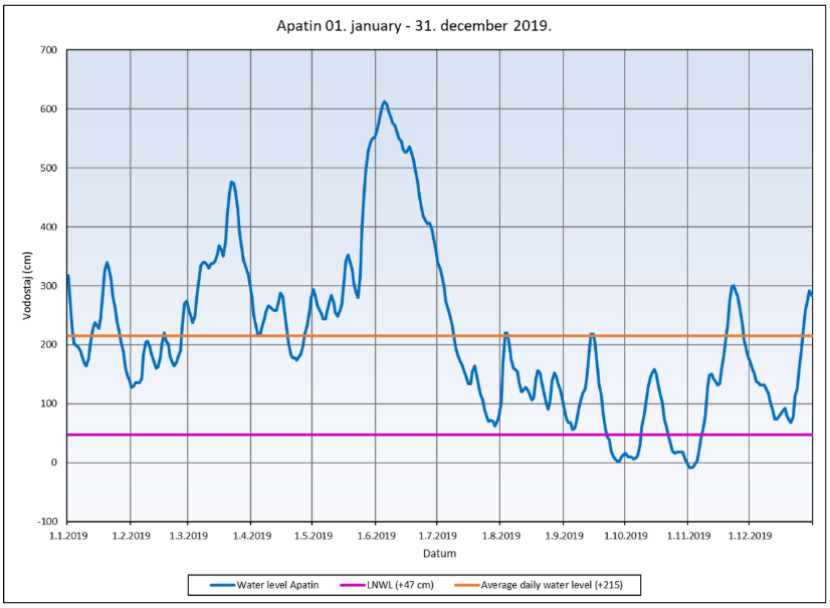




Fairway depths of 2.5 m were available throughout the entire period of January to December 2019 for the minimum Level of Service (100 m). On the 100 m and 120 m fairway width, fairway depths of 2.5 m were achieved on 365 days (100%). For a fairway width of 150m, fairway depth of 2.5 m was only achieved on 209 days (57.26%). For a fairway width of 200 m, fairway depth of 2.5 m was only achieved on 131 days (35.89%).

7.2 HR | Hydrological conditions at main critical locations 2019

At the gauging station Apatin in the period January – mid September 2019 the water levels remained above LNWL. In the second half of September until first third of October and last third of October until beginning of the November the LNWL was reached for almost 40 days. First period of the year (January – June) water levels alternated with sudden occurrences of slightly elevated water levels. After June water levels began to decrease, reaching lowest peak after 1st of November. At the Apatin sector there were no restrictions for navigation as the navigation conditions improved during the past few years due to the construction of T-groynes. The average daily water level was 215 cm.



7.3 HR | Key issues and related activities 2019

Related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014) and last updated in October 2017:

	Key issues	*Need for action*	*Activities performed 2019*
HR 01	Old monitoring fleet and equipment	Support retrofit and acquisition of up-to-date single-beam sounding equipment, software and vessels	*Within the FAIRway Danube project a surveying vessel was purchased with multi-beam equipment (baptism in October 2017) – key issue resolved.*
HR 02	Insufficient number of skilled staff	Secure education and provision of well-trained staff in the short, medium and long term	*No new activities.*
HR 03	The number and the accuracy of gauging stations should be raised	Support increasing the number and quality of gauging stations	*DHMZ performed regular maintaining of existing gauging stations. Within the FAIRway Danube project – purchase of 4 new gauging stations and modernisation of 5 existing ones on the Danube. The equipment is purchased, 9 out of 9 gauging stations were installed – key issue resolved.*
HR 05	Deterioration of equipment of dredging companies	Support acquisition of modern vessel at dredging companies	*No new activities. No influence on investment decisions of dredging companies.*

HR 06	Cumbersome procurement procedures for dredging activities	Start improved and more efficient concessions procedures for Sava, Drava and Danube	*Planning to start new concessions for Drava – Port.*
HR 07	Not enough vessels available with MMPI to provide quick reaction on needed marking interventions; equipment and vessel malfunctions	Support acquisition of modern maintenance and marking vessels	*Within the FAIRway Danube project, a marking vessel with single-beam equipment was purchased (baptism in October 2018). Purchase of the new vessels for Sava and Drava rivers is planned through national OP in the near future.*
HR 08	Inefficient procedures, suboptimal link between surveying and marking department, insufficient data storage and analysis facilities	Support development and harmonisation of adequate IT tools	*Within FAIRway Danube a national WAMS (Waterway Asset Management System) is being implemented and connected to the transnational WAMOS tool. Tender procedure for procurement of the national WAMS is ongoing.*
HR 09	The low number and the accuracy of gauging stations; non-existence of water level forecasts	Support cooperation between actors involved in water level information and increase the number of additional gauging stations	*Established great communication between MMPI and DHMZ. By the end of 2018 all gauging stations were installed and the water level forecast developed - key issue resolved.*

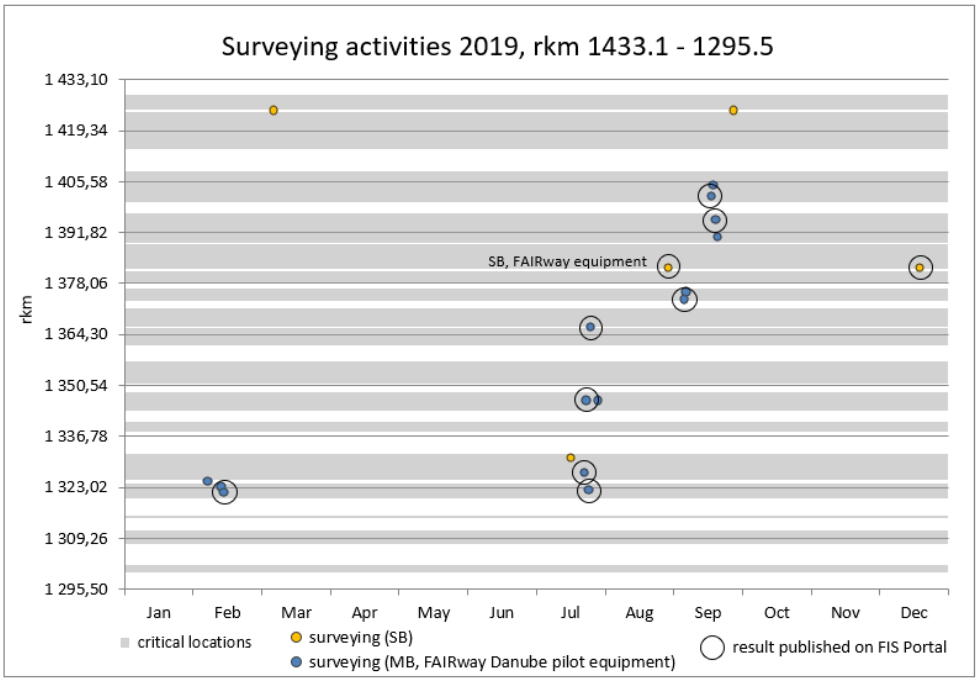
7.4 HR | Review of monitoring, rehabilitation and maintenance activities 2019

The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified in the Rehabilitation and Maintenance Master Plan (version December 2014).

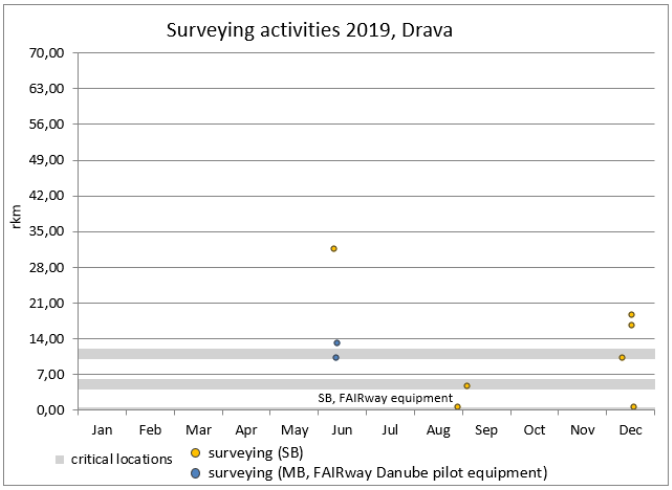
Riverbed surveying activities 2019

Danube

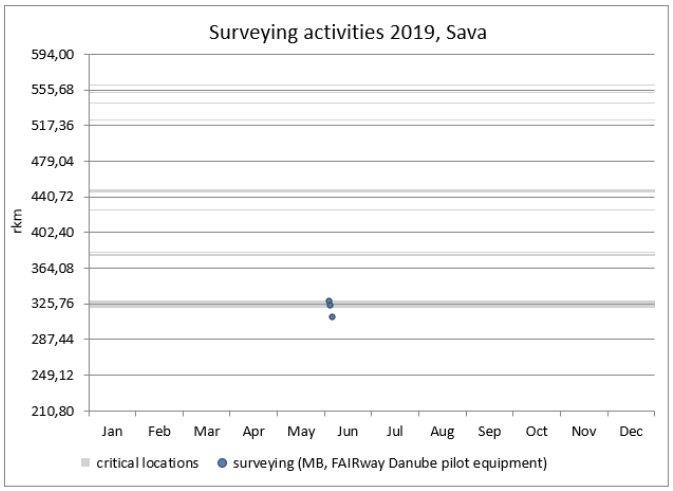
The river bed surveying is done according to an annual surveying plan. This plan consists of annual surveying of the whole Danube sector (single-beam) with main surveying of critical locations and waterway objects on which the maintenance works are planned. The plan also contains surveying of fairway locations for the production of geodetic and morphological surfaces in order to update the technical documentation. During 2019, surveying activities were conducted with the new surveying vessel with multi-beam equipment, purchased within FAIRway Danube. Pilot operation of this equipment was concentrated on the most critical locations Sotin, Židovski rukavac, Bogojevo, Borovo, Apatin, Drava mouth, Dalj, Staklar, Erdut and Vukovar.



Drava



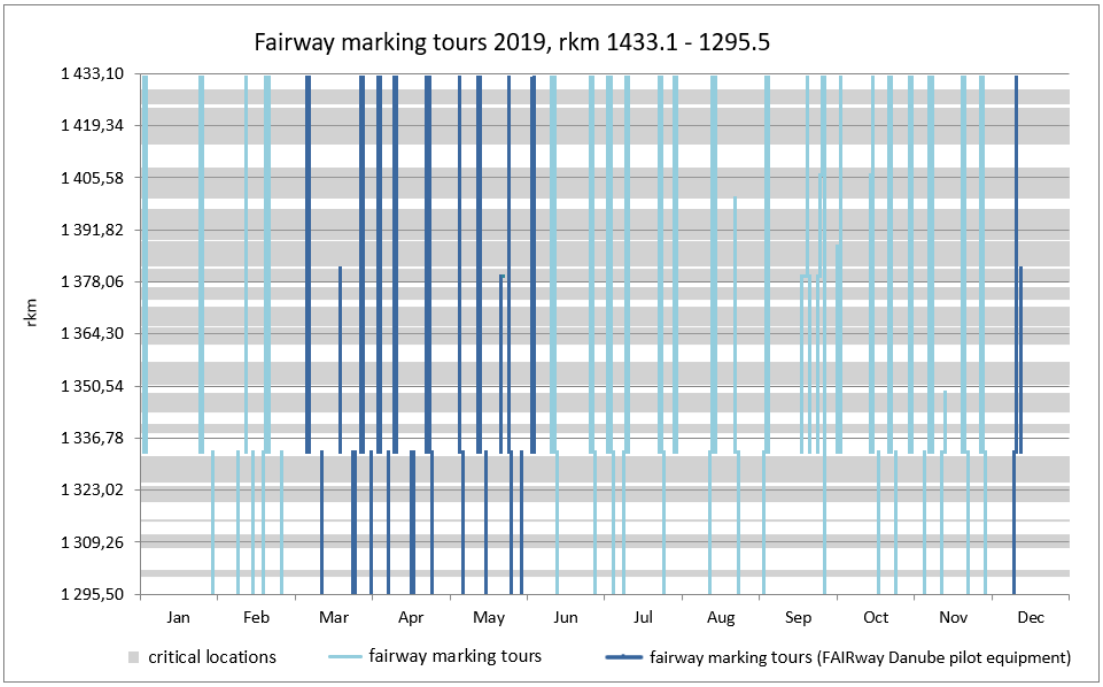
Sava



Fairway marking activities 2019

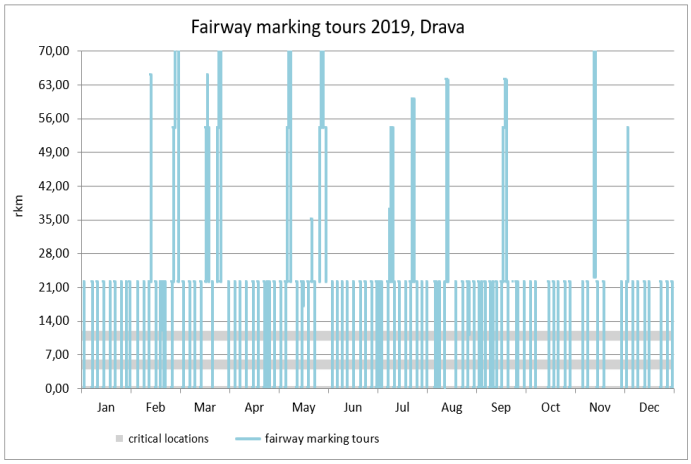
The marking vessel is equipped with an echo-sounder, so the marking tours also serve as quick checks of the fairway. Nevertheless, data is not post-processed but used solely for the purpose of marking. The fairway marking is done approximately every two weeks, based on a work plan.

Danube

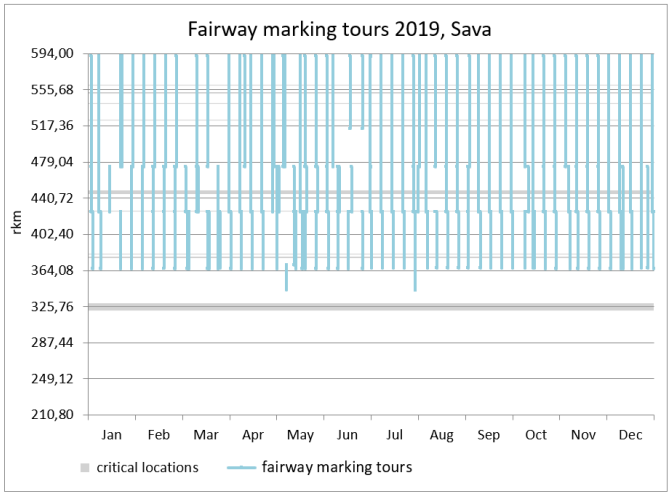


In 2019, the situation on the whole Danube stretch was stable and there was no reallocation of the fairway as the most favourable depth was held throughout the year within the fairway limits of 100m.

Drava



Sava

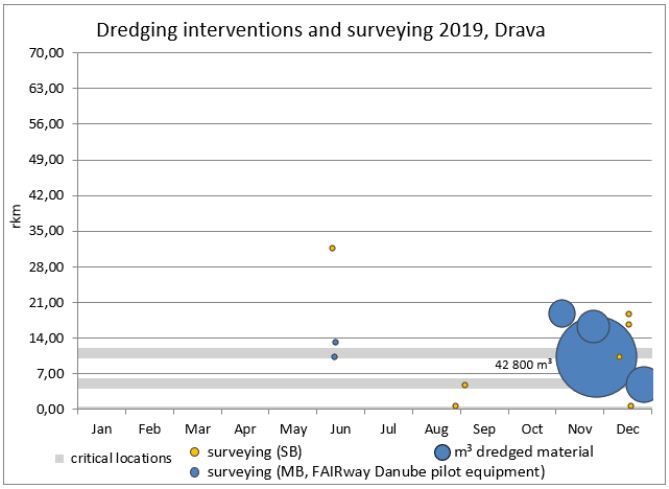


Dredging activities 2019

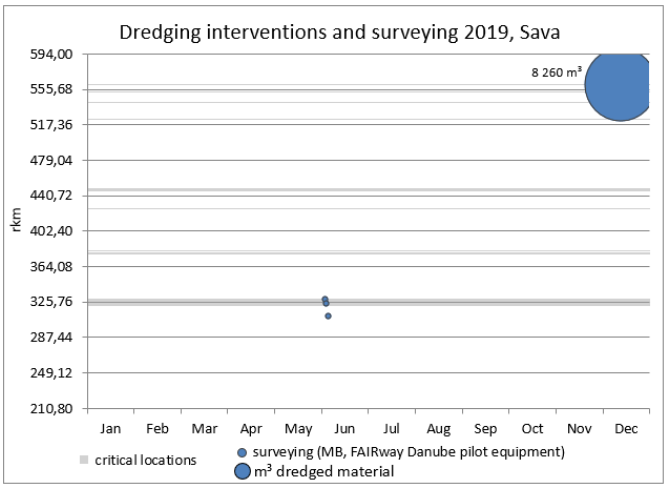
In 2019 there was dredging on Drava river (63 300 m³) and on Sava river (8 259.71 m³) for commercial navigation. The dredging interventions are reported in combination with the surveying activities. This illustrates the strong dependency of dredging works on up-to-date surveying results.

Prior to, during and after dredging works the respective critical locations were surveyed in addition to the regular surveying tours.

Drava

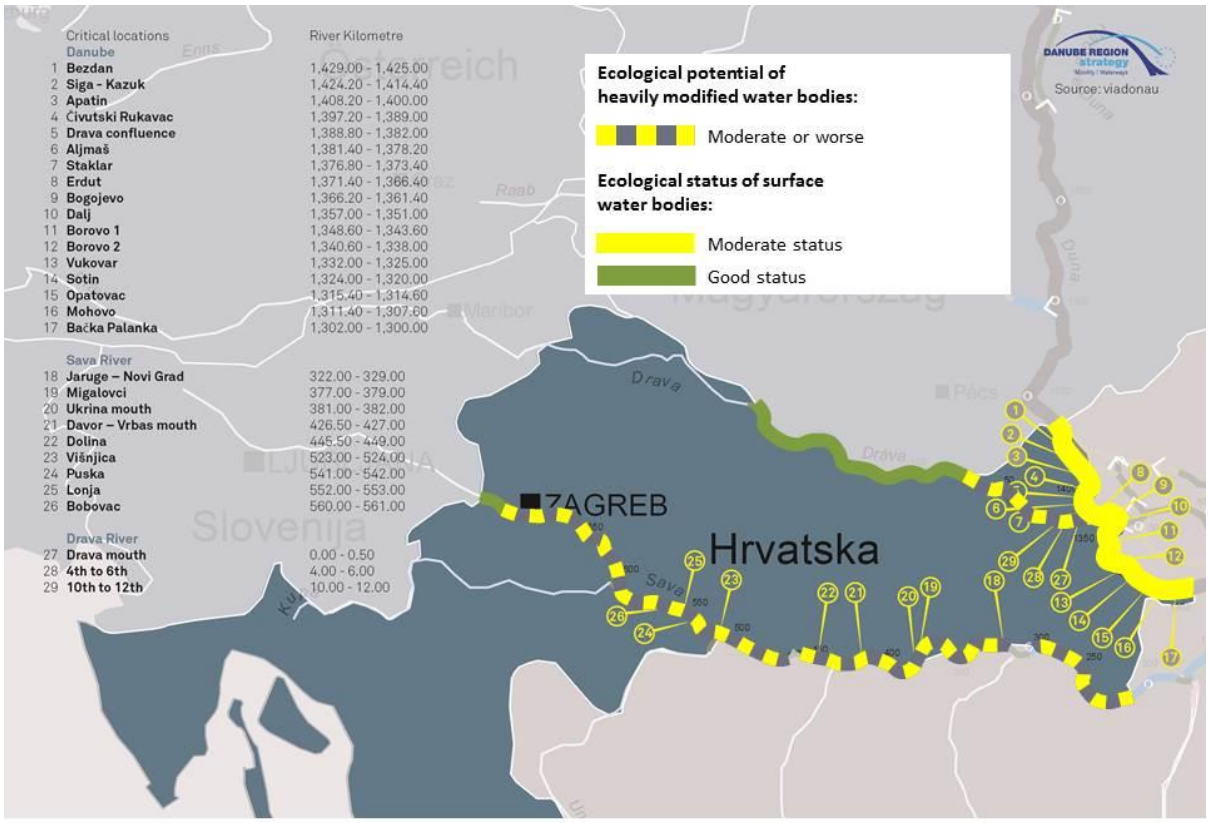


Sava



7.5 HR | Summary of current ecological status and environmental impacts

The following map displays the ecological status and ecological potential of the Croatian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Croatia.



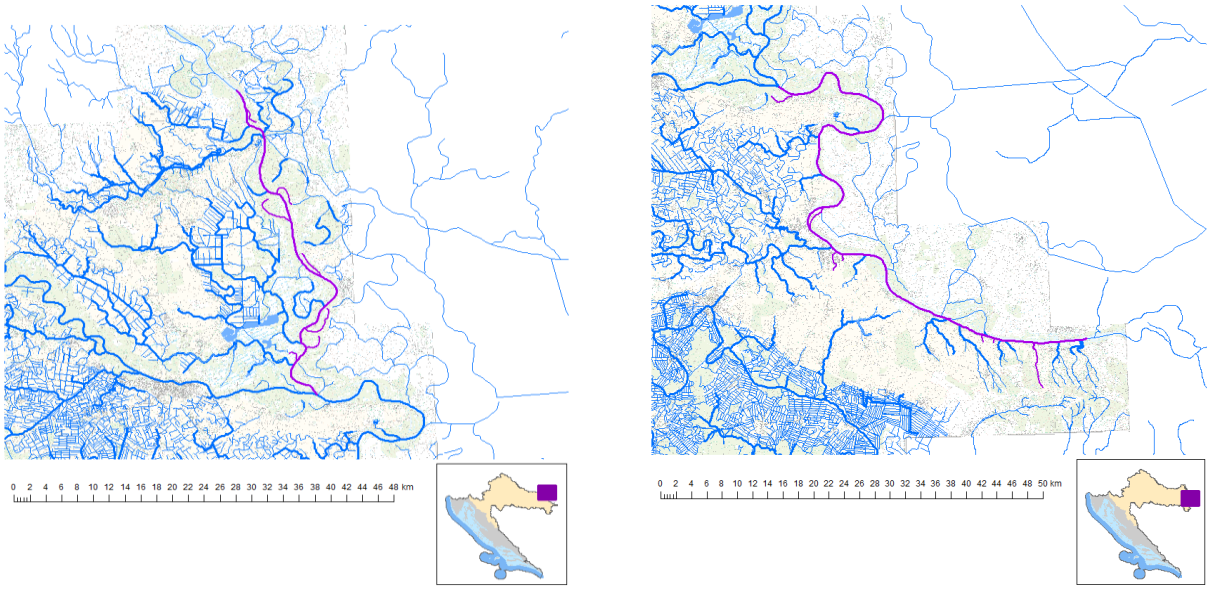
Ecological status and ecological potential of surface water bodies

(*Source: DRBM Plan – Update 2015*)

According to the River Basin Management Plan (RBMP) 2016-2021, water bodies on the Danube River in Croatia aren't designated as HMWBs and there are no hydropower plants built there.

In the RBMP 2016-2021, the status of water bodies on the Danube River is assessed according to the Regulation on water quality standard (official gazette 73/2013) and based on the impacts and pressures analysis.

According to the Regulation, the ecological status of the water body (from the Croatian-Hungarian border to the Drava-Danube confluence) is assessed as moderate, and its chemical status as good. Downstream of the Drava-Danube confluence to the Croatian-Serbian border, both the ecological and chemical statuses of the water body are assessed as good.



Water bodies on the Danube River in Croatia

Measures to improve environmental conditions

Instruments to control hydro-morphological pressures to water bodies are provided in the Water Act and the Environmental Protection Act.

Hydro-morphological modifications to the water bodies due to physical interventions (projects) that affect the water regime are controlled by issuing water rights acts or binding water rights opinions as part of integrated environmental protection requirements, which precedes the issuance of a location permit or some other form of project approval. Compliance with the specified requirements is controlled during project implementation.

Comprehensive control of the impacts of development plans, programmes and projects on environmental quality, including impacts on the aquatic environment, is regulated by the Environmental Protection Act.

The lack of appropriate hydro-morphological and biological monitoring significantly restricts the possibility to prepare an elaborate programme of measures to control and reduce hydro-morphological pressures to water bodies.

Due to very limited data, the programme of measures for the period 2016-2021 includes activities corresponding to a temporary character of designating artificial and heavily modified water bodies (no regret approach).

Navigation maintenance measures and environmental impacts

Maintenance works are executed in the framework of navigation law ("Zakon o plovidbi i lukama unutarnjih voda", official gazette nr. 109/2007, 132/2007, 51A/2013, 152/2014 and 118/2018), Regulation on technical maintenance of waterways ("Pravilnik o tehničkom održavanju vodnih putova", official gazette nr. 62/2009, 136/2012, 41/2017 and 50/2019) and in accordance with the applicable technical regulations in the field of construction, spatial planning and environmental protection, and water management relating to maintenance works on constructions which are used for the improvement of navigation conditions.

The Annual Maintenance Program is prepared based on the maintenance studies, annual and detailed surveying data, information about the changes in the waterway and data about the execution of works from previous years. When the Program is adopted the Assessment Study of main impact for the ecological network (which is done by official experts on nature conservation and water ecology) must be done towards Ministry of Environment and Nature Protection. Assessment Study contains proposed measures to mitigate adverse impacts of planned activities and program for monitoring and reporting of planned activities. If the proposed mitigation measures / alternatives are eliminating negative effects, the competent authority (Ministry of Environment and Energy or Department of Spatial Planning, Environment and Nature Protection in competent county) issues their conclusions and approval of the procedure. Based on given conclusions the Water conditions (in accordance with Water law) are issued by the Croatian Waters.

By the end of 2018 there was no need for dredging activities on the Danube River. For the works on Drava river (rkm 00+000 – 169+490) existing environmental measures have been prolonged by the Ministry of Environment and Energy and are in force until 04.02.2020.

7.6 HR | Budget status March 2020

Investments taken for FRMMP implementation 2014 – 2019

Need areas	Required investments 2014 – 2020 according to FRMMP	Secured investment costs (state budget or other financing) and investments taken	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	1 000 000	966 000	0%	34 000
Surveying of the riverbed	241 000	400 000	85%	0
Water level gauges	57 000	70 000	85%	0
Marking of the fairway	3 230 000	1 050 000	85%	2 180 000

Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	0	210 000	85%	0
Information on fairway depths	60 000	60 000	0%	0
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
Sum (Euro)	**4 588 000**	**2 756 000**	**53.4%**	**2 214 000**

Operational expenditures for conducted activities 2019 and budget needs 2020

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	950 000	1 000 000	1 000 000	0
Surveying of the riverbed	20 000	25 000	25 000	0
Water level gauges	10 000	10 000	10 000	0
Marking of the fairway	116 000	113 000	113 000	0
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	30 000 (DHMZ)	30 000 (DHMZ)	30 000 (DHMZ)	0
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	5 000 (DHMZ)	5 000 (DHMZ)	5 000 (DHMZ)	0
Other needs	-	-	-	-
Sum (Euro)	**1 131 000**	**1 183 000**	**1 183 000**	**0**

7.7 HR | Outlook: actions, milestones and funding sources

HR 01: Old monitoring fleet and equipment		
Planned activities:	This key issue is resolved with the purchase of the new hydrographical equipment (multi-beam) and vessel within FAIRway Danube project	
Current shortcomings:	No shortcomings	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: EU funds/national budget and CEF funds (FAIRway)	
Next steps:	Vessel and equipment were delivered, execution of pilot operation	until 2021
HR 02: Insufficient number of skilled staff		
Planned activities:	Plans to have additional education of MMPI staff in the future, but still no exact starting time	
Current shortcomings:	National restrictions of hiring new staff due to a lack of national funds/budget for additional staff	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: National budget	
Next steps:	Hopefully, the purchase of new equipment/vessels will open the possibility of hiring new workers and additional education	tbd
HR 03: The number and the accuracy of gauging stations should be raised		
Planned activities:	This key issue is resolved with the purchase and installation of 4 new gauges and the modernisation of 5 existing gauging stations within the FAIRway Danube project in the course of 2018.	
Current shortcomings:	No shortcomings.	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: EU funds/national budget and CEF funds (FAIRway)	
Next steps:	Equipment was delivered, execution of pilot operation.	until 2021

HR 06: Cumbersome procurement procedures for dredging activities		
Planned activities:	Starting a concessions procedure - waterway will be maintained more efficiently – no more time wasted on a time-consuming procedure	
Current shortcomings:	Time consuming procedures	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	Not applicable
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: national budget	
Next steps:	Concession procedures for Sava, Drava and Danube	Planning to start new concessions for Drava – Port.
HR 07: Not enough vessels available with AVP to provide quick reaction on needed marking interventions; equipment and vessel malfunctions		
Planned activities:	New marking vessel and equipment were delivered during 2018 within the FAIRway Danube project. Application for EU co-financing for additional two vessels for the Sava and Drava rivers in 2020.	
Current shortcomings:	Lack of staff needed for preparation of applications	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: EU funds/national budget and CEF funds (FAIRway)	
Next steps:	Marking vessel was delivered, execution of pilot operation. Purchase of the new vessels for Sava and Drava rivers is planned through national OP in 2020.	until 2021 until 2023
HR 08: Inefficient procedures, suboptimal link between surveying and marking department, insufficient data storage and analysis facilities		
Planned activities:	The part of needs will be resolved within the FAIRway project – IT tool that will be developed within the project - waterway asset management system (WAMS)	
Current shortcomings:	With enough funds for future operation AVP would be able to plan activities that would improve the current status quo	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: EU funds/national budget and CEF funds (FAIRway)	

Next steps:	Improve the link between surveying and marking department using the IT tool developed within FAIRway Danube project Execution of tender procedure for procurement of the national WAMS.	until 2021
HR 09: The low number and the accuracy of gauging stations; non-existence of water level forecasts		
Planned activities:	This key issue is resolved with the purchase and installation of 4 new gauges, the modernisation of 5 existing gauging stations and the development of a water level forecast within the FAIRway Danube project.	
Current shortcomings:	Hydrological forecast model non-existent	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No environmental impacts
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	Not applicable
Possible funding:	Budget availability 2019/2020: national budget and CEF funds (FAIRway)	
Next steps:	Equipment was delivered, execution of pilot operation. Increase the number of gauging stations where needed.	until 2021

8 Romania

The **Administration of the Lower Danube (AFDJ)** and the **Administration of the Navigable Canals (ACN)** are responsible for fairway maintenance, rehabilitation and upgrade.

8.1 RO | Status report on main critical locations including water level information 2012 – 2019

Since AFDJ is currently in the process of recalculating the Low Navigable Water Level at certain critical locations, the achievement of 2.5m fairway depth in relation to the number of days above Low Navigable Water Level is not always correct.
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

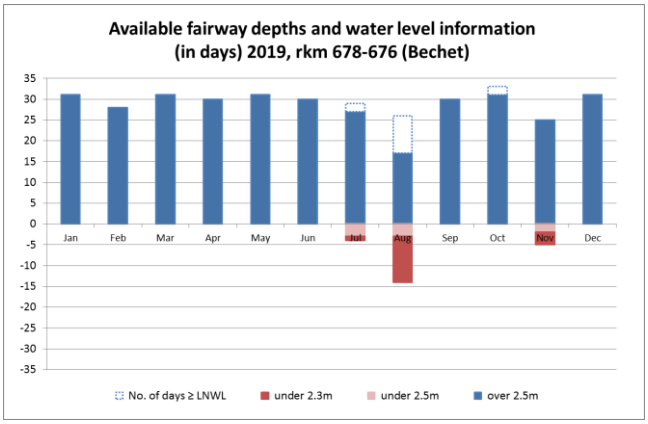
Danube

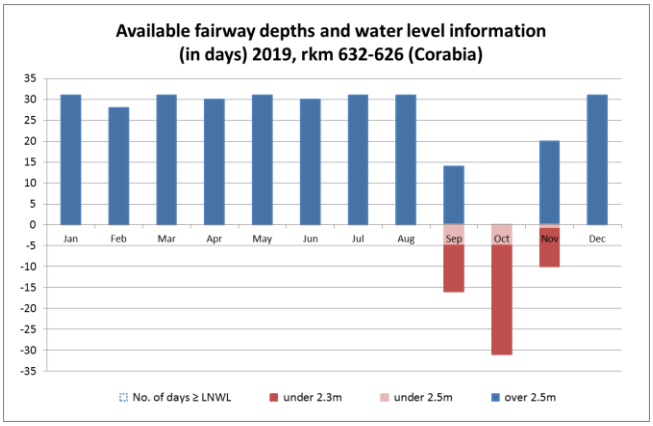
Number of days with fairway depths ≥ 2.5m on main critical locations

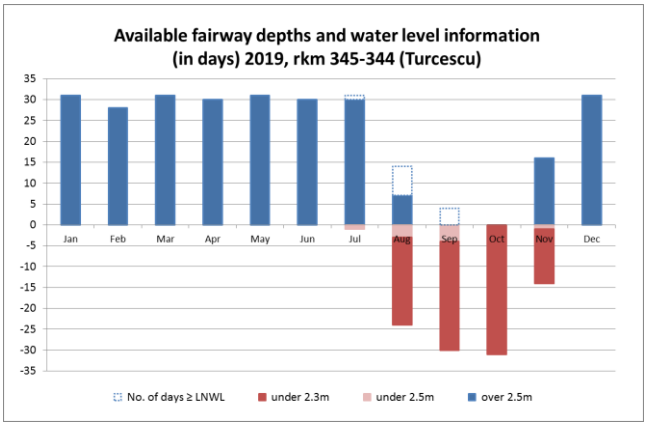
Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Bechet (100m fairway width)	355	327	365	285	351	357	317	342
Corabia (100m fairway width)	348	335	365	272	352	355	317	308
Turcescu (100m fairway width)	281	297	345	260	301	312	253	265
Cochirleni (80m fairway width)	196	234	319	236	257	200	201	225
Seimeni (100m fairway width)	323	329	365	336	347	352	339	363
Prut (80m fairway width, depth > 7.32m)	352	333	365	308	338	365	318	350
Tulcea (100m fairway width, depth > 7.32m)	351	318	365	321	359	365	329	365

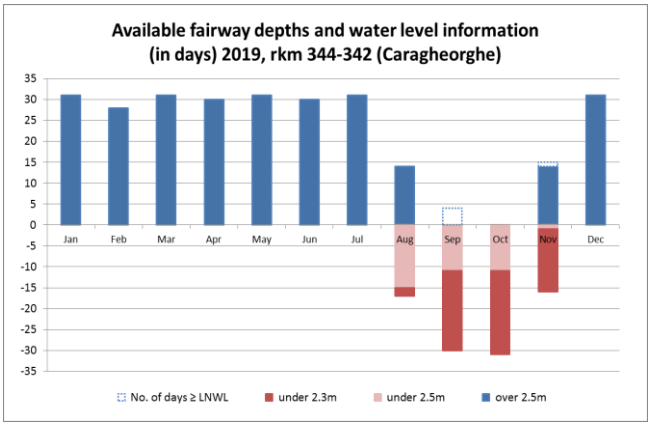
Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Bechet	Bechet	332	329	365	277	348	309	322	297
Corabia	Corabia	328	325	365	258	348	285	317	265
Turcescu	Calarasi	319	325	365	279	348	330	290	276
Cochirleni	Cernavoda	331	325	365	295	355	355	301	302
Seimeni	Cernavoda	331	325	365	295	355	355	301	302
Prut	Galati	366	365	365	365	353	353	334	316
Tulcea	Tulcea	366	365	365	365	359	350	318	314

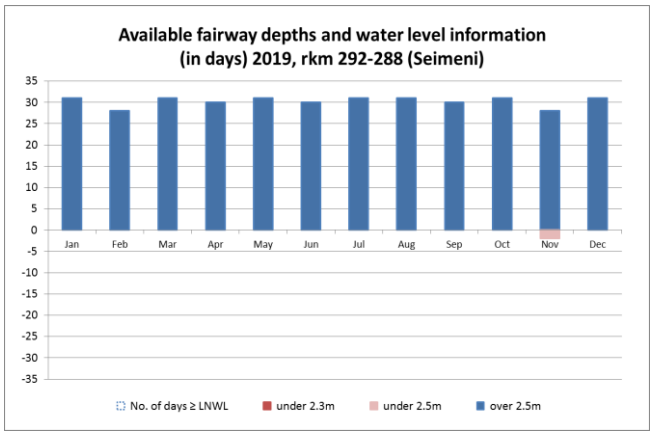


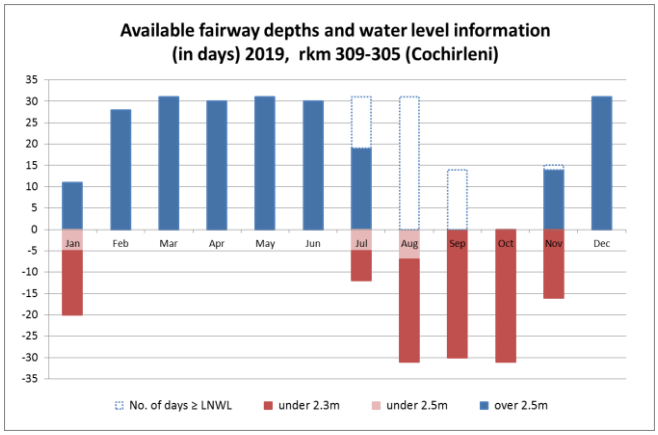




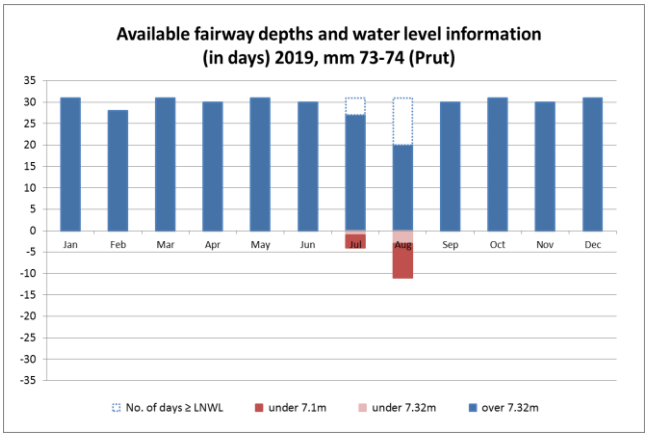


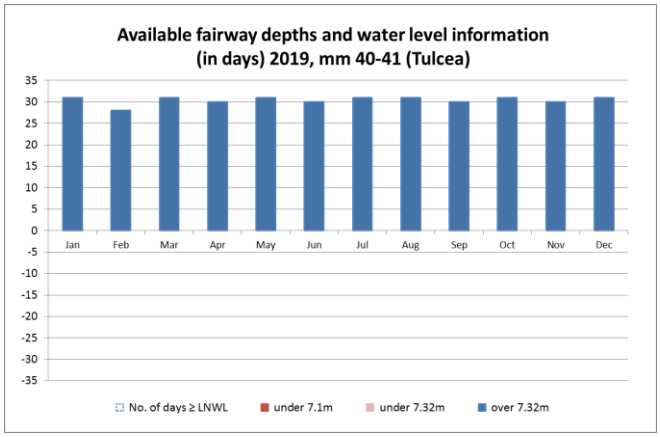
The year 2019 can be characterized by two distinct periods. The first half with good navigation conditions on the entire Romanian Danube stretch in most critical sections, where fairway depths above 2.5m were encountered in the free flow section. Starting with the second half, end of July, due to the poor hydrological conditions, a number of days with depths below 2.5m were recorded, especially in the downstream sector of Calarasi (Turcescu and Cochirleni). In the Cochirleni section, depths below 2.5m have been encountered since July, amounting to 140 days and in the critical location Turcescu a number of 100 days.





In the maritime sector of the Danube the 2019 showed good navigation conditions. Only in the Prut section 15 days with fairway depths below 2.5m were recorded. It is noteworthy that in this sector the **minimum navigation depth is 7.32m (24 feet).**





Danube-Black Sea Canal

The Danube Black Sea canals bottom is dredged 1 meter below the Danube River, so in the period 2012 – December 2019 fairway depths were over 2.5m on the Danube Black Sea canal for the entire time. Between Cernavoda and Agigea locks minimum depths were 7m, which allows maritime ships to access the Basarabi and Medgidia ports.

Critical location	2012	2013	2014	2015	2016	2017	2018	2019
confluence with the Danube river km 64-65 - DBSC	365	365	365	365	366	365	365	365
Port Medgidia km 37- DBSC	365	365	365	365	366	365	365	365
Downstream Navodari lock – CPAMN	365	365	365	365	366	365	365	365

Port Luminita – river branch Luminita	365	365	365	365	366	365	365	365

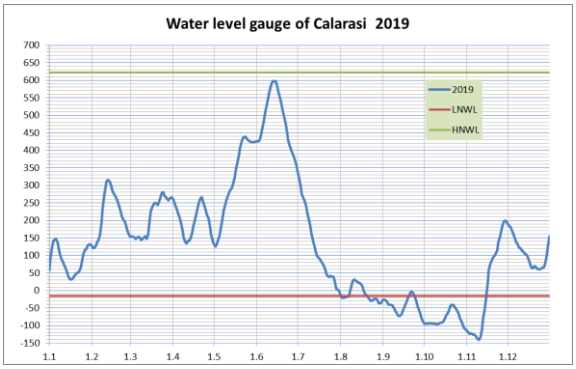
In the period January –December 2019 there were no restrictions for navigation in the reported critical locations due to low navigable water levels.
Nevertheless, navigation on navigable canals was restricted or closed due to meteorological conditions as follows:

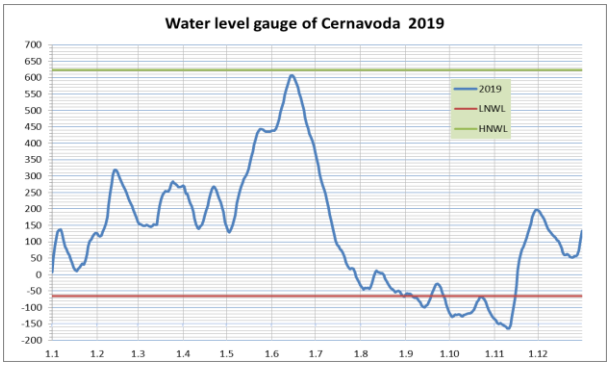
1. **Due to unfavourable weather conditions**
   - Danube-Black Sea Canal: due to fog conditions (107 hours) and due to strong wind conditions (383 hours)

In these conditions the measures taken by Romanian Naval Authority were to close the port of Constanta (for DBSC) and port of Midia (for PAMNC) and the measures taken by ACN were to restrict navigation on the canals.

8.2 RO | Hydrological conditions at main critical locations 2019

During the first part of the year 2019 (January-July), there were good hydrological conditions with water levels above LNWL and required fairway depths were reached. The maximum water levels were recorded in June with a discharge of 12 757 m³/s. Starting with August, water levels dropped drastically, reaching values below LNWL, even below 100 cm. The lowest water level was recorded in first half of November. Starting with December the situation was starting to improve. During the year 2019 the number of days with water levels below LNWL in main gauges were: Bechet 68 days, Corabia 100 days, Turcescu 89 days, Cochirleni 63 days.





8.3 RO | Key issues and related activities 2019

Related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014):

Danube

	Key issues	*Need for action*	*Activities performed 2019*
RO 01	Insufficient number of sounding vessels	Support acquisition of up-to-date sounding equipment to raise the coverage of surveyed areas.	*Pilot action for surveying activity defined within the FAIRway Danube project.* *The pilot actions of the sounding vessel and equipment were performed in 2019 in Bechet – Corabia – Calnovăț sector and Izvoarele – Cernavodă sector.* *Based on survey results the decision for additional dredging works in Bechet area was taken.* *All measurement results were published in pdf. format on the company's website and on the Danube FIS Portal. Since October, after the WAMOS platform became operable, the digital results of the surveying were uploaded on WAMOS.* *Based on the Agreement regarding the joint procurement of the technical assistance of the pilot evaluation activity signed in December 2018, by viadonau, AFDJ and IAPPD, was performed the tender procedure and the contract was signed in April 2019. In December 2019 the first Intermediate report for pilot evaluation was issued.*
RO 02	Insufficient number of automatic gauging stations.	Support acquisition of additional automatic gauging stations, especially for critical sections.	*Pilot activity of 6 new automatic gauging stations, 4 rehabilitated gauging stations and a centralized computer system was defined within the FAIRway Danube project.* *The infrastructure for installing 6 new and 4 rehabilitated gauging stations was integrated within the FAIRway Danube project during the year 2019. The tender procedure for the 6 new automatic gauging stations, the 4 rehabilitated gauging stations and a centralized computer system was completed and on 06.12.2019 the contract was signed.* *Within the feasibility study, the draft project proposal for the last 63 gauging stations, were identified within the LIOP 2014-2020 for rehabilitating and extending the network of hydrometric stations on the Romanian sector of the Danube was elaborated. The project proposal is under preparation and will be submitted in 2020 in order to be approved for funding.*

			As preparatory work, the urbanism certificates were obtained for a number of 63 locations; work is being done on the specifications for the supervision services and for the execution of the works. *In July 2019 the notification regarding the intention to carry out the project was submitted to the National Agency for Environmental Protection.*
RO 03	Lack of dredging equipment, specialized personnel and deficiency of investments in river regulation	Support acquisition of dredging equipment performance to increase the efficiency of working problem areas and the possibility of intervention at any time where it is needed	*The Romanian – Bulgarian Common Plan of measures necessary for 2019 including dredging works (December 2018) was mutually elaborated.* *Enough budget for dredging works during 2019 was scheduled in order to ensure a good navigation status.* *In October 2019 the Romanian – Bulgarian Joint Commission was organised in Galati and the measures plan necessary for 2020 including dredging works were discussed.* *The dredging works, with a volume of 800.000 m^3 on the river sector of the Danube was carried out with the third parties, as well as the dredging works with the AFDJ maritime dredger, with a volume of 728.605 m^3 on the maritime sector of the Danube.* *Within the SWIM project the contract for the capital dredging vessels (dredger – 1 piece, pontoon – 1 piece, split hopper barges - 2 pieces, assistant works vessel and its equipment – 1 piece) was completed in September 2019.* *The Application Form for two river tugs and two maritime tugs was approved within the LIOP 2014 -2020 in March 2019.* *The contracts for two river tugs and two maritime tugs were signed in September 2019.* *The documentation for the relaunch of the tender procedure for purchasing the two sets of dredging equipment was prepared using state budget funds. The tender procedure was launched in September 2019.*
RO 04	Inefficient procedures. The documentation to draw up a contract for dredging is time- consuming.	Support standardization and simplification of documentation procedures.	*The final version of the report with a list of pilot measures for dredging works within the SWIM project was elaborated together with the Bulgarian administration within the SWIM project.* *The internal procedures for different types of activities in order to implement the Integrated Management System of AFDJ were elaborated.*

			The Framework Contract for dredging works was signed for period 2019 – 2021.
RO 05	Lack of efficient vessels and special equipment for marking.	Support acquisition of vessels equipped with advanced machines to perform operations board assembly / disassembly floating signals.	*The pilot actions for the marking activity within the FAIRway Danube project were defined.* *The contract signed in October 2017 for delivery the marking vessel was completed in February 2019, after testing period performed in period January – February 2019.* *The baptism event of the marking vessel was organised on 26 March 2019.* *In June 2019 the pilot for marking activity started. In according with the Operational Plan, the marking trips for pilot operations were performed minimum once a month on the entire pilot area.* *Based on the Agreement regarding the joint procurement of the technical assistance of the pilot evaluation activity signed in December 2018, by viadonau, AFDJ and IAPPD the tender procedure was performed and the contract was signed in April 2019.* *In December 2019 the first Intermediate report for pilot evaluation was issued.*
RO 06	Insufficient number of buoys and position monitoring equipment. Unavailable automated system for the transmission of information on the buoys. The dissemination of information could be improved.	Support acquisition of buoys and monitoring equipment. Support establishment of an automated monitoring system and improve the provision of information on fairway marks.	*Until December 2018, 22 pieces of standard buoys were manufactured with the new developed design for floating signalisation.* *No further news.*
RO 07	Unavailable forecast for water levels.	Support establishment of a water level forecast	*See also key issue RO 02.* *The pilot action for water level forecast within the FAIRway Danube project was defined.* *The Agreement for providing the water level forecast was signed between AFDJ Galati, IAPPD Ruse and National Institute of Hydrology and Water Management.* *The technical specification elaboration for the national WAMS was completed and will incorporate the water level forecast. The tender procedure was launched in October 2019.* *Based on the Agreement regarding the joint procurement of the technical assistance of the pilot evaluation activity signed in December 2018, by viadonau, AFDJ and IAPPD, the tender procedure was performed and the contract was signed in April 2019.*

RO 08	Information could be provided customer-friendly using established river information portals.	Support customer-friendly processing and dissemination of information.	*AFDJ forwarded most information to the FIS PORTAL.* *AFDJ forwarded the information to the RoRIS PORTAL.* *From April 2019 until mid-September, when the new FIS Portal was put online, surveying results were published on RoRIS Portal and the new FIS Portal.* *AFDJ provided fairway information on the official website: www.afdj.ro*
RO 09	Unavailable digital terrain models for shallow sections.	Support set-up of digital terrain models for shallow sections.	*The digital terrain model has been developed within the FAST DANUBE project and is available for the entire Romanian – Bulgarian sector.*
RO 10	Insufficient number and quality of weather stations.	Support improvement of meteorological information.	*See key issue RO 02, since the gauging stations will be hydro-meteorological stations.*
RO 11	Missing interconnection with database of other waterway administrations to exchange data	Support interconnection between databases of different waterway administrations	*The pilot action for transnational data gathering and exchange was defined within the FAIRway Danube project.* *The tender procedure for the national WAMS implementation was completed and the system was launched in November 2019, including database and also technical characteristics for ensuring the interconnection with the transnational platform WAMOS.*

Danube-Black Sea Canal

	Key issues	*Need for action*	*Activities performed 2019*
RO 01	Insufficient number of sounding vessels	Support acquisition of up-to-date sounding equipment to raise the coverage of surveyed areas.	*Defining of the action within the proposed FAIRway Danube project.* *At the end of 2016 the portable single-beam echo sounder was procured.* *The equipment has started the pilot operation within FAIRway Danube in October 2017. Pilot operation is implemented.*
RO 02	Insufficient number of automatic gauging stations.	Support acquisition of additional automatic gauging stations, especially for critical sections.	*Defining of the action within the FAIRway Danube project.* *The procurement contract was signed in July 2018 and the works were finalised in July 2019. With August 2019 the pilot activities for all 4 rehabilitated gauging stations and 4 new gauging stations were started.*
RO 03	Lack of dredging equipment, specialized personnel and deficiency of investments in river regulation	Support acquisition of dredging equipment performance to increase the efficiency of working problem areas	*The contract for dredging works was signed in November 2018. Between January and December 2019 approx. 291.800 m^3 were dredged.*

		and the possibility of intervention at any time where it is needed	*Optimum navigation conditions were assured in this period.*
RO 07	Unavailable forecast for water levels.	Support establishment of a water level forecast	*Defining of the action within the FAIRway Danube project.* *According the Application Form and Grant Agreement ACN should provide water level forecast for Cernavoda, Navodari and Agigea locations.* *Taking into consideration that gauging stations were rehabilitated/constructed and put into operation, ACN focused to elaborate the forecast for water level in designated locations.* *In this respect the Agreement between ACN and National Institute of Hydrology and Water Management was signed for providing the water level forecast for Cernavoda locks location.* *For the other 2 locations (Navodari and Agigea) there will be established the procedure for water level forecast.*

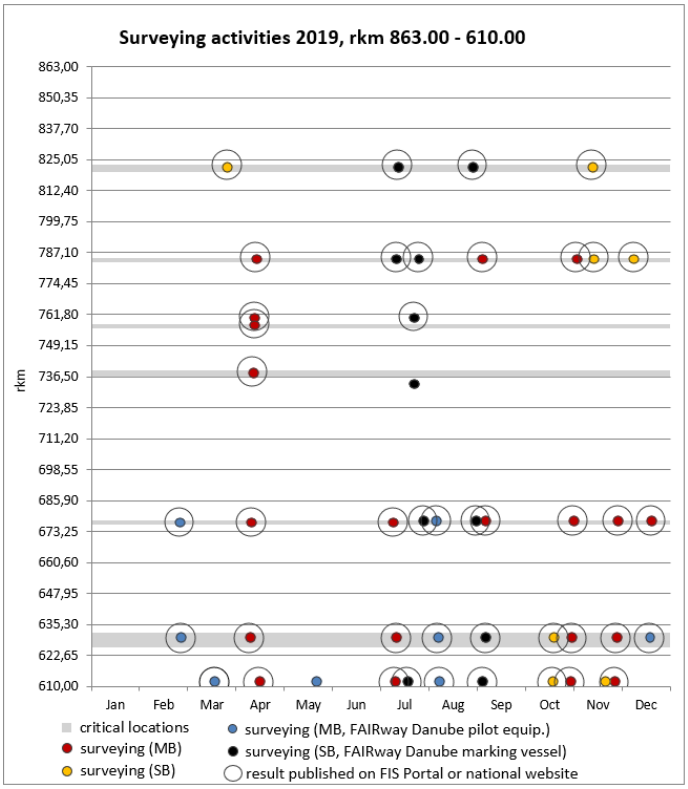
8.4 RO | Review of monitoring, rehabilitation and maintenance activities 2019

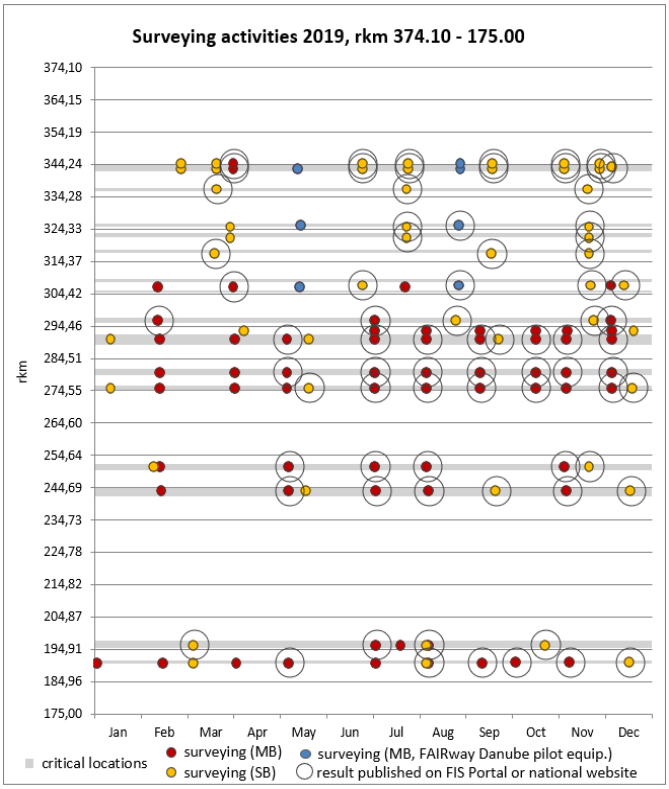
The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical locations as itemised in the Rehabilitation and Maintenance Master Plan (version December 2014) was last updated in September 2017.

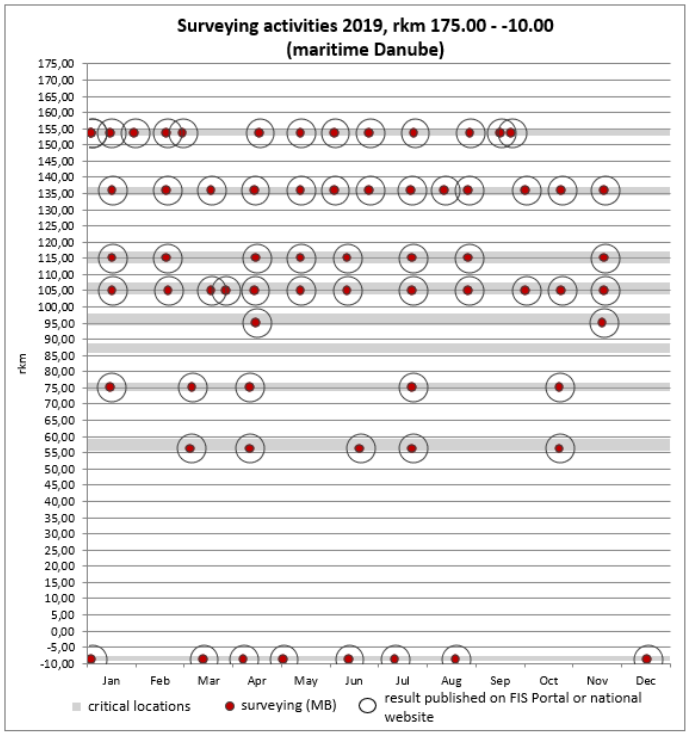
Riverbed surveying and waterway monitoring activities 2019

In the period mentioned, the following river bed surveying activities were performed in accordance with an annual plan and depending on the water levels and fairway dimensions. The charts below show the sections monitored and whether the surveying results were published.

Danube



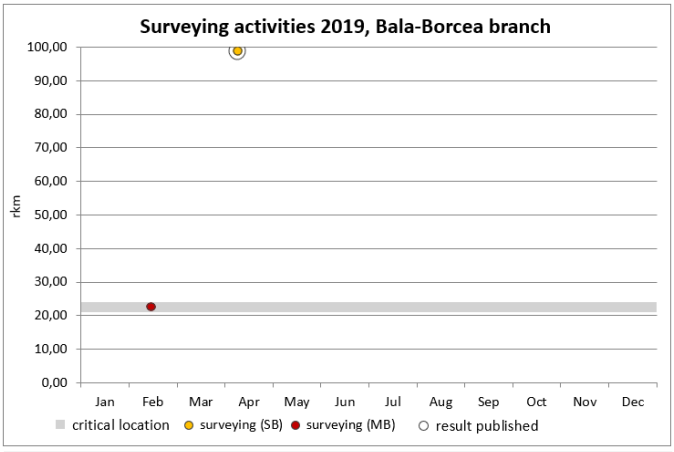


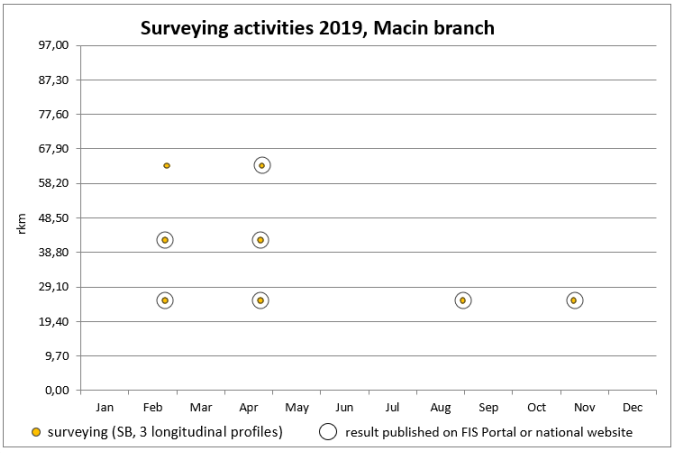


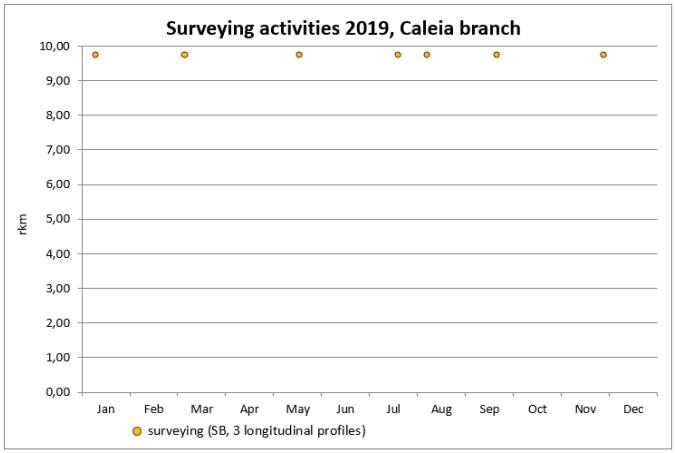
Shallow sections are always monitored by detailed surveys and control surveys.

In 2019, most shallow sections have been surveyed monthly, some of them even more often during the shallow water period. The surveys were carried out for planning and establishing the areas for dredging works and as surveys for user information purposes.

In 2019, with the new surveying equipment purchased within the FAIRway Danube project, six session of surveys were performed in the stretches Bechet-Calnovat and Turcescu-Cochirleni.







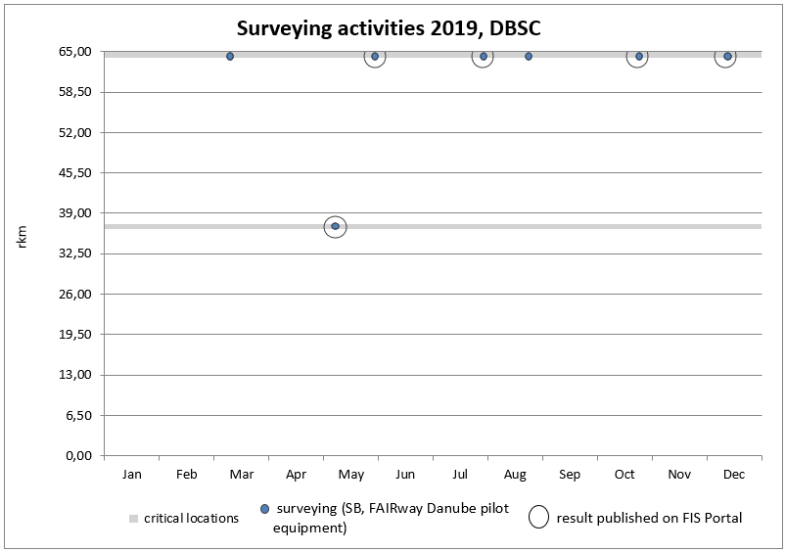
Single-beam surveying tours are either conducted with a specialised surveying vessel, recording cross-profiles, or, in some cases, with a marking vessel (equipped with an echo-sounder), recording 3-5 longitudinal profiles and in the stretch rkm 610-rkm 845, with the new marking vessel purchased in FAIRway Danube project. Nearly all surveying results were published.

From April 2019 until mid-September 2019, when the new FIS Portal went online, all surveying results of AFDJ were published only on the national portal of AFDJ (and on new FIS Portal) for user information purposes.

Danube-Black Sea Canal

In the period January – December 2019 the critical location Cernavoda was surveyed four times:

- In March 2019 with the portable single-beam equipment purchased within the FAIRway Danube project and a profile density of 20 m.
- In May 2019 another session of surveying with FAIRway Danube equipment took place in this area with 20 m density of profiles.
- In July 2019, according to the operation plan of the FAIRway Danube surveying activities took place with a profile density of 20 m.
- In August 2019 also with the FAIRway Danube equipment the area was surveyed, with a profile density of 20 m.
- In October 2019, within FAIRway Danube pilot activities, Cernaoda area was surveyed at the confluence with the Danube River with a profile density of 20 m.
- Also, in December 2019 surveying activities were performed with FAIRway Danube equipment with a profile of 20 m.

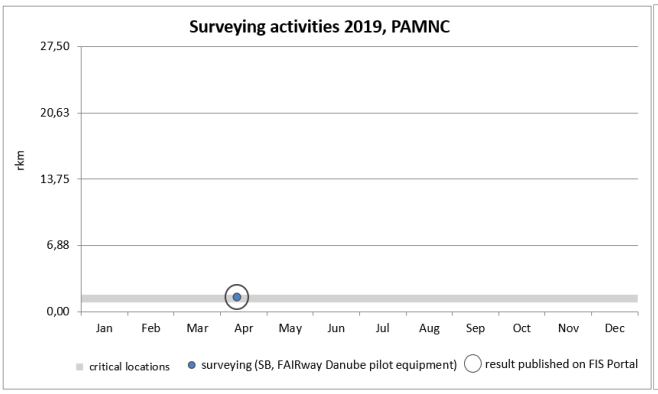


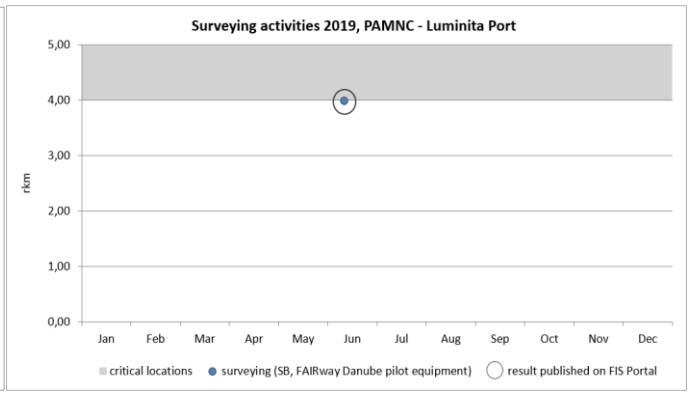
Due to dredging works in this area the surveying activities were performed more often, with company equipment in order to establish the dredged area and the dredged quantity of alluvial materials.

Also, according to the operation plan of the FAIRway Danube project, the critical location Medgidia port was surveyed in May 2019 with the purchased equipment, using a profile density of 20 m. Another session of surveying activities took place in April 2019 in Agigea locks area, with the FAIRway Danube equipment. The profile density was 20 m.

Furthermore, on the Poarta Alba-Midia Navodari Canal and the Luminita branch the following areas were surveyed:

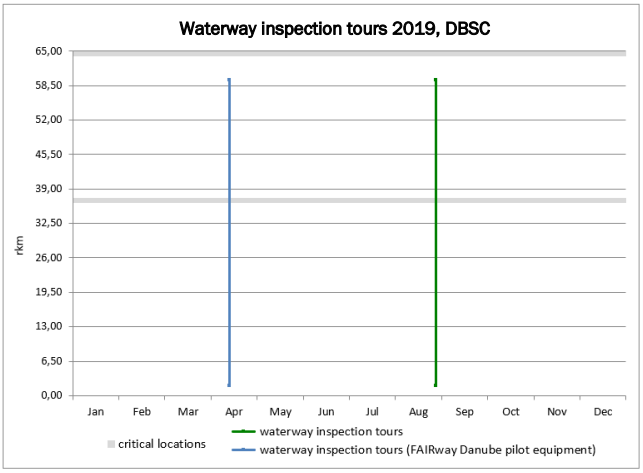
- In April 2019 critical location Navodari and in June 2019 critical location Port Luminita, according to the operation plan of the FAIRway Danube. FAIRway Danube equipment was used for those activities. The profile density was 10 m.

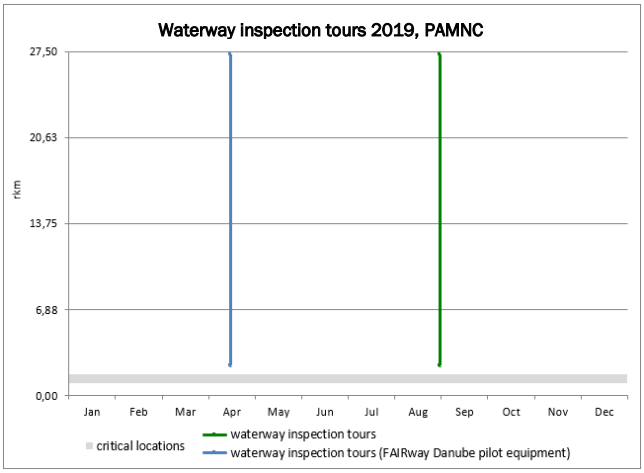




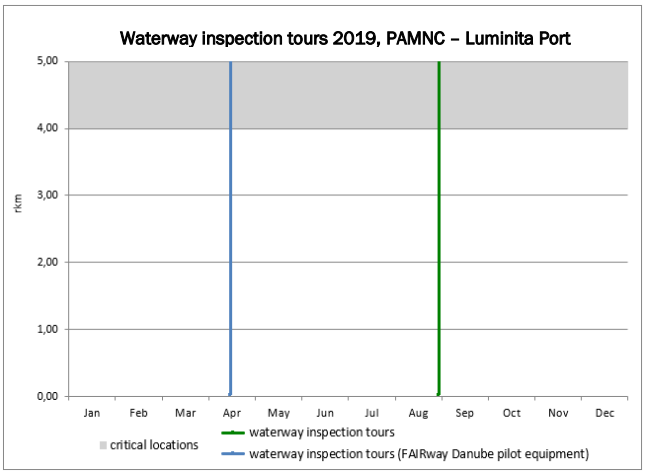
Inspection tours on the entire canals (DBSC and PAMNC) were performed in April 2019 covering the limits of the fairway, where the other vessel cannot survey. The monitoring was performed with the portable single-beam equipment, purchased within the FAIRway Danube project.

According to the Annual Plan for Hydrographical Measurements a waterway inspection and monitoring tour was also performed in August 2019 with Izvoru Mare vessel along the longitudinal axis of the fairway for both canals.





The old vessel and the equipment purchased within the FAIRway Danube project combined increase the accuracy and consistency of the hydrographical data and cover the entire waterway, up to the limits of the canal shores.

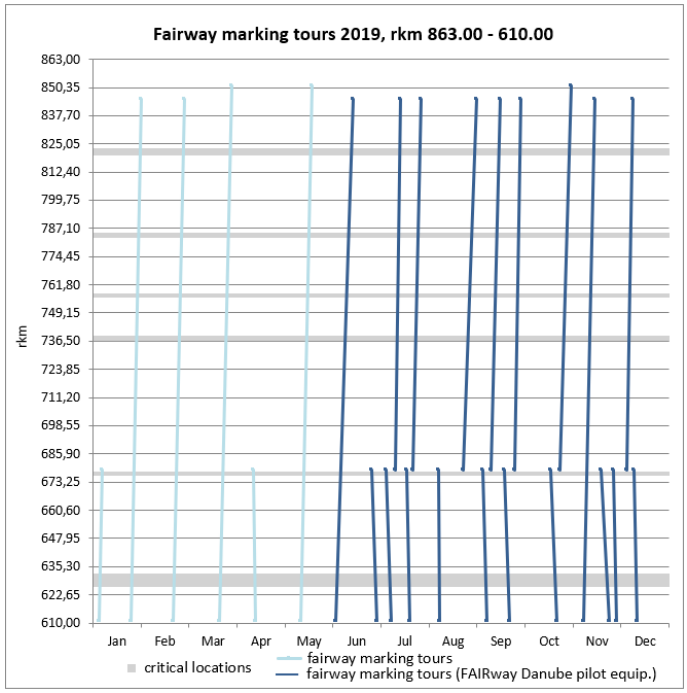


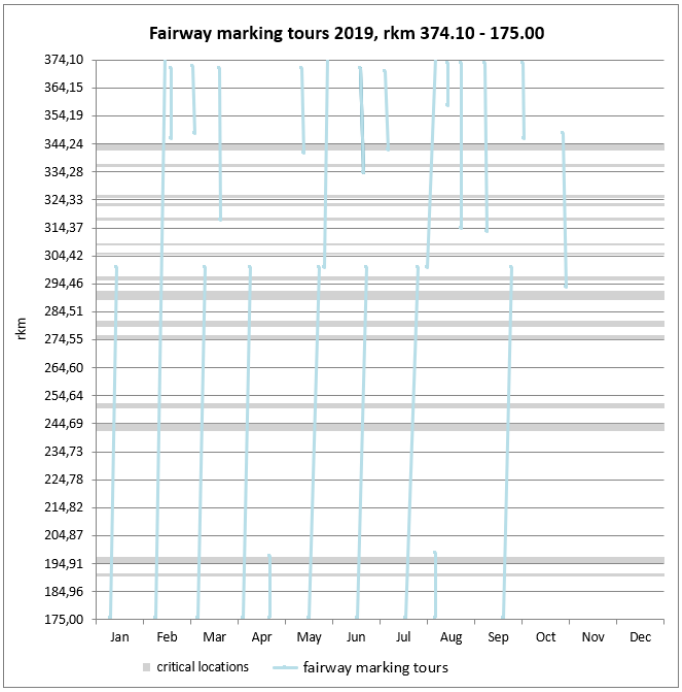
Fairway marking activities 2019

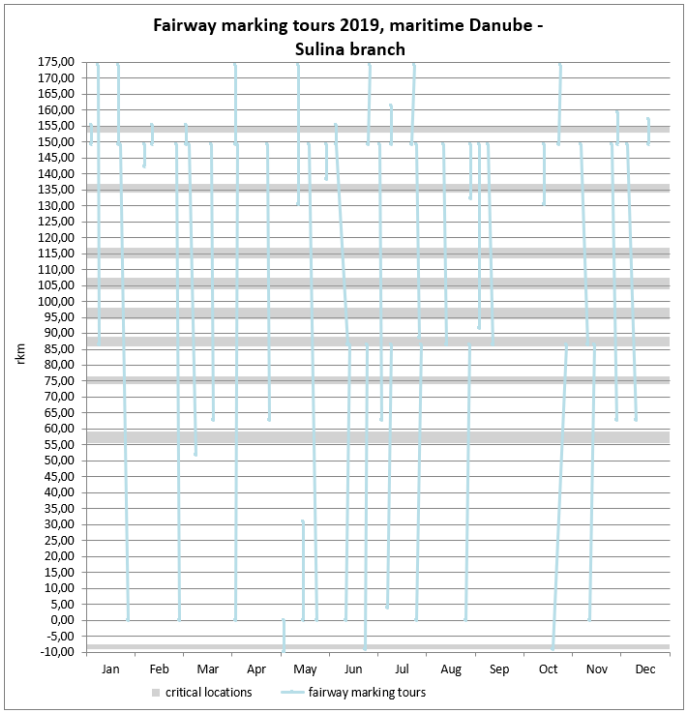
<u>Danube</u>

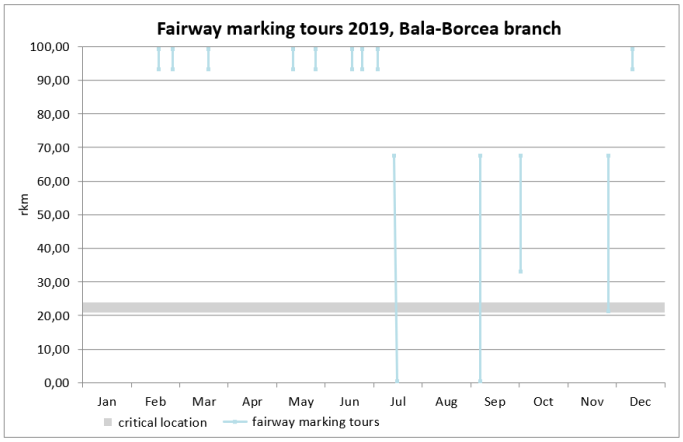
Based on the annual plan and the actual situation of the waterway, monthly field trips were performed with specialised marking vessels. Depending on the hydrological conditions, recourse to the fairway buoying works were conducted. Wherever necessary, due to low water levels (below LNWL), the fairway was narrowed. Preventively, when water levels were close to LNWL values, interventions for narrowing the fairway and ensuring depths for navigation were performed.

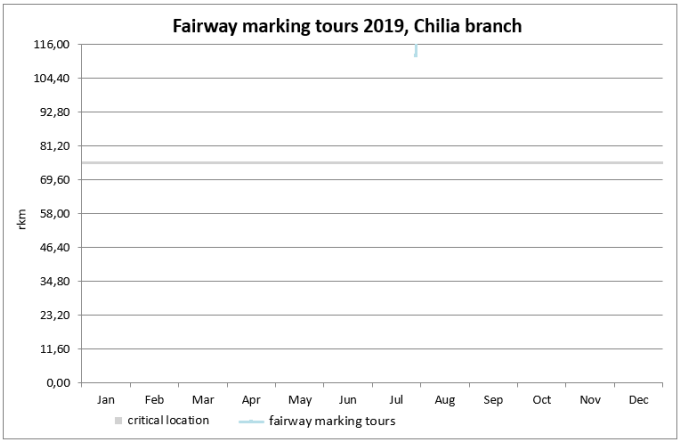
Most of the field inspection and marking tours included some kind of small intervention or narrowing of the fairway. In 2019, with the new vessel purchased in FAIRway Danube project, 20 marking tours were performed along the stretch rkm 610 - rkm 845.5.

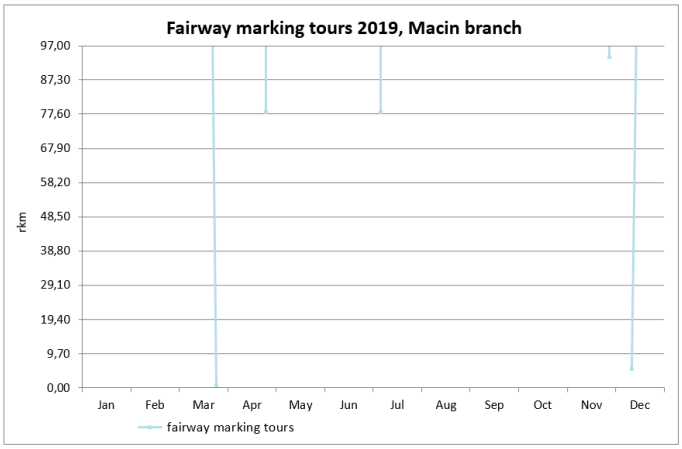


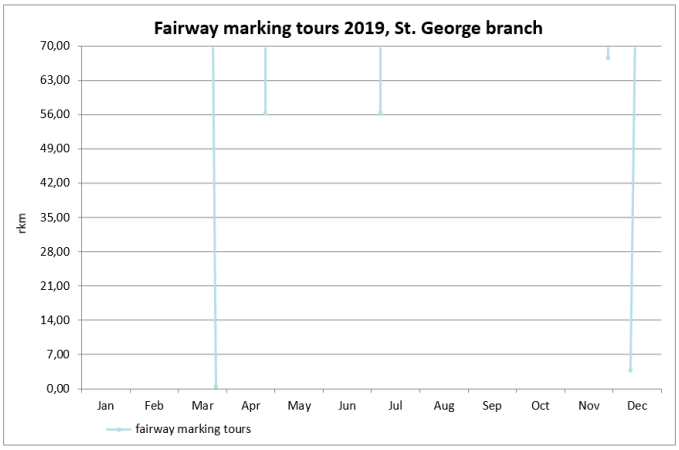












Dredging activities 2019

Danube

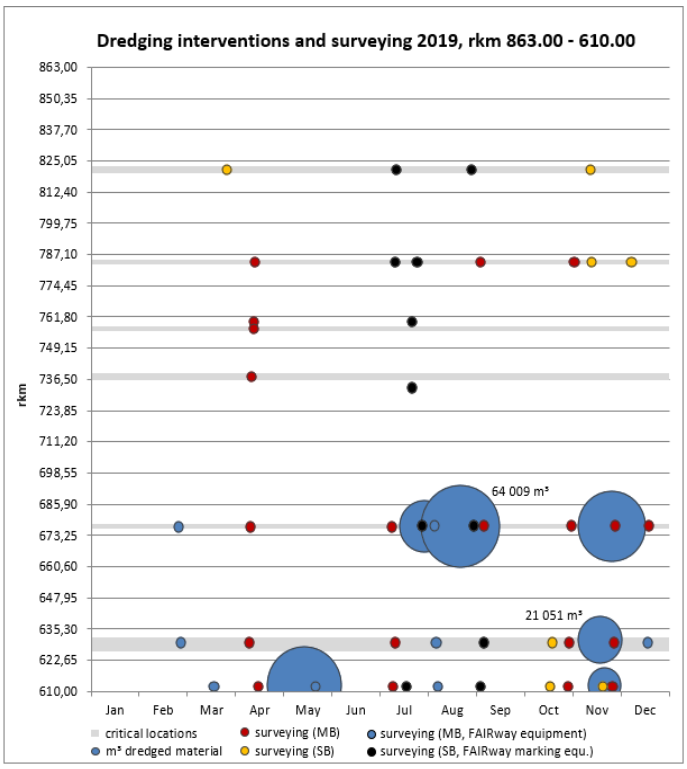
The following fairway dredging measures for ensuring navigation conditions were implemented on the Romanian Danube:

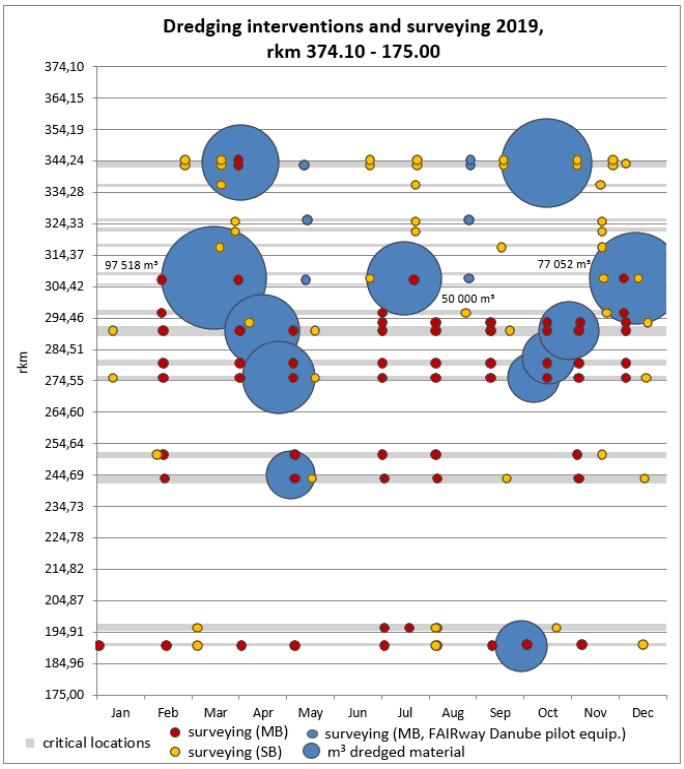
Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utili-sation	m³	Permits (see next table)
	from river km	to river km	from river km	to river km						
Siret	155.0	153.0	158.0	157.5	21.01.2019	01.03.2019	Fine sediment	Dumping	180 594	n/a
Isaccea	107.4	103.7	107.8	107.0	04.03.2019	28.03.2019	Fine sediment	Dumping	202 521	1,2
Cochirleni	310.0	304.0	305.0	304.0	07.03.2019	25.03.2019	Fine sediment	Dumping	97 518	n/a
Caragheorghe	345.0	342.0	340.5	340.0	25.03.2019	10.04.2019	Fine sediment	Dumping	52 482	n/a
Tulcea	75.9	74.0	80.0	79.0	01.04.2019	12.04.2019	Fine sediment	Dumping	42 281	1,2
Seimeni	292.6	288.0	289.0	288.5	10.04.2019	22.04.2019	Fine sediment	Dumping	48 951	n/a
Isaccea	107.4	103.7	107.8	107.0	17.04.2019	26.04.2019	Fine sediment	Dumping	80 712	1,2
Capidava	277.0	274.0	279.8	279.4	22.04.2019	01.05.2019	Fine sediment	Dumping	48 244	n/a
Giurgeni	246.0	243.0	242.0	241.0	01.05.2019	07.05.2019	Fine sediment	Dumping	21 729	n/a
Calnovat	611.9	612.5	613.0	613.5	08.05.2019	23.05.2019	Fine sediment	Dumping	55 483	n/a
Cochirleni	310.0	304.0	305.0	304.0	09.07.2019	23.07.2019	Fine sediment	Dumping	50 000	n/a
Bechet	676.8	677.6	672	673	10.07.2019	06.08.2019	Fine sediment	Dumping	25 711	n/a
Prut	138.9	135.2	134.6	134.0	01.08.2019	27.08.2019	Fine sediment	Dumping	144 895	1,2
Bechet	676.8	677.6	672	673	06.08.2019	06.09.2019	Fine sediment	Dumping	64 009	n/a

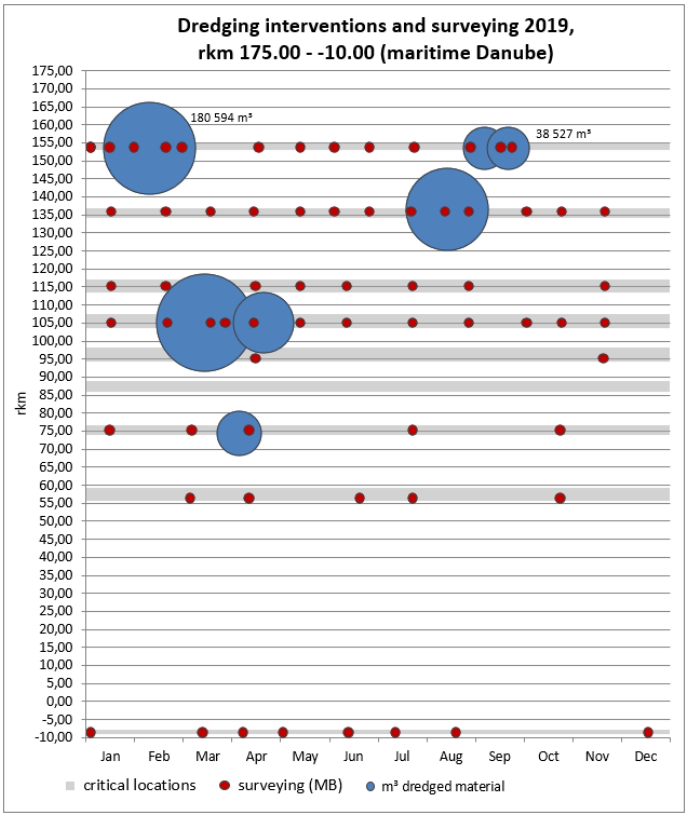
Siret	155.0	153.0	158.0	157.5	28.08.2019	16.09.2019	Fine sediment	Dumping	39 075	n/a
Siret	155.0	153.0	158.0	157.5	19.09.2019	23.09.2019	Fine sediment	Dumping	38 527	n/a
Capidava	277.0	274.0	279.8	279.4	03.10.2019	11.10.2019	Fine sediment	Dumping	23 729	n/a
Albanesti	284.5	279	279.8	279.0	11.10.2019	22.10.2019	Fine sediment	Dumping	25 687	n/a
Seimeni	292.6	288	289.0	288.5	22.10.2019	06.11.2019	Fine sediment	Dumping	32 463	n/a
Corabia	629.5	630.0	627.0	628.0	07.11.2019	27.11.2019	Fine sediment	Dumping	21 051	n/a
Calnovat	611.9	612.5	613.0	613.5	14.11.2019	26.11.2019	Fine sediment	Dumping	11 597	n/a
Bechet	676.8	677.6	672	673	21.11.2019	28.11.2019	Fine sediment	Dumping	47 146	n/a
Cochirleni	310.0	304.0	305.0	304.0	01.12.2019	22.12.2019	Fine sediment	Dumping	77 052	n/a

Referenced and relevant permits	Title of permit (original language)	Permitting authority	Permit applicable		Valid until	Type of permit (e.g. environmental, water, navigation law)	Main conditions for permit
			from river-km	to river-km			
1	Autorizația nr. 284 din 13.11.2013	Environmental Protection Agency Galati	0	175	12/11/2023	Navigation law	• To respect the Law no. 211/2011 regarding the regime of waste; • To respect Government Decision no. 235/2007 regarding the management of the used oil; • To respect the provisions of the International Convention for the Prevention of Pollution From Ships - MARPOL 73/78; • It is forbidden the abandonment or storage in any way, in riverbed or on the banks of surface water or maritime of any kind of waste • Monitoring of the quality of the environment • Monitoring of the chemical composition of dredged material
2	Autorizația nr. 1154 din 25.02.2013	Administration of the Danube Delta Biosphere Reserve	0	175	25/02/2023	Water Law	• the dredging works within the Danube Delta Biosphere Reserve in Bara Sulina Mm critical points at 77-90, Rostock Mm 31, Mm 41 upstream Tulcea, Isaccea Mm + 800-Mm 58 • storage of the dredged material on the dredger „Dunărea Maritimă” • discharge of the dredged material in the discharge areas in Bara Sulina 2 km offshore, km 108-km 109 St. Gheorghe arm, left bank, upstream Tulcea – Mm 45 + 500 right bank, 58-Mm 58 Isaccea Mm + 1/2 right bank

The dredging interventions are reported in combination with the surveying activities. This illustrates the strong dependency of dredging works on up-to-date surveying results. Prior to, during and after dredging works the respective critical locations were surveyed in addition to the regular surveying tours.





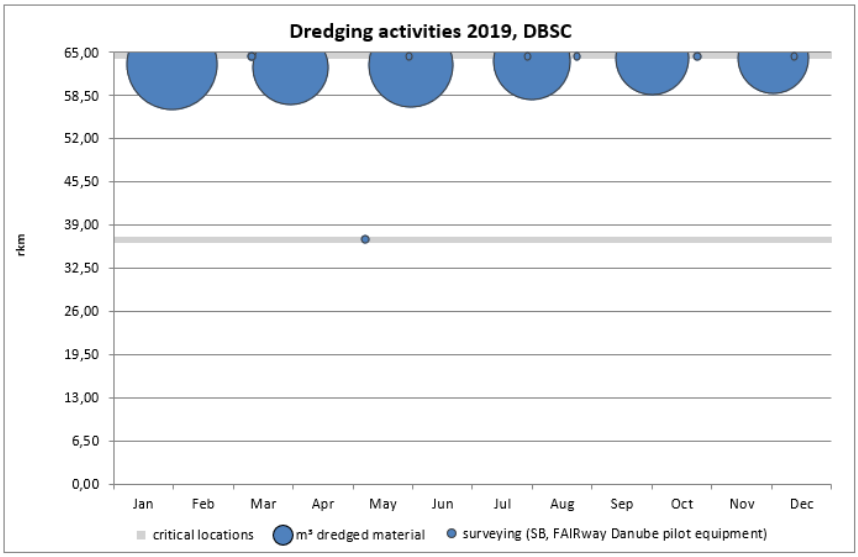


In 2019, in the Romanian Danube River sector dredging works started in March and a volume of 799 997 m³ was dredged by third parties. For the maritime Danube, the dredging works started in January and a volume of 728 605 m³ was dredged with AFDJ resources.

Danube-Black Sea Canal

The following fairway dredging measures for ensuring navigation conditions were implemented in area administered by ACN:

Between January-December 2019 291 800 m³ of alluvial materials were dredged from the confluence of Danube-Black Sea Canal with Danube river, in the Cernavoda area.

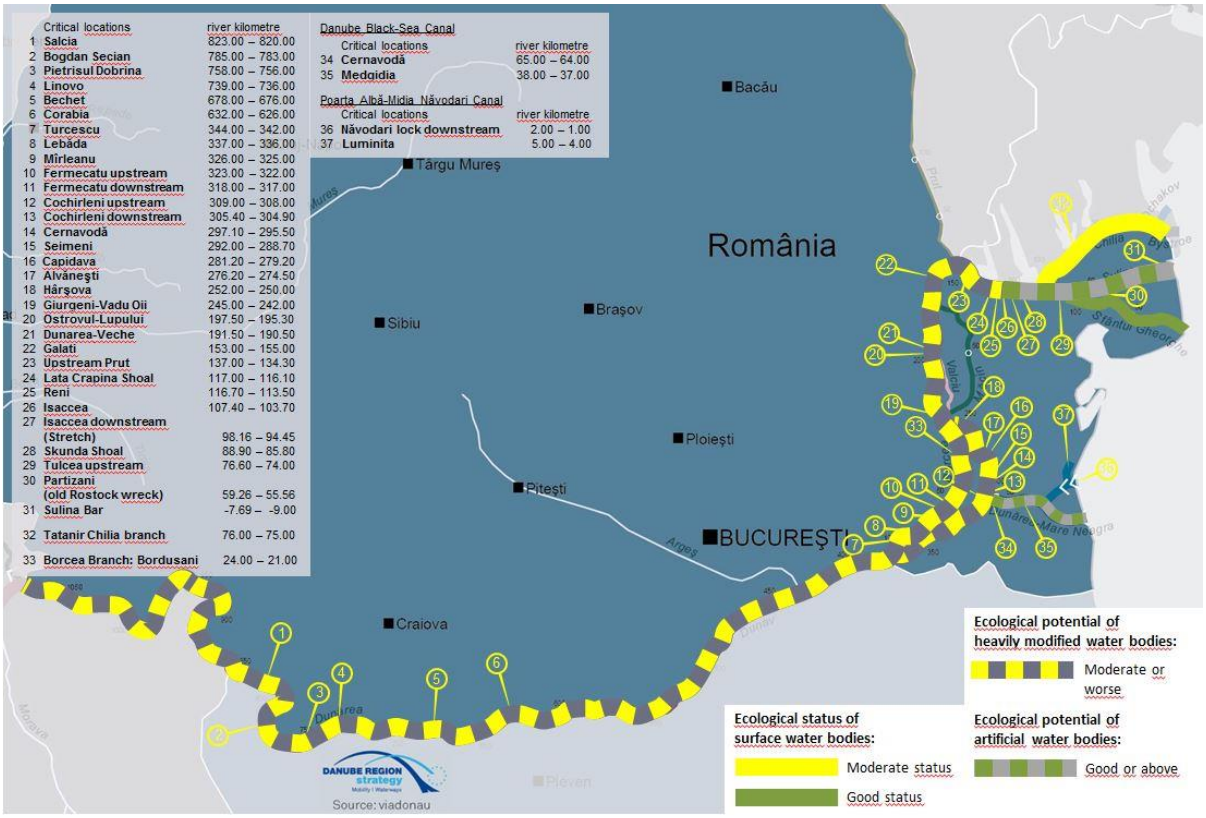


Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m³	Permits (see next table)
	from river km	to river km	from river km	to river km						
Cernavoda	62.82	63.85	-	-	01.01.2019	31.01.2019	Fine sediment	Dumping	26 103	-
Cernavoda	62.53	63.62	-	-	01.02.2019	28.02.2019	Fine sediment	Dumping	38 410	-
Cernavoda	62.5	63.27	-	-	01.03.2019	31.03.2019	Fine sediment	Dumping	21 490	-
Cernavoda	62.68	63.01	-	-	01.04.2019	30.04.2019	Fine sediment	Dumping	22 680	-
Cernavoda	63.02	63.33	-	-	01.05.2019	31.05.2019	Fine sediment	Dumping	30 282	-
Cernavoda	63.34	63.56	-	-	01.06.2019	30.06.2019	Fine sediment	Dumping	25 310	-
Cernavoda	63.57	63.88	-	-	01.07.2019	31.07.2019	Fine sediment	Dumping	23 510	-
Cernavoda	63.89	64.44	-	-	01.08.2019	31.08.2019	Fine sediment	Dumping	22 805	-

Cernavoda	64.22	64.35	-	-	01.09.2019	30.09.2019	Fine sediment	Dumping	20 060	-
Cernavoda	64.19	64.57	-	-	01.10.2019	31.10.2019	Fine sediment	Dumping	21 760	-
Cernavoda	64.37	64.44	-	-	01.11.2019	30.11.2019	Fine sediment	Dumping	21 940	-
Cernavoda	64.30	64.37	-	-	01.12.2019	31.12.2019	Fine sediment	Dumping	17 455	-

8.5 RO | Summary of current ecological status and environmental impacts

The following map displays the ecological status and ecological potential of the Romanian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Romania.



Danube

Ecological status and ecological potential of surface water bodies

The Danube River is the main navigable route from Romania. On Romanian territory, the waterway is divided into riverine Danube, from entering the country to Galati and maritime Danube from Galati until it flows into the Black Sea. Also, the Danube - Black Sea channel (CDMN) and Poarta Alba - Midia - Năvodari channel (CPAMN) provides the connection with the Black Sea.

In terms of ecological status as defined in the Water Framework Directive, most water bodies are good and moderate ecological status or ecological potential moderate.
Target "status deterioration" of water bodies is a key element in the protection of water bodies. Damage / risk of damage to the ecological status of water bodies in relation to new infrastructure projects will be permitted only in compliance with Art. 4.7 of the Water Framework Directive. Deteriorating (green) of water bodies considering item level of quality of the state of incorporation, applying the principle of "most unfavourable situations / one out all out", given the provisions of Annex V of the Water Framework Directive.
New projects / works are identified within a planning cycle and that were not contained in the Management Plan precedent can be implemented with the requirements Art. 4.7 of the WFD (where the expected risk of deterioration of the ecological / we achieve good status of the water body), to be published / contained in the following Management Plan.
Also, in cases where there is a change the environmental objective by passing water body category of natural water bodies heavily modified water bodies this is achieved by compliance with Art. 4.7 and Art. 4.3 of the WFD.
At the international river basin district of the Danube were established by the first and second Management Plan of the district Danube management objectives of the core management issues surface waters represented by: organic pollution, nutrient pollution, and pollution by hazardous substances, morphological alterations. For each category of important issues of water management and management objectives have been defined deadlines and 'targets' / compliance objectives and programs of specific measures. These objectives have been taken at national level as part of the process of water management in the Danube district. Detailed information on the management objectives at the Danube basin and sub-basin Tisa can be obtained by accessing the website: www.icpdr.org (public section).

Measures to improve environmental conditions

Potential work types, with the horizon of implementation during 2016-2020, largely depend on the availability of funding, and other issues such as, for example technical feasibility, availability of land where the work are executed, etc. In the call CEF Transportation was approved for funding the project "Technical assistance for reviewing and completing the feasibility study on improving navigation conditions on the joint Romanian-Bulgarian Danube and Additional studies " (former ISPA project II), with a deadline for completion in December 2018. Within the POS-T 2007-2013 was funded project "Improvement of navigation on the Danube between Calarasi and Braila, Km 375 - Km 175" (former ISPA project I). For the critical point Bala, will study an alternative solution within the project Study of alternative technical solutions about the works which will be carried out on the critical point 01 Bala, in the project "Improving the navigation conditions on the Danube between Calarasi and Braila, km. 375–km.175, Stage II". The projects mentioned have regard to the „Joint Statement on guiding principles for the development of Inland navigation and environmental Protection in the Danube River basin", adopted in December 2007 / January 2008. Thus, it was envisaged protection of the riparian environment and the necessary conditions and processes that lead to a sustainable development of inland navigation, the set measures to reduce the effects due to navigation. Within infrastructure works also mention the works included in the Romanian Operational Programme as follows: major projects that will be implemented during the programming can be found at the following link: http://www.fonduri-ue.ro /Operational Programme Infrastructure

2014. Potential future infrastructure works will be subjected to an analysis in terms of damage / deterioration state / ecological potential of water bodies in the light of Art. 4.7 of the Water Framework Directive.
Information detailed in the National Plan for Management of the Danube River Basin.
Within the project "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" financed under the Connecting Europe Facility Program, was finalised the tender procedure and was signed the contract with the consultant for feasibility study elaboration.

Within the procedure all mandatory documents shall be prepared, including:
- EIA report, including the Appropriate Assessment Study and a Non-Technical Summary
- Environmental Monitoring Program for the preferred option
- Assessment of risk and vulnerability to climate change
- Report on Impacts of the Project on Water Bodies in accordance with Article 4.7 of WFD
- Relevant documents to conduct cross-border consultations between Romania and Bulgaria to meet ESPOO requirements.

Also, arguments and evidence to support mitigating measures will be prepared, and compensatory measures if they are relevant, documentation for public consultation, and as appropriate draft documents to explain and argue where major public interest may need to be a consideration for Environmental Approval by both Romanian and Bulgarian authorities.
All 12 critical sites are located within or partially within Natura 2000 sites in both Romania and Bulgaria (and partly within Habitats and Birds Directive sites; pSCI, SCI, SAC, SPA).

Measures to ensure longitudinal connectivity

For the Danube River from Romanian sector, the Iron Gate Dams 1 & 2 (EN / RS) has significant river and habitat continuity interruptions.
Regarding additional measures such as ensuring longitudinal connectivity of water bodies within the period of drafting the by - second Management Plan was envisaged generally a prioritization of measures to ensure firstly connectivity longitudinal if transverse sealing existing heights below 15 m (considered technically feasible) on watercourses. Also analysed the possibility of providing longitudinal connectivity of water bodies for dams with heights greater than 15 m for the first Management Plan were provided as measures / tools, research studies which aimed at this goal.
The next stage will analyse the requirements of Article 4.7., the WFD and will be identified "alternative objectives" related by taking test compliance with the requirements of Art. 4.7. and other bodies of water which are expected deterioration / or non-ecological potential environmental objectives in the context of new infrastructure projects.
Navigation on the project "Improvement of navigation on the Danube between Calarasi and Braila, km 375- km 175" (ISPA), will be improved through the application of the alternative solution resulted in the project Study of alternative technical solutions about the works which will be carried out on the critical point 01 Bala, in the project "Improving the navigation conditions on the Danube between Calarasi and Braila, km. 375–km.175, Stage II" which will include the report on environmental impact assessment (EIA) report on appropriate assessment (AA). Works done in critical points 02 Epuraşu and 10 Ostrovul Lupu will not have negative impact on the environment, according to the data monitored within the project "Monitoring the environmental impact of works to improve navigation conditions on the Danube between Călăraşi and Braila, km 375 - km 175".

In order to achieve the environmental objectives within the project "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" will be developed the EIA Study.
The EIA report will include the assessment of risk and vulnerability to climate change for the sector of the Danube studied in the project, and the Study for the waterbody impact assessment.
Constructive solutions will be sought that can optimise the incorporation of the "measures with the lowest impact" for every critical sector, and appropriate mitigation measures will be determined which will help minimise the project's environmental impacts (including those on Natura 2000 sites).
Appropriate Assessment procedures will be undertaken in parallel with EIA procedures within a transboundary context according to the legal requirements, and ensure that the EIA includes a fully developed Environmental Management Plan for monitoring environmental impacts and appropriate assessment.
Consistent with District Management Plan International Danube (http://icpdr.org/main/management-plans-danube-river-basin-published) measures proposed in the program of measures of the Management Plan were correlated with impact climate change.

Danube-Black Sea Canal

Ecological status and ecological potential of surface water bodies

ACN particularly monitors the water quality in the navigable canals, taking into consideration that the canals represent a source for drinkable water for the nearby residences.
In order to respect the Water Framework Directive, the global quality of the navigable canals water, regarding chemical properties should be according to the second class of quality, appropriate for a good ecological state.
ACN has the following responsibilities, according with the Water Management regulation: to operate and maintain the navigable canals with respect of operating procedures; to provide to the users the required waters quantity in order to maintain the normal level of canal water; to receive treated wastewater from users in specified range of water quality parameters; to maintain in operating conditions the warning systems for cases of emergency, accidents and the informational system.
In case of critical situations such as natural calamities, flood, water inrushes for increasing the discharge of exceeding water to the sea, ACN uses lockage processes and flood management.

Measures to improve environmental conditions

According with the Environmental regulation ACN has the following responsibilities:
To publish a public report on its website or other media, on a quarterly frequency about the environmental activity (in accordance with art. 26, paragraph 1 of Government Decision no 878/2005);

- to monitor the water quality of the navigable canals in order to comply with the limits imposed by the current water legislation;
- compliance with Plans for intervention and combating accidental pollution;
- to monitor and prohibit the discharges of the waste waters from the ships in transit, that can be loaded with hydrocarbons, detergents or other hazardous substances and to inform environmental agency.

In order to improve the results for the above responsibilities, ACN has done the following:

- a program to identify and evaluate the environmental aspects of all processes/projects of the company;
- identify, evaluate and classify the environmental impacts associated with the environmental aspects of all the processes /projects of the company;
- periodically updates of Plans for intervention and combating accidental pollution, the environmental management program for the company, the environmental monitoring program
- periodically training of employees regarding the environmental legislation and waste management
- the automatic system for monitoring water quality parameters using automatic stations along the navigable canals
- chemical analysis in the company's laboratory, as well as the visual observation of hydro technical agents in the field

Navigation maintenance measures and environmental impacts

The maintenance of fairway supposed to maintain the wet section of the canals in limits of the designed parameters through periodic dredging of alluvial material deposits by water taken from the Danube and rising from hydrographic basin. Dredging periods will be established so that solid deposits on the bottom of canals do not exceed thickness of 1 m (max 1.25 m) for the Danube Black Sea Canal and 0.75 m (max. 1 m) for Poarta Alba-Midia Navodari Canal. Dredging works are realised by keeping traffic open at least one way of navigation with corresponding signalization. The navigation dispatcher of ACN has the responsibility to notify the seafarers, by notification, all changes on sailing conditions.

8.6 RO | Budget status February 2020

Investments taken for FRMMP implementation 2014 – 2019

The figures in this table comprise AFDJ and ACN	Required additional investment 2014 – 2020 according to FRMMP	Investment cost secured by state or other co-financing 2015 – 2020	(% thereof EU co-financed)	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	23 500 000	23 500 000	32.61%	0
Surveying of the riverbed	5 433 000	433 000	85.00%	5 000 000
Water level gauges	300 000	246 650	85.00%	53 350
Marking of the fairway	10 274 000	3 750 000	79.33%	6 524 000
Availability of locks / lock chambers	400 000	200 000	85.00%	200 000
Information on water levels and forecasts	206 000	206 000	85.00%	0
Information on fairway depths	400 000	400 000	85.00%	0
Information on marking plans	80 000	80 000	85.00%	0
Meteorological information	365 000	356 010	56.11%	8 990
Other needs	100 000	100 000	54.40%	0
Sum (Euro)	**41 058 000**	**29 271 660**	**41.76%**	**11 786 340**

Operational expenditures for conducted activities 2019 and budget needs 2020 (AFDJ and ACN)

The operational budgets for AFDJ and ACN are considered secured, although last official approval is pending.

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	4 672 088	5 248 421	5 248 421	-
Surveying of the riverbed	692 584	763 550	763 550	-
Water level gauges	-	-	-	-
Marking of the fairway	3 245 738	3 754 211	3 754 211	-
Availability of locks / lock chambers	4 400 246	5 120 835	5 120 835	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	186 335	208 042	208 042	-
Sum	**13 196 991**	**15 095 059**	**15 095 059**	**-**

Operational expenditures 2019 and budget needs 2020 (AFDJ)

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	3 566 825	3 800 000	3 800 000	-
Surveying of the riverbed	680 000	750 000	750 000	-
Water level gauges	-	-	-	-
Marking of the fairway	3 239 520	3 750 000	3 750 000	-
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
Sum	**7 486 345**	**8 300 000**	**8 300 000**	**0**

The required operational budget for ensuring the navigation conditions is estimated annually, in the last quarter of the year, for the next year, considering the Danube Commission recommendations, navigation class (AGN) and the recommended minimum LoS.

The required budget for dredging works it is estimated based on the most recent hydrographical surveys performed in order to establish the river bed morphology, especially in the bottleneck areas

and taking into account the statistical hydrological information related to the water level and water flow discharge, as well as the riverbed morphology evolution until the start of the interventions.
The dredging quantities are estimated related to the minimum depths in the bottlenecks area about LNWL reference. For each bottleneck area are estimated the dredging quantities necessary to ensure minimum fairway parameters, as follow:

- on the basis of the unit price established into the framework contract, in case of dredging works with third parties on the river Danube;
- on the basis of estimated costs for dredging with own resources on the maritime sector of the Danube.

During the year, depending on the morphological changes, the required dredging quantity can be re-evaluated with influence on the additional budget.
For riverbed surveying activities, which provide information about riverbed morphology and hydrological parameters with influence on the navigation conditions is elaborated the annual plan for surveying activity for navigation conditions monitoring and publishing the fairway information to the end users. The plan includes daily surveys for water level information and periodic surveys for determining the riverbed morphology.
The required budget is estimated in relation with the surveying trip number included into the surveying plan, considering the riverbed morphology dynamics and minimum level of services which should be achieved.
For the marking activities the fairway alignment and the signalisation scheme are designed for each river sector and the annual marking plan which includes the floating and coastal signals and the marking trip numbers is developed.
The required budget is estimated based on the costs for buoys and coastal signals manufacturing and marking trips number.

Operational expenditures 2019 and budget needs 2020 (ACN)

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	1 105 263	1 448 421	1 448 421	-
Surveying of the riverbed	12 584	13 550	13 550	-
Water level gauges	-	-	-	-
Marking of the fairway	6 218	4 211	4 211	-
Availability of locks / lock chambers	4 400 246	5 120 835	5 120 835	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	186 335	208 042	208 042	-
Sum	**5 710 646**	**6 795 059**	**6 795 059**	**0**

RO | Outlook: actions, milestones and funding sources

Danube and Danube-Black Sea Canal

RO 01: Insufficient number of sounding vessels		
Planned activities:	Support acquisition of up-to-date sounding equipment to raise the coverage of surveyed areas (managing of the purchasing)	
Current shortcomings:	Insufficient sounding vessels and equipment, modernisation and acquisition requested	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Budget availability 2019/2020: Funding through CEF Programme – FAIRway Danube project Operational Programme Transport 2014-2020	
Next steps:	**AFDJ:** Performing the pilot actions with the sounding vessel and equipment within the FAIRway Danube project	until 2021
	ACN: Finalization of feasibility study for design and building of 2 multifunctional vessels	until December 2019
	Design and building of 2 multifunctional vessels (depending on the financial resources)	until December 2021
RO 02: Insufficient number of automatic gauging stations.		
Planned activities:	Support acquisition of additional automatic gauging stations, especially for critical sections	
Current shortcomings:	Insufficient number of automatic gauging stations, especially for critical sections	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Funding through SOP-T 2007-2013 – HyQ Danube Project Budget availability 2019/2020: CEF Programme – FAIRway Danube project Operational Programme Transport 2014-2020	
Next steps:	**AFDJ:** Putting into operation 10 automatic gauging stations (6 new and 4 rehabilitated) in selected pilot areas within the FAIRway Danube project	May 2020
	Submitting the project proposal for realisation of the network of hydrometric stations (installation or rehabilitation of 63 hydrometric stations)	June 2020

	Organising the tender and realisation of the network of hydrometric stations **ACN:** Acquisition procedure for modernization and extension of the existing gauging network system + execution	until the end of 2023 finalised July 2019
RO 03: Lack of dredging equipment, specialized personnel and deficiency of investments in river regulation		
Planned activities:	Support acquisition of dredging equipment performance to increase the efficiency of working problem areas and the possibility of intervention at any time where it is needed	
Current shortcomings:	**AFDJ:** Missing dredging equipment for critical river sectors and the possibility of intervention at any time where it is needed Lack of new specialized personnel due to the restrictions of national legislation Low level waterway infrastructure **ACN:** One of the important issues to ACN is to ensure the stability of navigable canals banks, in an area where the gap between service road level and natural ground level is up to 55 m (about 20 km on Danube-Black Sea canal – each shore and about 7 km on Poarta Alba-Midia Navodari canal – on each shore)	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Budget availability 2019/2020: Funding through state budget CEF-Programme	
Next steps:	**AFDJ:** Complete the tender procedure for acquisition of dredging equipment with state budget funds and sign the contract Delivery of the dredging equipment Monitoring the contract for two river tugs and two maritime tugs provision Delivery of the river tugs Monitoring the Framework contract for dredging works for period 2019 – 2021 New dredging equipment needs new specialized personnel – engage the specialized personnel and training existing staff	until June 2020 until December 2021 February 2021 February 2021 December 2021 May 2020

	ACN: ACN received the approval from the Ministry of Transport to support the feasibility study within the LIOP 2014-2020. Submit the application form for feasibility study to LIOP 2014-2020 Elaborate the feasibility study (estimation 9 months) Submit the application form for rehabilitation works (according with the last estimation CEF II or LIOP 2014-2020) Design and execution of works (protection and consolidation of banks)	submitted December 2019 December 2020 beginning of 2021 2021-2023
RO 04: Inefficient procedures. The documentation to draw up a contract for dredging is time-consuming.		
Planned activities:	Support standardization and simplification of documentation procedures	
Current shortcomings:	Inefficient procedures	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Budget availability 2019/2020: Funding through AFDJ budget/state budget CEF-Programme	
Next steps:	**AFDJ:** Preparing specific documentation for the efficient procedures concerning with existing standards and national legislation Elaboration and permanent update of the Measures Plan together with Bulgarian administration for capital dredging activity on the common Romanian – Bulgarian sector of the Danube	until June 2020 2019 - 2021
RO 05: Lack of efficient vessels and special equipment for marking		
Planned activities:	Support acquisition of vessels equipped with advanced machines to perform operations board assembly / disassembly floating signals	
Current shortcomings:	Missing the efficient vessels and special equipment for marking	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Funding through SOP-T 2007-2013 – Feasibility study for technical vessels Budget availability 2019/2020: CEF-Programme – FAIRway Danube project	
Next steps:	**AFDJ:**	until 2021

	Performing the pilot actions within the FAIRway Danube project	
RO 06: Insufficient number of buoys and position monitoring equipment. Unavailable automated system for the transmission of information on the buoys. The dissemination of information could be improved		
Planned activities:	Support acquisition of buoys and monitoring equipment Support establishment of an automated monitoring system and improve the provision of information on fairway marks	
Current shortcomings:	Insufficient number of buoys and position monitoring equipment	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Budget availability 2019/2020: Funding through CEF-Programme – FAIRway Danube project Operational Programme 2014 - 2020 AFDJ budget/state budget	
Next steps:	**AFDJ:** Preparing the technical specification for public procurement for marking system equipment Improving and monitoring Romanian marking system Manufacturing the buoys using the new design	 until December 2020 until the end of 2021 until the end of 2020
RO 07: Unavailable forecast for water levels		
Planned activities:	Support establishment of a water level forecast	
Current shortcomings:	Unavailable forecast for water levels	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Funding through SOP-T 2007-2013 – HyQ Danube Project Budget availability 2019/2020: CEF-Programme – FAIRway Danube project next call of CEF-Programme or next Investment Programme	
Next steps:	**AFDJ:** Acquisition of 10 automatic gauging station and put into operation in the selected pilot areas within FAIRway Danube project Realisation of hydrological database within the FAIRway Danube project Set-up the mathematical model used for water level forecast	 May 2020 2020 - 2021 May 2020 June 2020

	Submitting the project proposal for realisation of the network of hydrometric stations Implement a national water level forecast for 5 days with a high accuracy for the next 2-3 days (AFDJ+ACN) Organising the tender and realisation of the network of hydrometric stations (install/rehabilitate 54 hydrometric stations) **ACN:** Implement a national water level forecast for 5 days with a high accuracy for the next 2-3 days (AFDJ+ACN) It was signed the technical Agreement between ACN and INHGA to provide the forecast for Cernavoda area. For Agigea and Navodari area will be developed by ACN	May 2020 2020 - 2022 until April 2020 April 2020
RO 08: Information could be provided customer-friendly using established river information portals.		
Planned activities:	Support customer-friendly processing and dissemination of information	
Current shortcomings:	Insufficient quality and frequency of transmitting information to users	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Budget availability 2019/2020: Funding through AFDJ budget/state budget Danube Transnational Programme 2014-2020	
Next steps:	**AFDJ:** Increasing technical capacity for processing and publishing fairway information Update of FIS Portal and D4D Portal Update the RoRIS Portal Update the fairway information on the company website and mobile RIS application **ACN:** Update the RoRIS portal Update the fairway information on the company website Update of FIS Portal and D4D Portal	September 2020 permanently permanently permanently permanently permanently permanently
RO 09: Unavailable digital terrain models for shallow sections.		
Planned activities:	Support set-up of digital terrain models for shallow sections	
Current shortcomings:	Unavailable digital terrain models for shallow sections	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A

Possible funding:	Budget availability 2019/2020: Funding through AFDJ budget/ state budget CEF-Programme	
Next steps:	**AFDJ:** Realisation of data base for hydrographical data	end of 2021
RO 10: Insufficient number and quality of weather stations.		
Planned activities:	Support improvement of meteorological information	
Current shortcomings:	Insufficient number and quality of weather stations	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Funding through SOP-T 2007-2013 – HyQ Danube Project Budget availability 2019/2020: CEF-Programme – FAIRway Danube project next call of CEF-Programme or next Investment Programme	
Next steps:	**AFDJ:** Launching the acquisition procedure and necessary actions in order to put into operation 10 automatic gauging stations (6 new and 4 rehabilitated) in selected pilot areas within the FAIRway Danube project	May 2020
	Submitting the project proposal for realisation of the network of hydrometric stations (installation or rehabilitation of 54 hydrometric stations)	June 2020
	Organising the tender and putting into operation the network of hydrometric stations	until the end of 2022
RO 11: Missing interconnection with databases of other waterway administrations to exchange data		
Planned activities:	Support interconnection between databases of different waterway administrations	
Current shortcomings:	Insufficient interconnection with databases of other waterway administrations to exchange data	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	no environmental impacts
	Which measures are taken to mitigate these impacts?	N/A
	Is water status still expected to deteriorate?	N/A
Possible funding:	Funding through SOP-T 2007-2013– HyQ Danube Project Budget availability 2019/2020: CEF-Programme – FAIRway Danube project and other project proposal AFDJ budget/state budget	
Next steps:	**AFDJ:** Acquisition of hardware and software for creating data base within the FAIRway Danube project and SWIM project	2019 - 2021
	Creating data base with the same structure with other waterway administrations for improving the data exchange service within the FAIRway Danube project	2019 - 2021

9 Bulgaria

EAEMDR – Executive Agency "Exploration and Maintenance of the Danube River" (a public authority within Ministry of Transport) is responsible for fairway maintenance, rehabilitation and upgrade.

9.1 BG | Status report on main critical locations including water level information 2012 – 2019

Since EAEMDR is currently in the process of recalculating the Low Navigable Water Level at certain critical locations, the achievement of 2.5m fairway depth in relation to the number of days above Low Navigable Water Level is not always correct.
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

Number of days with fairway depths ≥ 2.5m on critical locations

This table includes the main critical locations as identified by the Danube waterway users in the Master Plan in December 2014 *(marked grey)* and further very critical locations as additionally identified by EAEMDR. The fairway width is given related to LoS 1 (80m fairway width).

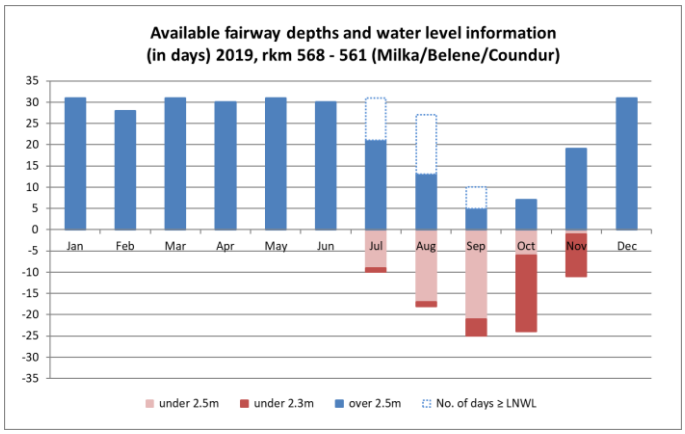
Critical location rkm from-to	Critical location name	2012	2013	2014	2015	2016	2017	2018	2019
km 610 - km 607	Somovit	318	327	365	313	366	365	365	365
km 591 - km 584	Sredniak island Palets island	345	346	365	316	366	365	347	365
km 569 - km 561	Belene island Milka island Kondur island	283	275	337	212	273	220	280	277
km 548 - km 540	Vardim island	292	309	360	268	327	316	289	343
km 539 - km 530	Yantra River Giska Island	316	317	360	253	306	337	330	343
km 525 - km 520	Batin island	339	314	352	246	295	288	285	309
km 476 - km 472	Gostin island	337	326	365	365	366	365	349	365
km 463 - km 460	Mishka island	366	365	365	365	366	365	346	365
km 458 - km 455	Brashlian island	341	365	365	365	313	263	297	329
km 441 - km 435	Radetski island	366	365	365	365	366	365	365	365

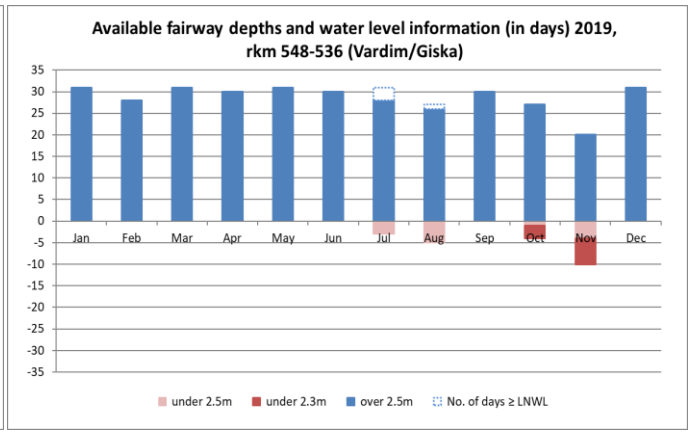
km 426 - km 420	Kosui island Dunavets island	332	354	365	322	366	365	342	318
km 414 - km 410	Malak Preslavets island	345	341	365	365	366	361	302	329
km 408 - km 399	Popina island	342	365	365	311	304	269	293	313
km 395 - km 390	Vetren island	345	365	365	365	366	365	365	365
km 386 - km 382	Chajka island	346	358	365	365	366	365	349	365

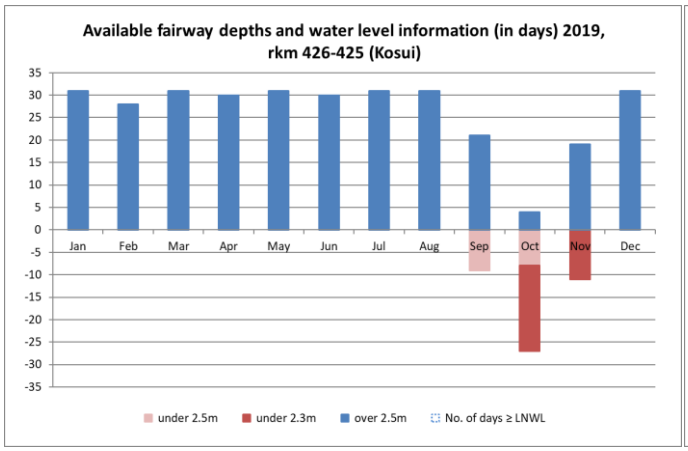
Number of days with water level ≥ LNWL on main critical locations

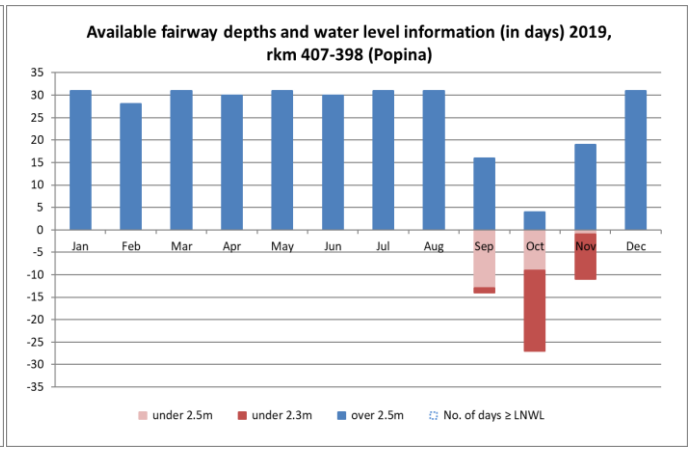
Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
567.00-566.70 – Belene island 562.00-561.50 – Coundur/ Milka island 541.60-541.00 – Vardim island 538.50-537 – Giska island	Svishtov km 554.300	337	326	365	285	348	334	293	298
523.80-523.20 – Batin island 475.70-475.30 – Gostin island	Ruse km 495.600	341	329	365	288	348	339	295	303
425.90-425.20- Kosui island 391.60-391.10 – Vetren island 383.50-382.50 – Chajka island	Silistra km 375.500	325	326	365	293	348	343	288	290

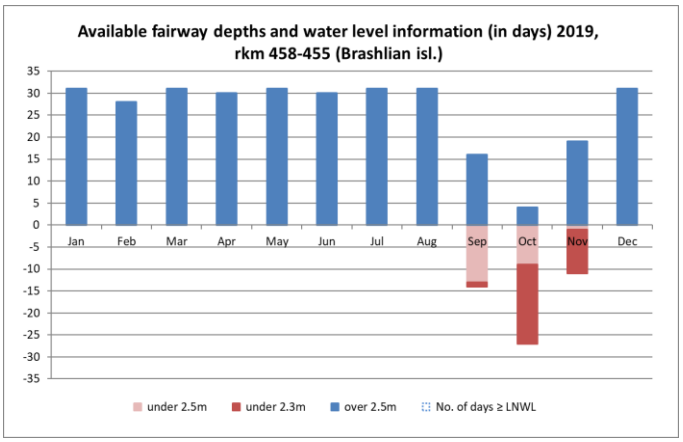
The common Bulgarian-Romanian section (km 845.650-km 374.100) with a length of 471.55 km is characterized by a large number of critical for navigation sections, in which, at certain water levels, the required depths are not reached (bottlenecks appear) and this impedes and / or restricts the navigation.











As a general statement, fairway depths less than 25 dm at critical locations were observed at different water levels and different water levels occur at certain gauging stations where the same water discharges are measured. The tendency of the last couple of years points towards decreasing of the observed water levels.

9.2 BG | Hydrological conditions at main critical locations 2019

The average multiannual water discharge of the Danube in the Bulgarian section is an average of 6000 m³/s. This discharge has declined significantly in the recent years and for the period 1982-2002 it is with 465 m³/s at Novo Selo and 610 m³/s at Silistra lower, which is 10%. This is due to global climate change on a world scale. Global warming has also led to an increase of the average water temperatures with 0.6 ° - 0.7 °.

Another factor that influences the depths of the navigable part of the river is the sediment transport. After the construction of the Iron Gate Hydrotechnical Complexes, the amount of sediment discharge decreased with 40 to 50%, which led to increased erosion processes and reduced depths in fairway.

Generally, from a hydrological point of view, 2019 can be considered as a low water year. Throughout almost the whole period, water levels were below the average multiannual. There were 316 days with water levels below the average multiannual levels and the average water level was 225 cm. The first half of the year was characterized by the usual for the period May - June average and high water quantities flowing through the common Bulgarian-Romanian section of the Danube River. No ice phenomena were registered.

The second half of the year was characterized by unusually low water levels. The water levels started to decrease in July. On the 22nd of July 2019, a depth of 25 dm was measured at critical sectors, at water level 111 cm (Ruse gauge), at LNWL 52 cm. The water levels continued to decline and after 28th of August, they were below or about LNWL. The lowest water level for Ruse gauge, minus 43 cm, was registered on the 8th of November 2019. These circumstances hampered the navigation, particularly due to necessity of reduction of the fairway parameters - the minimum depth, width and the radius of the curves.

The section in the area of Belene island (rkm 566.000 - 564.000) was again a critical section, with 96 days with depth below 25 dm and width of the fairway reaching 60 m. Another area with difficulties for the navigation was the region of Vardim island (rkm 547.000 – 545.000), Brashlyan island (rkm 457.000 – 455.000), the region of Popina (rkm 407.000 – 405.000) and Batin island (rkm 523.000 – 522.000). The critically low water levels lasted for all the months from July to November.

Based on the monitoring during 2019 the following data was registered:

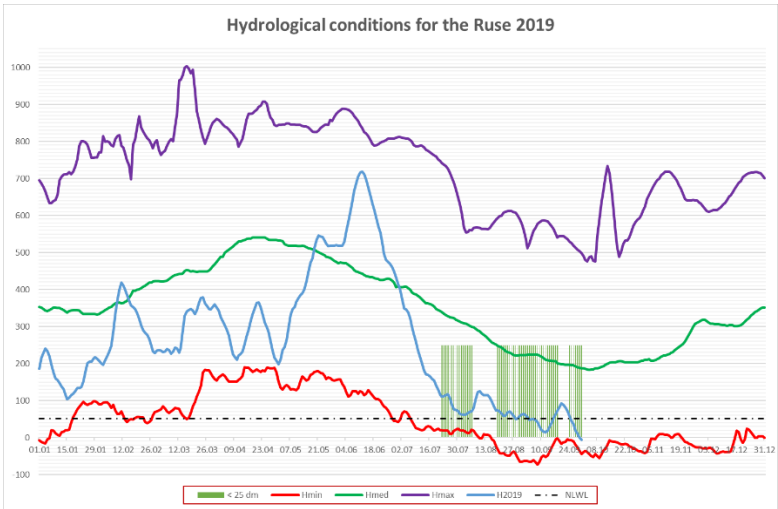
- Number of days with depth below 25 dm – 96;
- Number of days with water levels below LNWL – 68;
- The width of the fairway was reduced to 60 m at Belene island;
- Depths below 25 dm appeared in June at water level 123 cm at Svishtov gauge;
- Average water level – 225 cm.
- The lowest water level for Ruse gauge, minus 43 cm, was registered on the 8th of November 2019 (at LNWL= 52 cm).

Some of the reasons for deterioration of the navigational conditions in the past years are listed below:

- Alteration in the hydraulic characteristics of the riverbed due to disturbed sediment transport in the upper, middle Danube and its tributaries;
- Reduced water discharges;
- Unprotected from erosion coasts and islands;
- Reduced diameter of debris (sediments);
- Increasing water abstraction from the catchment area;

At one and the same water quantities, the corresponding water level decreases with the years as a result of:

- Degradation of the river bed;
- Widening of the river bed;
- Reduction of the hydraulic roughness.



Due to the low water levels of the Danube River in 2018 and 2019, these years can be assessed as extremely rare in hydrological terms. According to preliminary estimates of specialists such a phenomenon occurs no more than once every 70 or even 100 years. However, as a result of the fairway maintenance dredging activity in 2018 and 2019 (further information below) and state-of-the-art technologies used for surveying activities of APPD, the indicative values show a decrease in the number of days with non-compliance with the DC recommendations.

9.3 BG | Key issues and related activities 2019

Related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014), the need for action and the activities performed are described below:

	Key issues	Need for action	*Activities performed 2019*
BG 01	Old or insufficient measuring equipment	Support acquisition of up-to-date (renewed single-beam and additional multi-beam) sounding equipment	*The FAIRway Danube project was approved by INEA and funded under CEF. Activity 3 includes the delivery of a specialized surveying vessel with multi-beam echo sounder and 10 automatic gauging stations. The surveying vessel was delivered in February 2018 and since April 2018, the surveying pilot activity officially started.* *The tender for the automatic gauging stations was launched on 12th of December 2018 and the contract with the selected contractor was signed on 26th of August 2019. According to the contract deadline, the 10 automatic gauging stations should be put into operation until April 2020.*

BG 02	Limited number of skilled personnel	Secure education and provision of well-trained staff in the short, medium and long term	*A project for improving the administrative and technical capacity of the Agency was submitted to priority axes 5 – Technical assistance of Operational program on "Transport and Transport Infrastructure 2014-2020" and approved by the MA in September 2016.* *As part of the project activities different trainings were organized and conducted in order to improve the qualifications of the Agency's employees.* *The project was successfully finalized in September 2018.*
BG 03	To a large extend, interventions are planned on short term due to rapidly changing fairway conditions	Support improvement of monitoring procedures, data basics and methods for analysis and planning of interventions	*During 2018 the elaboration of the transnational Waterway Monitoring System, financed under the FAIRway Danube project, continued. After a jointly carried out public procurement, the contract for phase 2, the IT-implementation of WAMOS was started. The contract was signed in April 2018. Final acceptance tests were made in beginning of October 2019.* *Concerning the national WAMS system – the tender documentation including the technical specification were prepared in 2019 and the public procurement procedure was launched on 30th of December 2019. The contract was signed on 31st of January 2020 and the deadline for implementation is end of June 2020.* *The FAST Danube project was approved by INEA and funded under CEF. Within the project a feasibility study for river engineering measures in the common Bulgarian-Romanian sector will be elaborated. In 2018, the two complete surveying campaigns performed the year before (one in April 2017, one in September 2017) on the preliminary selected critical locations in both Bulgarian and Romanian stretches were processed and analysed. Based on the historical and newly collected data a mathematical model was elaborated, verified and calibrated.* *A complete report on the possible engineering measures for the twelve most critical locations in the common Bulgarian-Romanian section of the Danube River was submitted by the consultant, as well as a multi-criteria analysis was elaborated and discussed. The EIA and AA reports are under preparation. The public consultations are expected to be held in September 2020 and the EIA confirmation is expected until the end of 2020. For the first phase of intervention, there will be 3 bottlenecks with engineering structures (Bechet, Belene and Popina), the others will only have capital dredging.*

BG 04	Inefficient allocation of resources due to suboptimal information support system, lack of consistent database of riverbed surveys and cumbersome procedures	Support introduction of a Fairway Management System	*The FAIRway Danube project was approved by INEA and funded under CEF. Activity 3 includes delivery of a national Waterway Asset Management System and a transnational Waterway Monitoring System.* ***For status see key issue BG 03.***
BG 05	Only very little dredging works of the fairway have been performed for many years because of insufficient dredging equipment and limited financial resources	Support acquisition of up-to-date dredging equipment	*In the beginning of 2018, the Managing Authority of OPTTI 2014-2020, approved the project "Modernization and optimization of the activities for rehabilitation of the fairway in the common Bulgarian-Romanian section of the Danube River, through delivery of equipment". The Grant Agreement was signed on 29.01.2018. The project foresees delivery of a multifunctional dredger (cutter suction dredger), a set of pipelines, manoeuvring vessel, pontoon and a barge. The technical specifications and tender documentation for 2 public procurement procedures were elaborated and the procedures were launched in January 2019. The procedures were then cancelled and relaunched again in August 2019. The contract for delivery of the pipelines (which is a separate lot in the tender for the dredger) was signed on the 20th of February 2020. The decisions for selection of the contractors for the dredger, the manoeuvring vessel, the pontoon and the barge are appealed.*
		Increase available annual resources for dredging works	*In 2018, a framework contract was signed by the Ministry of Transport, EAEMDR and a subcontractor for the implementation of maintenance dredging works. The contract was valid for three years (or till the financial resources are exhausted) and worth about 4.1 Mn EUR. In 2018, dredging works were performed in the most critical sectors along the Bulgarian stretch of the Danube River – Belene and Vardim.* *During the period July – September 2019 maintenance dredging works were performed again in the most critical sectors (Belene, Batin and Vardim) and appr. 300 220 m³ of alluvial deposits in the fairway were excavated and deposited back in the river. As a result of the dredging works the navigational conditions in these critical sections were significantly improved, despite the low water levels.* *After a common public procurement procedure between the Ministry of Transport and EAEMDR, which was held in the end of 2019 another framework contract for maintenance*

		Support implementation of structural river engineering measures	*dredging works was signed on the 29th of January 2020. The new contract worth about 4,1 Mil euro and is valid for 3 years (or till the financial resources are exhausted).* *This will guarantee the continuation of the maintenance dredging works in the Bulgarian section of the Danube River.* *FAST Danube project was approved by INEA and funded under CEF. Within the project a feasibility study for river engineering measures in the common Bulgarian-Romanian sector will be elaborated.* *Based on the findings of FAST Danube project, an engineering project will be prepared and possible financial sources will be identified.*
BG 07	Insufficient marking equipment	Support acquisition of monitoring and marking equipment	*FAIRway Danube project was approved by INEA and funded under CEF. Activity 3 includes delivery of specialized monitoring equipment, including a multi-beam echosounder and a marking vessel.* *The surveying vessel (including the multibeam echo sounder) and the marking vessel were delivered in 2018 and were put into operation. Currently, pilot activities with the new equipment are running.*

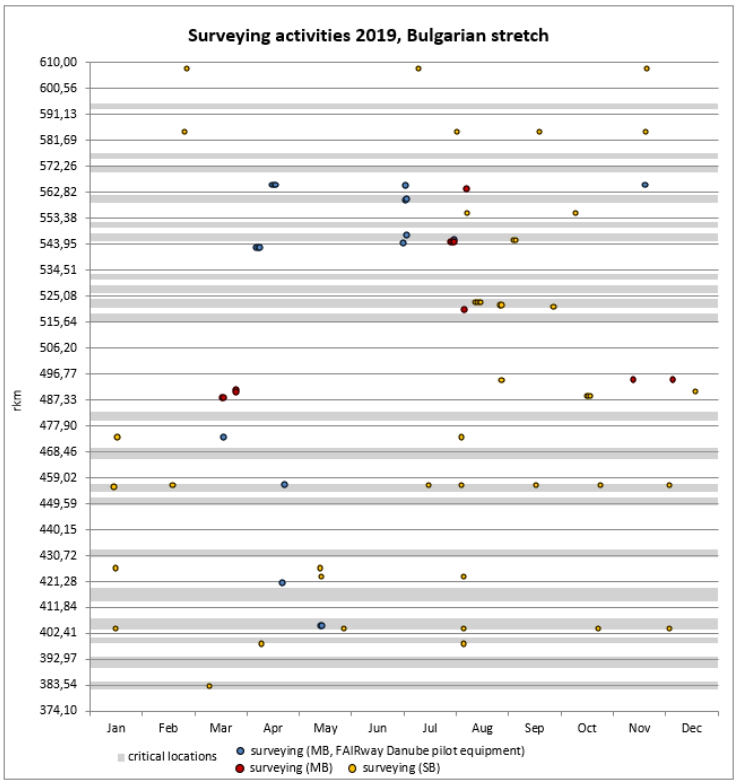
9.4 BG | Review of monitoring, rehabilitation and maintenance activities 2019

The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical locations as itemised in the Rehabilitation and Maintenance Master Plan (version December 2014) was updated in September 2017.

Riverbed surveying activities 2019

Since 2017 the hydrographical surveys are carried out using multi-beam and/or LiDAR systems with the hydrographical ship "Danube-1", purchased within the project *"Improvement of the systems for navigation and topo-hydrographic measurements on the Danube – phase 2"*. In February 2018, the new specialized vessel was delivered within the project FAIRway Danube, equipped with a multi-beam system (blue dots in the chart below). Since April 2018 both vessels perform measurements on the Bulgarian stretch of the Danube River.

The locations to be surveyed in 2019 were prioritized by the hydrographic department. The following surveys were performed in 2019:



Due to irregularities in the FIS PORTAL monitoring the publication activity cannot be traced. Data might be provided at a later stage.

Fairway marking activities 2019

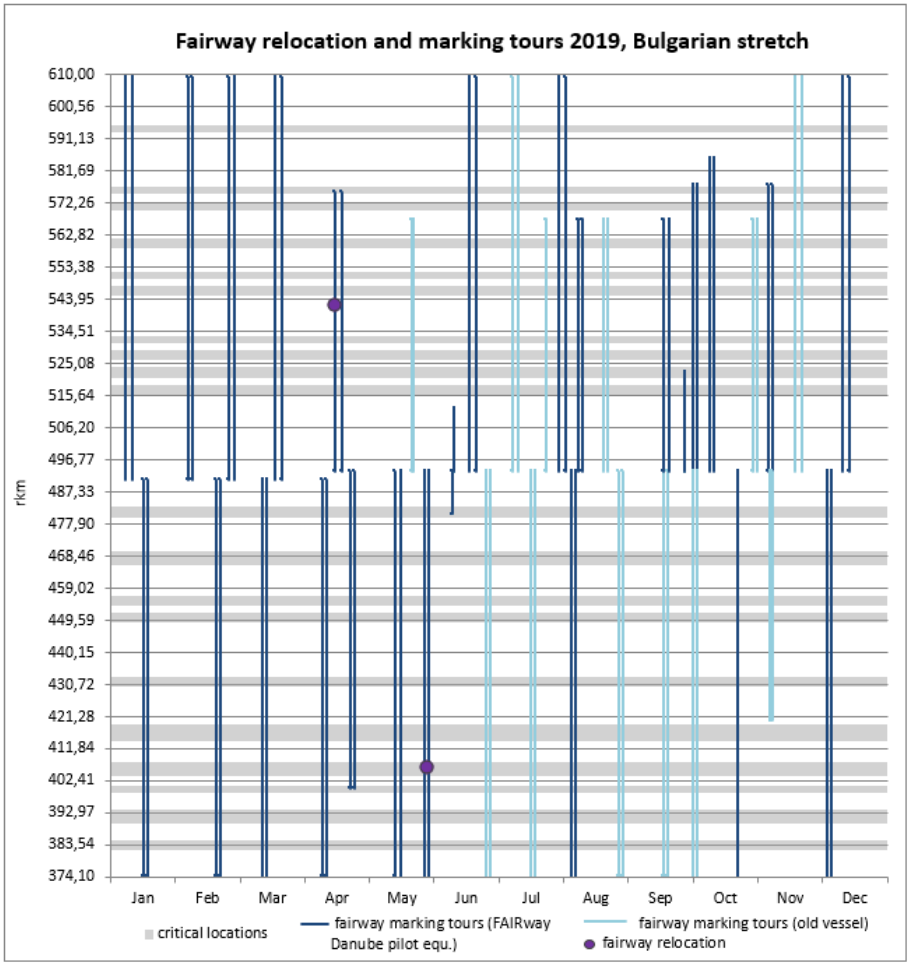
Fairway marking tours are done with the EAEMDR marking vessel, equipped with a single-beam echo-sounder. Under the FAIRway Danube project, a new marking vessel was delivered and, starting from October 2018, the vessel was put into operation and pilot activities are implemented. The marking tours are quick checks to determine the need for more detailed surveying and fairway relocation activities. They are conducted several times per month. When necessary, the fairway is narrowed / widened or the trajectory is changed.

The depth measurements conducted during the marking and monitoring tours during 2019 were also published on the FIS Portal and EAEMDR's website.

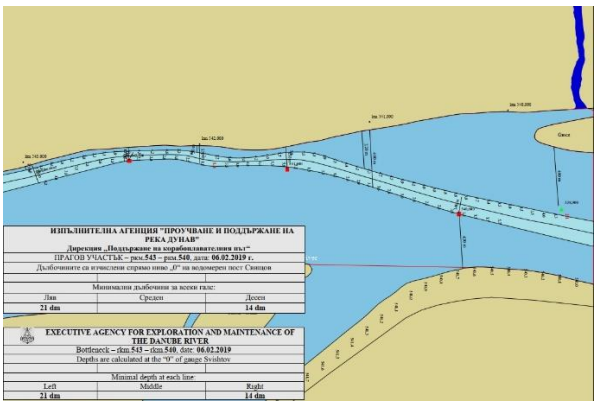
During 2019 in order to ensure the navigational conditions fairway corrections were made and in total 243 floating signs were mounted and 245 floating signs were dismounted. During the period in total 58 floating signs were damaged or misplaced due to an accident.

The unfavourable navigational conditions due to low water levels in the period August – November 2019 necessitated a number of fairway adjustments and mounting of an additional number of floating signs in order to ensure the safety of navigation. The frequent and more accurate sounding with the new marking vessel contributed to finding and ensuring better fairway trajectory and thus improving the navigational conditions in the most critical sections. During the 2019 the fairway trajectory was relocated 2 times in the following sections:

- rkm 543 – rkm 540 on 16th of April 2019
- rkm 407 – rkm 404 on 29st of May 2019



<u>Area from rkm 543 to rkm 540 (Vardim isl.)</u>
Changing of the fairway trajectory on 16.04.2019.



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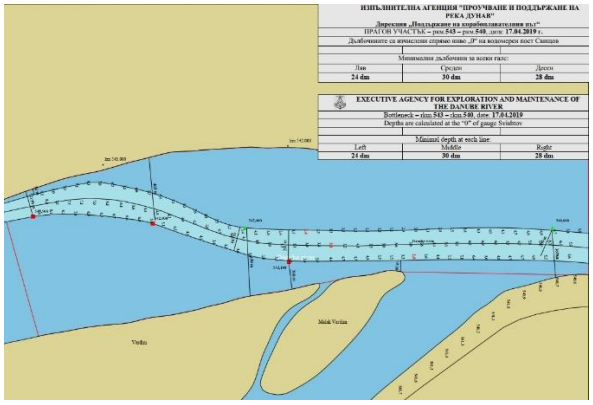
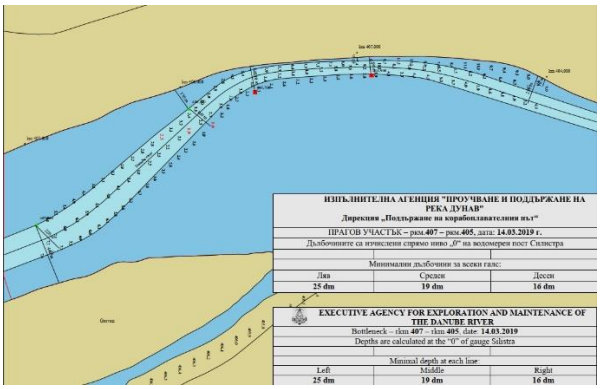


17.04.2019

<u>Area from rkm 407 to rkm 404 (Garvan isl.)</u>
Changing of the fairway trajectory on 29.05.2019.



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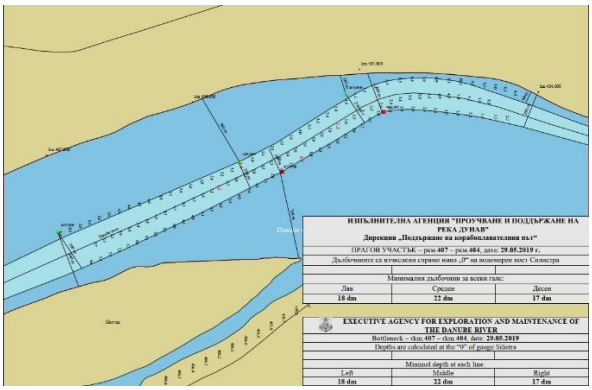


29.05.2019

Dredging activities 2019

According to an agreement between MTITC and EAEMDR a common public procurement procedure for dredging on the fairway was implemented in 2017, as a result of which a framework contract for implementation of maintenance dredging activities (from rkm 610.000 to rkm 374.100) was signed in February 2018. The contract authorities are both MTITC and EAEMDR, and the contractor is Cosmos Shipping Ltd. The contract duration was up to 36 months or until the financial resources (contract value about 4,1 Mil euro) are exhausted. Based on the contract, in 2018, dredging works were performed in the most critical sectors along the Bulgarian stretch of the Danube River – Belene and Vardim.

In July 2019, there was a sharp drop in the water levels and to guarantee sustainable depths when bottlenecks appear, maintenance dredging was assigned and performed during the period July – September 2019 in the following critical areas:

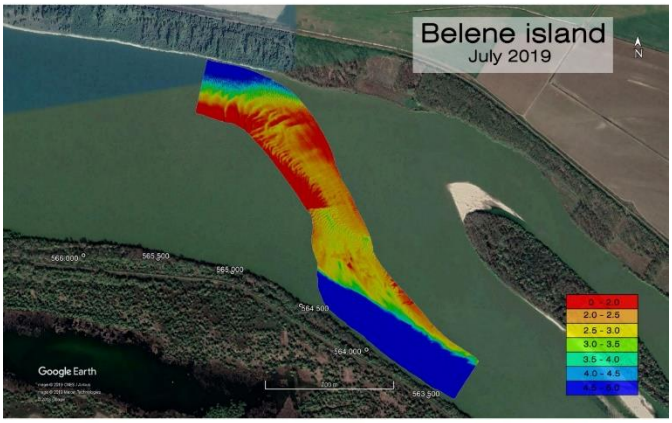
Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m^3	Permits (see next table)
	from river-km	to river-km	from river-km	to river-km						
Belene island	563.80	565.50	565.00	566.10	20.07.2019	05.08.2019	fine sand*	dumping	69 992	none
Vardim island	544.00	546.40	547.00	548.00	07.08.2019	28.08.2019	fine sand	dumping	116 059	none
Batin island	520.60	522.20	520.00	521.50	10.09.2019	25.09.2019	fine sand	dumping	114 169	none

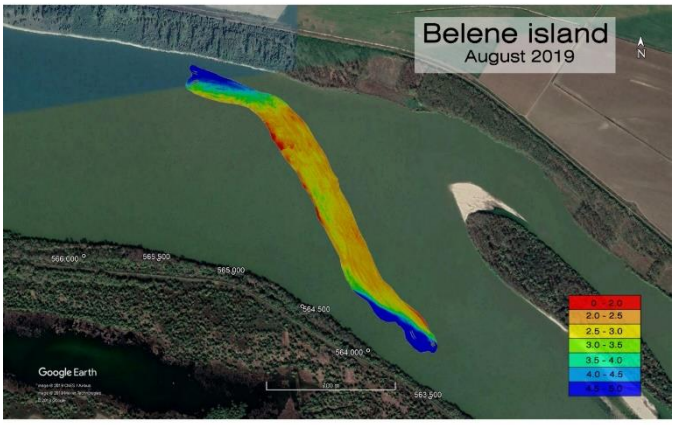
* the average diameter of the sand is 0.35mm

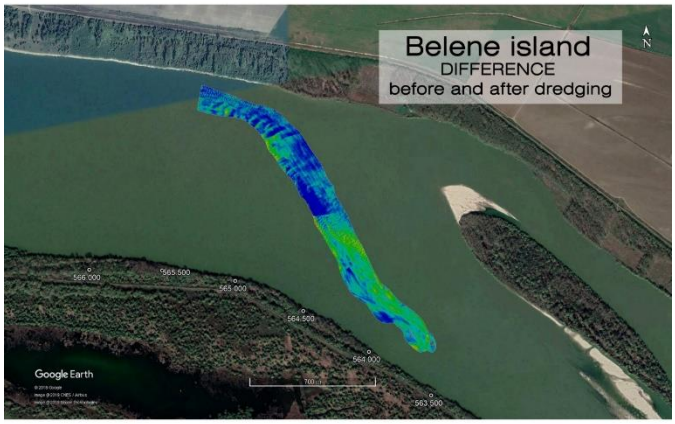
In total, the amount of 300 220 m^3 of alluvial deposits in the fairway were excavated and deposited back in the river. As a result of the dredging works the navigational conditions in these critical sections were significantly improved, despite the low water levels.

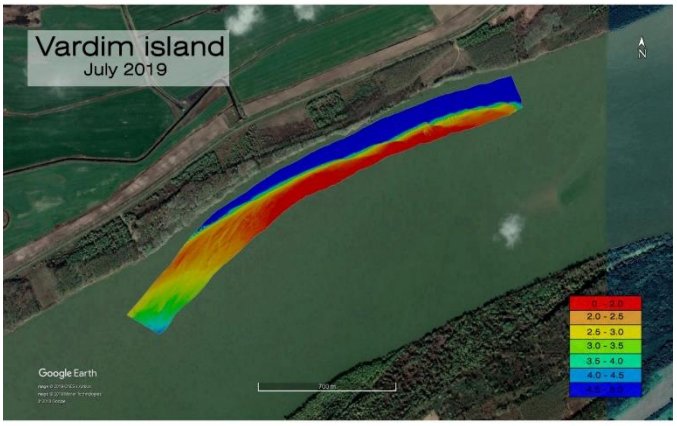
After a common public procurement procedure between the Ministry of Transport and EAEMDR, which was held in the end of 2019 another framework contract for maintenance dredging works was signed on the 29th of January 2020. The new contract worth about 4,1 Mil euro and is valid for 3 years (or till the financial resources are exhausted). This will guarantee the continuation of the maintenance dredging works in the Bulgarian section of the Danube River.

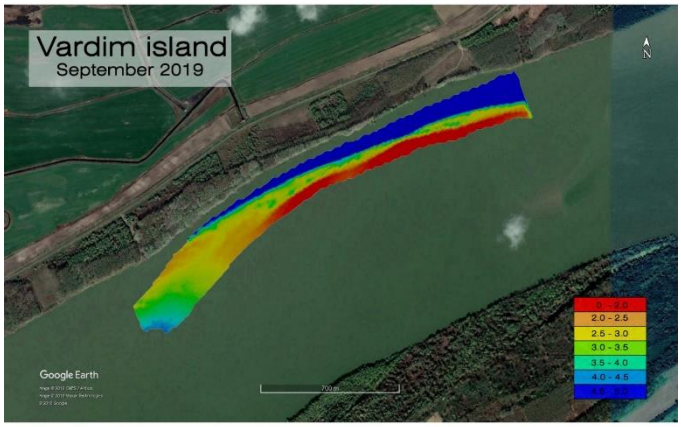
The Bulgarian Ministry of Environment and Waters officially informed EAEMDR that no permission is necessary, if the dredging measures are connected with the maintenance of the fairway and the dredged material is deposited in the river.

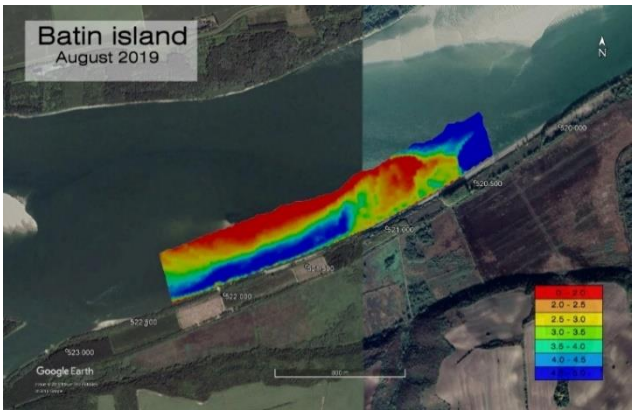


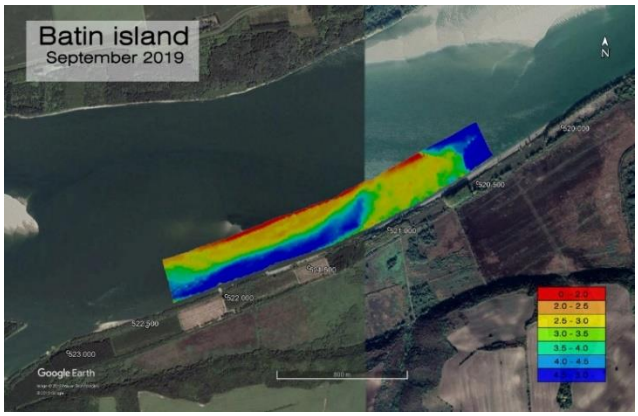


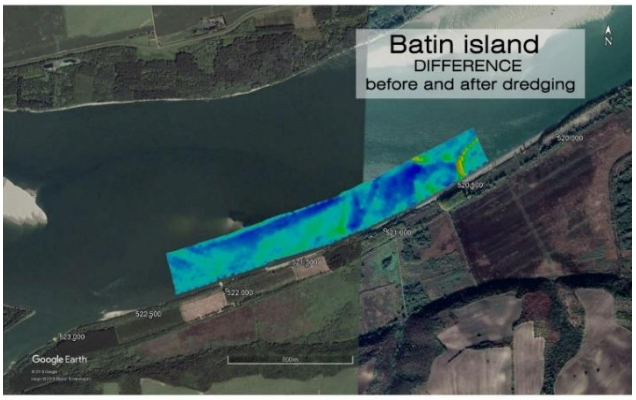


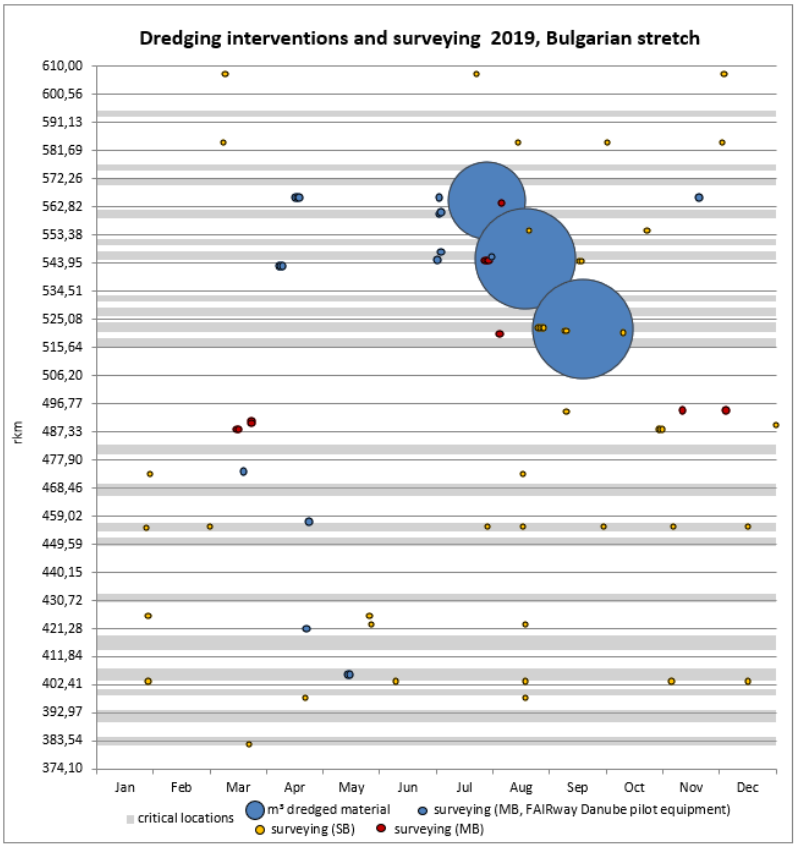












The status of the fairway was studied after the finalization of the dredging works. The results showed that the parameters of the fairway were reached - depths above 3 meters at LNWL, width of 150 m and curve radius of 1000 m at both sites. The fairway was deepened with more than 100 cm and reached the Level of Service recommended by the Danube Commission.

The dredging activities in the area have led to a lasting improvement of the navigational conditions and stabilization of the configuration of the underwater relief.

The control measurements of depths showed that, despite the high mobility of sand deposits forming the sills at km 564, last year's situation was generally preserved. A relative balance was established between the erosion and the deposition of sediments at the sills. This critical point is extremely difficult for navigation during the low water period. At the critical point at rkm 566 - 564, the minimum depth reached 20 dm.

The dredging interventions are reported in combination with the surveying activities. This illustrates the strong dependency of dredging works on up-to-date surveying results. Prior to, during and after dredging works the respective critical locations were surveyed in addition to the regular surveying tours. Extensive surveying tours were conducted in the areas of later dredging works.

9.5 BG | Summary of current ecological status and environmental impacts

The whole Bulgarian stretch of the Danube River is classified as Heavily Modified Water Body. According to the Danube River Basin Management Plan 2010-2015 the ecological status and ecological potential of the Bulgarian Danube was determined as moderate. The new Danube River Basin Management Plan 2016-2021 has been approved on 29.12.2016 with decision of the Council of Ministers.

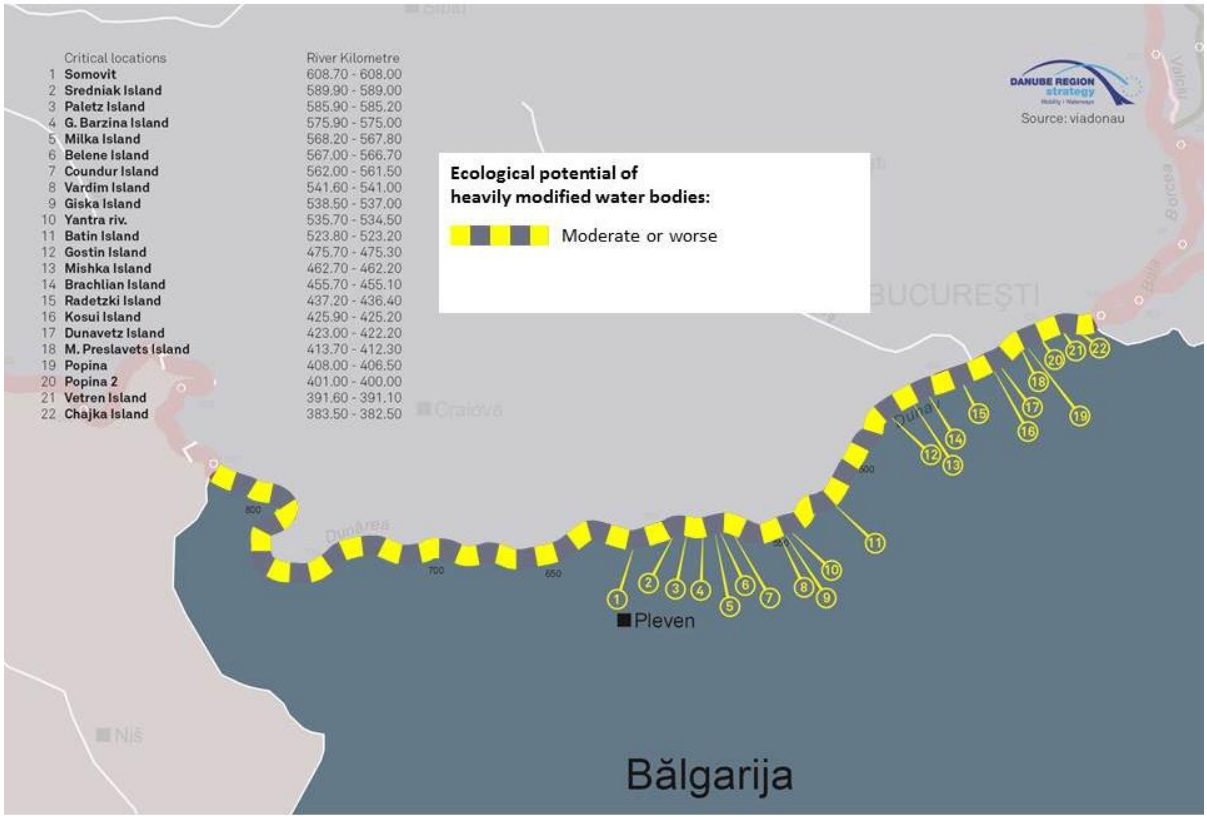
During the update of the DRBMP the current impact on the Bulgarian stretch of the Danube River was investigated, according to the criteria for preliminary HMWB identification. Based on the preliminary results for the Danube River, it could not be determined as HMWB. Moreover, the approved national criteria for HMWB identification are not applicable for large rivers as Danube in their original version.

One of the main deliverables of the on-going project “Intercalibration of the methods for analysis of biological quality elements (BQE) for the types of surface waters on the territory of Bulgaria, corresponding to common European types in the Geographical intercalibration groups” (November 2013 - December 2016) is detailed assessment of the hydro-morphological change of the Danube River.

The project foresees assessment of the stage of modification of the lateral connectivity of the river, because the construction of dikes for the purpose of flood protection has the main impact on the hydro-morphological regime of the river.

Taking into account that the Danube River is boundary during the process of HMWB classification the impact of the Romanian side was considered, including the cumulative effect of both countries. In the updated DRBMP for Romania the Danube River is classified as HMWB. During the joint meeting in 2015 between Bulgarian and Romanian Ministries of environment, the Bulgarian delegation informed the participants that at this stage the Danube could not be identified as HMWB based only on the analysis of the hydromorphological impact on the Bulgarian territory. For the moment the Danube River is defined as HMWB.

The following map displays the ecological status and ecological potential of the Bulgarian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Bulgaria.



Ecological status and ecological potential of surface water bodies
(Source: DRBM Plan – Update 2015)

For the heavily modified water bodies measures are to be implemented for the achievement of the good ecological potential.

Within the new DRBMP the assessment of the impact on the surface waters in the Danube region from the human activities was updated in compliance with the requirements of the Act for the water and Regulation No H-4 from 14.09.2012 on the characterization of the surface waters.
Based on the collected, analyzed and processed information on the Danube region the following main categories of surface water impact are identified:

- Impact from point sources of pollution;
- Impact from diffuse sources of pollution;
- Impact from hydro morphological changes;
- Impact from invasive species;
- Impact from climate changes.

The main activities generating hydro-morphological pressure on water bodies in region of the Danube River are: water abstraction (including related equipment construction), production of electricity through Water power plant, flood protection, abstraction of sedimentary deposits, navigation.

Construction of dykes and river corrections are carried out in order to provide protection floods of the population. The corrections of the rivers change the shape of the river (removing the meanders) and the river profile; the speed is also changing of the current. These changes lead to changes in

ecosystems in these areas. The presence of dug interrupts connection with the natural floodplains and leads to the drainage of the riparian wetlands. Abstraction of sediment is performed to ensure the conductivity of river bed and for the construction purposes, which changes the bottom and the profile of the river, which has a severe negative impact on habitats.

Measures to improve environmental conditions

According to the Structural Regulations of EAEMDR the only ecology related activities, performed by the Agency are:

- participation in localization and removal of pollution, caused by navigation in the common BG-RO section of the Danube River;
- collecting oily and greasy ship waste from transit vessels.

In the past 10 years the Executive agency has implemented two projects, related to the waste management of inland navigation on the Danube (WANDA – 2009-2012; CO-WANDA – 2012-2014) and a project called WATER – Danube integrated water management. The three – year strategic project launched in June 2012 addressed the achievement of the integrated water management and environmental protection objectives for the Danube Floodplain as required by the European Union Water Framework Directive 2000/60/EC (WFD). The general objective of the Danube WATER project was to create a common management and monitoring system for water quality in extreme environmental conditions (floods, droughts, accidental pollution by chemical and radioactive substances), including providing a data and information dissemination mechanism, necessary for the regional development of the border area.

Several ecological projects were implemented in the period 2009-2015 along the Bulgarian stretch of the Danube River, with focus on natural parks.

The project: Limiting the negative influence of invasive species and restoration of the natural habitats, through planting of local species in Srebarna Nature Reserve has been financed under the national operational programme on environment 2007-2013. The beneficiary was the Regional Inspectorate of Environment and Water – Rousse and the project was implemented during 2013. The goal of the project is to protect the biodiversity in the Srebarna Nature Reserve and to restore and maintain the habitats - subject of protection. The project included exploration activities as: inventory of the forest habitats (natural and / or semi-natural) in Srebarna Nature Reserve and the habitat 91 EC*, as part of them; analysis of the state and the evaluation of its favorable conservation status; working out a program for reforestation of areas with native species (technological plans for reforestation), exempt from hybrid poplar; initial study of the vegetation in terms of invasiveness of the territory of Srebarna Nature Reserve, by walkthrough and testing of the protected territory and determining of the invasive plant species, their area distribution and their impact on the natural vegetation in the wetland; and implementation of the practical measures: marking of the invasive species and implementation of effective measures for eliminating them and limiting their negative impact; activities on utilization operations of the extracted material, according to the developed methodology; implementation of activities for rehabilitation and repair of the gateways in the Srebarna Nature Reserve, etc.

Project Implementation of activities for planning and management of reserve "Chuprene", reserve "Gorna Koria" and managed reserve "Ibisha" (situated on km 717 of the River Danube). The project has been financed under the national operational programme on environment 2007-2013.

The beneficiary of the project was the Regional Inspectorate of Environment and Water – Montana. The main activities implemented within the project were:

- Identification and analysis of currently available information for each of the three protected areas;
- Field research, incl. forestry taxation in order to provide the necessary additional information;
- Conducting workshops both formal and in operating order;
- Data analysis and evaluation of the environmental and socio-economic importance of the protected areas;
- Development of database for protected areas and identifying monitoring scheme for its supplementing;
- Defining territorial regimes and norms for use;
- Identifying the main threats to protected areas as well as identifying long-term objectives and constraints;
- Development of long-term and short-term programmes, plans and projects;
- Conducting a public discussion for each of the protected areas.

Navigation maintenance measures and environmental impacts

Maintenance works of the fairway on the Danube River are executed in the framework of the Water Act (SG 67/27.07.1999, last amended SG61/11.08.2015), Law for the maritime spaces, the inland waterways and the ports of the Republic of Bulgaria (SG 12/11.02.2000, last amended SG52/10.07.2015).
No dredging activities in the fairway were performed by EAEMDR during the past years until 2017. The main maintenance activity performed by the Agency in these years was marking of the fairway. In 2018, dredging works for fairway deepening in the areas of two of the most critical sections, Vardim and Belene (area of intervention from km 545.000 to km 547.800 and from km 564.000 to km 565.300) were performed and the amount of 256 650 m3 fine sediments were dredged and deposited back in the river close to the dredging places. In 2019, during the period July – September dredging works were performed in Belene, Vardim and Batin and in total 300 220 m^3 of alluvial deposits were dredged and deposited back in the river. As a result of the dredging works the navigational conditions in these critical sections were significantly improved, despite the low water levels. The negative environmental impact from the dredging activity can be considered insignificant.

9.6 BG | Budget status February 2020

Investments taken for FRMMP implementation 2014 – 2019

Need areas	Required investments 2014 – 2020 according to FRMMP	Secured investment costs (state budget or other financing) and investments taken	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	8 020 000	10 549 321[1]	85%	0
Surveying of the riverbed	3 810 000	3 827 822	85%	0
Water level gauges	0	400 000	85%	0
Marking of the fairway	9 215 000	4 062 623	85%	5 152 377
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	0	125 000	85%	0
Information on fairway depths	12 000	320 000	85%	0
Information on marking plans	0	0	0	0
Meteorological information	75 000	0	0	75 000
Other needs	0	150 000[2]	85%	0
Sum (Euro)	**21 132 000**	**19 434 767**	**85%**	**5 227 377**

[1] The investment concerns the dredging equipment (pipeline, manoeuvring vessel, pontoon and barge) to be purchased via the OPTTI 2014-2020.

[2] The investment concerns the recalculation of the Low Navigable Water Level.

Operational expenditures for conducted activities 2019 and budget needs 2020

The expenditures for riverbed surveying include the pilot operation budget from the FAIRway Danube project, as does the secured operational budget for 2020.

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	2 192 014[1]	3 067 751[3]	4 129 649[4]	0
Surveying of the riverbed	126 324	200 000[5]	200 000	0[5]
Water level gauges	64 692[2]	76 000	76 000[2]	0
Marking of the fairway	317 082	300 000	300 000	0
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	64 692[2]	76 000	76 000[2]	0
Information on fairway depths	8 000	8 000	8 000	0
Information on marking plans	8 000	8 000	8 000	0

Meteorological information	64 692[2]	76 000	76 000[2]	0
Other needs	20 000	20 000	20 000	0
Sum (Euro)	**2 865 496**	**3 831 751**	**4 893 649**	**0**

1 The invoices for the dredging works conducted in 2019 were issued to the Bulgarian Ministry of Transport.

2 The operational expenditures for 2019 in lines "water level gauges", "information on water level and forecasts" and" meteorological information" (194 076 Euro) could not be provided separately for each activity, because the stations on Bulgarian riverbanks provide both hydrological and meteorological information.

3 In 2016, a preliminary study (incl. market research) was conducted in order to estimate the money needed for public procurement for dredging in the fairway. Based on this, indicative dredging budget (in terms of "most dredging demanding year") was estimated to 3,067,751 Euro/year.

4 The framework contract for 3 years for dredging works was signed in February 2018 with the option for continuation for 3 more years after that or when the money is exhausted. Due to the fact that in 2018 and 2019 almost the full amount of the money was spent (value of the contract 4,1 Mil. Euro), in September 2019 an Agreement for a common public procurement procedure between the Ministry of Transport and EAEMDR was signed. Based on this on 29th of January 2020 another framework contract (with value about 4,1 Mil. Euro) was signed, which will guarantee the continuation of the maintenance dredging works in the Bulgarian section of the Danube River for three more years. The value of the contract is not included in EAEMDR operational budget, but it is secured and available in the Bulgarian Ministry of Transport to be spent either during only 2020 or in 2020+2021+2022, depending of the works needed to be performed.

5 During the preparation of the FRMMP it was calculated a certain amount of money to be needed for surveying (i.e 600 000 euro). Due to the fact that new equipment (multibeam) was delivered in 2017 and 2018, and the surveying process was optimized and improved, less resources are required; the amount of money needed should be reduced.

9.7 BG | Outlook: planned actions, milestones and funding sources

BG 01: Old or insufficient measuring equipment			
Planned activities:	Delivery of automatic gauging stations within the FAIRway Danube project		
Current shortcomings:	Network of gauging stations is not sufficient		
Environmental relevance of planned activities:	What are the main expected environmental impacts?	Some of the automatic gauging stations will be installed in the area of natural parks, but no negative impact is expected, as stated in the confirmation letter from MOEW	
	Which measures are taken to mitigate these impacts?	-	
	Is water status still expected to deteriorate?	-	
Possible funding:	CEF		
Next steps:	The surveying vessel was delivered in February 2018 and since April 2018 the surveying pilot activity officially started. During 2018 the public procurement documentation including the technical specification for the automatic stations was finalised and the tender was launched on 12th of December 2018. The contract with the selected contractor was signed on 26th of August 2018 and according to the contract deadline, the 10 automatic gauging stations should be put into operation until April 2020. The delivered equipment will be used in the monitoring pilot sub-activity within FAIRway Danube project, which covers the analysis of the data collected by the surveying vessel and the water level gauges.	2019	

BG 03: Interventions are planned on short term due to rapidly changing fairway conditions		
Planned activities:	Currently, EAEMDR operates 9 automatic hydrological and 9 automatic meteorological stations, delivered within project "Improvement of the systems for navigation and topo-hydrographic measurements along the Danube River", OPT 2007-2013 Procurement of additional gauging stations, surveying vessel (for good data basis), national WAMS and transnational WAMOS tools are foreseen within project FAIRway Danube.	
Current shortcomings:	Insufficient data available and non-state-of-the-art methods of gathering of fairway information (multi-beam)	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	Some of the automatic gauging stations will be installed in the area of natural parks, but no negative impact is expected, as stated in the confirmation letter from MOEW
	Which measures are taken to mitigate these impacts?	-
	Is water status still expected to deteriorate?	-
Possible funding:	CEF	
Next steps:	Delivery of the automatic gauging stations and WAMOS/WAMS software and start of operation	2020
BG 04: Suboptimal information support, lack of consistent database		
Planned activities:	Procurement of national WAMS and transnational WAMOS tools are foreseen within project FAIRway Danube (see also key issues BG 03)	
Current shortcomings:	No Fairway Management System available	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	n/a
	Which measures are taken to mitigate these impacts?	n/a
	Is water status still expected to deteriorate?	n/a
Possible funding:	CEF	
Next steps:	Procurement of the transnational WAMOS and delivery of the software Implementation of the national WAMS and delivery of software and hardware components	2019 end of June 2020
BG 05: Insufficient dredging equipment and limited financial resources		
Planned activities:	Implementation of project “Modernization and optimization of the activities for rehabilitation of the fairway in the common Bulgarian-Romanian section of the Danube River through delivery of equipment“ (OPTTI 2014-2020). The project foresees delivery of a multifunctional dredger (cutter suction dredger), a set of pipe-lines, manoeuvring vessel, pontoon and a barge. Conducting river engineering measures within the second phase of the implementation of project FAST Danube	

	Dredging activities within the framework contract for conducting dredging works, signed in January 2020	
Current shortcomings:	Very little dredging works, limited financial resources for interventions, but need for rehabilitation measures	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	Environmental impacts of the planned river engineering measures conducted within FAST Danube are considered in the EIA conducted in Activity 2 of the project
	Which measures are taken to mitigate these impacts?	n/a
	Is water status still expected to deteriorate?	n/a
Possible funding:	CEF (Fast Danube) Operational Programme "Transport and Transport Infrastructure 2014-2020"	
Next steps:	The two public procurement procedures for the delivery of dredging equipment under the OPTTI project were launched in January 2019. The procedures were then cancelled and relaunched again in August 2019. The contract for delivery of the pipelines (which is a separate lot in the tender for the dredger) was signed on the 20th of February 2020. The decisions for selection of the contractors for the dredger, the manoeuvring vessel, the pontoon and the barge are appealed.	2018 - 2019 end of 2020
BG 07: Insufficient marking equipment		
Planned activities:	Procurement of a specializes marking vessel within project FAIRway Danube. The vessel was delivered in 2018.	
Current shortcomings:	non-state-of-the-art marking equipment	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	n/a
	Which measures are taken to mitigate these impacts?	n/a
	Is water status still expected to deteriorate?	n/a
Possible funding:	CEF	
Next steps:	Pilot implementation	2019-2021

Fairway Rehabilitation and Maintenance Master Plan for the Danube and its navigable tributaries:

ANNEX I

to the

NATIONAL ACTION PLANS

UPDATE APRIL 2020

Coordinated by **Priority Area 1a** of the **EU Strategy for the Danube Region**.

10 Germany

The **Federal Waterways and Shipping Administration (WSV)** is responsible for fairway maintenance, rehabilitation and upgrade.

10.1 DE | Status report on main critical locations including water level information 2012 –2019

The **Level of Service of 2.0m fairway depth**[19] **at Low Navigable Water Level for the free-flowing section between Straubing and Vilshofen** would correspond to an equal height of the blue (availability of 2.0m fairway depth) and the white columns framed in blue (water level above Low Navigable Water Level) in the figures below.
It is also important to take the depth classes close to 2.0m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.0m threshold. Therefore, the **number of days with 1.8m fairway depth** is displayed additionally.

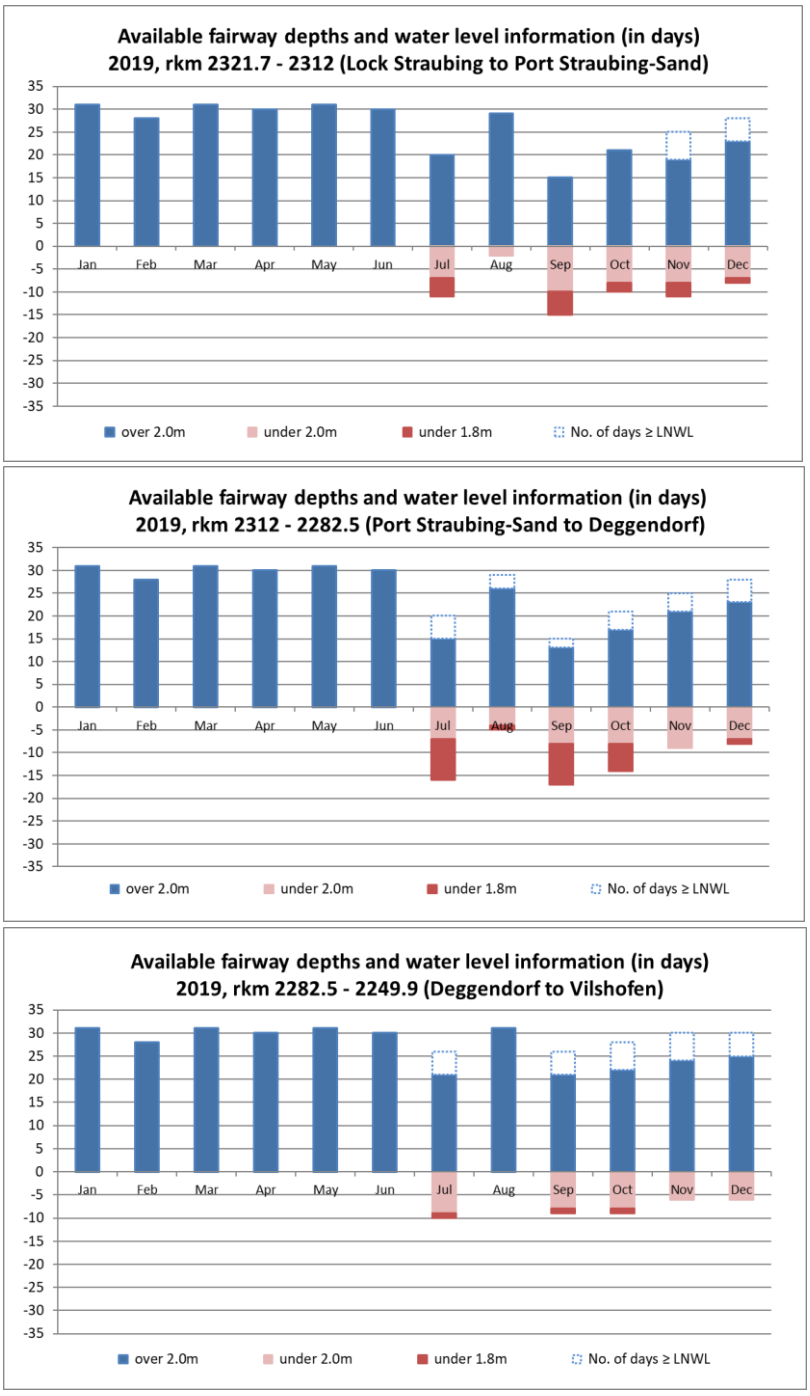
Number of days with fairway depth ≥ 2.00 m (target value[15]) for main critical locations

Critical location	2012	2013	2014	2015	2016	2017	2018	2019
Lock Straubing to Port Straubing-Sand	352	362	335	258	344	326	214	308
Port Straubing-Sand to Deggendorf	332	359	320	243	295	305	204	296
Deggendorf to Vilshofen	352	330	272	250	335	321	214	325

Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Lock Straubing–Port Straubing-Sand	Pfelling	352	362	335	258	344	326	217	319
Port Straubing-Sand–Deggendorf	Pfelling	352	362	335	258	344	326	217	319
Deggendorf–Vilshofen	Hofkirchen	360	365	351	273	360	345	239	352

[15] In the free-flowing section between Straubing and Vilshofen a fairway depth of 2.50 m as defined by NEWADA duo is neither developable nor maintainable. In this section the objective is to maintain the fairway depth of 2.00 m related to LNWL (in Germany: RNW).



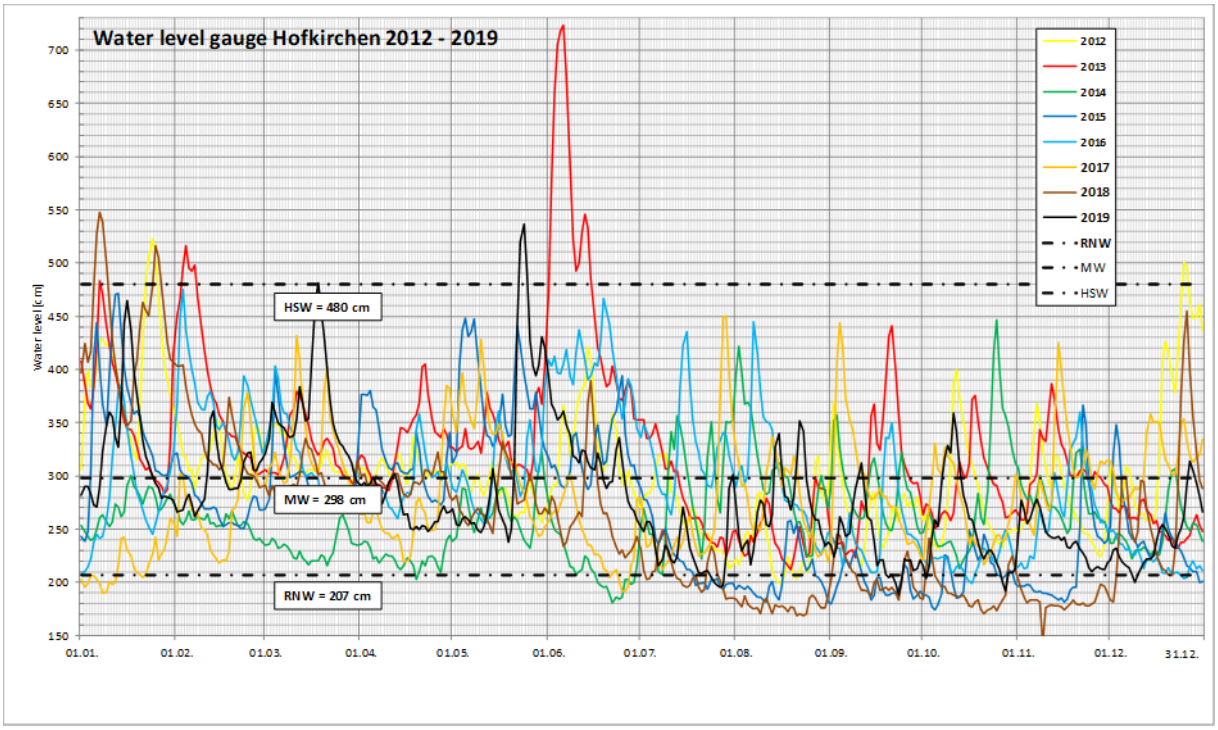
2019 was split into two periods: while the first half of the year was characterized by a very favourable fairway situation due to good hydrological conditions, water levels decreased slightly in the second half of the year. From January to October there was no critical sedimentation in the section from lock Straubing to port Straubing-Sand, as the number of days with available fairway depths above 2.0 m (target value) is equal to the number of days with water levels above LNWL (equal height of the blue and white columns). Overall, 2.0 m fairway depth was formally **not** provided on 57 days (15.6% of the year), which already includes 46 days (12.6%) with low water levels. Consequently, only on 11 days immediate dredging would have improved shipping conditions.

Circumstances are quite analogous for the critical section from port Straubing-Sand to Deggendorf. However, available fairway depths remained below the envisaged 2.0 metres on 69 days (18.9%) including the 46 days with water levels below LNWL. On the remaining 23 days during the second half of the year direct maintenance interventions have not been feasible.

Due to the confluence of the Isar at Deggendorf the hydrological situation was slightly better in the section Deggendorf–Vilshofen leading to 352 days with water levels over LNWL and fairways depths above 2.0 metres at 325 days (89%). Moreover, 1.8 metres fairway depth was always available on 362 days (99%).

Generally, closures of navigation due to naval accidents, ice periods, flood events as well as service and maintenance works in the waterway (complex dredging) and constructive works (locks, weirs, groynes etc.) are not included in the above compilation.

10.2 DE | Hydrological conditions at main critical locations 2019



While the year 2015 (dark blue line) was characterized by very unfavourable hydrological conditions from a shipping perspective, this situation improved in 2016 (light blue line). In 2017 (orange line), water levels were on average slightly lower than in 2016 and fell below RNW twice, namely at the beginning and at the middle of the year. 2018 was clearly split into two periods: while the first half of the year was characterized by a very favourable fairway situation due to good hydrological conditions, water levels decreased in the second half of the year and remained almost continuously below LNWL from July to November. The situation started to improve in December. In 2019 water levels remained above LNWL for most parts of the year.

10.3 DE | Key issues and related activities 2019

Activities performed related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014, cf. 10.7):

	Key issues	*Need for action*	*Activities performed 2019*
DE 01	20% of dredging works may be conducted by WSV itself, while 80% are tendered (providing sufficient available capacity)	Preserve a certain percentage of execution by the authority itself to keep professional expertise, equipment, skilled staff, autonomy, and the capacity to act in special market or emergency situations	*Dredging activities overall: 213,260 m³ (cf. 10.4) All measures have been tendered (however, own capacities would have been available)*
DE 02	Enhancing the information on water levels	Implementing an hourly push-mode (currently pull-mode via modem), duplication for redundancy purpose; both partly in cooperation with the Bavarian Water Resources Management	*Approximately 20% (overall 90%) successful implementation for gauges at German Danube section*

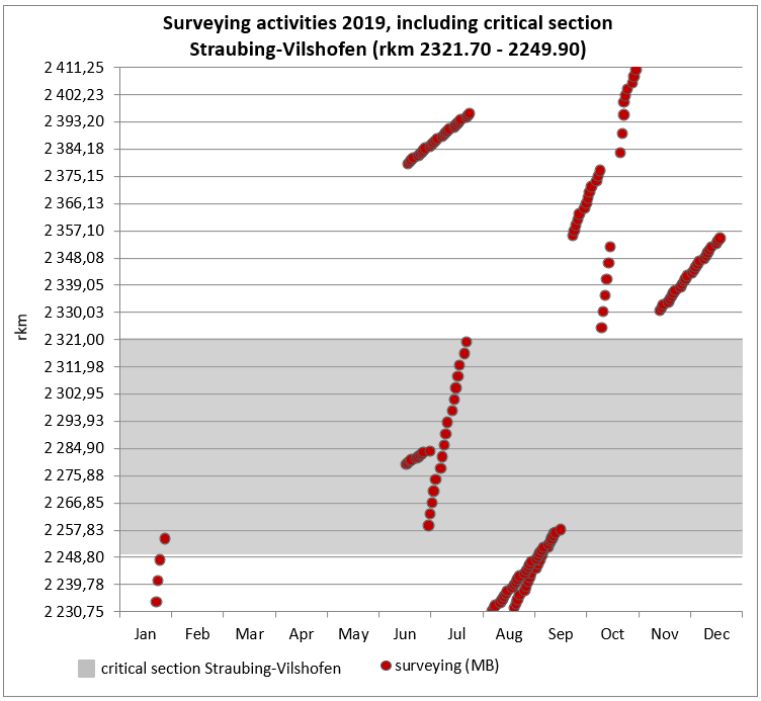
10.4 DE | Review of monitoring, rehabilitation and maintenance activities 2019

The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical locations was itemised in the Rehabilitation and Maintenance Master Plan (version December 2014).

Riverbed surveying activities 2019

Monitoring of the fairway on the **entire** German Waterway Danube (including the free-flowing section between Straubing and Vilshofen) is conducted annually. Every two years the navigable water beyond/alongside the fairway is recorded. All measurements (for several purposes) are performed by the sounding vessel “Kepler” via triple-head multibeam echosounder (each producing a swath of depth readings from a single ping).

Additional surveying activities after special incidents (e.g. floods, naval accidents) as well as in the context of development measures are conducted by means of multiple single beams mounted on a frame (work boats “Laber” and “Regen”) and via a double-head multibeam echosounder (sounding vessel “Tangens”), respectively. These event-driven surveying activities are not included in the compilation of scheduled measuring campaigns.



Fairway relocation and marking activities 2019

Due to the geometrical and hydraulic boundary conditions (e.g. limited cross-section, narrow curves, and small discharges) at the German section of the Danube, fairway relocation is usually not an option. In 2019, there was no significant relocation activity in Germany.

Dredging activities 2019

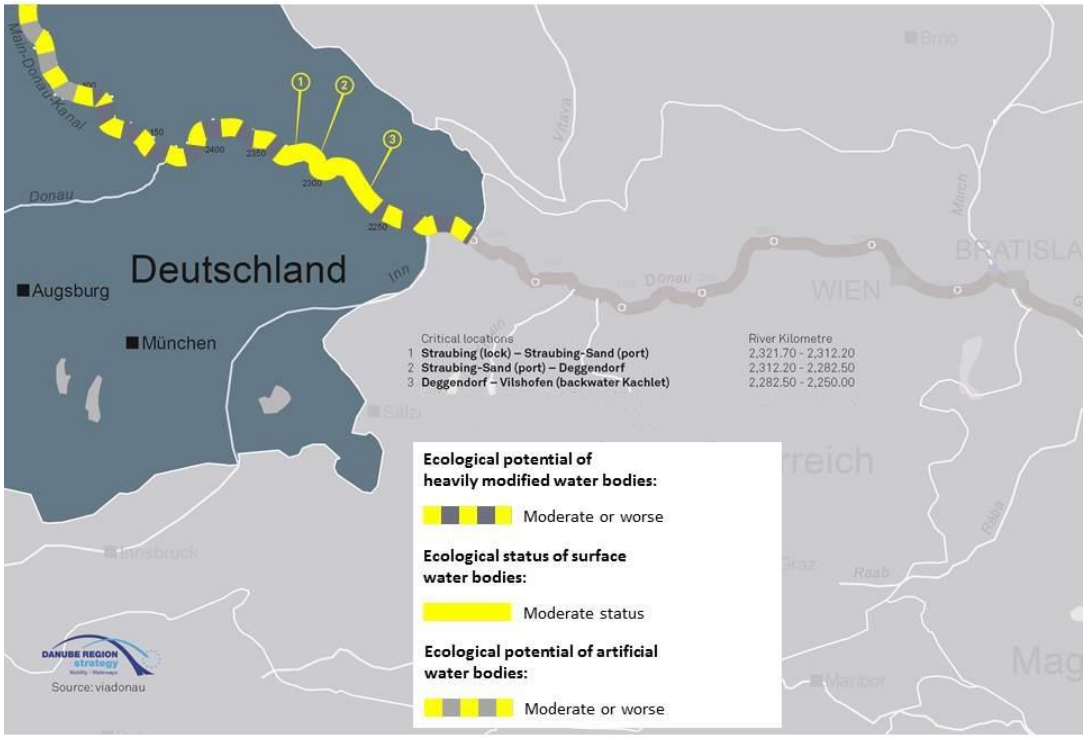
Designation of assignment (navigable route only)		Dredging site (river-km)	Dumping or placement site (river-km)	Beginning - end of service	Material	Quantity [m³]
Jochenstein Tailwater - Austrian Border		2202,700 - 2202,400	2202,200 - 2201,900		Sand / Gravel	5000
Straubing - Vilshofen	near Hofkircher	2258,850 - 2258,625	River Isar		Sand / Gravel	840,87
(free flowing section)	Winzer	2261,650 - 2259,850	2260,000 - 2259,500		Sand / Gravel	8.658,47
	Winzer	2263,575 - 2269,550	River Isar		Sand / Gravel	3.458,03
	Winzer	2268,925 - 2266,050	2270,000 - 2266,500		Sand / Gravel	4727,3
	Aicha	2273,075 - 2272,775	River Isar		Sand / Gravel	662,01
	Niederalreich	2275,825 - 2274,725	2278,000 - 2273,800		Sand / Gravel	2.921,90
	Niederalteich	2277,075 - 2276,700	River Isar		Sand / Gravel	771,01
	Deggendorf	2280,700 - 2280,225	2280,600 - 2280,000		Sand / Gravel	1.298,50
	Deggendorf	2291,310 - 2283,925	River Isar		Sand / Gravel	1.759,11
Geisling Tailwater	Geisling	2354,018 - 2353,525	2374,800 - 2374,000		Sand / Gravel	1.001,20
Bad Abbach Tailwater	Gundelshausen	2396,175 - 2394,600	2376,000 - 2375,600		Sand / Gravel	7.510,40
Reservoir Bad Abbach	Poikam	2407,300 - 2398,860	2408,200 - 2406,000		Sand / Gravel	6.021,90
	Kelheim	2411,700 - 2409,525	2410,500 - 2406,000		Sand / Gravel	36.076,39
	Kelheim	2412,125 - 2411,700	2376,000 - 2375,600		Sand / Gravel	20.932,67

In total 101,640 m³ were dredged for commercial navigation in 2019 on the entire German waterway Danube. Additionally, 111,620 m³ (in total 213,260 m³) have been dredged in 2019 but accounting is not finished. These works are not included in the above table.

Regarding official permissions (cf. 10.5), the Waterways and Shipping Office Danube MDK presents annually (usually in February) all planned dredging measures to institutions and stakeholders from water resources management, fishery and nature conservation in order to achieve mutual agreement. In addition, unscheduled dredging works are conducted as sovereign tasks to maintain safety.

10.5 DE | Summary of current ecological status and environmental impacts

As regards the Danube corridor there are all classifications of surface water bodies for the German waterway section. The Main-Danube Canal is classified as artificial and heavily modified water body, respectively. The main stretch of the German Danube is impounded and therefore declared as heavily modified while the free-flowing section between Straubing and Vilshofen is designated as natural water body.



The map above displays the ecological status and ecological potential of the German Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Germany.

Ecological status and ecological potential of surface water bodies
(*Source: DRBM Plan – Update 2015*)

The ecological potential of the heavily modified German Danube stretches is moderate. The same classification applies to the free-flowing section Straubing–Vilshofen though the status of the biological quality elements fish and benthic invertebrates is actually good.

Measures to improve environmental conditions

Measures have already been taken until 2015 to improve river continuity for fish migration, reconnecting adjacent floodplains/wetlands, impoundments, and water abstractions.

"*Inland navigation can contribute to making transport more environmentally sustainable, particularly where it can act as a substitute for road transport. It can, however, also have significant influence on river ecosystems, jeopardizing the goals of the WFD*" (DRBM Plan – Update 2015).

These different ecological points of view, namely a regional and a global perspective, also apply to the development of the waterway and improvement of flood protection on the Danube between Straubing and Vilshofen. This project contains an upgrading of the waterway solely by stream control measures (without locks/weirs) and improvements of flood protection measures up to a 100-year-event, both in combination with a suitable landscape management plan. The latter is characterized by an interactive and iterative planning procedure of engineering and accompanying landscape management measures to prevent, minimize, (re)assess and finally compensate unavoidable impacts. These obligations and responsibilities under environmental law include a public and stakeholder involvement. The plan approval order for the 1st subsection from Straubing to Deggendorf (confluence Isar) is final and conclusive since May 2020. As regards the 2nd subsection from Deggendorf to Vilshofen the planning approval procedure has started end of 2018. The Hearing procedure starts end of June 2020. Further information on the project is provided on the project's website http://www.lebensader-donau.de/.

Navigation maintenance measures and environmental impacts

Maintenance works are executed under environmental law (Federal Nature Conservation Act) and in accordance with the Federal Waterways Act. The corresponding measures in Federal waterways do not require permission under water law, but have to consider the objectives of WFD as well as all significant flood protection issues by mutual agreement with the water resources management administration. Maintenance measures are neither impacts in terms of environmental law nor projects/plans in terms of environmental impact assessment or FFH Directive because the approved state is only restored. Naturally, the respective issues have to be considered but no special permission or exemption is needed. The same release with regard to formal requirements exists for species conservation law. The implementation in practice is described in chapter 10.4.

10.6 DE | Budget status February 2020

Investments taken for FRMMP implementation 2014 –2020

	Required additional investment 2014 – 2020 according to FRMMP	Investment cost secured by state or other co-financing	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	0	0	0	0
Surveying of the riverbed	0	0	0	0
Water level gauges	0	0	0	0
Marking of the fairway	0	0	0	0
Availability of locks / lock chambers	0	0	0	0
Information on water levels and forecasts	0	0	0	0
Information on fairway depths	0	0	0	0
Information on marking plans	0	0	0	0
Meteorological information	0	0	0	0
Sum (Euro)	**0**	**0**	**0**	**0**

Operational expenditures for conducted activities 2019 and budget needs 2020

Need areas	Operational expenditures 2019*1	Required operational budget 2020	Secured*3 operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth) (here only dredging costs cf. 10.4)	1 829 644 (+ 1 507 586)*4	-	-	0
Surveying of the riverbed	-	-	-	0
Water level gauges	-	-	-	0
Marking of the fairway	-	-	-	0
Availability of locks / lock chambers	-	-	-	0
Information on water levels and forecasts*2	-	-	-	0
Information on fairway depths*2	-	-	-	0
Information on marking plans*2	-	-	-	0
Meteorological information*2	-	-	-	0
Other needs	-	-	-	-
Sum (Euro)	**1 885 649*1 (3 337 230*4)**	-	*3	**0**

*1 Operation and maintenance works are mandatory tasks (sovereign duties) of the Federal Waterways and Shipping Administration (WSV). Due to in-house efforts an assignment of tangible costs per need area is not possible. The sum (see above) only comprises all definable costs, actual costs are in fact substantially larger.

*2 Job completion in legal and administrative cooperation with Free State of Bavaria (Water Resources Management Administration), German Federal Institute of Hydrology (BfG), and German Weather Service (DWD).

*3 For sovereign tasks all necessary investments are by default covered by federal budgets.

*4 Dredging works performed in 2019 but not yet booked.

10.7 DE | Outlook: actions, milestones and funding sources

DE 01: 20% of dredging works may be conducted by WSV itself (providing sufficient available capacity for government-operation)		
Planned activities:	Continuous training (personnel), maintenance and repair (gear) to provide skilled operational staff and appropriate equipment	
Current shortcomings:	No current shortcomings identified	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No such impact
	Which measures are taken to mitigate these impacts?	n/a
	Is water status still expected to deteriorate?	n/a
Possible funding:	Budget availability: National Funding is assured	
Next steps:	Market Observation (current dredging prices), monitoring waterway (safety and ease of shipping)	permanently

DE 02: Improved water level information		
Planned activities:	Implementation of a nationwide “push-target” (EDP System) Provision of hardware and capacity for Danube gauges	
Current shortcomings:	Temporary suspension due to other tasks of higher priority	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No such impact
	Which measures are taken to mitigate these impacts?	n/a
	Is water status still expected to deteriorate?	n/a
Possible funding:	Budget availability: National Funding is assured	
Next steps:	Configuration of an independent parallel system in terms of availability including redundancy for remaining 10% of gauges (cf. 10.3) to some extent in cooperation with the Bavarian Water Resources Management Administration	until 12/20

11 Serbia

PLOVPUT (Directorate for Inland Waterways within the Ministry of Construction, Transport and Infrastructure) is responsible for fairway maintenance.

11.1 RS | Status report on main critical sectors including water level information 2012 – 2019

The **recommended Level of Service of 2.5m fairway depth at Low Navigable Water Level** would correspond to an equal height of the blue columns (availability of 2.5m fairway depth) and the white columns framed in blue (water level equal to or above Low Navigable Water Level) in the figures below.
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical sectors, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

Danube

Number of days with fairway depths ≥ 2.5m on main critical sectors
(fairway width reduced to 100 m – minimum LoS)

Critical sector	2012	2013	2014	2015	2016	2017	2018	2019
Apatin	366	365	365	365	366	365	365	365
Futog	366	235	365	360	327	329	291	365

Number of days with water level ≥ LNWL on main critical sectors

Critical sector	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
Apatin	Apatin	366	365	365	316	353	353	266	331
Futog	Novi sad	366	363	365	324	353	358	281	332

The critical location Apatin was identified as the most critical one by Danube waterway users in a survey by PA1a conducted in December 2014. Apatin is, however, not the most critical sector for navigation in terms of available fairway parameters (depth and width). The most critical location for navigation in terms of available fairway parameters (depth and width) is Futog.

The Apatin critical sector will be dealt with in the Croatian chapter, in order to avoid duplication of information. Data on Apatin sector is jointly prepared by both Croatian and Serbian administration, in order to guarantee harmonized data provision.

Sava

Number of days with fairway depths ≥ 2.5m on main critical sectors
(fairway width 55 m)

Critical sector	2012	2013	2014	2015	2016	2017	2018	2019
Sabac	n/a	n/a	306	216	337	276	337	*
Kamicak	n/a	n/a	346	203	324	290	365	*

* no data was provided for this update

11.2 RS | Hydrological conditions at main critical sectors 2019

No data was provided for this update.

11.3 RS | Key issues and related activities 2019

	Key issues	*Need for action*	*Activities performed 2019*
RS 01	Limitations of available data due to insufficient number of vessels and surveying equipment Limited budget for monitoring activities	Support acquisition/retrofit of up-to-date single-beam sounding equipment, software and vessels Enforce cooperation with AVP on joint stretch and improve data exchange	*No new surveying equipment has been acquired, due to limited budget resources.* *Exchange of hydrographic data with AVP has been performed, in line with established procedure, improving the frequency of hydrographic data collection.* *For the purpose of the "River Training and Dredging Works on critical sectors on Danube in Serbia" project, new hydrographic survey equipment and activities are established by both Works and Service Contractors.*
RS 02	Insufficient number of skilled staff	Secure education and provision of well-trained staff in the short, medium and long term Facilitate different geographical organization of surveying teams to allow more effective and efficient performances	*At the end of 2015, the decision of rationalization of the number of employees in the Governmental institutions has been announced. According to that decision, Directorate for Inland Waterways started a procedure of reduction of the number of employees from 89 to 70. This reduction was performed at the beginning of 2016. The decision is still in force.* *Different geographical organization of surveying teams to allow more effective and efficient performances is linked to the acquisition of an additional vessel and*

		Enable expert exchange with other Danube waterway administrations	*equipment for hydrographic surveying activities. Since no acquisition of vessel and equipment for hydrographic activities has been performed, due to lack of budget resources and rationalization of the number of employees, no changes in geographical organization have been performed.* *No expert exchange with other Danube waterway administrations has been performed.*
RS 03	Insufficient number of automatic gauging stations in the free flowing section	Support acquisition and operation of additional gauging stations.	*No new automatic gauging stations have been acquired, due to limited budget resources.* *Within the project "Supervision and Environmental Monitoring of River Training and Dredging Works on the Critical Sectors on the Danube River", six new automatic gauging stations are installed at 6 critical sectors before the start of the works, which was completed in July 2018. These stations will be additional to those part of the RHMS official monitoring network.*
RS 04	Further absence of budget for dredging activities will lead to deterioration of navigation conditions, while the cost-benefit ratio of these activities is very favourable	Secure sufficient and predictable financial means Implement structural hydraulic engineering works in order to reduce the recurring need for dredging interventions	*No update available.* *In 2017, the EU co-funded project, "River Training and Dredging Works on Critical Sectors on the Danube River & Supervision and Environmental Monitoring of River Training and Dredging Works on Critical Sectors on the Danube River" has started, which implementation consists of two contracts – Works Contract and Supervision and Environmental Monitoring Service Contract. Under this project dredging activities will be performed on five critical sectors on the Danube in Serbia.*
RS 05	Old marking vessels and equipment	Support acquisition of up-to-date marking vessels and buoys	*No acquisition of up-to-date marking vessels and buoys has been performed yet, due to lack of budget resources.* *New buoys are provided through the project "Technical Assistance and Supervision for Installation of Equipment and Integration of Navigation Monitoring System on the Danube River", which has started*

			on July 1st, 2016 with the AIS system integrated. The scope of this project is the development and integration of the Navigation Monitoring and Reaction System on the Danube River in Republic of Serbia.
RS 06	Inefficiencies due to missing comprehensive database and web tool for navigation aids	Support development of a web application for marking activities on the Danube and its tributaries integrating Croatia and Romania	*Web application for marking activities on the Danube has been developed and put into operation (finalised).* *Under the Danube STREAM project other project partners have decided to participate in this web application further development.*
RS 07	Limited number of skilled personnel and inability to employ new staff due to Government regulation and restrictions	Secure education and provision of well-trained staff in the short, medium and long term	*At the end of 2015, decision of rationalization of the number of employees in the Governmental institutions has been announced. According to that decision, Directorate for Inland Waterways started procedure of reduction of the number of employees from 89 to 70. This reduction has been performed at the beginning of 2016.*
RS 08	The low number of gauging stations results in incomplete water level information and lead to inaccurate forecasts	Support acquisition and operation of additional gauging stations.	*No activities were performed, due to lack of budget resources.* *Within the project "Supervision and Environmental Monitoring of River Training and Dredging Works on the Critical Sectors on the Danube River", six new automatic gauging stations are installed at 6 critical sectors before the start of the works, which was completed in July 2018.*
RS 09	Provision of dynamic fairway information to users	Launching of Navigational Bulletin, an on-line fairway information services portal for the Republic of Serbia (Danube, Sava and Tisza Rivers)	*Navigational bulletin, and online portal for provision of dynamic fairway information services, was launched in 2015 and is being improved now with new functionalities and data. The following dynamic information are available: water levels, water levels forecast, wind speed and direction, Notices to Skippers, waterway marking system, available depths at critical sectors, forecast of available depth at critical sectors, available vertical clearances at bridges, forecast of available vertical clearances at bridges, available depth at berths, forecast of available depth at berths, availability of*

			locks, availability of river information services, contact information of relevant authorities. Data is available in Serbian, German and French language. url: http://www.plovput.rs/navigational-bulletin *Updated versions of electronic navigational charts and paper charts are being prepared on an annually basis based on the latest hydrographic measurements. Layouts are also covering the corresponding critical sectors.*

11.4 RS | Review of monitoring, rehabilitation and maintenance activities 2019

The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified by the waterway administrations. The list of critical sectors as itemised in the Rehabilitation and Maintenance Master Plan (version December 2014).

Riverbed surveying activities 2019

International inland waterways in the Republic of Serbia, Danube and Sava, and the interstate waterway with the international regime of navigation of the Tisza River are being surveyed on annual basis by the Directorate for Inland Waterways – Plovput. Almost 1000 km of the Danube, Sava, and Tisza rivers are being covered by surveying campaigns, using the well-established methodology.

Each year a plan for regular annual survey is being prepared, so the surveyed sections could differ between years. Regarding the Danube River, the free-flowing section (km 1433+000 – km 1170+000) is being surveyed on a regular basis – once per year, with the exception of the critical sectors, where hydrographic measurements are performed multiple times per year (depending on the river bed dynamics at the specific sector). The downstream part, as the backwater stretch (Iron Gate Reservoir) does not require that surveying frequency and is surveyed once in four years (except the Danube stretch from rkm 1170+000 – 1132+000 which is regularly surveyed).

This is compatible with the regular annual updating of electronic navigational charts, which are based on the latest hydrographic surveys. On the Sava River, surveys are being performed on annual basis, as well, but with the focus on sectors critical for navigation. Tisza River is being surveyed, on annual basis, along its full length through the Republic of Serbia, in total of 164 km.

The hydrographic surveys are established through monitoring of cross sections which locations are permanent and defined by coastal markers on both sides of the river bed. Each marker has a prescribed geodetic position ensuring the provision of coherent data. Data on markers and survey results are stored in the internal database of the Directorate for Inland Waterways.

The cross sections distance was defined differently since the first hydrographic measurements, depending on available survey methodologies. Currently, there are three types of cross sections set

by Plovput. Originally, in 1962 profiles at the distance of 1000 m were defined. In the beginning of 2000's new – additional profiles were defined for the Sava River, with a denser network (profiles every 50m on critical sectors. This principle was applied on the Danube River in 2007, while profiles at 50m distance, at critical sectors, were introduced in 2012. On the Tisza River survey of profiles at the 200m distance has started in 2016. In the area of the Iron Gate reservoir a different surveying methodology has been applied, since the profiles within that area are established for the purpose of sediment balance monitoring, and they are being surveyed every 4 years. The cross-profile data are coded EP, NO or DP and consist of text files containing x-coordinate, y-coordinate and bed elevation in m a.s.l. The majority of NO profiles covers the Danube River bed between bank lines and is perpendicular to the fairway. These profiles are surveyed once a year using single-beam equipment.

Danube

No update available for 2019.

Fairway marking activities 2019

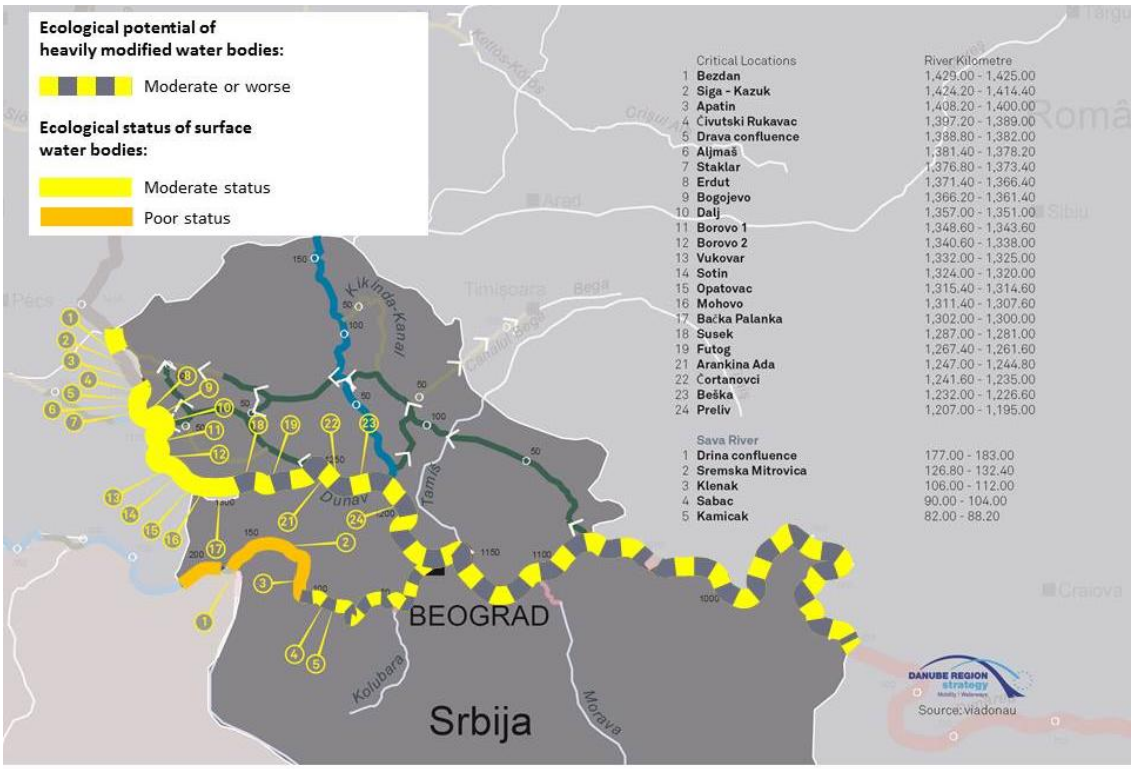
No update available for 2019.

Dredging activities 2019

No update available for 2019.

11.5 RS | Summary of current ecological status and environmental impacts

The following map displays the ecological status and ecological potential of the Serbian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Serbia.



Ecological status and ecological potential of surface water bodies
(*Source: DRBM Plan – Update 2015*)

The ecological status of the Danube waterbody in the Republic of Serbia is identified within the DRBMP as moderate in the upper stretch to moderate to worse in the middle and lower stretch. Having in in mind a long-term absence of river training and dredging works for the purpose of fairway maintenance, no major impact to the existing quality of the waterbody was identified.

Measures to improve environmental conditions

Environmental protection measures are respected within each project established or participated by Plovput. Basic principles of strategic, national and international documents related to environmental protection and waterway management are included during the preparation of technical documentation and planned works. The role of EIA studies is crucial as well as supervision activities before, during and after performing the maintenance or other specific works within the fairway.

Navigation maintenance measures and environmental impacts

Due to the absence of budget for maintenance dredging activities, fairway maintenance activities are usually limited to hydrographic surveying activities and waterway marking activities, with no effect on the environment. Nevertheless, a few dredging activities were performed, as said, at the most critical sectors, following the basic principles of waterway and environmental protection. The dredged sediment has been dumped within the river, in line with the adopted sediment balance principle.

In 2017, an EU-funded project of river training and dredging works on critical sectors on the Danube River in Serbia has started, including an independent environmental monitoring component as a

part of the Supervision contract. The environmental monitoring will be performed before, during and after river training and dredging works, in order to properly identify and evaluate effects of the works to environmental components, in terms of hydro-morphology, sediment and water quality and biology. The main objective of the environmental monitoring before works is to address the base values of the main parameters identified during the elaboration of the EIA Report. These values are established within the Environmental Monitoring Report before Works and will serve as the base for evaluation of effects of river training and works to the environment. In such a way, the next basic steps are included within the environmental component of the Project:

- Establish a sufficient background description of the environmental conditions within the project area and especially at the site where specific activities are planned;
- To ensure the above outline description exist within a monitoring programme defined for the situation before, during and after the construction phase;
- Collect, process, and present monitoring data. Evaluate whether any unexpected adverse impact occurs during the construction phase as well as during the operation phase;
- If any unexpected adverse impacts are observed additional mitigation measures should be taken. Carry out the decided supplementary action and monitor whether the decided supplementary mitigation measure will have the expected effect (within this Project compensation measures procedure is established too).

11.6 RS | Budget status March 2020

Investments taken for FRMMP implementation 2014 – 2020

No update available for 2019.

Need areas	Required investments 2014 – 2020 according to FRMMP	Secured investment costs (state budget or other financing) and investments taken	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	0	0	-	0
Surveying of the riverbed	0	0	-	0
Water level gauges	0	0	-	0
Marking of the fairway	0	0	-	0
Availability of locks / lock chambers	0	0	-	0
Information on water levels and forecasts	0	0	-	0
Information on fairway depths	0	0	-	0
Information on marking plans	0	0	-	0
Meteorological information	0	0	-	0
Other needs	0	0	-	0
Sum (Euro)	**0**	**0**	**-**	**0**

Operational expenditures for conducted activities 2019 and budget needs 2020

No update available for 2019.

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	0	0	0	0
Surveying of the riverbed	0	0	0	0
Water level gauges	0	0	0	0
Marking of the fairway	0	0	0	0
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	0	0	0	0
Information on fairway depths	0	0	0	0
Information on marking plans	0	0	0	0
Meteorological information	0	0	0	0
Other needs	0	0	0	0
Sum (Euro)	**0**	**0**	**0**	**0**

11.7 RS | Outlook: planned actions, milestones and funding sources

RS 04: Absence of dredging budget will lead to deterioration of navigation conditions			
Planned activities:	Implementation of the IPA 2013 project "River Training and Dredging Works on Critical Sectors on the Danube River & Supervision and Environmental Monitoring of River Training and Dredging Works on Critical Sectors on the Danube River"		
Current shortcomings:	Not only is there insufficient budget available to conduct dredging interventions in critical sectors, but the recurring need for dredging interventions due to the dynamic morphological changes of the riverbed would result in high expenditures for maintenance dredging.		
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No negative impacts are to be expected, since the environmental issues are taken into account in the course of the supervision and environmental monitoring conducted throughout the project runtime.	
	Which measures are taken to mitigate these impacts?		
	Is water status still expected to deteriorate?	No	
Possible funding:	EU co-funding IPA 2013 and national funding		
Next steps:	River training structures will be established on three critical sectors – Futog, Cortanovci and Preliv;		2018/2019

	Capital dredging will be executed on five critical sectors – Susek, Futog, Arankina Ada, Cortanovci and Beska The works execution has started in August 2018 at the critical location Futog, according to the adopted Programme and Project Implementation Schedule.	2019/2020

12 Bosnia and Herzegovina

Currently there is no agency on state level which is responsible for maintenance, rehabilitation and upgrade.

12.1 BA | Status report on main critical locations including water level information 2012 – 2019

Number of days with fairway depths ≥ 2.5m on main critical locations (as listed in the FRMMP):

Critical location	2012	2013	2014	2015	2016	2017	2018	2019
From rkm 69,7 To rkm 72,9	No data available.[16]							
From rkm 79,9 To rkm 85,8								
From rkm 88,3 To rkm 101,9								
From rkm 103,5 To rkm 109,8								
From rkm 173,8 To rkm 176,6								
From rkm 177,8 To rkm 187,4								
From rkm 189,2 To rkm 202,5								
From rkm 202,5 To rkm 225,1								
From rkm 225,1 To rkm 260,7								
From rkm 260,7 To rkm 306,8								
From rkm 306,8 To rkm 331,5								
From rkm 364,4 To rkm 395,5								
From rkm 417,1 To rkm 445,7								
From rkm 445,7 To rkm 459,9								
From rkm 459,9 To rkm 480,4								
From rkm 480,4 To rkm 511,8								

[16] Data might be provided at a later stage. In this case an updated version of this National Action Plan update will be made available on the following websites: http://www.fairwaydanube.eu/ and www.danube-navigation.eu.

Number of days with water level ≥ LNWL on main critical locations
Not applicable (please see the explanation given below).

Critical location	Reference gauges	2012	2013	2014	2015	2016	2017	2018	2019
x	x	x	x	x	x	x	x	x	
x	x	x	x	x	x	x	x	x	

The main reasons for not meeting the level of service are the following:

The Sava river waterway needs huge and comprehensive rehabilitation and reconstruction works in order to ensure considerable and full usage of the waterway. The rehabilitation and reconstruction works should also ensure necessary conditions for safe navigation along the Sava River, which concedes afterwards regular maintenance works of the fairway. Sava river waterway is included in the core transport network in Bosnia and Herzegovina, and its rehabilitation is one of the priorities in the transport sector in the country.
Once the rehabilitation works are completed and fairway infrastructure parameters are harmonised with the appropriate parameters along the Danube fairway, the regular maintenance works shall be established, following the principles and guidelines from the Fairway Rehabilitation and Maintenance Master Plan (cycle of monitoring, planning, execution, information), including usage of best practices and experience of other countries in the Danube region in this respect. Bosnia and Herzegovina currently maintains the fairway signalling system of the Sava river fairway from rkm 343 to rkm 211 on BiH and Croatian fairway/river banks, and from rkm 211 to rkm 178 for BiH part of the fairway/river bank, according to the Agreement between the Government of the Republic of Croatia and the Council of ministers of Bosnia and Herzegovina on inland waterways navigation, its signalling and maintenance.

12.2 BA | Hydrological conditions at main critical locations 2019

Not applicable (please see the explanation given above).

12.3 BA | Key issues and related activities 2019

	Key issues	*Need for action*	*Activities performed 2019*
BA 01	In order to rehabilitate the Sava fairway, it is necessary to prepare Study and Technical documentation for rehabilitation works. Documentation includes prepare of Environmental and Social Impact Assessment Study (ESIA), update of Preliminary design from the Feasibility study (FS prepared by the Sava Commission in 2008) and Main design.	The financial means need to be secured for preparation of study and technical documentation for the rehabilitation works on the Sava river waterway, to be upgraded to Va navigation class (according to the parameters for Va class given by the Sava Commission)	No update available.[17]

12.4 BA | Review of monitoring, rehabilitation and maintenance activities 2019

Currently, there is no update available for rehabilitation and maintenance tasks.[19]

Riverbed surveying activities 2019

River-km (from-to)	Frequency of surveying	Type of survey (single-/multi-beam)
Not applicable.		

Fairway relocation and marking activities 2019

Not applicable.

Dredging activities 2019

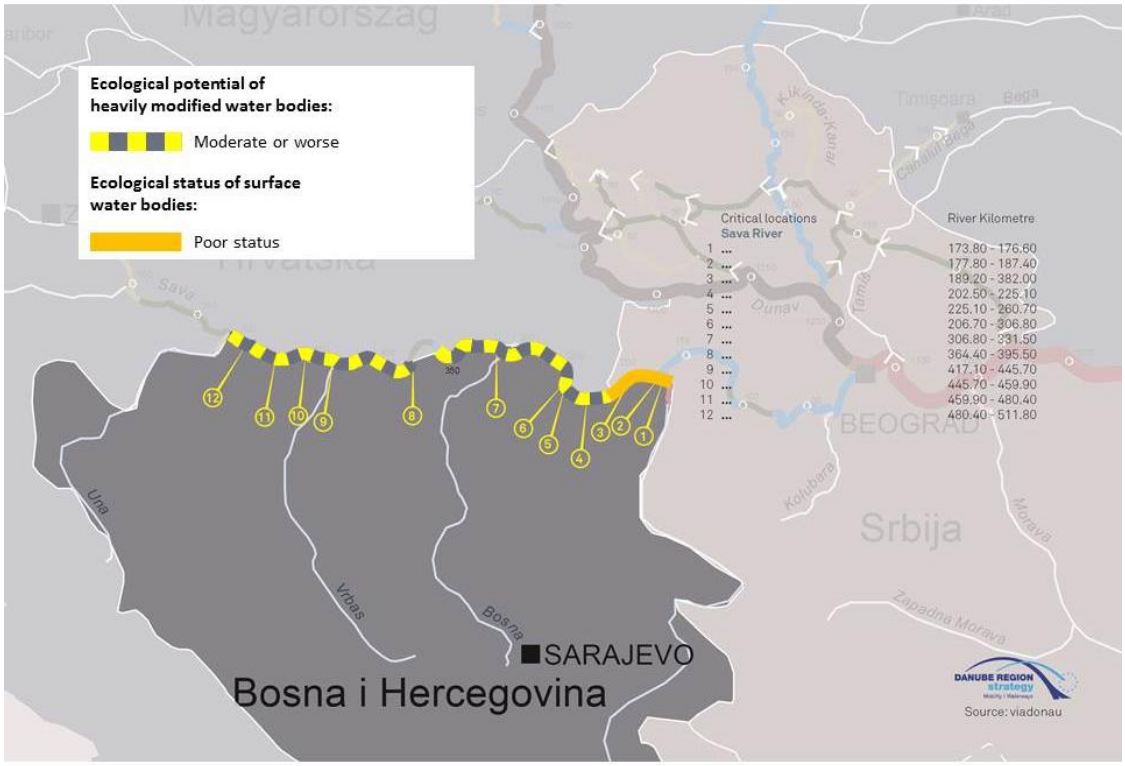
Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m³	Permits (see next table)
	from river-km	to river-km	from river-km	to river-km						
x	x	x	x	x	x	x	x	x	x	x

Referenced and relevant permits	Title of permit (original language)	Permitting authority	Permit applicable		Valid until	Type of permit (e.g. environ-mental, water, navigation law)	Main conditions for permit
			from river-km	to river-km			
1	x	x	x	x	x	x	x

[17] Information and data might be provided at a later stage. In this case an updated version of this National Action Plan update will be made available on the following websites: http://www.fairwaydanube.eu/ and www.danube-navigation.eu.

12.5 BA | Summary of current ecological status and environmental impacts

The following map displays the ecological status and ecological potential of the Save in waters Bosnia and Herzegovina – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Bosnia and Herzegovina.



Ecological status and ecological potential of surface water bodies
No information available.[18]

Measures to improve environmental conditions
No information available.[20]

Navigation maintenance measures and environmental impacts
No information available.[20]

[18] Information might be provided at a later stage. In this case an updated version of this National Action Plan update will be made available on the following websites: http://www.fairwaydanube.eu/ and www.danube-navigation.eu.

12.6 BA | Budget status February 2020

Operational expenditures 2019 and budget needs 2020

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	No update available.[19]			
Surveying of the riverbed				
Water level gauges				
Marking of the fairway				
Availability of locks / lock chambers				
Information on water levels and forecasts				
Information on fairway depths				
Information on marking plans				
Meteorological information				
Other needs				
Sum (Euro)				

12.7 BA | Outlook: planned actions, milestones and funding sources

No data provided.

BA 01:		
Planned activities:		
Current shortcomings:		
Environmental relevance of planned activities:	What are the main expected environmental impacts?	xxx
	Which measures are taken to mitigate these impacts?	xxx
	Is water status still expected to deteriorate?	xxx
Possible funding:		
Next steps:		

[19] Budget data might be provided at a later stage. In this case an updated version of this National Action Plan update will be made available on the following websites: http://www.fairwaydanube.eu/ and www.danube-navigation.eu.

13 Moldova

No update has been provided by Moldova for April 2019. The text of the Roadmap June 2015 is given below.

The Danube stretch of Moldova is only about 500 metres long and is restricted to the port area of Giurgiulesti. Fairway administration and maintenance of the Danube waterway in Moldova is carried out by the Romanian AFDJ on the basis of a bilateral agreement.

13.1 MD | Status report on main critical locations including water level information 2012 – 2019

According to the Fairway Rehabilitation and Maintenance Master Plan (version December 2014), there are no critical locations.

13.2 MD | Hydrological conditions at main critical locations 2019

Not relevant.

13.3 MD | Key issues and related activities 2019

In the Fairway Rehabilitation and Maintenance Master Plan (version December 2014), no key issues were identified.

13.4 MD | Review of monitoring, rehabilitation and maintenance activities 2019

According to the Fairway Rehabilitation and Maintenance Master Plan (version December 2014), no rehabilitation and maintenance activities were implemented.

13.5 MD | Summary of current ecological status and environmental impacts

Ecological status and ecological potential of surface water bodies
(Source: DRBM Plan – Update 2015)

No data available.

Measures to improve environmental conditions

No data available.

Navigation maintenance measures and environmental impacts

No data available.

13.6 MD | Budget status May 2019

No data available.

13.7 MD | Outlook: planned actions, milestones and funding sources

Not relevant.

14 Ukraine

The State Enterprise **«Ukrainian Sea Ports Authority»** of the Ministry of Infrastructure of Ukraine is responsible for maintenance, rehabilitation and upgrade.

14.1 UA | Status report on main critical locations including water level information 2012 –2019

The report on the state of the main critical areas in 2012 – 2014 is subject to the list of the Main European Inland Waterways-IWT («The blue book»). According to the United Nations Economic Commission for Europe (UNECE), the part of river Danube from 0 to 116 km of Chilia branch where *Danube-Black Sea Deep-Water Navigation Route* (DBSDWNR) was defined as a category E80-09 waterway with a planned fairway depth of 7.2 metres. «The blue book» was developed under the AGN - European Agreement on Main Inland Waterways of International Importance (Decree of the President of Ukraine from 28.09.2009 №767/2009 on the "accession of Ukraine to the European Agreement on Main Inland Waterways of International Importance (СМВП/AGN)").

Works in the specified section of the Danube river, namely deepening of the river in order to provide navigation parameters, would be works in border waters which, according to the Agreement between the Governments of Ukraine and Romania on the Romanian-Ukrainian State Border's Regime, Collaboration and Mutual Assistance in Border Issues (signed in 2003) and the Agreement on cooperation in the field of water management at the border waters (1997), should be agreed with the Romanian side. Until now, Romania has refused to agree to the implementation of the project "Creating a Deepwater Navigation Course 'Danube – Black Sea' on the Ukrainian section of the delta" (hereinafter referred to as DNC 'Danube – Black Sea'). The main argument is the failure by Ukraine to comply fully with the requirements of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) on the DNC 'Danube – Black Sea'. The last dredging works on the river crossings of the DNC Danube - Black Sea (mouth of Kilia, Starostambulsk, Bystre) were carried out in 2005.

Regarding the implementation of the requirements of the Espoo Convention the Ministry of Ecology and Natural Resources of Ukraine provided the Romanian authorities with a letter dated 27.04.2018 concerning a 'Roadmap for bringing the DNC Danube - Black Sea on the Ukrainian section of the delta in full compliance with the Espoo Convention', adopted by the Implementation Committee Espoo Convention at the 41st session (regular meeting of the Implementation Committee on the Convention on Environmental Impact Assessment in the Transboundary Context and the Protocol on Strategic Environmental Assessment (March 13-15, 2018 in Geneva, Switzerland)). In addition, according to the results of the integrated environmental monitoring during the operation of the DNC Danube - Black Sea, which is being performed since 2004 under the guidance of the Ukrainian Scientific and Research Institute of Ecological Problems of the Ministry of Ecology and Natural Resources of Ukraine), the following conclusion was made:

"According to the monitoring results, no significant impacts on the exploitation of the DNC Danube - Black Sea were identified as well as the work on supporting the passport characteristics of the maritime approach channel of the river basin of the DNC 'Danube – Black Sea', as well as the transboundary impact of the sea dump of soils, development and storage of bottom sediments. Therefore, conducted in 2017, monitoring studies indicate that there is no significant transboundary impact."

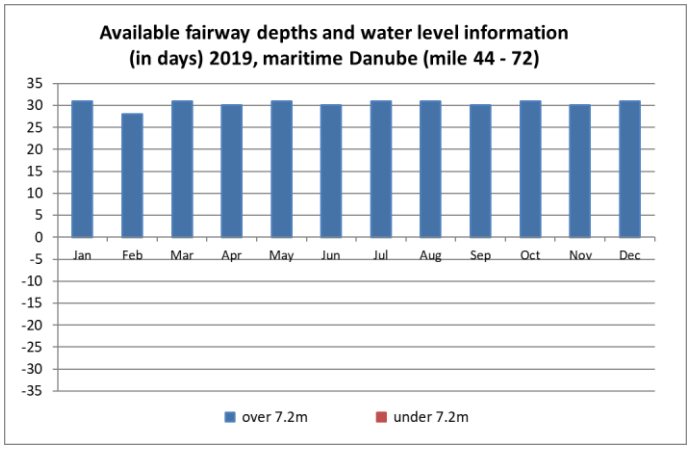
Number of days with fairway depths ≥ 7.2m on main critical locations

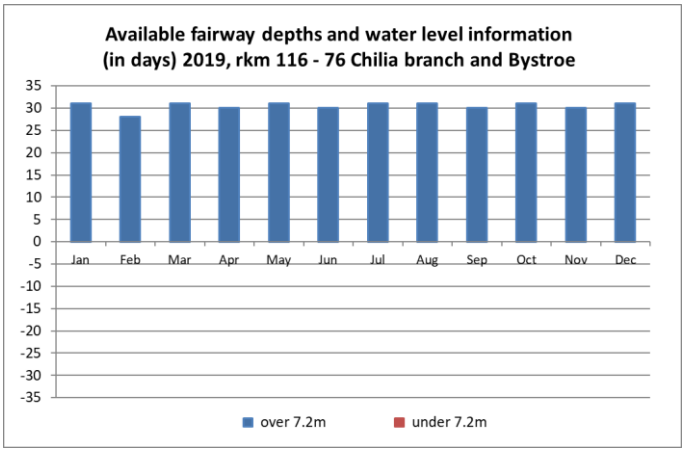
Critical location	2012	2013	2014	2015	2016	2017	2018	2019
44 – 72 mile (maritime Danube)	366	365	365	x	366	365	365	365
116 – 76 km	366	365	365	x	366	365	365	365
76 – 0 km*	366	365	365	x	51	3	0	365*

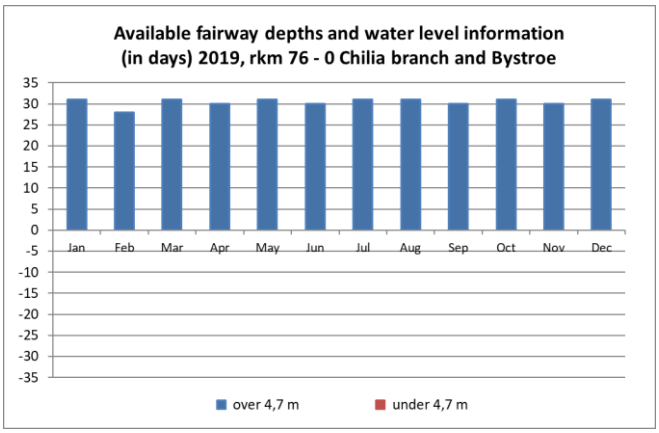
* The depth at the section 76 - 0 km of the Danube-Black Sea Deep-Water Navigation Route and the mouth of the marine approach channel Bystroe will be 7.2m after construction. For now the depth is mostly 4.7m.

Number of days with water level ≥ LNWL on main critical locations

Critical location	Reference gauge	2012	2013	2014	2015	2016	2017	2018	2019
44 - 72 mile (maritime Danube)	Reni	327	326	365	x	366	x	x	105
116 – 76 km	Izmail	305	328	365	x	330	x	x	121
76 – 0 km	Vylkove	330	348	363	x	330 (at gauge Izmail)	x	x	121







14.2 UA | Hydrological conditions at main critical locations 2019

The Danube Hydrometeorological Observatory (DHO) is responsible for the hydrometeorological issues at the Ukrainian part of Danube.

One of the main tasks of DHMO is the provision of hydrometeorological support to the companies and organizations of the Danube region. Water level forecasts for the Danube waterway from Germany to the Black Sea are published with different forecast horizons. Short-term forecasts with a forecast horizon from 24 to 72 hours for 17 gauging stations are published daily. Forecasts of characteristic water levels (mean, minimal and maximal) for 10 days are published for 11 gauging stations as are monthly forecasts.
One in four days forecasts of average, minimum and maximum water levels are provided on 11 sections and once a month forecasts of average, minimum and maximum water levels are provided for the coming month on 16 sections.
Water level forecasts are provided to companies of the marine industry and are also published on the websites of DHMO (www.dhmo.org.ua) and the River Information Service on inland waterways of Ukraine (http://ukrris.com.ua/).

The hydrometeorological regime and its variability are among the main factors defining the opportunities for navigation on the Danube. Difficulties for navigation on the Ukrainian part of the Danube occur in the following situations:

- minimum water levels in the summer and autumn low-water period
- maximum water levels during the spring and summer floods
- a sharp decline in depth on limiting sections of the river as a result of sedimentation after the passage of floods or flash-floods
- periods of high intensive ice phenomena (thick ice drift, ice jams and freezing)

Thus, the main principle of customer support lies in the operative provision of actual and forecast information on the hydrological regime for navigation companies.

The long-term hydrological monitoring performed at the Ukrainian section of the Danube reveals some tendencies in alterations of the hydrological regime, affecting the conditions for navigation. A permanent mathematical model of the Danube delta must be created in the future as a tool for

the feasibility study and evaluation of changes in the hydromorphology of the delta, due to different possible scenarios of climate change and Danube water discharge as well as sediment runoff alterations, Black Sea level fluctuations or planned hydrotechnical works.

14.3 UA | Key issues and related activities 2019

During 2019, SE "USPA" was continuously providing measures directed on the implementation of decisions IS/1 f Meeting of the Parties of ESPOO Convention, which are represented in the Action Plan of the Roadmap on bringing the Danube-Black Sea Deep-Water Navigation Route in the Ukrainian Part of the Danube Delta into full compliance with ESPOO Convention.

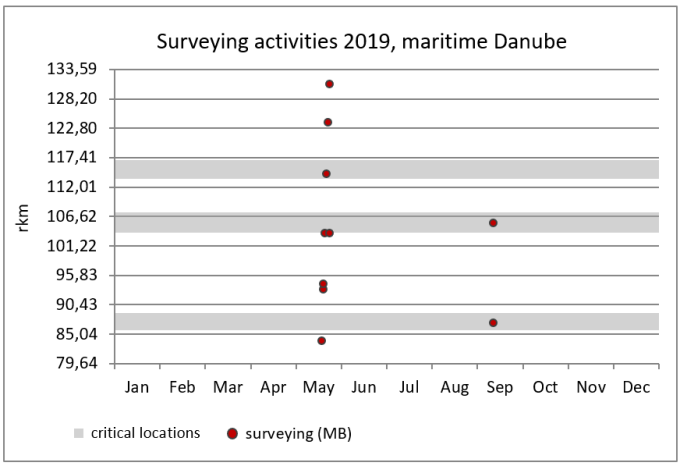
	Key issues	*Need for action*	*Activities performed 2019*
UA 01	Maintenance of the waterway	Ensuring compliance with the international environmental conventions and bilateral agreements with Romania	*No update available.*
UA 02	Hydrological forecasts are not precise enough	Improve the accuracy of hydrological forecasts supporting Danube navigation	*The software complex of "Analytical and expert system for navigable water level forecasting" was developed by Ukrainian Scientific Research Hydrometeorological Institute in 2015. The method of corresponding daily water level gradients implemented in the analytical system allows for the production of highly reliable daily, 10-day and monthly forecasts. The experimental use of this software complex within the Danube Hydrometeorological Observatory during 2015 demonstrated the proven quality of the water levels forecasts for the Danube waterway. Further implementation of computer-assisted methods for hydrological forecasting in DHMO practice will raise the quality of customers' hydrological support.* *No update available.*

14.4 UA | Review of monitoring, rehabilitation and maintenance activities 2019

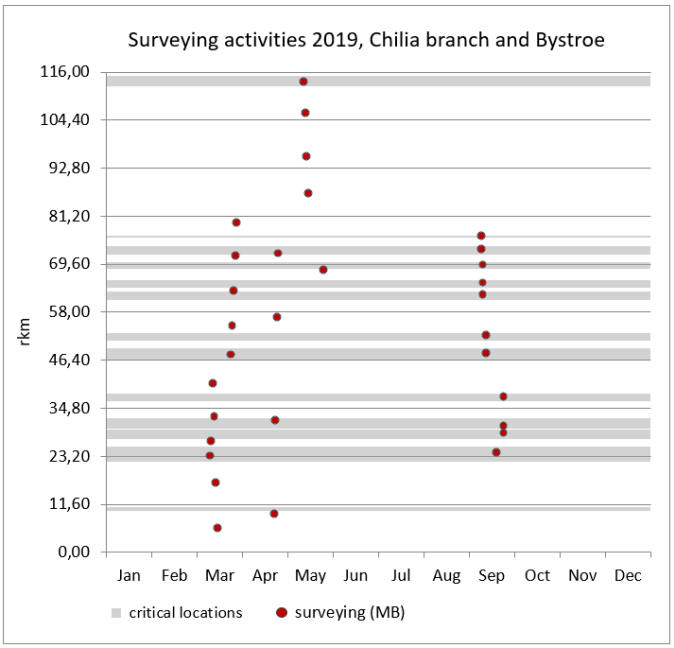
The surveying and monitoring, dredging and fairway marking activities are visualised in charts, each of which represents a specific river section. The vertical axis displays the river-kilometres; the horizontal axis adds the temporal dimension, showing when exactly rehabilitation or maintenance measures were conducted. The grey horizontal bars represent the critical locations, as identified in the Rehabilitation and Maintenance Master Plan (version December 2014).

Riverbed surveying activities 2019

Maritime Danube



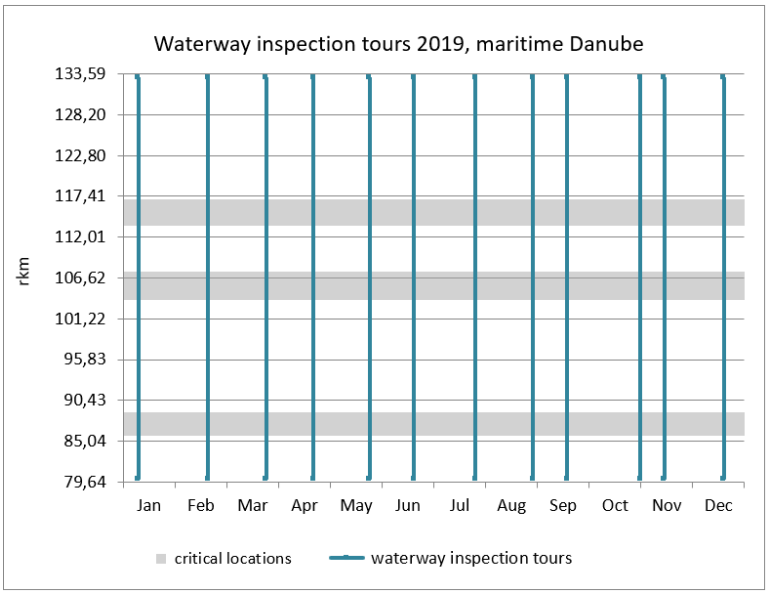
Chilia branch – Bystroe



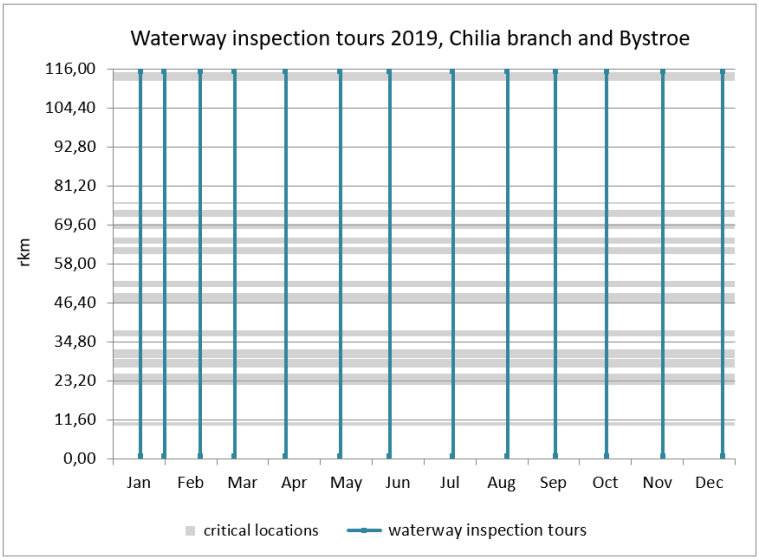
The entire Chilia branch and Bystroe maritime approach channel were surveyed with multi-beam equipment in summer 2019.

Waterway monitoring tours 2019

Maritime Danube and Chilia branch – Bystroe



Waterway monitoring and inspection tours are conducted once almost every month with a small vessel, equipped with a single-beam echo-sounder. The boat travels along the axis and the edges of the fairway to check for changes along the entire Ukrainian river stretch.



Fairway relocation and marking activities 2019

In general, on section 0-116 rkm on the Ukrainian river side 34 plastic river luminous buoys are exposed and exploited all year round. On the left coast from rkm 0 to 116, from 44 to 72 miles in the Ruk Solmoniv (0-12 km) and Ivanesht (0-13 km) 369 coastal marks are set.

In 2019 no changes were made to the fairway trajectory.
The operation of the following navigation equipment was maintained on a regular basis:

shore-based facilities in total	369 pcs
luminous	54 pcs
informational	144 pcs
km and m	171 pcs
light buoys in total	34 pcs

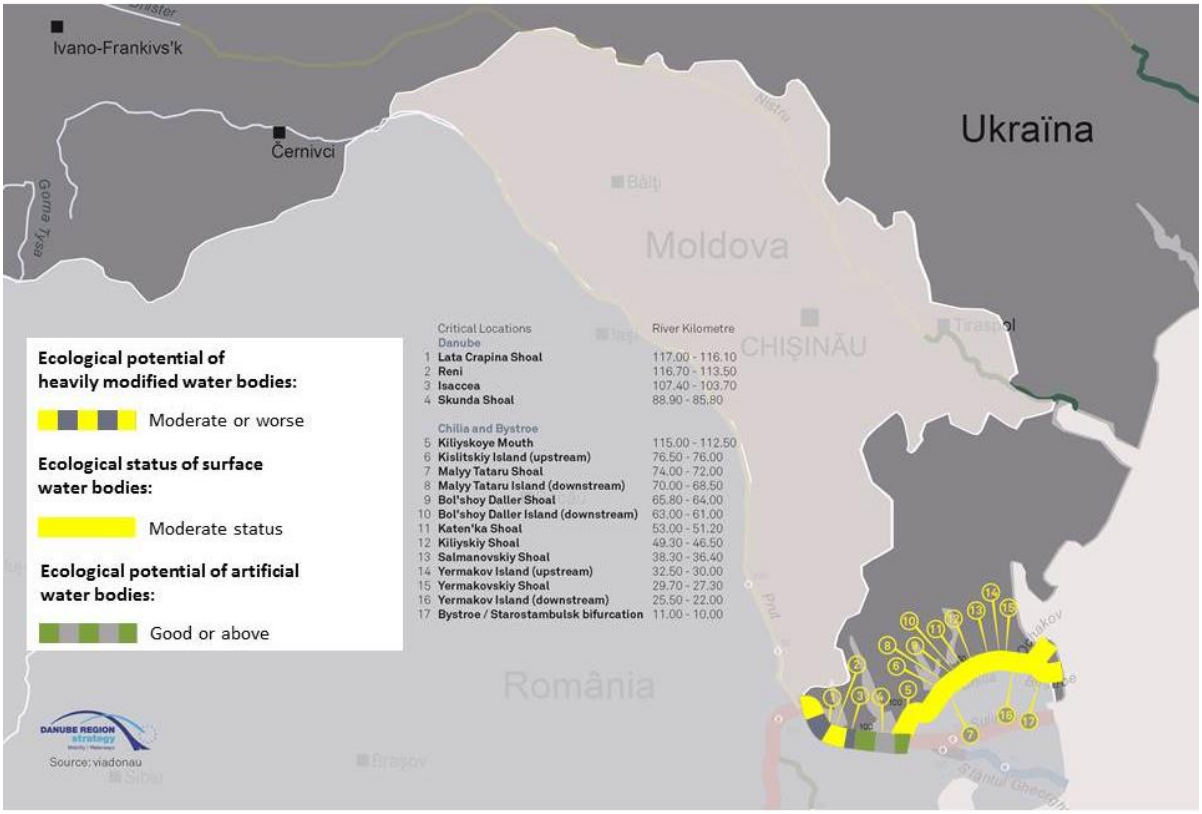
Dredging activities 2019

At the river part of the Danube-Black Sea Deep-Water Navigation Route dredging works weren't conducted since 2005.
In 2019, a temporary suspension of dredging works was arranged on this waterway for the period June – September 2019. During this period, works were provided for analysis of the impact on the environment (at least in a transboundary context) which follow from the already implemented works related to the project stage 1 and stage 2.
By the end of November 2019, maintenance dredging works at the maritime approach channel were conducted by means of the trailing suction hopper dredger "Ingulskiy". Information on the dredging in 2018 and 2019 is shown below:

Year	Quarter	Volume of soil, m3	Year	Quarter	Volume of soil, m3
2018	I	48624,4	2019	I	96822,0
	II	72901,8		II	251449,27
	III	109993,2		III	0
	IV	90893,4		IV	37552
Total during 2018		322412,8	Total during 2019		385823,27

14.5 UA | Summary of current ecological status and environmental impacts

The following map displays the ecological status and ecological potential of the Ukranian Danube – according to the Danube River Basin Management Plan/Update 2015 – against the background of the critical navigation locations in Ukraine.



Ecological status and ecological potential of surface water bodies
(Source: DRBM Plan – Update 2015)

No information available.

Measures to improve environmental conditions

No information available.

Navigation maintenance measures and environmental impacts

To resolve the issues related to the implementation of the Espoo Convention provisions, Resolution of the Cabinet of Ministers of Ukraine (02.04.2008 №295) formed Interagency Coordinating Council for implementation the Espoo Convention in Ukraine which is headed by the Minister of Ecology and Natural Resources of Ukraine. Decision-making on the future implementation of the project to creating the DNR Danube - Black Sea (full development or of the first phase of the project) is exclusively within the competence of the Government of Ukraine.

SE "USPA" commissioned the research institution "Ukrainian Scientific Research Institute of Ecological Problems" of the Ministry of Energy and Environmental Protection of Ukraine with a research "Analysis of the impact on the environment of the Danube River Delta which follows from the already implemented work related to the project *Danube-Black Sea Deep-Water Navigation Channel on the Ukrainian section of the Delta (stage 1 and on full deployment)* with the development of compensatory measures and measures to mitigate the likely impact based on the materials of integrated environmental monitoring 2004-2017 and the results of the field monitoring observations (at least in a transboundary context".
Within this research a Plan for compensatory and mitigation measures was elaborated.

14.6 UA | Budget status February 2020

Operational expenditures 2019 and budget needs 2020

Need areas	Operational expenditures 2019	Required operational budget 2020	Secured operational budget 2020	Remaining financing gap 2020
Minimum fairway parameters (width/depth)	No update available.[20]			
Surveying of the riverbed				
Water level gauges				
Marking of the fairway				
Availability of locks / lock chambers				
Information on water levels and forecasts				
Information on fairway depths				
Information on marking plans				
Meteorological information				
Other needs				
Sum (Euro)				

14.7 UA | Outlook: planned actions, milestones and funding sources

No updated information available.

[20] Budget data might be provided at a later stage. In this case an updated version of this National Action Plan update will be made available on the following websites: http://www.fairwaydanube.eu/ and www.danube-navigation.eu.