

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

## **NATIONAL ACTION PLANS**

**UPDATE MAY 2017**

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

Version 10/09/2018



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Version 10/09/2018



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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. It is 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 fifth update of the Master Plan and comprises an overview of the fairway situation during 2016. Furthermore, taken and planned measures as well as the resulting budget needs and financing gaps 2017 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 significantly better in 2016 than in 2015.** After January, which showed fairway depths below 2.5m on most critical sections as a continuation of the bad winter in 2015, minimum fairway depths were exceeded along the Danube due to good hydrological conditions. In September though, water levels dropped on the **Lower Danube** and fairway depths of 2.5m could not be reached for almost two months at some critical sections. On the **Upper and the Central Danube** the hydrological and fairway conditions were mostly favourable until October, when water levels slowly started to decline. In combination with insufficient maintenance works or required capital interventions this led to unfavourable fairway conditions in winter and several days with fairway depths below the 2.5m threshold.

**On a large part of the 20 main critical sections along the Danube, the recommended fairway depth of 2.5m<sup>1</sup> at Low Navigable Water Level<sup>2</sup> was not achieved throughout the whole year.** However, in some sections, fairway depths just slightly below the 2.5m threshold were provided.

Considering the good hydrological conditions along the entire Danube in 2016, significant efforts have to be made as soon as possible to achieve better fairway conditions in 2017. This particularly entails **more targeted maintenance and rehabilitation measures** and **securing sufficient national budgets**.

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<sup>1</sup> In some river sections however - in Germany, Slovakia and Hungary - this target is not valid, as it is not achievable by stream regulation and maintenance measures due to physical preconditions. Specific target values apply, e.g. 2.0m in Germany between Straubing and Vilshofen.

<sup>2</sup> 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.

## Executive summary

The operational expenditures in 2016 amount to approx. 26 856 400 Euro and the **operational budget needs for 2017 amount to approx. 29 173 450 Euro**. In Hungary and Bulgaria this need is not yet entirely secured.

**Considerable investments** have been initiated in the last years since launching the Master Plan. The amount varies, but **at least a third of the national needs** declared in 2014 have been satisfied in most countries, which participate in the FAIRway Danube project. 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 Masterplan. 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 are sometimes not sufficient.

Overall budget sums for the Danube region cannot be provided. Not all Danube Fairway Master Plan counties participate in the FAIRway Danube project and thus, not all budget data is available.

## 2 Introduction

### *Purpose of action plans*

In their conclusions of 3<sup>rd</sup> 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 30<sup>th</sup> 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 benefit for the maintenance and rehabilitation process of the Danube and its navigable tributaries. The aim is to standardise and simplify the data gathering process as much as possible, the use of electronic support tools is envisaged.

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 which requires a biannual update (October and May) for additional steering purposes 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 once a year (May). In the **October update**, building on the status report as regards critical locations, hydrological conditions and rehabilitation and maintenance activities undertaken in the course of the year, the focus is laid on the **resulting budget needs** and – if already available – information on **the allocated budget for the coming calendar year**. This shall support effective planning of activities and financing.

The **May update** shall provide a possibility to fine-tune the budget and activity planning for the ongoing year. Furthermore, data on the **status of critical locations, hydrological conditions and implemented measures for the full preceding year** will be provided.

The **summarising tables on cost and budget** 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 fourth National Action Plan of October 2016 for the Fairway Rehabilitation and Maintenance Master Plan for the Danube and its Navigable Tributaries. It is the fourth 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.

## Introduction

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	2,249,90	32,50	DE / DE	Deggendorf – Vilshofen (backwater Kachlet)
2,014.00	2,013.50	0,50	AT / AT	Weißkirchen
2,010.20	2,008.90	1,30	AT / AT	Dürnstein
1,888.40	1,887.60	0,80	AT / AT	Treuschütt
1,884.70	1,883.50	1,20	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



## Introduction

As regards the reporting of the status of critical locations or sections in the national chapters, the visual illustration has been modified to include the water level information for the respective month. The recommended **target** of the Fairway Rehabilitation and Maintenance Masterplan is to provide a **fairway depth exceeding 2.5 m<sup>3</sup> at least on as many days per year as show actual water levels equal to or above the statistical Low Navigable Water Level (LNWL)<sup>4</sup>**. 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.

Another change to the current update of the national action plans concerns 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.

### ***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<sup>5</sup> 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<sup>6</sup>, 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 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

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<sup>3</sup> Or the respective target value relevant for the special section (e.g. 2.0 m in Straubing-Vilshofen on the German Danube)

<sup>4</sup> 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

<sup>5</sup> <http://www.newada-duo.eu/>

<sup>6</sup> 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-Vilshofen, 2.0m are set as target value by the German waterway administration

## Introduction

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.

- 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 Danube). 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 (CEMT class 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 cost 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.

### ***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



## Introduction

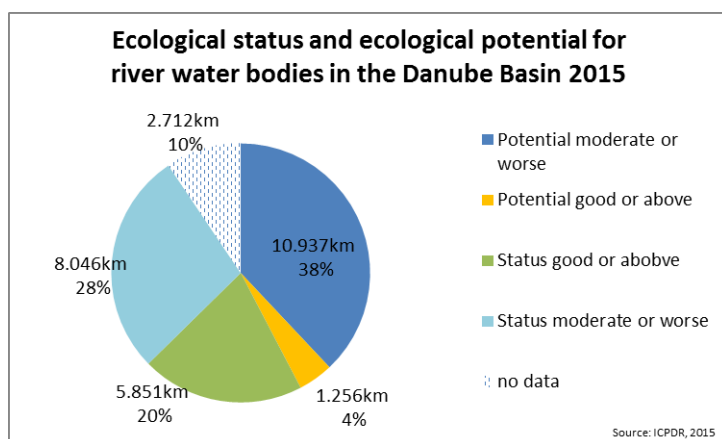
Strategic Environmental Impact Assessment Directive (2001/42/EC), the Flood Risk Management Directive (2007/60/EC) and the Public Participation Directive (2003/35/EC).

### *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<sup>7</sup>. 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.”

<sup>7</sup> <http://www.icpdr.org/main/activities-projects/river-basin-management>

## Introduction

According to a decision of the European Court of Justice in 2015<sup>8</sup> as regards a dredging project on the river Weser, the following two main conclusions as regards application of the WFD in practice can be derived and may also serve as guidelines for practical implementation of maintenance and rehabilitation measures on the Danube and its navigable tributaries<sup>9</sup>:

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<sup>10</sup>. 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.

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<sup>8</sup> 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)

<sup>9</sup> For more information, see the Weser press release: <http://curia.europa.eu/jcms/upload/docs/application/pdf/2015-07/cp150074en.pdf>

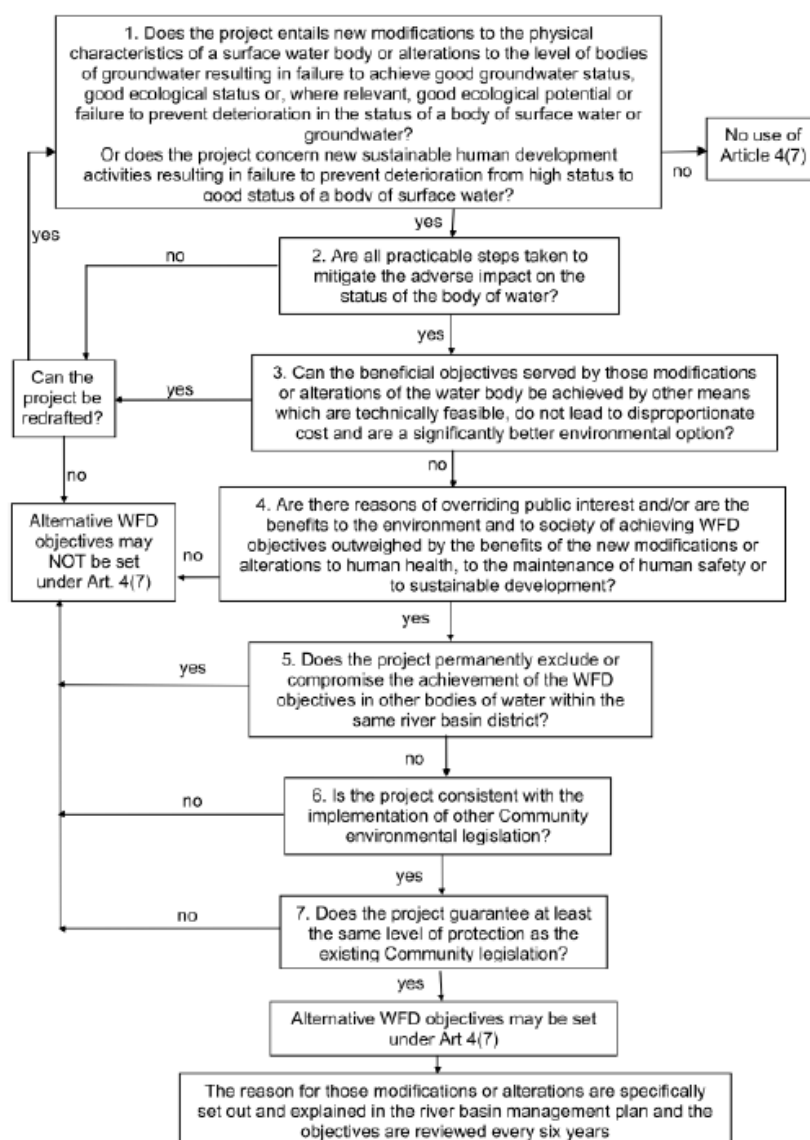
<sup>10</sup> See, e.g., „Leitfaden Umweltbelange bei der Unterhaltung von Bundeswasserstraßen“, Bundesminister für Verkehr und digitale Infrastruktur, Bundesanstalt für Gewässerkunde (Hrsg.), Bonn, 2015, p.12

## Introduction

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<sup>11</sup>.

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<sup>12</sup> provides an example for an iterative approach regarding application of Art 4(7):



<sup>11</sup> 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

<sup>12</sup> 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<sup>13</sup>. 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<sup>14</sup>, 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.

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<sup>13</sup> 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

<sup>14</sup> [http://ec.europa.eu/environment/nature/natura2000/management/docs/IWT\\_BHD\\_Guidelines.pdf](http://ec.europa.eu/environment/nature/natura2000/management/docs/IWT_BHD_Guidelines.pdf)

## Introduction

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 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), ARVD - Waterborne Transport Development Agency (Slovakia), OVF - Országos Vizügyi Főigazgatóság together with NDA - Nemezeti Infrastruktúra Fejlesztő Zrt. (Hungary), AVP - Agencija za vodne putove (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 coordinates the updates of the national action plans of the countries participating in the project. The remaining countries (Germany, Bosnia and Herzegovina, Serbia, Moldova and Ukraine) were 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.



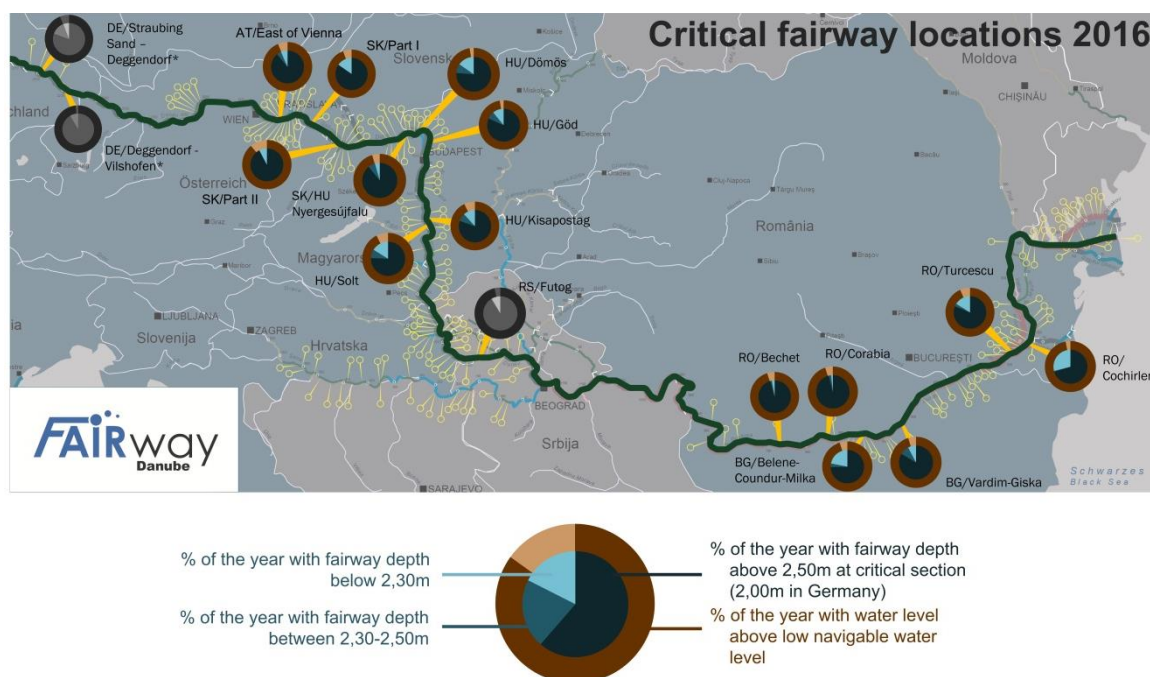
## 3 Synthesis and conclusions

### 3.1 Fairway conditions

Fairway conditions were significantly better in 2016 than in 2015. After January, which showed fairway depths below 2.5m on most critical sections as a continuation of the bad winter in 2015, minimum fairway depths were exceeded along the Danube due to good hydrological conditions. In September though, water levels dropped on the **Lower Danube**. The most critical location was Cochirleni, where the minimum fairway depth was not achieved in July, August and September. On the **Upper and the Central Danube** the hydrological and fairway conditions were mostly favourable until October, when water levels slowly started to decline. In combination with insufficient maintenance works or required capital interventions this led to unfavourable fairway conditions in winter and several days with fairway depths below the 2.5m threshold.

The figure below provides a **status overview of the main critical locations on the Danube in 2016**. Locations are only displayed if they showed a critical status in 2016. 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.

## Synthesis and conclusions

The recommended **target** of the Fairway Rehabilitation and Maintenance Masterplan is to provide a **fairway depth exceeding 2.5 m<sup>15</sup>** at least on as many days per year as **show actual water levels equal to or above the statistical Low Navigable Water Level (LNWL)<sup>16</sup>**. *This situation would correspond to an equal share of the dark blue and the dark brown circle in the figure above.*

**Key facts displayed in the “Critical fairway locations 2016” figure** on the previous page:

The **recommended Level of Service of 2.5m fairway depth<sup>17</sup>** at Low Navigable Water Level could **not be reached on the majority of the main critical locations** throughout the entire year (inner dark blue circle does not reach the level of the outer dark brown circle). Considering the good hydrological conditions during 2016, the unfavourable situation in the second half of the year is a result of insufficient maintenance works or required capital interventions.

In **some sections, fairway depths just slightly below 2.5m could be provided for some days** (middle blue colour in the inner circle).

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 taken into account**, 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 2.5m. In addition, supporting measures like providing high quality information on the morphology of the critical section to skippers can improve navigability significantly.

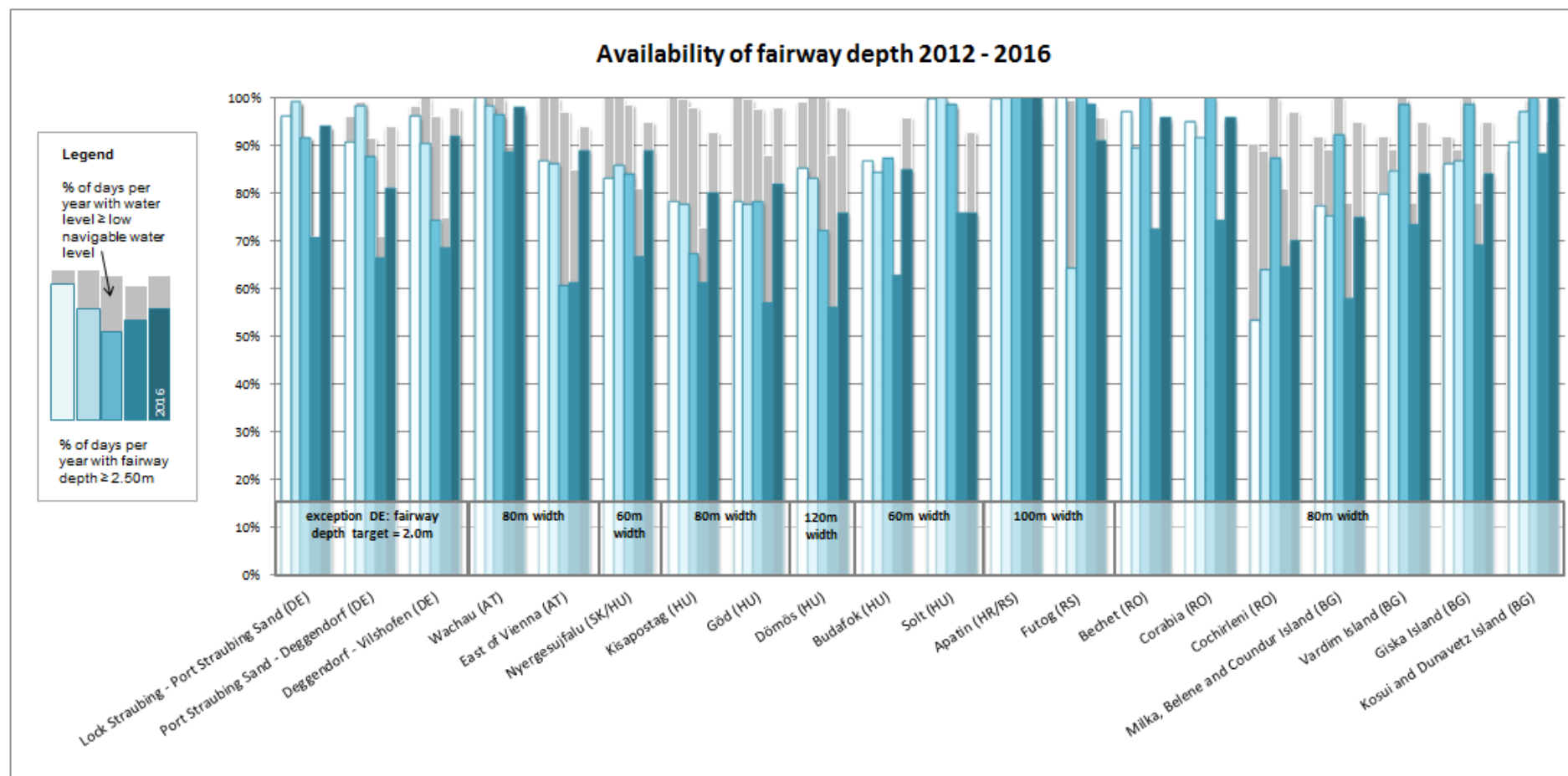
In the next figure, the **fairway availability of critical locations in 2016 is compared with the previous years**. Locations are displayed if they had been identified as critical by waterway users in 2014 and if data for 2012–2016 was available. Analogous to the first figure, the targeted availability of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level would correspond to an *equal height of the blue (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.

<sup>15</sup> Or the respective target value relevant for the special section (e.g. 2.0 m in Straubing-Vilshofen on the German Danube)

<sup>16</sup> 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

## Synthesis and conclusions





**Key facts illustrated in the “Fairway availability 2012–2016” figure** on the previous 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: Straubing–Vilshofen (DE), the section East of Vienna, the Hungarian Danube, the area around Milka/Belene/Coundur (BG) and Cochirleni (RO). 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 16 days East of Vienna, on 24 days at Nyergesújfalu, on 3 days in Cochirleni and on 13 days in the Belene/Milka/Coundur area.

### 3.2 Expenditures and budgets for maintenance and rehabilitation

Considering the good hydrological conditions in 2016, **more targeted maintenance and rehabilitation measures and sufficient respective budget could have significantly contributed to the achievement of the recommended Levels of Service** in some critical sections.

#### Operational costs

**In order to achieve better fairway conditions and to avoid critical situations in the year 2017, significant efforts have to be made as soon as possible, including securing the necessary national operational budgets.**

The operational expenditures for 2016 and the required operational budgets for 2017 are at a **comparable size** in most of the countries besides Bulgaria and Hungary. **Major operational budget gaps** also appear in **Hungary** (about 450 000 EUR) and **Bulgaria** (about 3.4 mln EUR). Bulgarian state budget needs are about ten times the national expenditures for 2016; Hungary's need is about twice the expenditures for 2016. For the fields of work that show the budget gaps, please study the country sections.

The operational expenditures in 2016 amount to approx. 26 856 400 Euro and the **operational budget needs for 2017 amount to approx. 29 173 450 Euro.**

## Synthesis and conclusions

	operational expenditures 2016	required operational budget 2017	secured operational budget 2017	remaining financing gap 2017
DE	1 320 084.00*	150 000.00*	150 000.00	-
AT	7 629 278.00	6 110 221.00	6 110 221.00	-
SK	2 415 060.23	2 700 000.00	2 700 000.00	-
HU**	783 000.00	1 156 000.00	703 500.00	452 500.00
HR	489 000.00	506 000.00	506 000.00	-
BA	****			
RO	13 889 980.00 (8 807 529.00 for locks)	14 548 726.00 (8 810 000.00 for locks)	14 548 726.00*** (8 810 000.00 for locks)	-
BG	330 000.00	4 002 501.00	680 000.00	3 396 501.00
UA	****			

\* Due to in-house efforts a complete assignment of tangible costs is not possible. The sum only comprises all definable costs. Therefore, actual costs are in fact substantially larger.

\*\* estimated in October 2016      \*\*\* The ACN budget is pending approval by the Finance Ministry

\*\*\*\* 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](http://www.danube-navigation.eu).

## Investment costs

**Considerable investments** have been initiated in the last years since the launch of the Master Plan. The amount varies, but **at least a third of the national needs declared in 2014 have been satisfied in most countries, which participate in the FAIRway Danube project.** 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)	thereof EU co-financed	remaining financing gap (% of required investment costs)
A	-	-	-	-
SK	8 080 000	2 010 000	-	75%
HU	4 333 700	22 181 397	18 854 187	0,9%
HR	4 588 000	2 199 000	77%	61,5%
RO	41 058 000 (thereof locks: 400 000)	21 327 711 (thereof locks: 200 000)	75% (locks: 85%)	48% (locks: 50%)
BG	21 132 000	8 947 067	85%	62%

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 are sometimes not sufficient.

Overall budget sums for the Danube region cannot be provided. Not all Danube Fairway Master Plan counties participate in the FAIRway Danube project and thus, not all budget data is available.

### 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 –2016

The **recommended Level of Service of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level** would correspond to an equal height of the blue (availability of 2.5m fairway depth) and the white columns framed in blue (water level above Low Navigable Water Level) in the figures below.

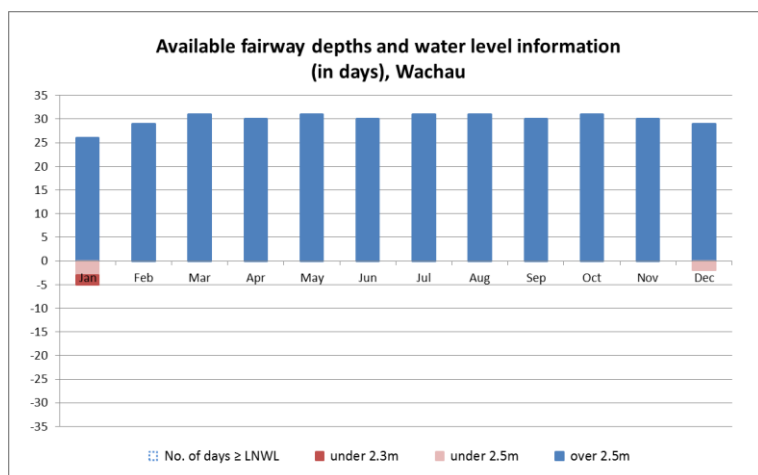
It is also important to take the depth classes close to 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Therefore, the **number of days with 2.4 or 2.3m fairway depth** is displayed additionally.

*Number of days with fairway depths  $\geq 2.50\text{m}$  on main critical locations for a fairway width according to Level of Service 1 (40 - 80m)*

Critical location	2012	2013	2014	2015	2016
Wachau	366	359	352	323	359
East of Vienna	318	315	222	224	326

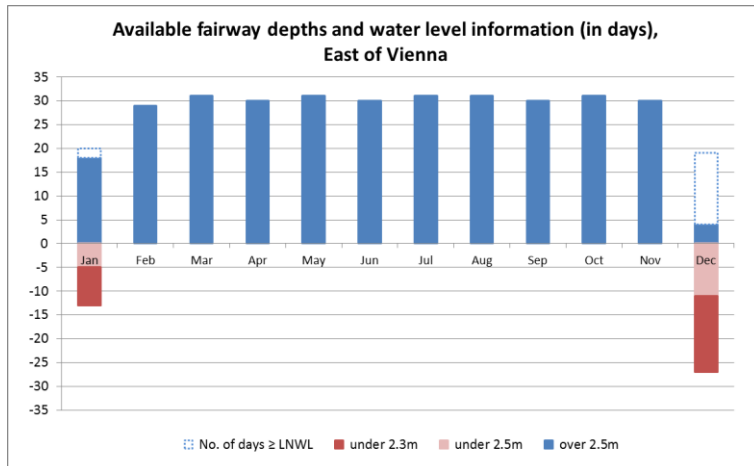
*Number of days with water level  $\geq$  LNWL on main critical locations*

Critical location	Reference gauges	2012	2013	2014	2015	2016
Wachau	Kienstock + Dürnstein	366	365	365	330	355
East of Vienna	Wildungsmauer + Thebenerstraßl	366	365	355	310	343

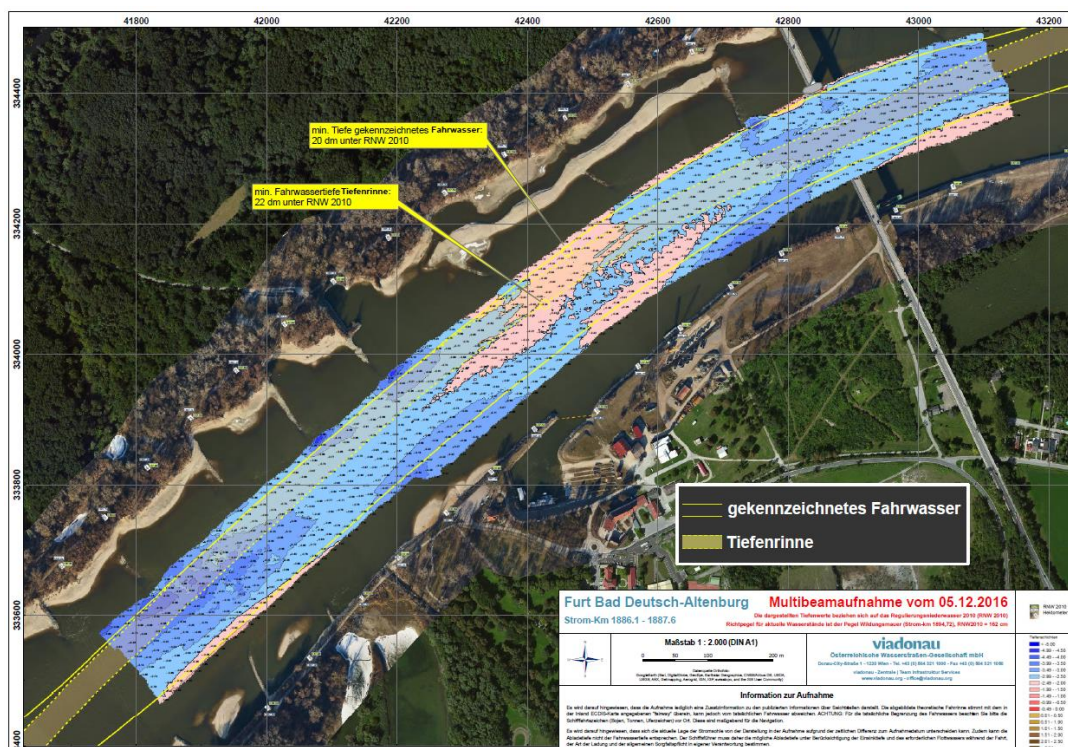


## Action Plan: Austria

In 2016 the Austrian Danube saw good conditions in the critical section Wachau as well as the critical section East of Vienna. Only in January and December fairway depths were below 2.5 metres on several days. In the critical section East of Vienna the hydrological conditions would have allowed for several more days with fairway depths according to the recommended Level of Service. The gap between the available water levels and the actual fairway depths shows a further need for maintenance or rehabilitation activities.



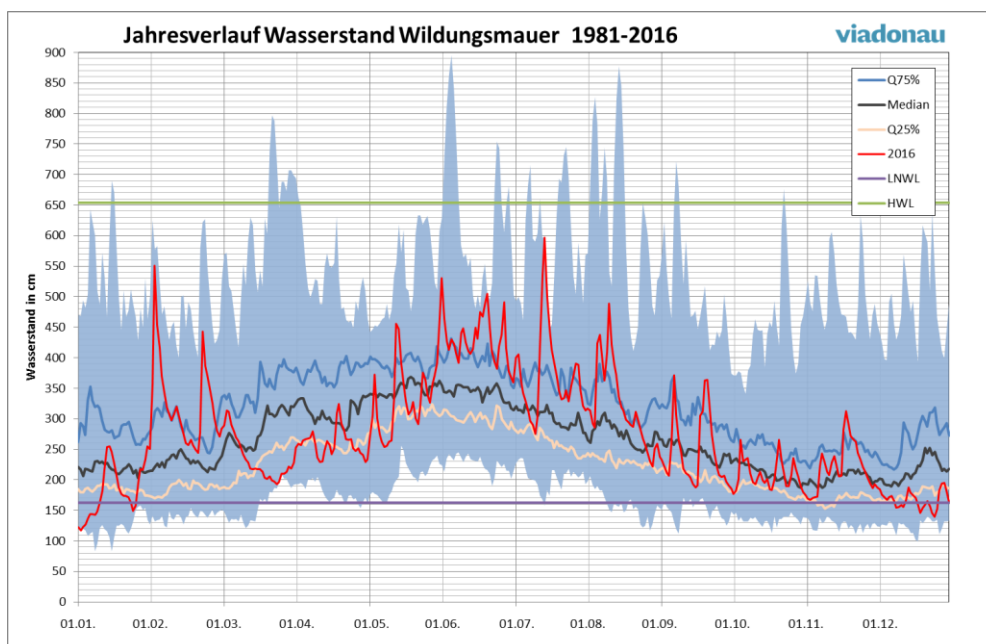
Especially the ford Bad Deutsch-Altenburg was responsible for the unfavourable situation in December. The nautical difficulties relate to a lateral sedimentation in the magnitude of approx. three decimetres. Due to the high quality surveying of viadonau, this section was therefore classified as „not reaching the target“, but the corresponding problems for inland navigation were not severe.





## 4.2 AT | Hydrological conditions at main critical locations 2016

### Water level gauge East of Vienna 1981- 2016



In the year 2016, good conditions as regards the water levels were encountered in the free-flowing and critical section east of Vienna. Water level gauges measured values above the median value in a considerable part of the year, especially during the summer months.

## 4.3 AT | Key issues and related activities 2016

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

	Key issues	Need for action	Activities performed 2016
AT01	Maintaining water level measurements during extreme weather events	Establishment of back-up energy supply systems at automatic gauging stations	Equipping most important water gauging stations with high-capacity batteries in combination with solar panels to keep gauges running as stand-alone systems (finalised).
AT02	Maintaining technical equipment of gauging stations to avoid data errors and gaps	Staff for weekly or even daily on-site checks	Inventory of existing gauging stations and classification regarding priority, identification of human and financial resources.
AT03	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	Set up of multi-annual framework contract for dredging services with contractors (in force since August 2015).

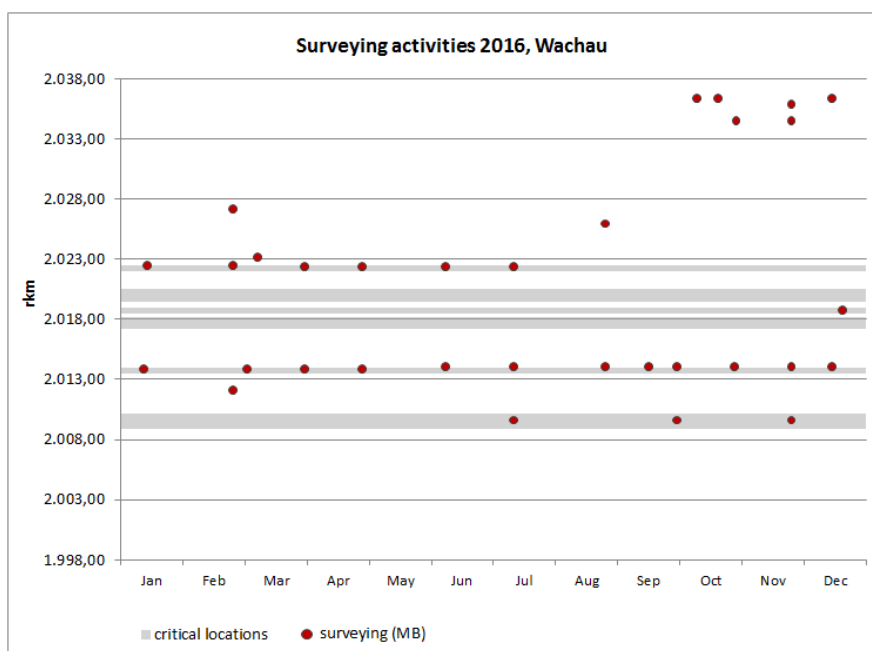
AT04	Limited fairway depth in shallow sections to the East of Vienna	Optimisation of the shallow section at Petronell - Witzelsdorf  Optimisation and readjustment of shallow section Bad Deutsch-Altenburg (planning and implementation of respective river engineering measures).	Completed in October 2015.  <i>The shallow section Bad Deutsch-Altenburg has been optimised. The development of the critical section is being monitored closely.</i>
AT05	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	<i>Designation and display of "deep navigation channel" within the existing fairway and integration in the published maps (finalised).</i>

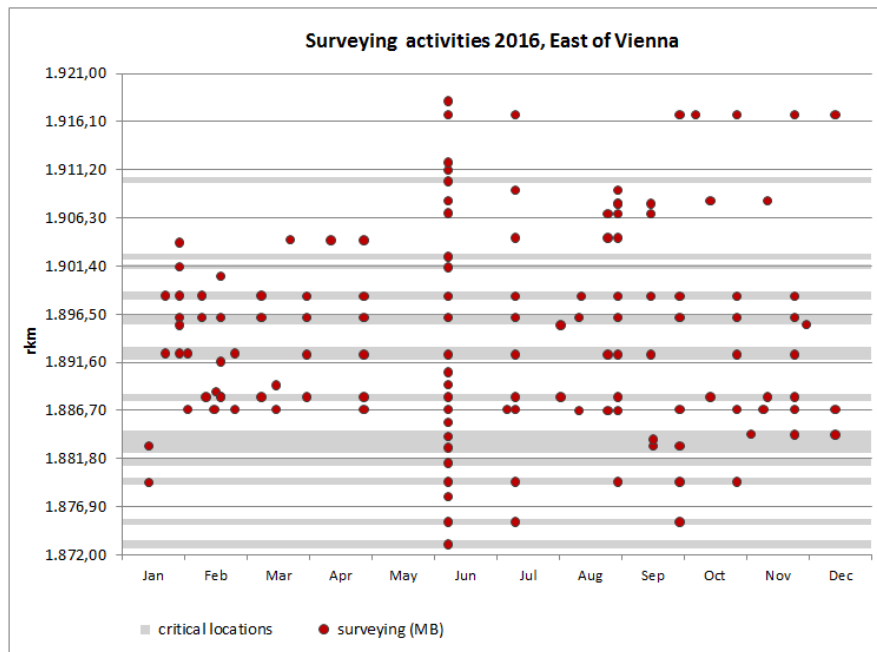
#### 4.4 AT | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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 2016**

During 2016, hydrographic surveys were carried out according to plan.

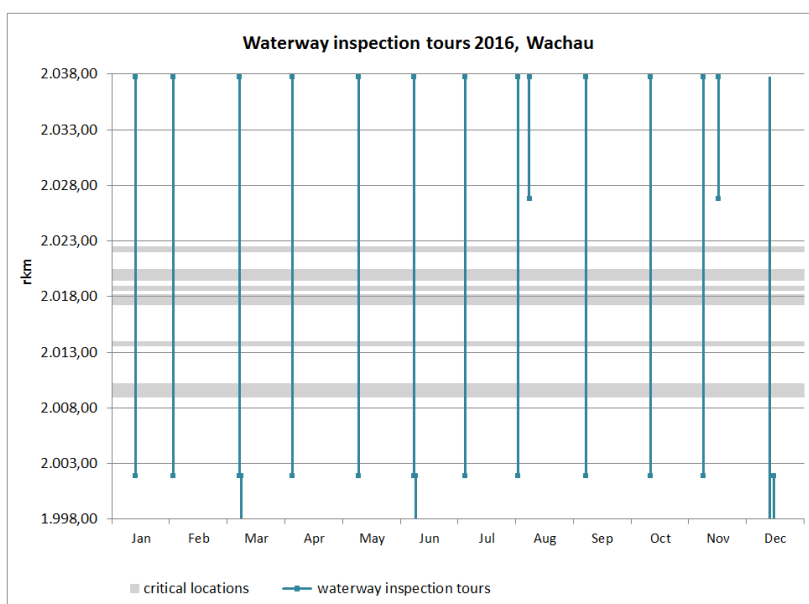




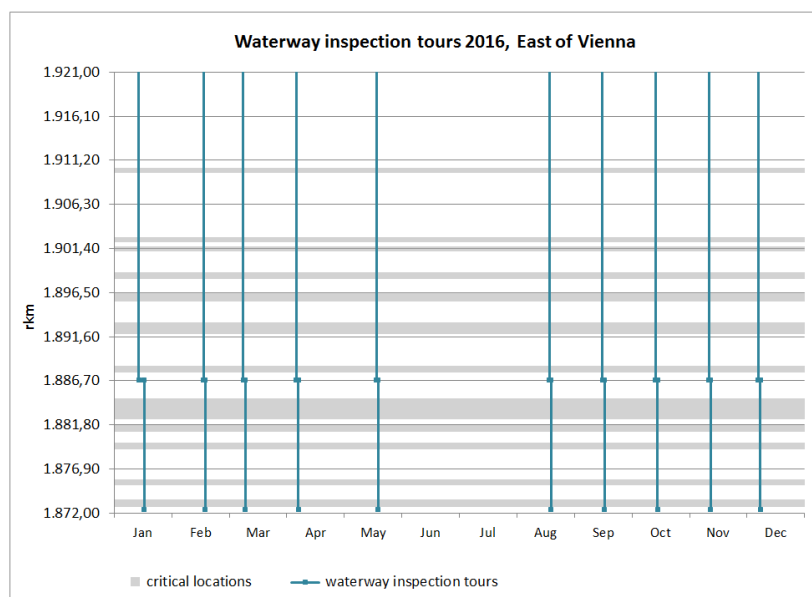
In the section Wachau only the most critical location Weißenkirchen (rkm 2013.50 – 2014) was surveyed monthly. In the Danube section east of Vienna the most critical locations Regelsbrunn, Rote Werd, Petronell-Witzelsdorf and Treuschütt were surveyed monthly. As usual, a whole series of surveys was conducted in June prior to dredging activities in the months before the low water season.

### Waterway monitoring tours 2016

Waterway monitoring and inspection tours serve the purpose of quick checks of the fairway and the riverbanks. The tours are conducted solely in longitudinal direction using small vessels, equipped with an echo-sounder.







### Fairway relocation and marking activities 2016

Due to the very limited cross-section of the Austrian section of the Danube, fairway relocation is usually no significant option for fairway maintenance at viadonau. In 2016, no significant relocation activities took place on the Austrian stretch of the Danube.

Fairway marking and relocation tasks lie within the field of competence of the Austrian Navigation Authority ("Oberste Schifffahrtsbehörde - OSB"). In 2016 and 2017, these activities (and modernisation of the system) are being transferred to viadonau. As of 2018, viadonau will implement fairway marking and relocation on the Austrian Danube.

### Dredging activities 2016

Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m <sup>3</sup>	Permits (see next table)
	from river-km	to river-km	from river-km	to river-km						
Wendeplatz Theben	1879,8	1879,1	1884,1	1.883,50, right	12.01.2016	20.01.2016	Gravel	Dumping	7274,2	1
Furt Rote Werd I	1896,5	1895,5	1901,8	1.901,00, left	26.01.2016	01.02.2016	Gravel	Dumping	11229	1
Furt Bad Deutsch-Altenburg	1886,9	1886,1	1888,6	1.888,25, right	01.02.2016	17.02.2016	Gravel	Dumping	17317	1
Furt Petronell-Witzelsdorf	1893,4	1891,8	1895,7	1.895,20, right	08.02.2016	10.02.2016	Gravel	Dumping	6275,9	1
Furt Regelsbrunn I	1898,8	1898	1904,6	1.903,10, right	10.02.2016	17.02.2016	Gravel	Dumping	11857	1
Furt Rote Werd II	1896,5	1895,5	1901,8	1.901,00, left	17.02.2016	02.03.2016	Gravel	Dumping	15136	1
Furt Treuschütt I	1888,4	1887,6	1895,8	1.895,30, right	17.02.2016	03.03.2016	Gravel	Dumping	12890	1
Furt Rote Werd III	1896,5	1895,5	1899,6	1.899,10, left	07.03.2016	09.03.2016	Gravel	Dumping	6035,8	1

## Action Plan: Austria

Furt Treuschütt II	1888,4	1887,6	1895,8	1.895,30, right	08.03.2016	11.03.2016	Gravel	Dumping	4603	1
Furt Regelsbrunn II	1898,8	1898	1904,6	1.903,10, right	09.03.2016	10.03.2016	Gravel	Dumping	4965,8	1
Furt Bad Deutsch-Altenburg II	1886,9	1886,1	1889,8	1.889,00, right	16.03.2016	21.03.2016	Gravel	Dumping	8688,9	1
Furt Bad Deutsch-Altenburg	1887,6	1886,1	1904,9	1903,8, left	01.08.2016	19.08.2016	Gravel	Dumping	45374	1
Furt Rote Werd	1896,5	1895,5	1909,9	1908,5, right	04.08.2016	02.09.2016	Gravel	Dumping	34280	1
Furt Petronell-Witzelsdorf	1893,2	1891,8	1907,1	1906,5, right	31.08.2016	23.09.2016	Gravel	Dumping	19813	1
Furt Regelsbrunn	1899	1897,8	1908,1	1907,5, middle/right	02.09.2016	19.09.2016	Gravel	Dumping	28698	1
Furt Käsmacher	1875,7	1895,1	1883,4	1882,9, right	26.09.2016	05.10.2016	Gravel	Dumping	10200	1
Furt Treuschütt	1888,6	1887,6	1908,2	1907,4, middle/right	28.09.2016	19.11.2016	Gravel	Dumping	27592	1
Furt Weißenkirchen	2014	2013,6	2026,5 li	2025,7 left	08.09.2016	23.09.2016	Gravel	River bank structurig	7872,8	2
Furt Haufenrand Hainburg	1884,8	1884,3	1895,7	1895,2	12.12.2016	18.12.2016	Gravel	Dumping	8500	1

In total, 291.756,46 m<sup>3</sup> were dredged for commercial navigation in 2016.

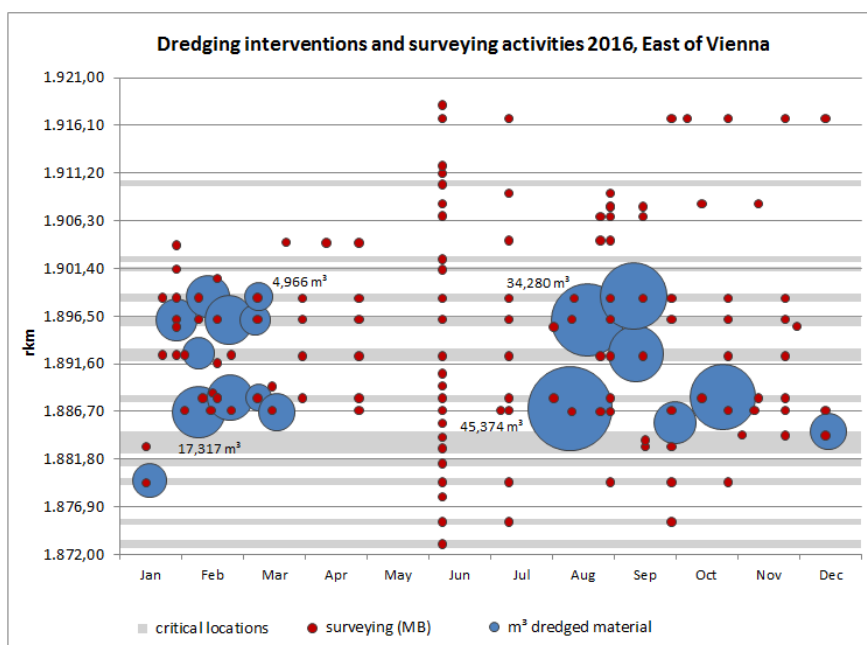
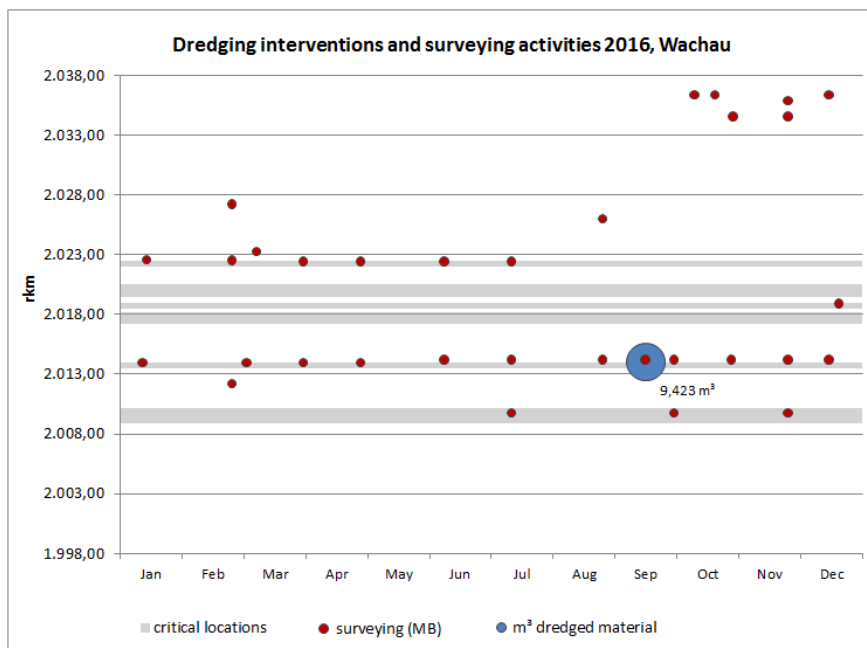
NOTE: The above table only includes maintenance dredging in the main course of the fairway, it does not include various maintenance dredging activities which were also performed in 2016 in port basins or at mooring sites.

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 Schiffsverkehrsverhältnisse 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	<ul style="list-style-type: none"> <li>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</li> <li>After high waters sediment in ford areas has to be removed as fast as possible at a width of 80/100 m</li> <li>As far as possible, ecological aspects shall be accounted for when planning single measures</li> <li>Dredging measures shall be kept to a minimum</li> </ul>
2	LIFE Natur Projekt Wachau, Uferstrukturierung in der Wachau	Administrative District Authority Krems	2033.35	2003.85	31/12/2020	Water Law, Navigation Law, Nature Conservation Law	<ul style="list-style-type: none"> <li>Establishment of ecological construction supervision, drafting annual monitoring reports</li> <li>Consideration of spawning seasons of fish in performance of measures</li> <li>No impediment for navigation must be created by island structuring measures</li> <li>No technical lining is allowed for newly created islands</li> </ul>

## Action Plan: Austria

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.

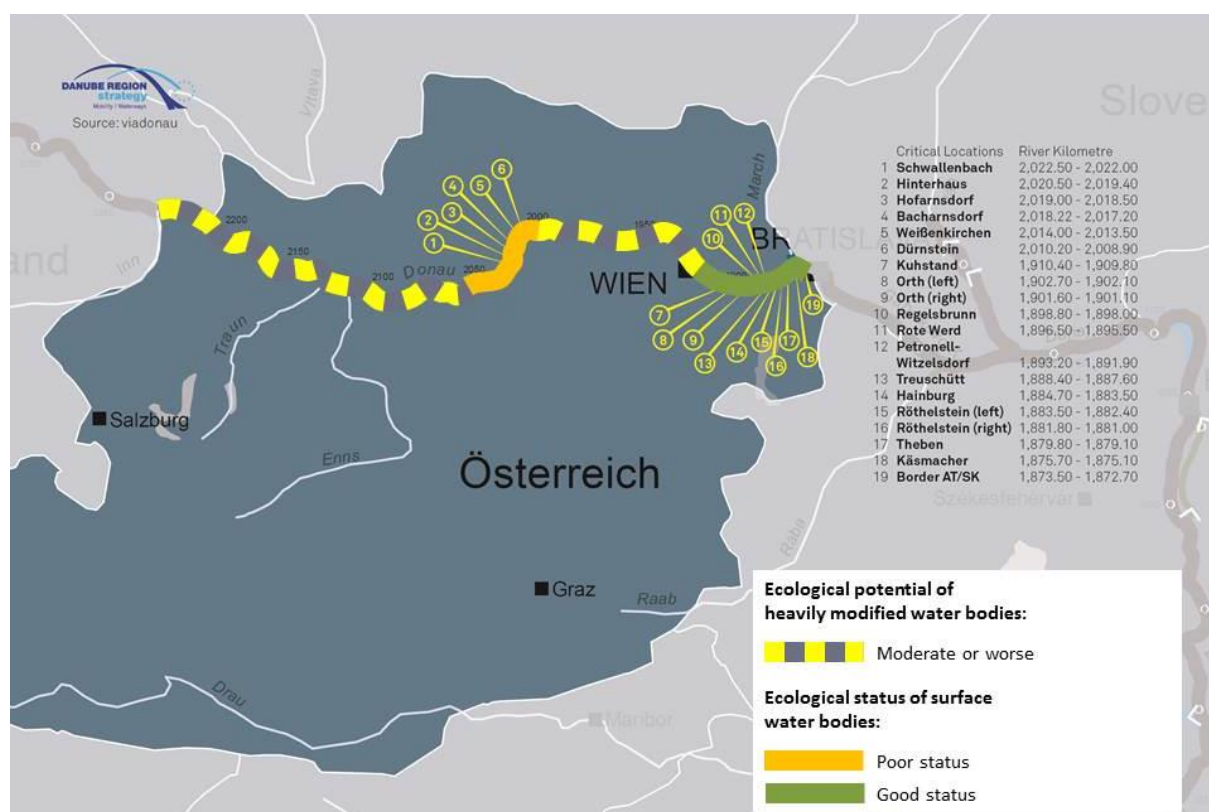
In the critical section Wachau only the critical location Weißenkirchen was dredged in autumn 2016. In the section east of Vienna several smaller dredging works were carried out from January to March, the most critical fords were also dredged from August to December.



#### 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)

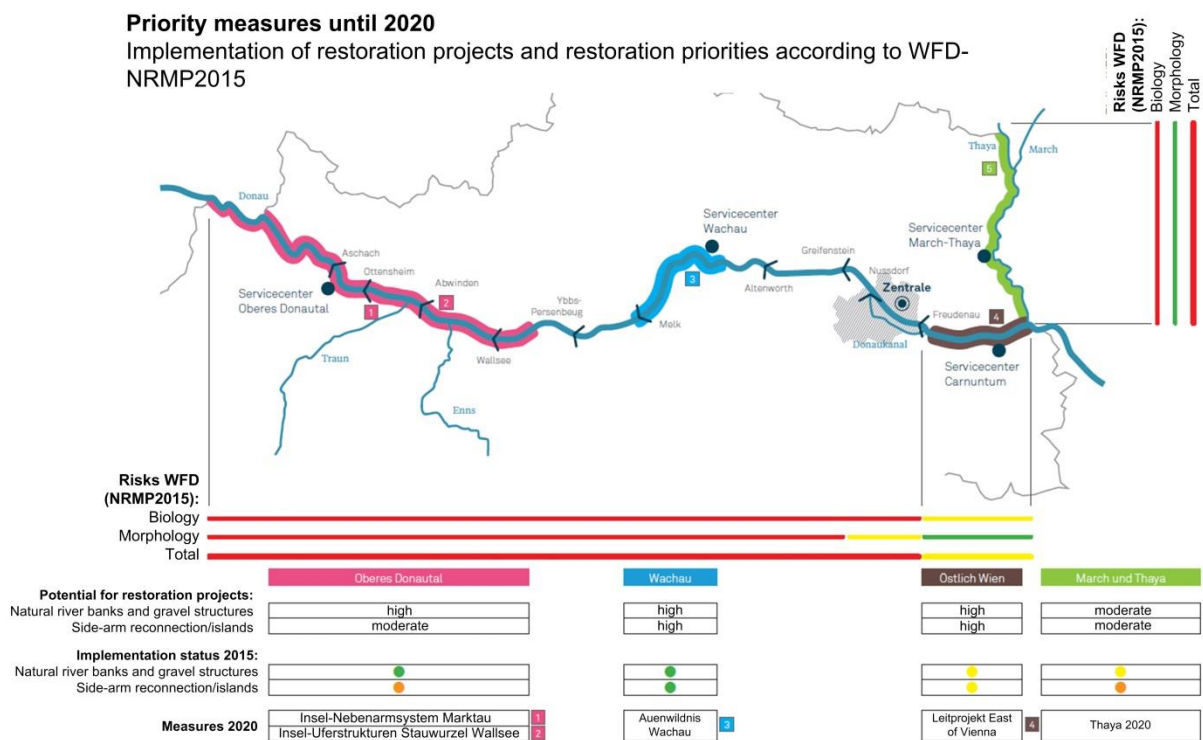
The designation as heavily modified water body of main parts of the Danube is mainly attributed to barrages for hydropower generation within the draft national water management plan for Austria (2015), whereas the attainment of good ecological status is considered to be achieved to the east of Vienna. 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 has already been taken between 2009 and 2015 to improve river continuity, reconnecting wetlands/floodplains and hydrological alterations like

## Action Plan: Austria

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. Further information on the project is provided on the project’s website: <http://www.donau.bmvit.gv.at/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 2016**

### **Investments taken for FRMMP implementation 2014 – 2016**

<b>Need areas</b>	<b>Required additional investment 2014 – 2020 according to FRMMP</b>	<b>Investment costs secured by state or other co-financing</b>	<b>% thereof EU co-financed</b>	<b>Remaining financing gap - Investments according to FRMMP</b>
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
Other needs	0	0	0	0
<b>Sum (Euro)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Operational expenditures for conducted activities 2016 and budget needs 2017**

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	5 503 413	4 221 798	4 221 798	0
Surveying of the riverbed	1 001 185	834 318	834 318	0
Water level gauges	1 124 680	1 054 105	1 054 105	0
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	-	-	-	-
<b>Sum (Euro)</b>	<b>7 629 278</b>	<b>6 110 221</b>	<b>6 110 221</b>	<b>0</b>

**4.7 AT | Outlook: actions, milestones and funding sources**

<b>AT 01: Water level measurements during extreme weather events</b>		
Planned activities:	Ensuring automatic water level measurements, validity checks and real-time data transfer throughout extreme weather events and providing these data to management systems	
Current shortcomings:	Currently, there are no shortcomings identified	
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 2015/2016: Sufficient funding is available through national/company budgets.	
Next steps:	<p>Real-time data transfer (15-minute intervals) has been established for years and the data is integrated into the management systems of viadonau. To ensure proper operation of the gauging stations during extreme weather events, the most important water gauging stations were equipped with high-capacity batteries in combination with solar panels to keep gauges running as stand-alone systems. With this step, data transfer throughout extreme weather events is ensured.</p> <p>Additionally, the most important gauging stations are gradually being equipped with a second, independent gauge as back-up system. The necessary changes will take some time, but they will not affect operation of the existing gauges.</p>	



<b>AT 02: Technical equipment of gauging stations</b>		
Planned activities:	Increase the efficiency in the maintenance of the gauging network system, automatic validity checks with cameras	
Current shortcomings:	Lack of market analysis regarding suitable equipment and software	
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 2015/2016: Sufficient funding is available through national/company budgets.	
Next steps:	Installation of software for automatic checks with cameras.	First tests might be conducted end of 2018. Until then, data is continuously being transferred in real-time.
<b>AT 03: Limited dredging market</b>		
Planned 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: x	Budget availability 2015/2016: Sufficient funding is available through national/company budgets.	
Next steps:	Award of multi-annual framework contract to tenderers for dredging measures in free-flowing sections	in force since August 2015
<b>AT 04: Optimisation of waterway engineering measures Bad-Deutsch-Altenburg</b>		
Planned activities:	Optimisation and readjustment of shallow section Bad Deutsch-Altenburg (planning and implementation of respective river engineering measures).	
Current shortcomings:	Insufficient fairway parameters in shallow section Bad Deutsch-Altenburg during low water periods	



## Action Plan: Austria

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?	No
Possible funding:	National funding	
Next steps:	Implementation of construction measures	31.03.2017
<b>AT 05: Integration of monthly fairway depths data of critical sectors in the IENC</b>		
Planned activities:	Increased update rate of depth data in Inland ECDIS charts; monthly updates of most important shallow section are planned. (further improvement of up to date and accurate information)	
Current shortcomings:	Update rate of depth data of critical sections in Inland ECDIS is currently too low to be of real value to waterway users (twice per year), given that shallow sections are highly dynamic. Topical depth information must nowadays be retrieved from separate information sources (e.g. FIS Portal, shallow section information). Topical data should be integrated in the wide-spread electronic navigational charts according to the Inland ECDIS standards.	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	No negative impacts; positive impacts are that waterway users can exploit available depths better without physical interventions.
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	No
Possible funding:	National funding	
Next steps:	Start of implementation	As of September 2016

## 5 Slovakia

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

### 5.1 SK | Status report on main critical locations including water level information 2012 - 2016

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 1740 - 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 = Nyergesújfalu) which is situated on common SK-HU stretch of the Danube.

#### *Number of days with fairway depths $\geq 2.5\text{m}$ on main critical locations*

The targeted minimum fairway widths are 60 to 100 m in Slovakia and on the Slovakian-Hungarian border section, on the Slovakian-Austrian section; it is 40 to 80 m.

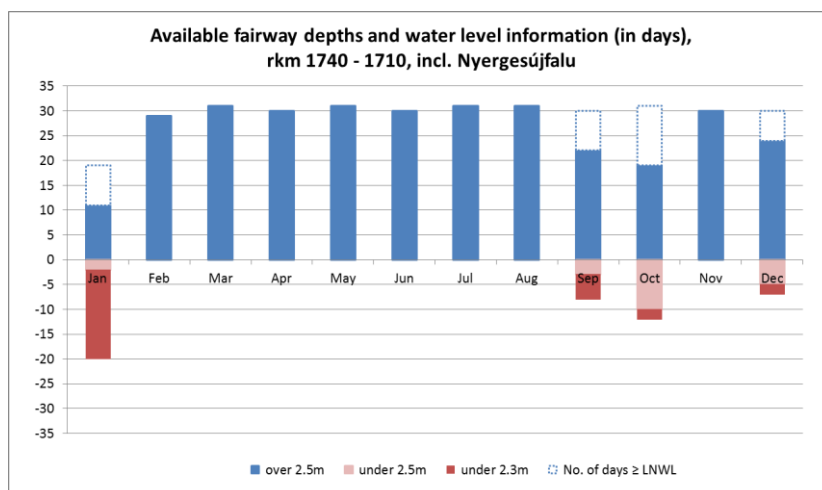
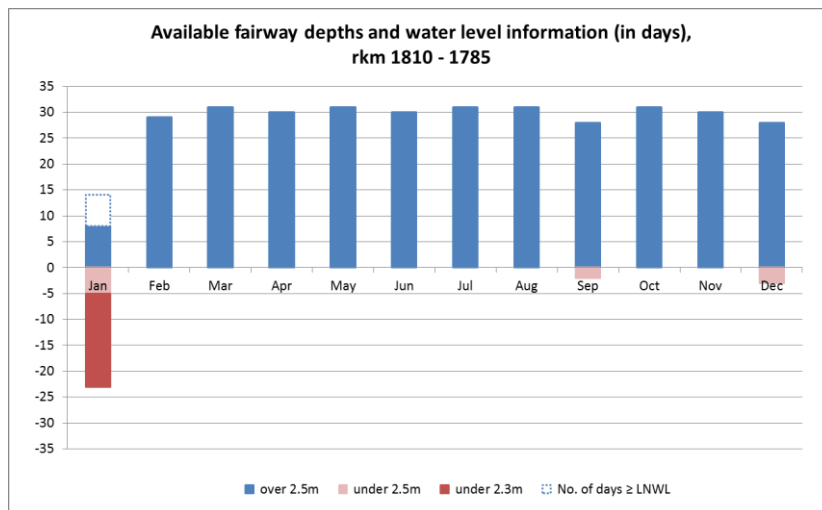
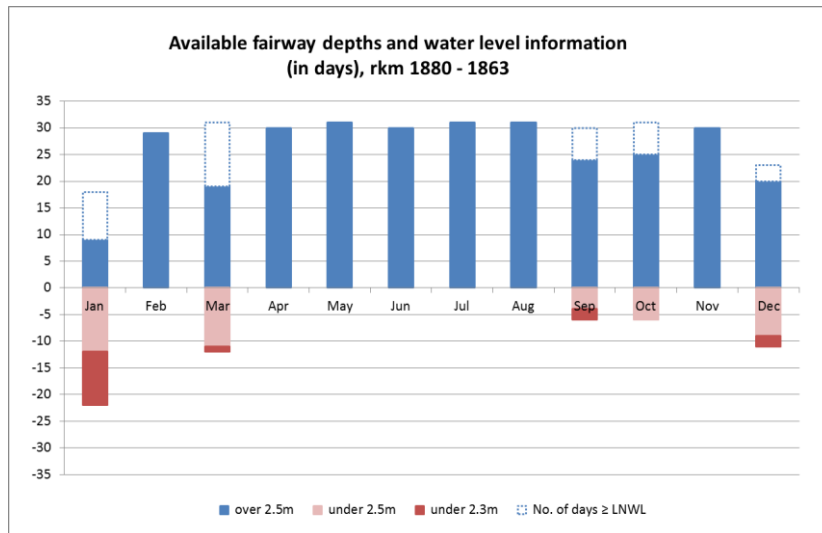
Critical location	2012	2013	2014	2015	2016
part I. (rkm 1880 - 1863)	366	365	365	287	310
part II. (rkm 1810 - 1785)	360	341	359	307	338
part III. (rkm 1740 - 1710) including Nyergesújfalu	303	324	300	223	319

#### *Number of days with water level $\geq \text{LNWL}$ on main critical locations*

Critical location	Reference gauge	2012	2013	2014	2015	2016
part I. (rkm 1880 - 1863)	Devin	366	362	349	294	345
part II. (rkm 1810 - 1785)	Medvedov / Gonyu	366	362	348	259	325
part III. (rkm 1740 - 1710) including Nyergesújfalu	Sturovo / Komarom	319	334	292	288	353

In 2016 for all three measured sections, Part I. (rkm 1880 - 1863) fairway depth of 2.5 m and more were realised on 310 (84,7%) days, for Part II. (rkm 1810 - 1785) on 338 (92,3%) days and for Part III. (rkm 1740 - 1710) on 319 (87,1%) days.

## Action Plan: Slovakia



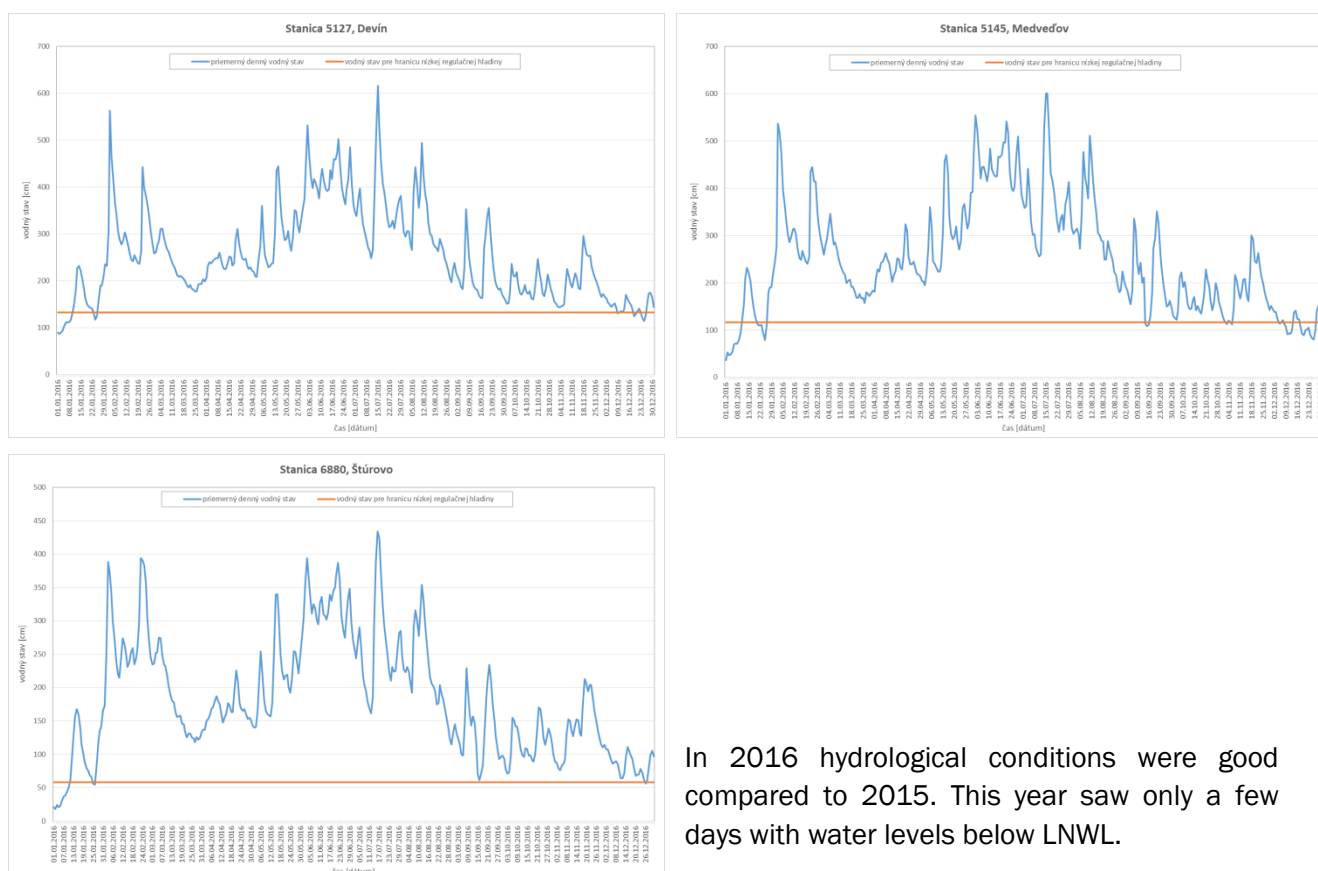
In Part III., in year 2016, (the most critical section rkm 1735.5 – 1733.7 – Cenkov (in HU language – Nyergesújfalu)) fairway depths were below 2.0m on 10 days.

## Action Plan: Slovakia

The main reasons for not meeting the Level of Service and availability of 2.5m depth 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 using technology for dredging (maybe detonation and removing of the stone after that). In Part I. the regular dredging intervention was done according to the plan.

In total, the navigation conditions in mentioned period were standard, no extreme deviations occurred.

### 5.2 SK | Hydrological conditions at main critical locations 2016



In 2016 hydrological conditions were good compared to 2015. This year saw only a few days with water levels below LNWL.

### 5.3 SK | Key issues and related activities 2016

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

	Key issues	Need for action	Activities performed 2016
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	Market research, preparation of the technical specification

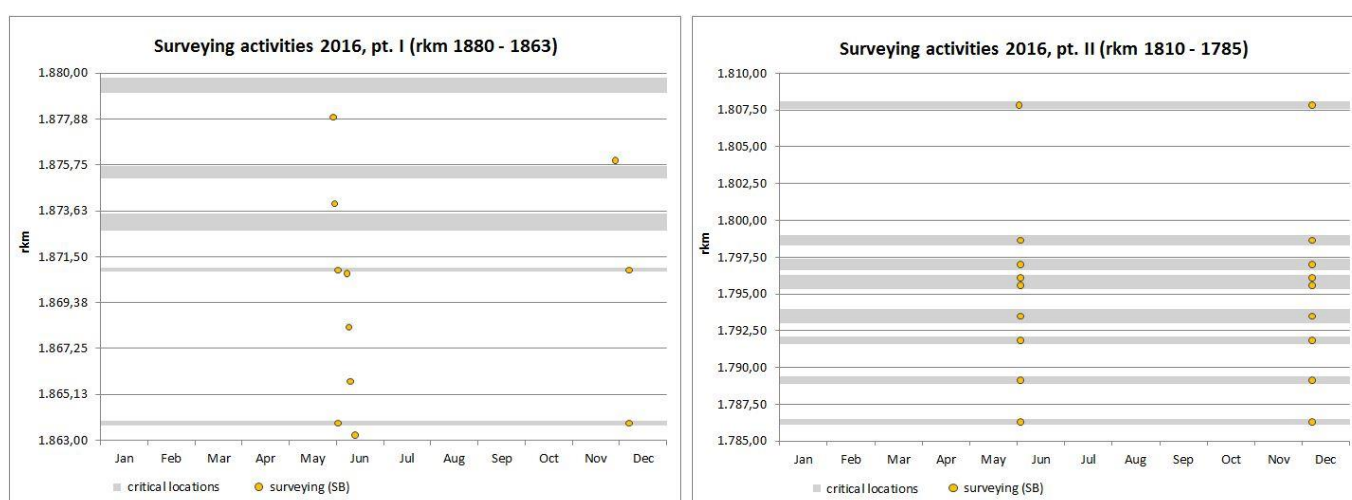
SK 05	Different coordinate systems used for measurements in border stretches as an impediment to efficient planning	Support cross-border harmonisation of monitoring standards	<i>Harmonization via transboundary water commissions</i>
SK 06	Old and dredging and marking fleet and equipment	Support acquisition of up-to-date dredging and marking vessels and equipment	<i>Preparation of the specification for marking vessel</i>

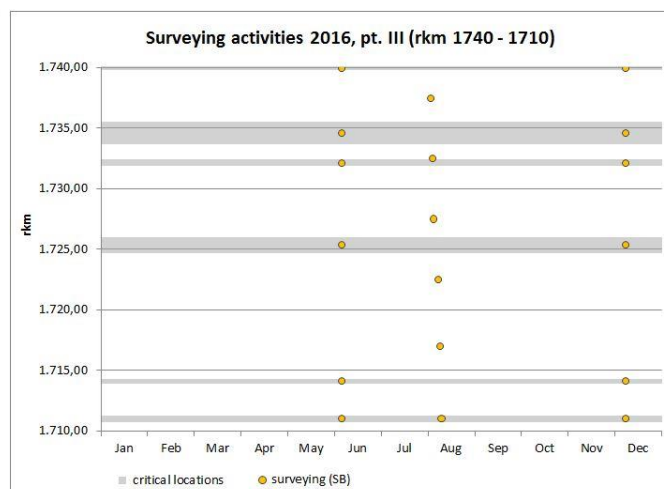
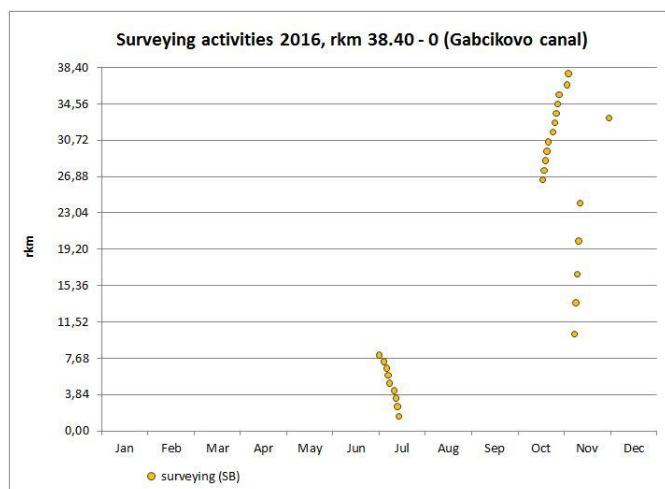
#### 5.4 SK | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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 for the update of May 2017.

##### **Riverbed surveying activities 2016**

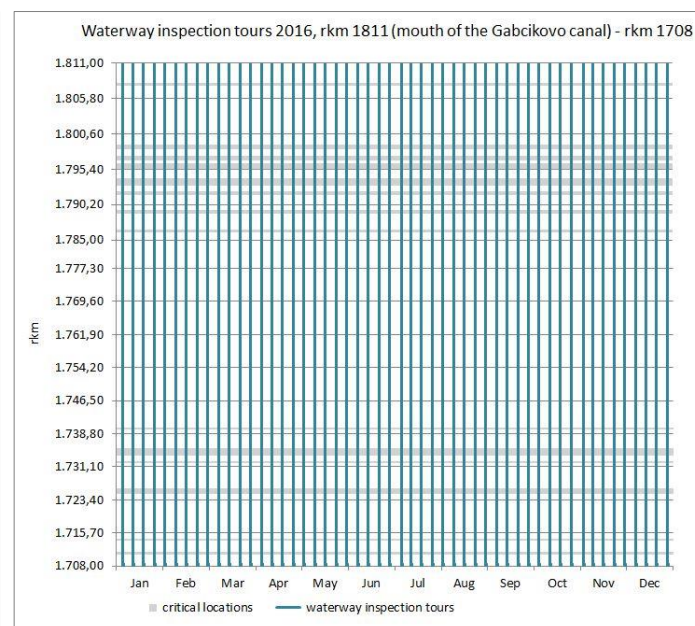
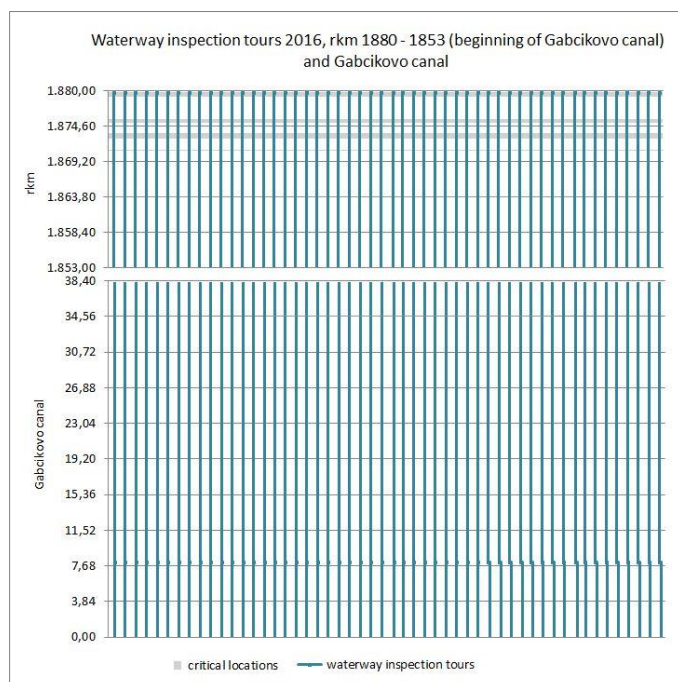
The following river bed surveying activities took place according to the annual procedure. Critical locations are monitored within the yearly measurement of the entire Slovakian stretch, but since 2015 SVP is performing extra measurements of the critical sections besides the entire stretch measurement. Surveying is conducted with a single-beam echo-sounder; the profiles are 50m apart.





### Fairway monitoring and marking activities 2016

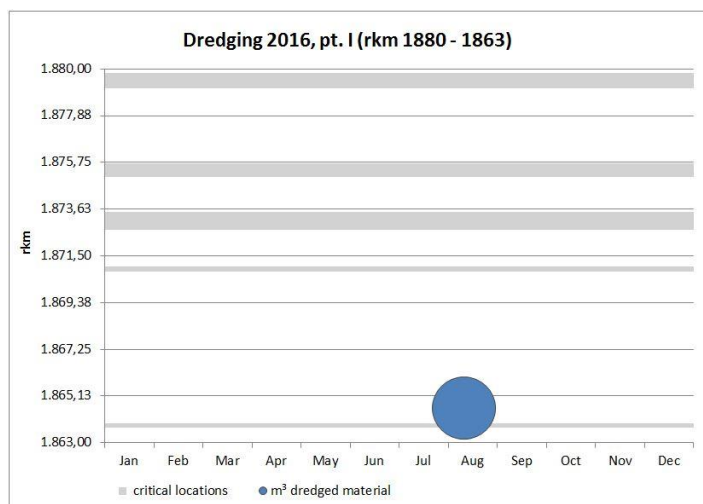
The fairway monitoring and marking has been done on a weekly basis in Slovakia based on the approved Project of the Marking of the fairway. Changes of the fairway have not been done in 2016, only the minor changes were realised by the marking vessels staff with movement of the buoys based on actual water level condition.



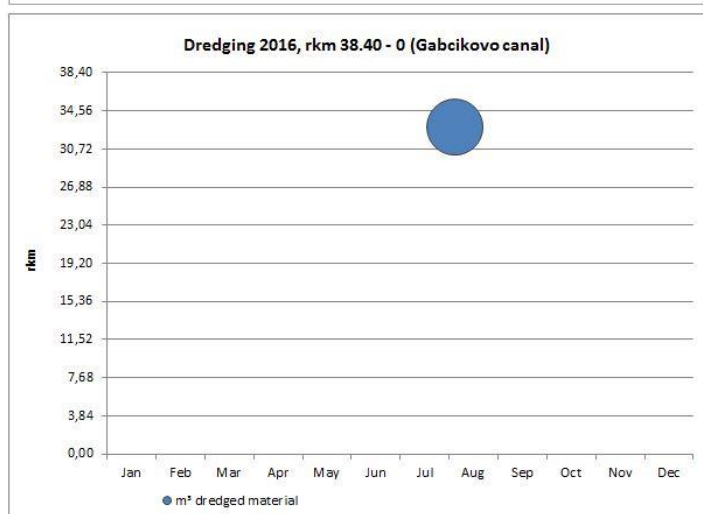
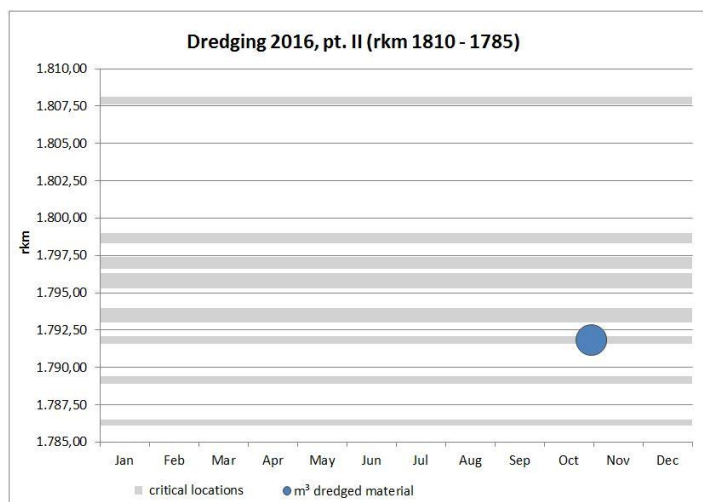
## Dredging activities 2016

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, 184 191 m<sup>3</sup> were dredged for commercial navigation in year 2016.



Dredging from rkm 1865.2 – 1864 was conducted from April to December 2016.



Dredging in the Gabcikovo canal from km 34 – 31.6 was conducted from April to November 2016.



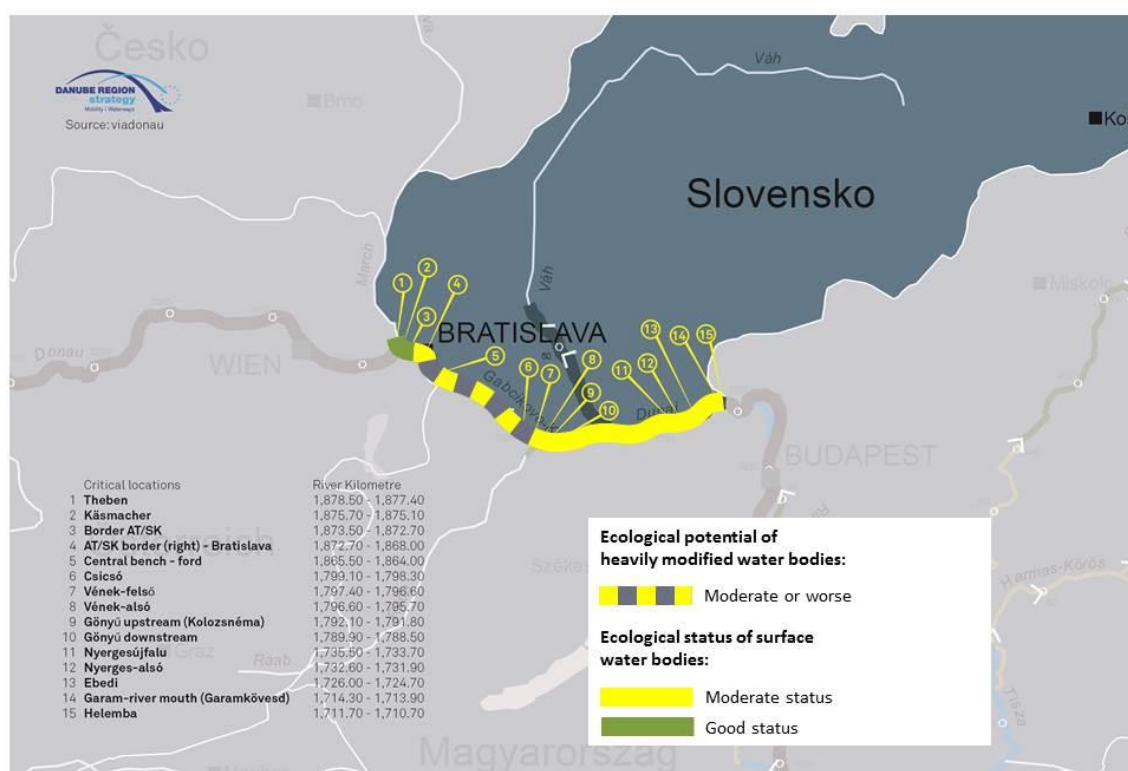
SVP is according to the Act No. 338/2000 Coll. on Inland Navigation the only enterprise which is authorized and responsible to perform fairway marking and works related to marking (dredging included). Thus, only a permission from the Transport Authority is needed, who publishes navigation notices for 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 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, 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 2016**

### **Investments taken for FRMMP implementation 2014 – 2020**

Need areas	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)	6 100 000	0	0	6 100 000
Surveying of the riverbed	450 000	500 000	0	0
Water level gauges	-	-	-	-
Marking of the fairway	1 510 000	1 510 000	0	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	-	-	-	-
<b>Sum (Euro)</b>	<b>8 080 000</b>	<b>2 010 000</b>	<b>0%</b>	<b>6 100 000</b>

**Operational expenditures for conducted activities 2016 and budget needs 2017**

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	1 880 766	2 160 000	2 160 000	0
Surveying of the riverbed	100 600	100 000	100 000	0
Water level gauges	-	-	-	-
Marking of the fairway	433 694.23	440 000	440 000	0
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
<b>Sum (Euro)</b>	<b>2 415 060.23</b>	<b>2 700 000</b>	<b>2 700 000</b>	<b>0</b>

**5.7 SK | Outlook: actions, milestones and funding sources**

No update of the following table was provided.

<b>SK 01: Level of detail of monitoring data is suboptimal for exact and cost-effective planning of dredging interventions</b>		
Planned activities:	Support acquisition of up-to-date multi-beam sounding vessels, equipment and software, managing of the purchasing	
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 2015/2016: Funding through Project FAIRway (CEF)	
Next steps:	If project approved, then definition of the condition for the public procurement, competition itself, purchasing of the vessel with all requested devices, starting of the using (measurements)	until 2017

<b>SK 02: Out-of-date information technology, missing database for monitoring data</b>		
Planned activities:	Support establishment of Fairway Management System, Establishment, development and installation of the management system is planned within the implementation of the FAIRway Slovakia project	
Current shortcomings:	Missing system actually	
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 2015/2016: Funding through Project FAIRway (CEF)	
Next steps:	Fairway Management System installation	until 2017-2018
<b>SK 03: Insufficient number of skilled staff to monitor of the fairway</b>		
Planned activities:	Actually only experienced staff available (closely to retirement), securing of the well-trained staff after purchasing of the new marking vessel (from the project 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 2015/2016: Funding through Project FAIRway (CEF) and company budget	
Next steps:	New marking vessel, needs of having new trained staff	until 2017-2018
<b>SK 04: Different departments performing the monitoring as an impediment to efficient planning</b>		
Planned activities:	Development and installation of the common database, monitoring done by hydromorphology 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 2015/2016: Funding through Project FAIRway (CEF)	
Next steps:	Definition of the structure and content of the database (based on NEWADA duo	until 2017-2018

	database task result)	
<b>SK 05: Different coordinate systems used for measurements in border stretches as an impediment to efficient planning</b>		
Planned activities:	Actually exchanging of the data are 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 2015/2016: Funding through company budget, CBC funds	
Next steps:	Definition of the problems, possible solutions, proposals on TWC level	in progress
<b>SK 06: Old and dredging and marking fleet and equipment</b>		
Planned activities:	Acquisition of the new marking vessel, 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 2015/2016: Project FAIRway (CEF) for marking vessel (multioperational vessel), for dredgers – follow up investments funds	
Next steps:	Acquisition of marking vessel	until 2017
<b>SK 07: Lack of staff and resulting missing flexibility in case of urgencies (related to dredging activities)</b>		
Planned activities:	Ensuring of the well-trained and educated staff in parallel with purchasing of the new dredgers	
Current shortcomings:	Old fleet of dredgers (high maintenance fee)	
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 2015/2016: Investments funds	

Next steps:	Definition of the possible projects	until 2018-2019
<b>SK 08: Frequent need to adjust fairway marking as substitution for dredging activities</b>		
Planned activities:	Installation of the Fairway Management System (planning in following project NEWADA III), 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
Possible funding:	Budget availability 2015/2016: Funding through Danube Transnational Programme (NEWADA III project), FAIRway Project	
Next steps:	Definition of the structure of the database (possibility of using existing database structure developed within NEWADA duo – Marking plans task)	until 2018

## 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 – 2016

The **recommended Level of Service of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level** would correspond to an equal height of the blue (availability of 2.5m 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 2.5m 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.

#### Section rkm 1811 - 1708

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

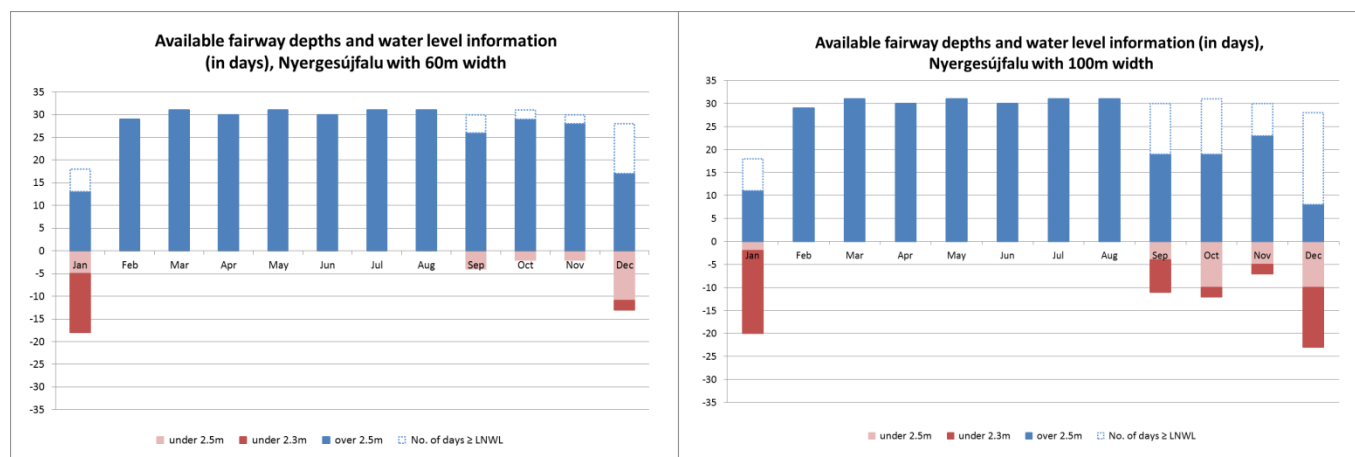
Critical location	2012	2013	2014	2015	2016
<b>Nyergesújfalu</b> critical location with <b>60 meters</b> wide fairway	304	314	307	244	326
<b>Nyergesújfalu</b> critical location with <b>100 meters</b> wide fairway	286	304	256	213	293

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  $\geq$  LNWL on main critical locations**

Critical location	Reference gauge	2012	2013	2014	2015	2016
Nyergesújfalu	Esztergom	366	365	360	294	349





## Section rkm 1,708 - 1,560

### Number of days with fairway depths $\geq 2.5$ m on main critical locations

Critical location	2012	2013	2014	2015	2016
<b>Kisapostag</b> critical location with <b>80 meters</b> wide fairway	287	284	246	224	294
<b>Göd</b> critical location with <b>80 meters</b> wide fairway	287	284	286	208	299
<b>Dömös alsó</b> critical location with <b>120 meters</b> wide fairway	312	304	264	205	279
<b>Budafo</b> k critical location with <b>60 meters</b> wide fairway	318	308	319	229	310

### Number of days with water level $\geq$ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016
Dömös-alsó	Nagymaros	363	365	365	322	357
Göd	Budapest	366	364	357	320	357
Kisapostag	Dunaföldvár	365	364	357	268	340

Fairway width (range of values accounts for different curve radii): 80 to 120 m in Hungarian Danube (rkm 1708-1433) section based on Fairway Rehabilitation and Maintenance Master Plan.

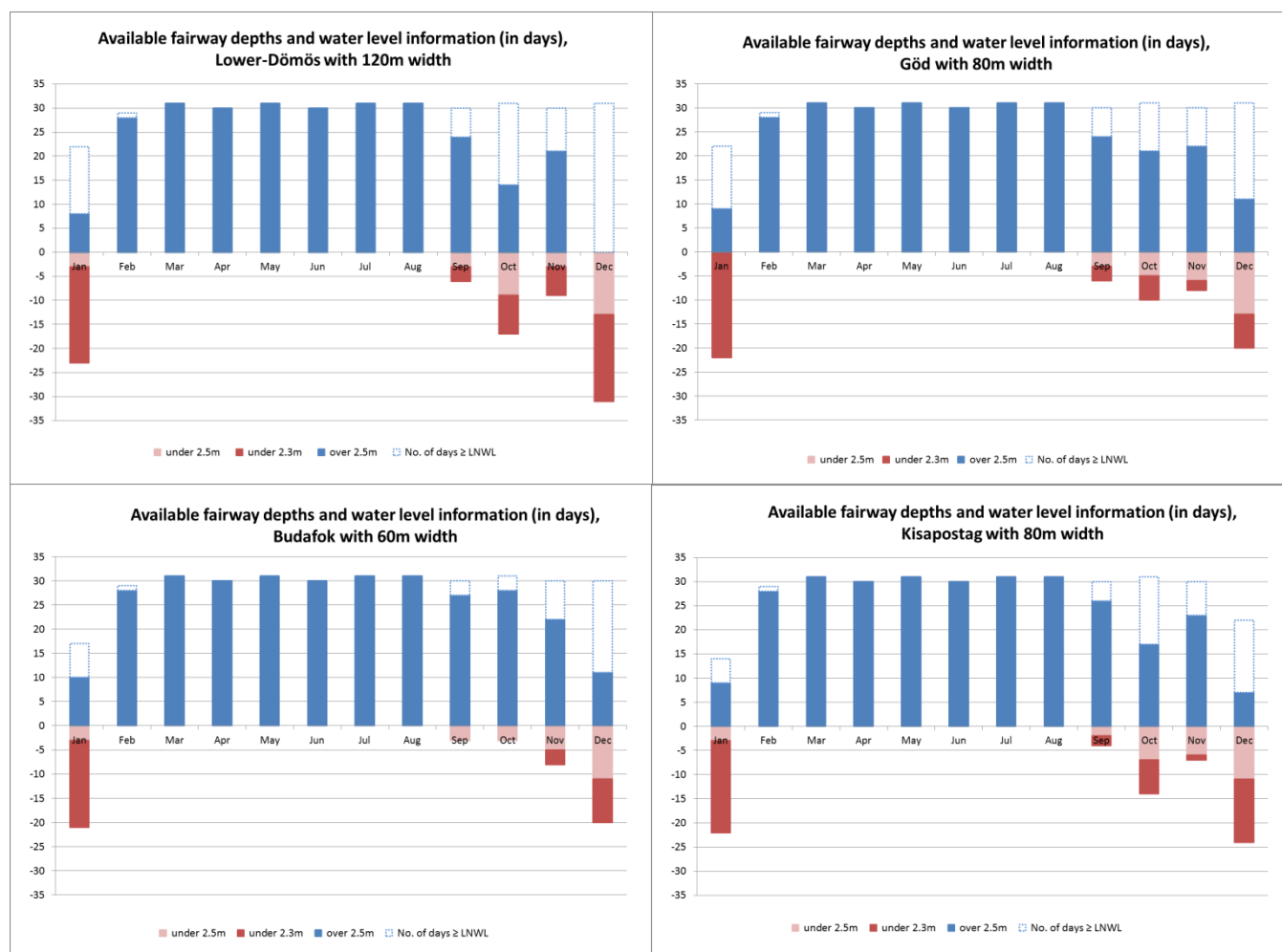
Due to the annual changes of water discharge and riverbed the most critical section at KDVIZIG area is not a given ford and also shallow section parameters could change within a year according to our latest riverbed survey.

## Action Plan: Hungary

The critical location Budafok, mentioned by the Danube users in 2014 to be one of the main critical sections, has never been the worst section in terms of depth, but is considered critical because of limited width, which is 60 meters.

In 2016 Lower-Dömös - rocky bottomed ford - was the most critical section of KDWIZIG. Due the river bed degradation between rkm 1590 – 1560 the water level was more often below LNWL than in the other section – like Lower-Dömös.

As it is probable that further critical locations arise (in addition to the ones mentioned in the table), these will be reported in the text.



In 2016 a min. fairway depth of 2.5m was available in Middle-Danube section for 274 days/366 days (~89%).

## Section rkm 1,560 - 1,433

### Number of days with fairway depths $\geq 2.5\text{m}$ on main critical locations

Critical location	2012	2013	2014	2015	2016
<b>Solt</b> critical location with <b>60 meters</b> wide fairway	365	365	360	277	344
<b>Solt</b> critical location with <b>100 meters</b> wide fairway	293	318	232	210	277

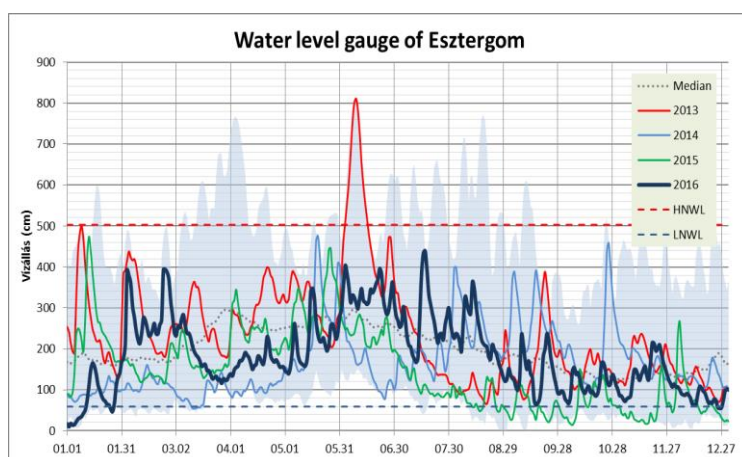
### Number of days with water level $\geq \text{LNWL}$ on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016
Solt	Dunaföldvár	366	364	358	270	339

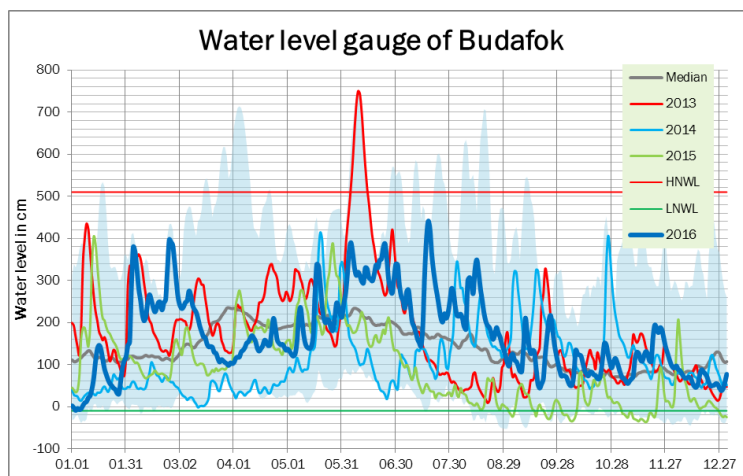
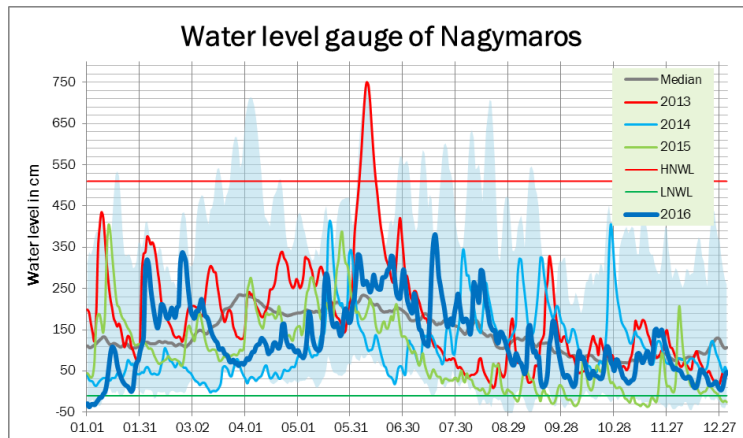


## 6.2 HU | Hydrological conditions at main critical locations 2016

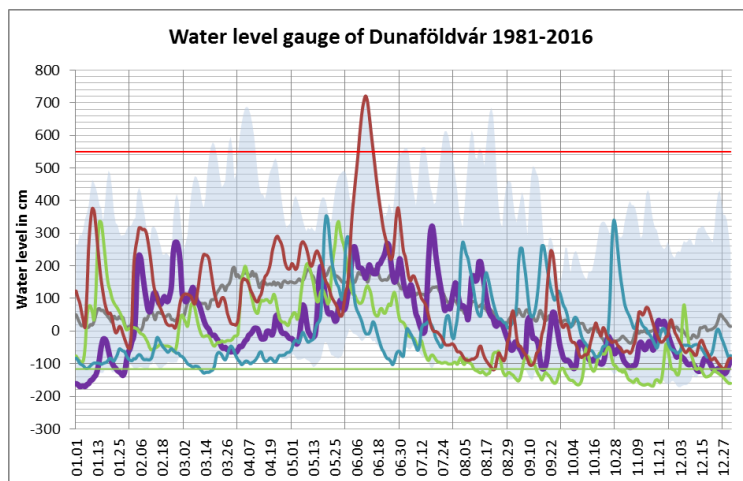
In hydrological terms, the years 2016 saw good fairway conditions almost through the whole year. Only January and December had a longer low-water period. Beside them the navigation was almost possible with 2.5 meter ship's depth.



## Action Plan: Hungary



The Nagymaros gauge refers to Dömös and the while Budapest gauge to Budafok.



### 6.3 HU | Key issues and related activities 2016

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

	<b>Key issues</b>	<b>Need for action</b>	<b>Activities performed 2016</b>
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	<i>Test of different types of multibeam sounding equipment was performed within FAIRway CEF project. Based on the results the technical specifications for procurement were finalized. The procurement documentation is under preparation by the public procurement consultant.</i>
HU 02	Old monitoring equipment and fleet (related to fairway marking)	Support acquisition of up-to-date vessels and maintenance-free buoys that make marking more cost-effective	<i>Technical specifications for procurement were finalized. The procurement documentation is under preparation within HUMARK CEF project by the public procurement consultant.</i>
HU 03	Integration of updated fairway depths data in the IENC	Support skippers with continuously updated charts	<i>Due to RSOE CEF project progress, contract has been made and work has started.</i>

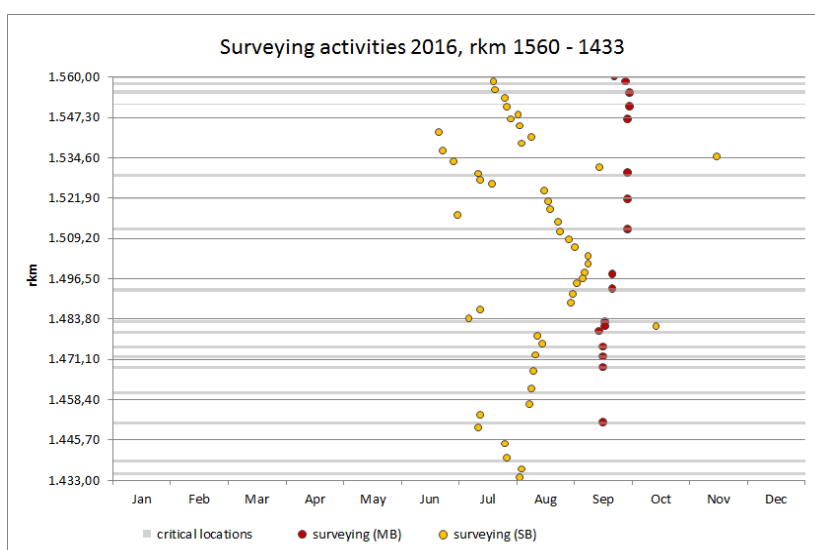
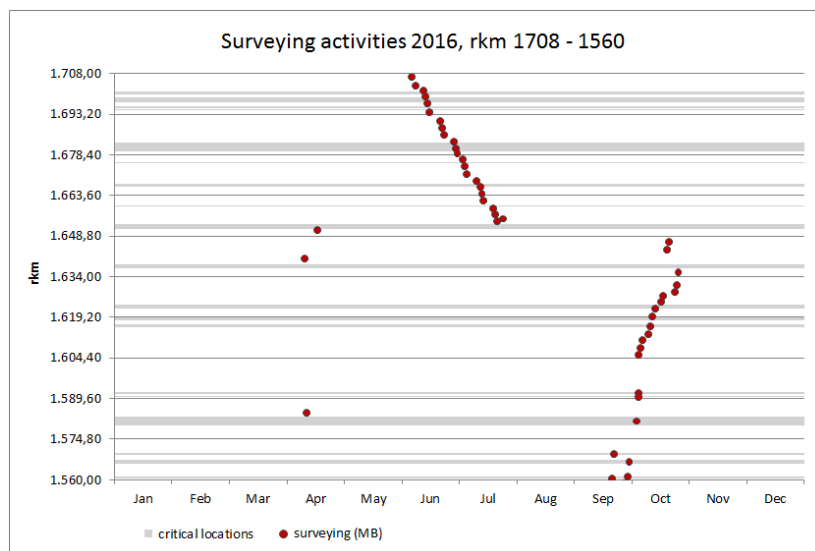
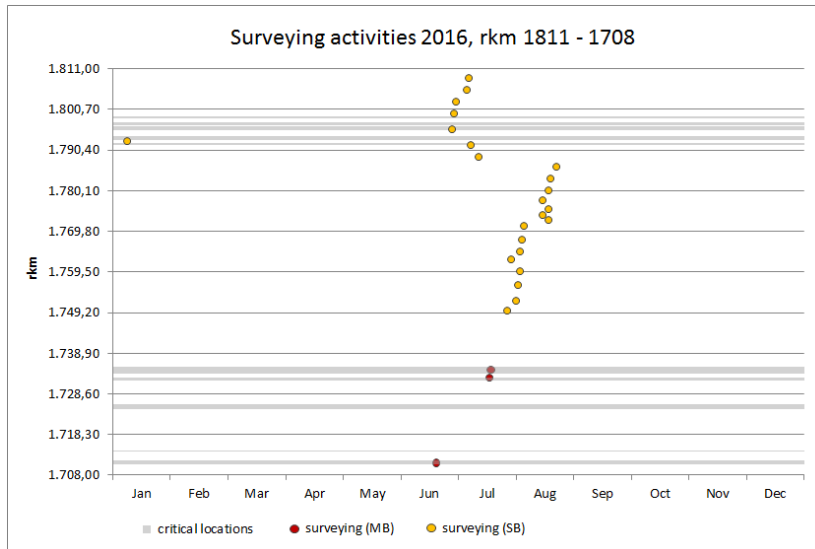
### 6.4 HU | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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 2016**

In 2016 the whole Hungarian section was measured according to the yearly plan. The most critical sections of ÉDUVIZIG and ADUVIZIG area and the whole KDVVIZIG area were measured with multi-beam technology.

## Action Plan: Hungary

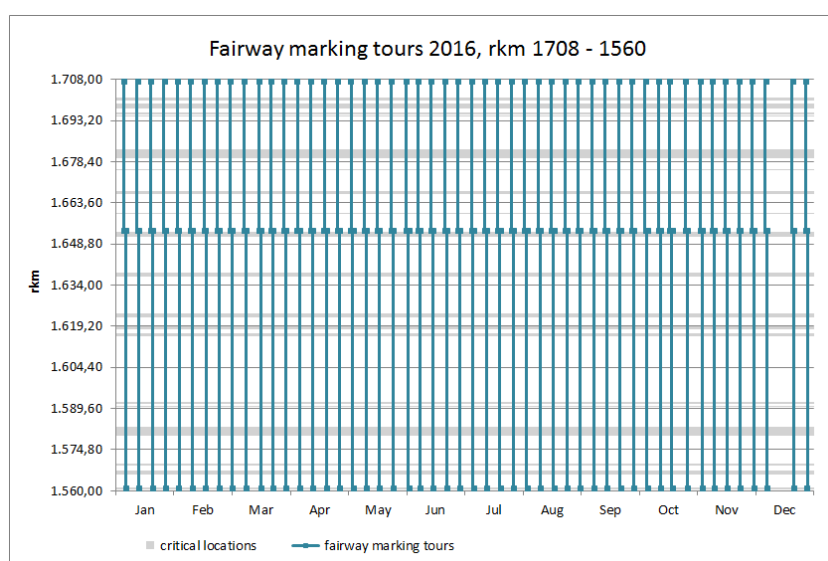


### **Fairway monitoring and marking activities 2016**

Major changes of the fairway have not been done in 2016. Only minor changes were realised during marking tours by the marking vessels staff with movement of the buoys based on actual water level condition.

Due to an accident at the Türr István Bridge, Baja at rkm 1480.2 the shipping across the bridge-section (1480.2) happened according to the temporary marking plan between 22.11.2016-15.12.2016.

In ÉDUVIZIG area (rkm 1811 – 1708) fairway monitoring and marking has been done on a weekly basis, based on the Marking Plan approved by the Common HU-SK Border Commission Danube Subcommission and the actual status of the fairway.



In KDVIZIG area (rkm 1708 – 1560) the actual dates of when the marking tours and fairway marking works were conducted are illustrated in the chart. The tours were conducted on a weekly basis.

In ADUVIZIG area waterway inspection and marking tours were done every week with two signalling vessels, one from Baja (1479) to Mohács (1433), the other from Baja (1479) to Dunaföldvár (1560).

### **Dredging activities 2016**

No dredging was done for commercial navigation in 2016.

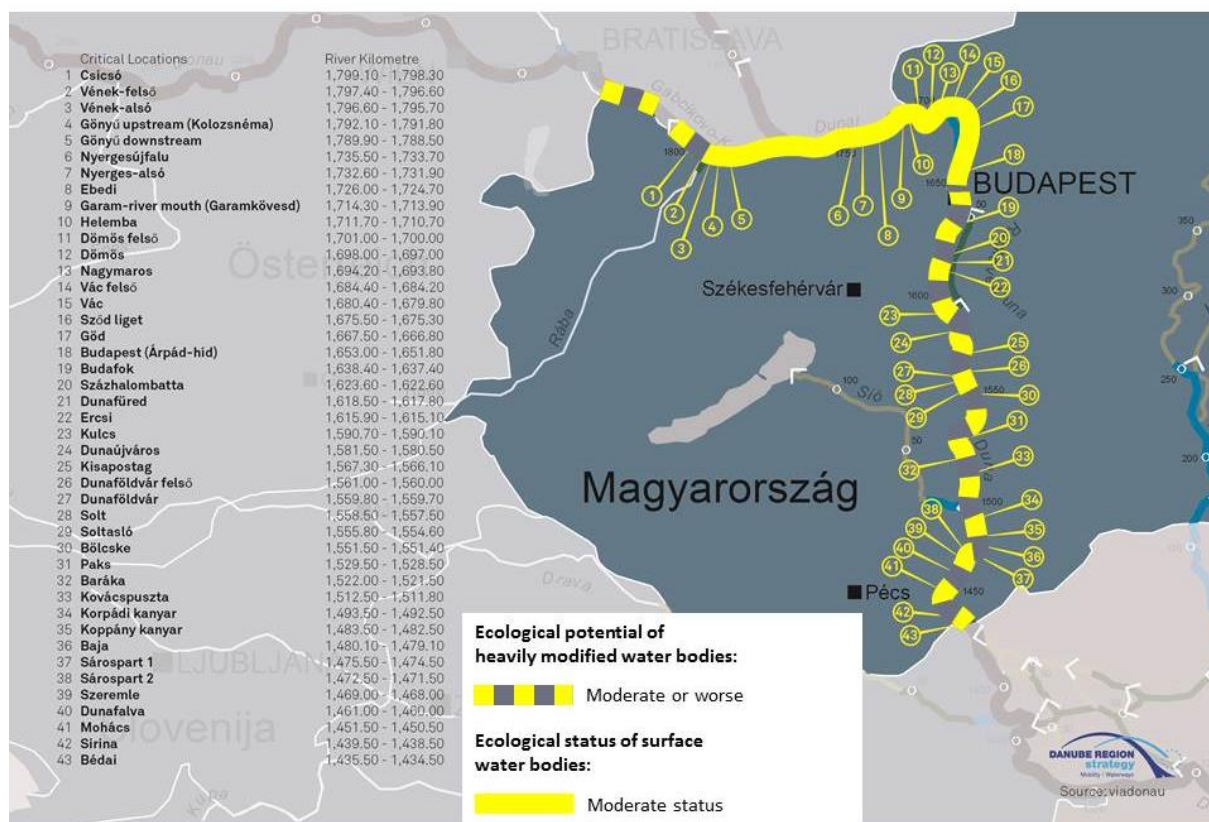
## **6.5 HU | Summary of current ecological status and environmental impacts**

The Hungarian section of the Danube is divided in 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”.



## Action Plan: Hungary

The following map 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 to often dry up and separate, some unique and valuable habitat 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 geomorphological 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 activity shall be based on activity plan, which is prepared by the waterway maintainer each year by the end of March, and has to be approved by the competent regional water authority.

By the end of 2013 a permit was obtained for carrying out fairway marking activities of the Danube section 1811-1708 rkm.

## 6.6 HU | Budget status 2016

*Investments taken for FRMMP implementation 2014 –2016*

The budget data was not updated since October 2016.

Need Areas	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)	150 000	6 200 000	5 270 000	-
Surveying of the riverbed	749 700	2 940 000	2 499 000	-
Water level gauges	150 000	1 500 000	1 275 000	-
Marking of the fairway	3 187 000	8 675 000	7 373 750	-
Availability of locks / lock chambers	n/a	-	-	-
Information on water levels and forecasts	50 000	10 000	8 500	40 000
Information on fairway depths	0	1 220 000	1 037 000	-
Information on marking plans	47 000	620 000	527 000	-
Meteorological information	-	-	-	-
Other needs	0	1 016 397	863 937	-
<b>Sum (Euro)</b>	<b>4 333 700</b>	<b>22 181 397</b>	<b>18 854 187</b>	<b>40 000</b>

*Operational expenditures for conducted activities 2016 and budget needs 2017*

The budget data was not updated since October 2016.

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	0	320 000	0	320 000
Surveying of the riverbed	110 000	122 000	92 000	30 000
Water level gauges	13 000	14 000	11 500	2 500
Marking of the fairway	580 000	620 000	520 000	100 000
Availability of locks / lock chambers	0	0	0	0
Information on water levels and forecasts	50 000	50 000	50 000	0
Information on fairway depths	10 000	10 000	10 000	0
Information on marking plans	20 000	20 000	20 000	0
Meteorological information	0	0	0	0
Other needs	0	0	0	0
<b>Sum (Euro)</b>	<b>783 000</b>	<b>1 156 000</b>	<b>703 500</b>	<b>452 500</b>

## 6.7 HU | Outlook: actions, milestones and funding sources

<b>HU 01: Level of detail of monitoring data</b>		
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:	- Signature of the Subsidy Contract between Hungarian Ministry of National development as CEF Beneficiary and NIF and OVF as Implementing Bodies, which provides the necessary financing to the implementation and regulates in detail the tasks, roles, duties, responsibilities, deadlines for the project implementation.	30.06.2017
	- Publication of the public procurement for multi-beam sounding equipment and surveying vessel	31.07.2017
	- Signed contract for multi-beam sounding equipment and surveying vessel (start of measurements)	31.12.2017
<b>HU 02: Old monitoring equipment and fleet (related to fairway marking)</b>		
Planned activities:	Purchasing equipment within national CEF project called <i>"Improving fairway marking on the Hungarian section of the Danube in the Rhine-Danube corridor"</i> <ul style="list-style-type: none"> <li>Fairway marking vessels - 3 pcs</li> <li>High-speed patrol boats - 3 pcs</li> <li>Intelligent light buoys - 115 pcs</li> <li>New floating unlighted buoys - 210 pcs</li> <li>Light bank markers - 55 pcs</li> <li>New bank marks and navigation control marks - 300 pcs</li> <li>New river km marks - 400 pcs</li> </ul>	
Current shortcomings:	Missing agreement of the Subsidy Contract between Hungarian Ministry of National development as CEF Beneficiary and NIF and OVF as Implementing Bodies.	
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:	- Signature of the Subsidy Contract between Hungarian Ministry of National development as CEF Beneficiary and NIF and OVF as Implementing Bodies, which provides the necessary financing to the implementation and regulates in detail the tasks, roles, duties, responsibilities, deadlines for the project implementation	30.06.2017
	- Publication of the public procurement for the marking	31.07.2017

## Action Plan: Hungary

	vessels and patrol boat - Signed contract for the marking vessels and patrol boat	31.12.2017
<b>HU 03: Integration of fairway depths data in the IENC</b>		
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:	- Signature of the works contract for upgrading of inland ECDIS charts (complying with 909/2013 Commission Implementing Regulation) in iENC v2.3 format	31.10.2016
	- Deliver 2016 complex riverbed survey result of 1811 – 1433 rkm and all relevant data to the contractor	31.01.2017
	- Electronic charts available for downloading on the National Transport Authority website and on the PannonRIS website	30.09.2017

## 7 Croatia

**AVP - Agency for Inland Waterways** (within the Ministry of Maritime Affairs, 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 - 2016

The **recommended Level of Service of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level** would correspond to an equal height of the blue (availability of 2.5m 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 2.5m into account when interpreting the status of critical locations, as these provide a certain range of navigability although not meeting the 2.5m threshold. Due to data provision by PLOVPUT, Croatia was not able to report the **number of days with 2.4 or 2.3m fairway depth** in the current update.

#### Danube

**Number of days with fairway depths  $\geq 2.5$ m on main critical locations**  
(for a fairway width of 100m)

Critical location	2012	2013	2014	2015	2016
Apatin *	366	365	365	365	366

\*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)

Critical sector in 2015	200 x 2,5	150 x 2,5	120 x 2,5	100 x 2,5
Apatin *	320	250	182	0

\*Data provided by PLOVPUT

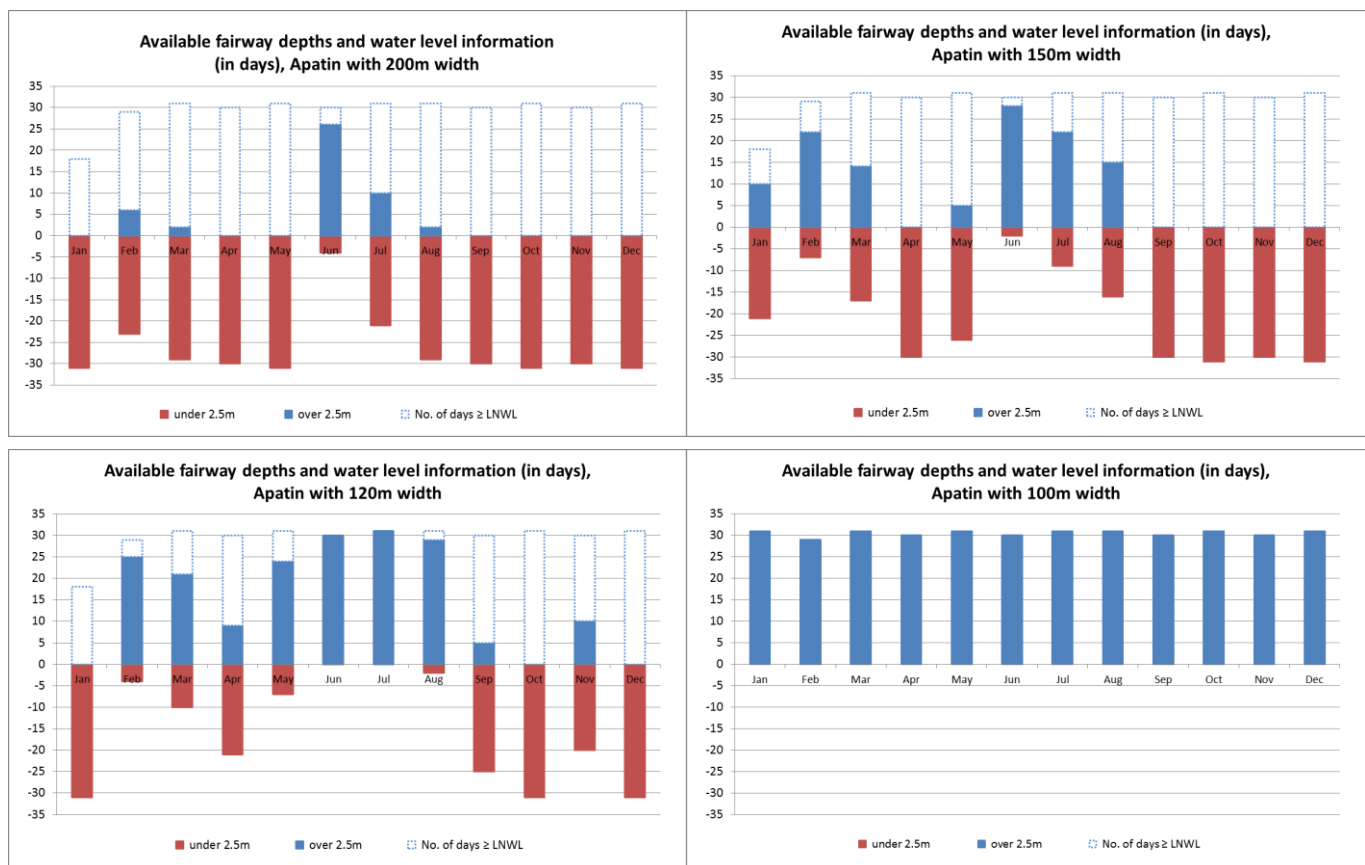
**Number of days with water levels  $\geq$  LNWL on main critical locations**

Critical location	Reference gauges	2012	2013	2014	2015	2016
Apatin *	Apatin	366	365	365	315	353

\*Data provided by PLOVPUT

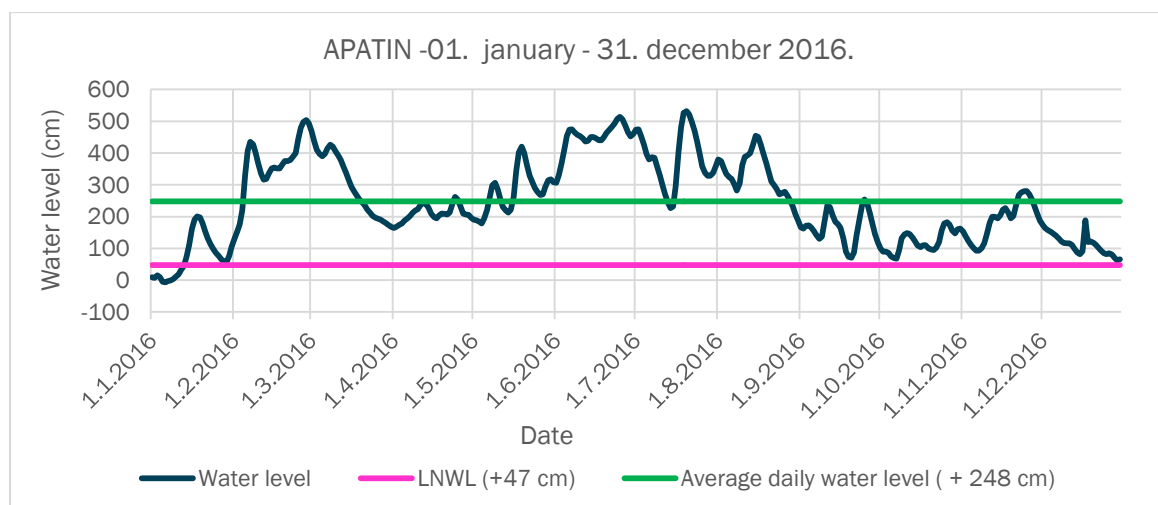


## Action Plan: Croatia



Fairway depth of 2.5 m was available throughout 2016 for the minimum Level of Service (100 m). On the 100 m fairway width, fairway depth of 2.5 m was achieved on 366 days (100%). On the 120 m fairway width, fairway depth of 2.5 m was achieved on 184 days in 2016 (50.2%).

## 7.2 HR | Hydrological conditions at main critical locations 2016





## Action Plan: Croatia

In 2016, at the gauging station Apatin, the water level was below LNWL during a short period in January. The average daily water was 248 cm.

The period from January to September was generally characterised as a period with higher values which favoured the maximum navigation depths. Starting from September, levels began to drop but values were above the LNWL.

### 7.3 HR | Key issues and related activities 2016

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

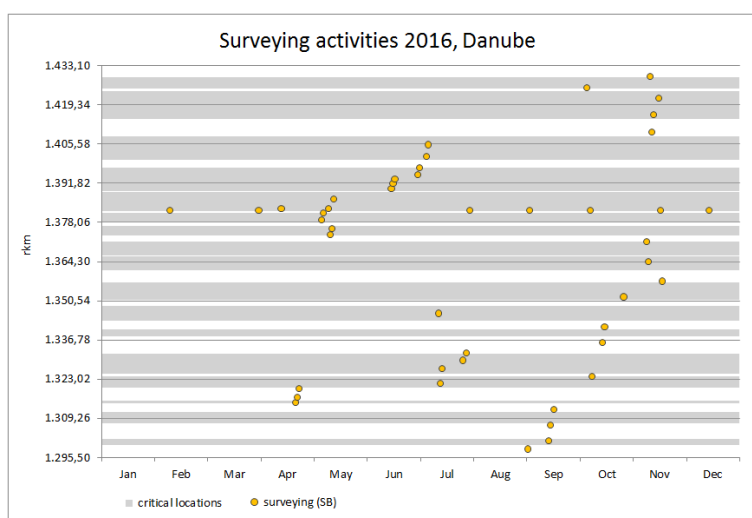
	<b>Key issues</b>	<b>Need for action</b>	<b>Activities performed 2016</b>
HR 01	Old monitoring fleet and equipment	Support retrofit and acquisition of up-to-date single-beam sounding equipment, software and vessels	<i>Within the FAIRway Danube project it is planned the purchase of one marking vessel and one surveying vessel with single and multi-beam equipment.</i>
HR 03	The number and the accuracy of gauging stations should be raised	Support increasing the number and quality of gauging stations	<i>DHMZ performed regular maintaining of existed gauging stations. Within the FAIRway Danube project – purchase of 4 new gauging stations and modernisation of 5 existing ones on the Danube.</i>
HR 06	Cumbersome procurement procedures for dredging activities	Start improved and more efficient concessions procedures for Sava, drava and Danube	<i>Concessions procedure started in 2016 for Drava – Port.</i>
HR 07	Not enough vessels available with AVP to provide quick reaction on needed marking interventions; equipment and vessel malfunctions	Support acquisition of modern maintenance and marking vessels	<i>Within the FAIRway Danube project – purchase of one marking vessel and one surveying vessel with single and multi-beam equipment.</i>
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	<i>The hydrological forecasts modelling project started in year 2014, using MIKE 11 software tools, and in cooperation with Croatian Waters (Sava and Kupa rivers).  Established great communication between AVP and DHMZ – DHMZ will be subcontracted for establishment of (4) new gauging stations together with development of water level forecast until 2020 on the Danube river within the FAIRway Danube project.</i>

## 7.4 HR | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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).

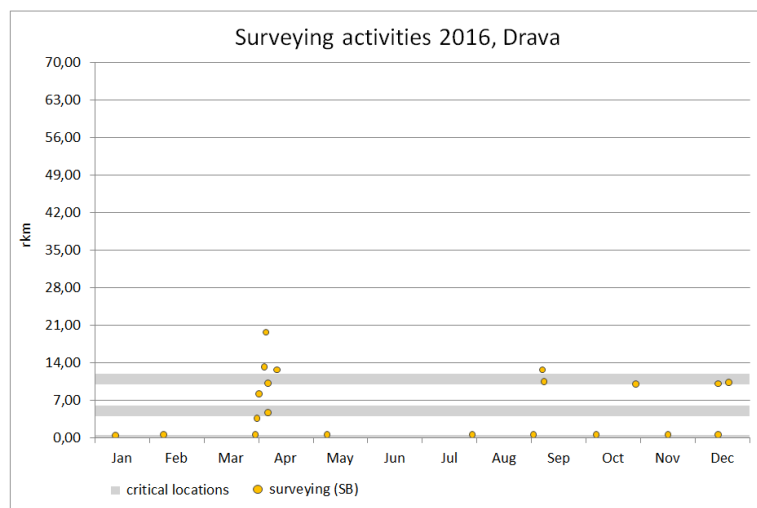
### *Riverbed surveying activities 2016*

#### Danube



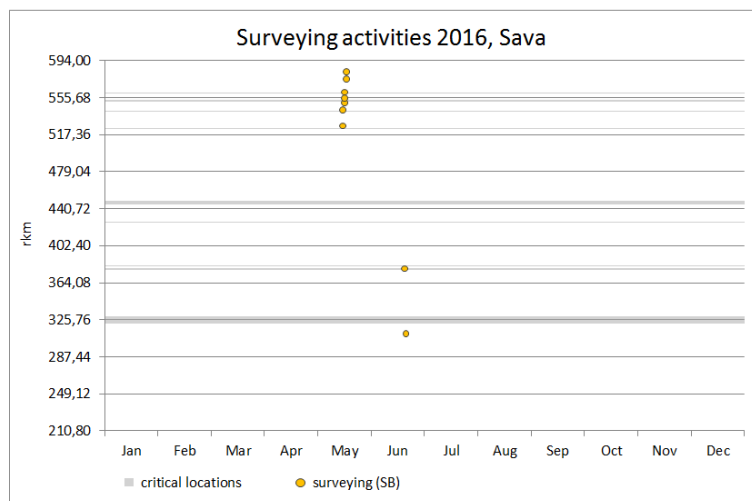
The river bed surveying is done according to an annual surveying plan. This plan consists of annual surveying of the whole Danube sector (single-beam) with main surveying of critical locations and waterway objects on which the maintenance works are planned. The plan also contains surveying of fairway locations for the production of geodetic and morphological surfaces in order to update the technical documentation.

#### Drava



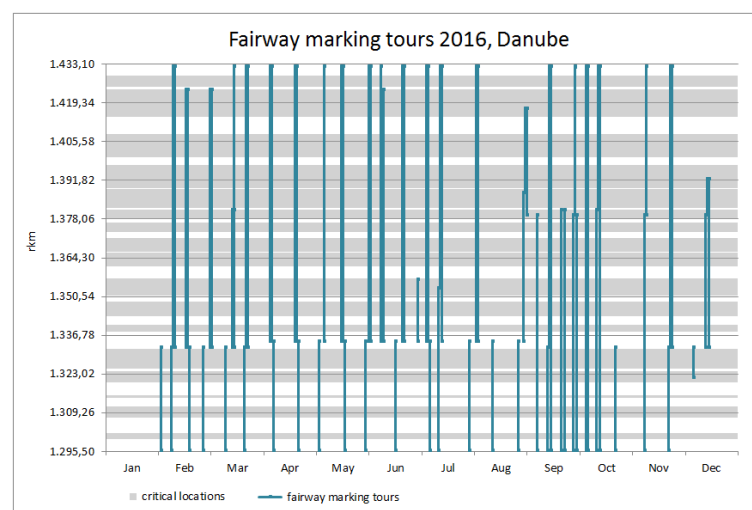
## Action Plan: Croatia

### Sava



### *Fairway monitoring and marking activities 2016*

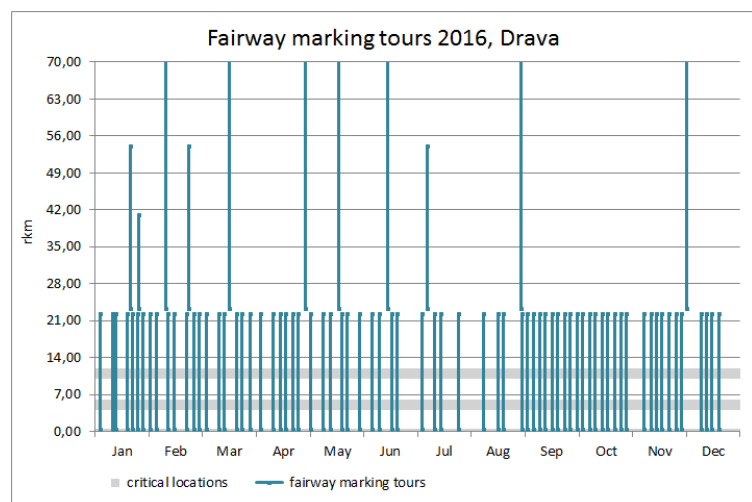
#### Danube



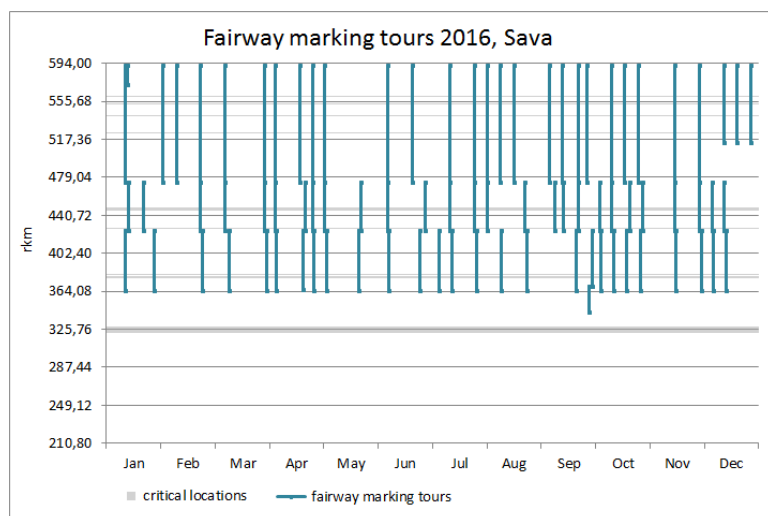
During 2016, the situation on the whole Danube stretch was stable and there was no reallocation of the fairway as the most favourable depth was held throughout the year within the fairway limits of 100m.

Fairway monitoring and marking tours are conducted with a marking vessel, based on a work plan.

#### Drava



## Sava

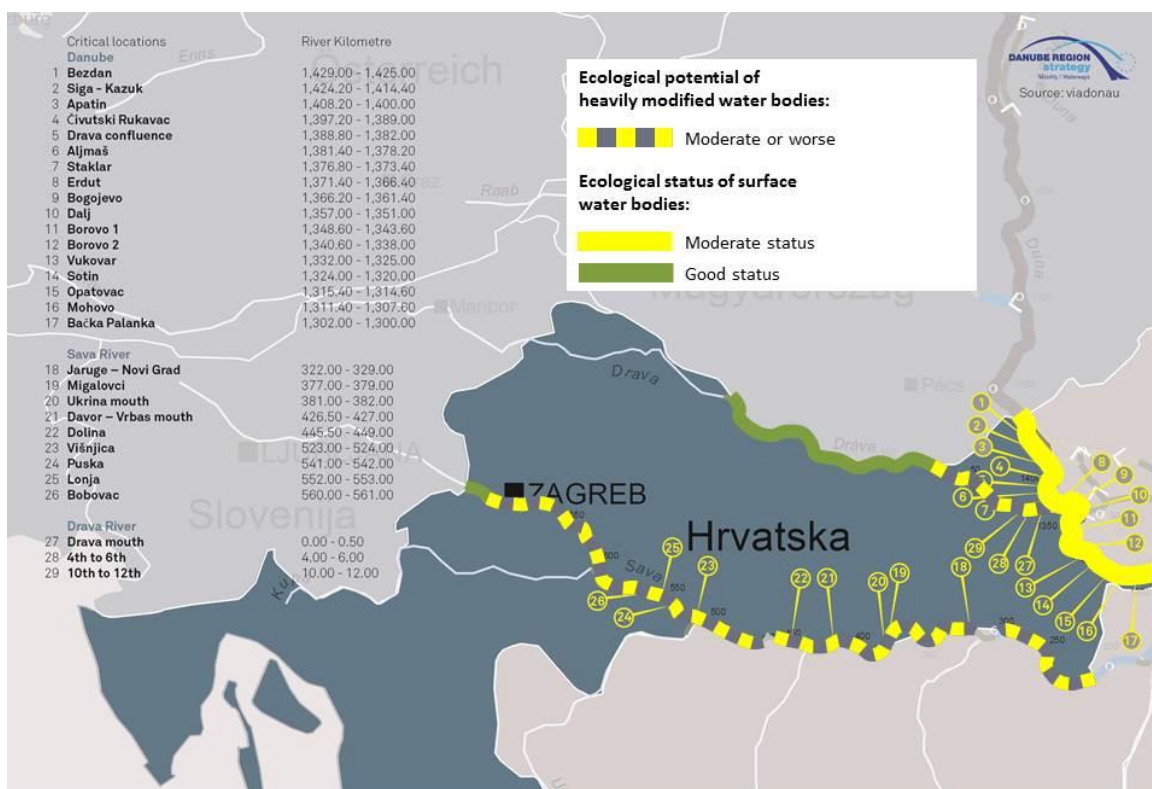


## Dredging activities 2016

During 2016 there was no dredging for commercial navigation.

## 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.



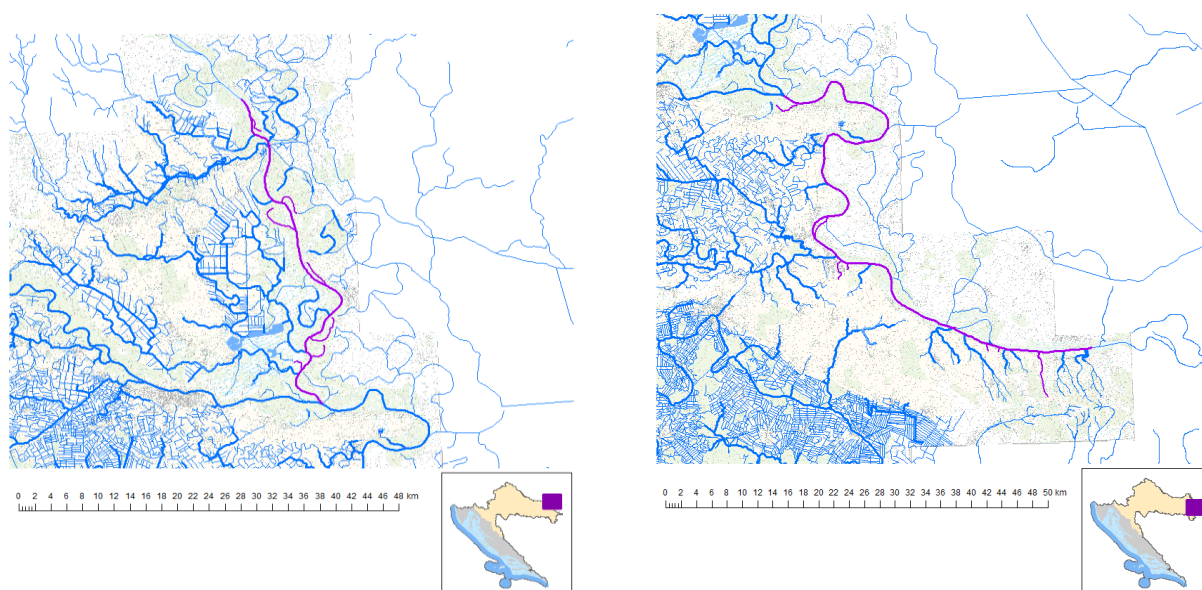
### ***Ecological status and ecological potential of surface water bodies***

(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 and 152/2014), Regulation on technical maintenance of waterways ("Pravilnik o tehničkom održavanju vodnih putova", official gazette nr. 62/2009 and 136/2012) 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 Nature Protection 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 2016 there was no need for dredging activities on the Danube river. For the works in Batina section (rkm 1425- 1425+900) required environmental measures are provided by Department of Spatial Planning, Environment and Nature Protection in Osijek-Baranja County and they are in force until 13.7.2017.



## 7.6 HR | Budget status 2016

*Investments taken for FRMMP implementation 2014 –2016*

Need Area	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)	1 000 000	330 000	-	670 000
Surveying of the riverbed	241 000	464 000	93%	
Water level gauges	57 000	85 000	100%	
Marking of the fairway	3 230 000	1 135 000	88%	2 095 000
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	0	185 000	100%	
Information on fairway depths	60 000			60 000
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
<b>Sum (Euro)</b>	<b>4 588 000</b>	<b>2 199 000</b>	<b>77%</b>	<b>2 825 000</b>

*Operational expenditures for conducted activities 2016 and budget needs 2017*

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	280 000	320 000	320 000	0
Surveying of the riverbed	31 000	31 000	31 000	0
Water level gauges	10 000	10 000	10 000	0
Marking of the fairway	133 000	110 000	110 000	0
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	30 000	30 000	30 000	0
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	5 000	5 000	5 000	0
Other needs	-	-	-	-
<b>Sum (Euro)</b>	<b>489 000</b>	<b>506 000</b>	<b>506 000</b>	<b>0</b>



## 7.7 HR | Outlook: actions, milestones and funding sources

<b>HR 01: Old monitoring fleet and equipment</b>		
Planned activities:	Preparation of projects for purchasing needed equipment and vessels (financed from EU funds)	
Current shortcomings:	Lack of qualified staff needed for project implementation, not enough 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 2016/2017: EU funds/national budget	
Next steps:	Application for EU co-financing	until 2020
<b>HR 02: Insufficient number of skilled staff</b>		
Planned activities:	We are planning to have additional education of our staff in future, but still do not know exact start 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 2016/2017: National budget	
Next steps:	We hope that the purchase of new equipment/vessels will open the possibility of hiring new workers and additional education	tbd
<b>HR 03: The number and the accuracy of gauging stations should be raised</b>		
Planned activities:	DHMZ plans the activities for the whole hydrological stations network on yearly basis. Within the FAIRway project it is planned installation of 4 new gauging stations and modernisation of existing 5 gauging stations	
Current shortcomings:	The uncertainty of funding	
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 2016/2017: EU funds/national budget	
Next steps:	To plan the achievable activities in year 2017, depending on available funding	until the end of 2017

<b>HR 04: Insufficient and hardly predictable financial backings</b>		
Planned activities:	Planning of projects that could help us provide additional funds for waterway maintenance	
Current shortcomings:	Insufficient communication between all relevant institutions	
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 2016/2017: EU funds/national budget	
Next steps:	Planning of projects that could help us provide additional funds for waterway maintenance	tbd
<b>HR 05: Deterioration of equipment of dredging companies</b>		
Planned activities:	No planned activities	
Current shortcomings:	Not enough funds/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 2016/2017: EU funds/privat budget	
Next steps:	N/A	tbd
<b>HR 06: Cumbersome procurement procedures for dredging activities</b>		
Planned activities:	Starting a concessions - waterway will be maintained more efficiently – no more time waste on a time consuming procedures	
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 2016/2017: national budget	
Next steps:	Concession procedures for Sava, Drava and Danube	Concession for Drava – Port Nemetin started in 2016
<b>HR 07: Not enough vessels available with AVP to provide quick reaction on needed marking interventions; equipment and vessel malfunctions</b>		
Planned activities:	Preparation of projects for purchasing needed equipment and vessels (financed from EU funds)	

Current shortcomings:	Lack of staff needed to research the current needs, not enough 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 2016/2017: EU funds/national budget	
Next steps:	Purchase of equipment within the FAIRway Danube project	until 2020
<b>HR 08: Inefficient procedures, suboptimal link between surveying and marking department, insufficient data storage and analysis facilities</b>		
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	
Current shortcomings:	With enough funds for future operation we would be able to plan activities that would improve 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 2016/2017: EU funds/national budget	
Next steps:	Improve link between surveying and marking department using IT tool developed within FAIRway Danube project	until 2020
<b>HR 09: The low number and the accuracy of gauging stations; non-existence of water level forecasts</b>		
Planned activities:	Hydrological forecasts modelling	
Current shortcomings:	The project started with modelling the Kupa river and a part of the Sava river from Slovenian border to Sisak. The model will be expanded to Danube river	
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 2016/2017: The funding of the project is national at the moment, but DHMZ is going to apply for EU funds	
Next steps:	To continue with the modelling. To increase the number of gauging stations where needed	until 2020

<b>HR 10: River engineering measures Sotin</b>		
Planned activities:	Construction of inline structure and two T-groins	
Current shortcomings:	Formation of sandbar is present due to the collapse of the high river bank which causes problems in navigation.	
Environmental relevance of planned activities:	What are the main expected environmental impacts?	Ecological study is ongoing (done by the end of 2017)
	Which measures are taken to mitigate these impacts?	Not applicable
	Is water status still expected to deteriorate?	No
Possible funding:	Budget availability 2016/2017: EU funds/national budget	
Next steps:	Application for EU co-financing	until 2020

## 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 –2016

The **recommended Level of Service of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level** would correspond to an equal height of the blue (availability of 2.5m 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 2.5m 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 $\geq 2.5\text{m}$ on main critical locations*

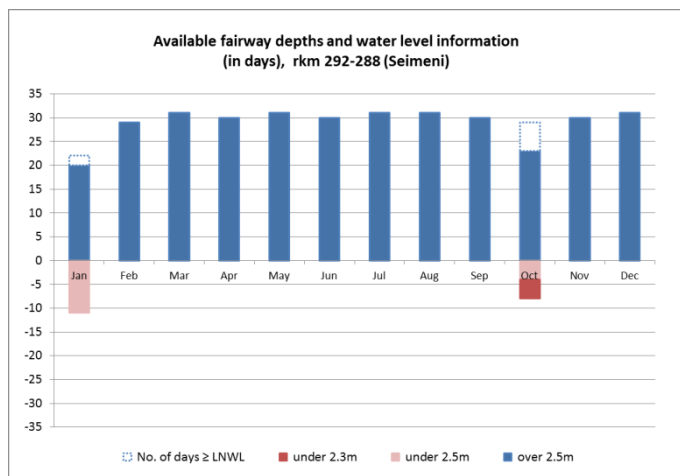
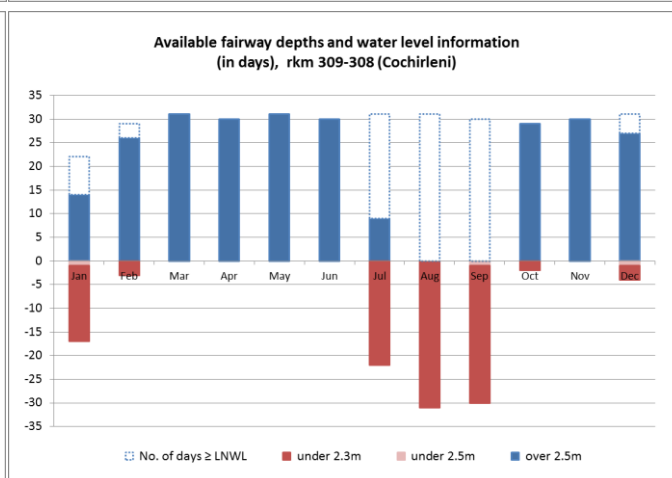
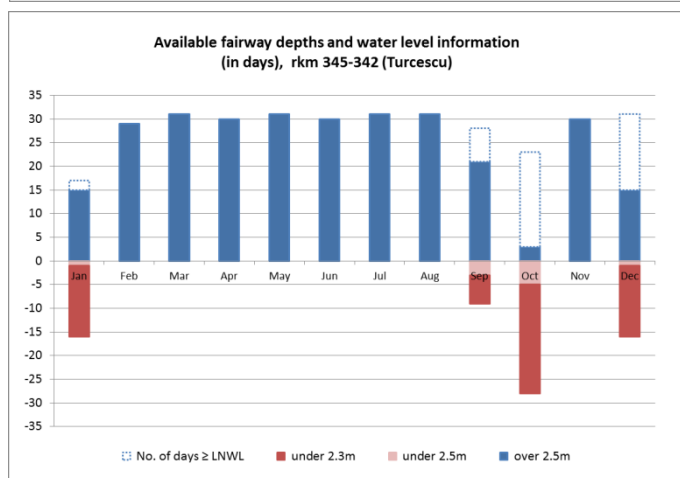
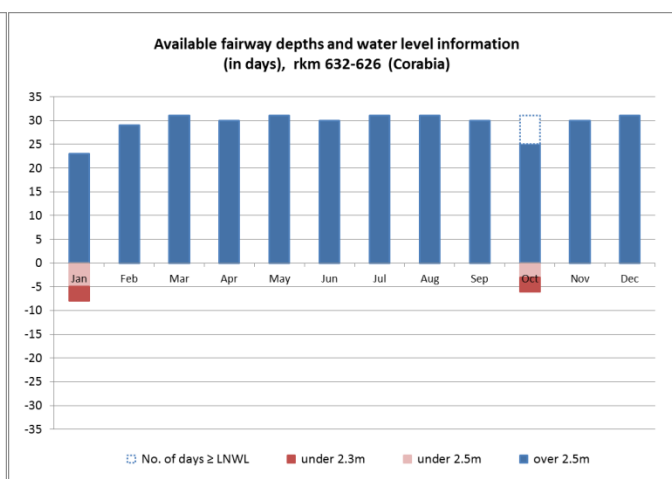
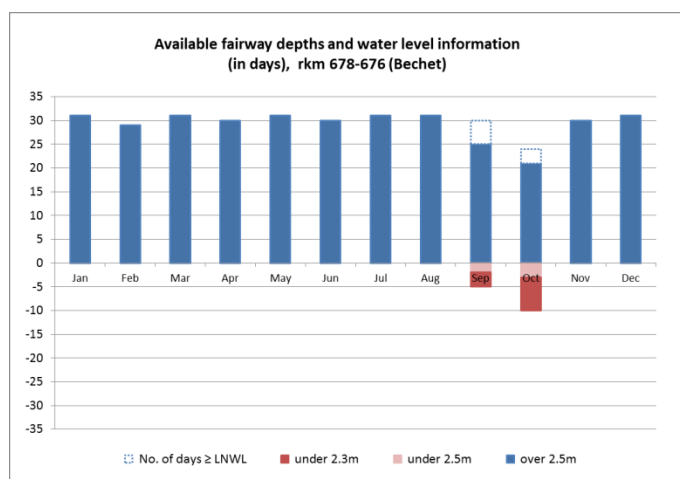
Critical location	2012	2013	2014	2015	2016
Bechet (80m fairway width)	355	327	365	285	351
Corabia (100m fairway width)	348	335	365	272	352
Turcescu (80m fairway width)	281	297	345	260	301
Cochirleni (80m fairway width)	196	234	319	236	257
Seimeni (80m fairway width)	323	329	365	336	347
Prut (80m fairway width, depth > 7.32m)	352	333	365	308	338
Tulcea (100m fairway width, depth > 7.32m)	351	318	365	321	359

##### *Number of days with water level $\geq$ LNWL on main critical locations*

Critical location	Reference gauges	2012	2013	2014	2015	2016
Bechet	Bechet	332	329	365	277	348
Corabia	Corabia	328	325	365	258	348

## Action Plan: Romania

Turcescu	Calarasi	319	325	365	279	348
Cochirleni	Cernavoda	331	325	365	295	355
Seimeni	Cernavoda	331	325	365	295	355
Prut	Galati	366	365	365	365	353
Tulcea	Tulcea	366	365	365	365	359

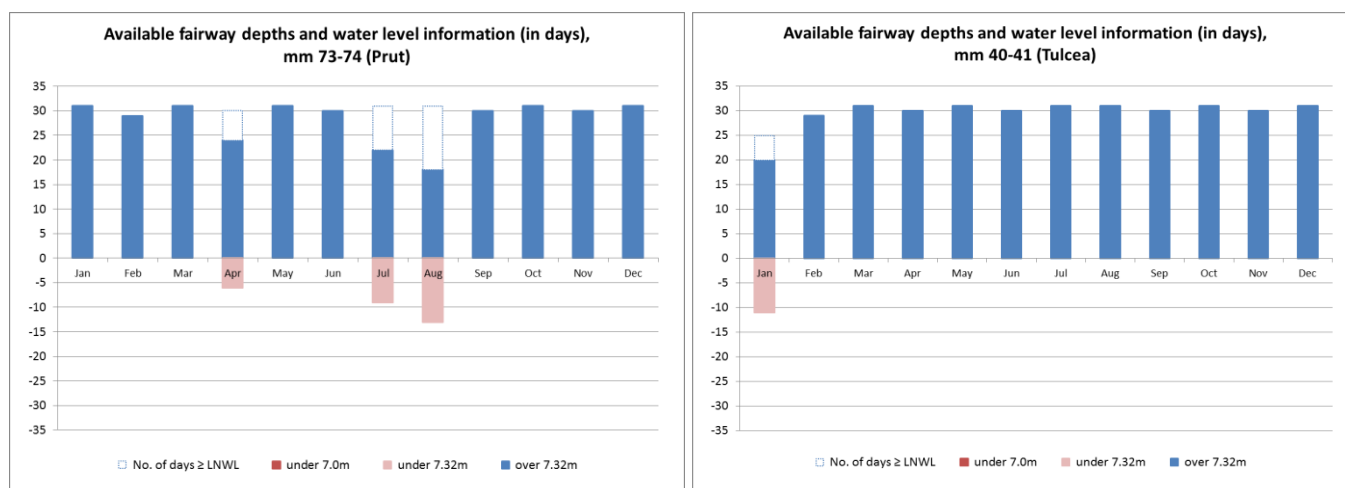


In the year 2016, good conditions as regards the water levels were encountered most of the time, over average values.

## Action Plan: Romania

During the year 2016, in the free flowing section upstream of Calarasi, good conditions for navigation were encountered in the fairway and critical sections. Only in January, September and October a few days with depths less than 2.5m were recorded (15 days), in periods with water levels below LNWL value. In the Calarasi-Cernavoda section, hydrological conditions recorded during July-October, caused the occurrence of several more days with fairway depth below 2.5m, in Turcescu and Cochirleni.

In the maritime sector of the Danube, throughout the year, good conditions for navigation were met, in accordance with minimum recommended depths. It is noteworthy, that in this sector the minimum navigation depth is 7.32m (24 feet).



### Danube-Black Sea Canal

Danube Black Sea canals bottom is dredged 1 meter under the Danube River so in the years 2012-2016 fairway depths were over 2.5 m on the Danube Black Sea canal for the entire year. Between Cernavoda and Agigea locks minimum depth is 7m which allows maritime ships to access the Basarabi and Medgidia ports.

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

During 2016 there was no restriction for navigation in the reported critical locations.



## 8.2 RO | Hydrological conditions at main critical locations 2016

In 2016, in terms of water levels, the recorded gauging station values were above LNWL values most of the time, about 95% - 98% of the time. In early few days of the year, were recorded few days under the multiannual average values (which they were recorded and depths below 2.5m), after which the values grew until March when they were maximum (11.500m<sup>3</sup>/s in Bechet). Starting with September, water levels began to decrease, approaching the LNWL values. Usually the low water period is August-October, which represents 25% of the year. The minimum of the year was recorded in October. In general, hydrological conditions in 2016 were good.

## 8.3 RO | Key issues and related activities 2016

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 2016
RO 01	Insufficient number of sounding vessels	Support acquisition of up-to-date sounding equipment to raise the coverage of surveyed areas.	<i>Pilot action for surveying activity defined within the FAIRway Danube project. The tender procedure for sounding vessels was launched in December 2016.</i>
RO 02	Insufficient number of automatic gauging stations.	Support acquisition of additional automatic gauging stations, especially for critical sections.	<i>Finalised the project for elaboration of the feasibility study for rehabilitating and extending the network of hydrometric stations on the Romanian sector of Danube-HyQ Danube project, implemented within the SOPT 2007 – 2013.</i>  <i>Pilot action for surveying activity defined within the FAIRway Danube project.</i>  <i>Elaborated the draft project proposal within the SOPT 2014-2020 for rehabilitating and extending the network of hydrometric stations on the Romanian sector of Danube. The project proposal will be finalised and submitted in 2017 in order to be approved for funding.</i>
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	<i>Elaborated the Romanian – Bulgarian Common Plan of measures necessary for 2016 including dredging activities. Ensured enough budget for dredging works for 2016.</i>  <i>Finalised the project for elaboration of the feasibility study for technical vessels incl. dredging equipment in SOPT 2007 – 2013. Set-up the necessary actions within the SWIM project for purchasing the dredging equipment and perform the capital dredging works.</i>

			<i>Launched the tender procedure for purchasing the dredging equipment using funds from the state budget.</i>
RO 04	Inefficient procedures. The documentation to draw up a contract for dredging is time-consuming.	Support standardization and simplification of documentation procedures.	<i>Elaborated the draft version of the Measures Plan together with Bulgarian administration within the SWIM project.</i>  <i>Elaborated the internal procedure for different types of activities in order to finalise the Internal Control Code of AFDJ.</i>
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.	<i>Finalised the project for feasibility study elaboration for technical vessels including marking vessels in SOPT 2007 – 2013.</i> <i>Defining the pilot actions for marking activity within the FAIRway Danube project.</i> <i>Launched the tender procedure for purchasing the marking vessel.</i>
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.	<i>Manufacturing the 80 pieces of buoys.</i>
RO 07	Unavailable forecast for water levels.	Support establishment of a water level forecast	<i>Finalised the project for the feasibility study for rehabilitating and extending the network of hydrometric stations on the Romanian sector of Danube - HyQ Danube project, implemented within the SOPT 2007 – 2013.</i> <i>Finalised the project for developing a geodesic network of support – BORD project, financed by the SOPT 2007 – 2013.</i>  <i>Defining the pilot action for water level forecast within the FAIRway Danube project.</i> <i>Elaborated the draft technical specification for developing the necessary tools, used for improving the water level forecast for the Lower Danube.</i>  <i>Elaborated the draft project proposal within the SOPT 2014 - 2020 for rehabilitating and extending the network of hydrometric stations on the Romanian stretch of Danube.</i>

## Action Plan: Romania

RO 08	Information could be provided customer-friendly using established river information portals.	Support customer-friendly processing and dissemination of information.	AFDJ forwarded the information to the FIS PORTAL. AFDJ forwarded the information to the RoRIS PORTAL. AFDJ provided fairway information on the official website: <a href="http://www.afdj.ro">www.afdj.ro</a> and MobileRIS application.
RO 09	Unavailable digital terrain models for shallow sections.	Support set-up of digital terrain models for shallow sections.	Finalised the bids evaluation within the tender procedure for feasibility study into FAST DANUBE project, which include the digital terrain models for entire Romanian – Bulgarian sector.
RO 10	Insufficient number and quality of weather stations.	Support improvement of meteorological information.	Finalised the project of the feasibility study elaboration for rehabilitating and extending the network of hydrometric stations on the Romanian sector of Danube - HyQ Danube project, implemented within the SOPT 2007 – 2013.  Pilot actions for defined within the FAIRway Danube project.  Elaborated the draft project proposal within the SOPT 2014-2020 for rehabilitating and extending the network of hydrometric stations on the Romanian sector of Danube. The project proposal will be finalised and submitted in 2017 in order to be approved for funding. Purchasing a performant hydro- meteorological buoy for Sulina Bar, with funds from the state budget.

## Danube Black Sea Canal

	Key issues	Need for action	Activities performed 2016
RO 01	Insufficient number of sounding vessels	Support acquisition of up-to-date sounding equipment to raise the coverage of surveyed areas.	DBSC: Defining of the action within the proposed FAIRway Danube project. At the end of 2016 the portable single beam echosounder was procured.
RO 02	Insufficient number of automatic gauging stations.	Support acquisition of additional automatic gauging stations, especially for critical sections.	DBSC: Defining of the action within the proposed FAIRway Danube project.
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	DBSC: No dredging works took place in 2016. Optimum navigation conditions were assured for entire 2016.

RO 07	Unavailable forecast for water levels.	Support establishment of a water level forecast	DBSC: Defining of the action within the proposed FAIRway Danube project.
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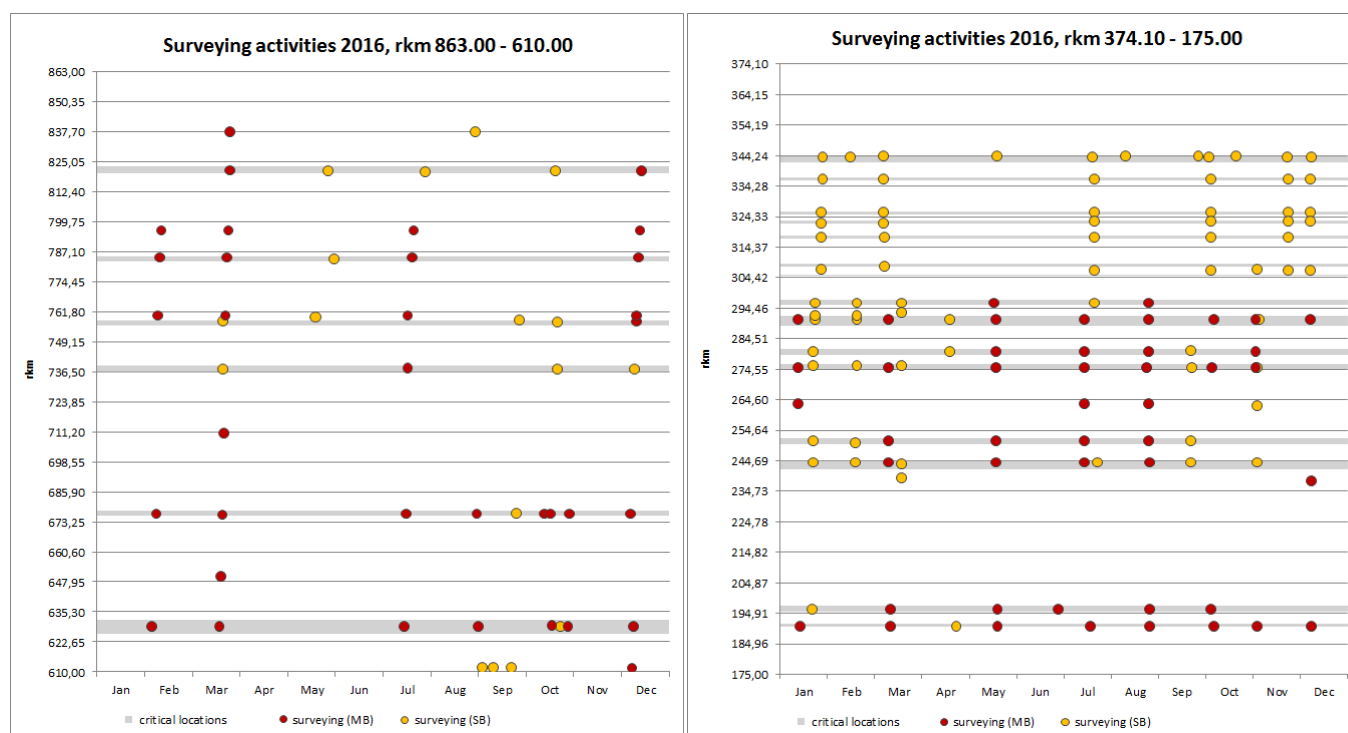
#### 8.4 RO | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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 2016*

In the period mentioned, the following riverbed 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.

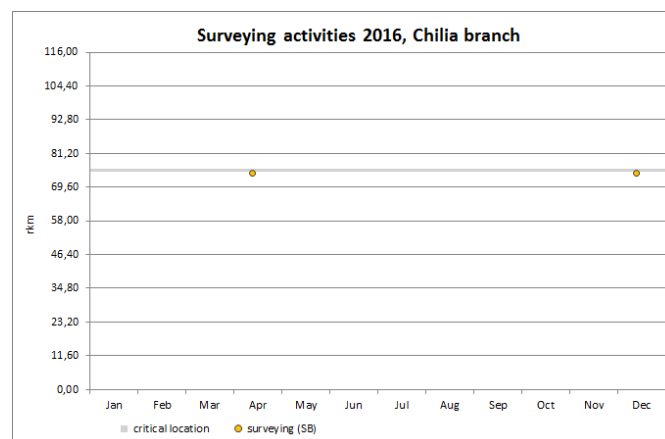
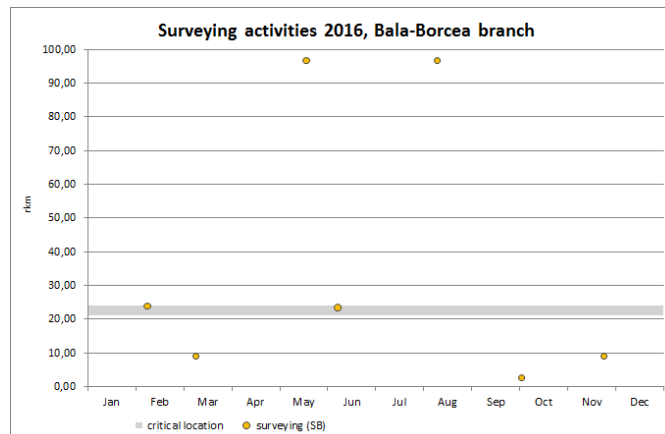
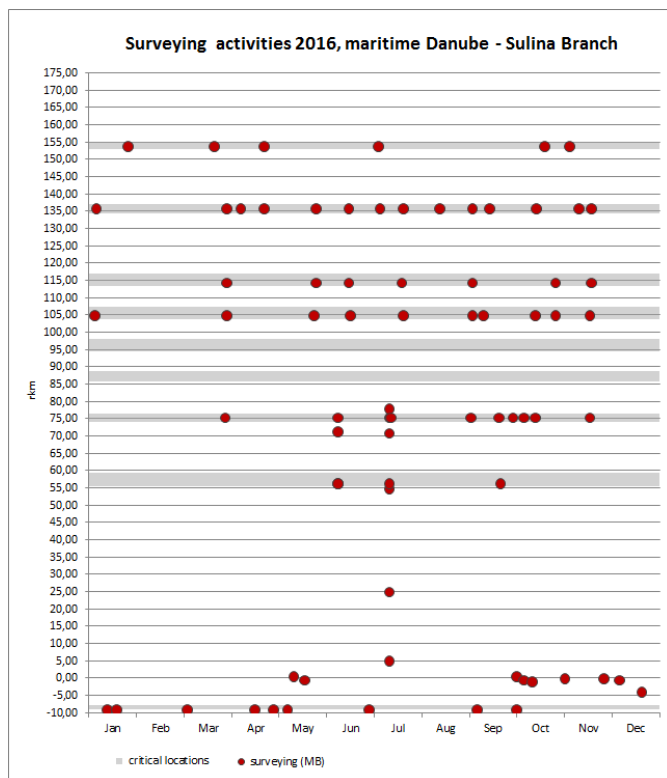
##### Danube



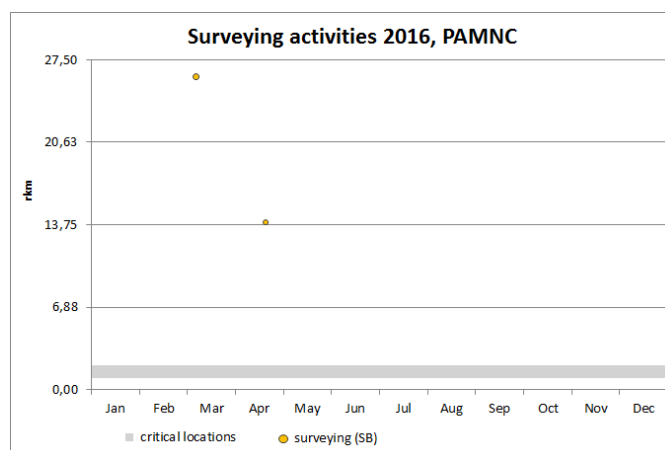
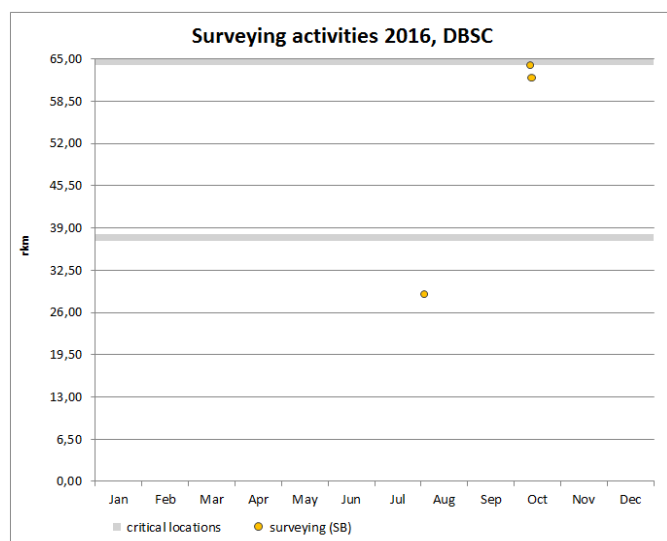
Shallow sections are always monitored by detailed surveys and control surveys.

## Action Plan: Romania

During 2016, especially the shallow sections have been measured at least one time per month. Also, there were surveys carried out for planning and establishing the areas for dredging works and surveys for monitoring.



## Danube-Black Sea Canal



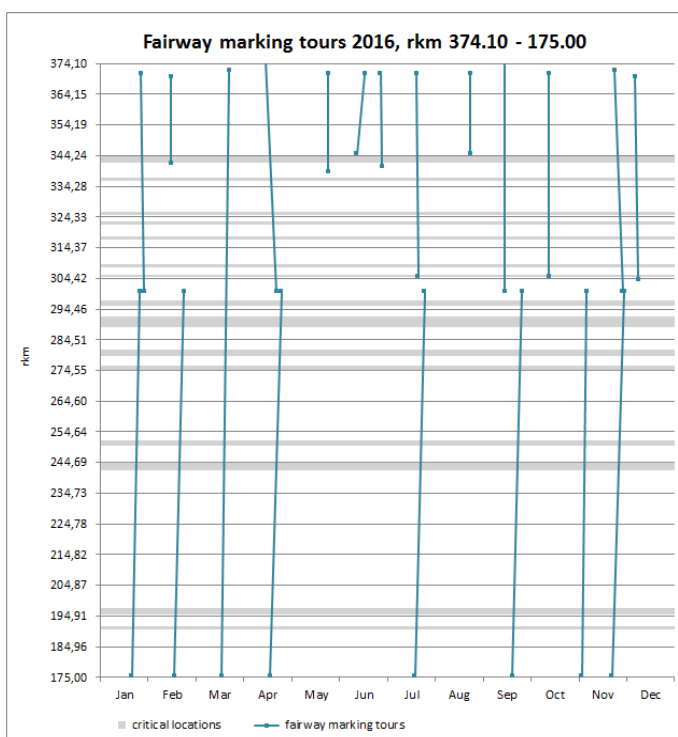
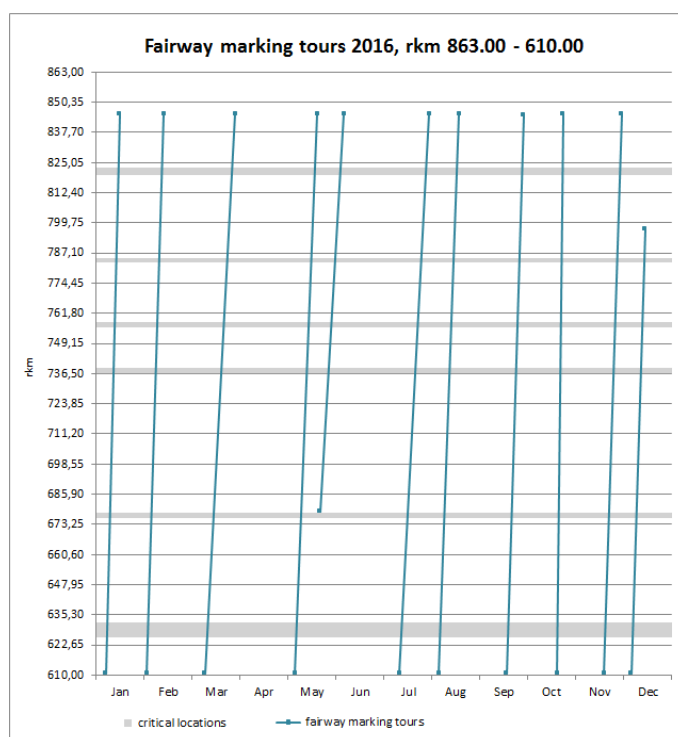
## Fairway monitoring and marking activities 2016

### Danube

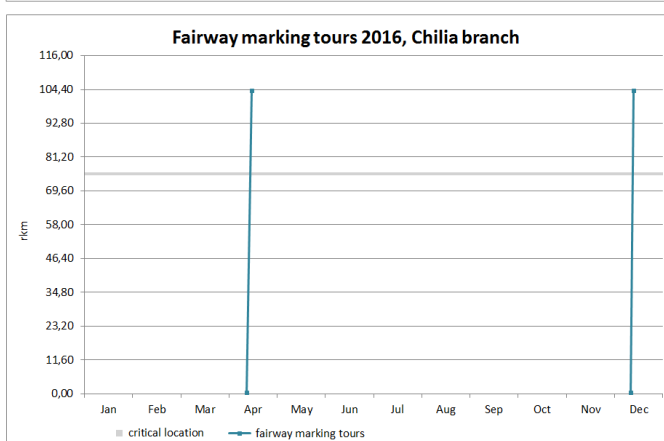
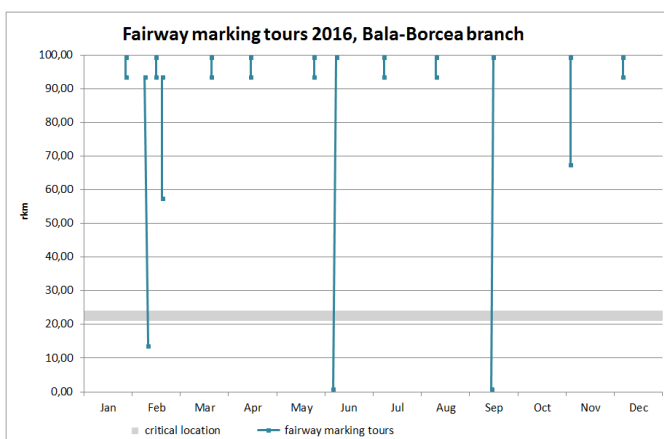
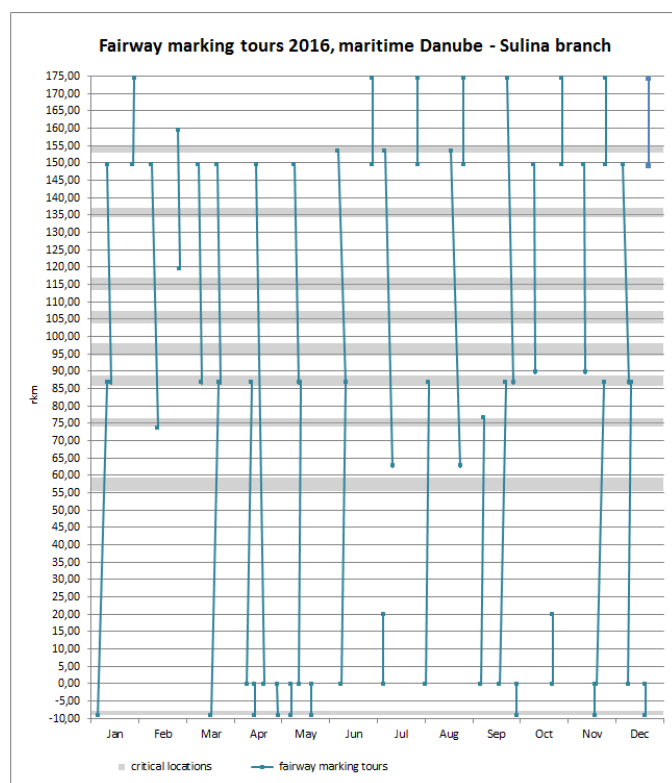
Based on the annual plan and the situation on the field, monthly field inspections were performed with specialised vessels that are equipped with a single-beam echo-sounder. The trips take about 10 days during which buoys are replaced, repaired, mounted, moved etc., depending on the situation in the field.

Depending on the hydrological conditions, recourse to the fairway buoying works was conducted (especially in Bechet and Corabia). When necessary, because of the low water levels, situated below LNWL, it was proceeded to narrow the fairway. Preventively when levels were close to LNWL values, interventions for narrowing the fairway and ensuring depths for navigation were performed. Most of the field inspection tours included some kind of small intervention or narrowing of the fairway.

Due to water levels and flow discharge, the fairway trajectory was not changed in 2016.



## Action Plan: Romania



### Danube-Black Sea Canal

During 2016 no fairway relocation took place on the Danube-Black Sea Canal.

### *Dredging activities 2016*

#### Danube

The following fairway dredging measures for the 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	Utilisation	m³	Permits (see next table)
	from river km	to river km	from river km	to river km						
Prut	137.0	133.0	138.6	138.0	15.04.2016	25.04.2016	Fine sediment	Dumping	53.568	1,2
Sulina bar	0.80	0.50	Black Sea	Black Sea	25.04.2016	28.04.2016	Fine sediment	Dumping	14.413	1,2
Prut	137.0	133.0	138.6	138.0	01.08.2016	13.09.2016	Fine sediment	Dumping	294.053	1,2
Bechet	678.0	675.0	672.0	671.0	01.09.2016	30.09.2016	Fine sediment	Dumping	71.394	n/a
Cochirleni	310.0	304.0	305.0	304.0	01.09.2016	30.09.2016	Fine sediment	Dumping	10.943	n/a



## Action Plan: Romania

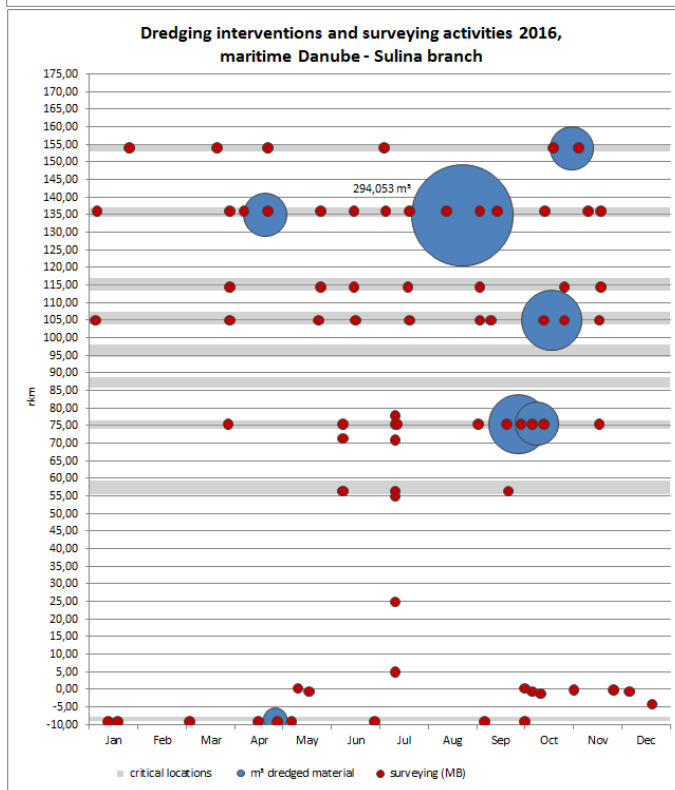
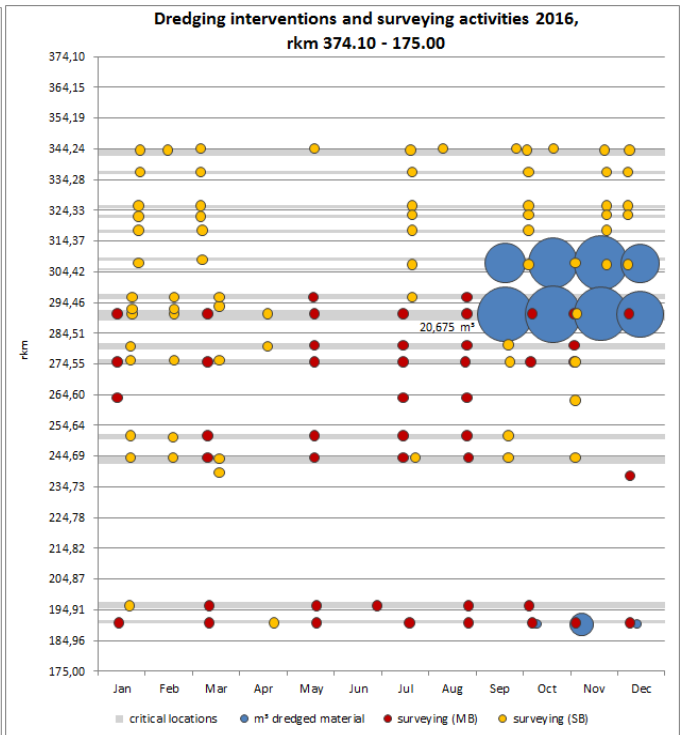
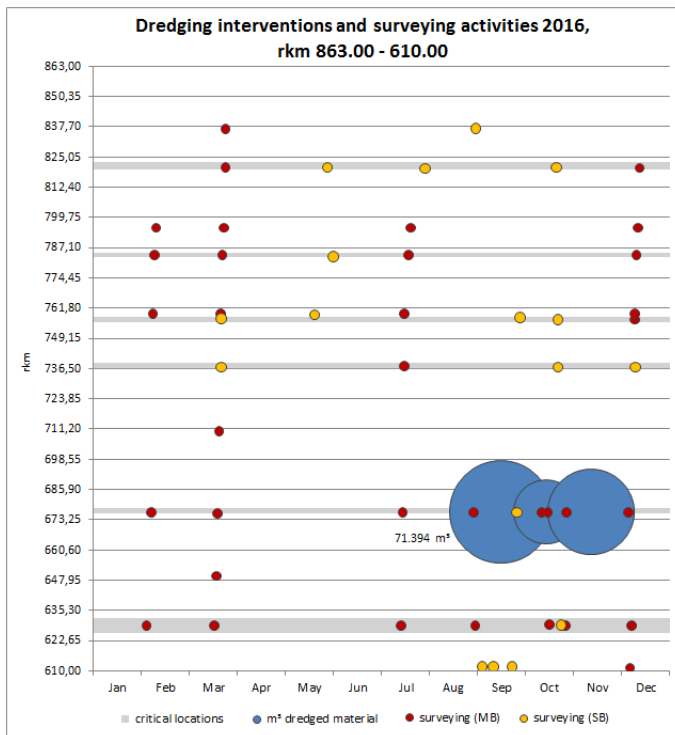
Seimeni	292.0	289.0	289.0	288.5	01.09.2016	30.09.2016	Fine sediment	Dumping	20.675	n/a
Tulcea	77.0	74.0	80.0	79.0	19.09.2016	05.10.2016	Fine sediment	Dumping	101.250	1,2
Bechet	678.0	675.0	672.0	671.0	01.10.2016	28.10.2016	Fine sediment	Dumping	28.606	n/a
Cochirleni	310.0	304.0	305.0	304.0	01.10.2016	31.10.2016	Fine sediment	Dumping	16.826	n/a
Seimeni	292.0	289.0	289.0	288.5	01.10.2016	31.10.2016	Fine sediment	Dumping	21.657	n/a
Dunarea Veche	191.5	189.0	188.0	187.5	05.10.2016	06.10.2016	Fine sediment	Dumping	532	n/a
Tulcea	77.0	74.0	80.0	79.0	05.10.2016	12.10.2016	Fine sediment	Dumping	53.850	1,2
Isaccea	107.0	103.0	102.0	101.5	12.10.2016	24.10.2016	Fine sediment	Dumping	100.451	1,2
Siret	155.0	153.0	151.5	151.0	27.10.2016	03.11.2016	Fine sediment	Dumping	52.974	n/a
Bechet	678.0	675.0	672.0	671.0	01.11.2016	23.11.2016	Fine sediment	Dumping	50.000	n/a
Cochirleni	310.0	304.0	305.0	304.0	01.11.2016	30.11.2016	Fine sediment	Dumping	20.121	n/a
Seimeni	292.0	289.0	289.0	288.5	01.11.2016	30.11.2016	Fine sediment	Dumping	19.636	n/a
Dunarea Veche	191.5	189.0	188.0	187.5	01.11.2016	06.11.2016	Fine sediment	Dumping	3.604	n/a
Cochirleni	310.0	304.0	305.0	304.0	01.12.2016	30.12.2016	Fine sediment	Dumping	10.178	n/a
Seimeni	292.0	289.0	289.0	288.5	01.12.2016	30.12.2016	Fine sediment	Dumping	14.720	n/a
Dunarea Veche	191.5	189.0	188.0	187.5	08.12.2016	09.12.2016	Fine sediment	Dumping	521	n/a

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 2016, on the river stretch of the Danube, the dredging works started in September and a volume of 289.413 m<sup>3</sup> was dredged with the assistance of third parties. In the maritime Danube, a volume of 670.559 m<sup>3</sup> was dredged starting with April 2016 with AFDJ resources.

In 2016, a volume of 959.972 m<sup>3</sup> was dredged to ensure the navigation conditions on the Romanian Danube sector.

## Action Plan: Romania



## Action Plan: Romania

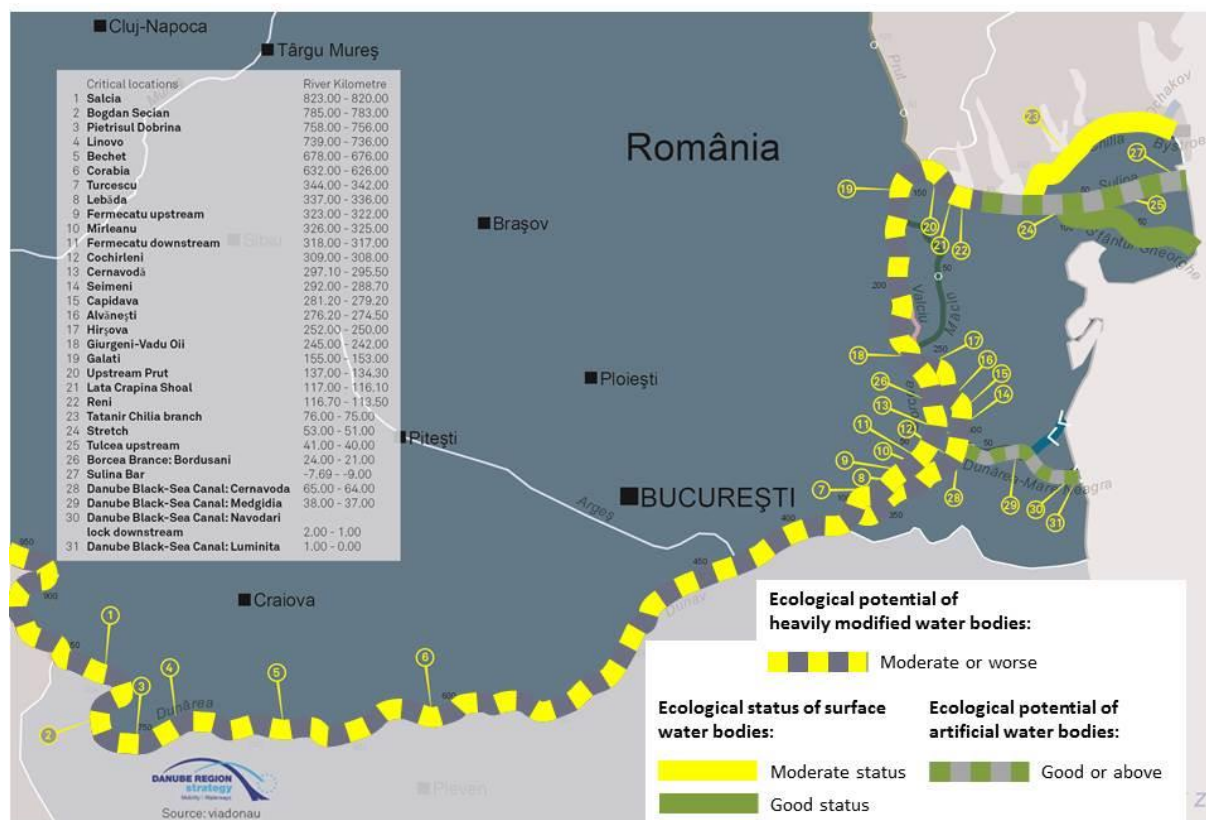
Referenced and relevant permits	Title of permit (original language)	Permitting authority	Permit applicable		Valid until	Type of permit (e.g. environmental, water, navigation law)	Main conditions for permit
			from river-km	to river-km			
1	Autorizația nr. 284 din 13.11.2013	Environmental Protection Agency Galati	0	175	12/11/2023	Navigation law	<ul style="list-style-type: none"> <li>To respect the Law no. 211/2011 regarding the regime of waste;</li> <li>To respect Government Decision no. 235/2007 regarding the management of the used oil;</li> <li>To respect the provisions of the International Convention for the Prevention of Pollution From Ships - MARPOL 73/78;</li> <li>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</li> <li>Monitoring of the quality of the environment</li> <li>Monitoring of the chemical composition of dredged material</li> </ul>
2	Autorizația nr. 1154 din 25.02.2013	Administration of the Danube Delta Biosphere Reserve	0	175	25/02/2023	Water Law	<ul style="list-style-type: none"> <li>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</li> <li>storage of the dredged material on the dredger „Dunărea Maritimă”</li> <li>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</li> </ul>

### Danube-Black Sea Canal

During 2016 no dredging works were performed on navigable canals.

## 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](http://www.icpdr.org) (public section).

### ***Measures to improve environmental conditions***

Potential works 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/OperationalProgrammeInfrastructure2014>. 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.

In order to achieve the environmental objectives will be developed documents required for EIA and will be considered the information presented in the 2011 feasibility study EIA report, and update that report in accordance with Article 5 and Annex III of the EIA Directive as last amended, and with the specific legal provisions of Romania and Bulgaria.

Within the procedure all mandatory documents shall be prepared, including:

- EIA report with 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, will be prepared arguments and evidence to support mitigating measures, 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) and thus require an Appropriate Assessment which will influence the development of solutions and details of the preferred option.

Will be undertaken Appropriate Assessment procedures 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.

### ***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. another 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 adequate assessment (AA). Works done in critical points 02 Epurașu and 10 Ostrovul Lupu will not have negatively impact the environment,



## Action Plan: Romania

according to the data monitored within the project "Monitoring the environmental impact of works to improve navigation conditions on the Danube between Călărași 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 documents required for EIA and will be considered the information presented in the 2011 feasibility study EIA report, and update that report in accordance with Article 5 and Annex III of the EIA Directive as last amended, and with the specific legal provisions of Romania and Bulgaria.

The EIA report will also include the *assessment of risk and vulnerability to climate change* for the sector of the Danube studied in the Project, and the *Report on the Impact of the Project on the Water Body in the Area Studied* will be prepared to assess the requirements of Article 4.7 of the Water Framework Directive.

will be seek constructive solutions that can optimise the incorporation of the "measures with the lowest impact" for every critical sector, and will be determined appropriate mitigation measures which will help minimise the project's environmental impacts (including those on Natura 2000 sites).

Will be undertaken Appropriate Assessment procedures 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 intrushes 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 the 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 2016

*Investments taken for FRMMP implementation 2014 –2020*

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	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
Minimum fairway parameters (dredging)	23 500 000	15 555 051	49%	7 944 949
Surveying of the riverbed	5 433 000	434 000	78%	4 999 000
Water level gauges	300 000	246 650	80%	53 350
Marking of the fairway	10 274 000	3 750 000	82%	6 524 000
Availability of locks / lock chambers	400 000	200 000	85%	200 000
Information on water levels and forecasts	206 000	206 000	85%	0
Information on fairway depths	400 000	400 000	85%	0
Information on marking plans	80 000	80 000	85%	0
Meteorological information	365 000	235 000	85%	130 000
Other needs	100 000	100 000	64%	0
<b>Sum (Euro)</b>	<b>41 058 000</b>	<b>21 327 711</b>	<b>75%</b>	<b>19 851 299</b>

*Operational expenditures for conducted activities 2016 and budget needs 2017 (AFDJ and ACN)*

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017*	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	1 800 000	2 000 000	2 000 000	-
Surveying of the riverbed	660 770	707 607	707 607	-
Water level gauges	-	-	-	-
Marking of the fairway	2 544 300	2 814 000	2 814 000	-
Availability of locks / lock chambers	8 807 529	8 810 000	8 810 000	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	77 381	217 119	217 119	-
<b>Sum</b>	<b>13 889 980</b>	<b>14 548 726</b>	<b>14 548 726</b>	<b>-</b>

\* The ACN budget is pending approval by the Finance Ministry

**Operational expenditures 2016 and budget needs 2017 (AFDJ)**

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining estimated financing gap 2017
Minimum fairway parameters (width/depth)	1 800 000	2 000 000	2 000 000	-
Surveying of the riverbed	655 900	700 000	700 000	-
Water level gauges	-	-	-	-
Marking of the fairway	2 525 500	2 700 000	2 700 000	-
Availability of locks / lock chambers	-	-	-	-
Information on water levels and forecasts	-	-	-	-
Information on fairway depths	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
<b>Sum</b>	<b>4 981 400</b>	<b>5 400 000</b>	<b>5 400 000</b>	<b>-</b>

**Operational expenditures 2016 and budget needs 2017 (ACN)**

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining estimated financing gap 2017
Minimum fairway parameters (width/depth)	-	-	The ACN budget is pending approval by the Finance Ministry	-
Surveying of the riverbed	4 870	7 607		-
Water level gauges	-	-		-
Marking of the fairway	18 800	114 000		-
Availability of locks / lock chambers	8 807 529	8 810 000		-
Information on water levels and forecasts	-	-		-
Information on fairway depths	-	-		-
Information on marking plans	-	-		-
Meteorological information	-	-		-
Other needs	77 381	217 119		-
<b>Sum</b>	<b>8 908 580</b>	<b>9 148 726</b>		<b>-</b>

## 8.7 RO | Outlook: actions, milestones and funding sources

**Danube and Danube-Black Sea Canal**

<b>RO 01: Insufficient number of sounding vessels</b>		
Planned activities:	Support acquisition of up-to-date sounding equipment to raise the coverage of surveyed areas managing of the purchasing	
Current shortcomings:	Insufficient of the up-to-date 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 2015/2016: Funding through CEF Programme – FAIRway Danube project Operational Programme Transport 2014-2020	
Next steps:	<b>AFDJ:</b> Acquisition of sounding vessels and equipment	until the end of 2017
	<b>ACN:</b> Acquisition of a portable single-beam echosounder	Finalised in Dec. 2016
	Finalization of feasibility study for design and built 2 multifunctional vessels	until Sept. 2017
	Design and built 2 multifunctional vessels (depending the financial resources)	until June 2020
<b>RO 02: Insufficient number of automatic gauging stations.</b>		
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:	Budget availability 2015/2016: Funding through SOP-T 2007-2013 – HyQ Danube Project CEF Programme – FAIRway Danube project next Operational Programme	
Next steps:	<b>AFDJ:</b> Organising the tender for acquisition and installation of the 10 automatic gauging stations in selected pilot areas within FAIRway Danube project	until June 2017

	Installation of automatic gauging stations in selected pilot areas within FAIRway Danube project	until Dec. 2017
	Submitting the project proposal for realisation of the network of hydrometric stations (installation or rehabilitation of 54 hydrometric stations)	until October 2017
	Organising the tender and realisation the network of hydrometric stations	until the end of 2020
	<b>ACN:</b> Technical expertise for existing gauging network system	Finalised Dec. 2016
	Acquisition procedure for modernization and extension of the existing gauging network system +execution.	until Dec. 2017
<b>RO 03: Lack of dredging equipment, specialized personnel and deficiency of investments in river regulation</b>		
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:	<b>AFDJ:</b> Missing dredging equipment for river sector problem areas 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  <b>ACN:</b> One of the important issues to ACN is to ensure the stability of navigable canals banks, in 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 2015/2016: Funding through state budget CEF-Programme	
Next steps:	<b>AFDJ:</b> Launch the tender for dredging equipment procurement within the SWIM project	until June 2017
	Finalised the tender procedure for acquisition of dredging equipment with funds from state budget	End of 2017
	New dredging equipment needs of having new specialized personnel – training will be made	2017- 2018

	<p><b>ACN:</b> Currently ACN is looking to identify the possible financial resources for execution of works. If ACN identifies the financial allocation for this project, the feasibility study (financed by ISPA funds) for protection and consolidation of banks will be revised and updated</p> <p>Design and execution of works (protection and consolidation of banks)</p>	<p>until 2018</p> <p>until 2020</p>
<b>RO 04: Inefficient procedures. The documentation to draw up a contract for dredging is time-consuming.</b>		
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:	<p>Budget availability 2015/2016: Funding through AFDJ budget/state budget CEF-Programme</p>	
Next steps:	<p>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</p>	<p>until July 2017</p>
<b>RO 05: Lack of efficient vessels and special equipment for marking</b>		
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:	<p>Budget availability 2015/2016: Funding through SOP-T 2007-2013 – Feasibility study for technical vessels CEF-Programme – FAIRway Danube project</p>	
Next steps:	Launch the tender procedure for purchasing the marking vessel	until June 2017
	Delivery of the marking vessel	until the end of 2018

<b>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</b>		
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 2015/2016: Funding through CEF-Programme – FAIRway Danube project Operational Programme 2014 - 2020 AFDJ budget/state budget	
Next steps:	Preparing the technical specification for public acquisition for marking system equipment	until June 2017
	Submitting a project proposal for improving and monitoring Romanian marking system	until 2017
	Manufacturing the standard buoys and develop a new design for winter floating signalisation	until the end 2017
<b>RO 07 Unavailable forecast for water levels</b>		
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:	Budget availability 2015/2016: Funding through SOP-T 2007-2013 – HyQ Danube Project CEF-Programme – FAIRway Danube project next call of CEF-Programme or next Investment Programme	
Next steps:	<b>AFDJ:</b> Organising the tender for automatic gauging stations for installation of 10 automatic gauging stations in selected pilot areas within FAIRway Danube project	until June 2017
	Installation of automatic gauging stations in selected pilot areas within the FAIRway Danube project	End of 2017
	Realisation of hydrological database within the FAIRway Danube project	until the end of 2018
	Set-up of the mathematical model used for water level forecasts	End of 2018



	Submitting the project proposal for realisation of the network of hydrometric stations	until Oct. 2017
	Implement a national forecast water level for 5 days with a high accuracy for the next 2-3 days (AFDJ+ACN)	until March 2019
	Organising the tender and realisation of the network of hydrometric stations (install/rehabilitate 54 hydrometric stations)	until 2020
	<b>ACN:</b> Organising the tender for automatic gauging station for installation automatic gauging station in a selected locations	until Dec. 2017
	Implement a national forecast water level for 5 days with a high accuracy for the next 2-3 days (AFDJ+ACN)	until March 2019
<b>RO 08: Information could be provided customer-friendly using established river information portals.</b>		
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 2015/2016: Funding through AFDJ budget/state budget Danube Transnational Programme 2014-2020	
Next steps:	<b>AFDJ:</b> Increasing technical capacity for processing and publishing fairway information Update of FIS Portal and D4D within Danube Stream Project Update the RoRIS Portal Update the fairway information on the company website and mobile RIS application	until the end of 2017 Permanent Permanent Permanent
	<b>ACN:</b> Update of FIS Portal and D4D within Danube Stream Project	until the end of 2017
<b>RO 09: Unavailable digital terrain models for shallow sections.</b>		
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 2015/2016: Funding through AFDJ budget/ state budget CEF-Programme	
Next steps:	<b>AFDJ:</b> Acquisition of software for creating the DTM within the FAST DANUBE project	End of 2018
	Realisation of data base for hydrographical data	End of 2018
<b>RO 10: Insufficient number and quality of weather stations.</b>		
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:	Budget availability 2015/2016: Funding through SOP-T 2007-2013 – HyQ Danube Project CEF-Programme – FAIRway Danube project next call of CEF-Programme or next Investment Programme	
Next steps:	Organising the tender for automatic gauging stations for installation of 10 automatic gauging stations in selected pilot areas within the FAIRway Danube project	until June 2017
	Installation of automatic gauging stations in selected pilot areas	End of 2017
	Submitting the project proposal for the realisation of the network of hydrometric stations	until Oct. 2017
	Organising the tender and install or rehabilitate 54 hydrometric stations	until the end of 2020
<b>RO 11: Missing interconnection with databases of other waterway administrations to exchange data</b>		
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:	Budget availability 2015/2016: Funding through SOP-T 2007-2013 – HyQ Danube Project CEF-Programme – FAIRway Danube project and other project proposal AFDJ budget/state budget	

## Action Plan: Romania

Next steps:	Acquisition of hardware and software for creating data base within the FAIRway Danube project and SWIM project	End of 2018
	Creating data base with the same structure with other waterway administrations for improving the data exchange service within the FAIRway Danube project	End of 2018

## 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 2012-2016

The recommended Level of Service of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level would correspond to an equal height of the blue (availability of 2.5m 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 2.5m 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 $\geq 2.5$ m 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
km 610 - km 607	Somovit	318	327	365	313	366
km 591 - km 584	Sredniak island Palets island	345	346	365	316	366
km 569 - km 561	Belene island Milka island Kondur island	283	275	337	212	273
km 548 - km 540	Vardim island	292	309	360	268	327
km 540 - km 536	Yantra River Giska Island	316	317	360	253	306
km 525 - km 520	Batin island	339	314	352	246	295
km 476 - km 472	Gostin island	337	326	365	365	366
km 463 - km 460	Mishka island	366	365	365	365	366
km 458 - km 455	Brashlian island	341	365	365	365	313
km 441 - km 435	Radetski island	366	365	365	365	366
km 426 - km 420	Kosui island Dunavets island	332	354	365	322	366
km 414 - km 410	Malak Preslavets island	345	341	365	365	366

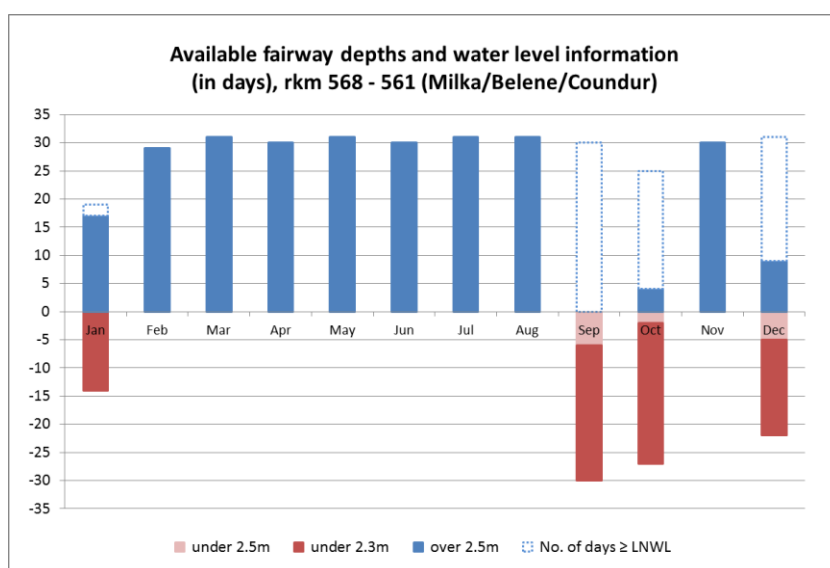
## Action Plan: Bulgaria

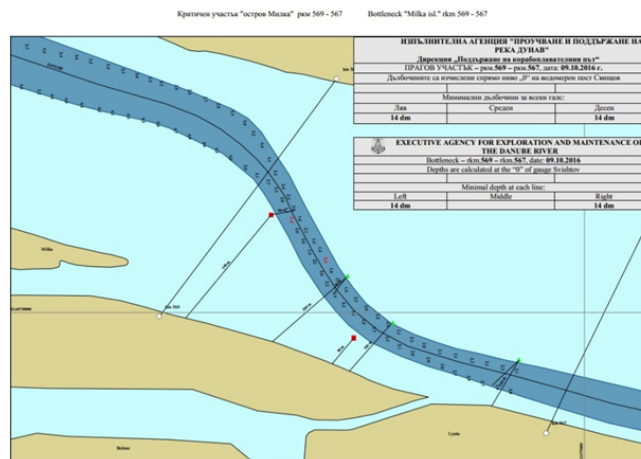
km 408 - km 399	Popina island	342	365	365	311	304
km 395 - km 390	Vetren island	345	365	365	365	366
km 386 - km 382	Chajka island	346	358	365	365	366

### Number of days with water level $\geq$ LNWL on main critical locations

Critical location	Reference gauges	2012	2013	2014	2015	2016
567.00-566.70 – Belene island 562.00-561.50 – Countur/Milka island 541.60-541.00 – Vardim island 538.50-537 – Giska island	Svishtov km 554.300	337	326	365	285	348
523.80-523.20 – Batin island 475.70-475.30 – Gostin island	Ruse km 495.600	341	329	365	288	348
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

2015 had been a very critical year on the Lower Danube. 2016 also started with fairway depths below 25 decimetres at some critical locations during the first half of January. After January the situation improved until September, when the low water season started.





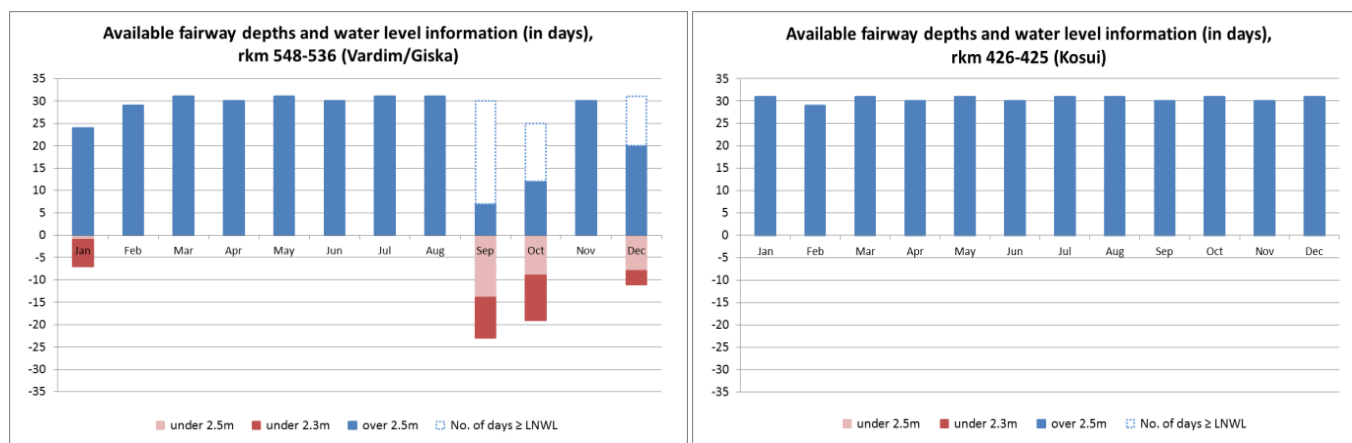
Minimum depth measured in the critical location Milka island - 2015:

- Depth less than 25 dm was observed in June 2015 at water level 220 cm at gauging station Svishtov;
- Number of days with depth <25 dm - 153;
- Number of days with water level under LNWL - 66.

Minimum depth measured in the critical location Milka island - 2016:

- Depth less than 25 dm was observed in the beginning of September 2016 at water level 188 cm in gauging station Svishtov;
- Number of days with depth <25 dm - 93;
- Number of days with water level under LNWL - 18.

## Action Plan: Bulgaria



As a general statement, fairway depths less than 25 dm at critical locations were observed at different water levels and different water levels occurred 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.

Some of the identified 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).

### 9.2 BG | Hydrological conditions at main critical locations 2016

2016 started with water levels below LNWL for several days, as a continuation of the bad winter in 2015. After January the hydrological conditions improved and the critical locations saw high medium water levels until September, when an extreme decrease of water levels caused occurrence of critical sections at e.g. water level +188 (reference gauging station Svishtov). Similar problems appeared in the area of Brashlian island (rkm 457 – 455) and in the area of Popina (rkm 407 – 405).



### 9.3 BG | Key issues and related activities 2016

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 2016
BG 01	Old or insufficient measuring equipment	Support acquisition of up-to-date (renewed single-beam and additional multi-beam) sounding equipment	<p>The FAIRway Danube project was approved by INEA and funded under CEF. Activity 3 includes the delivery of specialized vessel with multi-beam echo-sounder and 9 automatic gauging stations. Tender procedure for the vessel was launched in February 2017. The preparation of the tender documents for launching the procedure for the stations is in progress and most probably will be finalized in June 2017.</p> <p>The Project "Improvement of the systems for navigation and topo-hydrographic measurements on the Danube – phase 2" was approved for funding under OPTTI 2014-2020. The Application form was approved by the MA of OPTTI on 02.03.2016 and the Grant Agreement was signed on 30.03.2016. The contract with the supplier, selected during an open public procurement procedure according to the Public Procurement Act, was signed in March 2016. The surveying vessel was delivered in February 2017 and baptized in March 2017.</p>
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	<p>The FAIRway Danube project was approved by INEA and funded under CEF. Activity 3 includes delivery of a Waterway Monitoring System. An Agreement regarding the joint procurement of the transnational Waterway Monitoring System was concluded and the procurement documents were elaborated.</p> <p>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. The public procurement for the selection of consultant was conducted and the contract, awarding the service was signed in February 2017.</p>
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 surveying vessel, gauging stations, water level forecast software and WMS. The tender procedure for surveying vessel was launched in December 2016.

			Preparation and submission of project "Improvement of the systems for navigation and topohydrographic measurements on the Danube – phase 2" to be financed under OPTTI 2014-2020. The project foresees delivery of surveying vessel to deliver data for the WAMOS.
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  Increase available annual resources for dredging works  Support implementation of structural river engineering measures	Preparation of project "Modernization and optimization of the activities for rehabilitation of the fairway in the common Bulgarian-Romanian section of the Danube River" to be financed under OPTTI 2014-2020. The project foresees delivery of multifunctional dredger (cutter suction dredger). The Application form is under preparation and is expected to be submitted to the MA latest in June 2017. The evaluation period is 90 days. In parallel, the technical specifications and tender dossier will be elaborated, respectively - a tender should be done.  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.
BG 06	High traffic risks due to loss or incorrectness of navigation signs provoked by accidents with ships or insufficient maintenance	Enable improved surveillance of navigation activities by electronic means  Increase resources for maintenance of floating signs	The delivered floating and coastal navigational signs within project „Improvement of the systems for navigation and topohydrographic measurements along the Danube River" under OPT 2007-2013, were positioned. The system for control of location of floating signs and coastal light beacons in real time has been tested and was fully operable by the end of 2015. Possible extension of the system for control of location of the signs is under internal discussion and could be financed under the OPTTI 2014-2020.  The necessary resources are secured and available.
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 multi-beam echosounder and marking vessel. The tender procedure for the marking vessel was launched in March 2017. See "Improvement of the systems for navigation and topohydrographic measurements on the Danube – phase 2" (BG01).

## 9.4 BG | Review of rehabilitation and maintenance activities 2016

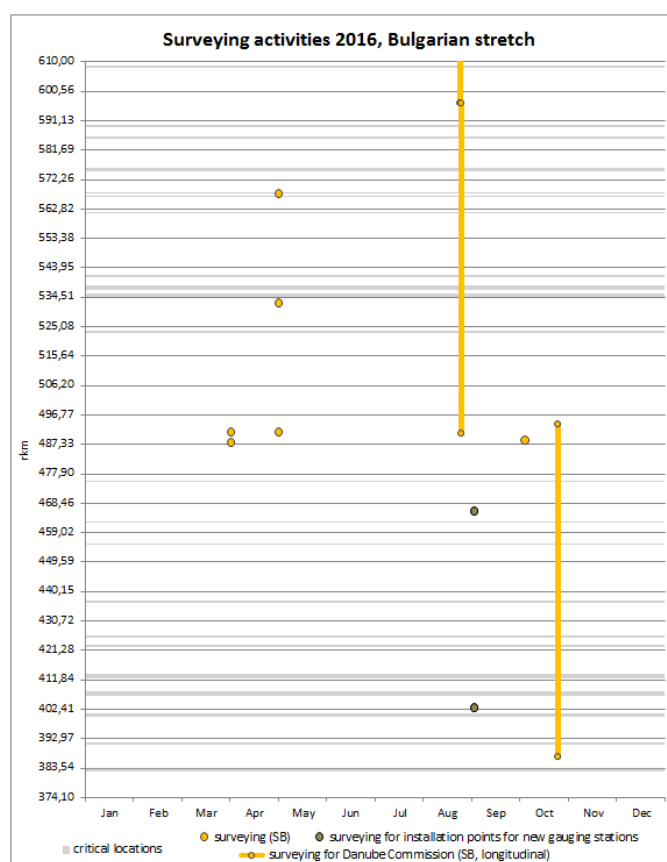
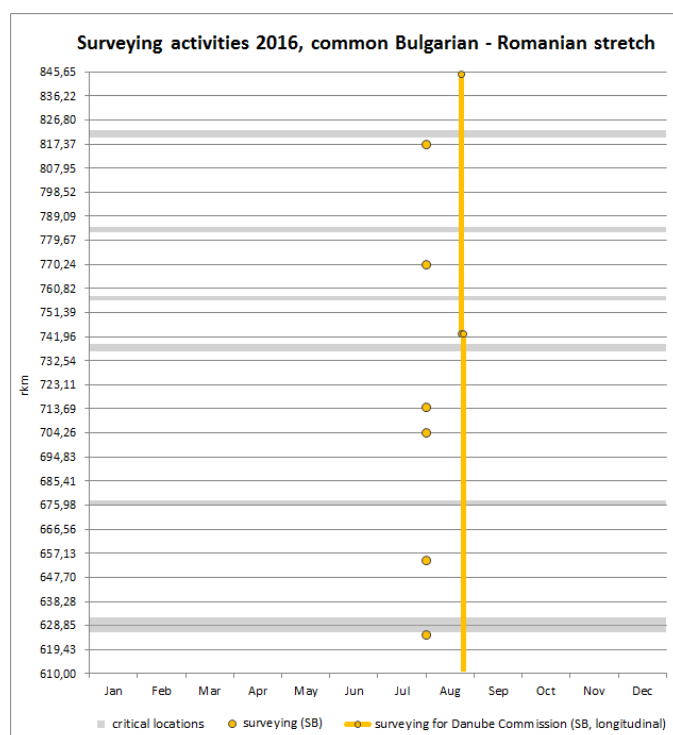
For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours are visualised in charts, each 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 2016

During 2016, the following surveys were performed. The locations to be surveyed in 2016 were prioritized by the hydrographic department.

In August and September 2016 a detailed planning of the new locations of the gauging stations, which will be delivered under FAIRway Danube project, was done. Yet, EAEMDR chose another location on the shore which is suitable for providing the correct water-levels for inland navigation and flood protection, but which is installed at a less ecologically sensitive area.

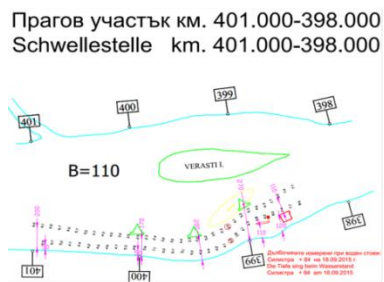
The surveys at the end of August and in late October were requested by the Danube Commission and were performed as a single-beam survey of the longitudinal fairway profile instead of cross-section profiles.



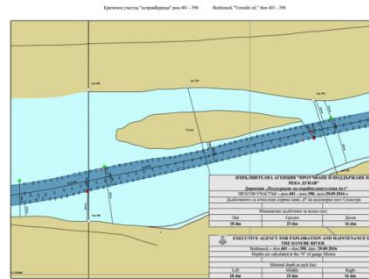
## Fairway monitoring and marking activities 2016

Waterway inspection and marking tours are done with the EAEMDR marking vessel, equipped with a single-beam echo-sounder. The 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.

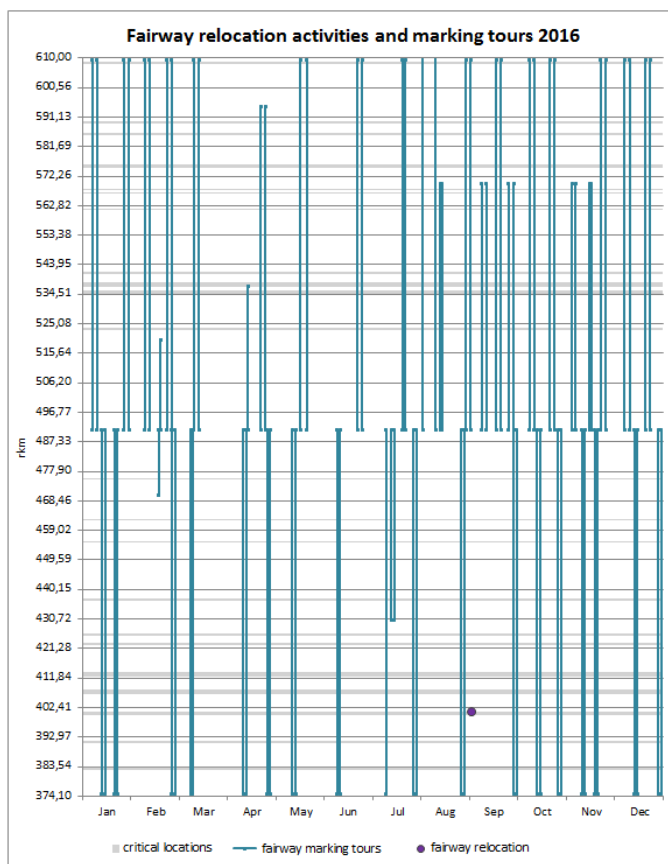
In 2016 only one relocation intervention of the fairway trajectory was performed. The change was done in September 2016 from rkm 401 to rkm 399.



Fairway trajectory 2015



Fairway trajectory 2016



### ***Dredging activities 2016***

No dredging activities on the fairway were performed by EAEMDR in 2016. The main reason lies in the lack of suitable dredging equipment available to EAEMDR (see key issue BG 05). The extremely limited financial resources additionally hamper the execution of dredging works with the equipment which is available. In March 2017 a tender for dredging on the fairway from rkm 610.000 until rkm 374.100 on the Danube was published. The deadline for receiving offers is 02.05.2017.

## **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 updated and currently it is under procedure of public hearings. The process is not finalized and the updated plan is not approved yet.

The Danube River in the Bulgarian stretch was determined in DRBMP 2010-2015 as “heavily modified water body” on the basis of following criteria: water discharge alteration due to significant withdrawals of water bodies (category “River”) after dams; regulation of the flow (via built dams); morphological changes (due to extraction of inert materials from the river beds, corrections riverbed and building hydropower plants).

During a technical meeting between Bulgaria and Romania in 2004 and an agreement was achieved for the classification of the Danube River in the common Bulgarian-Romanian section (from km 833.6 – Novo selo to km 375.5 - Silistra) as HMWB. For the WBMP 2010-2015 the final tests from the Common implementation strategy for WFD were not applied.

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.

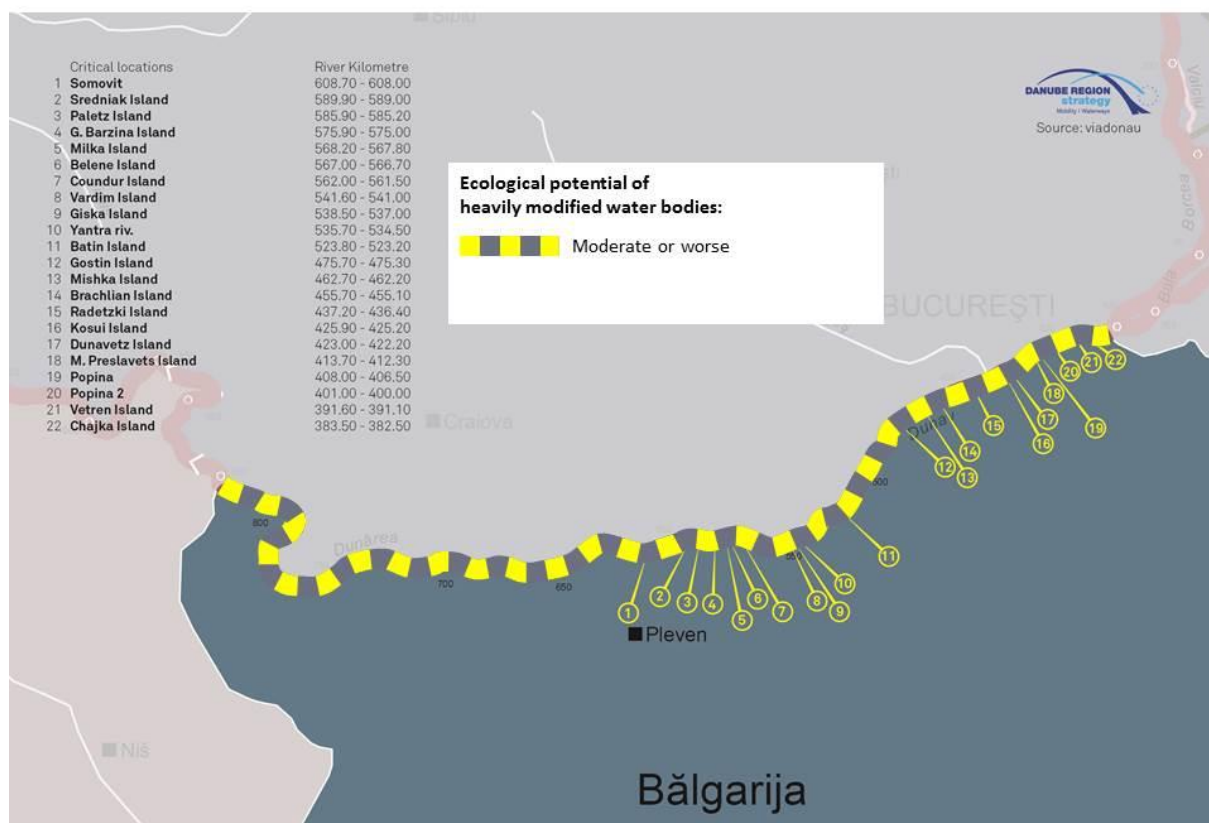
One of the main deliverables of the on-going project “Intercalibration of the methods for analysis of biological quality elements (BQE) for the types of surface waters on the territory of Bulgaria, corresponding to common European types in the Geographical intercalibration groups” (November 2013 - December 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 construction of dikes for the purpose of flood protection exercise the main impact on the hydromorphological 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 should be also 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, but could be finally

## Action Plan: Bulgaria

determined as such after the conclusions of “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” project are ready.

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.

The new Danube River Basin Management Plan 2016-2021 has been updated and approved on 29.12.2016. During the update of DRBMP an investigation of the existing one was conducted.

### **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 favourable 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;



## Action Plan: Bulgaria

- 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 on the fairway were performed by EAEMDR during the past years. The main maintenance activity performed by the Agency is marking of the fairway. The negative environmental impact from the marking activity can be considered insignificant.

## 9.6 BG | Budget status 2016

### *Investments taken for FRMMP implementation 2014 –2016*

	Required additional investment 2014 – 2020 according to FRMMP	Investment costs secured by state or other co-financing	% thereof EU co-financed	Remaining financing gap - Investments according to FRMMP
<b>Need areas</b>				
Minimum fairway parameters (dredging)	8 020 000	4 500 000	0	3 520 000
Surveying of the riverbed	3 810 000	3 827 822	85%	-
Water level gauges	0	400 000	85%	-
Marking of the fairway	9 215 000	4 044 245	85%	5 170 755
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	0	125 000	85%	-
Information on fairway depths	12 000	320 000	85%	-
Information on marking plans	0	0	0	0
Meteorological information	75 000	80 000	85%	75 000
Other needs	0	150 000	85%	-
<b>Sum (Euro)</b>	<b>21 132 000</b>	<b>8 947 067</b>	<b>85%</b>	<b>13 190 755</b>

**Operational expenditures for conducted activities 2016 and budget needs 2017**

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	0	3 067 751 <sup>3</sup>	0	3 067 751 <sup>3</sup>
Surveying of the riverbed	30 000 <sup>4</sup>	600 000	380 000 <sup>1</sup>	220 000
Water level gauges	36 000 <sup>2</sup>	5 000	36 000 <sup>2</sup>	-
Marking of the fairway	160 000	268 750	160 000	108 750
Availability of locks / lock chambers	n/a	n/a	n/a	n/a
Information on water levels and forecasts	36 000 <sup>2</sup>	14 000	36 000 <sup>2</sup>	-
Information on fairway depths	6 000	6 000	6 000	0
Information on marking plans	6 000	6 000	6 000	0
Meteorological information	36 000 <sup>2</sup>	15 000	36 000 <sup>2</sup>	-
Other needs	20 000	20 000	20 000	0
<b>Sum (Euro)</b>	<b>330 000</b>	<b>4 002 501</b>	<b>680 000</b>	<b>3 396 501</b>

<sup>1</sup> including 350 000 € foreseen for pilot implementation during 2017 within FAIRway Danube project

<sup>2</sup> The operational expenditures for the year 2016 (108.000 Euro) in lines “water level gauges”, “information on water level and forecasts” and “meteorological information” could not be provided separately for each activity, because the stations on Bulgarian banks provide both hydrological and meteorological information

<sup>3</sup> In 2016 a tender documentation for public procurement for dredging on the fairway was elaborated and the estimated indicative budget for one year is 3.067.751 Euro

<sup>4</sup> The significantly low expenditure for the surveying activities during 2016 could be explained with the fact that some of the measurements were performed together with the marking activities in one and the same trip of EAEMDR marking vessel

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

<b>BG 01: Old or insufficient measuring equipment</b>		
Planned activities:	Implementation of FAIRway Danube project - delivery of surveying vessel, equipped with a multi-beam echo sounder and delivery of automatic gauging stations.	
Current shortcomings:	None identified	
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 public procurement procedure for the surveying vessel was launched in December 2016, as for the gauging stations the tender is expected to be launched in March 2017. The delivered equipment will be used in the monitoring pilot sub-activity within FAIRway Danube project. This sub-activity covers the analysis of the data collected by the surveying vessel and the water level gauges. The measurements will be carried out at critical locations on the Danube and the Danube-Black Sea Canal.	2016-2017
<b>BG 02: Education and skilled staff</b>		
Planned activities:	<p>The requirements for sufficient training for personnel to operate the equipment, delivered within FAIRway Danube project and project "Improvement of the systems for navigation and topohydrographic measurement – phase 2", are included in the terms of reference for the deliveries. In respect to the project schedule some of the trainings were conducted at the end of 2016 and the beginning of 2017.</p> <p>A project proposal for improving the administrative and technical capacity of the Agency was submitted to priority axes 5 – Technical assistance of Operational programme on "Transport and Transport Infrastructure 2014-2020". The MA approved the project in September 2016. The implementation of the activities included in the project (organization and conduction of trainings to improve the qualifications of the Agency`s employees working on projects, specialized training on Public Procurement Act, information and publicity/presentation and communication skills; financial implementation and completion of projects under operational programmes; development, management, monitoring and reporting on the implementation of projects under programs funded by the ESIF, as well as Auto CAD training;</p>	

	improvement of the existing office equipment; optimization of the existing website/development of an online platform for publishing of information) also started in September 2016, when the Grand Agreement was signed between EAEMDR and the MA of the operational programme.	
Current shortcomings:	None identified	
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:	Operational Programme "Transport and Transport Infrastructure 2014-2020"	
Next steps:	Implementation of project "Increasing the capacity of EAEMDR for implementation of projects under the OPTTI 2014-2020, and improvement of the the material and technical base of the Agency"	2016
<b>BG03: Improved monitoring procedures, data quality and analyses</b>		
Planned activities:	Currently EAEMDR operates 9 automatic hydrological and 9 automatic meteorological stations, delivered within project "Improvement of the systems for navigation and topohydrographic measurements along the Danube River", OPT2007-2013 Additional number of gauging stations, surveying vessel and integration of WAMOS is 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
	Which measures are taken to mitigate these impacts?	-
	Is water status still expected to deteriorate?	-
Possible funding:	CEF	
Next steps:	The public procurement procedure for the surveying vessel was launched in December 2016, as for the gauging stations the tender is expected to be launched in June 2017. The delivered equipment will be used in the monitoring pilot sub-activity within FAIRway Danube project. This sub-activity covers the analysis of the data collected by the surveying vessel and the water level gauges. The measurements will be carried out at critical locations on the Danube and the Danube-Black Sea Canal.	2017

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

## ANNEX

to the

NATIONAL ACTION PLANS

UPDATE MAY 2017

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 –2016

The **Level of Service of 2.0m fairway depth<sup>17</sup> 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 2.5m 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 1.9 or 1.8m fairway depth** is displayed additionally.

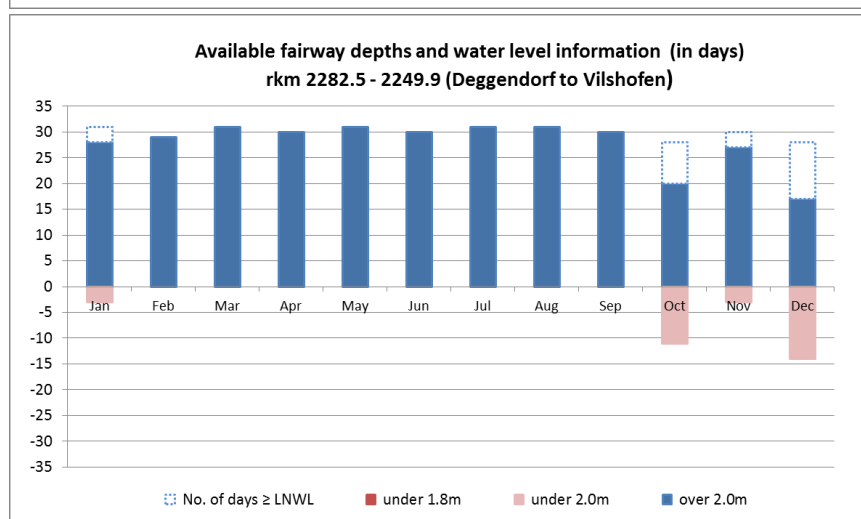
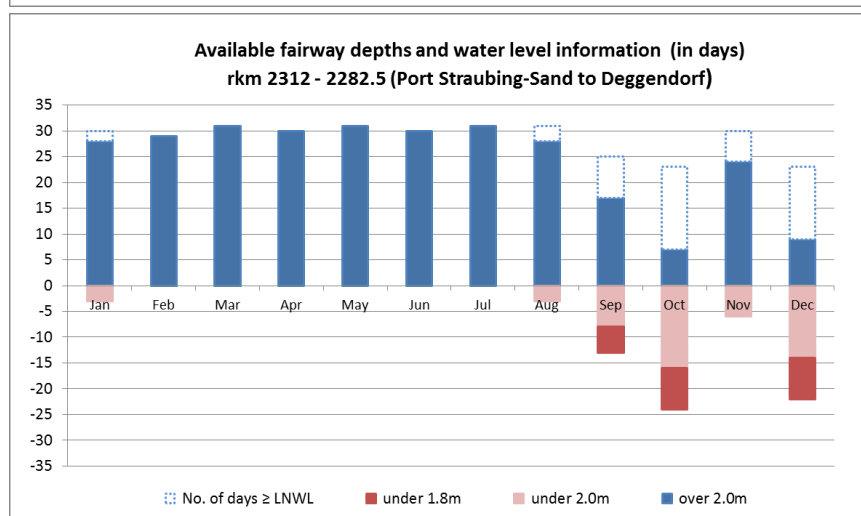
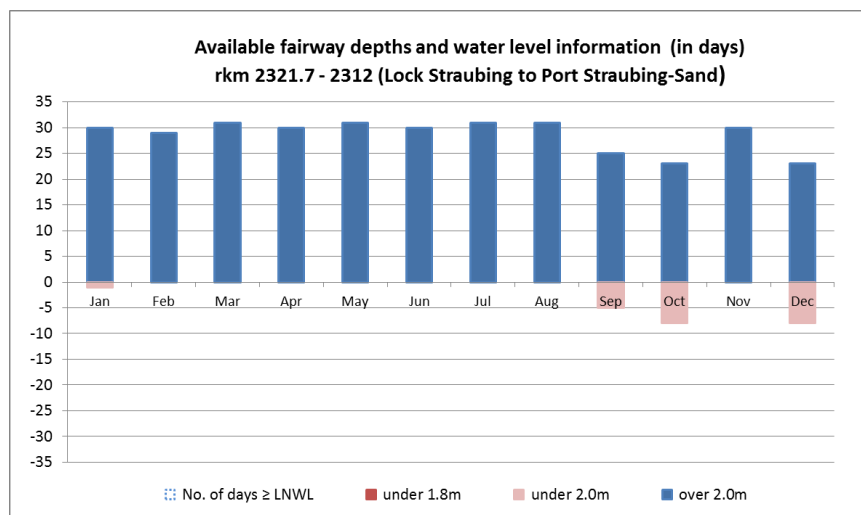
#### *Number of days with fairway depths $\geq 2.00$ m (target value<sup>17</sup>) for main critical locations*

Critical location	2012	2013	2014	2015	2016
Lock Straubing to Port Straubing-Sand	352	362	335	258	344
Port Straubing-Sand to Deggendorf	332	359	320	243	295
Deggendorf to Vilshofen	352	330	272	250	335

#### *Number of days with water level $\geq$ LNWL on main critical locations*

Critical location	Reference gauges	2012	2013	2014	2015	2016
Lock Straubing–Port Straubing-Sand	Pfelling	352	362	335	258	344
Port Straubing-Sand–Deggendorf	Pfelling	352	362	335	258	344
Deggendorf–Vilshofen	Hofkirchen	360	365	351	273	360

<sup>17</sup> 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).



During 2016 there was no critical sedimentation in the critical section from lock Straubing to port Straubing-Sand. That is why the number of days with fairway depths above 2.0 m (target value) is equal to the number of days with available water levels above LNWL.

Regarding the section from port Straubing-Sand up to the city of Deggendorf, existing sedimentation do not yield fairway limitations due to sufficient available water levels the first two



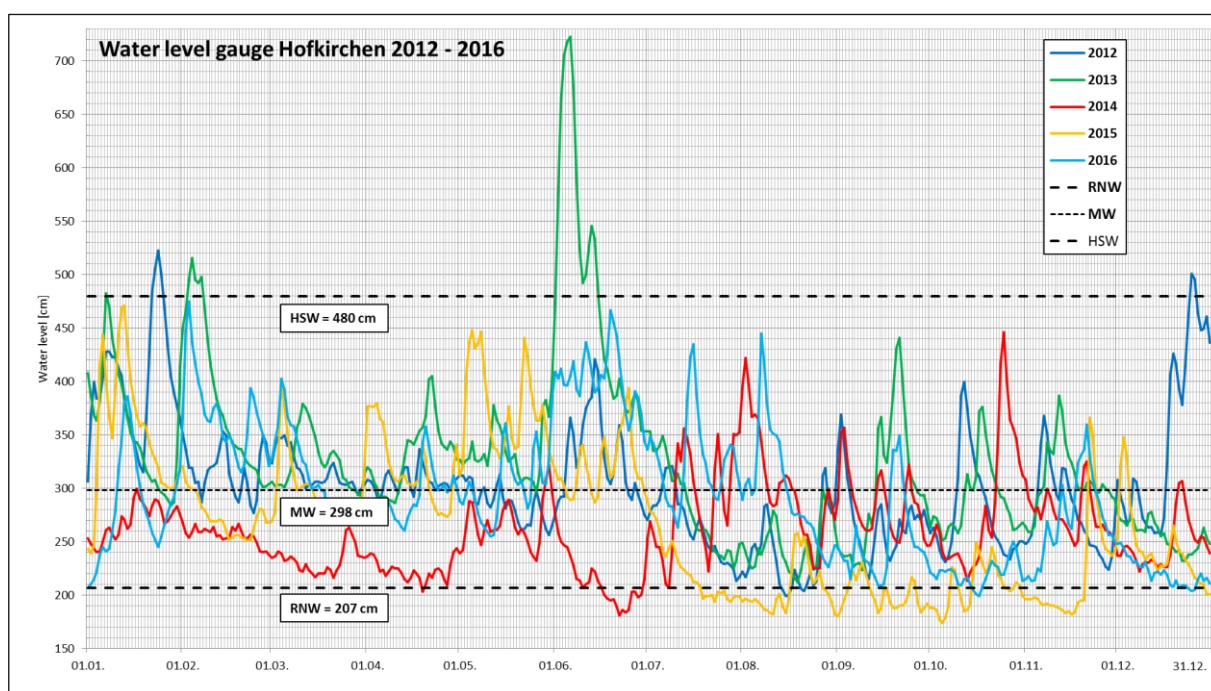
thirds of the year 2016. The main reasons for not meeting the target value of 2.0 m below LNWL in the last trimester of 2016 was the combination of required dredging works and low water levels. Overall, 2.0 m of fairway depth formally was **not** provided on 71 days (19,4%), which includes 22 days (6%) with low water.

In section Deggendorf–Vilshofen in 2016 sedimentation lead to fairway limitations only for a couple of days in October and November, combined with particularly low water levels. The available fairway depths dropped below the envisaged 2.0 metres on 31 days (8,5%).

Moreover, there was massive sedimentation at the confluence of river Isar in 2015, which persisted up to midmonth January 2016. Naturally, the Isar fills up a gravel cone into the Danube which leaves room for one-way traffic to all vessels. The passage was only permitted for vessels with a maximum beam of 11.55 m (no barge combination allowed).

Generally, shipping ban due to naval accidents or service and maintenance works at the waterway (complex dredging) and its constructive works (locks, weirs, groynes etc.) are not included in the above compilation.

## 10.2 DE | Hydrological conditions at main critical locations 2016



While the year 2015 was characterized by difficult hydrological conditions from a shipping perspective, this situation has been improved in 2016. Above all in the first half of the year the median value has been exceeded. However, there have been low discharges in the last third of 2016, especially in October and December.

### 10.3 DE | Key issues and related activities 2016

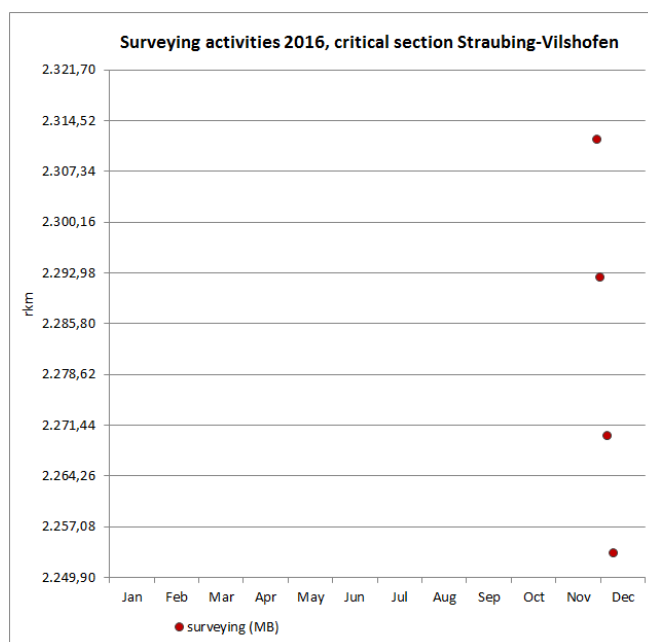
Activities performed related to the key issues illustrated in the Fairway Rehabilitation and Maintenance Master Plan (version: December 2014, cf. 10.7):

	Key issues	Need for action	Activities performed 2016
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	<i>Dredging activities overall: 76.000 m<sup>3</sup> (cf. 10.4) Thereof government-operated: 0 m<sup>3</sup> (however, own capacities would have been available)</i>
DE 02	Enhancing the information on water levels	Implementing an hourly push-mode (currently pull-mode via modem) Duplication for redundancy purpose	<i>Approximately 50% successful implementation for gauges at German section of the Danube</i>

### 10.4 DE | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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 2016



Monitoring of the fairway on the entire German Waterway Danube is conducted annually. Every two years the navigable water beyond the fairway is recorded. These measurements (for several purposes) are performed by the sounding vessel “Kepler” via trifold multibeam echosounder (each producing a swath of depth readings from a single ping). Furthermore, the free flowing section Straubing–Vilshofen is measured each year to safeguard safety and ease of shipping by means of multiple single beams mounted on a frame (work boats “Laber” and “Regen” and by means of a multi-beam system mounted on sounding vessel “Tangens”).

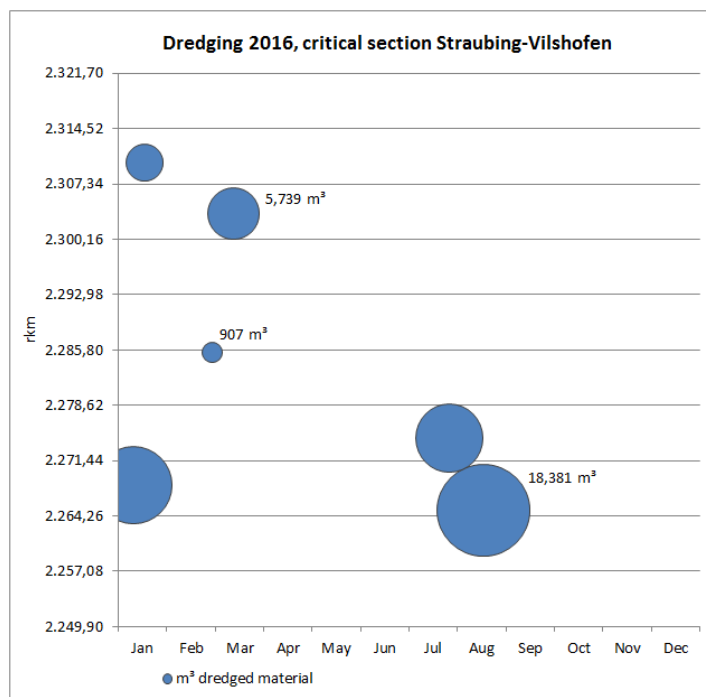
This measuring campaign was conducted at the end of the year (cf. figure below). Additional surveying activities after special incidents (e.g. floods, naval accidents) as well as in the context of new construction works or development measures are not included in this compilation.

### Fairway relocation and marking activities 2016

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 2016 there was no significant relocation activity in Germany.

### Dredging activities 2016

Designation of assignment (navigable route only)	Dredging site (river-km)	Dumping or placement site (river-km)	Beginning - end of service	Material	Quantity [m³]
<b>Reservoir Aschach</b> (Tailwater Sluice Jochenstein)	2202,700 - 2202,600	2202,000	29.02.2016	Sand / Gravel	94
<b>Reservoir Jochenstein</b> (Headwater Sluice Jochenstein)	2203,500 - 2203,400	2204,000	01.09.2016	Sand / Gravel	1500
Passau	2227,300 - 2227,100	2221,000 - 2220,000	01.-02.03.2016	Sand / Gravel	366
Passau (Tailwater Kachlet)	2230,375 - 2230,125	2221,000 - 2220,000	03.03.2016	Sand / Gravel	119
<b>Reservoir Kachlet</b>	Windorf	Isar river	07.03.2016 - 18.03.2016	Sand / Gravel	2301
Vilshofen	2249,775 - 2249,475	Isar river	16.03.2016 - 23.03.2016	Sand / Gravel	1677
<b>Straubing - Vilshofen</b> (free flowing section)	Winzer	Isar river	25.08.2016 - 30.08.2016	Sand / Gravel	3305
Winzer	2264,550 - 2263,775	Isar river	24.08.2016	Sand / Gravel	2799
Winzer	2267,325 - 2263,775	Isar river	02.12.2015 - 19.01.2016	Sand / Gravel	5825
Winzer	2266,725 - 2265,525	Isar river	17.08.2016 - 23.08.2016	Sand / Gravel	3929
Betw een Winzer and Aicha	2269,025 - 2266,950	Isar river	02.08.2016 - 16.08.2016	Sand / Gravel	8348
Betw een Winzer and Aicha	2272,376 - 2268,500	Isar river	02.12.2015 - 19.01.2016	Sand / Gravel	7026
Betw een Aicha and Niederaltich	2276,150 - 2272,075	Isar river	18.07.2016 - 02.08.2016	Sand / Gravel	9878
Deggendorf	2285,300 - 2285,100	Isar river	28.02.2016	Sand / Gravel	907
Irlbach	2303,950 - 2302,650	2328,400S - 2321,200S	09.12.2015 - 23.05.2016	Sand / Gravel	5739
Bogen	2309,917 - 2309,658	2328,400S - 2321,200S	13.01.2016 - 21.01.2016	Sand / Gravel	2931
<b>Reservoir Straubing</b>	Straubing	2348,970 - 2348,489	22.01.2016 - 03.02.2016	Sand / Gravel	3760
<b>Reservoir Geisling</b>	Donaustauf	2369,046 - 2368,789	02.2016 - 07.2016	Sand / Gravel	704
Regensburg	2376,259 - 2373,245	2371,800 - 2371,100	02.2016 - 07.2016	Sand / Gravel	692
<b>Reservoir Regensburg</b>	Sinzing	2389,849 - 2389,225	15.06.2016 - 30.06.2016	Sand / Gravel	3069
betw een Matting and Gundelshausen	2396,400 - 2393,475	2371,800 - 2371,100	10.03.2016 - 14.06.2016	Sand / Gravel	4755
<b>Reservoir Bad Abbach</b>	Saal	2408,477 - 2406,049	17.02.2016 - 08.03.2016	Sand / Gravel	6265



In total 75.988 m³ were dredged for commercial navigation in 2016 on the entire German waterway Danube. Regarding official permission (cf. 10.5), the Waterways and Shipping Office Regensburg presents annually (usually 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 task to maintain safety. The figure shows that most works were dredged in January (winter) and in August (summer).

## 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 following map 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. Currently, the approval and hearing procedure under public law for the 1<sup>st</sup> subsection from Straubing to Deggendorf (confluence Isar) is taking place. As regards the 2<sup>nd</sup> subsection from Deggendorf to Vilshofen a scoping was held and a planning approval procedure is prepared to start in 2017. 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 a 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 (last paragraph).



## 10.6 DE | Budget status 2016

### Operational expenditures for conducted activities 2016 and budget needs 2017

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth) (here only dredging costs cf. 10.4)	1 170 084	*1	*3	0
Surveying of the riverbed	*1	*1	*3	0
Water level gauges	150 000 and *1	150 000 and *1	150 000 and *3	0
Marking of the fairway	*1	*1	*3	0
Availability of locks / lock chambers	*1	*1	*3	0
Information on water levels and forecasts	*1,2	*1,2	*3	0
Information on fairway depths	*1,2	*1,2	*3	0
Information on marking plans	*1,2	*1,2	*3	0
Meteorological information	*1,2	*1,2	*3	0
Other needs	-	-	-	-
<b>Sum (Euro)</b>	<b>1 320 084</b>	<b>150 000 and *1,2</b>	<b>150 000 and *3</b>	<b>0</b>

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

**\*2** Job completion in legal and administrative co-operation 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.

## 10.7 DE | Outlook: actions, milestones and funding sources

<b>DE 01: 20% of dredging works may be conducted by WSV itself (providing sufficient available capacity for government-operation)</b>		
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: Sufficient national funding is available	
Next steps:	Market Observation (current dredging prices), monitoring waterway (safety and ease of shipping)	permanent

<b>DE 02: Improved water level information</b>		
Planned activities:	Provision of hardware Implementation of an hourly push-mode	
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:	Improvement of central EDP systems in terms of availability including redundancy for remaining 50% (cf. 10.3)	until 12/17



## 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 locations including water level information 2012 –2016

The **recommended Level of Service of 2.5m fairway depth<sup>17</sup> at Low Navigable Water Level** would correspond to an equal height of the blue (availability of 2.5m fairway depth) and the white columns framed in blue (water level above Low Navigable Water Level) in the figures below.

#### Danube

***Number of days with fairway depths  $\geq 2.5\text{m}$  (fairway width reduced to 100 m – minimum LoS) on main critical locations***

Critical location	2012	2013	2014	2015	2016
Apatin	366	365	365	365	366
Futog	366	235	365	360	327

***Number of days with water level  $\geq$  LNWL on main critical locations***

Critical location	Reference gauges	2012	2013	2014	2015	2016
Apatin	Apatin	366	365	365	316	353
Futog	Novi sad	366	363	365	324	353

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

The situation at the critical location Futog was a bit worse in 2016 compared to 2015, having in mind available fairway depth and width. Fairway width is still reduced to the minimum Level of Service, which is 100 m. On the 100 m fairway width, fairway depth of 2.5 m was achieved for 327 days (89.3%). On the 120 m fairway width, fairway depth of 2.5 m was also achieved for 327 days in 2016 (89.3%).



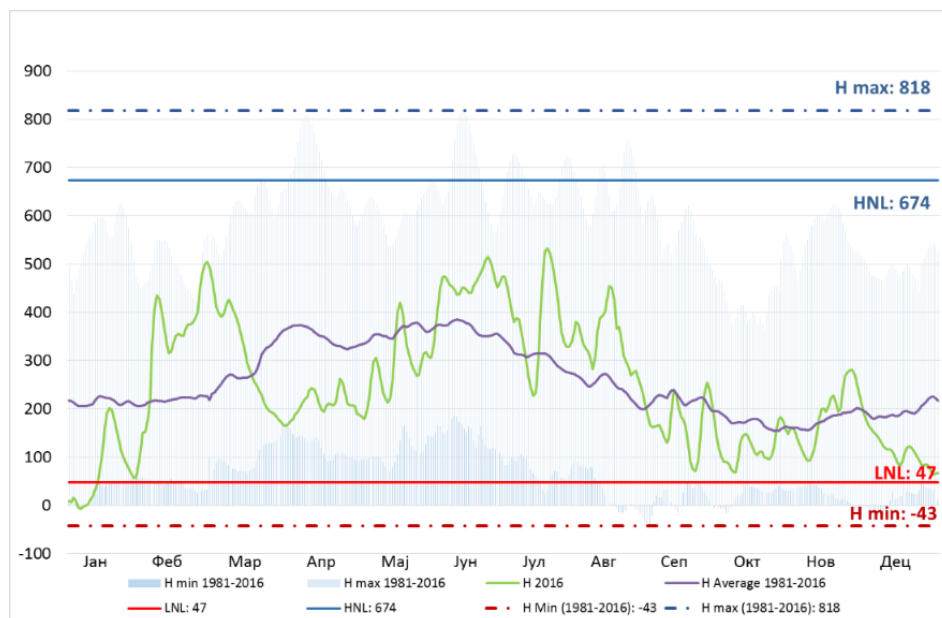
## Sava

*Number of days with fairway depths  $\geq 2.5$  m (on fairway width 55 m) on main critical locations*

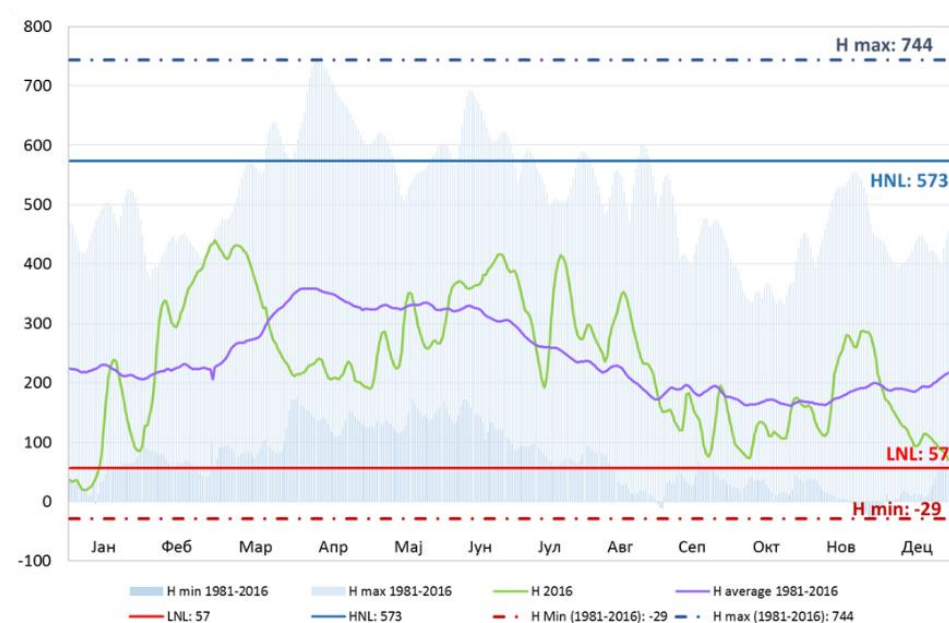
Critical location	2012	2013	2014	2015	2016
Sabac	n/a	n/a	306	216	337
Kamicak	n/a	n/a	346	203	324

## 11.2 RS | Hydrological conditions at main critical locations 2016

**Gauging station Apatin:** In the period January-December 2016, 13 days with water levels below LNWL have been recorded. Multiannual hydrograph for the gauging station Apatin and water level data for 2016 are presented in the figure below.



Water level data for the **gauging station Novi Sad** (which is the reference gauging station for the critical sector Futog): In 2016, 13 days with water levels below LNWL have been recorded. Multiannual hydrograph for the gauging station Novi Sad and water level data for 2016 are presented in the figure below.



## 11.3 RS | Key issues and related activities 2016

	<b>Key issues</b>	<b>Need for action</b>	<b>Activities performed 2016</b>
<b>RS 01</b>	<p>Limitations of available data due to insufficient number of vessels and surveying equipment</p> <p>Limited budget for monitoring activities</p>	<p>Support acquisition/retrofit of up-to-date single-beam sounding equipment, software and vessels</p> <p>Enforce cooperation with AVP on joint stretch and improve data exchange</p>	<p><i>No new surveying equipment has been acquired, due to limited budget resources.</i></p> <p><i>Exchange of hydrographic data with AVP has been performed, in line with established procedure, improving the frequency of hydrographic data collection.</i></p>
<b>RS 02</b>	<p>Insufficient number of skilled staff</p>	<p>Secure education and provision of well-trained staff in the short, medium and long term</p> <p>Facilitate different geographical organization of surveying teams to allow more effective and efficient performances</p> <p>Enable expert exchange with other Danube waterway administrations</p>	<p><i>At the end of 2015, decision of rationalization of the number of employees in the Governmental institutions have 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 was performed at the beginning of 2016.</i></p> <p><i>Different geographical organization of surveying teams to allow more effective and efficient performances is linked to the acquiring of additional vessel and equipment for hydrographic survey activities. Since no acquisition of vessel and equipment for hydrographic activities have been performed, due to lack of budget resources and rationalization of the number of employees, no changes in geographical organization have been performed.</i></p> <p><i>No expert exchange with other Danube waterway administrations has been performed.</i></p>
<b>RS 03</b>	<p>Insufficient number of automatic gauging stations in the free flowing section</p>	<p>Support acquisition and operation of additional gauging stations.</p>	<p><i>No new automatic gauging stations have been acquired, due to limited budget resources.</i></p>
<b>RS 04</b>	<p>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.</p>	<p>Secure sufficient and predictable financial means</p>	<p><i>No dredging in the fairway has been performed, due to limited budget resources.</i></p>

RS 05	Old marking vessels and equipment	Support acquisition of up-to-date marking vessels and buoys	<i>No acquisition of up-to-date marking vessels and buoys has been performed, due to lack of budget resources.</i>
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	<i>Web application for marking activities on the Danube has been developed and put into operation.</i>
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	<i>At the end of 2015, decision of rationalization of the number of employees in the Governmental institutions have 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.</i>
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.	<i>No activities performed, due to lack of budget resources.</i>
Other	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)	<i>Navigational bulletin, and online portal for provision of dynamic fairway information services, was launched in 2015. 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.</i> <i>Data is available in Serbian, German and French language.</i> <i>url:</i> <a href="http://www.plovput.rs/navigation-al-bulletin">http://www.plovput.rs/navigation-al-bulletin</a>

## 11.4 RS | Review of rehabilitation and maintenance activities 2016

### *Riverbed surveying activities 2016*

Every year the entire Serbian stretch of the Danube, Sava and Tisza are being surveyed. The most critical locations are surveyed more often using several more cross-profiles.

#### Danube

River-km (from-to)	Frequency of surveying	Type of survey (single-/multi-beam)
1.299 – 1.170	1	Singlebeam – 200 m cross-sections on the whole stretch
1.267 – 1.261	3	Singlebeam – 50 m cross-sections on the most critical sector Futog

#### Sava

The survey on the Sava was conducted in May and June 2016. At the critical sector Kamičak (and others) the distance of the cross-profiles was narrowed to 50 metres.

River-km (from-to)	Frequency of surveying	Type of survey (single-/multi-beam)
210.8 – 80.0	1	Singlebeam – 200 m cross-sections on the whole stretch
88.2 – 82.2	1	Singlebeam – 50 m cross-sections on the critical sector Kamicak

#### Tisza

River-km (from-to)	Frequency of surveying	Type of survey (single-/multi-beam)
122.0 – 0.0	1	Singlebeam – 200 m cross-sections on the whole stretch

### *Fairway relocation and marking activities 2016*

#### Danube

River-km (from-to)	Frequency of relocation interventions	Comments
1.267 – 1.261	2	Realignment and reduction of the width of the fairway at the critical sector Futog due to dynamic morphological developments and identified available depth and width.

#### Sava

River-km (from-to)	Frequency of relocation interventions	Comments
88.2 – 82.0	1	Realignment and reduction of the width of the fairway at the critical sector Kamicak in accordance to available depth.
112.0 – 106.0	1	Realignment and reduction of the width of the fairway at the critical sector Klenak in accordance to available depth.



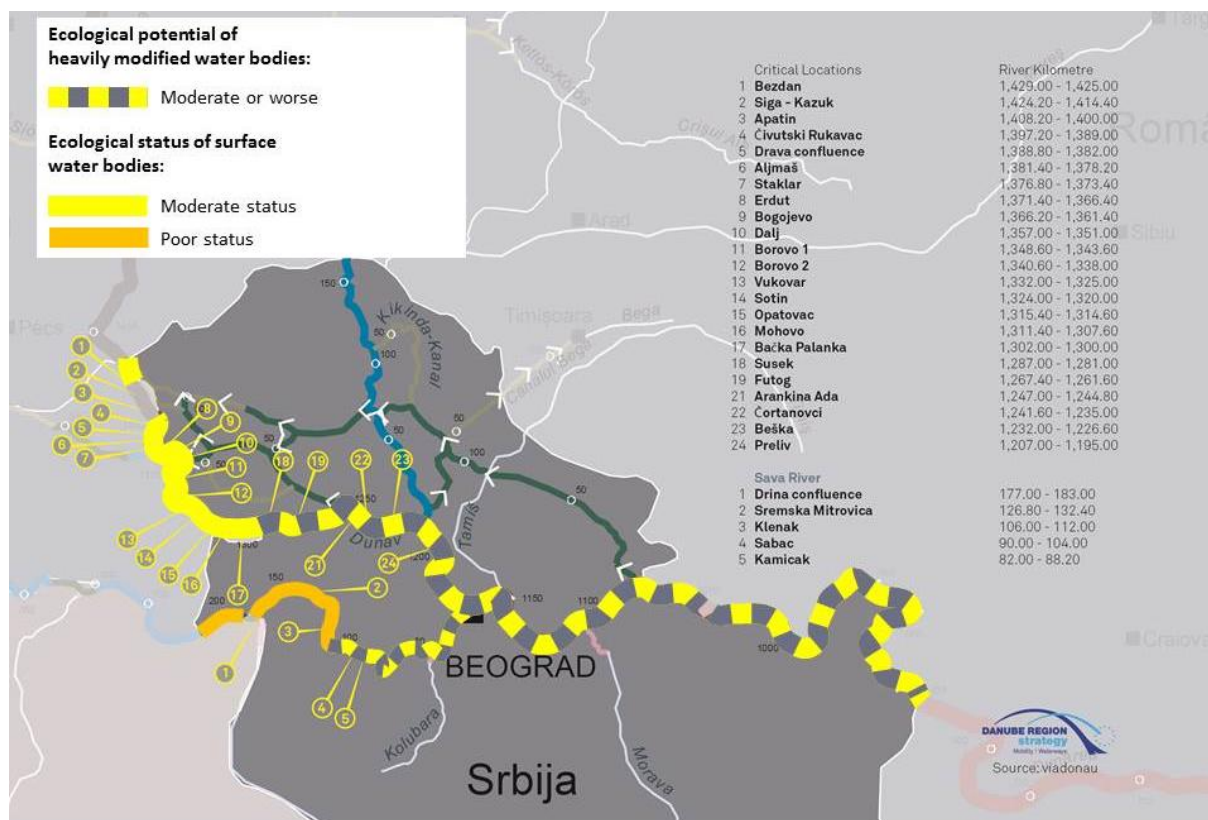
### Dredging activities 2016

No dredging activities were performed in the fairway. Dredging of sediment from entrance to the winter port and from winter port on the Danube River in Novi Sad was performed in the fourth quarter of 2016. The dredged sediment has been dumped within the Danube River, in line with the adopted sediment balance principle.

Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m <sup>3</sup>	Permits (see next table)
	from river-km	to river-km	from river-km	to river-km						
Dredging of sediment at the entrance of the winter port Novi Sad	1258.0	1257.8	1257.8	1257.7	01.11.2016	30.11.2016	Fine sediment	Dumping	30 000	-

### 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 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***

No specific activities are being performed by the authority responsible for waterway maintenance.

### ***Navigation maintenance measures and environmental impacts***

Due to the absence of budget for maintenance dredging activities, fairway maintenance activities are limited to hydrographic surveying activities and waterway marking activities, with no effect to the environment.

In 2017, an EU-funded project of river training and dredging works on critical sectors on the Danube River in Serbia will start, 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.

## **11.6 RS | Budget status**

No budget data is available for Serbia.

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

No activities planned due to budget limitations.

<b>RS 01: ....</b>		
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:		

## 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 – 2016

**Number of days with fairway depths  $\geq 2.5\text{m}$  on main critical locations** (as listed in the FRMMP):

Critical location	2012	2013	2014	2015	2016
From rkm 69,7 To rkm 72,9	No data available. <sup>18</sup>				
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					

<sup>18</sup> 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](http://www.danube-navigation.eu).

**Number of days with water level  $\geq$  LNWL on main critical locations**

Not applicable (please see the explanation given below).

Critical location	Reference gauges	2012	2013	2014	2015	2016
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 2016**

Not applicable (please see the explanation given above).

### 12.3 BA | Key issues and related activities 2016

	Key issues	Need for action	Activities performed 2016
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. <sup>19</sup>

### 12.4 BA | Review of rehabilitation and maintenance activities 2016

Currently, there is no update available for rehabilitation and maintenance tasks.<sup>19</sup>

#### Riverbed surveying activities 2016

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

#### Fairway relocation and marking activities 2016

Not applicable.

#### Dredging activities 2016

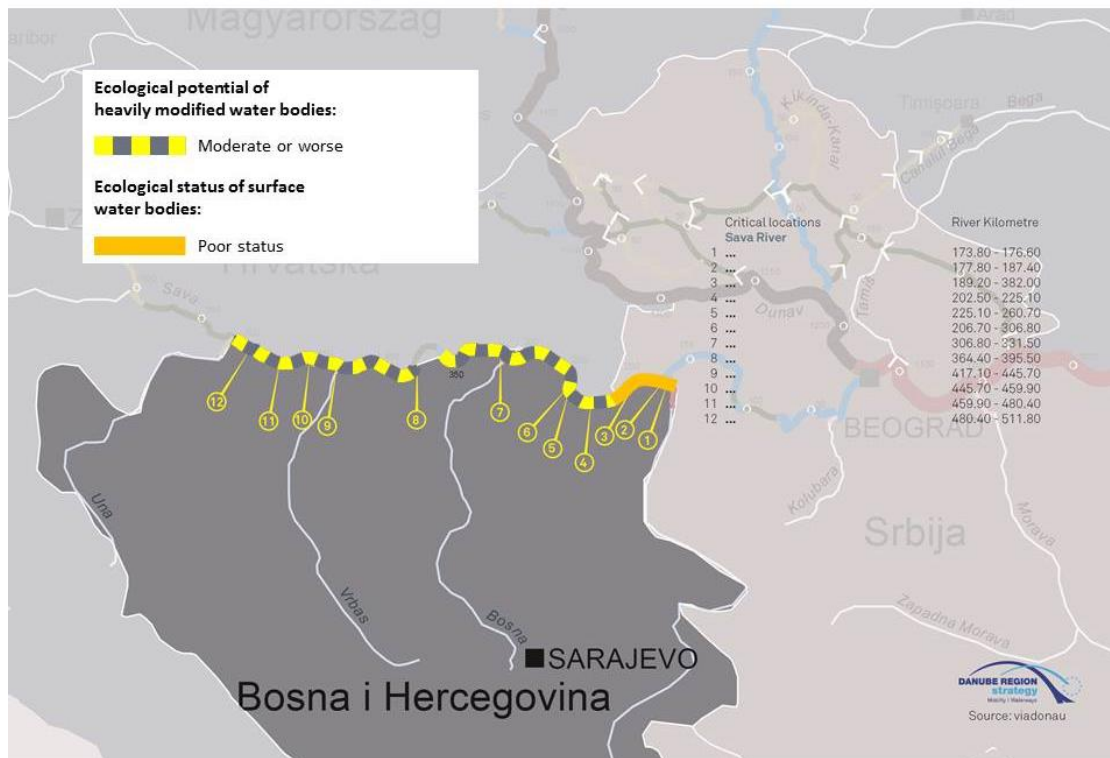
Designation of assignment	Dredging site		Dumping or placement site		Beginning of service	End of service	Material	Utilisation	m <sup>3</sup>	Permits (see next table)
	from river-km	to river-km	from river-km	to river-km						
x	x	x	x	x	x	x	x	x	x	x

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

<sup>19</sup> 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](http://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.<sup>20</sup>

### *Measures to improve environmental conditions*

No information available.<sup>20</sup>

### *Navigation maintenance measures and environmental impacts*

No information available.<sup>20</sup>

<sup>20</sup> 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](http://www.danube-navigation.eu).

## 12.6 BA | Budget status 2016

### Operational expenditures 2016 and budget needs 2017

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	No update available. <sup>21</sup>			
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				
<b>Sum (Euro)</b>				

## 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:		

<sup>21</sup> 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](http://www.danube-navigation.eu).

## 13 Moldova

*No update has been provided by Moldova for May 2017. 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 – 2016

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 2016

Not relevant.

### 13.3 MD | Key issues and related activities 2016

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

### 13.4 MD | Review of rehabilitation and maintenance activities 2016

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 2016

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 –2016

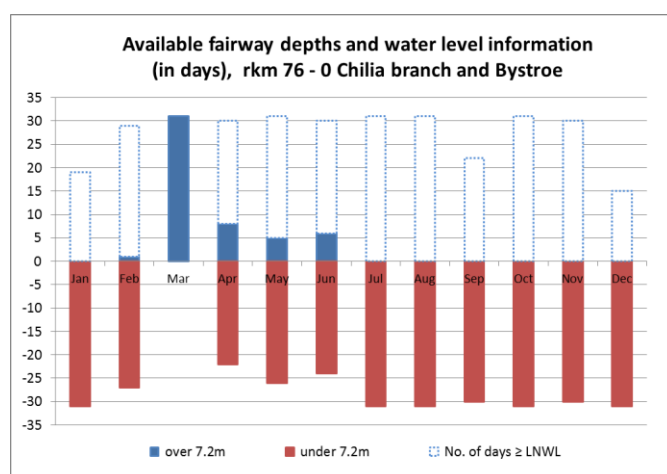
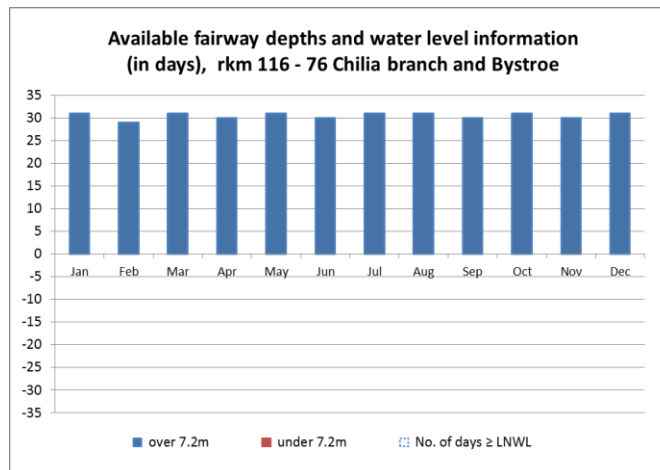
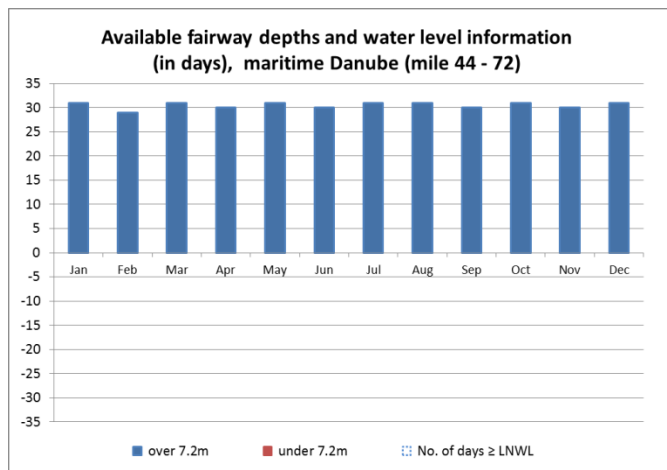
The report on the state of the main critical areas in 2012 – 2014 is subject to the list of the Main European Inland Waterways- IWT («The blue book»). According to the United Nations Economic Commission for Europe (UNECE), the part of river Danube from 0 to 116 km of Chilia branch where *Danube-Black 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 (CMBП/AGN)”).

#### *Number of days with fairway depths $\geq 7.2\text{m}$ on main critical locations*

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

#### *Number of days with water level $\geq \text{LNWL}$ on main critical locations*

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



The depth at the section 0-76 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 most of 2016 the depth was 4.7m.

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 Danube occur in 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 flood or flash-flood.
- 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 hydrological regimes for navigation companies. Long-term hydrological monitoring performed at the Ukrainian stretch of the Danube reveals some tendencies in alterations of hydrological regimes affecting the navigation conditions.

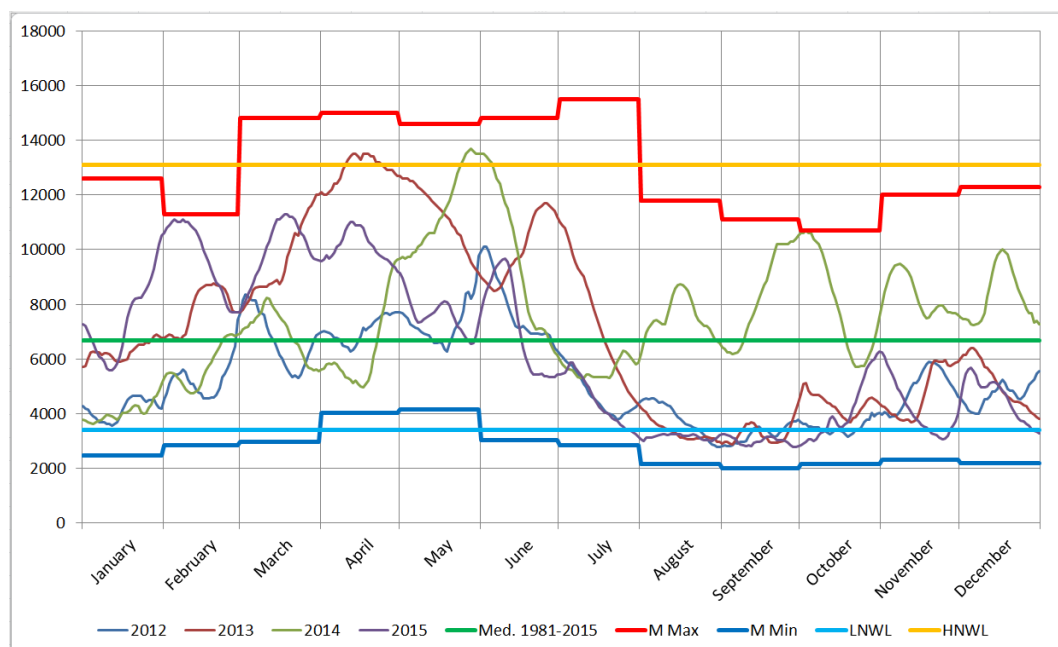
A permanent mathematical model of the Danube delta must be created in the future to have a tool for the feasibility study and evaluation of changes in hydromorphology of the delta, due to possible scenarios of climate change, Danube water and sediments runoff alterations, Black Sea level fluctuations or planned hydrotechnical works.

## 14.2 UA | Hydrological conditions at main critical locations 2016

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

The water discharge m<sup>3</sup>/s on the gauging station Reni in 1981 – 2015

No update for the year 2016 was provided.<sup>22</sup>



## 14.3 UA | Key issues and related activities 2016

	Key issues	Need for action	Activities performed 2016 <sup>22</sup>
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

### Ad UA 02:

One of main tasks of DHMO is the provision with 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 lead-time. Short-term forecasts with lead-time from 24 to 72 hours for 17 gauging stations are published daily. Forecasts of characteristic

<sup>22</sup> Data and 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](http://www.danube-navigation.eu)

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 on 11 paragraphs are provided and once a month forecasts of average, minimum and maximum water levels (16 paragraphs) for the coming month.

Water level forecasts are provided to companies of the marine industry and also are published on web-sites of DHMO ([www.dhmo.org.ua](http://www.dhmo.org.ua)) and River Information Service on inland waterways of Ukraine (<http://ukrris.com.ua/>).

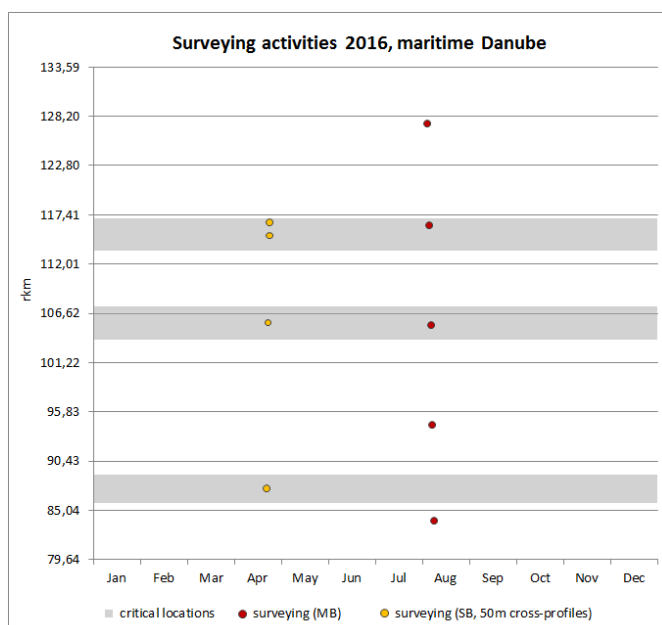
Tending to improve the accuracy of hydrological forecasts to support waterway users, the software complex of “Analytical and expert system for navigable water level forecasting” was developed by Ukrainian Scientific Research Hydrometeorological Institute. Method of corresponding daily water level gradients implemented in analytical system allows producing highly reliable daily, 10-day and monthly forecasts. Experimental use of this software complex in Danube Hydrometeorological Observatory during 2015 demonstrated the proven quality of water levels forecast for Danube fairway. Further implementation of computer-assisted methods of hydrological forecasting in DHMO practice will raise the quality of customers’ hydrological support.

#### 14.4 UA | Review of rehabilitation and maintenance activities 2016

For the current update of the national action plans a more graphical approach was chosen for the reporting of conducted rehabilitation and maintenance activities. The surveying, dredging and fairway relocation activities as well as waterway inspection and marking tours 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).

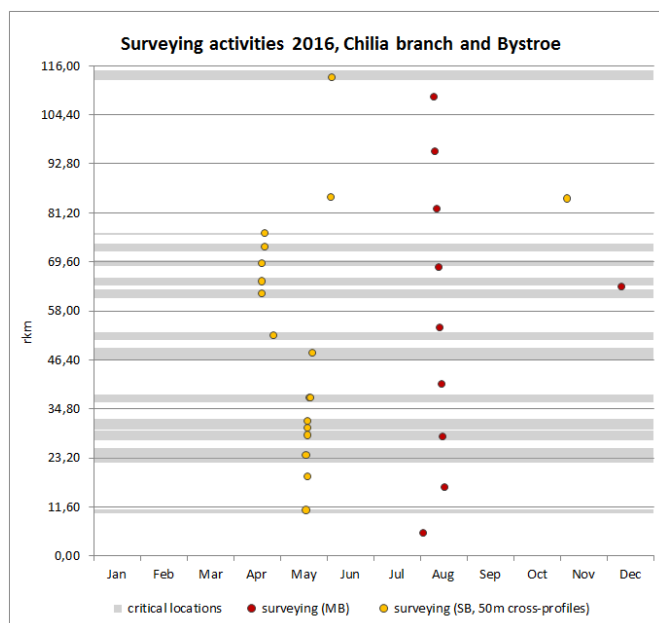
##### *Riverbed surveying activities 2016*

##### Maritime Danube



In April 2016 all critical locations were surveyed with single-beam equipment, recording cross-profile 50 metres apart. Additionally, the entire maritime sector of the Ukrainian Danube was surveyed once in August, using a multi-beam echosounder.

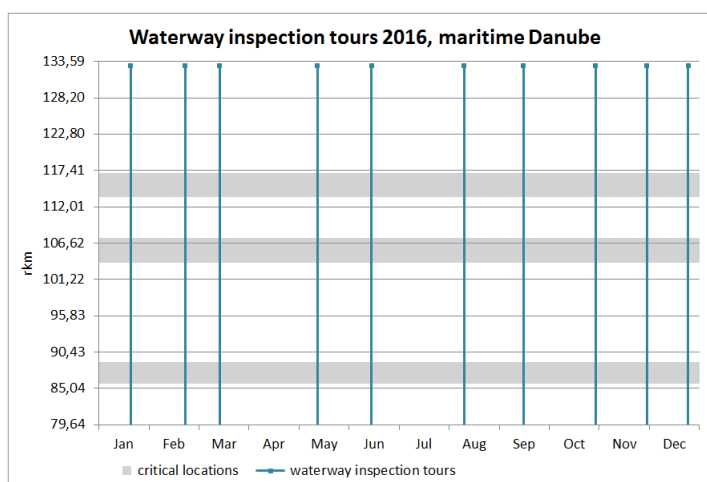
### Chilia branch – Bystroe



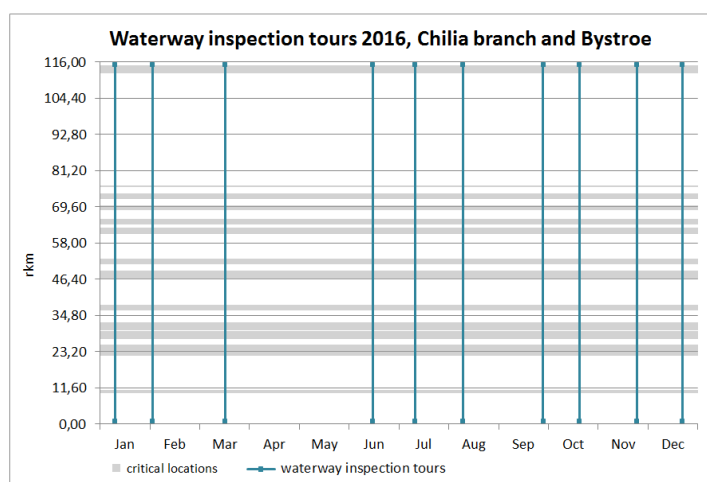
The entire Chilia branch and Bystroe maritime approach channel were surveyed with multi-beam equipment once in summer 2016. The critical location Bol'shoy Daller Shoal was checked again in December. From April to June the individual critical locations were surveyed using single-beam equipment.

### *Waterway monitoring tours 2016*

#### 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 2016***

In 2016 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 2016***

Operational dredging in 2016 was implemented on the maritime Danube. In total 315 075.2 m<sup>3</sup> were dredged over the entire year.

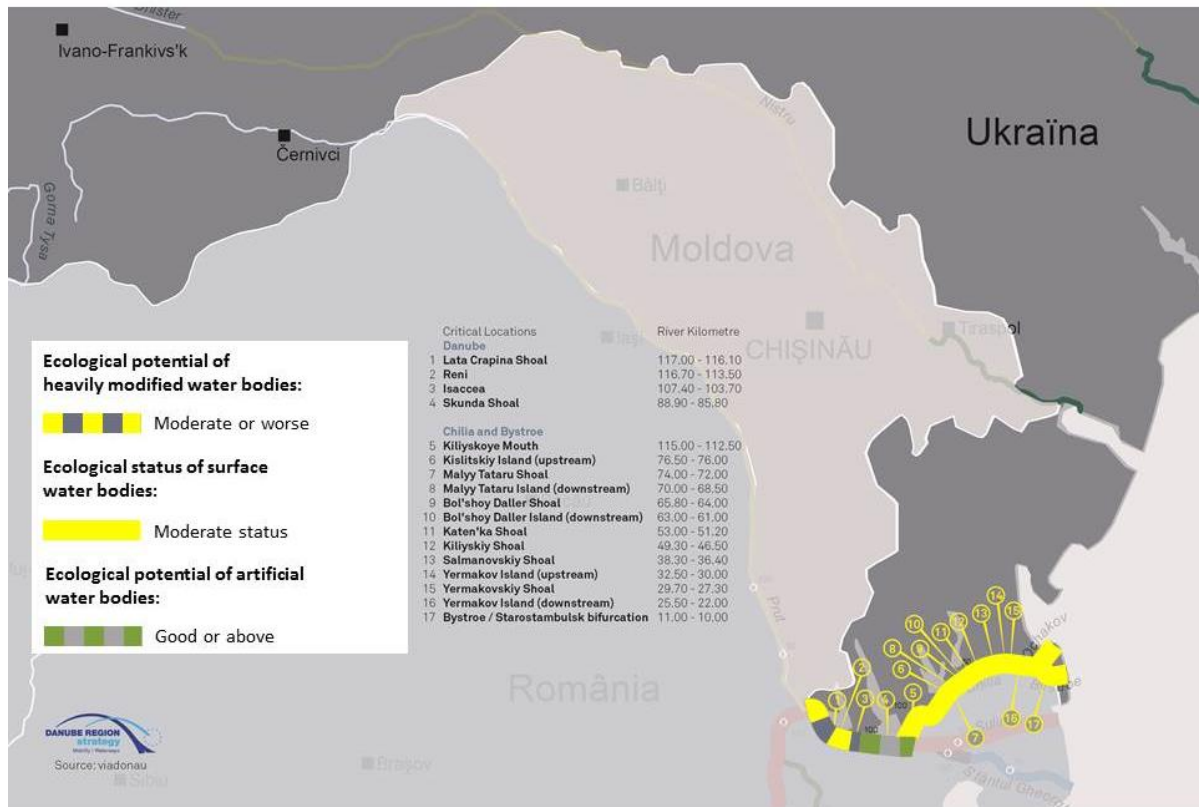
Dredging on the Chilia branch was conducted between April and September 2016 and from October until December. Cubic volumes of these works are unknown.

Works on the section of the Danube River - namely dredging river shallow sections (sections located along the state border with Romania) - are carried out as works in transboundary waters, which are regulated by the bilateral agreements between the Governments of Ukraine and Romania on the Ukrainian-Romanian State Border Cooperation and Mutual Assistance on Border Issues (signed on 17.06.2003, entered in force on 12.05.2004) and the Agreement between the Government of Ukraine and the Government of Romania on Cooperation in the Field of Water Management in Transboundary Waters (signed on 30.09.1997, entered in force on 28.01.1999) and are to be agreed with the Romanian side.



### 14.5 UA | Summary of current ecological status and environmental impacts

The following map displays the ecological status and ecological potential of the Ukrainian 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 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.

## 14.6 UA | Budget status 2016

### Operational expenditures 2016 and budget needs 2017

Need areas	Operational expenditures 2016	Required operational budget 2017	Secured operational budget 2017	Remaining financing gap 2017
Minimum fairway parameters (width/depth)	No update available. <sup>23</sup>			
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				
<b>Sum (Euro)</b>				

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

No updated information available.

UA 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:		

<sup>23</sup> 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](http://www.danube-navigation.eu).