



Our common objective: Living waters in the Rhine catchment

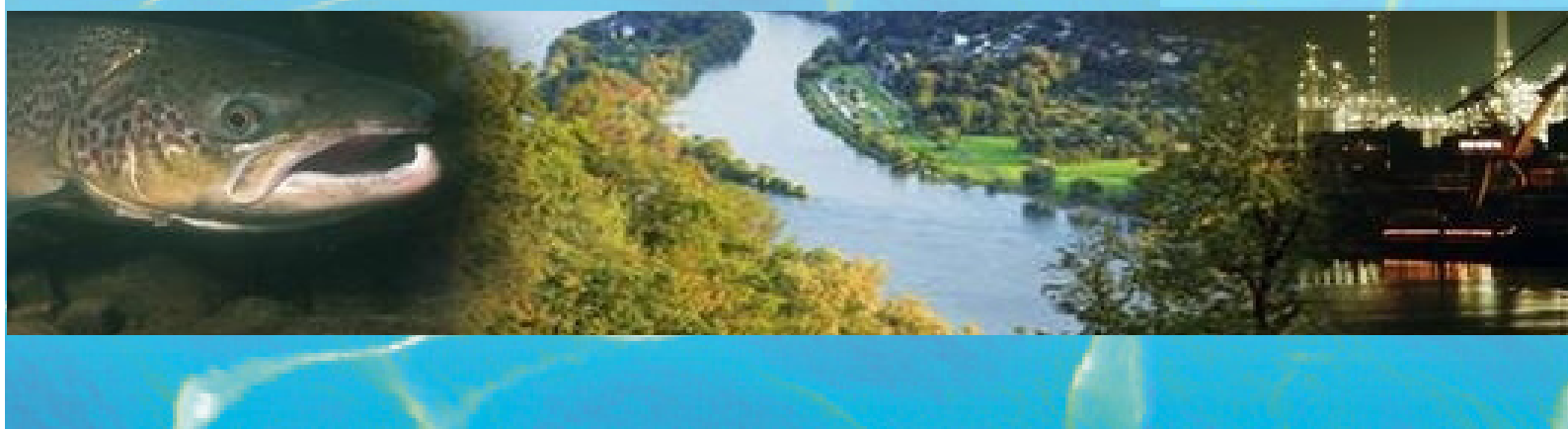
Abstract

Internationally Coordinated Management Plan Part A

Internationale
Kommission zum
Schutz des Rheins

Commission
Internationale
pour la Protection
du Rhin

Internationale
Commissie ter
Bescherming
van de Rijn



International Cooperation Targeted at Ecologically Intact Waters

Water is essential for man, animals and plants. Therefore, it must be placed under particular protection. By means of the **European Water Framework Directive (WFD)** in force since 2000, the Member States of the European Union aim at protecting water on a high level. This applies to groundwater, rivers, lakes and coastal waters. The target for all water bodies is to achieve a good status. By 2015 they are not only to be clean, but ecologically intact.

The WFD requires close cooperation and coordination for natural river catchments within the European Union and beyond national frontiers.

Switzerland, France, Germany, Luxembourg, the Netherlands and the EU Commission have been cooperating in the **International Commission for the Protection of the Rhine (ICPR)** for 60 years already. Along the Alpine Rhine and Lake Constance as well as along the rivers Moselle and Saar, transboundary coordination has been normal for a long time. Due to the WFD and in order to cover the entire catchment, cooperation within the ICPR has been extended to Austria, Liechtenstein and the Belgian region Wallonia.

In December 2009, the states in the catchment presented the **first international management plan for the Rhine** drafted in common. It was published on the ICPR website (www.iksr.org). Together with the programme „Rhine 2020“ it constitutes the basis for future work in the Rhine catchment.

The Rhine – multiple uses but a living river

The Rhine figures among Europe's most intensively used rivers. In spite of these uses, water quality and ecology are constantly improving.

Water quality

As a result of the investments of the states, municipalities and industry in the 200,000 km² catchment area, water quality has considerably improved. More than 96 % of the 58 million inhabitants of the Rhine catchment are today connected to wastewater treatment plants and many industrial sites dispose of modern wastewater treatment plants. The effects of air-borne diffuse water body pollution or pollution eroded from the soil continue to be problematic. **Phosphorous** and above all **nitrogen contents** in excess affect the biological quality of water bodies, particularly in the marine environment (Dutch coast, Wadden Sea).

In the Rhine catchment, the following **pollutants** are locally or wide spread in excess of the threshold values called **environmental quality standards (EQS)**:

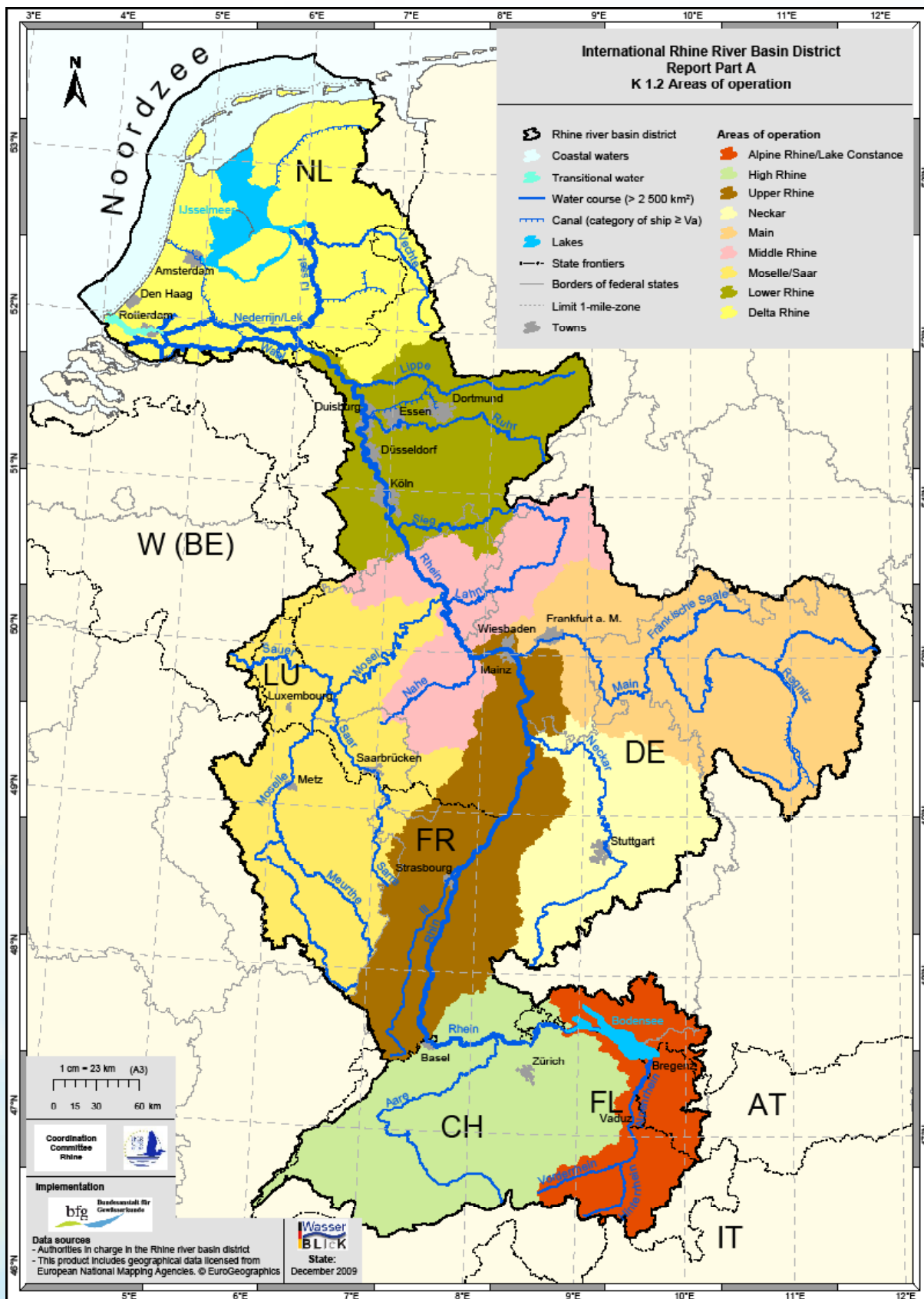
- **Heavy metals** such as **zinc and copper** e.g. from buildings and roads, as well as **cadmium**
- **Polychlorinated biphenyls (PCB)**, e.g. from transformers and hydraulic fluids and **polycyclic aromatic hydrocarbons (PAH)**, e.g. from combustion plants and which are measured everywhere in the Rhine
- **Bentazone, dichloroprop, tributyltin, pentachlorobenzene, diurone, brominated diphenylethers, hexachlorobutadien**. These substances are, among others, plant protection agents, conservation agents or industrial chemicals.

In 12 % of the water bodies of the main stream of the Rhine the **chemical status** is good, in 88 % it is not good. In most cases, the cause is PAH exceeding the environmental quality standards..

Groundwater

On the whole, the **quantitative groundwater status** in the Rhine catchment can be said to be good, which means that there is no abstraction in excess. Due to draining measures, the status in the brown-coal mining are along the Rhine is bad.

Apart from certain groundwater bodies with a bad status, the **chemical status** of groundwater bodies is largely good. The reasons for this classification are the nitrate pollution due to fertilization in agriculture and intensive livestock keeping as well as inputs of plant protection agents.



Survey of the IRBD Rhine with the network of waters >2,500 km² and its division in nine areas of operation

The Rhine and its tributaries as habitat for fauna and flora

Eight hundred km of the Rhine between Rotterdam and Basel are navigable. From Iffezheim (Upper Rhine) to the North Sea estuary, the Rhine flows freely without obstacles. Between the outlet of Lake Constance and Iffezheim there are 21 dams serving hydropower generation. Further upstream, in the Alps and their foothills there are numerous reservoirs and barrages; during power consumption peaks, the hydropower plants often regulate the water supply according to the need for power supply ("hydropeaking operation"). Apart from disturbing river continuity, the surge effects of hydropeaking operation are further pressures on flora and fauna.

There are more than 100 barrages (often combined with hydropower plants and shipping) with barrage locks in the Neckar, Main, Lahn and Moselle tributaries.

The still natural upper reaches or stretches of tributaries, the coastal waters and the Wadden Sea covering about 10 % of the overriding network of water bodies in the Rhine catchment make an important contribution to water ecology. Due to man-made changes, the remaining 90 % can only to a limited extent fulfil their ecological function as habitat for flora and fauna. However, step by step, they can be ecologically further developed.

Biological diversity in the Rhine

Biological inventories of the state of flora and fauna in the Rhine have been carried through, which were subsequently compared to earlier **investigations**.

According to these inventories the **fish** species composition in the Rhine is almost complete: Together with the three existing trout varieties (lake trout, sea trout, brook trout) and non-indigenous species, 67 fish species were detected. Thus, all historically identified species except for the Atlantic sturgeon have returned.



Sea lamprey. Photo: U. Weibel

Improved river continuity and the protection of habitats attract more and more **migratory fish** returning from the sea for reproduction.

The **macrozoobenthos** (invertebrates living on the river bottom) in the Rhine is closely linked to the substance pollution of the river water. Due to improved water quality it has recovered to such an extent that 560 species have been inventoried. Many species characteristic of the river which were extinct or considerably diminished in the Rhine have returned. However, many species are still absent.

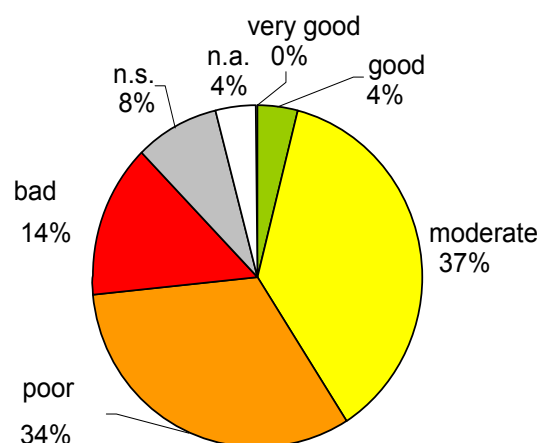


Mayfly. Photo: B. Eiseler

On the other hand, **invasive species** - species which have immigrated to the Rhine catchment - often spread at the expense of the indigenous fauna. Apart from numerous invertebrate species, even some fish species, among others from the Black Sea area have been detected.

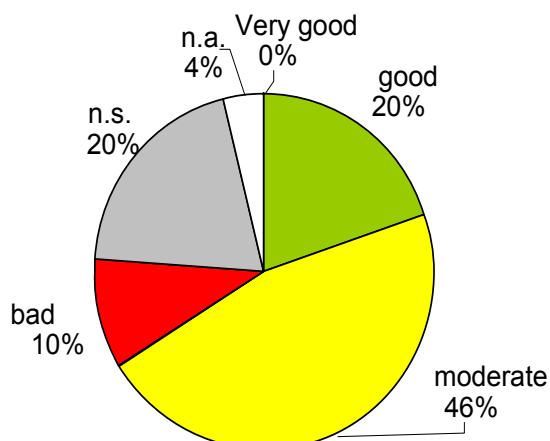
All in all, 36 water plant species (**macrophytes**) and 269 fixed diatom species (**phytobenthos**) have been inventoried in the Rhine.

Present ecological state or potential of the water bodies



The present **ecological state of the main stream of the Rhine** shows that 4 % of the water bodies are classified as good, 37 % as moderate, 34 % as poor and 14 % as bad. By 2015, this situation should have considerably improved.

Expected ecological state resp. ecological potential of water bodies in 2015



Common objectives - measures

Restore continuity

Migratory fish are at the same time **pilot and indicator species** for the living conditions of numerous other organisms.

To survive and spread, **migratory fish** such as salmon, sea trout, sea lamprey, allice shad and eel which spend one phase of their life in fresh water and one in salt water, require free migration as an essential condition. Salmon hatch in fresh water, they migrate into the sea and return to reproduce in fresh water. For eel it must be granted that 40 % of the silver eel succeed their downstream migration into the sea for reproduction.

As far as the **Lake Constance lake trout** is concerned, which is the indicator species for the region of the Alpine Rhine and Lake Constance, a separate Lake Trout Programme is under implementation.

The states in the Rhine catchment strive to progressively restore **river continuity in the main stream of the Rhine as far as Basel** and in certain programme waters.

The „**Master Plan Migratory Fish Rhine**“ has been drafted with a view to achieving this target (see www.iksr.org – Report no. 179): In order to build a self-sustained stock of salmon and lake trout, access to a maximum number of identified spawning and juvenile habitats in the Rhine catchment must be restored or these habitats must be re-vitalised. Additionally, among others the possibilities of upstream migration must be improved. On the whole, with these measures a total of more than 1,000 ha of spawning and juvenile habitats are supposed to be opened in the Rhine catchment area.

The most important fields of action in the main stream of the Rhine and major tributaries will be:

- Improve fish migration at the Haringvliet sluices and at the closure embankment of the Lake IJssel
- The two dams in the Upper Rhine upstream of Gamsheim (Strasbourg by 2015, work in Gerstheim to begin before 2015 in order to open the way into the Elz-Dreisam system in the Black Forest)
- Improve existing fish passages at 4 dams on the High Rhine, a new construction is planned for the Rheinau dam
- Several big dams in the navigable tributaries Moselle (19), Main (6), Lahn (20), Neckar (3), etc.

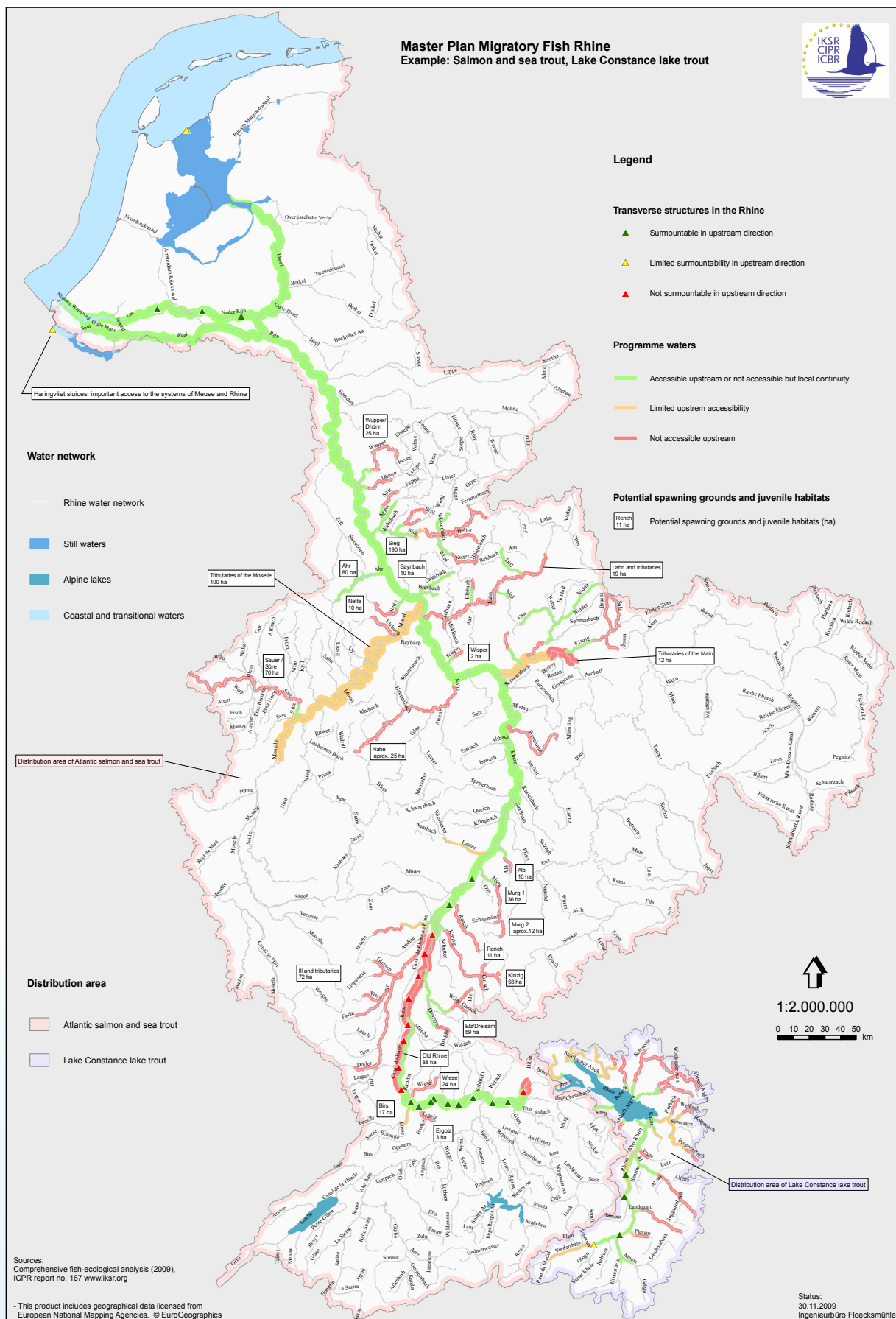
In addition, several hundreds of individual measures will be implemented at smaller barrages in suitable tributaries where the most spawning habitats are found..

Increase habitat diversity

Species diversity may be increased by increasing structural diversity in the river bed and on the river banks. Water maintenance must be environmentally compatible. These measures will contribute towards opening up further habitats for the flora and fauna living in the water, on its banks and in the floodplains. By 2015, various measures will have been implemented along the main stream of the Rhine, in the old bed of the Rhine, along the big navigable tributaries Moselle, Main, Neckar and along R. Lippe, as well as in many smaller waters in the Rhine catchment.

Further reduce nutrient and pollutant load

Mainly with a view to improve the marine environment, a reduction of the load of **total nitrogen** by 15 to 20 % as a result of reduction at source is targeted. Measures already implemented will be taken into account. A reduction of input by 10 to 15 % by the first cutoff year according to WFD, 2015, is considered to be achievable.



Largely, zinc and copper inputs are of diffuse origin. For some applications, environmentally friendly alternatives are imaginable (e.g. construction sector, car components, antifouling, treatment of animal's hoofs). No further direct **PCB** inputs are known. Former PCB pollutions still exist in water sediments and may be released during flood surges or dredging. These pollutions must be rehabilitated to the extent possible. Since **PAH** mainly get into waters as diffuse air-borne pollution, no considerable improvement is expected by 2015 for this group of substances and thus for the chemical status of the water bodies concerned.

Harmonize water use and environmental targets of the WFD

Water uses for the purpose of drinking water production, water supply for agriculture and industry, for navigation, inland fishing, recreation and tourism must be harmonized with the protection of the Rhine ecosystem. During the implementation of the Rhine Action Programme, the exchange of information with drinking water works, industry, navigation and ports was intensive. Since 1998, non-governmental organizations (NGO) with observer status in the ICPR actively participate in the work of the ICPR and followed the different working groups drafting of the Management Plan.

Aspects of climate change

Since 2007, the ICPR is recording the impact of eventual climate change on the water household and on water temperatures of the Rhine.

According to present knowledge, air temperature has risen by about 1 °C during the past 100 years and precipitation in the Rhine catchment has increased. The glaciers of the Alps continue to retreat. There is a tendency towards more humid winters and drier summers accordingly impacting water discharge. The Rhine water temperature has risen by about 1°C to 2.5°C but it is also impacted by cooling water discharges.

During the years to come, the ICPR will work on harmonized adjustment strategies with respect to floods and draughts, water temperature, water quality and ecology in the Rhine catchment. These strategies will be part of the second international Management Plan.

Further information

The coordinated Management Plan for the overriding Rhine catchment - part A, the reports of the sub-basins/ areas of operation and the links to the websites of the States and Regions/Federal States with the detailed management plans are to be found on the ICPR website www.iksr.org.

Austria: wisa.lebensministerium.at; www.vorarlberg.at

France: www.eau2015-rhin-meuse.fr

Germany:

Baden-Württemberg: www.wrrl.baden-wuerttemberg.de

Bavaria: www.wrrl.bayern.de

Hesse: www.flussgebiete.hessen.de

Northrhine-Westphalia: www.flussgebiete.nrw.de; wiki.flussgebiete.nrw.de

Lower Saxony: www.nlwkn.de

Rhineland-Palatinate: www.wrrl.rlp.de

Saarland: www.saarland.de

Thuringia: <http://www.thueringen.de/de/tmlfun/themen/wasser/flussgebiete/oea/bewirtschaftung/daten/>

Liechtenstein: www.llv.li/amtstellen/llv-aus-wasserwirtschaft.htm

Luxemburg: www.waasser.lu

Netherlands: www.kaderrichtlijnwater.nl

Region Wallonia: <http://environnement.wallonie.be>

Switzerland: www.bafu.admin.ch/wasser

Further background information is available on the websites of the ICPR (www.iksr.org), the IKSMS for the international Moselle-Saar district (www.iksms.de) or of the IGKB for Lake Constance (www.igkb.org).

Outlook

Within the framework of their good and trusting cooperation the states will exchange information on the measures implemented. The next management plan according to the WFD will be drafted by end 2015.



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