

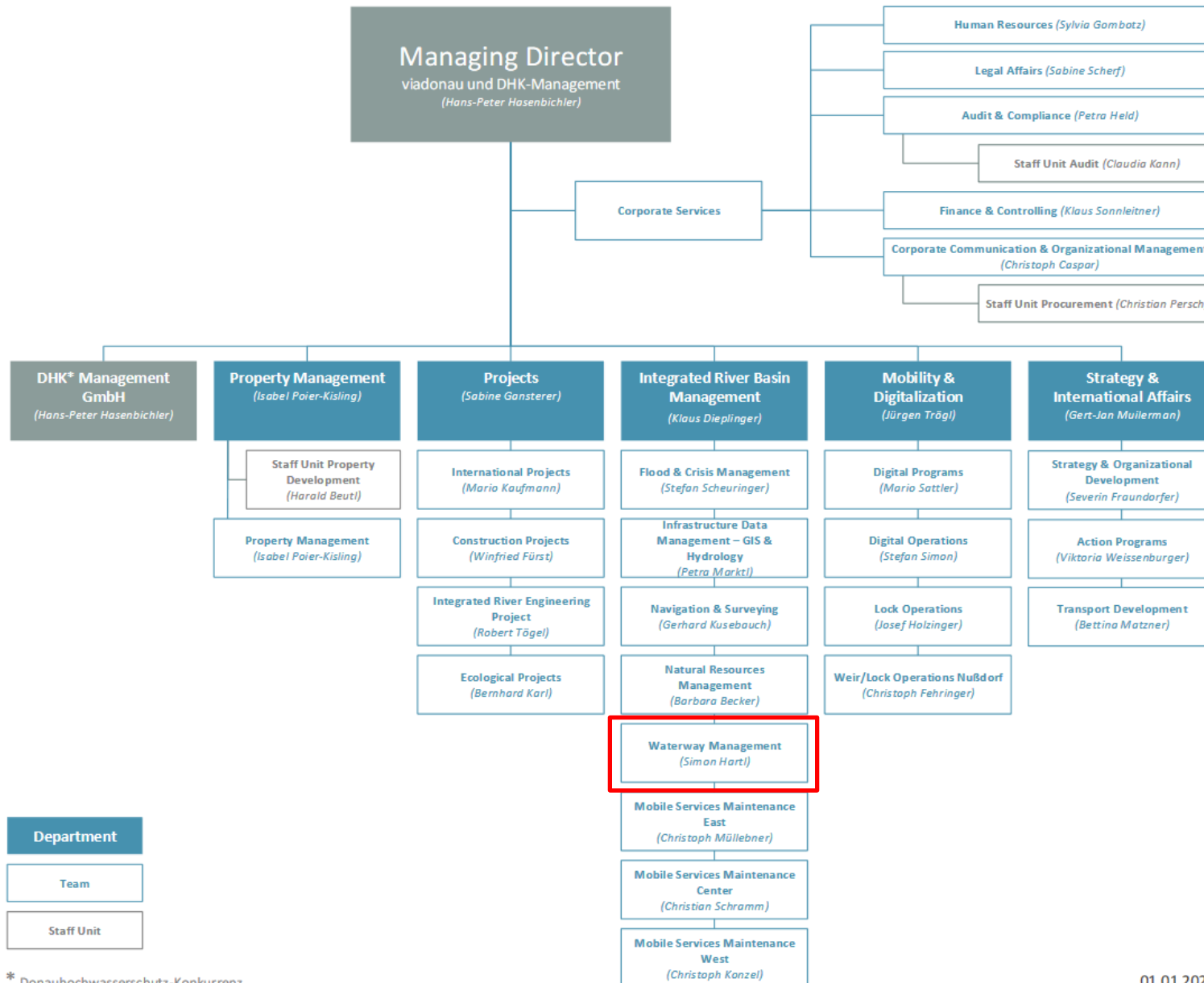
Proactive waterway management Presentation and discussion of activities planned in Austria



Simon Hartl, Head of Team Waterway Management, viadonau
Danube Commission, Expert Meeting on Hydraulic Engineering
28 February 2023

Team Waterway Management (after re-organisation)

Organisational chart



Team Waterway Management - Core tasks (I)

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- Establishment and maintenance of the defined **minimum infrastructural parameters** on the Austrian section of the Danube waterway
- Planning and implementation of **fairway maintenance measures** on the Austrian Danube (including access to federally owned ports and landing sites, etc.) as well as operation of the **maintenance management system** (WAMS – Waterway Asset Management System)
- **Bedload management** in the free-flowing section east of Vienna to mitigate riverbed erosion (management of the two bedload traps Treuschütt and Hainburg)
- Planning and implementation of **hydraulic engineering optimization measures** to improve the navigability of the Danube waterway (groynes and training walls)



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Team Waterway Management - Core tasks (II)

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- Monitoring, optimization and modernization of the **fairway marking system**, including coordination with the Supreme Navigation Authority and the Navigation Surveillance
- Rehabilitation and upgrading of **public mooring places**
- Preparation and execution of **regular waterside monitoring cruises**
- Publication of up-to-date **shallow section information** on the state of the fairway (DoRIS website – Danube River Information Services)

Central contact point for viadonau's customers with regard to waterway management!

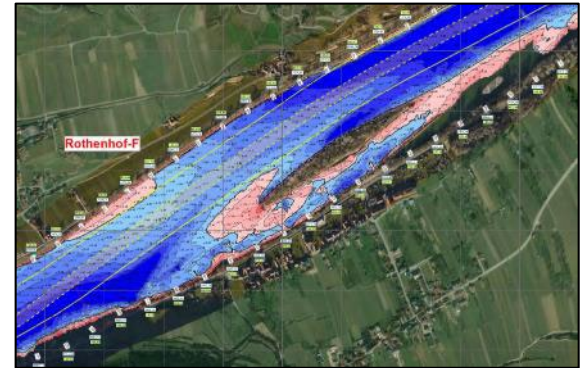


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Team Waterway Management

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Simon Hartl

Head of Team

T +43 50 4321-1614

simon.hartl@viadonau.org



Thomas Hartl

Senior Expert, Deputy Head of Team

T +43 50 4321-1603

thomas.hartl@viadonau.org



Christoph Bauer

Project Manager

T +43 50 4321-2602

christoph.bauer@viadonau.org



Lea Dosser

Project Manager

T +43 50 4321-1636

lea.dosser@viadonau.org



Michael Kalb

Specialist

T +43 50 4321-4005

michael.kalb@viadonau.org



Andreas Peck

Project Manager

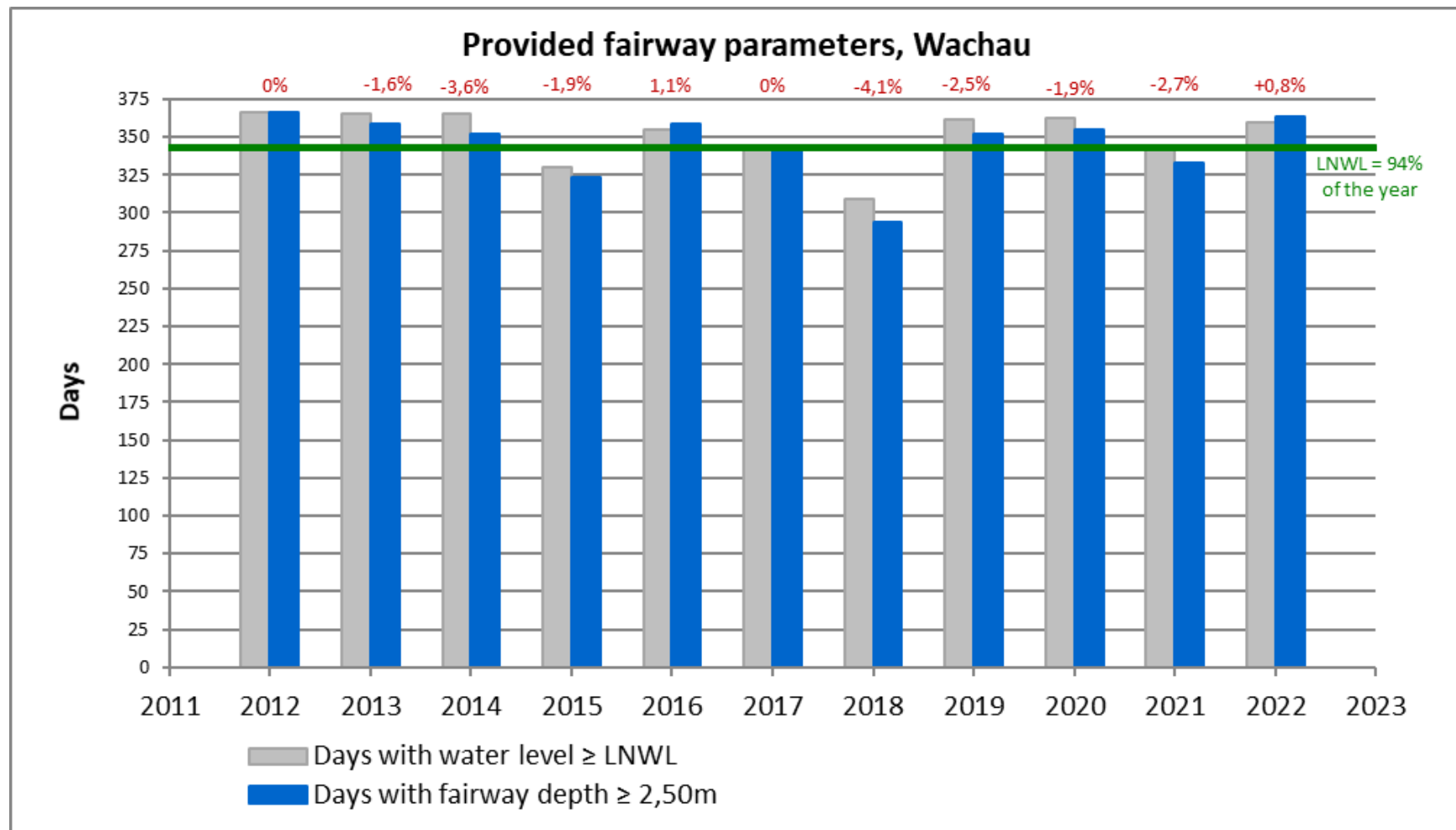
T +43 50 4321-5003

andreas.peck@viadonau.org

Status of main critical sections in 2020-2022

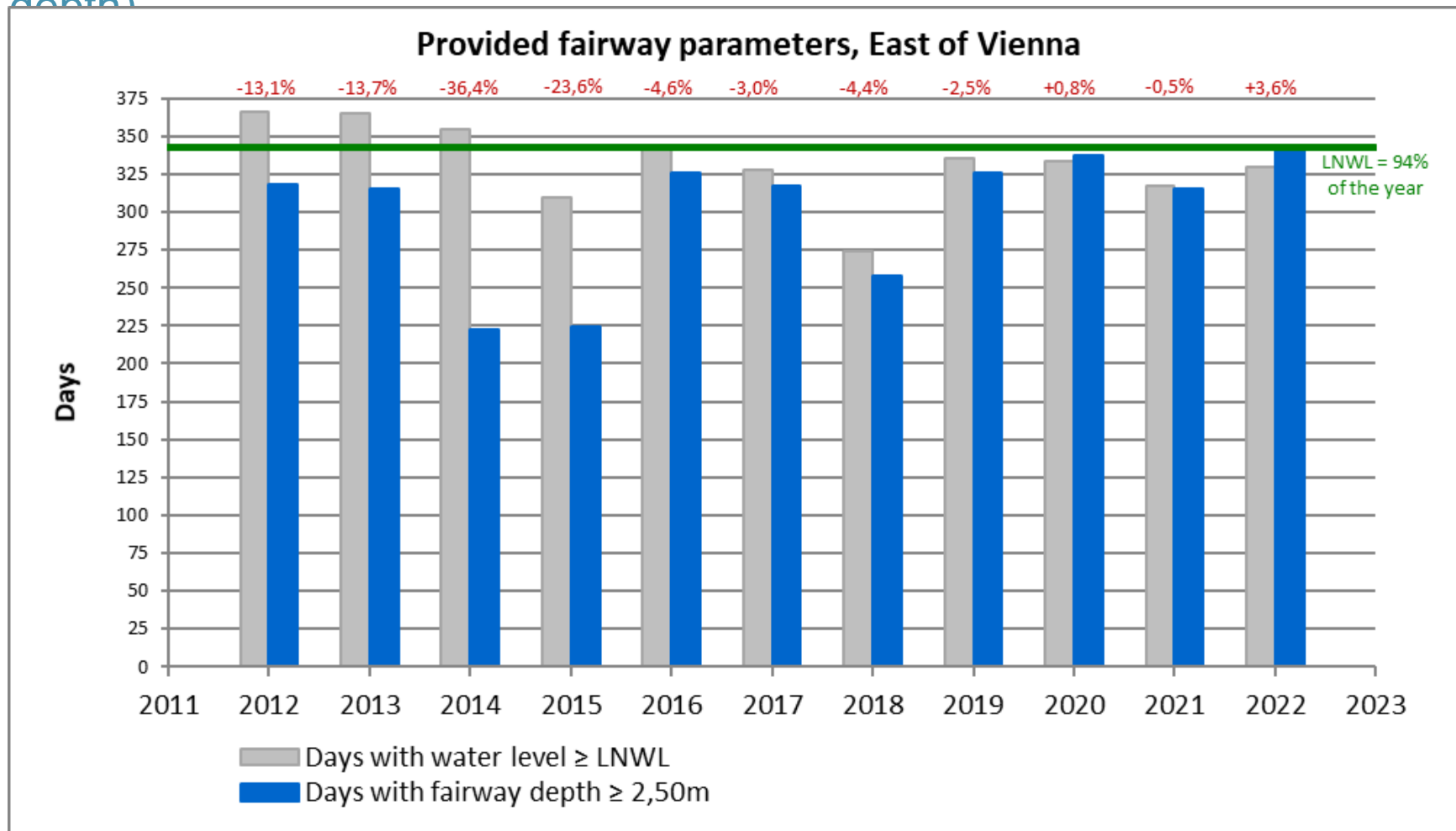
Status of main critical sections in 2020-2022

- Free-flowing section Wachau (363 days \geq 2,50m fairway depth)



Status of main critical sections in 2020-2022

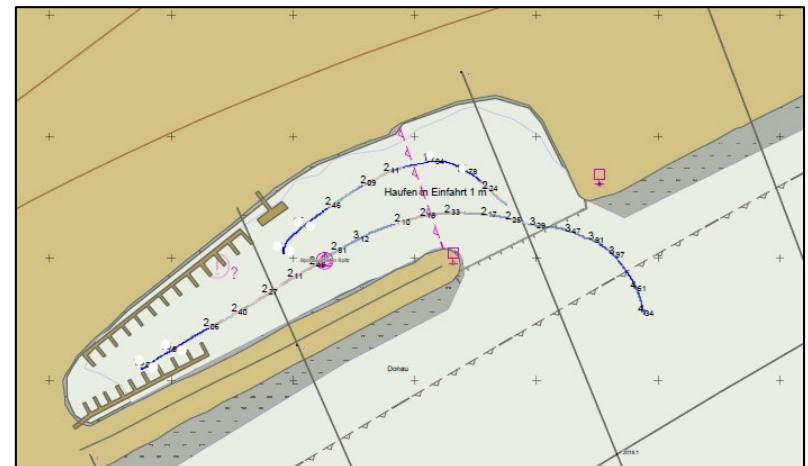
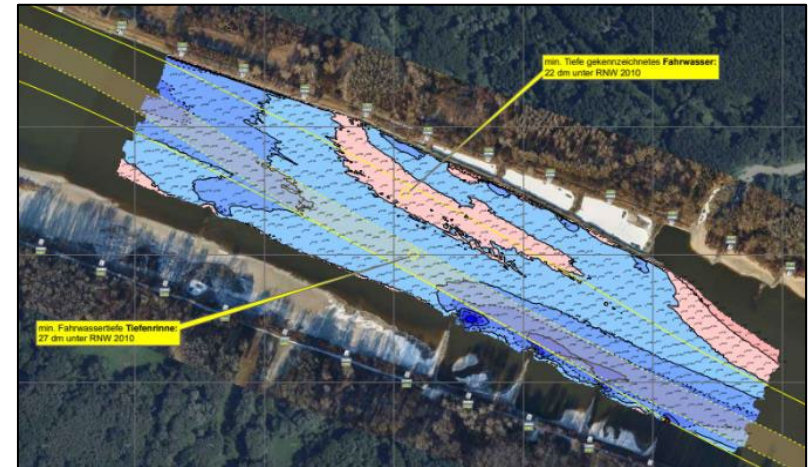
- Free-flowing section East of Vienna (343 days \geq 2,50m fairway depth)



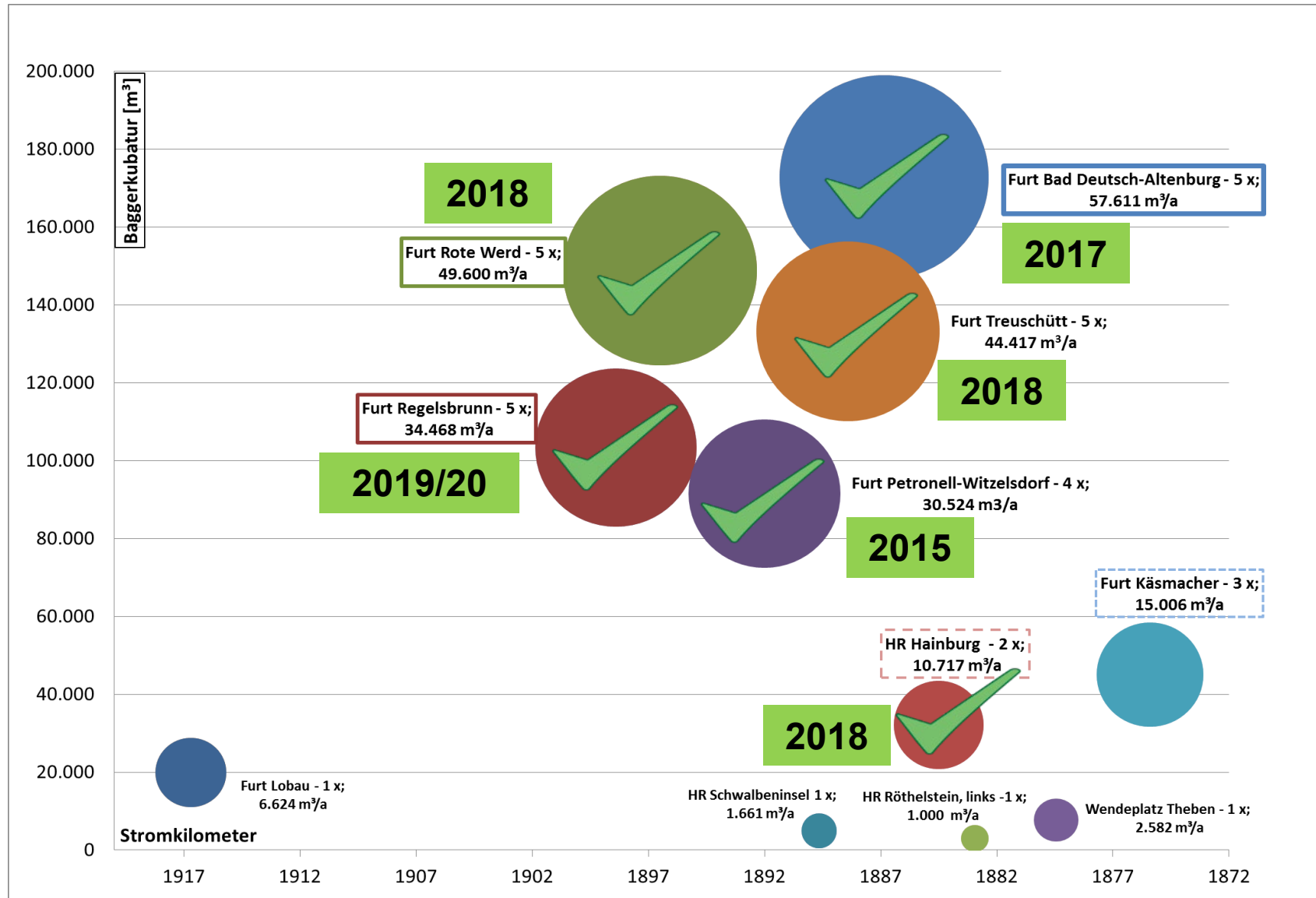
Re-verification of monitoring, rehabilitation and maintenance activities carried out in 2022

Monitoring activities 2022

- **Monthly multi-beam surveying** of the most important fords in the two free-flowing sections of the Austrian Danube; publication of results on the "fairway information" page of DoRIS (website and mobile app)
- **Single-beam surveying** of less important fords, lateral fairway sedimentation, mooring sites, and access to public ports:
 - bimonthly in the two free-flowing sections
 - biannually in impounded river sections



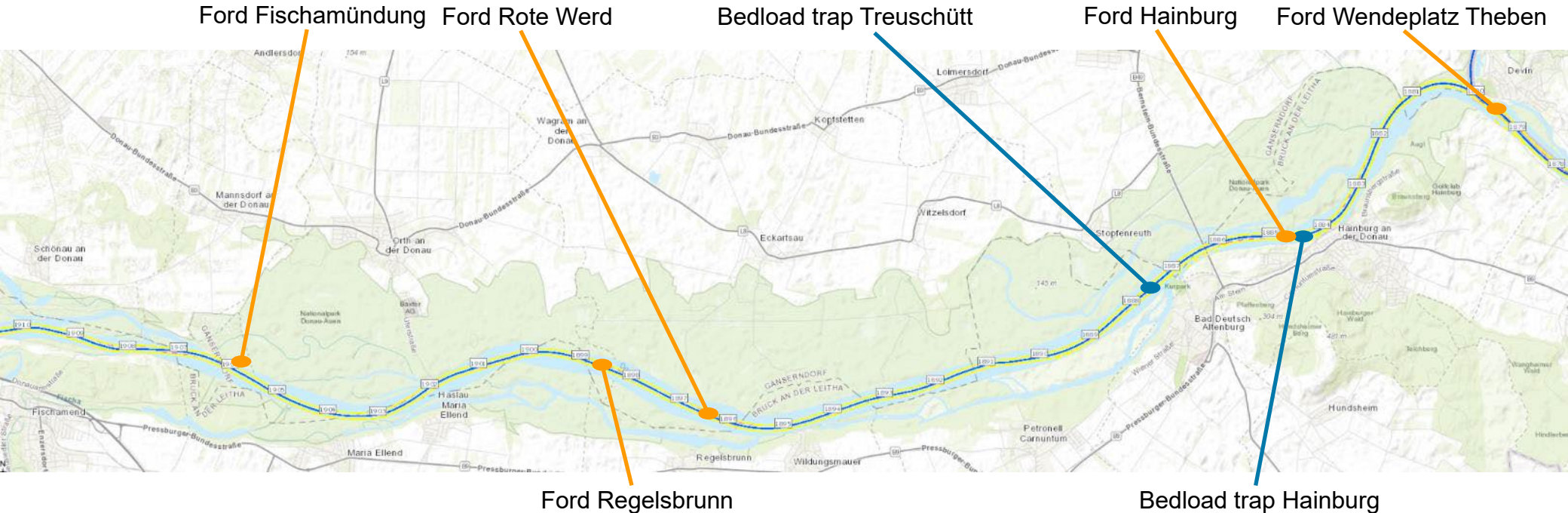
Optimisation of waterway infrastructure: main rehabilitation projects for shallow sections East of Vienna concluded 2020



Maintenance activities 2022

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Dredging activities 2022 – free-flowing section East of Vienna



Location	River-km	Gravel
Ford Regelsbrunn	1 899.025 – 1 897.925	4 429 m ³
Ford Rote Werd	1 896.575 – 1 896.000	4 074 m ³
Ford Hainburg	1 884.800 – 1 884.200	9 577 m ³
Ford Fischamündung	1 905.800 – 1 905.450	2 460 m ³
Ford Wendeplatz Theben	1 879.600 – 1 879.280	11 549 m ³

Maintenance dredging - gravel
32 089 m³

Location	River-km	Gravel
Bedload trap Treuschütt	1 888.350 – 1 887.700	62 759 m ³
Bedload trap Hainburg	1 885.000 – 1 884.200	49 424 m ³

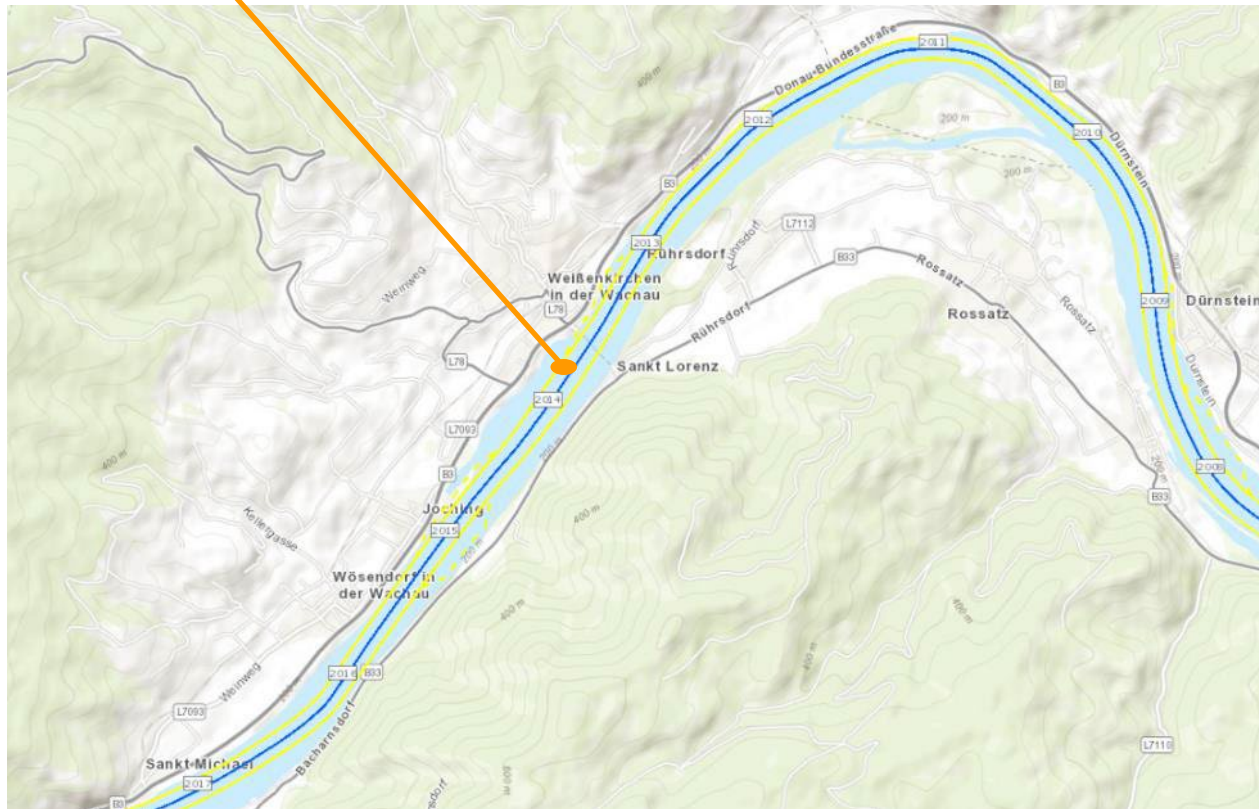
Dredging of bedload traps
112 183 m³
 + upstream transport and dumping of gravel

Maintenance activities 2022

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Dredging activities 2022 – free-flowing section Wachau

Ford Weißenkirchen



Location	River-km	Gravel
Ford Weißenkirchen	2 013.815 – 2 013.600	3 638 m ³

Maintenance dredging - gravel

3 638 m³

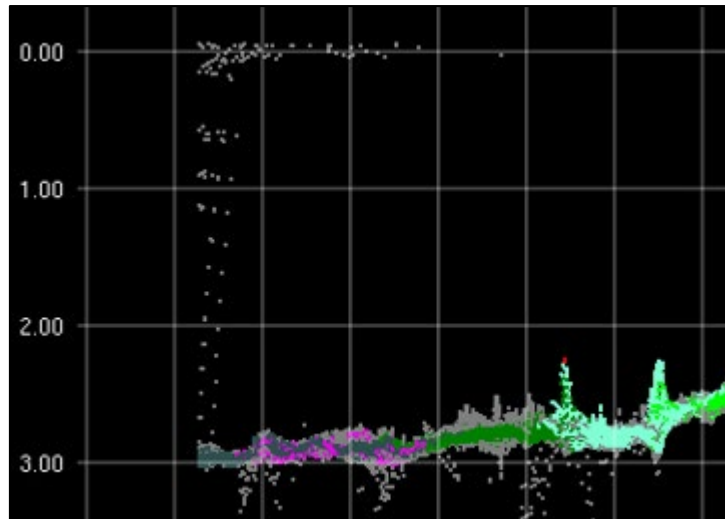
Usage for gravel structures in Schwallenbach

Maintenance activities 2022

Dredging of fine sediments

Location	River-km	Fine sediment
Port entrances (Cargo ports, ports for public authorities, port for leisure boats)	2 208.400 – 1 886.900	91 722 m ³

Recovery of objects in Wachau



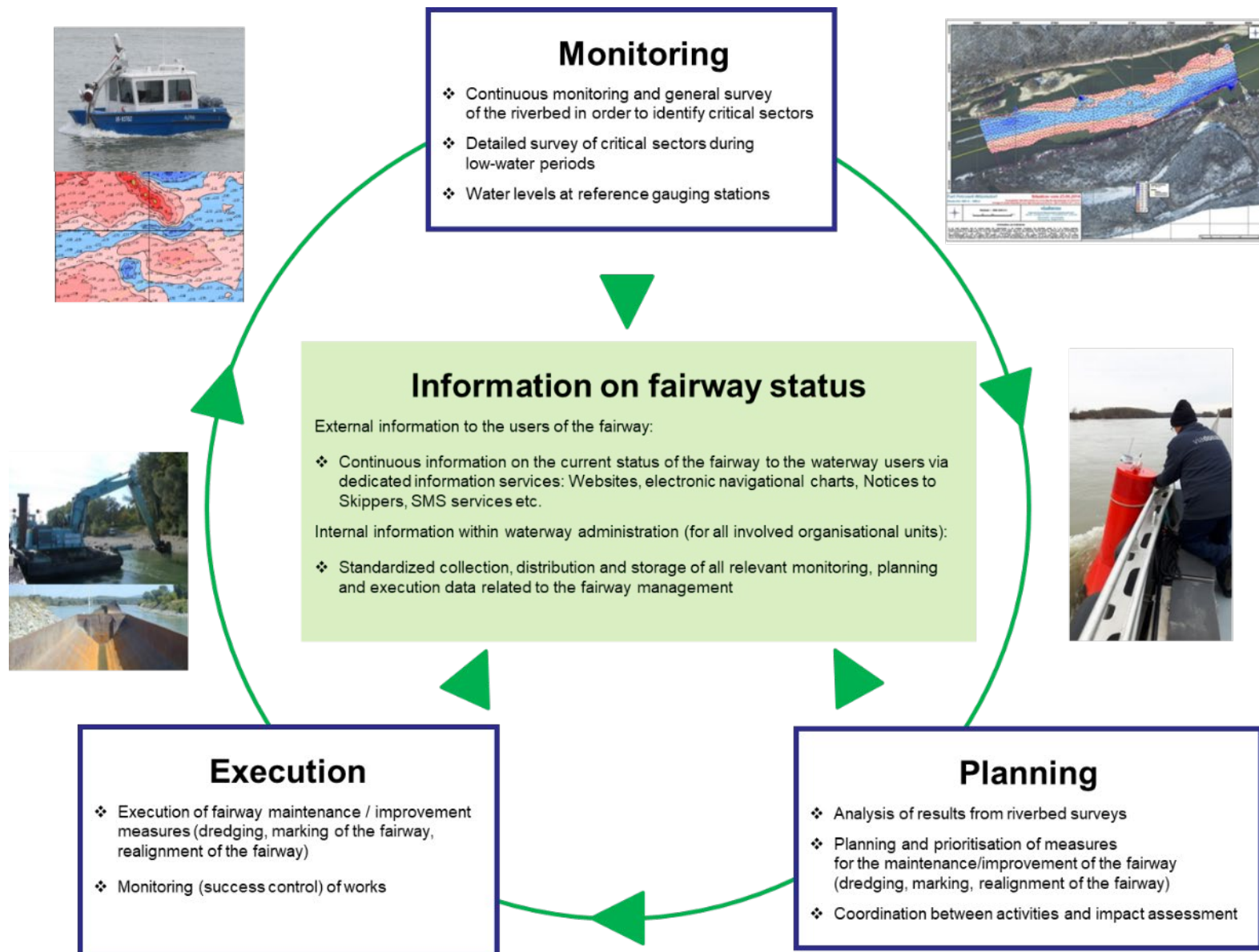
Stones/
Ford Schwallenbach



Planned activities to ensure navigation in 2023

Planned activities to ensure navigation in 2023

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Planned activities to ensure navigation in 2023

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- Activities to be defined in detail until the **dredging briefing session taking place in July 2023** in coordination with the Supreme Navigation Authority (well in advance to the low water period)
- **Maintenance dredging (fords):** Up to 30 000 – 50 000 m³ of gravel in fords in the two free-flowing sections of the Austrian Danube (Wachau and Danube east of Vienna); up to 20 000 – 40 000 m³ of fine-grained sediment for access to public ports and mooring sites (estimation)
- **Managing of bedload traps:** Dredging and upstream dumping of up to 130 000 m³ of gravel to mitigate riverbed erosion in the free-flowing section of the Danube east of Vienna; the bedload traps cover the area of two important fords (Hainburg and Treuschütt).

Planned activities to ensure navigation in 2023

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- **Flexible infrastructure elements**

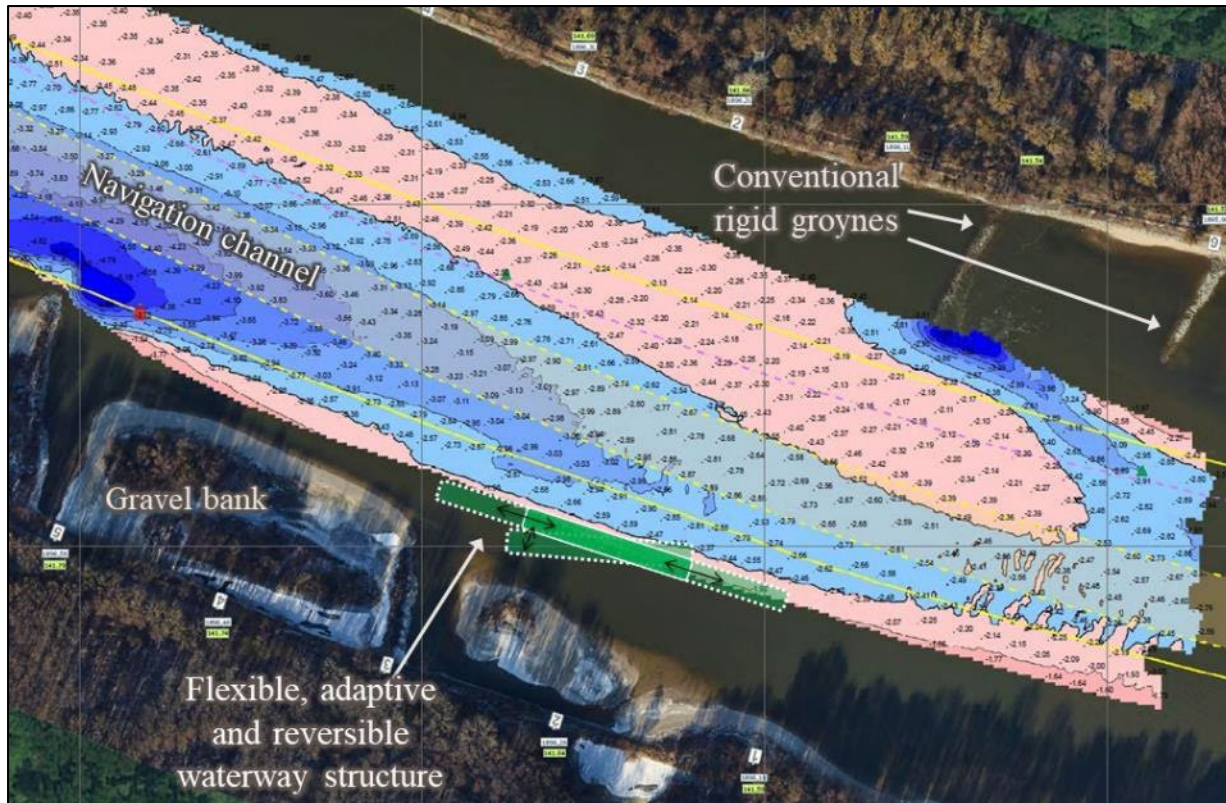
Temporary infrastructure for extreme low water periods (in analogy to mobile flood protection dams complementing the fixed dams)



Flexible infrastructure
elements

Planned activities to ensure navigation in 2023

■ Flexible infrastructure elements



- **Loaded lighters** strategically positioned in the vicinity of shallow sections
- **Effects:** narrowed cross-section and thus increased flow velocities
- **Result:** increased fairway depths where needed by inland navigation
- **Advantages:** reversible and environmentally friendly solution in addition to conventional hydraulic structures

Operational expenditures for conducted activities in 2022 and budget needs in 2023

Operational expenditures for conducted activities in 2022 and budget needs in 2023

Operational expenditures for conducted maintenance activities 2020-2023				
Need areas	Operational expenditures 2020	Operational expenditures 2021	Operational expenditures 2022	Operational budget 2023
Minimum fairway parameters (width/ depth) (maintenance dredging) ¹	2 158 797	2 209 995	2 452 921	1 825 984
Surveying of the riverbed	879 431	867 800	936 998	960 040
Water level gauges	1 048 584	1 007 054	1 119 734	1 183 455
Marking of the fairway	625 853	682 465	726 780	725 238
Availability of locks / lock chambers ²	-	-	-	-
Information on water levels and forecasts	78 935	58 299	52 938	89 688
Information on fairway depths ³	-	-	-	-
Information on marking plans	-	-	-	-
Meteorological information	-	-	-	-
Other needs	-	-	-	-
Sum (Euro)	4 791 600	4 825 613	5 289 371	4 784 405
Costs for dumping dredged material upstream	1 619 884	1 048 460	1 650 345	1 543 721
<p>1 This amount includes only dredging expenditures, not the additional expenditures resulting from dumping the excavated material further upstream. The dredging expenditures are significantly lower than in past years, due to the positive impact of river engineering measures east of Vienna.</p> <p>2 In Austria, the Verbund Hydropower AG is responsible for maintaining the lock infrastructure (revisions). viadonau has no expenditures in this area.</p> <p>3 Information on fairway depths is provided on the DoRIS website (http://www.doris.bmk.gv.at/) and the DoRIS mobile App (roughly EUR 700 000 p.a. in total). Since many other services are provided as well (e.g. bridge clearance), the specific expenditures and budget needs for information on fairway depths cannot be displayed separately.</p>				

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