WATER FRAMEWORK DIRECTIVE IN THE ELBE RIVER BASIN

Meeting environmental objectives

The assessment shows that the majority of the surface water bodies in the international Elbe river basin district did not achieve a good status in 2015. For these water bodies exemptions were used in the updated plan, in many cases extensions of the deadline (most often until 2027) and to a lesser extent less stringent environmental objectives *(Table 3)*. The results for groundwater are better, mainly in view of quantitative status *(Table 4)*.

It is expected that there will be only a one-digit increase in the percentage of surface and groundwater bodies meeting the environmental objectives until the end of 2021 *(Table 3 and 4)*. This is mainly due to the fact that the positive effect of implementing measures only manifests itself after a longer period of time. An additional factor is the "one-out, all-out" principle of the Water Framework Directive: All components that are included in the assessment of the overall conditions need to present a good status. Long flow times in the groundwater (often more than 50 years) result in slow or even non-existing pollutant degradation processes, even if the substance intake is reduced, and the improvement of the groundwater quality becomes visible with a certain delay.

Table 3: Proportion of the surface water bodies that have achieved the objectives and of the surface water bodies with exceptions regarding the ecological and the chemical status

International Elbe river basin district – proportion of surface water bodies		Ecological status/potential	Chemical status
Meeting environmental objectives	2015	9%	12%
	2021	14%	13%
Use of exemptions in the plan for 2015*	extension of the deadline	90%	87%
	less stringent environmental objectives	3%	3%

Table 4: Proportion of the groundwater bodies that have achieved the objectives and of the groundwater bodies with exceptions regarding the quantitative and the chemical status

International Elbe river basin district – proportion of groundwater bodies		Quantitative status	Chemical status
Meeting environmental objectives	2015	89%	46%
	2021	95%	49%
Use of exemptions in the plan for 2015*	extension of the deadline	4%	51%
	less stringent environmental objectives	2%	15%

* For a body of water both exemption types mentioned can be used.

ICPER work results in the years 2010 – 2015 used for updating the river basin management plan

Work was performed by the ICPER to deal with the problems determined in the river basin management plan 2009. The results have been taken into account when the plan was updated:

- Recommendations for maintaining surface waters used for navigation in order to improve hydromorphological conditions (published in 2013, in German and Czech). These recommendations contain general and concrete proposals as well as examples of maintenance measures that are finished or that are currently in progress.
- Proposals for good sediment management practice in the Elbe region – ICPER Sediment Management Concept (published in 2014, in German and Czech) with recommendations for actions regarding hydromorphology, quality (pollution load) and navigation. An eight-page summary *(see p. 3)* was also published in German, Czech and English.
- Recommendation on the subject of water quantity management for preparing the third management period, mainly in view of low water and water scarcity *(Chapter 5.1 of the river basin management plan)*.

Participation and consultation of the public

The draft of the updated river basin management plan was published for comments on the ICPER website from December 2014 to June 2015. In order to support this consultation process, the ICPER conducted an International Elbe Forum in Ústí nad Labem in April 2015 where the draft was presented and discussed.

Photo: Lenka Běhounek, ICPER

Participants of the International Elbe Forum in Ústí n. L. in April 2015

Altogether there were 14 comments on the draft with numerous individual demands which in some cases resulted in the plan being modified. The assessment of the public comments and an overview of their consideration in the plan was published on the ICPER website on 10 March 2016.

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ICPER information sheet 2016 on the Water Framework Directive in the Elbe River Basin

Circulation: 1,000 German copies, 500 Czech copies, 500 English copies

Printed by: Harzdruckerei Wernigerode, Max-Planck-Straße 12/14, 38855 Wernigerode

Editorial deadline: 31 March 2016

WATER FRAMEWORK DIRECTIVE IN THE ELBE RIVER BASIN

The International Commission for the Protection of the Elbe River (ICPER) published the updated "International Management Plan for the Elbe River Basin District" (Part A) for the period 2016 – 2021 on 17 December 2015, in German and Czech. The update of this plan was prepared in the last two years of the first six-year management period of the Water Framework Directive. It is based on the national river basin management plans (Parts B) that were updated in parallel.

The Elbe river basin is intensively used. The **main pressure types** for the surface water bodies are diffuse sources (42%), water flow regulation and/or morphological alterations (35%), point sources (20%), water abstraction (1%) and other pressures (2%). The situation for groundwater bodies is quite similar, they are mainly impacted by diffuse and point sources and to some lesser extent by groundwater abstraction.

The impacts of human activities are shown in the results of the **status assessment of the water bodies**. *Figure 1* shows the classification of the ecological status/potential of the surface water bodies for the individual coordination areas and the complete international Elbe river basin district. The assessment is based on a significantly wider database of higher quality in comparison with the first management period.

All in all, it can be stated for the international Elbe river basin district that most surface water bodies did not achieve a good ecological status/good ecological potential in 2015, namely:

- 91 % of the water bodies classified as rivers,
- 77 % of the water bodies classified as lakes,

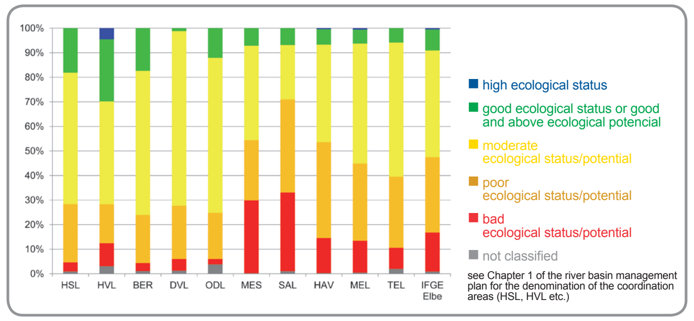

Fig. 1: Proportion of the surface water bodies in the classes of ecological status/potential for the individual coordination areas and the complete international Elbe river basin district.

- 5 out of 6 water bodies of the transitional and coastal waters (The ecological status of the water body Elbe Coastal Waters /Küstenmeer Elbe/ does not have to be assessed, as this water body is located outside the baseline plus one sea mile and needs to be analysed only chemically.)

A comparison of the assessment of the ecological status for the updated plan 2015 with the original plan 2009 is only possible to a limited extent. The changes of the assessment results are mainly due to changed requirements for the good status of the water bodies and methodological changes of the assessment or can be attributed to the variability of the values of the biological quality components.

Most surface water bodies in the international Elbe river basin district do not achieve a good chemical status. All test results for mercury in biota confirm that the environmental quality standards have not been complied with. In contrast to the Czech Republic, in Germany these results were transferred to all water bodies, this is why no German surface water body achieves a good chemical status *(Fig. 2)*.

Fig. 2: Chemical status of the surface water bodies in the international Elbe river basin district

The environmental quality standards of ubiquitous substances that are persistent, bioaccumulative and toxic (e.g. mercury) have been frequently exceeded. That's why the results for the other relevant substances on the water body level in *Figure 2* are not discernible. For this reason, the results of the chemical status of the surface water bodies without ubiquitous substances was shown in a separate illustration *(Fig. 3)*. See the river basin management plan for more information.

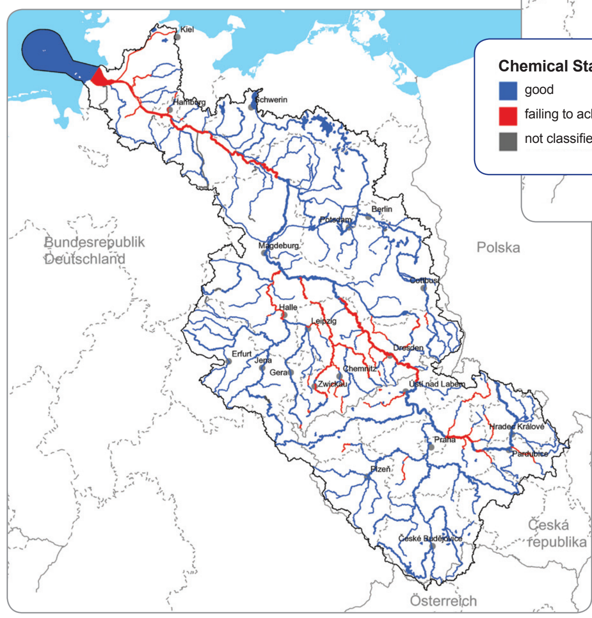

Fig. 3: Chemical status of the surface water bodies in the international Elbe river basin district - without ubiquitous substances

The designation of the water bodies from the first management period was updated. Among other things, eight joint transboundary surface water bodies have been designated along the German-Czech border. The assessment of their ecological and chemical status/ecological potential is coordinated between the countries involved.

THE UPDATED PLAN ON THE INTERNATIONAL LEVEL (PART A) MAINLY FOCUSES on the following important supra-regional water management issues, for which supra-regional environmental objectives were stipulated:

Improving surface water structure and river continuity

A natural, anthropogenically unmodified morphology of the waters widely permitting passage for aquatic organisms contributes to the achievement of the good ecological status of the water body. For this, the upstream and downstream river continuity is to be taken into consideration. In most water bodies in the international Elbe river basin these conditions still have not been met.

Supra-regional environmental objectives for improving the surface water structure:

- Re-establishing adequate habitats for aquatic organisms, lateral connectivity between rivers and their floodplains
- Recommendations according to the ICPER publications of 2013, 2014 *(p. 4)*
- Optimised and coordinated maintenance activities that aim at balanced sediment conditions in the tidal Elbe, and hydromorphologically effective river-engineering measures in order to reduce fine sediment transport in the estuary

Supra-regional environmental objectives for improving river continuity:

- The selection of the supra-regional priority water courses was slightly modified in the updated plan: The aim is to restore river continuity for migrating fish at all significant transverse structures of the Elbe river and 53 other water courses in its basin *(Table 1 and Fig. 4 – the photos show examples of transverse structures that were made passable for fish in the first management period)*.

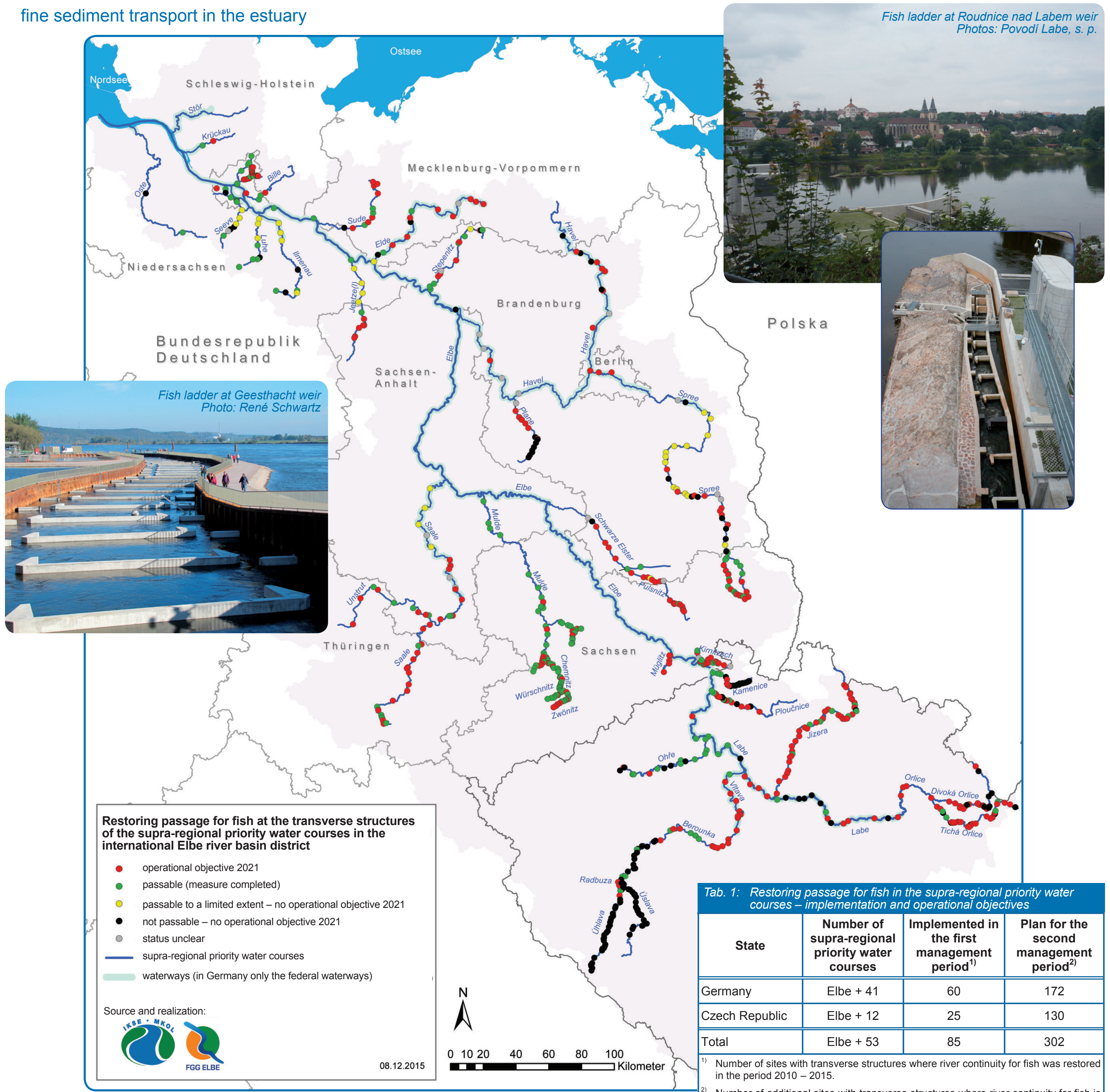

Fig. 4: Objectives for restoring river continuity for fish in the international Elbe river basin district

Tab. 1: Restoring passage for fish in the supra-regional priority water courses – implementation and operational objectives

State	Number of supra-regional priority water courses	Implemented in the first management period[1)]	Plan for the second management period[2)]
Germany	Elbe + 41	60	172
Czech Republic	Elbe + 12	25	130
Total	Elbe + 53	85	302

[1)] Number of sites with transverse structures where river continuity for fish was restored in the period 2010 – 2015.

[2)] Number of additional sites with transverse structures where river continuity for fish is to be restored in the period 2016 – 2021.

Reduction of significant substance contamination by nutrients and pollutants

Nutrient and pollutant input affects inland surface waters and groundwater and also the status of the transitional, coastal and sea waters. Reducing the impact of excessive nutrient and pollutant entry on the North Sea ecosystem is a supra-regional environmental objective that can only be achieved by implementing measures throughout the river basin.

Nutrients

Nitrogen and phosphorus entries in the Elbe river basin result in increased **formation of algae and blue green algal blooms** mainly in the area of the Middle Elbe and in the sea-going vessel deep, hydromorphologically modified tidal Elbe. Downstream of the Port of Hamburg they also contribute to an **oxygen deficit** which also affects other quality components for the classification of the ecological status. The nutrient input in the coastal waters leads to the known **eutrophication symptoms** which **endanger the achievement of the environmental objectives**. *Table 2* shows the marine ecological target concentrations for nitrogen and phosphorus at the Elbe monitoring sites Schmilka/Hřensko and Seemannshöft as annual average values.

Table 2: Supra-regional objectives and need for action to reduce nutrient input in the international Elbe river basin district	N_{tot} [mg/l]	P_{tot} [mg/l]
Data for the monitoring site Schmilka/Hřensko at the German-Czech border		
Average annual concentration for the period 2009 – 2012	4.09	0.117
Marine-ecological target concentration (annual average)	3.2	0.1
Annual average concentration expected by 2021 as a result of the Czech programme of measures	3.74	0.110
Need for further action until 2027	0.54	0.010
Data for the limnic-marine balance monitoring site Seemannshöft		
Average annual concentration for the period 2009 – 2012	3.4	0.16
Marine-ecological target concentration (annual average)	2.8	0.1
Annual average concentration expected by 2021 as a result of the Czech and the German programme of measures	3.0	0.146
Need for further action until 2027	0.2	0.046

Measures for the second management period (2016 – 2021) for reducing the **total nitrogen** water pollution**:**

- Reducing the nitrogen load of agricultural areas mainly in the form of nitrate (e.g. limiting fertilizing of unsuitable areas and in certain climatic situations such as frozen or soaked soil, establishing limits for nitrogen use per hectare of farmland, conversion of agricultural areas into grassland)
- Reducing the input into groundwater and drainage
- Intercropping, mulch seeding, retention measures and additional decrease of the nitrogen balance

Measures for the second management period (2016 – 2021) for reducing the **total phosphorus** water pollution:

- Increasing the effectiveness of phosphorus removal in wastewater treatment plants
- Improving the wastewater management in precipitation runoff events (rainwater retention)
- Setting limits on phosphorus content in dishwasher detergents (implementing the European Regulation (EU) No 259/2012 of the European Parliament and of the Council)

A realistic date for meeting the **supra-regional objectives** for the total nitrogen and total phosphorus concentrations at the Elbe balance monitoring sites is the third management period, that is to say the year 2027. Within the framework of preparing the third management cycle, it will be checked whether these long-term objectives can be achieved. Additional measures should be taken in the third management period, particularly regarding point and diffuse pollution sources as well as retaining nutrients in the river basin.

Pollutants

Trace concentrations of pollutants in surface waters may have toxic effects on animals and plants and affect human health by various pathways such as drinking water, eating fish and agricultural use of floodplains. The objectives of marine protection are endangered by a number of substances. The pollutant transfer from the entire Elbe river basin results in **substantial restrictions when dealing with sediments**, particularly in the area of the tidal Elbe.

The reasons for the contamination of the waters with heavy metals, pesticides and organic pollutants are mainly pollutant deposits from the past (inherited burdens) and contaminated sediments. Within the framework of the **"ICPER sediment management concept"** *(see also p. 4)*, a comprehensive analysis, assessment and risk analysis of the qualitative sediment conditions was conducted. The concept contains recommended actions for reducing pollutant entry. Top priority is given to **solutions at the very source and eliminating causes** or, if the actual source does not exist any longer, such as in the case of inherited burdens, **solutions near the source**.

In view of the natural conditions and for reasons of technical practicability, some requirements for reducing pollutants at the Elbe river basin cannot be fully met by 2021. There will be an ongoing review of to what extent these objectives can be met by 2027.